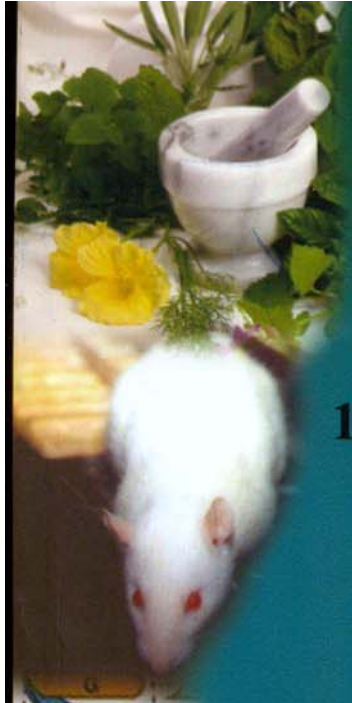

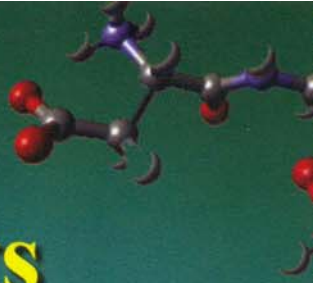

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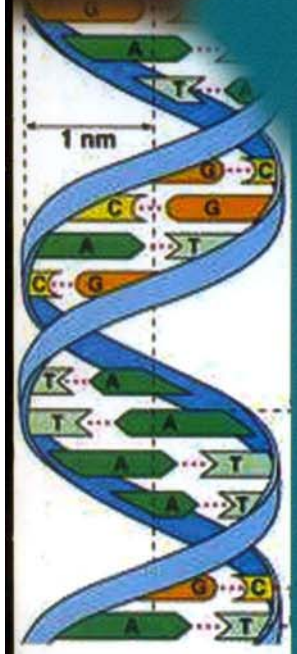
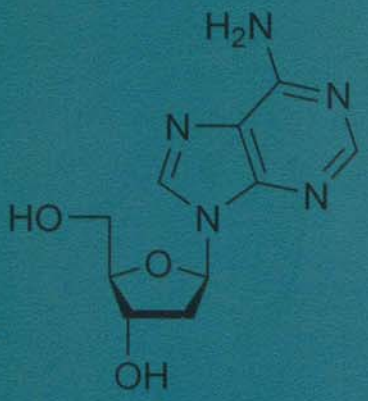
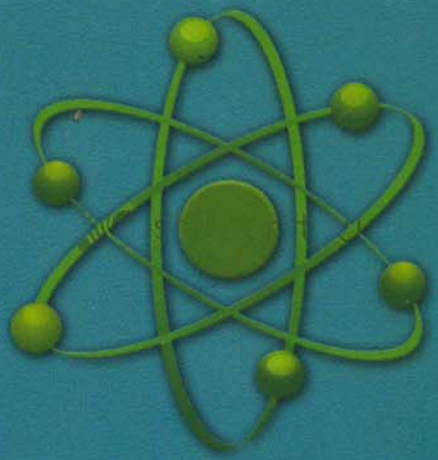
Perspective and Challenges in Chemical and Biological Sciences:
Innovation Cross Roads







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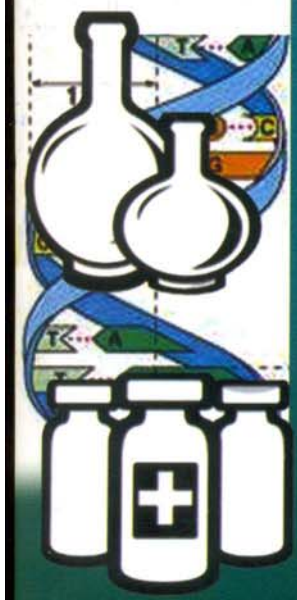

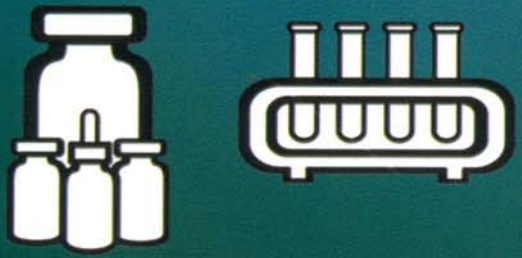

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Venue
IASST, Vigyan Path, Paschim Boragaon, Garchuk,
Guwahati- 781035, Assam

First Impression-2012

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Published by:

Institute of Advanced Study in Science and Technology (IASST)
PaschimBoragaon, Garchuk, Guwahati-781035, Assam, India
E-mail: director2iasst.in, Website: www.iasst.in

Printed by
Agragami Printers
Panbazar, A. R. B. Road, Guwahati1

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Conference Time Schedule

28 th JAN 2012

Registration: 1.00PM — Lobby (IASST)
Inaguration: 4.00PM — Hall-1(Main pendel)
Tea break: 6PM
Technical Session -I
6.30 PM-7.00 PM — PL 1 -Prof Mike Threadgill.
Palladium- catalysed couplings in the synthesis of isoquinolin-1-ones and 1,6-naphthyridin-5-ones, inhibitors of poly(ADP-ribose)polymerases (PARPs)
6.00 PM-6.30 PM-Poster session -I
Cultural program: 7.00-8.00PM
Dinner: 8.00-9.30PM

29 th JAN 2012

Registration: 8.30-9.00AM
Special session - OIL- Hall-1 (Main pendal)
9.00AM — Inaugural address by Mr. N.M. Borah
Chairman and Managing Director, OIL
10.30AM — Keynote address by Sri S. Rath
Director (operation): Exploration Challenges in the North East

11.00AM — Tea Break
Technical Session -II — Hall-1 (Main pendal)
12.00 PM — PL 2 - Prof D Spinelli

On the Diastereoselective Oxidation of 8-(4-Bromophenyl)-8-ethoxy-5-methyl-8H[1,4]thiazino[3,4-c][1,2,4]oxadiazol-3-one: a Combined Experimental and Computational Investigation

12.30 PM — PL3 -Prof K. P. Gopinathan
Biodesigning of a silk production unit

1.00 PM — PL 4 -Prof A Chattopadhay
Chemical Approaches to Nanotechnology

1.30-2.30 Lunch + Poster session -II

Technical Session III Hall-I	**Technical Session IV Hall-II**
2:30 PM IL1 -Dr W Abdou Sulfur and Nitrogen Containing Bisphosphonic Acids are a corner stone for Calcium-Related Disorders and their Role in Oncology	IL4 - Dr. S K Maulik First track translational research in medicinal plants for cardiovascular diseases (CVD) in India: a need of the hour
2.50 PM IL2- Dr. S Kabilan Synthesis, Structural Characterisation And Biological Evalution Of Some Heterocyclic Compounds With Nitrogen And Sulfur.	IL5 - Prof P Goswami Advances in biosensor research: Nano-materials as electroactive matrix for developing enzyme-based biosensors

3.10 PM IL3 - Prof A Saikia Novel Synthetic Approaches for Heterocyclic Compounds	IL6 - Dr R Rajkhowa Advances in silk Research
3.30 PM OL1 Dr. Brajesh Kumar Ultra-sound promoted one-pot synthesis of 2-aryl-1-arylmethyl-1H-benzimidazole derivatives in aqueous media: an ecofriendly and regioselective approach	OL5 Dr Brijesh Kumar Mass finger printing studies of Berberis petiolaris plant parts using DARTMS and Q-TOF LCMS (HRMS) instruments and their PCA analysis
3.40 PM OL2 Dr. Jyotirekha G Handique Phenolic Antioxidants of Synthetic and Natural Origin: A Dendritic Approach	OL6 Dr. Ratul Saikia Molecular phylogeny and detection of chitinase genes in Streptomyces isolated from tea rhizo-sphere
3.50 PM OL3 Dr. Pranjit Barman Synthesis of substituted 2-(N-aryl) aminobenzothiazoles via an intramolecular cyclization of corresponding symmetrical thioureas using tetrabutylammonium tribromide (TBATB) as brominating agent.	OL7 Dr. L. Rupachandra Singh Isolation And Partial Characterization Of Antheraea Proylei (J.) Sericin Having Potential Application As A Biomaterial
4.00-4.10 PM OL4 Dr.R. I. Kureshy Chiral Metal Complexes Catalyzed Various Asymmetric Organic Transformations	OL8Dr. Bela Keshan Developmental and tissue specific variations in hsp90 and vitellogenin mRNA expressions under heat stress in silkworm, Bombyx mori
4.10-4.20 PM TEA	
Technical Session V Hall-I	Technical Session 6 Hall-II
Chairperson: Rapoeteur:	Chairperson: Rapoeteur:
4.20 PM IL7 -Prof A K Prasad Novel Anti-inflammatory Molecules from Piper Species	IL10 -Dr M Ramanathan New drug development targeting androgen receptor to treat prostate cancer
4.40PM IL8 -Dr PP Sood Herbal Therapy Needs Adjubants	IL11 -Dr SS Cameotra Soil Microbes Population Identification for Sweeping the Residual Pesticides Load from the Soil and Aqueous Environment
5.00PM IL9 -Prof A Dandia Synthesis at the Interface of Chemistry and Biology: Mother Nature's Own Solvent as Chemical Enforcer.	IL12 -Dr TC Bora Bio-prospecting and bio-profiling microbial resource: a report from North East Gene pool
5.20PM OL9 - Dr.D. N. Singh Novel bis-iridoid-S-methythiocarbonate from the aerial part of Saprosma fragrans	OL 14 -Dr.Laxmikant S. Badwaik Effects of Fermentation on Neutraceuticals and

5.30PM OL 10 -Dr.Manjit K. Bhattacharyya Solid and Solution Structures and DNA binding properties of [MII(4-CNpy)2(SO4)(H2O)3].H2O for M = Cu, Co, Ni	Probiotics in Edible Bamboo shoots of Assam OL 15 -Dr. Bibhuti B. Kakoti Antitumor and Antioxidant status of Ervatamia coronaria leaves in experimental animal models
5.40PM OL11 -Dr. R. B. Pareek Anti-microbial activity of the constituents of Hygrophila auriculata (K.Schum) Heine	OL 16 -Dr. Mukamchem Yim Role of Herbal Drugs in the Managements of Bronchial Asthma
5.50PM OL12 -Dr.Okram Mukherjee Singh Investigations on certain medicinal plants used as traditional folk medicines in Manipur	OL 17 -Dr. Sobha gupta The Role Of A Herbal Compound In The Management Of Essential Hypertension - Clinical Study
6.00PM OL13 Dr Raghuvir R. S. Pissurlenkar Discovering New Leads For Alzheimer's Disease That Target Aectylcholinesterase Using Pharmacophore Model Guided Docking Protocol	OL 18 Dr.Anju Agrawal Antioxidant Potential Of Natural Products
6.00-6.45PM POSTER SESSION III	

7:00-8:00pm-Cultural program
8:00-9:30pm-Dinner

30th January 2012
Technical Session -VII Hall-I
09:00AM PL5 -Prof G Athina

2-Heteroarylimino-5-benzylidene-4-thiazolidinones as Dual COX/LOX inhibitors and new inhibitors of matrix metalloproteinase-13

09:30AM PL6 -Prof Peter A. Beal
Nucleic Acid Chemical Biology: Studies in RNA interference and RNA editing
10:00AM PL7 -Prof OK Medhi
Metal Based Anticancer Drugs
10.30AM PL8 -Dr RC Baruah
Some strategies for molecular modification of steroids

11.00AM-11.15AM TEA

Technical Session VIII Hall-I	Technical Session II : Hall-II
11:15 11:15AM IL 13 -Dr TS Basu Baul Structure-based design and synthesis of a novel series of new organotin(IV) 2-/4-[(E)-2-(aryl)-1-diazenyl]benzoates endowed with anticancer activities.	IL16-Dr SM Babu Design, synthesis, biological activity of novel sulfonamide derivatives
11:35AM IL14 -Dr O Mukh Singh	IL17 -Dr SB Katti Thiazolidine-4-ones: A new class of Antihyperglycaemic Agents

11:55AM IL15 -Prof B Dinda	IL18 -Dr A K Dwivedi
12:15 OL19-Dr. Kula Kamal Senapati Study on the Degradation of Methylene blue in Water using CoFe2O4-Cr2O3-SiO2 as Photocatalyst by Liquid Chromatography Electrospray Ionization Quadrupole Ion-Trap Mass Spectrometry	OL24 Dr.Subrata Borgohain Gogoi An Eco Friendly Alkali Solution For Enhanced Oil Recovery
12:25 OL20 Prof. Dibakar Chandra Deka Prospects of Biodisel Industry in the Northeast of India	OL25 Dr. Bisnhu Prasad Sarma HERBS From North-Eastern India In The Management Of Type - 2 Diabetes Mellitus
12:35 OL21 Dr.D. Sinha Effect of Gamma Irradiation on Polycarbonate Polymer	OL26Dr. Manash R. Das Metal-graphene composites materials and its role in antimicrobial activity
12:45 OL22 Dr.Prasenjit Saikia (Studies on Ignition Temperatures of NER Coals: A Thermogravimetric Approach 209)	OL27 Dr. L.N. Kakati Rearing potentiality of certain lesser known wild silk moth species in Nagaland, India
12:55 OL23-Dr. BP Baruah Coal-based industries in NER India: study of emission characteristics	OL28 -Dr.Mohamed A. Gad Role of Siderophore Production in Biological Control of Rice Fungal Pathogens by Plant Growth Promoting Rhizobacteria
1.05-2.00PM LUNCH+ POSTER SESSION - IV Technical Session X Hall-I Chairperson : Rapoeteur :	 Technical Session XI Hall-II Chairperson : Rapoeteur :
2.00PM IL19 -Dr N Deka Metabolism, Metabolic Activation and Drug Toxicity	IL22-Dr B Medhi Comparative Study to assess Ankle Edema following of Aryl Dihydropyrimidone (PRA 6) and Amlodipine in Experimental Model of Rats
2.20PM IL20 -Dr A Goswami Strategic Use Of Biocatalysts In Chiral Synthesis Of Value Added Products	IL23 -Dr P Chattopadhay Toxicity of T-2 Trichothecenes
2.40 IL21 -Dr NC Barua Herbal Drug Development from North East Resources 3.00 OL 29 -Dr. Upasana Bora Sinha ETHYLTRIPHENYLPHOSPHONIUM TRIBROMIDE - A VERSATILE NEW REAGENT (141)	IL24 -Dr N Sinha A Novel Approach for Testing Teretogenic Potential of A New Chemical Entity OL33 Dr Ruby Deka Role of Murraya koenigii in the management of diabetes mellitus

3.10 OL30 -Dr.Rimki Bhattacharjya Catechol (1, 2-Dihydroxybenzene) Encapsulated Charged Surfactant Film Modified Electrode For The Detection Of Vitamin C	OL34 -Dr.P Mishra Nutraceutical properties of Amla & its processing wastes and microwave assisted extraction of polyphenol by using response surface methodology
3.20 OL31 Dr.A. Idhayadhulla Imidazolidin-2,4-dione: Structure-activity relationship and stereo chemical approach 163)	OL35 Dr. Bijit Das Natural cure for Chikunguniya
3.30 OL32 Dr.Mridul Chetia Depth wise distribution of Arsenic in Groundwater of Golaghat, Assam (182)	OL36 Dr. Dilip Kr. Goswami Rasayana: The Unique Concept of Ayurveda for health and wellness.
3.30-3.45 TEA	
Technical session -XII Hall-I	Technical session-XIII Hall-II
3.45PM IL 25 -Dr E Coutinho eCoRIA: A novel 3D-QSAR approach for studying thermodynamic events involved in ligand-receptor interaction	IL27 -Prof A Shah Diversity oriented synthesis and antitubercular activity of selected heterocyclic libraries
4.05 IL26 -Dr PK Srivastava Mass Spectrometry: A Fast Emerging and Promising Analytical Technique	IL28 -Dr PMS Chauhan Perspectives and Challenges in Drug Research: Design and Synthesis of Nitrogen Heterocycles as Novel therapeutic Agents
4.25 OL 37 -Dr.N. H. Khan Asymmetric Cyanation Reaction Catalyzed by Chiral Catalysts	OL 40 Dr. Huidrom Rosyna an impact of panchakarma therapy in north east region - a study in govt. ayurvedic college & hospital, guwahati
4.35 OL38 Dr. Anand Kumar Arya A domino synthesis of structurally diverse heterocycles with medicinally privileged heterosystems	OL41Dr. Nandita Chakraborty Glutathione S-Transferases (Gstt1&Gstm1) Polymorphism In Mizo Population Of North East India
4.35 OL39 Dr. Jeetendra kumar nag Translation initiation factor-1 of Wolbachia, the endosymbiont of Brugia malayi: Molecular characterization	OL42 Dr. Ganesh Prasad Gupta Role Of A Herbal Compound In The Management Of Bronchial Asthma - A Clinical Study
4.35-5.30 pm POSTER SESSION-V	

5.00-6.00 pm Veledictory Function- Hall I
7.00-9.00 pm- Dinner

POSTER SESSION

28th Jan - 2012-
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29th Jan,2012
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1:30-2:30 pm POSTER
SESSION - 2
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Display -4:00 pm ONWARDS
6:00-6:45 pm **POSTER SESSION-3**
P-101-150

30th Jan, 2012
Display 8:30 am ONWARDS
1:00-2:00 pm **POSTER SESSION-4**
P-151-200
Display 3:30 pm ONWARDS
4:35-5:30 pm **POSTER SESSION-5**
P-201.....

From the desk of
ISCB President and General Secretary

Prof. Anamik Shah

Dr. P.M.S. Chauhan

The process of drug research has become more difficult, risky and expensive due to very tight regulatory parameters. To make a break through in this area a close interaction between the scientists and technologists in the area of chemistry and biology is highly desired. With this view in mind Indian of Society Chemists and Biologists is making consistent efforts to encourage interdisciplinary research activities in the field of chemistry and biology. Indian Society of Chemists and Biologists is unique in the sense that it promotes multidisciplinary research as compared to several scientific societies in the individual capacity with confined objectives. During the past the society has been very successful in achieving the targets.

We are extremely happy that 18th International Conference (Post ISCBC-2012), "Perspective and Challenges in Chemical and Biological Sciences" to be held at Institute of Advanced Study in Science & Technology (IASST), Guwahati ,Assam.We are glad that the scientific committee is bringing out an abstracts book covering the presentation to be made during Post ISCBC-2012. Our sincere thanks are due to the members organizing committee. During this conference a number of eminent scientists and technologists of the country and overseas will be discussing the trends, prospects and future directions of research. We look forward to fruitful deliberations in extremely interesting areas of scientific research. We are happy that an extensive and comprehensive scientific program is arranged. The scientific program beside inaugural function includes plenary lectures, invited lectures by the eminent scientists from India and abroad.Oral presentations by the young researchers are scheduled. The most heartening feature of the conference is that it is being participated with a number of young scientists and Ph. D. students and presentations are schedules in poster sessions. We are looking to the galaxy of speakers and young participants who made this conference a memorable event. We extend our warm welcome to all national and International delegates from pharmaceutical companies, research organization, universities and academic institutes wish them very happy stay at Guwahati ,Assam. Now Finally I take this opportunity to express my sincere thanks and gratitude to members and office bearers of organizing committee of post ISCBC-2012.

(Prof. Anamik Shah)
President, ISCB

(Dr. P.M.S. Chauhan)
General Secretary ISCB

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PLANARY LECTURE (PL)

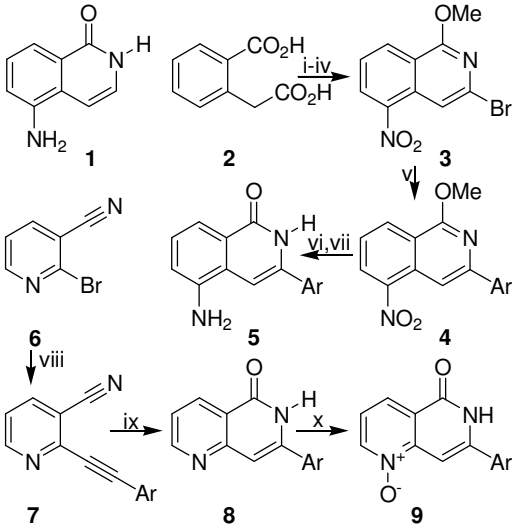
PL1

Palladium-catalysed couplings in the synthesis of isoquinolin-1-ones and 1,6-naphthyridin-5-ones, inhibitors of poly(ADP-ribose)polymerases (PARPs)

Michael D. Threadgill*, Helen A. Paine and Katerina Kumpan

Inhibitors of PARP-1 are of use in the treatment of cancer.[1,2] Several are already in clinical trial. Building on our water-soluble lead inhibitor 5-AIQ **1**,[3] we sought to introduce aryl groups at the 3-position (in **5**) and to replace the weakly basic amine of **5** with heterocyclic nitrogen in **8**. We have developed efficient general synthetic routes to these targets using Pd-catalysed couplings.

3-Aryl-5-AIQs have been synthesised *via* Hurtley couplings[4] but these are very limited in scope. Approaching **5**, the strategy was to carry out Suzuki couplings on a 3-haloisoquinoline, with a masked lactam and a nitro group which would form the 5-NH_2. Homophthalic acid **2** was transformed into **3** in four steps. Suzuki couplings with a wide range of arylboronic acids efficiently provided 3-arylisoquinolines **4**. Preserving the solubilising lactim ether, **4** was first reduced with hydrogen and Pd catalyst; finally, the lactam was exposed by demethylation to afford excellent yields of the target 3-aryl-5-AIQs **5**. The core step in assembly of **8** was Sonogashira coupling of arylethynes to the 2-bromopyridine **6** (prepared in three steps from the chloro analogue), giving **7** in good yields. Hydration and 6-*endo*-dig cyclisation gave **8**. Examples were converted to their N^1-oxides; the location of the oxygen was determined by ^{15}N-^1H HMBC NMR. Examples of **5**, **8**, **9** were evaluated for inhibition of several isoforms of PARP.



Scheme 1. Structure of **1** and synthesis of **5**, **8**, **9**. *Reagents*: i, urea Δ; ii, $POBr_3$; iii, HNO_3, H_2SO_4; iv, NaOMe; v, $Ar(B(OH)_2$, Pd_2dba_3, SPhos; vi, H_2, Pd/C; vii, HBr; viii; ArC≡CH, $(Ph_3P)_2PdCl_2$, CuI; ix, H_2SO_4; x, urea.H_2O_2, $(CF_3CO)_2O$.

This project is supported by AICR and the University of Bath.

Medicinal Chemistry, Department of Pharmacy & Pharmacology, University of Bath, Claverton Down, Bath BA2 7AY, UK

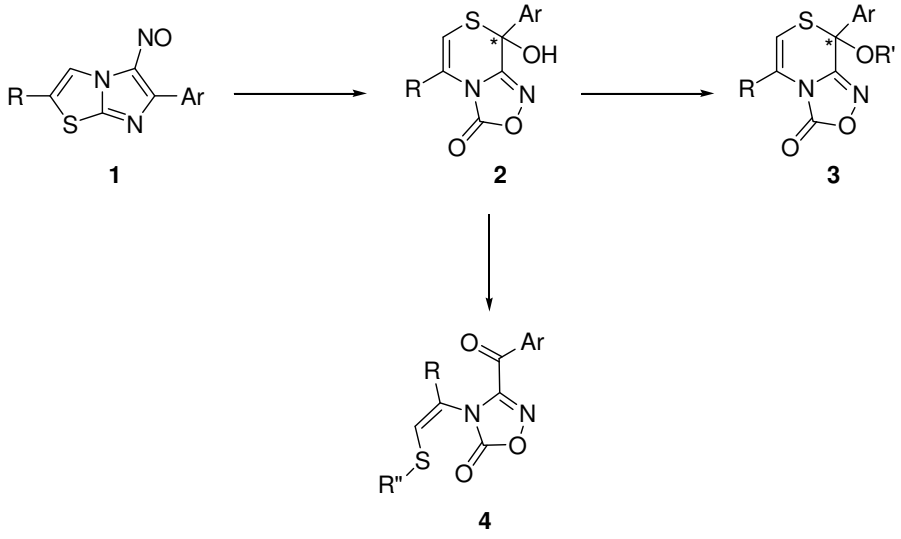
m.d.threadgill@bath.ac.uk

PL2

From 6-aryl-5-nitrosoimidazo[2,1-*b*][1,3]thiazoles to 8-aryl-8-hydroxy-8*H*-[1,4]thiazino[3,4-*c*][1,2,4]oxadiazol-3-ones: a new class of compounds showing a variegate reactivity and an interesting biological profile

Barbara Cosimelli[1] and Domenico Spinelli[2]

In the lecture a series of new reactions involving nitrosoimidazoles condensed with five- (1) or six-membered (2) rings will be described. Thus, 6-aryl-5-nitrosoimidazo[2,1-*b*] thiazoles **1** by treatment with hydrochloric acid provided *via* a ring-opening/ring-closing sequence the relevant 8-aryl-8-hydroxy-8*H*-thiazino[3,4-*c*]oxadiazol-3-ones **2** (1), a new class of compounds with interesting chemical reactivity and biological profile.
As a matter of fact compounds **2**, which contain a hemithioacetal cyclic structure, can react with alcohols in the presence of *p*-toluensulfonic acid giving the corresponding thioacetals, 8-aryl-8-alkoxy-8*H*-thiazino[3,4-*c*]oxadiazol-3-ones **3** (3), or with silver nitrate and reactive organic halide (haloalkanes, allylic and benzyl halides, and so on) furnishing the relevant 3-aryl-4[(*Z*)-1-methyl-2(alkylsulphanyl)-vinyl]-oxadiazol-5(4H)-ones **4** (4).



Scheme 1

Compounds **2** (5), **3** (3), and **4** (4) show interesting pharmacological activities: several of them showed a significant activity as L-type Ca^{2+} channel blockers (LTCCBs), some time more potent than diltiazem. The role of the substituents in the aryl moiety (3 5) and that of the chain in the acetal (5) as well as in alkylsulphanyl (4) groups have been evaluated and a virtual receptor scheme was derived for the binding site. Starting from this 3D QSAR model, virtual screening procedures were performed with the aim of identifying novel chemotypes for LTCCBs, starting from databases of purchasable compounds (6 7).
Moreover by examining the behavior of some **2** and **3** we have identified (8) some compounds able to contrast the phenomenon of multidrug resistance.

[1]*Dipartimento di Chimica Farmaceutica e Tossicologica, Università degli Studi di Napoli 'Federico II' (Italia)*
[2]*Dipartimento di Chimica 'G. Ciamician', Alma Mater Studiorum, Bologna (Italia)*
domenico.spinelli@unibo.it

PL3

Biodesigning of a silk production unit

K.P.Gopinathan

The mulberry silkworm *Bombyx mori* has been exploited for thousands of years for the commercial production of silk. India being the second largest producer of silk in the world, provides a means of livelihood to nearly 6million farmers through this agro-based cottage industry. Although mulberry silk accounts for more than 90% of the silk marketed , three other variants of silk, *viz.* Eri, Muga and Tasar derived from semi-domesticated or wild silk moths are also important commercial products. The molecular aspects of silk synthesis have been extensively studied in *B.mori*. This organism possesses a pair of silk glands, which are long tubular structures originating from the labial segment of the larval head and extending up to the posterior most caudal segment. The silk glands are anatomically and physiologically divided into three distinct compartments. The posterior parts of the silk glands (PSG) produce large quantities of the silk fibre proteins which are secreted into the lumen and gets transported and stored in the middle silk glands (MSG). MSGs are further sub compartmented into three parts, and each of them produce different splice variants of the glue proteins, sericins, which coat the fibroins in different layers. The sericins being highly hygroscopic, abstracts the water molecules from the fibroins to bring them to the surface so that when the highly polymerized silk proteins are extruded, the water molecules evaporate to make the filaments dry. The molecular designing and patterning of the silk glands , which are the factories for silk production within the silkworm larvae, have been elucidated by our group. The operation of the canonical *Wnt* signaling pathway and concerted action of a set of homeotic genes in this process will be the focus of the discussion.

Department of Microbiology and Cell Biology, Indian Institute of Science, Bangalore 560 012.

E mail: kpg369@gmail.com

PL4

Chemical Approaches to Nanotechnology

Arun Chattopadhyay

Our laboratory takes advantage of the available versatile chemical approaches in the generation of nanoparticles (NPs) such as those of Au and Ag, their assembly and polymer composites, and quantum dots (Qdots). We also aim to demonstrate their potential applications in chemical catalysis and chemical locomotion, lithography, their use as antimicrobial and anticancer agents and in assays of biomolecules and pathogens. These objectives are achieved using metal NPs, assembly of NPs and composites.

For example, it has been clearly demonstrated that specificity of interactions between functionalized NPs and the analyte results in changes in the optical properties of the NPs, providing a basis for sensing and assay. However, we have argued that interactions between non-functionalized NPs such as Au NPs and molecules / biomolecules also carry signatures of specificity and hence could form a convenient and general basis for assays with superior sensitivity.

On the other hand, we utilize Ag or Au NPs and their composites for the development of newer antimicrobial and anticancer agents and in estimation of pathogens. In this regard, an iodinated chitosan-Ag NP composite has been found to have the highest antimicrobial activity in comparison to its components at their individual concentrations in the composite. Recently, we have also discovered that a new composite made of paracetamol dimer and Ag NP killed bacteria along with linearization of its DNA, providing a new mechanism of antimicrobial activity. Our laboratory has also demonstrated that the antimicrobial action of Ag NPs primarily occur via perforation of cell walls of the bacteria.

Our other interest is in the development of model chemical locomotives. This has been achieved by catalytic chemical decomposition of H_2O_2 using nanoscale particles as the catalyst. The O_2 produced drive the motion while external and internal controls have been used for guiding the same.

Our efforts are also focused on the use of chemistry in tuning the optical properties of Qdots. For example, we have shown that by chemically tuning the population of the Mn^{2+} and higher oxidation states in Mn^{2+}-doped ZnS Qdots, it is possible to tune the emission of the Qdots.

PL5

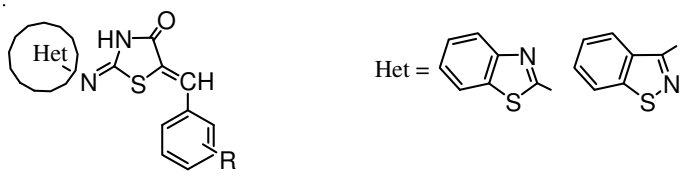
2-Heteroarylimino-5-benzylidene-4-thiazolidinones as Dual COX/LOX inhibitors and new inhibitors of matrix metalloproteinase-13

Rossella Messina[1], Athina Geronikaki[2], Ph. Eleftheriou[3], Annamaria Panico[1], Marco Fragai[4], Paola Vicini[5], Anil K. Saxena[6]

Inflammation is the organism response to various stimuli and is related to a number of disorders. Cyclooxygenase (COX) and lipoxygenase (LOX) produce two groups of arachidonic acid metabolites, prostaglandins (COX products) and leucotrienes (LOX products) that play a key role in inflammation.

On the other hand, osteoarthritis (OA) is a degenerative process characterized by progressive destruction and erosion of cartilage. Numerous studies have demonstrated that matrix metalloproteinases (MMPs) are most frequently implicated in the destruction of articular cartilage in arthritic diseases. Moreover, the functional alteration of cartilage results also from the interaction of different mediators, such as cytokines, (*e.g*. interleukin-1β), that induce high levels of nitric oxide (NO), inhibit collagen and proteoglycans synthesis, increase susceptibility to injury by other oxidants. Therefore, many efforts have been devoted to develop MMPs inhibitors able to block cartilage destruction during the inflammatory process.

In the present study the compounds selected for the investigation, 2-benzo[*d*]thiazolyl- and 2-benzo[*d*]isothiazolylimino-5-benzylidene-4-thiazolidinones, have been shown to possess anti-



inflammatory/chondroprotective activity *in vitro* in human chondrocyte cultures. The new compounds were evaluated for dual COX/LOX inhibitory action and exhibited IC_{50} values between 25 and 80 μM. Docking studies were performed in order to analyse the mode of binding of different derivatives.These compounds also inhibit NO, MMP-3, GAGs, key molecules involved in matrix. degradation in OA disease. Our studies clearly demonstrate that 5-heteroarylimino-4-thiazolidinone can block cartilage destruction during the arthritic inflammatory process, as simulated in our experimental model.

[1]Dipartimento di Scienze Farmaceutiche, Università di Catania, V.le Doria 6, 95125 Catania, Italy;

[2]Aristotle University, School of Pharmacy, Department of Pharmaceutical Chemistry, 54124 Thessaloniki, Greece;

[3]Alexandrion Technological Educational Institute of Thessaloniki, Department of Medical Laboratory Stiudies,Greece

;[4]Centro di Risonanze Magnetiche e Dipartimento di Biotecnologie Agrarie, Polo Scientifico, Università degli Studi di Firenze Via Luigi Sacconi 6, 50019 Sesto Fiorentino (FI), Italy;

[5]Dipartimento Farmaceutico, Università di Parma, V.le G. P.Usberti 27/A, 43100 Parma, Italy. Central Drug Research Institute, Chattar Manzil Palace, Lucknow-226 001, India

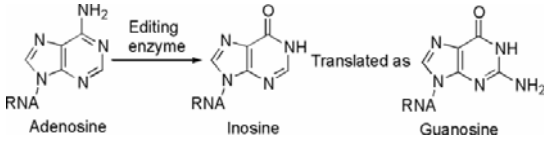
PL6

Nucleic Acid Chemical Biology: Studies in RNA interference and RNA editing

Peter A. Beal

The Beal lab is actively engaged in research at the interface of synthetic chemistry and nucleic acid biology. This lecture will cover recent studies wherein novel nucleoside analogs have been developed to explore different aspects of two RNA modification phenomena: RNA editing and RNA interference.

RNA editing. The ADAR enzymes convert adenosines to inosines in RNA in an example of base modification RNA editing. Since inosine is decoded as guanosine during translation, this modification can lead to changes in the meaning of codons (recoding). At least 50 recoding events are known in human mRNAs and perturbations in A to I editing have been observed in several human diseases. Recent efforts to define structure/activity relationships for the ADAR reaction will be described along with a newly discovered RNA editing reaction that causes recoding of the mRNA for a DNA repair enzyme.



RNA interference. Unmodified short interfering RNAs (siRNAs) are highly potent and effective at directing the selective digestion of specific messenger RNAs inside living cells grown in the lab. However, the native RNA structure has numerous drawbacks as a therapeutic agent. For instance, unmodified RNA is sensitive to nucleases, has poor delivery properties and can stimulate immune responses. While chemical modifications have been described that address these issues, the vast majority of this work has focused on structural changes to the ribose of the component nucleotides. Modification of the nucleobases can have profound effects on the chemical, physical and biological properties of oligonucleotides, yet this has been a comparatively unexplored route to the modulation of siRNA properties. Here we report the effects of newly developed base modifications for siRNAs. Purine derivatives with substituents that project into the minor groove of dsRNA are discussed that control RNAi potency, binding to off-target proteins and immune stimulation.

Department of Chemistry, University of California, Davis

PL7

Metal Based Anticancer Drugs

P. Hazarika, J. Deka, C. Medhi, S. Bhola, R. K. Bhola, and O. K. Medhi

Platinum complexes such as cis-diamminedichloroplatinum(II), commonly known as cisplatin, is found to be highly effective in the treatment of testicular and ovarian cancers and is also employed for treating various other forms of cancer. The biochemical mechanism of cisplatin cytotoxicity involve the binding of the drug to DNA, inducing distortion of the double helix, that effect replication and transcription leading to cell death. However, cisplatin has low solubility in lipid membranes leading to administration of higher dosage and cisplatin resistance by cells in several types of cancer. Moreover, platinum being a heavy metal is toxic and there is no natural mechanism in the body for removal of platinum.

There is a large need for the development of non-platinum based antitumour drugs which may have mechanism of action, biodistribution and toxicity which are different from those of platinum drugs. Anti-tumour activity of metallocenes, Ti(IV), Ga(III), and Au(I) complexes have been reported. Ruthenium complexes seem to be the most promising alternative to platinum due to much lower level of toxicity than cisplatin. The first ruthenium based compound to reach clinical phase trials is [ImH][trans-$RuCl_4$(dmso) (Imidazole)], commonly called NAMI-A, and other complexes with DMSO, biphenyl, p-cymene as ligands are proposed as anticancer drugs.

WE have synthesized a number of mixed ligand ruthenium complexes, studied the biological properties of a few of them. The complexes have 1,10-phenanthroloine, DMSO, Imidazole, amino acids as ligands. The complexes bind to d (GC) preferentially over d (AT) oligonucleotide. Further studies on binding to Calf Thymus DNA have been studied by spectroscopic and electrochemical methods. The anticancer activity of some of these compounds against Dalton's lymphoma cells in vivo is found to be promising. The toxicity level of some of the compounds is found to be less than that of cisplatin.

Gauhati University, Guwahati 781 014; okmedhi@gmail.com

PL8

Some strategies for molecular modification of steroids

R C Boruah

Medicinal Chemistry Division, CSIR-North East Institute of Science and Technology

Jorhat-785006, Assam, E-mail : rc_boruah@yahoo.co.in

Steroids are well known as important biological regulators which exhibit dramatic physiological effects when administrated to living organism. The ring modification of the steroid nucleus results in alteration of the biological activities. The pharmaceutical interests in steroids bearing heterocycles fused to steroidal core, led to the synthesis of numerous A-, B- and B-ring azasteroids with interesting biological activities like 5α-reductase, 17-α and PI-PLC enzyme inhibitors. A great deal of interests has been focused for the synthesis of hetero steroids and available in the literature. In this presentation, some novel and efficient strategies for the molecular modification of the steroidal nucleus will be discussed.

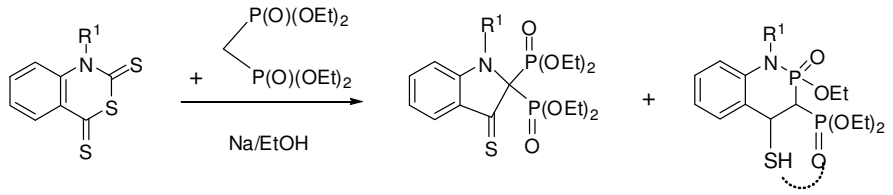
INVITED LECTURE (IL)

IL1

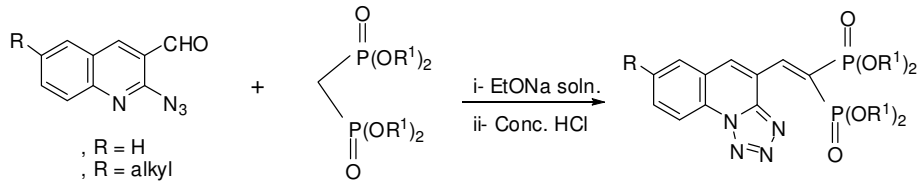
Sulfur and Nitrogen Containing Bisphosphonic Acids are a corner stone for Calcium-Related Disorders and their Role in Oncology

Wafaa M. Abdou,* Azza A. Kamel, and Athina Geronikaki

In addition to inhibiting bone resorption, and chronic arthritis, bisphosphonates (BPs) have also been shown to exhibit anti-tumor effects. *In vitro*, BPs inhibit proliferation and induce apoptosis in cultured human breast cancer cells. There is now a much greater appreciation of the benefits of introduction of BPs in oncology, which has dramatically changed the management of patients with metastatic bone disease. Recently, BPs have been, however, proven to be the drugs of choice to: i- Decrease in bone resorption in tumor bone disease. ii- Decrease in hypocalcemia as a result of diminution of bone resorption that leads to a big decrease of new osteolytic lesions, and iii- Decease of fractures, which results in amelioration of pain and an improvement of the quality of life. The nitrogen-containing BPs (*N*-BPs) are the latest and most potent addition to this family of compounds and have the widest use. They have high potency, and specifically targeted to the osteoclasts on bone and are used at relatively, very low doses (~10 mg clinically). Our present work considered an elaboration of a novel series of nitrogen and sulfur containing bisphosphonates (BPs) and relevant BP-acids. Cytotoxic/cytostatic and possible antineoplastic potency were evaluated for some selected new compounds. Furthermore, the new compounds were evaluated in animal models of arthritis: rat adjuvant-induced polyarthritis (AIP) and a murine model of chronic inflammation; e. g.:



Scheme 1



Scheme 2

*Chemical Industries Division, National Research Centre, Elbohouth St., Dokki, Cairo, Egypt; *correspondenc: e-mail: wabdou@link.net*

IL2

SYNTHESIS, STRUCTURAL CHARACTERISATION AND BIOLOGICAL EVALUTION OF SOME HETEROCYCLIC COMPOUNDS WITH NITROGEN AND SULFUR

Dr. S. Kabilan, Professor of Chemistry, Annamalai University,

Annamalainagar 608 002, Chidambaram, Tamil Nadu, India

E.mail: kabilan@sify.com : Cell: 09443924629

Abstract

Piperidine moiety can be quiet often used in the structure of numerous naturally occurring alkaloids and the synthetic compounds with appreciable biological, Pharmacological properties such as antimicrobial,antitumor, hypotensive and neuroleptic activities. As a results, the development of the investigation towards the discovery of new drugs for the treatment and to treat against diseases was investigated by the good number of heterocyclic compounds. In this aspect, we have synthesized some bicyclic based spiro thiadiazolines, thiazolidinones and monocyclic piperidone substituted piperazine derivatives. All the synthesized compounds were characterized by elemental analysis, HRMS, IR, 1H,13C NMR, single crystal XRD techniques and 3D-QSAR studies. Moreover all the compounds synthesized were screened for antimicrobial studies and found some of them are effective antimicrobials.

IL3

Novel Synthetic Approaches for Heterocyclic Compounds

Anil K. Saikia

Oxygen, sulfur and nitrogen heterocyclic compounds have always attracted the attention of synthetic chemists due to their presence in biologically active molecules. In particular, tetrahydropyrans are synthetically important as these are present in pharmaceutical, natural products such as polyether antibiotics, marine toxins and pheromones. They are also used as aroma material in food stuff and cosmetics. Similarly, tetrahydroquinoline ring system is a very common structural motif and is found in numerous biologically active natural products and pharmacologically relevant therapeutic agents. On the other hand the tetrahydrothiopyran ring also plays a key role in biological activities of a number of pharmaceutical agents such as cephalosporins, thiathromboxane and dithiathromboxane. There are many methods for the synthesis of heterocyclic compounds like hetero-Diels-Alder reaction, Michael reaction, Prins cyclization, oxonium-ene cyclization and others. We have developed a few methodologies for the synthesis of substituted tetrahydropyrans using multicomponent, one pot Sakurai-Hosomi-Prins-Ritter, Sakurai-Hosomi-Prins-Friedel-Crafts and Prins-Friedel-Crafts reactions. Further, oxonium-ene cyclization reaction is used for the synthesis of oxabicyclo[3.3.1]nonanone, oxabicyclo[3.3.1]nonene and substituted tetrahydropyrans. Most recently, thioniun-ene and aza-ene cyclization reactions are under investigation. Detailed results will be presented in the meeting.

Department of Chemistry, Indian Institute of Technology Guwahati, Guwahati 781039, Assam, India

e-mail: asaikia@iitg.ernet.in

IL4

First track translational research in medicinal plants for cardiovascular diseases (CVD) in India: a need of the hour

SK Maulik

CVD constitute a primary cause of death worldwide and is increasing steadily. Major cardiovascular diseases in India include ischemic heart disease, hypertension, cardiac failure, stroke and rheumatic heart disease. Classical risk factor accounts for 70-90% all these diseases. It is projected that CVD burden will be mostly in developing countries. India is expected to lose around 20% of its GDP due to CVD. India is also projected as the 'Diabetic Capital' of the world. Although there are many drugs, marketed over the last several decades, like nitrates, diuretics, beta- blockers, calcium channel blockers, ACE inhibitors, statins and antiplatelet drugs. But still these could not reduce the incidence and prevalence of CVD in India as well as worldwide. On the other hand, introduction of newer effective and safer drugs for CVD from industry has slowed down. Incentive to develop new drugs has been reduced due to escalating drug development cost, increased risk of clinical attrition and rigid regulatory environment. Therefore, there is a felt need to address this issue in Indian context, with her rich background of herbal remedies. For a wider recognition, fast track translational approach for basic research to clinical trials can pave the road to scientific validation of our herbal products in CVD.

MD,PhD
Professor, Department of Pharmacology
All India Institute of Medical Sciences, New Delhi

IL5

Advances in biosensor research: Nano-materials as electroactive matrix for developing enzyme-based biosensors

Prof. Pranab Goswami

This talk on biosensors would briefly cover the subject starting from the definition, importance, area of applications and a glimpse on the advances on biosensor research currently being pursued world wide. A biosensor is an analytical tool consisting of biologically active material used in conjunction with a device that converts a biochemical signal into a quantifiable electrical or other signal**.** These special analytical tools meet the performance criteria namely, high selectivity, sensitivity, accuracy and reproducibility, short response and recovery time, high storage stability etc. The complete biosensor should be cheap, small, portable and capable of being used by semi-skilled operators. Among the various classes of biosensors, electrochemical biosensors are central to the biosensor research owing to their certain advantages such as, label free system, sensitive, scope for scaling down the size, and analyzing sample without damaging to the host system. The biosensor research has got momentum since the beginning of 21st century with the advances on nano-material research. The dimensional similarities of nanoparticles with biomolecules made it possible to amalgamate the unique electronic and optical properties of nanoparticles with the selective and catalytic functions of biomolecules and develop different nanoparticles-biomolecules hybrid systems that reveal novel functional properties useful for developing biosensors. The department of Biotechnology at IIT Guwahati has initiated biosensor research focussing on the application of nanomaterials for developing sensitive, selective and stable enzyme-based advance bioelectrodes for various biosensors applications. The deliberation will cover the major findings obtained from the ongoing project works and future research programmes in the speakers' laboratory at IIT Guwahati.

Department of Biotechnology
Indian Institute of Technology Guwahati, Guwahati- 781039, Assam, India
Phone: 0361-2582202 Email: pgoswami@iitg.ernet.in

IL6

Advances in silk Research

Dr R Rajkhowa

Silk fibre has a long history of use not only as luxury textiles, but also in the human body in the form of suture material. Silk has an attractive balance of modulus, strength and elongation and is significantly tougher than competitive materials. On an equal weight basis, it can absorb more impact energy than steel. Importantly silk is also highly flexible, hydrophilic and biocompatible. Thus silk has become a valuable bio-mimetic reference point to produce future high performance structural materials. In recent years, there has been a resurge of interest in silk as a result of new knowledge and understanding on its potential for various biomedical, biotechnological, and healthcare applications. Silk products for advanced applications can be prepared either from silk fibres directly, or reconstituted silk materials such as films, sponges, gels and particles. The talk will present an overview of structure and properties of silk fibre and pros and cons of silk protein as a high performance structural material as well as smart biomaterial. Advances made in silk particle and composite research at Deakin University will be discussed. Unique properties of some of the rare silk fibres produced in North East India and their opportunities will be highlighted.

IL7

Novel Anti-inflammatory Molecules from *Piper* Species

Ashok K. Prasad

Piper species are highly commercial, economical and medicinally important. A large number of physiologically active compounds, *viz.* long chain esters and amides, alkaloids, lignans, neolignans, amides, terpenes, steroids, chalcones, flavones and flavanones have been isolated from the genus *Piper*. *Piper longum* Linn., an important medicinal plant of the genus *Piper* is used in traditional medicine by people in Asia and Pacific Islands, especially in Indian medicine.

We have isolated and characterized active principles from the combined hexane and chloroform extracts of *Piper longum* and *Piper galeatum*. Using primary human umbilical vein endothelial cells, we have evaluated the activities of active principles of *P. longum* and *P. galeatum* on TNF-induced expression of cell adhesion molecules, viz, ICAM-1, VCAM-1, and E-selectin which play key roles in controlling various inflammatory diseases. Results of these studies have implications in developing compounds with a better therapeutic index against various inflammatory diseases.

The financial support from Delhi University (DU-DST Purse Grant); DST, New Delhi and DSIR, New Delhi are greatly acknowledged.

Bioorganic Laboratory, Department of Chemistry, University of Delhi, Delhi-110 007

E-mail: ashokenzyme@yahoo.com

IL8

Herbal Therapy Needs Adjubants

P. P. Sood*

Considering that none of the therapies used so far has completely recovered the toxic effect of heavy metals as screen by biochemical, histopathological or ultrastructural parameters, attempts are made to monitor the effect of herbal antioxidants. However, these studies too are not well appreciated as free radicals are formed at different compartments of cell and different herbal antioxidants have different penetration power. Therefore, single herb may not be a potent therapeutic agent. Author studies in laboratory show that mixture of herbal extracts (herbal, natural and synthetic antioxidants) along with vitamin B complex, which acts as adjuvant, are quite strong therapeutic agents in detoxification.

Department of Biochemistry, Saurashtra University, Rajkot 360 005, India

** Emeritus Medical Scientist (ICMR), Emeritus Scientist, UGC, New Delhi, Adjunct Prof. Manipal University.*

IL9

Synthesis at the Interface of Chemistry and Biology: Mother Nature's Own Solvent as Chemical Enforcer.

Anshu Dandia*

The biological activity and structural complexity found in nature has stimulated generations of synthetic chemists to design strategies for assembling challenging structures found in natural products. The synthesis of compounds using combinatorial library methodology is beginning to make a significant impact on the drug discovery process. This need has sparked exploration of techniques that have the potential to generate large number of organic compounds.

We have contributed to the development of green organic chemistry by performing synthetic processes in water as the reaction medium focusing our attention on the recovery and reuse of both reaction medium and catalyst and on the definition of one-pot protocols for the preparation of target molecules. Use of water as a solvent is undoubtedly the best alternative as there will be no use of hazardous and toxic organic solvents and no need for vigorous drying of the solvents. The problem of insolubility and hydrolytic decomposition of many organic compounds in water was solved by the use of a surfactant, which in water forms an organized medium. This resulted in synthesis of a wide variety of novel spiro heterocycles and biologically important scaffolds via facile tandem reactions using non-conventional strategy which dramatically reduced chemical waste and reaction times along with increased selectivity of the process.

Centre of Advanced Studies, Department of Chemistry,

University of Rajasthan, Jaipur-302004 India

E-mail: dranshudandia@yahoo.co.in

IL10

New drug development targeting androgen receptor to treat prostate cancer

M. Ramanathan

Computer aided drug design is one of latest tool used in mechanism based drug development. To develop new drug or to design one has to explore the targets, ligand and their interactions. In prostate cancer over activation of androgen receptor (AR) by testosterone and dihydrotestosterone (DHT) major endogenous AR agonist is observed. AR belongs to the steroid /thyroid nuclear receptor super family. The AR is encoded by single gene located on the X- chromosome at region Xq 11-12. Prostate cancer can be androgen dependent or androgen independent. AR agonist binds with receptor through hydrophobic and hydrogen bond interaction. The hydrophobic pocket of AR is generated with amino acids Val746, Met742 and partly with Gln711, Met745 and Leu707. The keto and 17β-OH group of DHT forms H-bond with Gln711, Arg752 and Thr877 and Asn705 respectively. With this background new chemical entity targeting AR will be developed in *in silico*.

Professor cum Principal,

PSG College of Pharmacy, Peelamedu, Coimbatore- 641004

IL11

Soil Microbes Population Identification for Sweeping the Residual Pesticides Load from the Soil and Aqueous Environment

Swaranjit Singh Cameotra

Insecticides are considered cumulative and toxic compounds. Their presence as contaminates in aquatic environments may cause serious problems to human beings and other organisms. Problems related to waste remediation have emerged as a high national and international priority. The present study is an attempt to investigate the persistence of organophosphate pesticide in water matrix and enhancement of its degradation by using soil microbes. Quinalphos (O, O-diethyl O-quinoxalin-2-yl phosphorothioate) is one of the widely used organophosphate acaricide and insecticide in Indian agriculture for controlling caterpillar and scale insect on fruit trees, cotton, vegetables, peanuts and pest complex on rice. WHO and EPA classified Quinalphos in Class II as moderate toxic. Batch experiments were preformed for determining the persistence and degradation of Quinalphos in water matrix. For persistence experiment, water samples were spiked with Quinalphos (20ppm) and kept in the incubator for 160 days. After 0, 2, 4, 8, 16, 30, 45, 60, 80, 100, 120 and 160 days, samples were taken and analyzed by UV-Vis spectrophotometer and HPLC for the determination of residual concentration. The results showed that Quinalphos and its metabolites persist in water even after 150 days which encouraged us to investigate its biodegradation using bacterial isolates extracted from soil. For biodegradation studies, these bacterial isolates were inoculated in to minimal media with 100ppm Quinalphos concentration for 17 days. The UV absorption spectrum shows decreased absorbance at λ_{max} 320 up to 70% in different time intervals.

Institute of Microbial Technology, Sector 39A, Chandigarh 160036, India
ssc@imtech.res.in, swaranjitsingh@yahoo.com

IL12

Bio-prospecting and bio-profiling microbial resource: a report from North East Gene pool

*T C Bora, Ratul Saikia, Archana Yadav, Manurama Buragohain, Aparajita Duarah, Madhumita Talukder and Shruti Talukder

North–Eastern India is best known for its rich biodiversity and its un-tapped bioresources has been identified as the Indo-Burma Mega Hot Spot by Conservation International. Microbial diversity in this region includes a vast array of organisms, that offer a huge opportunity for exploration in various fields, such as, agriculture (PGPR, biocontrol of disease and pests managements, etc), nutrient management, chemical and cottage industry, oil industries and pharmaceuticals, etc. Therefore, existence of agriculturally, industrially and pharmaceutically potential microbes/plants/insects with diverse genetic resources cannot be ruled out. It is well recognized that the diversity of microbial communities in North-Eastern region remains unexplored and untapped. Very little has been done on exploration of these vast genetic resources, not only to enrich the national gene pool, but also to explore it for gainful purposes in the field of industrial, agricultural and pharmaceutical sectors. The need of the hour is to identify specific environmental settings to collect the representative microbial communities and screen out to short-list potential strains from NE Gene Pool for bio-profiling and bio-prospecting for potential functionalities. Moreover, application of molecular techniques for microbial identification, coupled with traditional methods and development of microbial database and microbial repository for future R&D utilities is also a significant aspects considering the needs of future R&D. A systemic exploration, exploitation, characterization and conservation of culturable and unculturable microbial diversity in NE India and its potential application will open up a new opportunity to explore the vast potentialities of endemic microflora of this hot zone to enrich national gene bank and also to preserve as a precious asset of rare genetic resources of the country. In this paper we are presenting report of a few potential strains on bio-prospecting and bio-profiling.

Biotechnology Division, CSIR-North East Institute of Science and Technology, Jorhat-785 006, Assam
Presenting author: tcbora@yahoo.com/ tcbora@rrljorhat.res.in

IL13

Structure-based design and synthesis of a novel series of new organotin (IV) 2-/4-[(*E*)-2-(aryl)-1-diazenyl]benzoates endowed with anticancer activities

Tushar S. Basu Baul

It has been long known that cisplatin was the first inorganic cancer chemotherapeutic agent, and remains a front-line treatment for testicular, ovarian and other cancers. Despite heavy side effects and drug resistance of tumor cells, cisplatin is among the most widely used anti-cancer drugs, and other platinum(II) complexes, such as carboplatin, oxaliplatin and nedoplatin, with improved activity and/or reduced toxicity, are being introduced in therapy. The wide clinical success of platinum(II) compounds has prompted a great deal of interest in other platinum and non-platinum metallodrugs (e.g., Sn, Ti, Au, Cu, Ru, Pd) that might exhibit comparable cytotoxic properties accompanied by a different pattern of antitumor specificities and by a more favorable pharmacological and toxicological profile. In addition, non-platinum metal-based antitumor agents have been developed where the activity does not rely on direct DNA damage and may involve proteins and enzymes.

Among the non-platinum metal compounds with antitumor activity, particular interest has focused on gold and tin derivatives, which have a common activity on mitochondria and a strong affinity to thiol groups of proteins and enzymes. As a result, a large number of organotin(IV) derivatives have been prepared and tested *in vitro* and *in vivo*, firstly against murine leukemia cell lines and then against different panels of human cancer cell lines [1]. Consequently, a large number of organotin(IV) carboxylates have been investigated for their antitumour potential owing to their better hydrolytic stability compared to organotin(IV) halides [1].

In line with these developments, a series of new organotin(IV) 2-/4-[(*E*)-2-(aryl)-1-diazenyl]benzoates have been prepared and characterized by IR, NMR (^{1}H, ^{13}C, ^{119}Sn), ^{119}Sn Mössbauer spectroscopic techniques and single crystal X-ray crystallography. The present lecture will be devoted to synthesis, structures and *in vitro* cytotoxic studies (in human tumor cell lines) in combination with recent results of docking studies with some key enzymes (e.g., see Fig) [2-6].

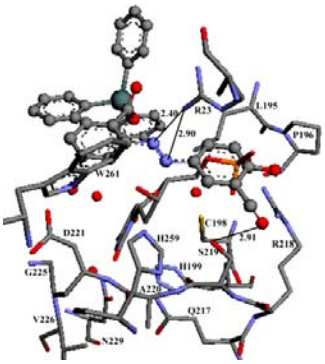


Fig.: Ph_3SnLH docked into the binding site of the enzyme thymidylate synthase (2G8D) showing two H-bonds observed between the azo-nitrogen atoms of the compound and R23 and interaction of formyl oxygen to S219 residue. H-atoms are omitted for clarity.

Department of Chemistry, North-Eastern Hill University, NEHU Permanent Campus, Shillong 793 022

E-mail: basubaul@nehu.ac.in; basubaulchem@gmail.com

IL14

IL15

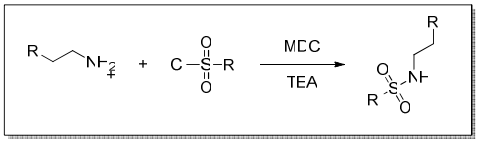
IL16

Design, synthesis, biological activity of novel sulfonamide derivatives

Suneel Manohar Babu Chennamsetty[i], Helen P. Kavitha,[ii,*] and Selvam Paramasivam[iii]

With innovations in new target and/or disease specific drug development, 40% of the new chemical entities coming out of drug discovery groups at pharmaceutical companies have been faced with poor water solubility challenges, and thereby poor bioavailability. Combinatorial chemistry and high throughput screening pursued by pharmaceutical companies are intrinsically biased towards poorly aqueous soluble drugs. Identifying the appropriate lead compounds and further formulating them optimally becomes the key, since poor bioavailability is often cited as the reason for the discontinuation of development of new chemical entities (NCEs). Keeping these problems in mind, new strategy had developed and synthasized a new series of aromatic sulfonamides with popular drug intermediates by nucleophilic displacement reaction of benzene, substituted benzene and 1 and 2 naphthalene sulfonyl chlorides with aromatic substituted amines (primary and secondary) in the presence of triethylamine. The title compounds were evaluated for anticancer properties and the results expressed in IC_{50} (μM).

Scheme:



i and iii. Piramal Life Sciences Limited, Mumbai
ii. Department of Chemistry, SRM University, Ramapuram, Chennai-89,
Email: suneelmanoharbabu.chalamaiah@piramal.com

IL17

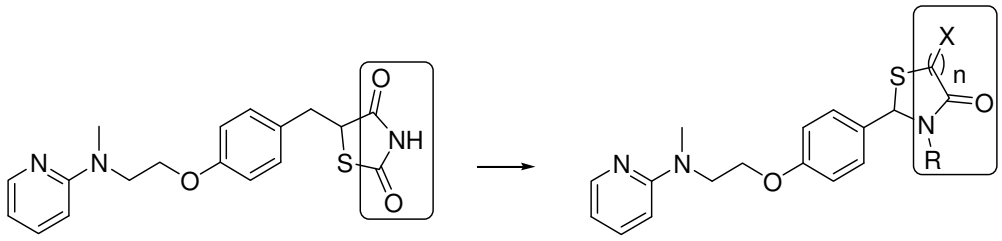
Thiazolidine-4-ones: A new class of Antihyperglycaemic Agents

S. B. Katti

One of the important developments in type 2 diabetes therapy has been the introduction of thiazolidinediones (TZDs); a class of antihyperglycaemic agents that enhance insulin sensitivity through activation of Peroxisome Proliferator-Activated Receptor (PPAR-γ), a nuclear receptor involved in glucose homeostasis and adipogenesis. The drugs from this class, pioglitazone and rosiglitazone are currently being used worldwide for the treatment of type 2 diabetes.

The basic structure of a TZD comprises of an acidic head group, a central phenyl ring and a hydrophobic tail group joined by alkyl linkers. Since their discovery a lot of SAR-studies have been carried out with extensive modifications at the head and tail segments to obtain molecules with better therapeutic profile. A few compounds have displayed interesting antihyperglycaemic activity suggesting that modifications at either site could modulate the biological activity. Compounds like balaglitazone, which has successfully completed phase III clinical trials and rivoglitazone, which is currently in phase III clinical trials are two such compounds which display better pharmacological profile than the existing TZD drugs.

Encouraged by these findings during the present study a series of head group modified analogues having thiazolidine-4-one as a head group (**figure 1)** keeping rosiglitazone side chain as a template were investigated. Design, synthesis and biological activities of the new derivatives will be presented.



Rosiglitazone Proposed Rosiglitazone derivatives

Figure 1. R = H, alkyl, aryl etc; X = H, -CH_3; n = 1, 2

Medicinal and Process Chemistry Division, Central Drug Research Institute, Lucknow. Email:sb_katti@cdri.res.in

IL18

IL19

Metabolism, Metabolic Activation and Drug Toxicity

Nabajyoti Deka

Adverse drug reactions (ADR) pose a major impediment to drug development, and the clinical management of marketed products. Metabolic bioactivation to reactive metabolites that covalently bind to proteins is believed to be a key reason of ADR. The active metabolites can deplete cellular levels of important thiols such as glutathione, form reversible protein modifications, and irreversible protein-adducts all of which can lead to an increased risk of adverse effects. In the drug development process NCE carrying toxicophores which can undergo metabolic activation is one of the causes of attrition. It is important to evaluate new chemical entities (NCEs) early in development for their ability to induce or inhibit CYP enzymes, as well as their potential to undergo metabolic activation for selecting compounds for further development. The metabolic bioactivation and drug-related adverse effects will be discussed in the presentation.

Medicinal Chemistry Division, Piramal Healthcare, Mumbai

IL20

Strategic Use Of Biocatalysts In Chiral Synthesis Of Value Added Products

Dr Amrit Goswami

The catalysis with small organic molecules where an inorganic element is not part of the active principle,has become a highly dynamic area in chemical research. As organic molecules readily react with each other why did we disregard these compounds as catalysts and rather relied on assistance of inorganic chemists to explain the foreign world of d-orbitals to us instead of truly designed organic molecule. From the Green Chemistry point of view the trend of using catalysts in organic synthesis is towards small organic molecule or biocatalysts with proper recycling over transition or heavy metal catalysts. Biocatalysts may be whole cell microbes from bacteria or fungi as such. or pure isolated enzymes from microbes or mammalian cell. and catalytic antibod**y.** Biocatalysts have emerged as an important tool in industrial synthesis of bulk chemicals, pharmaceuticals, agrochemicals, intermediate, food ingredients *etc.* However uses are modest and modest uses are perceived due to limited availability of biocatalysts, their substrate scope and operational stability. Use of biocatalysts is not new but 100 years old. However, from1980 onwards only enormous potential of these catalysts in synthetic organic chemistry is recognized. The reason behind is necessity,convenience and opportunity keeping aside the prejudices against biocatalysts such as biocatalysts are sensitive, expensive, active on their natural substrates only, work only in their natural environment and so on and so forth

The manufacture of single isomer product has become now-a-days mandatory and for that use of biocatalyst or small organic molecule that recognizes chirality of a molecule distinctly is convenient & necessary. Having located in the world's biodiversity hot spot zone, CSIR-NEIST has isolated and identified certain specific microbial strains having characteristic features from different niches It was therefore undertaken to study the catalytic activity of some of these microbial strains either alone or in combination with certain small organic molecule having track record of catalytic activity in oxido-reduction, transesterification or transferase reaction in the chiral synthesis of certain industrially important molecules or intermediates from their corresponding prochiral substrates. The result of this study will be presented

Synthetic Organic Chemistry Division

CSIR-North-East Institute of Science & Technology

(Formerly RRL-Jorhat)

Jorhat-785006, Assam, India

E-mail : goswamia@rrljorhat.res.in

IL21

Herbal Drug Development from North East Resources

N.C.Barua

The most significant services that we enjoy from nature are the drugs and other health care products. P**roducts extracted from living organisms have been the main source of medicines throughout history of humankind,, with the first record dating from 2600 BC in Masopotamia. Natural products have been transformed into modern drugs, of which the antimalarial quinine and the antipyretic analgesic aspirin are the archetypical ones. Today, there are still a relatively large number of natural products and their derivatives among the best selling drugs.** Many cultures throughout the world rely on indigenous medicinal plants for their primary health care needs. Moreover, one quarter of modern medicine are said to be made from plants first used by traditional medical practitioners. A textbook approach to drug discovery moves in logical order from the bench to the bedside to the clinic to the community in subsequently ordered steps: molecular targets are defined through basic research; biochemical assays are used to screen for lead compounds; animal studies establish pharmacokinetic and pharmacokinetic parameters; and toxicology studies assess safety and risk. All these lead to human clinical trials in a multiphase developmental process that has been well documented.

Recent trends indicate that herbal medicines and other herbal products are likely to play an increasingly dominant role in the pharmaceutical marketsin the near future. Although herbal drugs have a vast potential, it is not advisable to go blindly into the production of drugs based on herbs without evaluation of efficacy, toxicity, stability , etc. of the products for which collaborative efforts between different disciplines are called for.

In view of the rich biodiversity of the north eastern India, CSIR-NEIST has been putting efforts to validate the traditional remedies of this region for development of registered pharmaceutical products for certain critical diseases. The progress made in this area will be presented with specific examples.

CSIR-North East Institute of Science and Technology
Jorhat-785 006
baruanc@rrljorhat.res.in

IL22

Comparative Study to assess Ankle Edema following of Aryl Dihydropyrimidone (PRA 6) and Amlodipine in Experimental Model of Rats

Medhi B, Baldeep Kumar, Ajay Prakash, Prasad AK[#], Parmar VS[#], Raj HG[$]

Calcium channel blockers (CCBs) blunt postural skin vasoconstriction, an autoregulatory mechanism that minimizes gravitational increases in capillary pressure and avoids fluid extravasation when standing. Amlodipine, especially at the 10 mg dose, often causes ankle swelling. PRA 6 unlike Aspirin and Clopidogrel is very effective in producing significant inhibition of ADP-induced platelet aggregation in vitro. The aim of the present study was to compare the ankle edema following of Aryl Dihydropyrimidone (PRA 6) and Amlodipine in experimental model of rats. Drugs were administered to the animals for four weeks; ankle edema was measured with the help of plethysmograph at baseline two weeks and four weeks of completion of treatment. After completion of four weeks animals were sacrificed under deep anesthesia and blood was collected for cytokine estimation and histopathological evaluation of different vital organs were carried out. At the end of the study, there was no significant increase in ankle edema in rats as compared to control groupas well as amlodipine treated group. However, there was significant loss in body weight of Amlodipine treated and PRA-6 treated rats in comparison to the vehicle treated control group. Histopathological examination of different organs has revealed no significant pathological change in the heart and ileum. However, histology of kidney has shown glomerulus and congested vessels in amlodipine treated group and patchy interstitial inflammation in PRA 6 treated animals. There was a presence of moderately dense peri-bronchial inflammation in the lungs of PRA-6 as well as amlodipine treated group. In conclusion present study showed no significant ankle oedema in PRA-6 treated group.

Key words: Amlodipine, PRA-6, Ankle oedema

Department of Pharmacology, PGIMER Chandigarh, Department of Chemistry[#] and Biochemistry [$](VPCI), Delhi University.

IL23

Toxicity of T-2 Trichothecenes

P Chatopadhayay

Mycotoxins are defined as toxic secondary metabolites produced by fungi. They are the biggest chronic health risk when administred into the diet or when introduced in *invivo* system. T-2 toxin is perhaps the biggest concern and most lethal. T-2 toxin [3a-hydroxy-4hydroxy-4β, 15-diacetoxy-8a-(3-methyl-butyryloxy)-12, 13-epoxytrichothec-9-ene], a Fusarium trichothecene mycotoxin, produced by strains of *Fusarium, Myrothecium, Trichoderma, Cephalosporium, Verticimonosporium and Stachybotrys* molds. T-2 toxin is recently attracted for considerable international attention due to their possible uses in chemical warfare during the military conflicts in Laos (1975-81), Kampuchea (1979-81), and Afghanistan (1979-81) to produce lethal and nonlethal casualties. More than 6300 deaths in Laos, 1000 in Kampuchea, and 3000 in Afghanistan have been reported sofar . Inhalation and dermal rout are the important routes and systemic toxicity caused by T-2 toxin. T-2 mycotoxins can be delivered via food or water sources, as well as, via droplets, aerosols, or smoke from various dispersal systems and exploding munitions and this unique property make T-2 mycotoxin a potentially viable for biological warfare agent. Toxic effects of T-2 toxin have been reported in humans and we investigated toxicity in laboratory animal species. Pharmacokinetic studies showed that T-2 rapidly disappears from the plasma of animals in intravascular route, with mean plasma depletion in half-lives of 13.8, 17.4, and 5.3 min for swine, cattle and dogs respectively. A clear distinction is required between the biological (fungus) and chemical (toxin) aspects of the issue.

IL24

A Novel Approach for Testing Teretogenic Potential of A New Chemical Entity

Neeraj Sinha

The tragic episode of thalidomide at early 60s had sparked the need for efficient methods to screen new chemicals and drugs for their teretogenic ability. Recognizing the need a standard protocol was developed followed with regulatory acceptance. But with the advent of new drugs and chemicals, literatures say that there are more than 80,000 chemicals currently in the market place, existing as untreated drugs, industrial by-products, or environment pollutants. Furthermore, hundreds of such agents are introduced each year. Beside this standard *in vivo* test are expensive and require extensive facilities, thus screening of so many agents are totally impractical and unrealistic.

Hence, an extensive efforts and search for less cost and time intensive alternative methods, which can prioritize the existing large list of untested chemicals and drugs has emerged out. Time to time many *in vitro* systems with more or less potential application as test of teretogenecity has been suggested but no one could secure its reliability due to lack of proper end point and the inherent drawbacks and weaknesses associated with the *in vitro* system of testing.

Recent trends in instrumentation has emphasized on NMR based **Metabonomics** as a means to categorized organ specific toxicity, as a tool for monitoring the onset and progression of toxicological effects and identity biomarkers of toxicity. Future challenge however is to describe the cellular metabolome for purpose of understanding cellular function (i.e. metabolomics) the capability and advantage of multinuclear NMR to provide metabolic changes in cells and tissues can help in describing function and subsequently help in predicting teretogenicity and embyotoxicity. Not only this, it does not require any prior preparation of tissue before working with NMR for analysis and observations.

Hence with the above background the present work was aimed to develop a procedure for testing teretogenecity of New Chemical Entity (NCE) by describing the embryonic cellular metabolome for purpose of understanding cellular functions (metabonomics). For the purpose the timed mated rats were treated with of cyclophosphamide (CP) on day 11th. of gestation through oral route. After 24 hr i.e. on day 12th of gestation conceptuses were explanted and subjected for NMR (400 Mhz) procedures and studies. Data so obtained were analyzed to reach at a conclusion regarding teretogenic potential of CP. The approach will be discussed in detail during the conference.

Sr. Principal Scientist
Division of Toxicology
Central Drug Research Institute
Lucknow - 226001

IL25

*e*CoRIA: A novel 3D-QSAR approach for studying thermodynamic events involved in ligand-receptor interaction

Evans Coutinho*, Vijay Khedkar, Mahesh Borkar, Raghuvir Pissurlenkar, Anil Saran

Quantitative structure activity relationship (QSAR) studies have proven to be useful for predicting the activity of closely related inhibitors. A conceptual drawback in existing 3D-QSAR approaches is that these methods are based on the current *'one chemical–one structure–one parameter value'* dogma, which is inaccurate. Hence, an approach where biological activity is modeled as a function of molecular descriptors derived from an *ensemble* of low energy conformers, has the potential to enhance the quality of a 3D-QSAR model. To address this issue of importance of considering an *ensemble* of low energy conformers in QSAR studies, a 'dynamic' QSAR approach termed *e*CoRIA has been developed. The major highlights of the method are: adaptation of the QSAR formalism in a receptor setting to answer both the type (qualitative) and the extent (quantitative) of ligand–receptor binding, and use of descriptors collected from an *ensemble* of configurations that account for the complete thermodynamics of the ligand–receptor binding. The components of the free energy are then equated to the biological activity through chemometric methods. The methodology was developed and validated using complexes of Glycogen phosphorylase *b* (GPP*b*) with its inhibitors as a test bed. The QSAR models developed, and validated both internally as well as externally, were found to be robust with statistically significant values of r^2 (correlation coefficient) and r^2_{pred} (predictive r^2). The method can assist the medicinal and computational chemists in designing new molecules, and biologists studying the influence of mutations in the target receptor on ligand binding.

Computer-Aided Molecular Design Laboratory, Department of Pharmaceutical Chemistry, Bombay College of Pharmacy, Kalina, Santacruz (E), Mumbai 400 098, India

email: *evans@bcpindia.org*

IL26

Mass Spectrometry: A Fast Emerging and Promising Analytical Technique

Pradeep Kumar Srivastava

Mass spectrometry is a sensitive, selective, specific and powerful technique used to identify traces and ultra traces of organic compounds and inorganic elements. This technique originated in the early part of the last century from J. J. Thompson's vacuum tube, which demonstrated the presence of electron and positive rays. In 1920 primary application of Mass Spectrometry in physics isotopic analysis started. Use of Mass spectrometry in determining the molecular weight of the organic compounds started in 1930. In 1940 its use expanded to oil/petroleum exploration and 1950 saw its use in biological samples. Later on various techniques like Gas chromatography-Mass Spectrometry (GC-MS) and Liquid Chromatography-Mass Spectrometry (LC-MS), Fast Atom Bombardment Mass Spectrometry (FABMS) emerged which proved to be great tools in the area of drug research to several new areas like biomedical sciences, environment management and techniques like Dart.

Scientoonics is a novel attempt to systematically use scientoons, a novel class of science cartoons (www.scientoon.com) for explaining a scientific & technical subject starting from the basics to the latest and thus enabling even the non experts to understand the subject. Scientoons are the cartoons which are based on science, they not only make you smile and laugh but also provide information about new researches, subjects, data and concepts in a simple, understandable and interesting way. Now-a-days most of the scientific researchers have become interdisciplinary and many experts from different background have to work together. Scientoons can fill a knowledge gap among the various experts. European Science Festival 2008 held from July 18-22, 2008 at Barcelona, Spain, organized a full session on Scientoonics.

This paper is an attempt to discuss in detail about the various techniques of Mass spectrometry as a powerful tool of Science and its application in a variety of new areas like energy and environment using ***scientoonics,*** a novel branch of science (coined by the author for the first time in the world) in such a way that even a non expert can understand and enjoy it.

Medicinal and Process Chemistry Division, Central Drug Research Institute (CSIR)
Lucknow-226001, India

E-mail: pkscdri@gmail.com

IL27

Diversity oriented synthesis and antitubercular activity of selected heterocyclic libraries

Prof. Anamik Shah

New Antitubercular agents which can effectively work against opportunistic tubercular strains and also "resistance" Tuberculosis has become an urgent need looking to the various reports published by organized like WHO and global alliance for Tb. Efforts are made on several fronts like synthesis of newer molecules, use of molecular modeling & QSAR, existing anti Tb drugs and modification of pipeline drugs &, finding out new targets,

Our efforts of last several years have yielded very strategic revelation to provide new directions in the area of diversity oriented synthesis. Their positive outcome in terms of identification of several NCE's will be presented.

Principle Investigator:

"National Facility for Drug Discovery through New Chemical Entities(NCE's)

Development & Instrumentation Support to Small Manufacturing Pharma Entrprises"

Department of Chemistry, (UGC-SAP & DST-FIST funded)

Saurashtra University, Rajkot-360005 (INDIA)

IL28

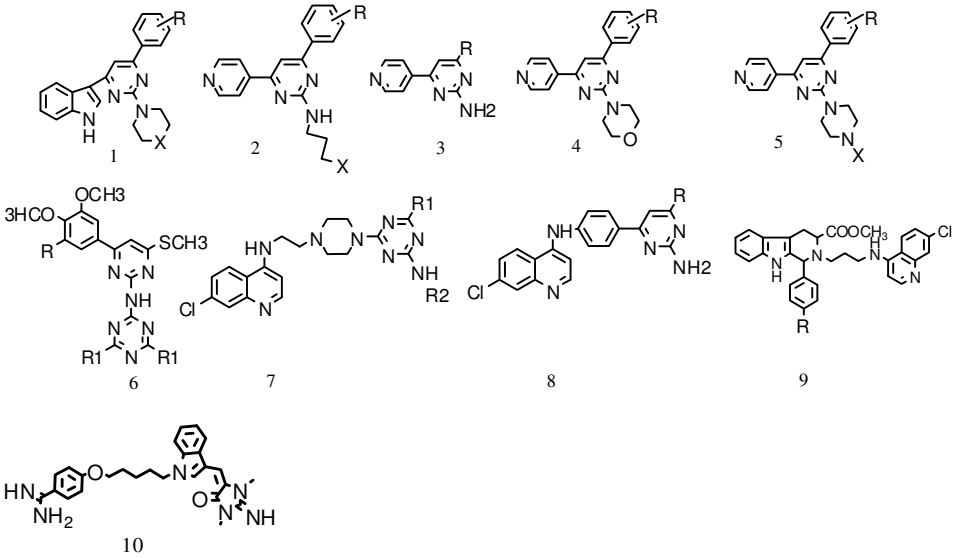
Perspectives and Challenges in Drug Research: Design and Synthesis of Nitrogen Heterocycles as Novel therapeutic Agents

P.M.S.Chauhan

Drug research one of the important area of science. It is also very time taking and require multidisciplinary efforts.

Nitrogen heterocycles are constituted a major class of existing drugs. These compounds are widely distributed in nature and are essential to life process.They also play a vital role in the controlling the metabolism of all living cells. The activity of these molecules is attributed to their ability to interfere against several imortant biological target sites.

Keeping in view importance of nitrogen hetrocycles in antiparasitic area, we have synthesized novel heterocycles **1-10** as antiparasitic agents [1-10]. These heterocycles were synthesized by classical solution phase as well as on solid support. Several synthesized compounds have shown promising *in vitro* and *in vivo* antiparasitic activity against Malaria and Leshimania parasites. The design, synthesis and antiparasitic activity of these **Novel therapeutic Agents** will be discussed.



Medicinal and Process Chemistry Division, Central Drug Research Institute Lucknow, India 226001,Email;premsc58@hotmail.com,prem_chauhan_2000@yahoo.com,Phone:91-522-2439492 Fax: +91-522-2623405

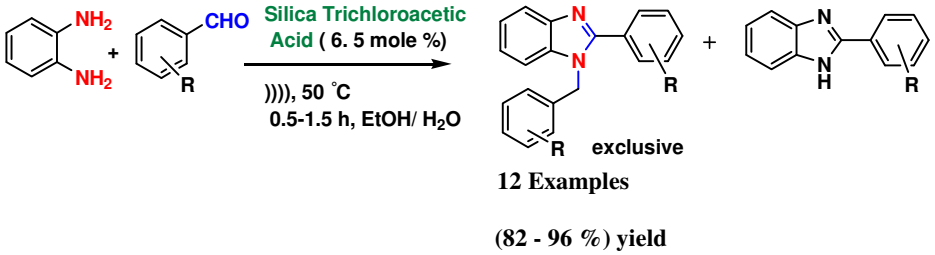
ORAL PRESENTATION (OL)

OL1

411. Ultrasound promoted one-pot synthesis of 2-aryl-1-arylmethyl-1*H*-benzimidazole derivatives in aqueous media: an ecofriendly and regioselective approach

Brajesh Kumar and Se Won Park *

Ultrasonic irradiation is an efficient and innocuous technique of reagent activation for synthesizing organic compounds. First one-pot synthesis of 2-aryl-1-arylmethyl-1*H*- benzimidazole derivatives from *o*-phenylenediamine and an aromatic aldehyde in presence of silica supported trichloroacetic acid (SiTCA) was carried out with excellent yields at 50 ºC by sonication. This method provided several advantages such as green solvent, inexpensive catalyst, simple experimental methodology, shorter reaction time and higher yield.



Department of Molecular Biotechnology, School of Life & Environmental Science
Konkuk University, Seoul 143-701, Republic of Korea
E-mail: krmbraj@gmail.com
Present Address
Dr. Brajesh Kumar, Assistant Professor
Department of Chemistry, TATA College, Kolhan University
Chaibasa, Jharkhand (INDIA)

OL2

321. Phenolic Antioxidants of Synthetic and Natural Origin: A Dendritic Approach

Jyotirekha G. Handique

Phenolic antioxidants of natural and synthetic origin have received considerable attention for their pharmacological and biological activities. In an attempt to mimic some antioxidant polyphenolic compounds of natural origin, we have developed an approach for synthesis of dendritic polyphenols, in which we attempted to incorporate the advantages of both polyphenols and dendrimers in a single type of molecule. By incorporating multiple phenolic units in a single molecule the antioxidant property of polyphenols are found to be amplified in a significant manner. We used divergent mode of synthesis of dendrimer synthesis for synthesis of linear and star type dendrimers for synthesis of polyphenolic esters and amides having first generation dendritic architecture. Phenolic acids of biological origin are used as terminal/peripheral units and various alcohols and amines as spacers and cores. Metal exchanged montmorillonites are used for catalytic esterification and amidation and Mitsunobu protocol has been employed for esterification. For investigation of antioxidant activities, different biologically relevant methods are employed. The synthetic protocols and investigation of their antioxidant activities will be discussed in this presentation.

Keywords: Dendritic polyphenol, Antioxidant

Synthetic Organic and Natural Products Laboratory

Department of Chemistry, Dibrugarh University

Dibrugarh – 786 004, Assam, India

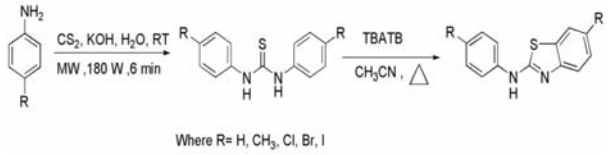
**E-mail: jghandique@rediffmail.com*

OL3

262. Synthesis of substituted 2-(N-aryl) aminobenzothiazoles via an intramolecular cyclization of corresponding symmetrical thioureas using tetrabutylammonium tribromide (TBATB) as brominating agent.

Pranjit Barman, Prasanta Gogoi, and Tirtha Bhattacharjee*

An efficient synthesis of 2-(N-aryl) aminobenzothiazoles from corresponding symmetrical thioureas is described. TBATB is used as brominating agent in the intra-molecular cyclization of thiourea involving sulfenyl bromide species. The symmetrical thioureas are synthesized from their corresponding para substituted anilines.



Department of Chemistry, National Institute of Technology, Silchar-788010, Assam, India
E-mail: barmanpranjitnits@gmail.com

OL4

161. **Chiral Metal Complexes Catalyzed Various Asymmetric Organic Transformations**

R. I. Kureshy,* Manish Kumar, K. Jeya Prathap, N. H. Khan, S. H. R. Abdi, H. C. Bajaj

Designing and development of efficient chiral catalysts for various organic transformations is one of the most fascinating areas in asymmetric catalysis because the enantio-pure products have wider applications in the field of pharmaceuticals, agrochemicals, flavors and fragrance. Although highly selective catalysts have been reported for a large number of catalytic transformations, there are only a few general catalytic systems that are enantioselective for a wide range of reactions and substrates. Moreover, it is difficult to predict which catalyst could perform better for a given target molecule. Therefore, the designing of the catalyst as well as the reaction conditions usually need to be optimized for each particular transformation. Our efforts in designing of chiral metal complexes for the synthesis of enantio-pure epoxides and their derivatives as key intermediate for pharmaceuticals will be presented.

[*]*Discipline of Inorganic Materials and Catalysis, Central Salt and Marine Chemicals Research Institute (CSIR-CSMCRI), Bhavnagar- 364 002, Gujarat, India. Fax: +91-0278-2566970; E-mail:rukhsana93@yahoo.co.in*

OL5

101.Mass finger printing studies of Berberis petiolaris plant parts using DARTMS and Q-TOF LCMS (HRMS) instruments and their PCA analysis

Brijesh Kumar, Awantika Singh, Vikas Bajpai, Mukesh Srivastava and K. R Arya

Brijesh Kumar, Sophisticated Analytical Instrument Facility, CSIR- Central Drug Research Institute, Lucknow-226001, India: E-mail:brijesh_kumar@cdri.res.in

The unique therapeutic properties of plant-based molecules have attracted worldwide attention. About 40% of the currently used pharmaceuticals are either fully derived or partially synthesized from plant-based molecules. Plants have been used for medicinal purposes right from the early days of civilization. The ancient Indian system of medicine, Ayurveda or the science of life, describes 8000 codified herbal remedies. Their continued popularity is due to the fact that these medicines are prepared from medicinal plants, have fewer side effects and hence are suitable for long-term use. The genus, Berberis belonging to family Berberidaceae has about 650 species world wide of which 54 have been found in the Himalayan region. Berberis aristata DC (Indian barberry), known as 'Daruharidra' in Ayurveda, belongs to the family Berberidacae and is one of the most important medicinal plants used extensively for treating several ailments in almost all of the indigenous systems of medicine in India. The use of berberine has been described for almost all disorders of the body. Berberine has been used in Indian and Chinese medicines as antimicrobial, stomachic, bitter tonic, and in the treatment of oriental sores.

One of the major problems faced by herbal industry is adulteration and substitution of herbal drugs. The original plants are substituted with the inferior commercial varieties to maximize the profit or to circumvent the problem of scarcity. There are several other plants having berberine in lesser quantities. A few among them found in India are Berberis asiatica, Berberis lyceum, Morinda umbellate, Coscinium fenestratum and Mahonia borealis. A recent market survey in India shows that Berberis asiatica, B. lyceum, Morinda umbellata and Coscinium fenestratum are traded as substitutes or adulterants for B. aristata and hence it is not always easy to get authentic Berberis aristata from the market. It is equally important to ensure that the correct parts are used for the medicinal purpose. Often it is difficult to distinguish roots and stems visually. Morphological, anatomical and phytochemical aspects have to be examined to identify this adulteration. Metabolic profiling followed by statistical analysis is a preferred method for the differentiation of plants. Plant phenotype demarcation using non-targeted LC-MS and GC-MS metabolite profiling are very common. These techniques require elaborate sample preparation starting from the crude plants. A quick and easy method of differentiation of plant species is therefore welcome. Recent developments in newer ionization methods have made it possible to obtain MS data directly from the plant parts without any sample preparation. One such method is Direct Analysis in Real Time (DART). It is an ambient ionization technique requiring no sample preparation. Organic molecules from a variety of surfaces can be ionized directly. It is therefore an appropriate technique for the rapid chemical profiling of plant species. Statistical analysis of the data should provide enough information to differentiate the plant species. Hence it was decided to profile the chemical constituents of the plants containing berberine using DART MS. Details of our findings will be discussed in seminar.

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OL6

275. Molecular phylogeny and detection of chitinase genes in *Streptomyces* isolated from tea rhizosphere

Rajal Debnath, Rupak K Sarma, Ratul Saikia*, Archana Yadav, Tarun C Bora

Thirty nos. of Streptomcyes isolated from various niches in tea rhizosphere were *in vitro* screened for their antifungal and antibacterial potency against the pathogens, *viz. Fusarium oxysporum* f. sp. *ciceri, Rhizoctonia solani, Fusarium moniliforme, Staphylococcus aureus, Bacillus subtilis* and *Escherichia coli*. Subsequent screening on colloidal chitin amended media as described by Takeshi et al suggested production of extracellular chitinase by 10 isolates. Molecular screening with chitinase specific primers as reported by Williamson et al. showed amplification for family 18 or family 19 glycosyl hydrolase genes. Molecular phylogenetic study among these isolates was investigated according to Upadhyay et al. by generating 16S rDNA-RFLP and BOX– PCR fingerprint profile with respect to four reference strains of *Streptomyces glaucescens* (MTCC 276^T), *Streptomyces coelicolor* (MTCC 8^T), and *Streptomyces fradiae* (MTCC 321^T). Matrix scoring followed by similarity and clustering of data for dendrogram generation by UPGMA was done using NTsys ™ software package. The study revealed considerable diversity among the isolates of tea rhizosphere with potential extracellular chitinase producing ability which may directly or indirectly involve in showing antifungal activity, since pathogenesis related (PR) proteins like chitinases are known to degrade cell wall chitin and inhibit fungal growth.

Biotechnology Division, North-East Institute of Science and Technology (CSIR), Jorhat 785006, Assam, India. Email: rsaikia19@gmail.com; saikia_ratul@rrljorhat.res.in

OL7

306. Isolation and Partial Characterization of *Antheraea Proylei* (J.) Sericin Having Potential Application as a Biomaterial

A. Ibeyaima, S. Kunjeshwori Devi and L. Rupachandra Singh†

The two major silk proteins, namely fibroin and sericin, find applications as biomaterials. These proteins are produced by a variety of silkworms. Apart from the well known domesticated mulberry silkworm species *Bombyx mori* (L.), non-mulberry silkworms, namely muga, eri, tasar silkworms, are also reared in India on a commercial scale. The two major tasar silkworm species reared are tropical tasar silkworm *Antheraea mylitta* (D.) and temperate (oak) tasar silkworm *Antheraea proylei* (J.). In the present investigation, the gummy silk protein sericin was isolated from the *Antheraea proylei* (J.) cocoons, and subsequently partially characterized. The new sericin isolation method was carried out by a demineralization step of EDTA treatment at pH 10 followed by a degumming step involving treatment with a solution of urea, SDS and β-mercaptoethanol. The resulting sericin preparation was subjected to SDS-PAGE and at least three sericin fractions were separated. A thin-film like preparation was also obtained from the serecin preparation in a preliminary experiment.

Key words: silk protein, serecin, *Antheraea proylei*

Laboratory of Protein Biochemistry, Biochemistry Department, Manipur University, Canchipur, Imphal-795003, India
Fax: +919436204352 Email: rslaishram@yahoo.com

OL8

354. Developmental and tissue specific variations in hsp90 and vitellogenin mRNA expressions under heat stress in silkworm, *Bombyx mori*

Bela Keshan*, Satinath Paul

Insect Endocrinology & Molecular Biology Lab
Department of Zoology
North-Eastern Hill University
Shillong-793022
Email: bkeshan@hotmail.com

The mRNA expressions of hsp90 and vitellogenin were studied in silkworm, *Bombyx mori* after giving heat stress at 39°C, 42°C and 45°C for 1h and 2h respectively, to spinning larvae and pupae. RT-PCR data showed that during spinning phase there is an up-regulation of hsp90 mRNA expressions under sub-lethal heat-stressed conditions in all the tissues examined such as fat body, ovary, wing epidermis and abdominal epidermis, whereas its expression was not getting up-regulated under severe heat-stressed conditions. During pupal stage the mild heat shock treatment showed an up-regulation of hsp90 expression but only in fat body and not in ovary. On contrast, the vitellogenin mRNA expression was very much up-regulated in both fat body and ovary even at 45ºC- 2h. During spinning phase there is an up-regulation of vg mRNA expression under sub-lethal heat stressed conditions only in ovary but not in fat body. This is the first report showing the putative protective role of vitellogenin besides hsp90 in silkworm development under heat stress.

OL9

145. Novel bis-iridoid-S-methythiocarbonate from the aerial part of *Saprosma fragrans*

D. N. Singh[1], N. Verma[1] and D. K. Kulshreshtha[2]

Terrestrial plants have played a promising role in the development of sophisticated traditional medicine systems and throughout the ages and nature has always been a source of medicines for the treatment of a wide spectrum of disease. Hence, extensive work in order to revalidate the traditional system of medicine is urgently needed, in order to develop the new drug in term of having novel structure or Novel mechanism of action or a novel prototype/ lead molecule for further drug development. Plant-derived compounds have played very important role in the developments of several clinically useful agents. Previously, we have reported the antifungal activity and also investigated novel saponins from the rhizomes of *Agapanthus africanus*. Recently, we have isolated the bis-iridoid-S-methythiocarbonate from the aerial part of *Saprosma fragrans*. Herein, the detailed isolation procedure and characterization of the isolated novel compound by using of various chemicals and spectral (^{1}HNMR, ^{13}C NMR, IR, UV and MS) will be discussed.

[1]Department of Chemistry, K. S. Saket PG College, Dr. RML Avadh University, Faizabad-224001, India, [2]Retired Scientist-G and Head, Process and Medicinal Chemistry Division, Central Drug Research Institute, Lucknow-226001, India.

E-mail: dnsinghsaket@ yahoo.com

OL10

206. Solid and Solution Structures and DNA binding properties of $[M^{II}(4\text{-}CNpy)_2(SO_4)(H_2O)_3].H_2O$ for M = Cu, Co, Ni

Manjit K. Bhattacharyya[2] and Birinchi K. Das[1*]

Compounds of the type $[M(H_2O)_3(SO_4)(4\text{-}CNpy)_2].H_2O$ with M = Co, Ni display an interesting hydrogen bonded layered structure in the solid state. The copper analogue of the above species, $[Cu(H_2O)_3(SO_4)(4\text{-}CNpy)_2].H_2O$ (**1**) has been presently synthesized and found to be isostructural in the crystallographic sense to the Co (**2**) and Ni (**3**) species. The solid and solution phase UV-vis-NIR spectra of **1**, **2** and **3** indicate that species of the type $[M(H_2O)_4(4\text{-}CNpy)_2]^{2+}$ may be present in aqueous solutions of **1**, **2**, and **3**. The DNA binding behaviour of the above water-soluble complexes with Calf-Thymus (CT) DNA has been investigated by isothermal titration calorimetry (ITC) to find that the nature and extent of interaction are dependent on the identity of the metal.

Keywords: Supramolecular solids; UV-vis-NIR spectra, Metal DNA binding; Isothermal titration calorimetry

[1]*Department of Chemistry, Gauhati University, Guwahati 781 014, India*

[2] *Department of Chemistry, Cotton College, Guwahati 781 001, India*

[*]*Corresponding author. B.K. Das: tel., +91 361 2570535;*

e-mail, Birinchi.Das@gmail.com, manjitbhattacharyya@yahoo.com

OL11

240. Anti-microbial activity of the constituents of *Hygrophila auriculata* (K.Schum) Heine

R.B.Pareek[1], Sunita Farkya[1] and T.J.Vidyapati[2]

Hygrophila auriculata (K.Schum) Heine (*Syn*. *Asteracantha longifolia* Nees. Acanthaceae) was widely used in the Indian System of medicine for the treatment of various liver ailments. The antifungal and antibacterial activity of the Petroleum ether, Chloform and *n*-butanol extract of the aerial part was studied. For study of the physiological activity of the crude extracts all the three extract i.e. Petroleum ether, Chloform, *n*-butanol extract were analyzed against *Aspergillus niger, Aspergillus flavus* and *Cladosporium and* shows positive results. - Petroleum ether extract after successive column chromatography responds three compounds which is Arnidiol(I), 1,3,4- Trihydroxy5-(or8)-methoxy-2-methylanthraquionone(II) & 3,8-Dihydroxy-4-methoxy-2-methylanthraquinone(III). The isolated three compounds were also screened for anti fungal activity. The compound I was dissolved in 95% of 1 ml *n*-butanol and II & III were dissolved in 1 ml of 95% ethanol and added to Potato-Dextrose –Agar (PDA) media to make final concentration of these compounds 0.002, 0.02 and 0.1%. Pure PDA media was used as control and PDA supplemented with 0.1% ethanol and *n*-butanol was used as placebo. All treatments were incubated in an incubator at 28^{o}C± 1^{o}C temperature for five days. It was observed that with the increases in concentration of the compounds colonial diameter and spore count per ml of each test fungi was decreased.

1. DESM, Regional Institute of Education, Ajmer 2. DESM, Regional Institute of Education Mysore

e-mail-rambabupareek@yahoo.com

OL12

242. Investigations on certain medicinal plants used as traditional folk medicines in Manipur

Okram Mukherjee Singh

Manipur, a border state in the North Eastern corner of India has been known for its richness in medicinal plants. Its Blue Mountains and green valley are the hosts of a wide variety of indigenous plants. The total forest area of the state is approximately 13500 sq. km. which is about 60% of the total land mass of the state. More than 300 plants having medicinal values and also commonly used by the local people have been identified by the ethno botanical survey works. The local people have been using these plants for treating different types of ailments. Recently we have reported the phytochemicals and medicinal applications of certain plants which are distributed as wild plants in both the plains and hill areas of Manipur.[1-3]

We wish to report here some of our works on the phytochemistry of certain medicinal plants from two families *Acanthaceae* and *Solanaceae* family.

Department of Chemistry, Manipur University, Canchipur, Imphal -795003, Manipur, India.

E. mail: ok_mukherjee@yahoo.co.in

OL13

386. Discovering new leads for Alzheimer's Disease that Target Aectylcholinesterase using Pharmacophore Model Guided Docking Protocol

Raghuvir R. S. Pissurlenkar[1]*, Premlata K. Ambre[1], Elvis A. Martis[1], R. Raghu[2] Krishna R. Iyer[1] and Evans C. Coutinho[1]

The principal role of acetylcholinesterase (AChE) is depletion by hydrolysis of acetylcholine (ACh) in the synaptic cleft. AChE inhibitors find use for neuromuscular disorders and treatment of Alzheimer's diseas. In this study, we present a virtual screening workflow for the identification and prioritization of potential leads against AChE. Multiple pharmacophore models were developed using HipHop in Accelrys Discovery Studio v3.1, Schrödinger Phase v3.4 and PharmaGist v1.0 and were validated by two distinct datasets containing molecules known to be active and in-active against AChE. The three best models are: Hypothesis I (Phase v3.4): one acceptor, one positive charge, one aromatic ring and variable features (APR + Var); Hypothesis II (PharmaGist v1.0): two acceptors, one positive charge and two aromatic rings (AAPRR) and Hypothesis III (Discovery Studio v3.15): one acceptor, two hydrophobes and one aromatic ring (AHHPR). Validation of the three hypotheses based on the two datasets strengthened their reliability for virtual screening. The best hypothesis AAPRR, based on validation, was considered for virtual screening of the "*all purchasable*" ZINC database (~14 million molecules). Hits from the screening were docked in their pharmacophore constrained conformations using Glide v5.8 and the complexes scored with Prime v3.1 MM-GBSA, to arrive at a subset of leads which are being evaluated for AChE inhibitory activity. Although pharmacophore modeling and docking are two independent virtual screening techniques, combining the two methods in one workflow increases the quality of leads.

[1]*Department of Pharmaceutical Chemistry, Bombay College of Pharmacy, Kalina, Santacruz (East), Mumbai 400098.*
[2]*Schrodinger LLC, 102 4th Block, 3rd Stage, 3rd Main, Sharadha colony, Basaveshwara Nagar, Bangalore 560079.*
e-mail: raghuvir@bcpindia.org

OL14

117. Neutraceuticals potential of bamboo shoots and its fermented products of Assam region

Laxmikant S. Badwaik*, Pallab Kumar Borah and Sankar C. Deka

Bamboo shoots are young, new canes that are generally 8-12 inches long, taper to one end and emerges from nodes of the rhizome of plants. They are rich in vitamins, cellulose and amino acids; low in fat and calories and having good source of fibre. They are effective in decreasing blood pressure, cholesterol and increasing appetite. The people of Assam have been consuming bamboo shoots as raw, processed and fermented (*Khorisa*) form because of its exotic taste, flavour and medicinal value. Current study was tried to explore the neutraceuticals potential of some bamboo shoot species and its fermented products of Assam region. Shoots of *Bambusa balcoa, B. tulda, B. pallida* and *Dendrocalamus hamiltonii* and fermented shoots of *B. balcoa* and *B. pallida* were examined for protein, fat, dietary fibre, mineral, vitamin-C, total phenols and antioxidant activity. Also HPLC analysis of fresh and fermented shoots of *B. balcoa* were carried out for detection of organic acid profile. Protein, fat, dietary fibre, mineral, vitamin-C, total phenols and antioxidant activity were found in the rang of 3.44-3.78g, 0.31-0.67g, 3.51-3.92g, 0.82-0.96g, 1.42-2.45mg, 83.00-97.5 and 25.60-29.59% respectively for 100g bamboo shoot. Phenolic content, antioxidant activity and acidity were found high in fermented shoots. HPLC results show the presence of lactic, tartaric and oxalic acid in fresh shoots as well as along with theses acids presence of pyruvic and formic acid were found in fermented shoots. Data shows the potential of bamboo shoot for maintaining health and wellness.

Keywords: Bamboo shoots, Neutraceuticals, Khorisa, Total phenols, Antioxidant activity

Department of Food Engineering and Technology, School of Engineering, Tezpur University,

Napaam-784028, Assam (India)

laxmikantbadwaik@gmail.com

OL15

171. Antitumor and Antioxidant status of *Ervatamia coronaria* leaves in experimental animal models

B.B. Kakoti[1] P. Gomathi[2], M. Gupta[3], U. K. Mazumder[3]

Ervatamia coronaria (Apocynaceae) a small evergreen shrub popularly known as 'tagor' in Assamese and 'nandhiyavattai' in Tamil widely distributed throughout the north eastern states of India, southern states of India and China. The various parts of the plant are widely used in the folk medicine for the treatment of pain, inflammation, cough, asthma, bilious febrile attacks, arthritis and rheumatism. Decoction of the root is used in diarrhea and toothache. The present study was designed to determine the antitumor and antioxidant properties of crude methanol extract from the leaves of *Ervatamia coronaria* (MEEC) against Ehrlich Ascites Carcinoma (EAC) bearing Swiss albino mice. The effect of MEEC (50, 100 and 200 mg/kg) on the growth of transplantable murine tumor, life span of EAC bearing host, viable and non-viable cell count, packed cell volume, hematological profile and biochemical parameters such as lipid peroxidation (LPO), reduced glutathione content (GSH), superoxide dismutase (SOD) and catalase (CAT) activities were estimated. MEEC caused significant ($P<0.01$) decrease in tumor volume, packed cell volume and viable count; and it prolonged the life span of EAC-tumor bearing mice. Hematological studies reveal that the Hb content and RBC count were decreased in EAC treated mice, whereas the restoration to near normal levels was observed in extract treated animals. MEEC significantly ($P<0.05$) decreased the levels of LPO and significantly increased the levels of GSH, SOD and CAT. Moreover the MEEC was found to be devoid of conspicuous short-term toxicity in the mice when administered daily for 14 days at the doses of 50, 100 and 200 mg/kg. The results suggested that the methanol extract of *Ervatamia coronaria* leaves exhibited antitumor effect by modulating lipid peroxidation and augmenting antioxidant defense system in EAC bearing Swiss albino mice.

Keywords: *Ervatamia coronaria,* antitumour, EAC, antioxidants.

[1] Department of Pharmaceutical Sciences, Dibrugarh University,

Assam- 786004

[2] Department of Pharmaceutical Chemistry, Vaagdevi College of

Pharmacy, Kishanpura, Warangal, Andhra Pradesh-506001

[3] Department of Pharmaceutical Technology,

Jadavpur University, Kolkata, India – 700 032.

Email: bibhuti_amc@yahoo.co.in

OL16

113. Role of Herbal Drugs in the Managements of Bronchial Asthma

Dr. Mukamchem Yim*, Dr. Bishnu Prasad Sarma**

Inspite of all round developments in the medical research, the problem of bronchial asthma still remains a challenge to the medical scientists. Of course this is a chronic disease which is paroxysmal in nature and highly horrifying to the patients as well as to the physician. It has a very high incidence i.e. 0.5-2% affecting people of every country irrespective of age & sex.

Inspite of phenomenal progress in the medical sciences, the treatment of Bronchial Asthma still consists of some palliative symptomatic remedies. Although several powerful drugs have been tried to dilate the bronchial, and then by relieve symptoms, all these effects are temporary and patient gets attacks quite repeatedly. Several herbal species were tired in different preparations in the treatment of bronchial asthma.

Since the time immemorial man has made use of plants in the treatment of disease. The pharmacopeias of many countries of the world include even today a large number of drugs of plant origin. The history of medicinal plants dates back to Rigveda, perhaps and the oldest repository of human knowledge, which was written in about 4500-1600 B.C. then there is the Ayurveda (about 2500 B.C) which contains a more details accounts of many drugs. Following the light divisions of Ayurveda, there are the comprehensive works of Charaka (1000 B.C) and Sushruta (800 B.C) which gave a detailed description of materia medica as it was known to ancients. The work of Atreya, Jivaka and Kashyap (about 600 B.C), Patanjali (about 200 B.C), Nagarjun (about 500 B.C) and the Bower script (about 300-400 A.D) added to the knowledge of herbal medicine. The Mohammedan culture enriched the vegetable materia medica which was more enlightened by coming in touch with Greece, Arabia and Persia (Arora 1965).

India is endowed with a very rich flora because of the size of the country with its variety of climate and soil conditions prevailing in different geographical regions and as such there is a wonderful opportunity for working on plant products.

Ayurveda, the treasure box of herbal medicine has the potential to offer drugs in the management of Bronchial Asthma which claimed to be effective without any side effect. The details will be discussed in the seminar.

Key words: Bronchial asthma, palliative, symptomatic remedies, Rigveda, Atreya, Charaka (1000 B.C), Sushruta (800 B.C) Greece, Arabia, Persia, geographical regions.

** M.D Scholar. Deptt of Kayachikitsa, Govt. Ayurvedic College & Hospital Jalukbari, Guwahati – 14. Assam. India. Ph: +918011138904. Email, yimmukam@yahoo.com*

*** M.D (Ay), IMS, BHU, Ph.D, PGCR (MUM), FICA, FCCP, DIP. YOGA (BHU), ANRAP FELLOW (DHAKA) Associated Professor Deptt of Kayachikitsa. Govt, Ayurvedic College & Hospital Jalukbari, Guwahati – 14. Assam. India.*

OL17

239. The Role of a Herbal Compound in the Management of Essential Hypertension - Clinical Study

* Dr. Sobha gupta, ** Dr. B.P. Sarma, *** Dr. O.P. Gupta

Cardiovascular disease is a great health challenge of today's urban and rural community, and Hypertension is one of such risk factor which has now spread like an epidemic to every class section of the population from corporate to labors, from officers to workers. Cardiac abnormalities mostly affect the people belonging to active age group which directly and indirectly produces problems in the family, society and ultimately to the country as a whole.

CAD including Hypertension are now the biggest acute and chronic problem which can be prevented by changing the lifestyle of a person with Ayurvedic tips. There are two factors established to-day are -

1. Modifiable risk factors

2. Non Modifiable risk factors

Non modifiable risk factors are age, hereditary and family history.

Modifiable risk factors includes hypertension, hyperlipidaemia, diabetes mellitus, obesity, physical inactivity, sedentary life style, excessive use of alcohol and cigarette smoking, random use of drugs, and stress.

It has been scientifically shortlisted by data and research that by reducing lipid profile, blood pressure and hyperglycaemia including reduction of weight by 1 or 2% may reduce the chances of CAD and heart attack by 30%.

Changing into lifestyle, restricting alcohol intake, avoiding smoking and by yogasanas and meditation 20% of the disease can be removed.

A clinical trial with a herbal compound is going on at Govt. Ayurvedic college and hospital which showed very good result in the management of Essential Hypertension.

**Dr. Sobha Gupta, P.G. Scholar, Department of Kayachikitsa, Govt. Ayurvedic College and Hospital, Guwahati - 14, Assam. Email : dr.sobha10@gmail.com*

*** Dr. B.P. Sarma, Associate Professor, Dept. of Kayachikitsa (Medicine), GACH, Ghy - 14, Assam , India. E-mail : bishnupsarma@sify.com*

**** Dr. O.P. Gupta, Professor and Head, Department of Kayachikitsa (Medicine), Govt. Ayrurvedic College & Hospital, Guwahati - 14, Assam. E-mail: drshivaji.tzp@gmail.com*

OL18

146. Antioxidant Potential of Natural Products

Anju Agrawal

A natural product is a chemical compound or substance produced by a living organism found in nature that usually has a pharmacological or biological activity for use in pharmaceutical drug discovery and drug design. Natural products have been the basis of treatment of human diseases and many higher plants contain novel metabolites with antimicrobial and antiviral properties. As an alternative medicine, people derived therapeutic materials from thousands of plants; however discovering medicines or poisons remains a vital question. Since reactive oxygen radicals play an important role in genesis of numerous human disease processes, antioxidants derived from consumable fruits, vegetables, spices and beverages have received considerable attention. The antioxidants protect our body systems from free radicals mediated damage at the cellular and molecular levels. The pool of free radicals production in our body stems mainly from the mitochondrial activity but the environmental factors such as xenobiotics, pollutants and other stressors also contribute in it enormously. This phenomenon generates imbalance between the oxidants (free radical species, FRS) and the innate antioxidants; a condition called as oxidative stress. Oxidative stress leads to onset of numerous disease processes including cancer, heart, lung, brain and kidney associated diseases, cell death and aging. Apart from the best-known antioxidants such as vitamins A, C and E, and the mineral selenium, some flavonoids (secondary metabolites) and vitamin precursors synthesised by plants are required to be taken from outside to establish the balance by quenching the excess FRS. The present review presents a comprehensive account of updated information available on natural products containing antioxidant potential with therapeutic implications.

Department of Zoology

SNSenBVPG College, CSJM University, Kanpur

Email. anjuagrawal2@gmail.com

OL19

332. Study on the Degradation of Methylene blue in Water using $CoFe_2O_4$-Cr_2O_3-SiO_2 as Photocatalyst by Liquid Chromatography Electrospray Ionization Quadrupole Ion-Trap Mass Spectrometry

Kula Kamal Senapati

A magnetic nanocomposite $CoFe_2O_4$-Cr_2O_3-SiO_2 was successfully synthesized using a sonochemical route in this study. The catalyst was characterized by X-ray diffraction (XRD), energy dispersive X-ray spectroscopy (EDS), transmission electron microscopy (TEM) and vibrating sample magnetometer (VSM). The results showed that the catalyst was composed of a ferromagnetic core of cobalt ferrite ($CoFe_2O_4$) with an antiferromagnetic Cr_2O_3 shell enveloped by SiO_2 mono layer. The photodegradation of methylene blue (MB), a typical organic dye was investigated in aqueous suspension containing the $CoFe_2O_4$-Cr_2O_3-SiO_2 nanocomposite under UV irradiation. Liquid Chromatography coupled with electrospary ionization mass spectrometry (ESI LCMS/MS Quadrupole, QTof) using UV-Vis diode array detector was applied to the analysis of the samples coming from the photocatalytic degradation of MB. The degradation products during the course of the photocatalytic reaction were identified and the results showed that MB could be completely degraded in the aqueous dispersion of $CoFe_2O_4$-Cr_2O_3-SiO_2 photocatalyst after 2 hr UV-illumination.

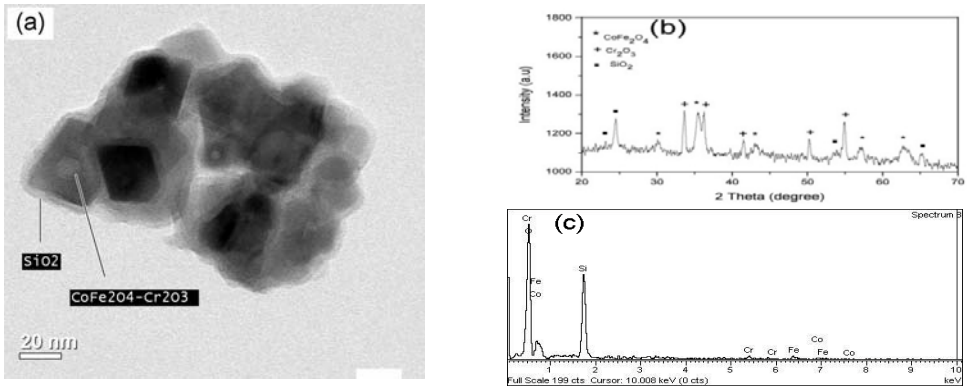


Figure 1. (a) TEM image; (b) XRD pattern; (c) EDS spectrum of the as-synthesized $CoFe_2O_4$-Cr_2O_3-SiO_2 photocatalyst.

Central Instruments Facility, IITGuwahati, Guwahati-781039, Assam, India

e-mail: kulakamal@yahoo.co.in

OL20

324. Prospects of Biodisel Industry in the Northeast of India

Prof. Dibakar Chandra Deka

Importance of biodiesel as the substitute for petrodiesel has been recognized all over the globe. R & D activities are going on for a couple of years but the issue of biodiesel has been taken up more vigorously only recently in several countries. Some of the countries, which have already developed technology for the production and use of biodiesel are Australia, Brazil, Canada, Germany, Indonesia, Malaysia, Thailand and United states. In most of these countries major part of the feedstock comes from vegetable oils although animal fats are also being used in a few of them. In Brazil feedstock comes from soybeans and sunflower seeds while Germany relies on rapeseeds and United States on soybeans. Indonesia is a major producer of biodiesel using palm oil as the feedstock, and is in a position to export biodiesel to countries like USA, Germany and Japan. Malaysia also produces biodiesel from palm oil. In Papua New Guinea the feedstock for biodiesel comes from coconut. Thailand uses varieties of feedstock

Biodiesel can be derived from both edible and non-edible vegetable oils. As India is deficient in edible oils, non-edible oil should be the main focus for producing biodiesel. In India Northeast is rich in plant diversity. There are many wild plants, which produce fruits with seeds highly rich in non-edible oils. Many of these plants have no apparent economic value, and therefore, people are not interested in preserving them. These plants are invaluable economic assets. It is these plants, which should be explored as potential source of oil for the production of biodiesel. Some of these plants presently being explored by us will be reported.

OL21

115. Effect of Gamma Irradiation on Polycarbonate Polymer

D. Sinha[a,c*] T. Swu[b] and D. Fink[c]

Gamma irradiation effect on polycarbonate polymer has been studied in the dose range of 10^1–10^6 Gy. Thin films of polycarbonate polymer have been irradiated with different gamma doses from a Co^{60} source. To understand the modifications caused by gamma irradiation, different analytical techniques like FT-IR, DSC, XRD studies have been performed. IR study have indicated that at the dose of 10^6 Gy, scissioning of ester linkage takes place leading to formation of phenolic group in the polymer matrix.. Though the effect of radiation is most significant at the highest dose, the process of modifications starts at 10^3 Gy. Scissioning of the polymeric chain initiates a different morphological zone within the polymer matrix, and the polymer becomes more crystalline with increasing dose. Owing to chain scissioning, the mobility of the polymer increases, which in turn reduces the glass transition temperature of the polymer.

[a]*Department of Chemistry, Nagaland University, Lumami -798627, India*
[b] *Department of Chemistry, Pondicherry University, Puducherry-605014, India*
[c] *Hahn Meitner Institut, Glienicker Str. 100, D 14109 Berlin, Germany*
Presenting Author : dipaksinha@gmail.com

OL22

209. **Studies on Ignition Temperatures of NER Coals: A Thermogravimetric Approach**

Tonkeswar Das, Binoy K Saikia, Prasenjit Saikia Bimala P Baruah*

The ignition temperature of coal generally means the temperature at which coal initially starts burning on combustion. The ignition temperature of coal depends upon their physico-chemical characteristics. The lower ignition temperature of coal requires low energy and will be better for using in coal combustion power plants. In this report, few thermogravemetric experiments were conducted for different coal samples from North-East Region (NER) and correlated with their physico-chemical properties to interpret their ignition temperatures. The result shows considerable variations in ignition temperatures of coal with their physico-chemical properties and gives a good idea about the combustion characteristics of these coals.

Coal chemistry Division, CSIR-North East Institute of Science & Technology, Jorhat-750006, India

**Corresponding author: bpbaruah @yahoo.com*

prasentu@gmail.com

OL23

210. Coal-based industries in NER India: study of emission characteristics

BP Baruah*, Puja Khare[1]

North Eastern Region of India has a good deposit of high sulphur tertiary coals; the caking variety found mostly in the states of Assam and Meghalaya are utilized for coke making in the region. The coke making is mostly practiced in the non-recovery coke ovens without Atmospheric Pollution Control Devices (APCD). These coke oven industries contribute heavily to the degradation of air quality by emitting total carbon, particulate matter (PM), SPM, toxic gases contributing to climate changes and affecting human health.

Here in this investigation, emission profile of coke oven using non-recovery technology is reported. The discussions are also made on effect of fuel types **on emissions**, composition of Particulate matter, the presence of Total carbon (TC), Water soluble organic (WSOC), Inorganic (WSIC), and total carbons (WSTC). The particle bound Polyaromatic Hydrocarbons (PAHs) released from coke ovens is also discussed.

Keywords: Non-recovery coke ovens, PM, PAHs, Elemental constituents.

**Coal Chemistry Division, CSIR-NEIST, Jorhat, Assam*

[1]Agronomy Soil Division, CSIR-CIMAP, Lucknow (present address)

*Address for communication: *bpbaruah@yahoo.com (Dr BP Baruah).*

OL24

111. An Eco Friendly Alkali Solution For Enhanced Oil Recovery

Subrata Borgohain Gogoi

The injection of alkali, alkali/surfactant and alkali/polymer solutions is a well-known Enhanced oil recovery (EOR) technique. This article demonstrates how wood ash can be used as a source of low cost alkali instead of synthetic alkali. The wood ash is also environmentally friendly. From the experimental studies, it is found that the pH value of 6% wood ash extracted solution is very close to the pH value of 0.5% synthetic NaOH or of 0.75% Na_2SiO_3 solution. A preliminary study of oil/oil droplets interaction in natural alkaline solution was carried out in order to understand the oil/water interfacial tension (IFT) and its effect on oil/oil droplet coalescence. Also IFT was measured for both synthetic and natural alkaline solutions. The IFT of natural and synthetic alkali with crude oil were compared based on EOR.

Department of Petroleum Technology, Dibrugarh University, Dibrugarh

Email: sbg6@rediffmail.com

OL25

107. Herbs From North-Eastern India In The Management Of Type – 2 Diabetes Mellitus

Dr. Bisnhu Prasad Sarma

Since time immemorial plants have been a source of medicines and food for human beings. Man had a close relation with the nature and used the divine gift with utmost restriction and sanctity for his personal use or for removing ailments or others. It is estimated that nearly 4.4 billion people comprising 80% of the world's population rely on plants as their primary source of medicine. A treasure trove of such knowledge still remains untapped in forests throughout the world. Presently there are nearly 700 plants species which are utilized for the development of modern drugs. In the present era of medical engineering, plants play an equally important role in drug discovery and development. Over the counter cost of herbal drugs is roughly estimated to be US$500 billion all over the world. It is constantly growing @10-15 % annually and likely to touch US $ 5 trillion during the next 40 years. Indian subcontinent is among the top nations having the richest source of Traditional Knowledge since the time immemorial. Traditional Knowledge in our country has survived due to its strength, efficacy in treatment and drug formulation taking care of health requirement of people.

Diabetes mellitus was known to ancient Indian physicians as 'Madhumeha'. Abundant of herbal and animal products including several metals/ minerals incorporated with herbs have been described for cure of diabetes in ancient literature. Special regiment of diet, with bitter vegetables has been mentioned to be most helpful to diabetic patients in Ayurveda. Thus, the indigenously available medicines and technology can prove an asset in the tropical and developing countries of the world. At the same time developed countries also can be benefited because of safety profile of the herbal agents.

Dept of Kayachikitsa (Medicine), Govt. Ayurvedic College, Guwahati, Assam, India,

Mobile No. : 09864036018, Email : bishnupsarma@sify.com

OL26

166. Metal-graphene composites materials and its role in antimicrobial activity

Manash R. Das,*[a] Sarat Ch. Borah[a], Rupak K. Sarma[b], Ratul Saikia[b] and Pinaki Sengupta[a]

Graphene, a single layer of carbon atoms closely packed into honeycomb two dimensional (2D) lattice, with a carbon-carbon distance of 0.142 nm has attracted enormous attention recent year . The main method of synthesis of Graphene is the exfoliation of graphite by chemical oxidation followed by reduction. The presence of metal nanoparticles on graphene oxide sheets prevents restacking of the graphene sheets. Metallic nanoparticles supported on Graphene oxide/ graphene play an important role in wide number of applications such as surface-enhanced Raman scattering (SERS), display devices, catalysis, microelectronics, light emitting diodes, photovoltaic cells and also in medical or biological applications. Motivated by this properties and the general interest in metallic nanoparticles, enormous efforts have been made for the synthesis of metal nanoparticles-graphene/graphene oxide composite materials. Insertion of the nanoparticles on the graphene based matrix is an important study for the exploration of their properties and applications. Ag nanoparticles and their composite materials have received great interest due to their bactericidal properties such as antiseptic, disinfection and pharmaceutical agent. We have adopted solution chemistry approach for in-situ synthesizes of Ag nanoparticles on Graphene oxide/Graphene nanosheets using sodium borohydride, citrate and ascorbic acid as reducing and stabilizing agent. The synthesized Ag nanoparticles-graphene oxide composites materials shows excellent antimicrobial activity towards gram positive bacteria such as S.aureus and B. subtilis and gram negative bacteria such as E. coli and P. aeruginosa.

[a] *Materials Science Division, CSIR-North East Institute of Science and Technology, CSIR-Jorhat, Jorhat-785006, Assam, India*
[b] *Biotechnology Division, CSIR-North East Institute of Science and Technology, CSIR-Jorhat, Jorhat-785006, Assam, India*
Email: mnshrdas@yahoo.com (M. R. Das)

OL27

256. Rearing potentiality of certain lesser known wild silk moth species in Nagaland, India

L.N.Kakati

Rearing potentiality of four wild silk moth species i.e. *Actias selene, Antheraea roylei, Cricula trifenestrata* and *Samia canningi* have been evaluated in Nagaland, a mountainous state of India lying between 25°26'-27°40' latitudes and 93°20'-95°15' E longitudes. While conducting rearing in their most preferred host plants in three different seasons these species exhibit bi- and tri- voltinism, with the shortest and longest life cycle period corresponding to summer and autumn season. Qualitative and quantitative characters of cocoon and silk content depend on the larval development which has been largely influenced by host plants and abiotic factors. Analysis of rearing parameters like effective rate of rearing, cocoon weight and silk content of these four wild sericigenous insects indicate a promising future in terms of producing novel silk with high economic value for the region. While salubrious climatic conditions during spring and summer has assured better production of the cocoons, the diapausing character of these wild silkmoths in their natural habitat indicate their adaptability to severe winters at higher altitude of the state.

Department of Zoology, Nagaland University, P.O.NU Lumami -798627, Nagaland.

e mail : kakati_ln@yahoo.com

OL28

251. Role of Siderophore Production in Biological Control of Rice Fungal Pathogens by Plant Growth Promoting Rhizobacteria

Mohamed A. Gad*, Dileep Kumar B.S. *, T.C. Bora*, B. S. Bhau*, Manab Deka**, P. D. Nath***

Rice blast caused by *Pyricularia grisea* and aggregate sheath spot caused by *Rhizoctonia oryzae* are the major diseases affecting the rice production. Application of beneficial bacteria as seed or seedling root dip to protect these diseases may be alternative strategies to chemical control (Reddy et *al*., 2010). Several reports suggest that beneficial pseudomonads enhance plant growth and affect biological control by producing siderophore that sequester iron in the root environment, making it less available to competing deleterious microflora (Kloepper *et al*., 1980). In this study, out of 200 bacterial strains, four were selected for their antagonistic ability against these pathogens under *in-vitro* conditions. Among four isolates, strain *Pseudomonas aurogenosa* "NEIST 003" gave significantly higher inhibition of mycelial growth of *P. grisea* and *R. oryzae*. Strain NEIST 003, only produced siderophore when grown on Fe deficient and Fe fortified King's B medium. Also when grown these strains on succinate medium for detection of siderophore production and measured its absorption spectrum by UV-visible spectrophotometer were found that NEIST 003 only can produce siderophore. In case of the antagonist of bacteria against *P.grisea*, NEIST 003 gave inhibition zones of (0.80 & 1.47 cm) followed by NEIST 050 (1.13 & 1.20 cm), NEIST 041 (1.07 & 1.17 cm) and NEIST 121 (1.03 & 1.13 cm) in media with $FeCl_3$ (100µM) and without $FeCl_3$, respectively and in case of the antagonist of bacteria against *R. oryzae* , NEIST 003 gave inhibition zones of (0.75 &1.77 cm) followed by NEIST 050 (0.17 & 0.17), NEIST 041 (0.27 & 0.30) and NEIST 121 (0.23 & 0.27) in media with $FeCl_3$ (100µM) and without $FeCl_3$, respectively. Strain NEIST 003 activity was superior compared to other strains evaluated.

Key words: siderophore, biological control, *Pyricularia grisea, Rhizoctonia oryzae*.

*Biotechnology Division, North East Institute of Science and Technology (NEIST), Council of Scientific and Industrial Research (CSIR), Jorhat 785006, Assam, India**

*Biotechnology Division, Gauhati University, Gwahati, Assam, India***

*Department of Plant Pathology, Assam Agricultural University, Assam, India****

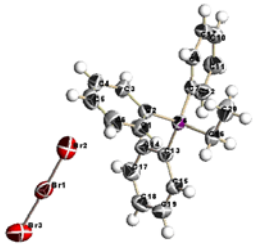
Email: Mohamedabo2002@yahoo.com

OL29

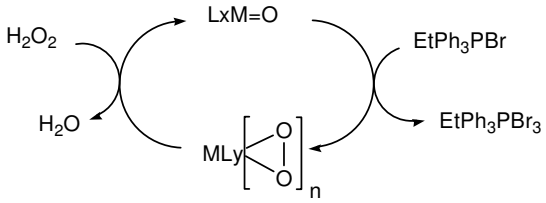
141. Ethyltriphenylphosphonium Tribromide – A Versatile New Reagent

Upasana Bora Sinha*, Latonglila Jamir, Anil Kumar, Alimenla B.

Organic tribromides have become an important group of reagents in recent years because of their versatility and long shelf life. Currently, the reagents that have become more popular are the alkyl quaternary ammonium tribromides, but considering the diverse uses of these reagents and their widespread commercial applications, it becomes important to incorporate newer tribromides into the existing series. In this regard focus was recently laid on synthesis and study of a phosphonium tribromide, especially because phosphonium based reagents are expected to have milder reactivity than organic ammonium tribromides which is quite essential for certain organic transformations. Therefore, ethyl triphenylphosphine tribromide (ETPPTB), having molecular formula $C_{20}H_{20}PBr_3$, was recently synthesized as a deep orange, solid crystalline compound that melts at 135°C. The crystal structure of the compound is given below:



This newly developed reagent was prepared by an environmentally benign hydrogen peroxide mediated oxidative method involving V_2O_5 as a promoter and hydrogen peroxide as the source of active oxygen, allowing ethylphosphonium bromide to be easily oxidized to tribromide, with KBr acting as the inexpensive source of additional bromide for the Br_3^- moiety:



In order to test the efficacy of the reagent for different organic transformations, a series of tests were conducted, upon which ethyltriphenylphosphonium tribromide was found to be useful in bromination reactions, acetylation reactions and in isothiocyanate preparations.

Department of Chemistry, Nagaland University, Lumami Campus-798627, Nagaland
upasanaborasinha@gmail.com

OL30

148. Catechol (1, 2-Dihydroxybenzene) Encapsulated Charged Surfactant Film Modified Electrode for the Detection of Vitamin C

Rimki Bhattacharjya, Diganta Kr. Das

Detection and determination of small bio molecules and metal ions are of great importance for diagnosis of a number of diseases and understanding environmental pollution leading to extensive research on development of sensors. Among different sensors, electrochemical sensors are unique because of simplicity, low cost, easy maintenance and easy in vivo applications. Voltammetric sensor, one of the major constituents of electrochemical sensors, is essentially a surface modified working electrode (WE)**.** The modifying agents may be surfactants, lipids, polymers, zeolites, clays etc. to name a few with or without a probe molecule. The objective of the research work presented in this paper is to modify surface of working electrode with thin films of various agents like surfactants, lipid, polymer, zeolite and clay impregnated with suitable probe molecules. In this paper, voltammetric sensors for vitamin C have been reported.

This paper is on detailed electrochemistry of catechol encapsulated sodium dodecylsulphate (SDS), CTAB and Phosphatidylcholine (PC) film on glassy carbon electrode in tris buffer (p^H 7.0). The charge of the film is found to effect redox potential of catechol by 120 mV. Cyclic voltammogram of catechol encapsulated SDS film modified electrode becomes irreversible in presence of 25 mM vitamin C which is not observed in case of the CTAB and Phospholipid film. A shift in 0.040 V in negative direction is observed when Catechol encapsulated Phospholipid film modified GC electrode interacts with vitamin C in solution.

Department of Chemistry, Pandu College, Pandu, Guwahati-781 012, Assam (India).

e-mail : rimki.bhatta@gmail.com

Department of chemistry, Gauhati University, Guwahati 781 014, Assam (India).

OL31

163. Imidazolidin-2,4-dione: Structure–activity relationship and stereo chemical approach

[1*]A. Idhayadhulla, [2]R. Surendra Kumar, [2] R.Karthikeyan, [2]A. Jamal Abdul Nasser

A serious of imidazolidin-2,4-dione derivatives were prepared from three compound mannich base method. The synthesized compounds were characterized on the basis of FT-IR, ^{1}H NMR, and ^{13}C NMR, mass spectral and elemental analyses. The synthesized compounds were screened for *in vitro* anti-bacterial activity against *Staphylococcus aureus* (ATCC-25923), *Klebsiella pneumoniae* (recaptured), *Escherichia coli* (ATCC-25922) and *Pseudomonas aeruginosa* (ATCC-27853), and *in vitro* anti-fungal activity against *Aspergillus niger, Candida albicans, Microsporum audouinii* and *Cryptococcus neoformans.* Some of the compounds are showing the MIC value in the range of 6.25–25 mg/ml against *Candida albicans* compared with current antifungal against. The structure-activity relationships (SAR) of these compounds were discussed with stereo chemical approach.

[1] *Department of Chemistry, Karur College of Engineering, Karur – 639002, Tamil Nadu, India.*

[2] *P.G. & Research Dept.of chemistry, Jamal Mohamed College, Tiruchirappalli- 620020, Tamil Nadu, India.*

e-mail: idhaya25chem@yahoo.co.in

OL32

182. Depth wise distribution of Arsenic in Groundwater of Golaghat, Assam

*Mridul Chetia and Nripen Kr. Boruah

Golaghat, a district of middle Assam is considered to be one, among the badly affected areas of NE region by arsenic poisoning. Around 31% of the drinking water sources (tube wells) have arsenic concentration more than 0.05ppm and 35.3% in between ≥0.01ppm to 0.05ppm≤. It has been also reported that 75% of the total 101 samples collected from the tube wells of depth 180±10 ft, 66% of total sample 97 of depth 120±10 ft and 58% sample of total collection 60 of depth 60±10 ft have arsenic concentration above the WHO/ BIS limit. A significant correlation coefficient 0.697 at $p < 0.01$ level between arsenic and iron indicates the phenomenon of reductive dissolution of As-Fe bearing minerals for arsenic mobilization. Presence of arsenic and iron detected in the EDX analysis of the sediment samples at different depth also supports the presence and mobilization process of arsenic in groundwater of Golaghat district.

Key Words: Arsenic, Golaghat, Depth, EDX

Department of Chemistry, D. R. College, Golaghat-785621, Assam, India
**Corresponding Author:*
Dr. Mridul Chetia, Dept. of Chemistry, D. R. College, Golaghat, Assam
E. mail: mridul_chetia@rediffmail.com
Ph No. 9706585368 (Mobile)

OL33

169. **Role of Murraya koenigii in the management of diabetes mellitus**

Dr. Ruby Deka, Dr.Bishnu Prasad Sharma

Diabetes Mellitus is one of the oldest diseases known to mankind and it has become a public health problamedue to the modern life style, which can be said as one of the life style disorders. It is a clinical syndrome characterized mainly by polyuria, polydipsia and polyphasia due to absolute deficiency of insulin or diminished biological effectiveness of it or both.

Nature has been a potential source of a variety of plants with diversified medicinal values and herbs were used for the treatment of various ailments for thousands of years and plants based drugs continue to play an essential role in the primary health care of 80% of the world's underdeveloped and developing countries.

In the present study, Murraya koenigii was chosen since it is one of the most widely administered remedies for the treatment of diabetes and it is a future hope in natural product that by using it in regular diet may keep away diabetes from us.

dekaruby@gmail.com

OL34

172. Nutraceutical properties of Amla & its processing wastes and microwave assisted extraction of polyphenol by using response surface methodology

Mishra P, Mishra S[1], Mishra V[1], Mahanta C.L.

Emblica officinalis (Amla) enjoys a hallowed position in Ayurveda-an Indian indigenous system of medicine (Khan [2009]). The antioxidants activities of Amla can not be attributed to ascorbic acid alone and that the overall effect is due to the polyphenolic contents of Amla. Amla contains 12.5% (w/w) of polyphenols in unbound form. Amla seed, seed coat are major processing wastes of Amla based industries. In present study compositional analysis for total phenols, vitamin C, proximate analysis, and optimization of method of isolation of polyphenols from Amla by using response surface methodology were carried out. Metal analysis was also carried out by using Atomic Absorption Spectrophotometer. Amla powder had 550-700 mg/100 gm of vitamin C, and 24.32-25.61 g/100 gm of total phenols. Both Amla seed and seed coat were found superior in terms of vitamin C and total phenols, the protein were also present in very good proportion in Amla seed (14.23%). All analyzed samples of Amla and its processing wastes showed presence of cu, zn at ppb level while significant amount of K (19-25 mg/gm), Mg (0.23-0.51 mg/gm) and Na were found in analyzed samples. For polyphenol isolation an initial three factor (ethanol concentration in the extraction solvent, liquid:solid ratio and time) were optimized. This revealed, after the use of response surface methodology that maximum polyphenols may be extracted in the first instance. MAE provided comparable or better extraction in a very rapid way in comparison to solvent extraction method.

Department of Food Engineering and Technology, Tezpur University Napaam Assam-784028

[1] *Center of Food Technology Science Faculty Campus University of Allah*

Email id : poonam@tezu.ernet.in

OL35

230. Natural cure for Chikunguniya

***** Dr. O.P. Gupta, ****Dr. Bishnu Prasad Sarma, ***Dr. Bijit Das

Chikunguniya is an emerging disease in Indian ocean region. The current outbreak has occurred after a gap of many years in number of countries. The clinical features and number of people affected by this outbreak suggest of this virus shedding its earlier benign form and form and becoming more pathogenic. There appears a wide gap in the knowledge about natural history of the disease. The report suggest of the changes in the genome of the virus making it more virulent, and are indicative of that the virus is emerging in the region. It only makes sense that world community and public health experts are empowered with appropriate knowledge for control and prevention strategies to avoid an epidemic, otherwise long disappeared disease like, this would keep returning to affect humanity, time and again. Ancient treatises like charak samhita has described about this type of exogeneous infection by different names and has shown the same types of clinical features and phenomenon related to pathology etc. Again different herbal preparations along with single herbs have been also mentioned for such type of infection. Some specific herbs like Brihati, Kantakari, Salaparni, Rasna, Bilva etc. are found more effective. Also minerals like suvarnamakshika, loha, shilajit etc. are found effective. By combining different herbs and minerals the recent use of compound like chandraprabhavati, Mahayograj guggulu and Dasamularista show great effectiveness for the same disease. So finally these preparation of Ayurveda can give a future assurance for the chikunguniya infection.

Key words: Chikunguniya, Bilva, Kantakari, suvarnamakshika, chandraprabhavati, Mahayograj guggulu and Dasamularista

***** *M.D. (Ayur.), Ph.D. (B.H.U.), F.I.C.A., F.C.C.P., Professor and Head Deptt. of Kayachikitsa, Govt. Ayurvedic College and Hospital, Guwahati – 14*

**** *M.D.(Ay), IMS (BHU), Ph.D, P.G.C.R. (Mumbai), F.I.C.A., F.C.C.P., Associate Professor, Deptt. of Kayachikitsa, Govt. Ayurvedic College and Hospital, Guwahati – 14*

*** *B.A.M.S. (G.U.), Internee Doctor of Govt. Ayurvedic College and Hospital, Guwahati-14*

E-mail: urbijit@gmail.com

OL36

233. Rasayana: The Unique Concept of Ayurveda for health and wellness.

Dr. Dilip Kr. Goswami[1*+], Dr. Ramakanta Sharma[2*], Dr. Biswajit Das[3*]

"Health" the most essential factor of life, was defined by the Ayurvedic scholars before 3000 years B.C. as the combination of both physical and mental equilibrium associated with the soundness of Mind and Soul.

A person may suffer from different types of diseases, both physical and mental, which may hamper in normal life. A diseased person is always neglected by the society. They are even considered to be the burden of not only the family but also the society.

Considering the affect of ill-health the Ayurvedic scholars give immense stress on maintenance of health of each and every individual and gave more stress on "Prevention of Diseases" by following a number of rules in relation to Diet, behavior and sometimes by using some drugs which is vividly described under the heading "Rasayana".

A number of drugs are mentioned in the Ayurvedic classics as "Rasayana" which need scientific evaluation in relation to their rejuvenating affect.

A detail description of "Rasayana" and it's affect will be discussed with classical background in the full paper.

Key words: Health, Disease, Rasayana.

1. Associate Professor, Deptt. of Agada Tantra and Vidhi Ayurveda
2. Professor & HOD, Deptt. of Rasa Sastra and Bhaisajya Kalpana
3. Ph. D. Scholar, Srimanta Sankaradeva University of Health Sciences
** Govt. Ayurvedic College, Jalukbari, Guwahati-14, Assam*
+ Corresponding Author. Mobile No. 098643-51115, E-mail: drdilipgoswami37@gmail.com

OL37

162. **Asymmetric Cyanation Reaction Catalyzed by Chiral Catalysts**

N. H. Khan, * S. Sarvanan, Prithibha Kumari, R. I. Kureshy S. H. R. Abdi, H. C. Bajaj

Chiral cyanohydrins and iminonitriles are versatile building blocks for pharmaceuticals, agrochemicals and specialty materials. In this direction a number of efficient and successful synthetic strategies have been developed. Among them, the chiral catalytic method is one of the most attractive strategies where asymmetric addition of different source of cyanide to the carbonyl group of aldehydes, ketones and imines was affected with the help of a chiral metal complex. I will discuss the various methods for catalytic asymmetric synthesis of cyanohydrins and iminonitrile derived from aldehydes, ketones and imines using different source of cyanide. The emphasis would be given to the designing of chiral Lewis acid metal complexes as well as organo-catalyst.

[*]*Discipline of Inorganic Materials and Catalysis, Central Salt and Marine Chemicals Research Institute (CSIR-CSMCRI), Bhavnagar- 364 002, Gujarat, India. Fax: +91-0278-2566970;*

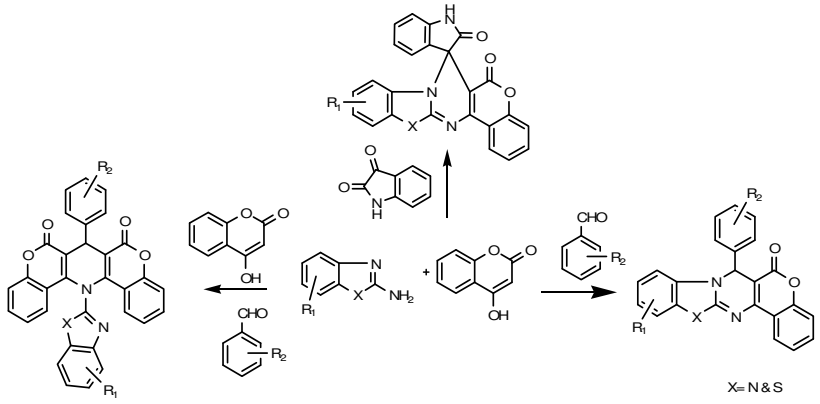
E-mail: khan251293@yahoo.co.in

OL38

213. A domino synthesis of structurally diverse heterocycles with medicinally privileged heterosystems

Anand Kumar Arya

The syntheses of fused heterocycles have attracted considerable interest in heterocyclic and medicinal chemistry because the fusion of biodynamic heterosystems has proved to be a very attractive and useful for designing new molecular framework of potential drugs with varying pharmacological activities. Recently, heterocycles with fused heterosystems are elegant targets of syntheses and have been synthesized by multicomponent reactions using conventional organic solvents and catalysts which are not eco-compatible, producing a large amount of waste and require longer reaction times. From this perspective, encouraged by the promising biological activities of the structurally diverse heterocycles with fused heterocyclic systems as guided by the observation that the presence of two and more heterocyclic systems in a single molecule often enhance the biocidal profile remarkably and our continuing research programme on the synthesis of therapeutically interesting heterocycles, we have combined synthetic potentialities of MCRs with environmentally safe disposable and reusable catalyst with a view to develop eco-compatible synthetic methodology for the synthesis of structurally diverse heterocycles, incorporating four/five privileged biodynamic heterocyclic scaffolds in a single molecule, in order to synthesize new structural motifs with promising bioactivity. The simplicity of the method, ease of the product isolation and mild reaction conditions will make this synthetic method useful on an industrial scale.



DESM, Regional Institute of Education, Ajmer-305004

e-mail-aanandarya@gmail.com

OL39

147. Translation Initiation Factor-1 of *Wolbachia,* the Endosymbiont of *Brugia Malayi: Molecular Characterization*

Jeetendra Kumar Nag, Nidhi Shrivastava, Jyoti Gupta and Shailja-Misra Bhattacharya

Lymphatic filariasis (LF) transmitted by filarial parasites *Wuchereria Bancrofti* and *Brugia sp*. is responsible for severe morbidities resulting in to social stigma and huge economic loss in several tropical and sub tropical countries including India. Repeated and prolonged treatment required with mainstay antifilarial drugs during mass drug administration programs face potential threat of development of drug resistance and mainly aims at reducing microfilarial levels in the host blood that will impair further transmission. There is a pressing need for developing new approaches to eradicate this disease. *Wolbachia*, the intracellular alpha-proteobacteria present in majority of filarial species are currently considered to be a future hope to control this disease. These endosymbionts are required for development, fertility and survival of the filarial parasites. *Wolbachia* for their own existence depends on various essential factors and one such factor is Translation initiation factor-1 (Tl IF-1) which is required for their growth and viability. Tl IF-1 exists only in bacterial system but not in eukaryotes and therefore presents a promising antifilarial drug/vaccine target. Tl IF-1 is involved in recruitment of IF-2 on 30S ribosome sub unit followed by stimulation of IF-2 dependent binding of fmet-tRNA to 30S Ribosome several folds ultimately releasing IF-2 from 70S initiation Complex. Tl IF-1 also possesses chaperon activity which is responsible for the melting of secondary structure formed in RNA [5]. We PCR amplified Tl IF-1 gene using genomic DNA of *B. malayi* and this amplicon was cloned in pET28a vector and 13 kDa protein was optimally expressed in *E. coli* rosetta host cell. Molecular characterization of the recombinant protein revealed supershift with single stranded RNA in EMSA and specific binding with 30S ribosomal subunit. The protein was found to be properly folded and it generated a polarized Th2 immune response on administration in to the rodent host. Efforts are underway to develop mutants of Tl IF-1 for further functional characterization.

Division of Parasitology, Central Drug Research Institute, M.G. Marg, Lucknow, (U.P.) -226001, India

OL40

198. An Impact of Panchakarma Therapy in North East Region - A Study in Govt. Ayurvedic College & Hospital, Guwahati

*Dr. Huidrom Rosyna, **Dr. Dinesh Bhagawati, ***Dr. Khagen Basumatary, ****Dr. Anup Baishya

The NE region of the India comprised of 8 states. The Govt. Ayurvedic College & Hospital, Guwahati, Assam is the only existing Government Institute since 1947 in whole NE region where a unique concept of Ayurveda i.e. Panchakarma therapy/bio-cleansing therapy is practiced and the results are found to be quite satisfactory in some specific diseases like Hypertension, Osteoarthritis, Rheumatoid Arthritis, Bronchial Asthma, Spondylitis, Hemiparesis, Psoriasis etc. This therapy aims to purify the body from gross to subtle levels and to clean the channels of the body to enable the free flow of nutrients, medicaments and metabolites. It envisages not only the visceral cleansing rather it aims at the total bio-purification upto the molecular level. This therapy consists of five folds therapy viz., Vaman (emesis), Virechana (purgation), Basti (enema), Nasaya (snuffing) and Raktamokshan (blood letting). Before doing this main procedure, pre operative procedures are also conducted like Deepan, Pachan, Snehan, Swedan & Rukshan. After main therapy, Samsarjan karma (post regimens) is followed like rationally planned diet and life style. A brief study about Panchakarma therapy and the data studied during the year 2011 at GACH will be discussed later in the presentation.

Key words: Panchakarma therapy, Hypertension, Arthritis, Hemiparesis, Psoriasis.

** Dr. Huidrom Rosyna, M.D Scholar, Dept. of Samhita and Siddhanta, Govt. Ayurvedic College & Hospital. Jalukbari, Guwahati 14. Assam. India. Email: rosyna.bliss@gmail.com. Ph: +919706452379*

*** Dr. Dinesh Bhagawati, H.O.D, Dept. of Panchakarma, Govt. Ayurvedic College & Hospital, Jalukbari, Guwahati 14, Assam, India.*

**** Dr. Khagen Basumatary, Associate Professor & H O D, Dept. of Samhita and Siddhanta, Govt, Ayurvedic College & Hospital. Jalukbari, Guwahati 14, Assam, India.*

***** Dr. Anup Baishya, Associate Professor, Dept of Roga Nidan, Govt, Ayurvedic College & Hospital, Jalukbari, Guwahati 14, Assam, India.*

OL41

238. Glutathione S-Transferases (Gstt1&Gstm1) Polymorphism In Mizo Population Of North East India.

Nandita Chakraborty[1] and Munish Kumar [2]

Glutathione S Transferase (GST) gene polymorphism examined among Mizo population of North East India. We have collected 15 blood and oral swab samples from Mizo population. Multiplex PCR method was used for genotyping. The frequency null genotype of GSTT1, GSTM1 and both null genotype was 50%, 71.42% and 42.85% respectively which is significantly higher than other ethnic groups of the world. Further a comparison between consumption of tobacco in any form within the group was examined. We are increasing the sample size for this specific population for further study.

KEYWORDS: Glutathione S-Transferase (GST), CYP1A1, Mizo, Multiplex PCR, Cancer

[1] *M.Sc., Dept. of Biotechnology, Assam University, Silchar.*
[2] *Assistant Professor, Department of Biotechnology, Assam University, Silchar, Assam*
babinzz1215@gmail.com

OL42

191. Role of a Herbal Compound in the Management Of Bronchial Asthma – A Clinical Study

* Dr. Ganesh Prasad Gupta, ** Dr. Bishnu Prasad Sarma

Natural products have been investigated and utilized to alleviate disease since early human history. As Rudyard Kipling wrote (1910), ''Anything green that grew out of the mould was an excellent herb to our fathers of old." In Ayurveda about 2,000 plant species are considered to have medicinal value, According to WHO report, over 80% of the world population relies on traditional medicine largely plant based for their primary healthcare needs.

Bronchial Asthma is one of the distressing diseases and it is quite common in all socio-economic strata in all age groups and is distributed all over the world. There is noticeable increase in health care burden from asthma in several areas of the world. According to WHO estimations, there are 300 million people of different ages and ethnic background suffering from asthma. Asthma cases are increasing at a rate of 50% every decade and according to WHO by the year 2020, asthma along with COPD will become the third leading cause of death. Pollutants, allergens and changing environmental conditions and lifestyles of the people are the major causative factors.

A considerable research is going on in this regard, but still there are lacunae in the successful management of this disease. Though synthetic drugs presently used in asthma give instant relief from symptoms but are known to cause various side effects and also their efficacy decreases by their continuous uses. There is need for holistic medicine of traditional indigenous origin which is very effective, non-toxic, affordable and acceptable.

Keeping in this view, an herbal compound consisting of Shirish (Albizia lebbeck), Kantakari (Solanum xanthocarpum), Yastimadhu (Glycyrrhiza glabra) and Vasaka (Adhatoda vasica) was prepared. The selection of drugs was done on the basis of their authentic background of traditional use, classical references and various researches of their action on the respiratory system. An open clinical trial is going on at Govt. Ayurvedic College & Hospital, Guwahati-14. The compound was found to very effective in the management of asthma.

Key words: bronchial asthma, allergens, drugs, shirish, kantakari, yastimadhu, vasaka

** P.G. Scholar, Department of Kayachikitsa (Medicine), Govt. Ayurvedic College & Hospital, Guwahati-14, Assam, India. Ph-+91-9954413360, E-mail- dr.ganesh.gupta@gmail.com*

*** Associate Professor, Department of Kayachikitsa (Medicine), Govt. Ayurvedic College & Hospital, Guwahati-14, Assam, India, ANRAP FELLOW, Dhaka, Bangladesh.*

OL43

184.Structure, spectra, redox and catalytic behaviour of the active site model complexes for Galactose Oxidase

Pranjoli Das[a], O.K.Medhi[* b]

[a]Centre for Nanotechnology, IIT Guwahati,

[b] Department of Chemistry, Gauhati University, Assam, India

e-mail : [a]pranjoli@iitg.ernet.in

ABSTRACT: Biologically important copper containing metalloenzyme Galactose oxidase catalyses oxidation of a large range of primary alcohols to aldehydes [1]. Its structure contains a cysteine-linked tyrosyl radical which is implicated as a redox-active subunit. Copper (II) phenolates are used as model complexes for the above protein. UV-visible spectra, Cyclic voltammetry, Square wave voltammetry and ESR spectra of the model complexes are carried out in surfactant medium above the cmc value. Surfactant micelles provide the typical hydrophobic environment in aqueous solutions around active site of metalloproteins under certain physiological pH. The model systems show a weak band at 500-600nm (d-d transition) and a sharp band at 320-360nm (MLCT band d Cu-π*antibonding orbital of phenolate residue) and their cyclic voltammograms contain a reversible, one electron wave at $E_{1/2}$ = 0.100V(SDS) or 0.200V(CTAB) vs Ag/AgCl (Glassy carbon electrode) which is for the ligand rather than the metal-centered process to yield M^{II}- Phenolate radical species. The electrochemically generated M^{II}- Phenolate radical species are EPR silent (antiferromagnetic coupling between a coordinated phenoxyl radical and a central metal ion) and shows a new optical absorption feature is observed at λmax = 440nm which is similar to that reported for the active forms of a coordinated phenoxyl radical in that of enzyme. Theoretical calculations also proved the oxidation-reduction potential of the model systems is through ligand rather than through metal. The model systems also show good catalytic behavior in aqueous surfactant medium.

References:

1. Kirsti Parikka*, Ann-Sofie Leppanen, Leena Pitkanen, Markku Reunanen, Stefan Willfor and Maija Tenkanen J. Agric. Food Chem., 58 (1), 2010, 262–271.

CHEMICAL

POSTER PRESENTATION (CPP)

CPP1

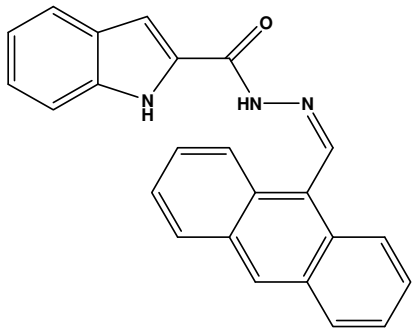
105. **Synthesis of Colorimetric and Ratiometric Fluorescent Sensor for Fluoride ion based on Indole and Anthracene moiety**

Israr Ahmad[a], Amitava Das[b] and Tamal Ghosh[a]*

Anions play a vital role in a wide range of medicinal, environmental and biological processes. Recently, development of selective anion receptors has received considerable attention. Heterocyclic molecule such as indoles have been found to have applications related to anion complexation in the field of supramolecular chemistry. Like pyrrole, Indole contains a single -NH hydrogen bond donor and is more acidic (pKa in DMSO: pyrrole 23.0, indole 21.0). Therefore, it is superior hydrogen-bond donar than pyrrole and is more prone to deprotonation. Moreover, the indole moiety has been a part of binding site in some natural systems, mainly in the tryptophan residue.

Here, we report a new indole based receptor **1**, which shows dual fluorescence and its colour changes from yellow to red upon addition of F^- in DMSO solution.

Keywords**:** dual fluorescence, Indole, Anthracene



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a : Motilal Nehru National Institute Of Technology, Alllahabad, 211004, UP.

b: Analytical Division , CSMCRI, Gijubhai Badheka Marg, Bhavnagar - 364021, Gujarat.

Email: israrahmad04@gmail.com, tamalghosh73@yahoo.co.in

CPP2

108. **Preparation of conducting polypyrrole/graphene oxide nanocomposites as supercapacitor electrode**

Surajit Konwer[1, 2], and Swapan K Dolui [2]*

An electrode material based on polypyrrole (PPy) doped with graphene oxide (GO) sheets was synthesized via in situ polymerization of pyrrole in the presence of GO in various proportions (5% and 10%). The synthesized samples were characterized by FTIR, SEM, TGA, XRD analysis and electrical conductivity measurements. FTIR spectroscopy and XRD revealed the interaction between GO and PPy. The dc electrical conductivity (75.8 S/cm) of the prepared composite was dramatically enhanced [Konwer et al., Sen et al.] compared to pure PPy (1.18 S/cm). The high specific capacitance of PPy/GO composite was obtained 421.4 F/g in the potential range from 0 to 0.50 V at 2 mA compared to 237.2 F/g of pure PPy by Galvanostatic charge - discharge analysis (Fig. 1). The incorporation of GO into PPy matrix have a pronounced effect on the electrical conductivity and electrochemical capacitance performance of the PPy/GO nanocomposites.

Keywords: polypyrrole; graphene oxide; electrical conductivity; capacitance; super capacitor

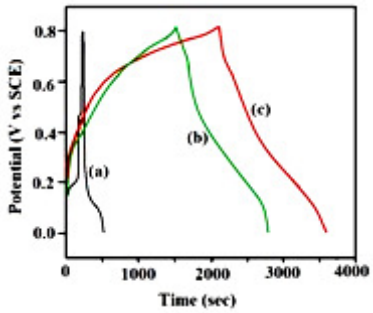


Fig. 1 Galvanostatic discharge curve at 2mA of (a) pure PPy (b) PPy/GO (5%) and (c) PPy/GO (10%) pellet electrode.

[1] *Department of Chemistry, Gargaon College, Assam-785685, India*
[2]*Department of Chemical Sciences, Tezpur University, Napaam, Assam-784028, India*
**Corresponding author: Surajit Konwer, E-mail: ksurajit27@gmail.com*

CPP3

110. **Removal of Iron and Arsenic by banana ash, carbonate and bicarbonate salts of sodium and potassium**

Shreemoyee Bordoloi and Robin K. Dutta*

Oxidation of ferrous ions by aeration and high pH facilitates adsorption of arsenic on iron and subsequent co-precipitation. Based on this novel technique, a novel treatment process has been studied for simultaneous iron and arsenate removal from contaminated water. In this study, the efficiency of banana ash, carbonate and bicarbonate salts of sodium and potassium and their 1:1 mixtures on simultaneous removal of arsenate and iron ion. Experimental results shows that arsenate could be efficiently treated from initial concentration of 250µg/L to residual (effluent) concentration lower than 5 µg/L. Simultaneous significant iron removal efficiency (over 98%) was also achieved from initial concentration of 20mg/L. Among all the salts and ash, potassium bicarbonate was found as the best candidate for the treatment process. With about 100mg/L of potassium bicarbonate both iron and arsenate ion goes to an undetectable level retaining the pH of the treated water well within the acceptable range of drinking water. The observed highest efficiency of the bicarbonate salt has been attributed to the precipitation of the iron ion as very poorly soluble and poorly crystalline goethite of high surface area unlike in the precipitation of the carbonate salts [Bordoloi et al.]. The treatment process by the bicarbonates being a highly efficient, low cost and simple have a high potential for use in simultaneous removal of arsenate and iron ion.

Keywords*:* Arsenate; iron; precipitation; groundwater; potassium bicarbonate; pH

Department of Chemical Sciences, Tezpur University, Napaam, Assam - 784028, India

**Corresponding author: id- shreebordoloi@gmail.com (Shreemoyee Bordoloi)*

CPP4

112. **Microwave Assisted Synthesis of flourochloro Benzimidazolo substituted Thiazolidinone derivatives for Antimicrobial activities**

Singhal L*, Patil S, Hippargi SM, Meharoon D, Preethi GB

Benzimidazole is an antiprotozoal agent, was found as anthelmintics by Gregory in 1992, also used as anticancer agent by inhibiting Poly (ADP-ribose) Polymerase (PARP). To synthesize some novel flourochloro Benzimidazolo substituted thiazolidinone derivatives by establishing microwave assisted methods for synthesis of the proposed derivatives and confirm the various structures by spectral and elemental analysis. Evaluation of synthesized derivatives for their Biological activity is done. Further the Benzimidazolo-thiazolidinone derivatives have been reported for antimicrobial activity with one gram positive and one gram negative staphylococcus aureus and E coli agents. Thiazolidinone derivatives have been used as antidiabetic agent in view of the above and in continuation of search we have prepared benzimidazolo-thiazolidinon derivatives**.**

We have prepared flourochloro Benzimidazolo substituted thiazolidinone derivatives by reacting 3-chloro 4-flouro o-phenylenediamine with para amino benzoic acid and the aspartic acid respectively followed by different aldehyde and thioglycolic acid in presence of aluminium chloride. In future it is tested for anti-diabetic activity. A series of 12 derivative has been reported as antimicrobial agents with g(+ve) and g(-ve) bacteria.Derivatives are confirmed by TLC, Melting point, IR, NMR, Mass spectrometry. In antimicrobial activity it is seen to show better activity in gram negative bacteria E coli, and also it shows good activity in gram positive bacteria also.

Department of pharmaceutical chemistry, KLE University's college of pharmacy Bangalore, India.

**Email: - luvsinghal32@gmail.com,DOB-03/12/1989*

CPP5

116. **Gamma irradiation effects on track properties of PADC detectors**

D. Sinha

Track properties of different types of Polyallyldiglycol carbonate (PADC) detectors irradiated with gamma radiation are studied in the dose range of 10^1–10^6 Gy. The bulk and track etch rates of all types of PADC detector increases due to gamma exposure at a dose higher than 10^4 Gy. This increase is more pronounced in post-gamma exposed samples. The change in etch rate ratio (*S*) for post-gamma exposed PADC–Homalite detectors is more significant when compared with the other detectors. The critical angle for etching shows that etching at a low temperature of 60 ◦C is more effective, and the critical angle value is decreased to a significant extent for the detectors. Etching efficiency of post-gamma exposed samples is found to be much higher than the pre-gamma exposed sample at the highest dose of 10^6 Gy. When compared, it was found that of the different PADC detectors, PADC–Homalite detectors seem to be more sensitive to gamma irradiation.

Department of Chemistry, Nagaland University, Lumami Campus, Nagaland 798627, India
Presenting Author : dipaksinha@gmail.com

CPP6

122. **Method development for the analysis of polycyclic aromatic hydrocarbons in chocolate candies**

Rupender Kumari1, Prashant Chaturvedi[1], Nasreen Ghazi Ansari[2], Ramesh Chandra Murthy[1] and Devendra Kumar Patel*[1]

Chocolate is one of the key ingredients in many food items such as cakes, candies, bars and biscuits. Chocolate candies are often consumed by people of all the age groups. The presence of polycyclic aromatic hydrocarbons (PAHs) in chocolate candies may result in serious health risks to people. An easy, rapid, precise and cost effective extraction method was optimized and validated for the simultaneous determination of sixteen priority PAHs in chocolate candies by high performance liquid chromatography (HPLC) and gas chromatography-mass spectrometry (GC - MS) as a confirmatory technique. The method was optimized at 256nm (HPLC-UV) by using different solvents for liquid-liquid extraction, varying volume of de-emulsifying agent and quantity of silica gel used for purification. The HPLC separation of 16 PAHs was carried out by C-18 column with mobile phase composed of acetonitrile: water (70:30) at a flow rate of 2ml min-1, in isocratic mode with runtime of 20minutes. Limit of Detection (LOD), Limit of Quantification (LOQ) and correlation coefficients were found to be in the range of 0.3 to 4ng g-1, 0.9 to 12ng g-1 and 0.9109 to 0.9952 respectively. The exploration of 25 local chocolate candy samples for the presence of PAHs showed the mean content of benzo[*a*]pyrene as 1.62 ng g-1 which representing the need to evaluate effective measures to prevent more severe PAHs contamination in chocolate candies in the future. Statistical findings bear out that the method is amenable for the investigation of all 16 PAHs in chocolate candies.

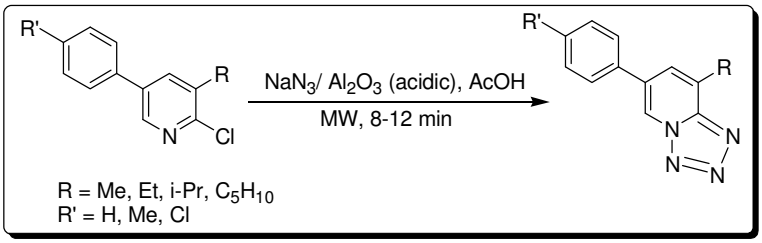
[1]Analytical Chemistry Section, CSIR-Indian Institute of Toxicology Research (CSIR-IITR), Lucknow, Uttar Pradesh, India
[2]Metal Analysis Laboratory, CSIR-Indian Institute of Toxicology Research (CSIR-IITR), Lucknow, Uttar Pradesh, India
Presenting author
Rupender Kumari

CPP7

124. Microwave Assisted Solvent-Less Synthesis of 3-Alkyl-5-Aryl-Tetrazolo-[1, 5-*A*] Pyridines

Shyamalee Gogoi, Romesh Ch. Boruah*

Most of the natural and synthetic biologically active compounds belong to nitrogen containing heterocycles and they constitute an important class of pharmacophores in medicinal chemistry. It has been found that tetrazole-fused nitrogenous heterocycles exhibit wide biological activities. Tetrazoloquinolines, for example, exhibit anti-inflammatory, antibacterial and antitumour properties and tetrazolo [1, 5-*a*] pyridines act as anti bacterial agents and show potent and selective inhibition of the two well known herpes viruses HSV-1 and HSV-2. Literature revealed that tetrazolopyridines are conventionally prepared by prolong heating of 2-halopyridine with NaN_3 in a polar solvent. In continuation of our interests for developing newer strategies for pyridine analogues, herein, we report an efficient solvent-less methodology for the synthesis of tetrazolo [1, 5-*a*] pyridines from 3-alkyl-2-chloro-5-arylpyridines in high yield under microwave irradiation.



Medicinal Chemistry Division, North East Institute of Science & Technology, Jorhat, Assam, India
e-mail: rc_boruah@yahoo.co.in

CPP8

125. "Study of Silica Supported Mg-Al Ldh Prepared by Sol-Gel Route"

Mridusmita Mishra[a], Chira Ranjan Bhattacharjee[b] Rajib Lochan Goswamee[a*]

Layered Double Hydroxides (LDHs) are the only known positively charged layered species having a crystalline layer charge. On low temperature thermal decomposition they form non-stoichiometric oxides (NSO). Mg-Al LDH synthesized by sol-gel route gives periclase (MgO) type NSO, where Al^{3+} ions are distributed isomorphously in Mg^{2+} sites. In comparison to other routes sol-gel derived LDH give these NSO in oxidic nano sheet forms, thereby enhancing the surface area. Being nano sheets they have a superior prospect as toxic gas scavengers as it would reduce the cost of disposal due to reduced volume of the spent materials. Supporting such NSO particles over network formed by silica particles is expected to further raise such chemical reactivity as well as device fabrication prospects. Silica supported Mg-Al LDH were synthesized by sol-gel methods at pH 10 from their corresponding alkoxide precursors. There is observed an increase of basal spacing of sol-gel derived Mg-Al LDH with increase of quantity of silica in the composite. The SEM pictures show that layered aggregated nature of the particles does not change even after calcination at about 450^{o}C and their X-Y width ranges about 1µm (Fig: 1). The rheological data of silica supported sol-gel Mg-Al LDH shows that on addition of silica the Mg-Al system get dispersed and viscosity increases. The stability of the dispersion is further corroborated by the negative zeta potential of the composite. The intensity of MgO peaks formed on calcination at 450^{o}C is prominent in non-supported product and the MgO particle formed is larger than the original hydroxide particles. On supporting NSO over silica surface there is an increase in the surface area of the materials.

Keywords: LDH, non-stoichiometric oxides, sol-gel, nano sheets.

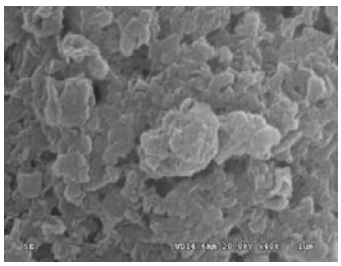


Fig: 1: SEM pattern of sol-gel derived Mg-Al LDH after calcination at about 450^{o}C

[a]*Materials Science Division, CSIR-NEIST, Jorhat-785 006, Asam, INDIA*

[b]*Department of Chemistry, Assam University, Silchar-788 011, Assam, INDIA*

[*] *Corresponding author's Email Id: goswamirl@rrljorhat.res.in*

CPP9

126. Formulation, Development and Optimization of Diclofenac Sodium Sustained Release Matrix Tablet

Deb R, Paul S, Deb P*

In this study, an attempt has been made to develop Sustained Release matrix tablet of 100mg Diclofenac Sodium(DS) by using both Hydrophilic And Hydrophobic polymers. Eight formulations were prepared using different Drug-Polymer Ratio(DS-1 to DS-8). The preparation involves Double Granulation; a primary granulation using Hydrophobic 'release-delaying' polymer(Glyceryl behenate), followed by a secondary granulation using Hydrophilic wet-granulation material(Hydroxypropyl methylcellulose). All the formulations are evaluated thereafter on the basis of pharmacopoeial specification. Hardness, thickness, friability, dissolution studies were carried out for all formulations. Amongst the formulations, DS-5 and DS-6 showed desirable release kinetics, and confirmed that Sustainability in release claimed for 100 mg Diclofenac sodium matrix tablet is well suited, as compared to the marketed product (Voveran SR 100). Therefore they are assayed and percentage purity was found to be 101.27% $^{w}/_{w}$ & 103.11% $^{w}/_{w}$ respectively. Then the swelling behaviors were also studied for those formulations by keeping them at room temperature as well as at 40^{o}C ± 2^{o}C / 75 ± 5% RH(stability chamber) for 30days. All the parameters were within the limit after 30days.

Department of pharmaceutics, Girijananda Chowdhury Institute of Pharmaceutical Science, Hatkhowapara, Azara, Guwahati-781017

e-mail: Ratul_db@rediffmail.com

CPP10

128. 3D-QSAR Study and Pharmacophore Identification of Nitrogen Containing Heterocycles As Novel Antitubercular Agents.

Dr. (Miss) Ranjan Khunt

Majority of the drugs in current use against Tuberculosis contain basic nitrogen, a lipophilic aromatic ring capable of interacting molecule at the drug receptor site. As a part of our ongoing research to develop novel antitubercular agents, a series of N-phenyl-3-(4-fluorophenyl)-4-substituted pyrazoles have been synthesized and tested for antimycobacterial activity *in vitro* against ***Mycobacterium tuberculosis H37Rv*** strain using the BACTEC 460 radiometric system. A 3D-QSAR study based on CoMFA and CoMSIA was performed on these pyrazole derivatives to correlate their chemical structures with the observed activity against ***M. tuberculosis***. The important features identified in the 3DQSAR models have been used to propose new molecules whose activities are predicted higher than the existing systems. This study provides valuable directions to our ongoing endeavour of rationally designing more potent antitubercular agents.

Department of Chemistry (UGC (SAP)& FIST(DST) Sponsored),
Saurashtra University, Rajkot (Gujarat)

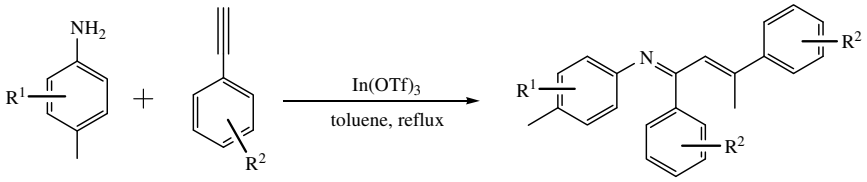
CPP11

137. A New Route to Conjugated Ketimines via an Indium Catalysed Tandem Hydroamination/Hydroalkylation of Terminal Alkynes

Rupam Sarma, Nimmakuri Rajesh and Dipak Prajapati*

In recent years, considerable effort has been devoted to develop methodologies which reduce multi-step transformations into one-step tandem processes. In this regard, use of multi-functional catalysts, which promotes sequential reaction steps without additional requirement of additives and/or co-catalysts, provides an effective way while taking care of two most basic challenges faced by a synthetic chemist, i.e. atom-economy and cost-reduction. The addition of N–H and C–H bonds across C–C π systems, also known as hydroamination and hydroalkylation is one of the most interesting and intriguing subject in synthetic organic chemistry, as they provide an attractive route for construction of plethora of versatile building blocks. Despite the numerous protocols for hydroamination and hydroalkylation of terminal alkynes available in the literature, to the best of our knowledge there is no report of any catalytic process where both the reaction steps occur concomitantly under the same reaction conditions.

Previously, we have demonstrated that indium effectively activates terminal alkynes for cross coupling reaction as well as for nucleophilic addition.[2-4] Here, we report the first example of indium catalyzed tandem hydroamination and hydroalkylation of terminal alkynes with arylamines for the construction of α,β-unsaturated ketimines (Scheme 1).



Scheme 1

Medicinal Chemistry Division, North-East Institute of Science & Technology (CSIR), Jorhat, Assam, India-785006

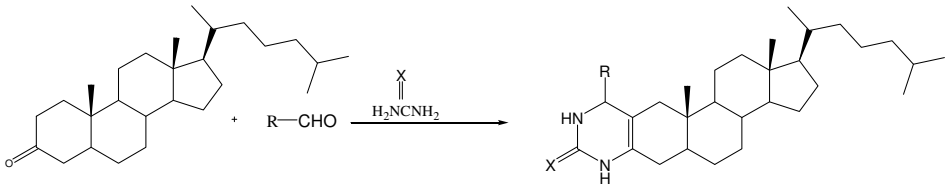
E-mail: dr_dprajapati2003@yahoo.co.uk

CPP12

138. Ultrasound Mediated One-Pot Synthesis of Steroidal Dihydropyrimidines

Mandakini Dutta and Romesh C. Boruah*

Aryl-3,4-dihydropyrimidinones have recently received great attention because of their wide range of therapeutic and pharmacological properties, such as antiviral, anti-tumor, antibacterial and antiinflammatory behaviour. Several alkaloids containing the dihydropyrimidine unit have been isolated from marine sources, which also exhibit interesting biological properties. Thus, synthesis of this heterocyclic nucleus is of much current importance. Accordingly, many synthetic methods have been described in the literature However, in many cases, expensive and toxic metals, extended reaction times, and/or elevated reaction temperatures are required, which affords attention for further development of milder protocols. Moreover, sonic energy has been routinely used in the field of synthetic organic chemistry for many years. Its chemical effects have been known to accelerate the rate of chemical reactions and for the synthesis novel molecules with unusual properties. It is believed that the interparticle collisions, which occur at very high speed during high intensity ultrasound radiation, ultimately lead to fusion and agglomeration. In continuation of our interests on the synthesis of steroidal heterocycles, we accomplished a convenient route to synthesis of dihydropyrimidinone in presence of NaOMe under ultrasound radiation. Here in, we report an efficient simple method for synthesis of the new steroid-dihydropyrimidine derivative, using a three component system in presence of sodium methoxide from steroidal carbonyl compound,aliphatic/aromatic aldehyde and thiourea/urea.



R = C_6H_5-, 4-MeC_6H_4-, 2-ClC_6H_4
C_5H_{11}-, C_3H_7-, C_4H_4-

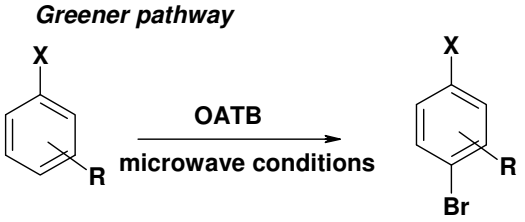
Medicinal Chemistry Division, North East Institute of Science & Technology, Jorhat, Assam, India
e-mail: rc_boruah@yahoo.co.in

CPP13

142. Microwave-Induced Solvent-Free Organic Brominations Using Organic Ammonium Tribromides

Upasana Bora Sinha*, Alimenla B., Anil Kumar and Latonglila Jamir

In the present day context, solvent-free reactions have a relevance of their own and recently such type of a methodology has been developed for organic brominations. Facile, high yielding reactions could be possible with different ammonioum tribromides, $R_4N^+(Br_3^-)$ under solvent-free, microwave conditions. The methodology could prove to be a useful alternative to the existing methods of brominations because of the extremely short reaction times and simple purification process. In order to study the versatility of the tribromides as brominating agent under microwave conditions, representative examples of different types of organic substrates were taken. This paper reports the results of those studies.



Department of Chemistry, Nagaland University, Lumami Campus-798627, Nagaland
upasanaborasinha@gmail.com

CPP14

144. Design and Synthesis of some novel N-substituted benzimidazolyl thiazolo [3,2-a] pyrimidine derivatives as antiviral agents

N. Verma, D. N. Singh and L.P. Pathak

Benzimidazole is characterized as privileged structure in Medicinal Chemistry because of their ability to interact with a wide range of different enzymes and receptors. Benzimidazole ring is an important pharmacophore in modern drug discovery and its derivatives exhibit diverse biological activities. This inspired us to combine benzimidazole ring to heteroannulated pyrimidine in order to studying their pharmacological activity. A series of N- substituted benzimiazolyl thiazolo[3,2-a] pyrimidines has been synthesized and were screened for their antiviral activity and some of the synthesized compound displayed significant activity. Herein, the detailed synthetic procedure, plausible mechanism and characterizations of the synthesized compounds by the various spectral data analysis and antiviral profile of the synthesized compounds will be discussed.

Department of Chemistry, K. S. Saket PG College, Dr. RML Avadh University, Faizabad-224001, India

E-mail: dnsinghsaket@ yahoo.com

CPP15

150. Pyrazole bridged late first row transition metal complexes derived from hexadentate compartmental ligand: Synthesis, characterization, antibacterial activity and DNA binding/cleavage studies

Anupama Kamath and Vidyanand K. Revankar*

A series of binuclear Co^{II}, Ni^{II}, Cu^{II} and Zn^{II} complexes having μ-1,2 diazine bridging have been prepared and characterized by various physico-chemical methods. The hexadentate ligands is synthesized by condensing pyrazole-3,5-dicarbohydrazide with 2-hydroxy naphthaldehyde (LH_3) in 1:2 ratio. All the complexes were found to be monomeric in nature with octahedral geometry and act as nonelectrolytes. Ligand and complexes were screened for antibacterial activity against *E.coli* and made to interact with its DNA to investigate the binding/cleaving ability by absorption, hydrodynamic, thermal denaturation and electrophoresis studies. An intercalative binding mode is predicted by the results. Intercalators introduce strong structural perturbations in DNA. Gel electrophoresis data indicate cleavage of E. coli DNA to a greater extent by both ligand and complexes.

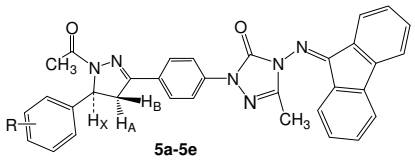
Department of Chemistry,
Karnatak University, Pavate Nagar, Dharwad-580 003 Karnataka, India.
e-mail: nanupamak@gmail.com, vkrevankar@rediffmail.com

CPP16

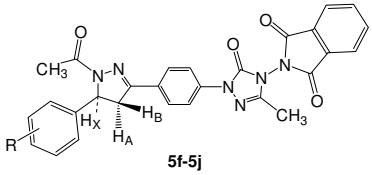
151. Expedient Synthesis of 1,2,4-triazolin-3-one derivatives as DNA cleavage and antioxidant agents

Tasneem Taj · Ravindra R. Kamble · Pramod P. Kattimani

An efficient synthesis of Schiff bases of fluorenone **5a-5e** and isoindolin-1,3-dione derivatives **5f-5j** have been synthesized in solvent and solvent free conditions with excellent yields. The procedural simplicity is the key aspect of the synthesis. The newly synthesized compounds were evaluated for the extent of penetration into biological membranes (*clogP*) and drug score was calculated and promising results were shown for compounds **5f**, **5g**, **5h** and **5j** with the drug score of 0.13. Compounds were screened for DNA cleavage, two compounds **5i** and **5j** cleaved DNA completely. Antioxidant evaluation of title compounds revealed that **5c, 5g** and **5j** exhibited potent activity as compared to BHA.



5a-5e



5f-5j

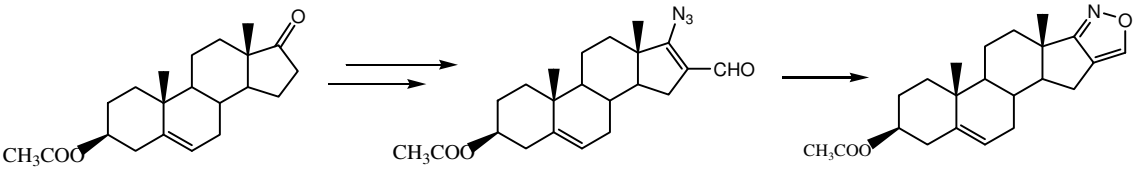
PG Department of Studies in Chemistry, Karnatak University Dharwad – 580 003, Karnataka, India
Tel/fax: +91 836 2747884, e-mail address: tasneemshifa@gmail.com, kamchem9@gmail.com

CPP17

152. A facile synthesis of biologically potential D-ring fused heterosteroid

Jonalee Goswami, Pranjal Bezbaruah & Romesh Ch. Boruah*.

Heterocycles are regarded as important compounds possessing pharmaceutical properties and become a major area of research worldwide.The isoxazoles have been reported for various biological application in medicinal chemistry because of their antileukemia, neuroleptic, anticonvulsant and antagonistic properties. On the other hand, the steroids are well known important class of compounds because of their presence in biological system. The substitution of one or more C-atoms by N-atom affects the chemical properties of the steroid and changes its biological activities. A ring azasteroid (finasteride) and D-ring azasteroid (abiraterone) have shown their activities against prostate cancer by inhibiting enzymes 5α-reductase and 17α-lyase. The C-17 heteroaryl steroids such as 17-imidazolyl, pyrazolyl, isoxazolyl androstene were designed and synthesized for the treatment of human PCA. Certain heterocyclic substituted steroidal drug molecules containing pyrazole, pyidine, pyrimidine, imidazole at C_2-C_3, C_3-C_4 and C_{16}-C_{17} exhibited anti-androgenic activity and anti-inflammatory activities. Herein,we report the synthesis of D-ring fused azasteroid such as isoxazolyl androstene from 17 keto androst- 5-ene through azide intermediate using NaN_3.



Medicinal Chemistry Division, CSIR-NEIST, Jorhat-785006, Assam, INDIA

**Corresponding author's email ID: boruahrc@rrljorhat.res.in*

CPP18

153. Purification of Chloroperoxidase from Musa paradisiaca stem juice

Pratibha Yadav[1], Meera Yadav[2] & Kapil Deo Singh Yadav[2*]

Chloroperoxidase from Musa paradisiaca stem juice has been purified to homogeneity using concentration by ultrafiltration and anion exchange chromatography on DEAE cellulose. The purified enzyme gave single protein band in SDS-PAGE analysis and the calculated molecular weight was 43 kDa. The purified enzyme chlorinated and bromonated monochlorodimedone, the substrate used for measuring the halogenating activity of chloroperoxidases. The Km and k_{cat} values using monochlorodimedone as the substrate were 190 µM and 1.34 s^{-1} respectively giving k_{cat}/Km value of 7.05X 10^3 $M^{-1}s^{-1}$.The pH and temperature optima of the chlorinating activity were 3.0 and 25°C respectively. The Km values for classical peroxidase activity using pyragallol and H_2O_2 as the variable substrates were 89 µM and 120 µM respectively. The pH and temperature optima of the classical peroxidase activity using pyrogalllol as the substrate were the same as the pH and temperature optima of the halogenating activity.

Key words: Chloroperoxidase, Plant peroxidase, Musa paradiaca, Metalloenzyme.

Department of Chemistry, Udai Pratap College,Varansi – 221002, India[1]

*Department of Chemistry, D.D.U. Gorakhpur University, Gorakhpur- 273 009, India[2]**

**Corresponding author.*

E-mail drmeerayadav@rediffmail.com

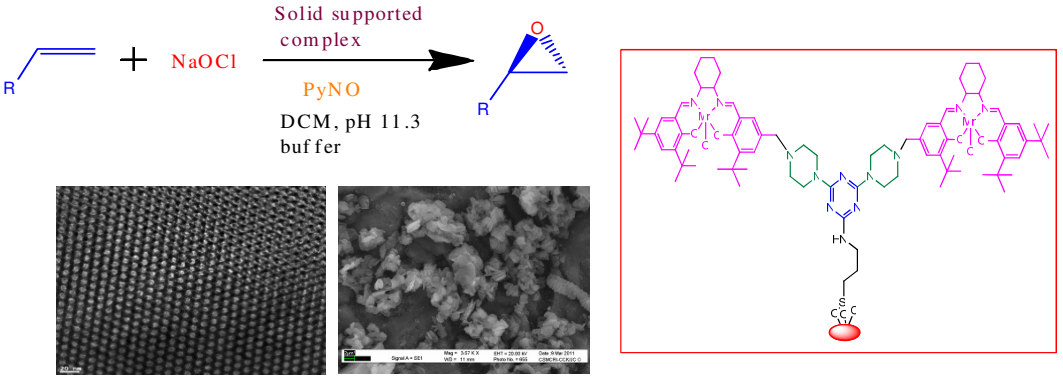
0551-2204943

CPP19

154. ChiralDinuclearDendrimericMn(III) Salen Complex Immobilzed On OMS/DENDRIMER Hybrid-An Efficient and Recyclable Catalyst For Asymmetric Epoxidation Of Non Functionalized Olefins

TamalRoy, N.H. Khan, S.H.R. Abdi, H.C. Bajaj andR.I. Kureshy*

Optically pure epoxides are key building blocks for the synthesis of wide range of fine chemicals and pharamaceuticals. Among the several strategies employed for their synthesis, Mn(III)-salen catalyzed asymmetric epoxidation of non-functionalized alkenes, initially developed by Jacobsen and Katsuki is the most efficient system. However, due to the more solubility of the Jacobsen salencatalyst in the reaction medium as well as even in non-polar solvent like hexane, the separation and recycling of such expensive catalyst is very difficult. Addressing this issue several attempts have been taken towards the immobilization of Mn(III)-salen complexes on inorganic solid support of varied porosity. In this direction, over the last decade ordered-mesoporoussilicas have drawn considerable interest as potential support. Herein we have immobilized Jacobsen type Mn(III)-salen complex on a first generation dendrimer modified ordered mesoporous silica and successes fully utilized them in asymmetric epoxidation on non-functionalized alkenes. Quantitative yield for product epoxides (in almost all cases) and high enantioselectivity (eeupto 98% for cyano-chromene oxide) was obtained. Furthermore the catalyst was subjected to recyclability for six cycles without any significant loss of activity and enantioselectivity.



Discipline of Inorganic Materials and Catalysis, Central Salt and Marine Chemicals Research Institute (CSMCRI),Council of Scientific and Industrial Research (CSIR), G. B. Marg, Bhavnagar- 364 002, Gujarat, India, Tel: +91-0278 2567760, Fax: +91-0278-2566970;
E-mail: rukhsana93@yahoo.co.in

CPP20

155. Analysis of Banana Pseudo-Stem (*Musa Balbisiana*) Extract

S. R. Neog and D. C. Deka*

Analysis of banana pseudo-stem (*Musa balbisiana*) juice and fibre were carried out separately using UV spectrophotometer, flame photometer, nmr, IR, GC-MS and wet chemistry method aiming to evaluate the organic and inorganic components present in them. Analysis indicated that banana plant juice contains 0.62 g/L Na^+, 2.25 g/L K^+ and 0.55 g/L Cl^- ion, and each gram of ash of fibre contains 0.048 g Na^+, 0.143 g K^+, 0.023 g Cl^-, 0.126 g CO_3^{2-} ions. Banana pseudo-stem is edible and is very popular in Assamese dishes. The results demonstrate that the banana pseudo-stem has potential value for preparing salt substitute. Salt substitutes are low-sodium table salt alternatives marketed to circumvent the risk of high blood pressure and cardiovascular disease associated with a high intake of sodium chloride while maintaining a similar taste. They usually contain mostly potassium chloride, whose toxicity is approximately equal to that of table salt in a healthy person. Salt substitutes vary in their composition, but their main ingredient is always potassium chloride.

The organic components were separated from ethyl acetate extract of banana pseudo-stem juice by column chromatography. Two pure organic compounds were isolated and identified. One is *p*-methoxy benzalacetone and other is *p*-methoxy cinnamic acid (*p*-MCA) which have reportedly *in vitro* anti-tumor promoting activity to curcumin. *p*-MCA exerts its antihyperglycemic effect by increasing insulin secretion and glycolysis, and by decreasing gluconeogenesis.

Keywords: Musa balbisiana, pseudo stem, salt substitute, potassium chloride,

Department of Chemistry, Gauhati University, Guwahati, Assam

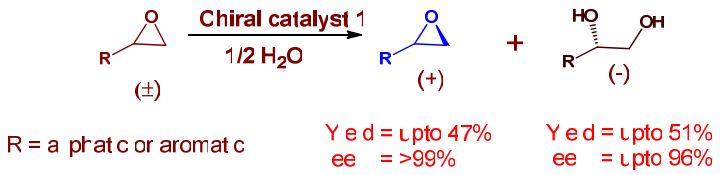
dcdeka@rediffmail.com

CPP21

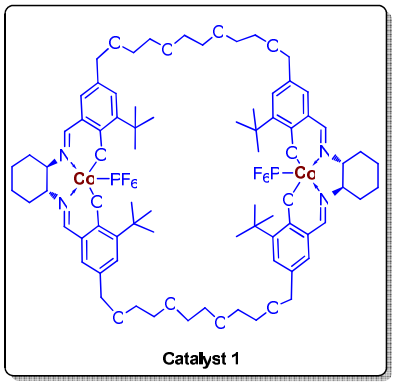
156. Hydrolytic Kinetic Resolution of Racemic Epoxides with Recyclable Co(III)- Macrocylic Salen Complex: An Approach Towards the synthesis of (*R*)- Mexiletine (anti arrhythmic agent)

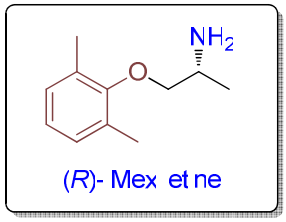
Arghya Sadhukhan, Rukhsana I. Kureshy, Sayed H. R. Abdi, Hari C. Bajaj, Noor-ul H. Khan*,

Hydrolytic kinetic resolution (HKR) of racemic epoxides is an attractive strategy for the synthesis of enantiopure epoxides and corresponding diols in a single step from inexpensive and commercially easily available racemic epoxides. Both enantio-pure epoxides and their respective diols have wider applications in both academic and industrial contexts.[1-3] Among several catalysts, chiral Co(III)–salen complexes have emerged as efficient catalysts for HKR under homogeneous as well as heterogeneous system. Herein, we wish to report a novel chiral Co (III) dinuclear macrocyclic salen complex **1** with ether linkage for HKR of a variety of epoxides and glycidyl ethers using water as resolving agent at room temperature (**Scheme 1**). Excellent yields (>47 % with respect to the epoxides and >51% with respect to chiral diols) with high enantioselectivity (*ee*, >99 % of epoxides and upto 96% of diols) were achieved in 3-16 h. The catalyst was successfully recycled up to 6 cycles with no significant loss in its performance.



Scheme 1 HKR of racemic aliphatic and aromatic epoxide





Discipline of Inorganic Materials and Catalysis, Central Salt and Marine Chemicals Research Institute (CSMCRI),Council of Scientific and Industrial Research (CSIR), G. B. Marg, Bhavnagar- 364 002, Gujarat, India, Tel: +91-0278 2567760, Fax: +91-0278-2566970;

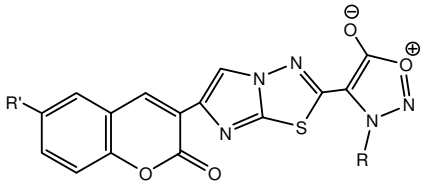
E-mail: khan251293@yahoo.in

CPP22

157. Synthesis, antioxidant and DNA cleavage studies of novel imidazo-[2,1-*b*][1,3,4]-thiadiazoles derivatised with coumarins

Tegginamath Gireesh, Ravindra R. Kamble

A novel series of 3-aryl-4{6'-(6"-substituted-coumarin-3"-yl)-imidazo[2,1-*b*][1,3,4]-thiadiazol-2'-yl}-sydnones **5h-s** were synthesized. The structures of the compounds were confirmed by spectral (IR, ^{1}H NMR and MS) and elemental analyses. The title compounds were further screened for their antioxidant and DNA cleavage activities. Some of the compounds have shown significant activities.



5h-s

PG Department of Studies in Chemistry, Karnatak University Dharwad – 580 003, Karnataka, India
Tel/fax: +91 836 2747884, e-mail address: tmgchem@gmail.com, kamchem9@gmail.com

CPP23

158. $Mg(ClO_4)_2$ catalyzed Eco-benign synthesis of 1,2,4-triazolinone derivatives as anti-tubercular agents

Dorababu Atukuri, Pramod Kattimani and Ravindra Kamble *

An eco-benign approach towards the synthesis of 1,2,4-triazolinones incorporated with isoindoline-1,3-dione (**4a-j**) and 9*H*-fluoren-9-imine (**5a-j**) was carried out using sydnone (**1a-j**) as synthon under magnesium perchlorate as catalyst *via* 1,3-dipolar cycloaddition**.** The yield observed under this condition is excellent. Anti-tubercular activity of the newly synthesized compounds will be discussed during the presentation.

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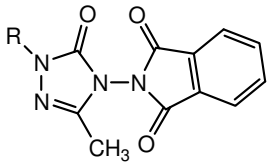
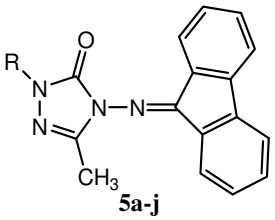


4a-j



5a-j

Department of Chemistry, Karnatak University, Pavate Nagar, Dharwad-580003, India.

CPP24

159. One pot synthesis of 4-(2'-thieno (2,3-b) quinolinyl)coumarins.

Madhura V. and Manohar V. Kulkarni*

Heterocyclic systems like furan, pyridine, isaxazole have been linked to C4 position of coumarin which has lead to biheterocycles of structural and biological interest. In view of the importance of the triheterocyclic thienoquinolines [1], the present paper reports the synthesis of title compounds in a two step synthetic sequence. 2-mercapto-3-formyl quinolines were obtained from acetanilides [2] and were reacted with various 4-bromomethyl coumarins [3].It is likely that under the mildly alkaline conditions employed during this work, the *in-situ* generated thiol form brings about an allylic nucleophilic substitution. The intermediate sulfide possessing an active methylene group can generate a carbanion (stabilized as the enolate) which adds across the carbonyl group followed by dehydration. The compounds obtained indicated the absence of aldehydic carbonyl in the IR spectra and ^{1}H NMR spectra showed the absence of CH_2 protons which confirmed the structure assigned for the compounds. This is also supported by the mass spectral data.

Department of Chemistry, Karnatak University, Pavate Nagar, Dharwad-580 003, India .
** Corresponding author. Tel.: +91 9880440790; fax: +91 836 2747884.*
E-mail address: manohar274@gmail.com

CPP25

160. Diastereoselective synthesis of dihydrofurano[3,2-c] coumarins and 1-aza coumarins

Reshma J Naik[a], Manohar V. Kulkarni[a,*]

One pot, three component tandem reaction was developed for an efficient diastereoselective synthesis of 2-(2-oxo-2H-chromen-4-yl)-3-phenyl-2,3-dihydrofuro[3,2-c]chromen-4-one and 1-aza coumarin derivative with the assistance of pyridinium ylide. Title compounds were obtained by readily available starting materials like pyridine, aromatic aldehyde, 4-hydroxycoumarin or 4-hydroxy carbostyril and 4-bromomethyl coumarins with triethylamine as catalyst. The reaction proceeds via Michael addition and intramolecular cyclization of pyridinium ylide formed *in situ*. Stereochemistry of the obtained compound was confirmed by ^{1}H NMR J values and single-crystal analysis.

[a] *P.G. Department of Chemistry, Karnatak University, Dharwad- 580 003, Karnataka, India*
[*] *Corresponding author. Tel.: +91 9880440790; fax: +91 836 2747884.*
E-mail address: rnaik318@gmail.com, manohar274@gmail.com

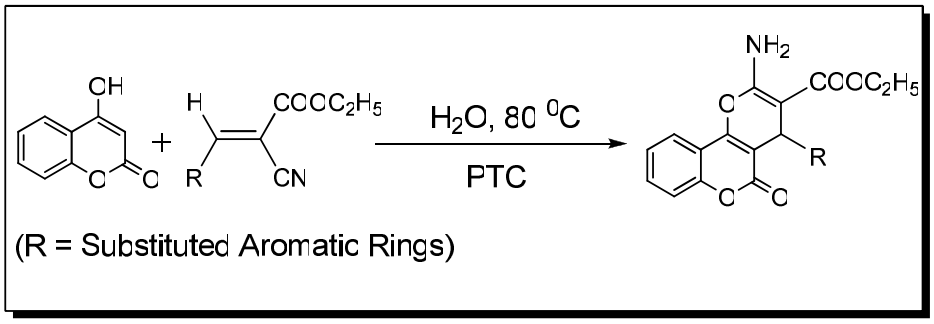
CPP26

179. An Efficient and Green Synthesis of Pyrano[3,2-*c*]coumarin Derivatives in Aqueous Media

Manas M. Sarmah, Rupam Sarma and Dipak Prajapati*

Fused coumarin systems, in particular pyranocoumarins, are abundant in nature and constitute the building block of many natural products found across the plant kingdom. Pyranocoumarin derivatives are found to possess antifungal, insecticidal, anticancer, anti-HIV, anti-inflammatory, antioxidant, and antibacterial activities. The pharmaceutical potency of this class of heterocycles has resulted in development of several methods for their synthesis. One of the fundamental challenges for organic chemists is to develop non-hazardous methodologies to perform organic reactions. In this respect, organic reactions in aqueous media have received much attention as water is a cheap, abundant and green alternative to organic solvents.

In a continuation of our interest in developing green methodologies and synthesis of diverse heterocyclic compounds of biological importance, we have developed a two component reaction of 4-hydroxycoumarin and ylidine nitrile in water under Phase Transfer Catalyst condition at 80 ^{0}C to give pyrano[3,2-*c*]coumarin derivative in good yield within a short reaction time. Ylidine nitriles are synthesized by using Knoevanagel condensation reaction between ethyl cyanoacetate and different aromatic benzaldehydes.



Medicinal Chemistry Division, CSIR-North East Institute of Science & Technology, Jorhat, Assam, India- 785006, Tel.: +91 367 2370356; Fax: +91 376 2370011.

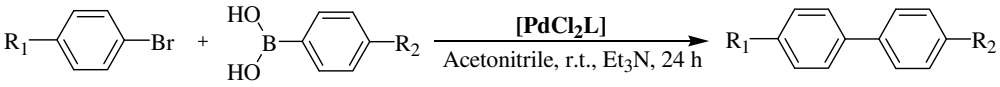
E-mail: dr_dprajapati2003@yahoo.co.uk
manas.mausum95@gmail.com

CPP27

180. Palladium complexes of P,P and P,S type bidentate ligands: Synthesis, Characterisation and Catalytic activity towards Suzuki-Miyaura cross-coupling reaction

Kokil Saikia and Dipak Kumar Dutta*

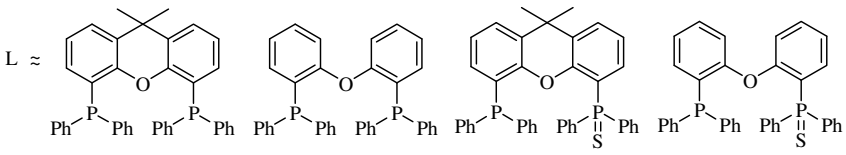
Metal catalysts occupy a special position of pivotal importance in the field of catalysis for different chemical transformations particularly in carbon-carbon bonds formation in organic syntheses. The palladium catalysed Suzuki-Miyaura cross-coupling reaction of arylboronic acids with arylhalides is found to be one of the most powerful tools for synthesising different bi-aryls. Herein, we report four palladium complexes (**1a-1d**) of bidentate phosphine donor ligands (P∩P and P∩S); where, P∩P = 9,9–dimethyl-4,5-bis (diphenyl phosphanyl) xanthene {Xantphos}(**a**) or bis (2-diphenylphosphanylphenyl) ether {DPEphos}(**b**); P∩S = 9,9-dimethyl-4,5-bis (diphenylphosphanyl) xanthene monosulfide {Xantphos(S)}(**c**) or bis(2-diphenylphosphanyl phenyl) ether monosulfide {DPEphos(S)}(**d**). The complexes are characterized by elemental analyses, mass spectrometry, ^{1}H, ^{13}C and ^{31}P NMR spectroscopy together with the single crystal X-ray structure determination of **1a**, **1c** and **1d**. The catalytic activities of **1a**-**1d** investigated for Suzuki-Miyaura cross-coupling reactions at room temperature exhibit good to excellent yield of the coupling products. Among **1a-1d**, the palladium complexes of bidentate phosphine (**1a**, **1b)** show higher efficacy than their monosulfide analogues (**1c**, **1d**). However, the recycling experiments with the catalysts for a selected coupling reaction between 4-bromobenzonitrile and phenylboronic acid exhibit that **1c** and **1d** are more efficient than **1a** and **1b**, which may be due to the donor effect of the P,S ligands during catalytic reaction.



Where,

$R_1 \approx$ -CN, -OMe, -H

$R_2 \approx$ -H, -Ome



Scheme 1. Palladium catalysed Suzuki-Miyaura cross-coupling reaction

Materials Science Division, Council of Scientific and Industrial Research-North East Institute of Science and Technology, Jorhat 785 006, Assam, India.

**Corresponding Author E-mail: dipakkrdutta@yahoo.com*

CPP28

181. Synthesis, characterization, biological and thermal behaviour of Co(II) complexes with Schiff bases having coumarin moieties

Sangamesh A. Patil [a]*, Shrishila N. Unki[a], Prema S. Badami[b].

Schiff bases derived from 5-amino-1,3,4-thiadiazole-2-thiol and 8-formyl-7-hydroxy-4-methylcoumarin/8-acetyl-7-hydroxy-4-methylcoumarin have been synthesized in ethanol and their structural features have been studied by elemental analyses, FT-IR and NMR spectral data. The coordination ability of Schiff bases towards Cobalt(II) ions have been studied by various spectroscopic techniques. Schiff bases act as bidentate ligand and coordinated to Co(II) ion through azomethine nitrogen and phenol oxygen.

The elemental analyses of the Co(II) complex confine to the stoichiometry of the type $ML_2.2H_2O$ where "L" acts as a deprotonated ligand and the metal complexes are non-electrolytic in nature in DMF solvent. The coordination mode of Schiff bases to metal ion was confine by FT-IR spectroscopy. The octahedral geometry of the metal complexes was proposed on the basis of UV-vis., and magnetic data. TG/DTA studies further provided the information about the coordination of water molecules to the metal ion and the thermal stability of the metal complexes. The Schiff bases and their metal complexes have been screened for their *in-vitro* antibacterial and antifungal activities by MIC method.

[a] *P.G. Department of Studies in Chemistry, Karnatak University, Dharwad-580 003. Karnataka, INDIA.*

[b] *Department of Chemistry, S. S. Khuba College of Science, Basavakalyan-585327. Karnataka, INDIA.*

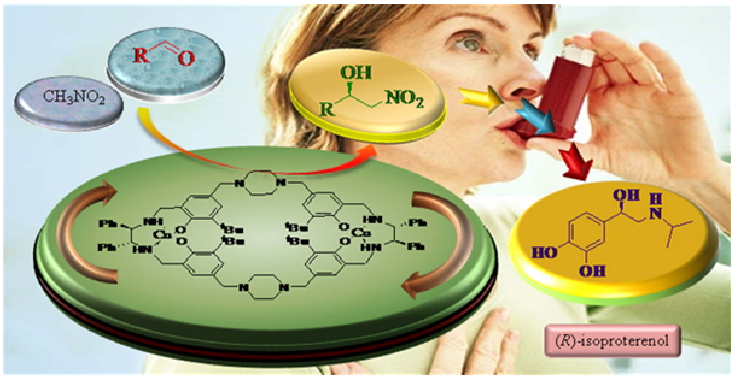
E-mail: patil1956@rediffmail.com

CPP29

183. Asymmetric Henry Reaction Catalyzed By Recyclable Cu(II)-Macrocyclic [H_4]salen Complex And Its Application For The synthesis of valuable drug (*R*)-isoproterenol (-adrenoreceptor)

Anjan Das, R. I. Kureshy,* N. H. Khan, S. H. R. Abdi, H. C. Bajaj

The asymmetric nitroaldol reaction has emerged as a powerful synthetic tool for the stereoselective C-C bond forming reaction because the resultant *β*-hydroxy nitroalkanes are important building blocks for the preparation of *β*-amino alcohol derivatives, α-hydroxycarboxylic acid and *β*-receptors. In this direction various chiral metal complexes with BINOL, aminoalcohol, bis-(oxazoline), bis-(thiazoline), bis-(imidazoline), sulfonylamine, salen, Schiff bases, thiols, thiophene, bipiperidine, aminopyridine, oxabispidine and organocatalyst have been reported for asymmetric Henry reaction under homogeneous system. Among them Schiff base ligands have been recognized as 'privileged ligands' because they can be easily prepared through the condensation between various aldehydes and primary amines. Due to the more solubility of the chiral catalyst in reaction medium, their separation and recyclability is problematic. Therefore, C_2-symmetric dimeric [H_4]salen ligands with two active centers derived from piperazine-bis aldehyde and 1*R*,2*R*-(-)-1,2-diphenyl-1,2-diaminoethane were synthesized in order to recycling the catalyst systems for Henry reaction and also to avoid high catalyst loading, sensitivity to air or moisture, and narrow substrate variation with $Cu(OAc)_2.H_2O$ as metal source. The catalysts were effectively recycled up to five cycles with preservation of its catalytic activity and enantioselectivity. We have also made use of the alternative route (via asymmetric Henry reaction) for the synthesis of (*R*)-isoproterenol as a potent -adrenoreceptor for bradicardia or heart block. It is also a highly effective bron-chodilator and therefore, used in the treatment of asthma and chronic obstructive pulmonary diseases.



Discipline of Inorganic Materials and Catalysis, Central Salt and Marine Chemicals Research Institute (CSIR-CSMCRI), Bhavnagar- 364 002, Gujarat, India. Fax: +91-0278-2566970;

E-mail: rukhsana93@yahoo.co.i, anjandaschem@gmail.com

CPP30

185. Bifunctionally Capped Semiconductor-Metal Nanoparticle Hybrid System as Bio Sensor

Lakshi Nandan Goswami and Devasish Choudhury*

Metal and semiconductor nanoparticles exhibit unique optical, electrical, thermal and catalytic properties. These properties originating from quantum sized dimensions could change with their sizes and shapes. Such nanosized particles have a chemical behavior similar to small molecules and can be used as specific electrochemical label. Therefore, they have attracted considerable interest and have been employed for construction of various electrochemical sensors. In this study, synthesis of a nanometer sized bifunctionally capped CdS/Ag nanoparticles (NPs) hybrid system at room temperature is reported, which can detect biomolecule such as Heme. Capped CdS nanocrystals are prepared in aqueous medium by using Cystein as capping agent and anchored with Ag NPs. The interaction of Ag NPs with the Heme molecule forming nano–bio conjugates has been investigated using Optical absorption and Fluorescence technique. The semiconductor-metal nanoparticle hybrid system was also characterized by Fourier transform Infra Red Spectra (FTIR) and Transmission Electron Microscope (TEM) measurement. The thermal properties were studied by Thermogravimetic Ananlysis (TGA) and Differential Scanning Calorimetry (DSC) methods.

Material Nanochemistry Laboratory, Physical Sciences Division, Institute of Advanced Study in Science and Technology, Paschim Boragaon, Garchuk, Guwahati – 781 035, Assam, India

Email: lngoswami24@gmail.com

CPP31

186. Novel Chitosan-Ag Nanocomposite with improved physio-chemical properties

Neelam Gogoi[1], Anamika Dey[2] and Devasish Chowdhury*[1]

Chitosan is the only known positively charged natural polysaccharides containing a backbone of partly acetylated β (1-4)-D-glucosamine residues. Chitosan is infact a collective term for deacetylated chitin, which is a main component of exoskeletons of arthropods and the cell walls of fungi. The primary amine of glucosamine repeating unit in chitosan provide sites to connect preformed nano scale particles to the polysaccharide backbone. The present study looks at the contemporary research in hydrogel system based on chitosan and its chemical modification by incorporation of silver nanoparticles. Spectroscopic characterization of prepared hydrogel nanocomposite such as Ultraviolet and Visible (UV-Vis) spectroscopy and Fourier Transform Infra Red (FT-IR) spectroscopy were also carried out. Thermal stability was done using Thermogravimetric analysis (TGA) and swelling behaviour studies to envision the characteristic modification in the gel network.

[1]*Material Nanochemistry Lab, Physical Sciences Division, Institute of Advanced Study in Science and Technology (IASST), Paschim Boragaon, Garchuk, Guwahati- 781035, Assam*

[2]*Department of Physics, Cotton College, Guwahati- 781001, Assam*

e-mail : neelamgogoi@gmail.com, devasishc@gmail.com

CPP32

187. Phenolics and Flavonoids profiling and Antioxidant Properties of three Indigenous plants of North East India.

Alakesh Phukan, Bolin Chetia* and Jyotirekha G. Handique

Three plants of North-East India viz. *Olax Acuminata*(Hanboka), *Gnetum Gnemon*(Hantho) and *Unknown* (Hansanbi) were investigated for their antioxidant activity by two different assays namely 1,1-diphenyl-2-picryl hydrazyl (DPPH) assay and superoxide radical scavenging assay(nitroblue tetrazolium chloride,NBT) assay, and also for their total phenolic and total flavonoid content. It was found that the methanolic extract of all the three plants possessed the highest antioxidant activity in both the assays compared to the ethyl acetate and hexane extract, and thus could be potential rich sources of natural antioxidants. These extracts also presented the highest phenolic and flavonoid content. The total phenolic content was measured by Folin-Ciocalteu method and was expressed as mg of gallic acid equivalent (GAE) per g of dry extract and it was found to be highest for the methanolic extract of *Olax Acuminata* (156.67 mg GAE/gm). The total flavonoid content was measured by aluminium chloride colorimetric assay and was expressed as mg of catechin equivalent (CE) per g of dry extract, and it was also found to be highest for the methanolic extract of *Olax Acuminata* (30.625mg CE/gm). A significant relationship between antioxidant activity, total phenolic and flavonoid content was found, indicating that phenolic compounds are the major contributors to the antioxidant properties of these plants.

Keywords: 1,1-diphenyl-2-picryl hydrazyl (DPPH), NBT(nitroblue tetrazolium), total phenolics content, total flavonoids content.

Synthetic Organic and Natural Products Laboratory, Department of Chemistry

Dibrugarh University, Dibrugarh-786004, Assam, India

**E-mail: bolin101@yahoo.co.in*

CPP33

188. Condensed 1,4-diydropyridine potential biological interest. Syntheses and structure-activity relationship studies

R. Surendra Kumar [1], A. Idhayadhulla [2], R.Karthikeyan [2], A. Jamal Abdul Nasser [2]

A series of 1,4-dihydropyridine derivatives were synthesized, characterized and screened for their antimicrobial activities, anti-inflammatory activities. The synthesized compounds were established by spectroscopic (FT-IR, ^{1}H NMR, ^{13}C NMR, Mass) and elemental analyses. These some newly synthesized compounds were examined for their in vitro antimicrobial activity and in vivo anti-inflammatory. Result indicated that these compounds showed promising anti-inflammatory activity in comparison to Ibuprofen (the standard anti-inflammatory drug). The structure activity relationships (SAR) and anti-inflammatory activities of these compounds are also discussed in this paper.

[1] Department of Chemistry, Mahalakshmi Engineering College, Tiruchirappalli- 621 213, Tamil Nadu, India.

[2]P.G. & Research Dept.of chemistry, Jamal Mohamed College, Tiruchirappalli- 620020, Tamil Nadu, India.
suren_chem@yahoo.co.in

CPP34

189. Room Temperature Suzuki-Miyaura Reaction in Aqueous Media Catalysed by Pd(II) Complexes with Symmetrical N_4 Schiff-base Ligand

Biplab Banik[a,b]*, Archana Tairai[a] and Pankaj Das[a]*

Due to easy synthesis and air stable nature, Schiff base ligands have got considerable interests in various metal catalyzed organic reactions such as oxidation, epoxidation, Heck coupling reactions etc. The ligand promoted palladium catalyzed Suzuki-Miyaura reaction of aryl halides with aryl boronic acids has proven to be one of the most powerful strategies for synthesizing diversified biaryls, which constitute an important class of compounds for pharmaceutical industry. During the last two decades, several ligands, such as phosphines, amines, N-heterocyclic carbenes, palladacycles etc. have been exploited for this reaction. However, Schiff bases as ligands have got only limited attentions for this reaction. Thus, as a part of our ongoing work on Suzuki-Miyaura reactions, we have synthesized two new palladium(II) complexes by reacting $Pd(OAc)_2$ with a symmetrical N_4-based Schiff base ligand [Fig.1] in 1:1 and 2:1 ratio. Both the complexes were characterized by various Spectroscopic techniques like ESI-Mass, IR, NMR (^1H, ^{13}C), UV-VIS etc. Both the complexes effectively catalyzed the Suzuki-Miyaura reactions of aryl halides with arylboronic acids at room temperature. Good-to-excellent yields of the coupling products were obtained for a large number of substrates in aqueous condition. Under the same experimental condition, the 2:1 complex was found to be more effective than the 1:1 complex.

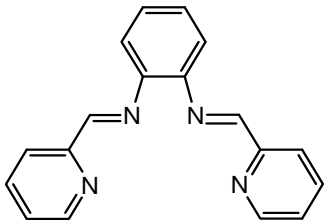


Fig 1

[a]*Department of Chemistry, Dibrugarh University, Dibrugarh-786004, Assam India*

[b]*Department of Chemistry,Tinsukia College,Tinsukia-786125, Assam India*

E-mail: biplab.tsk@gmail.com (B.B), pankajd29@yahoo.com (P.D)

CPP35

190. Effect of solvents and Ba^{2+} co-doping in the photoluminescence behavior of Sm^{3+} doped $LaVO_4$ nanoparticles

Reena Okram, Ganngam Phaomei and N. Rajmuhon Singh*

Well-dispersed Sm^{3+} doped $LaVO_4$ nanoparticles have been synthesized at relatively low temperature of 140°C in ethylene glycol (EG), water, dimethyl formamide (DMF) and mixed solvents. Structural and photoluminescence properties of the prepared samples are characterized and studied. XRD study shows mixture of monoclinic and tetragonal phases. The mixed phase transformed to monoclinic phase when heated at 900°C. Sm^{3+} doped $LaVO_4$ gives three characteristic emission peaks at 560, 600 and 645 nm correspond to $^4G_{5/2} \rightarrow {}^6H_{5/2}$, $^4G_{5/2} \rightarrow {}^6H_{7/2}$ and $^4G_{5/2} \rightarrow {}^6H_{9/2}$ transitions respectively with $^4G_{5/2} \rightarrow {}^6H_{7/2}$ (orange-red) giving the highest emission intensity. Both $^4G_{5/2} \rightarrow {}^6H_{5/2}$ and $^4G_{5/2} \rightarrow {}^6H_{7/2}$ transitions are magnetic allowed transitions obeying the selection rule $\Delta J = 0$ and ± 1 while $^4G_{5/2} \rightarrow {}^6H_{9/2}$ transition is electric dipole allowed with selection rule of $\Delta J = 2$ Yang et al. & Seeta Rama Raju et al. Enhanced emission intensity is observed upon the introduction of Ba^{2+} ions in $LaVO_4$: Sm^{3+}. The luminescence intensity is triple times higher for the samples prepared in water and mixed solvent (EG + Water) than that prepared in EG. Sm^{3+} (5 at.%) doped $LaVO_4$ sample prepared in EG show nanorods with length of 73-87 nm and breadth of 24-38 nm.

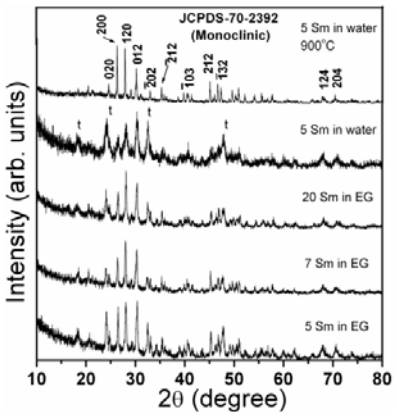


Fig.1. XRD patterns of Sm^{3+} (5 at.%) doped $LaVO_4$ prepared in EG and that annealed at 900 °C

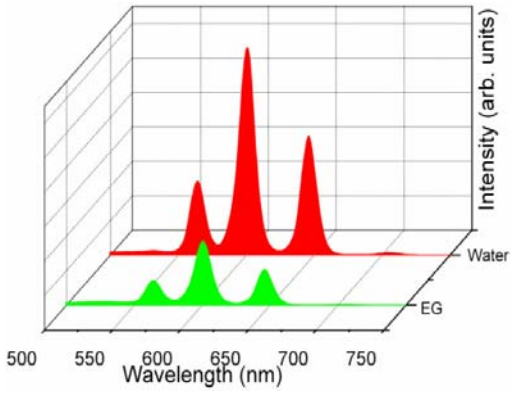


Fig.2. Emission spectra for Sm^{3+} (5 at.%) doped $LaVO_4$ samples synthesized in EG and water excited at 280 nm

Keywords: Nanoparticles; photoluminescence; quenching; mixed phase

Department of Chemistry, Manipur University, Canchipur-795003, Imphal, India

CPP36

199. Novel electrochemical sensor based on electroreduced graphene oxide film for the determination of mycophenolate mofetil

Prashanth S.N and J.Seetharamappa*

Graphene oxide was synthesised by two methods *viz.,* Hummers method and Staudenmaiers method. The synthesized graphene oxides were characterised by FT-IR and thermogravimetric analysis. Solution of graphene oxide (GO) cast on glassy carbon electrode was electrochemically reduced in phosphate buffer solution of pH 6 to give electrochemically reduced graphene (ER-G). This ER-G film was used for electrochemical study of an immunosuppressant drug, mycophenolate mofetil (MMF). MMF exhibited an irreversible oxidation peak. The ER-G film showed an enhanced peak current for electrooxidation of MMF. The GO synthesized by two methods was examined for the enhancement of peak current of MMF oxidation. Effects of accumulation time, different pH and scan rate were studied and different electrochemical parameters were evaluated. The electrooxidation of MMF was found to be irreversible over the pH range studied. The plot of pH *versus* E_p gave a slope of 63 mV/pH indicating the participation of equal number of electrons and protons in the electrode process. Linear dependence of peak currents with square root of scan rate was observed in the range of 10-250 mVs^{-1} indicating diffusion controlled electrode process. A differential pulse voltammetric method was developed for the determination of MMF in bulk, biological fluids and pharmaceutical formulations. The results indicate that the method is simple, fast and inexpensive; it could be readily adopted in clinical and quality control laboratories.

Department of Chemistry, Karnatak University, Dharwad – 580 003.

e-mail: jseetharam@yahoo.com

CPP37

200. Probing site-selective binding of stavudine to DNA by optical spectroscopic methods

Sandhya B. and J. Seetharamappa*

The interaction of an anti-HIV drug, stavudine (STV) with deoxyribonucleic acid (DNA) was investigated employing acridine orange as a fluorescence probe. The mechanism of binding of STV with DNA was studied by different optical spectroscopic techniques under simulative physiological conditions. The intercalative binding mode of STV to DNA-AO was revealed by absorption, fluorescence and CD studies. Further, the results of melting temperature (T_m) and interaction of STV with native DNA (dsDNA) and with denatured DNA (ssDNA) revealed the intercalative mode of binding between STV and DNA. The analysis of fluorescence data indicated the presence of static quenching mechanism in the binding. The decreased binding constant values with increase in temperature indicated the decreased stability of STV-DNA-AO system at higher temperatures. Negative values of $\Delta H°$ (-209.105 kJ/mol) and $\Delta S°$ (-625.288 J/molK) showed that the van der Waals forces and hydrogen bond were the major acting forces between STV and DNA. The negative values of $\Delta G°$ revealed the spontaneity of interaction process. The effects of some co-existing substances on the interaction of drug to DNA were investigated. The CD spectral data revealed the B→A conformational transition of DNA upon binding to STV.

Department of Chemistry, Karnatak University, Dharwad-580 003, India
Tel.: +91 836 2215286; fax: +91 836 2747884. E-mail address: jseetharam@yahoo.com (J. Seetharamappa)

CPP38

201. New method for the synthesis of (E)-1-(1H-benzo[d]imidazol-1-yl)-3-phenylprop-2-en-1-one and its Crystal studies

Veerendra Kumar A. Kalalbandi, Umesha K and J. Seetharamappa*

Compounds with chalcone as backbone have been reported to exhibit a wide variety of pharmacological effects including antioncogenic, anti-inflammatory, antiulcerative, analgesic, antiviral, antimalarial and antibacterial activities. The presence of a reactive α,β-unsaturated keto function in chalcones is found to be responsible for their antimicrobial activity, which may be altered depending on the type and position of the substituent on the aromatic rings. The relative ease of preparation and the great reactivity of some chalcones make them a promising starting point for the preparation of a variety of compounds.

Almost all benzimidazoles with their two ring systems bear different functional substituents and this leads to essential modification of the physico-chemical, metabolic and pharmacokinetic properties of drugs. Recently, the chemistry and biological profiles of various pharmacophores of 1N- substituted and 2-substituted benzimidazoles derivatives have been worked out in detail. However, the literature survey reveals that the chalcone group at 1N-position of benzimidazole is not yet explored. In view of this, a new method has been designed for the synthesis of (E)-1-(1H-benzo[d]imidazol-1-yl)-3-phenylprop-2-en-1-one.

The title molecule has been synthesized by the coupling of benzimidazole and cinnamic acid using sodium hydride as a base. The obtained compound was characterized by IR, Mass and NMR spectral data. NMR spectral data [the peak at δ: 8.58 (1H, s)] confirmed the occurrence of coupling at 1N-position of benzimidazole. Further, the single crystal of title molecule is developed and studied.

Dept. of Chemistry, Karnatak University, Dharwad-580 003, Karnataka.

**E-Mail: jseetharam@yahoo.com*

CPP39

202. Electrochemical Investigations of an Anorexiant, Sibutramine at an Electrochemically- Reduced Graphene oxide Film Modified Glassy Carbon Electrode and its Determination in Biological Samples

Nagappa L. Teradal, and J. Seetharamappa*

In this report, the electrochemical behavior of an anorexiant, sibutramine hydrochloride monohydrate (SHM) was studied at an electrochemically-reduced graphene oxide(ERGO) film modified glassy carbon electrode(GCE) in Britton-Robinson (BR) buffer solution by cyclic and differential-pulse voltammetric techniques. SHM exhibited two oxidation peaks which are observed to be irreversible over the pH range of 3-10. The first peak and second peak were found to be adsorption and diffusion controlled process, respectively. The oxidation peak current of SHM increased significantly and the peak potential shifted negatively at the ERGO film-modified GCE when compared to that at a bare GCE. These results indicated that the nano-structured film electrode exhibited excellent enhancement effects on the electrochemical oxidation of SHM. Consequently, a simple and sensitive electroanalytical method was developed for the determination of SHM in spiked urine and human serum samples in BR buffer of pH 7. The oxidation peak current ($peak_1$) was noticed to be proportional to the concentration of SHM in the range of 2.5×10^{-7} - 2.0×10^{-5} M. The values of LOD and LOQ were found to be 4.8×10^{-8} M and 1.6×10^{-7}, respectively. Hence, the proposed method could be employed for clinical samples analysis.

**Department of Chemistry, Karnatak University, Dharwad – 580 003.*

e-mail: jseetharam@yahoo.com

CPP40

203. Investigations to reveal the nature of interaction between human hemoglobin and curcumin using optical techniques

Ashwini H. Hegde, J. Seetharamappa*

Curcumin, a flavonoid with extensive bioactivities, is found in plant *Curcuma longa*. It has been widely investigated due to its potential therapeutic actions for some diseases. In the present work, binding characteristics of curcumin to human hemoglobin (Hb) were analyzed with steady state fluorescence spectroscopy, synchronous spectroscopy, 3D fluorescence spectroscopy, fluorescence anisotropy, UV absorption spectroscopy and circular dichroism (CD). The results indicated that the curcumin caused strong fluorescence quenching of Hb by dynamic quenching mechanism. The binding constant was calculated to be $2.8x10^5\ M^{-1}$. The thermodynamic parameters, ΔH^0 and ΔS^0 were estimated to be 77.10 kJ mol^{-1} and 33.34 J mol^{-1} K^{-1}, respectively according to the van't Hoff equation indicating that the hydrophobic forces played a major role in the interaction. 3D fluorescence results revealed the change in microenvironment around Hb upon the addition of curcumin. Results of CD indicated that the curcumin influenced the secondary structure of Hb by changing its α-helical content. The distance between donor (Hb) and acceptor (curcumin) is calculated according to the theory of Förster resonance energy transfer.

Department of Chemistry, Karnatak University, Dharwad-580003

E-mail:jseetharam@yahoo.com

CPP41

204. Development and validation of a stability indicating UPLC assay method for determination of chlorhexidinegluconate and lidocaine hydrochloride in throat spray

Vijay R. Ram[a], Kapil L. Dubal[b], and Hitendra S. Joshi[b]*

The objective of the current study was to developed simple, precise and accurate gradient reversed-phase stability indicating UPLC assay method and validated for determination of chlorhexidinegluconate and lidocaine hydrochloride in throat spray. Isocratic RP-UPLC separation was achieved on a Waters Acquity BEH C18, 2.4 x 50mm, 1.7µ column. The flow rate of the mobile phase was adjusted to 0.3 ml/min and the injection volume was 4µl partial loop with needle overfill. Detection was performed at 215nm using photo-diode array detector. The drug was subjected to oxidation, hydrolysis, photolysis and heat to apply stress condition. The method was validated for specificity, linearity, precision, accuracy, robustness and solution stability. The method was linear in the drug concentration range from 0.040-0.160 mg/ml with with correlation coefficient 0.9997 for Chlorhexidinegluconate and 0.016-0.064 mg/ml with correlation coefficient 0.9994 for Lidocaine hydrochloride. The precision (RSD) amongst six-sample preparation was 0.42 % for repeatability and the intermediate precision (RSD) amongst six-sample preparation was 0.53 % for Chlorhexidinegluconate. The precision (RSD) amongst six-sample preparation was 0.33 % for repeatability and the intermediate precision (RSD) amongst six-sample preparation was 0.33 % for Lidocaine hydrochloride. The mean recovery for Chlorhexidinegluconate was 98.6-99.80 % and for Lidocaine hydrochloride 99.17-99.52 %. Degradation products produced as a result of stress studies did not interfere with detection of chlorhexidinegluconate and lidocaine hydrochloride and the assay can thus be considered stability indicating.

[a]*Department of Chemistry, KSKV Kachchh University, Bhuj-370 001, Gujarat, India.*

[b]*Department of Chemistry, Saurashtra University, Rajkot-360 005, Gujarat, India.*

Corresponding author.

E-mail address: drvrram@gmail.com

Tel. +91 281 2578512(O), Fax. +91 281 2576802

CPP42

205. Investigation of Mineral Composition Present in *Barleria Prionitis*

NileshSharma[a], PratapDodia[b], Vijay Ram[a], HitendraJoshi[b]*

Barleriaprionitis plant finds a lot of reference in the ayurvedic literature, but its correct identity is not known today. There are several plants listed under the name of Barleria among them *Barleriaprionitis* selected for study as they have not been much investigated. Their morphological characters are capable of vegetative reproduction when cuttings or stem fragments encounter a suitably moist environment that allows them to start growing roots. Barleria can probably also reproduce vegetative. The amount of tannin was confirmed by qualitative and quantitative methods. Further mineral analysis was carried out according to standard procedure using various methods. In conclusion, it can be suggested that plant have significant amount of minerals in leaves, stem and roots for development as useful remedies.

[a]*Department of Chemistry, KSKV Kachchh University, Bhuj-Kachchh (Gujarat)*

[b]*Department of Chemistry, Saurashtra University, Rajkot (Gujarat)*

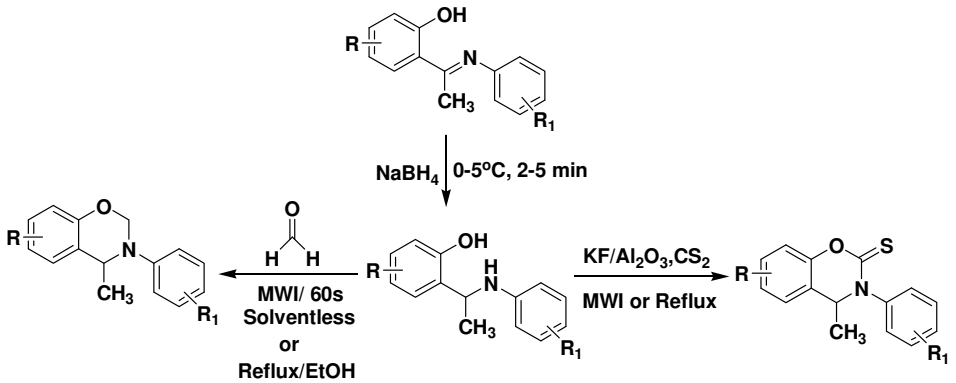
Corresponding Email Id: ram_vijay1982@yahoo.co.in

CPP43

207. Green and efficient heterocyclization of functionalized Schiff bases to 4-methyl-benzo[1,3]oxazines and 4-methyl-benzo[1,3]oxazine-2-thiones: Synthetic studies and comparison of 1D and 2D NMR spectras with the 4-unsubstituted derivatives.

R. L. Nongkhlaw

Oxazines and their thione derivatives have generated great interest as anti-psychotic agents and as possible effectors for serotonin and dopamine receptors. In addition, the oxazine nucleus features prominently in many biologically important natural product and other bioactive molecules. The most outstanding of these is Sustiva (Efavirenz), a non-nucleoside reverse transcriptase inhibitor that has been approved by the FDA in 1998 and is presently in clinical use for the treatment of AIDS. This has been the prime driving force for the synthesis of various compounds incorporating the oxazine moiety. Due to the versatile application possibilities, we herein report a method for the formation of a series of 4-methyl-benzo oxazine and their 2-thione derivatives from 2-hydroxy-arylaldehydes/acetophenones and primary aromatic amines via a Schiff base intermediate. While reaction from 2-hydroxyacetophenone resulted in C4 alkylation of oxazine, the reduced Schiff base can be cyclised to form oxazine-2-thiones. All the reactions have been performed keeping in mind the need for new and environment friendly techniques for chemical synthesis viz. Microwave irradiation and solid support synthesis. It was observed that two dimensional spectras (COSY, HETCOR) were required to appropriately assign the splittings in NMR of C-4-substituted compounds as only one dimensional NMR spectra failed to do so.



General Scheme 1

Department of Chemistry, North-Eastern Hill University, Shillong, Meghalaya 793022, India.
E-mail: rlnongkhlaw@nehu.ac.in

CPP44

208. Synthesis of some imidazolidine mannich base derivatives and their biological activities

A. Jamal Abdul Nasser [1], R.Karthikeyan [1,] A. Idhayadhulla [2], R. Surendra Kumar [3],

A series of new imidazolidine derivatives were synthesized and synthesized compounds were characterized by FT-IR, ^{1}H NMR, ^{13}C NMR, and Mass spectral, elemental analyses. The synthesized compounds were screened them for their antimicrobial activity against Gram positive, Gram negative and fungal species. The results of antibacterial study indicated that some of the compounds showed appreciable antibacterial activity and some of compounds emerged as the most potential antifungal agent. The results of SAR studies indicated that the presence of groups is necessary for the antimicrobial activity of the synthesized compounds. The results indicated that compounds might be of interest for the identification of new antimicrobial molecules as their antibacterial activity is equivalent to the standard drugs.

[1] P.G. & Research Dept.of chemistry, Jamal Mohamed College, Tiruchirappalli- 620020, Tamil Nadu, India.

[2]Department of Chemistry, Karur College of Engineering, Karur – 639002, Tamil Nadu, India.

[3] Department of Chemistry, Mahalakshmi Engineering College, Sirugambur Post, Tiruchirappalli 621 213, Tamil Nadu, India.

karthik.30823@gmail.com

CPP45

211. Thermal stability and composition study of PANI-Fly ash amine composites

Mridusmrita Sarmah[1], Puja Khare[2], B P Baruah[1*]

Amine solutions are the most preferred reagents for CO_2 capturing due to its high reactivity with CO_2. But its application has been prevented due to its corrosiveness, low stability and requirement of high energy input. Polyaniline (PANI), an amine based compound has now been emerged as a promising polymer. In the present investigation, aged polyaniline composites are prepared with low-cost fly ash by varying its concentration keeping the volume of polyaniline constant. Physico-chemical characteristics and thermal analysis of the composites was carried out through CHN, FTIR, SEM and TGA. The results from the present study showed that thermal stability of these composites varied with the concentration of fly ash. Among all the composites prepared, fly ash and PANI in the ratio of 2:15 shows the highest thermal stability. A comparison study was also made between the prepared polymer composites and some other significant amine composites reported earlier. The pore volume and pore size of the prepared composites are also measured.

Keywords: Polyaniline (PANI), Fly ash, Thermal Stability.

[1]*Coal Chemistry Division, CSIR-NEIST, Jorhat, Assam*

[2]*Agronomy Soil Division, CSIR-CIMAP, Lucknow*

** Corresponding author: bpbaruah@yahoo.com*

CPP46

212. Microwave Assisted Eco-Friendly Synthesis of Mannich Base Derivatives of Indole Associated With Antidiabetic Properties

Rajendra[a] and Jaya Dwivedi[a]

Within a very short period of time, microwave synthesis has developed into a tool to be taken seriously. The short reaction times and improved yields offered by this methodology have piqued the interest of industry, particularly in the area of drug development. The microwave assisted synthesis of various 3-(substituted)-1-H-indole by Mannich reaction and by using these product for synthesis of 1-phenyl-2-[-3-(substituted)-1-H-indole-1-yl]ethanone by Friedel Craft Arylation with Chloroacetophenone. Finally this product used to synthesize chalcone derivatives 3-substituted -1-{(2E)-1-1phenyl-3-(3, 4, 5-trimethoxyphenyl) but-2en-1-one} indole. An efficient microwave assisted protocol for the exclusive synthesis of hitherto unknown 1-phenyl-2-[-3-(substituted)-1-H-indole-1-yl] ethanone and 3-substituted-1-{(2E)-1-1phenyl-3-(3, 4,5trimethoxyphenyl) but-2en-one} indole has been achieved. It is well known fact that the indole nucleus is associated with a large number of pharmaceutical properties like antibacterial, anticancer, antibiotic, central nervous system modulating etc. In the same way chalcone is an aromatic ketone that forms the central core for a variety of important biological compounds, which are known collectively as chalcones. They show antibacterial, antifungal, antitumor, antidiabetic and anti-inflammatory properties.

[a]*Department of Chemistry, Banasthali University, Banasthali-304022,India*

E-mail: rajendra1509@gmail.com

CPP47

214. Pressmud as alternate resource to hydrocarbon fuel by a novel process of thermal pyrolysis followed by catalysis

Khursheed B. Ansari and Vilas G. Gaikar*

Pressmud is compressed sugar industry waste. It has been extensively used in fertilizers to prevent soil erosion, crusting and cracking, adjust soil pH, improve drainage and promote bacterial and microbial growth in the soil. Research has been demonstrated that pressmud is a source of valuable chemicals like wax, sugar, and protein. Also owing to diminishing energy reserve and need of alternate fuel resource, pressmud has been experimentally characterized to check its suitability for fuel and chemicals as it comprised of major compounds like fibre (30 wt%), crude wax (15wt%), sugar (15wt%), and crude protein (15wt%). However, no processes have been developed yet for the degradation of pressmud to fuels. A novel process of thermal pyrolysis followed by catalysis of pressmud degradation has been developed for the generation of hydrocarbon fuel. Apart from hydrocarbons, the process also results valuable chemicals. Products of this process, comprising of gases (12wt%), liquids (22wt%), and solid (66wt%) were well characterized. Gases were comprised of C_1 to C_3 hydrocarbons including N_2, CO_2, CO, and H_2, whereas liquid products were mostly hydrocarbons (C_{10}-C_{20}) along with alcohols, acids, aldehydes, and phenols. The solid char was macroporous with various functionalities on its surface and can be used for adsorptive separation studies. The entire process was modeled and simulated by computational software gPROMS ver 3.3 for the estimation of activation energy, order of reaction, and reaction rate constant. The investigation shows that pressmud is a resource of hydrocarbon fuel and valuable chemicals by thermal degradation.

Department of Chemical Engineering, Institute of Chemical Technology,
Matunga, Mumbai-400 019, India
ansarikh5@gmail.com

CPP48

215. Xanthine oxidase inhibitory effect of some rice based traditional alcoholic beverages of Assam and determination of phenolic constituents by HPLC-DAD

Dipankoj Gogoi[a] and Jyotirekha G. Handique[b]*

Xanthine oxidase inhibitory effects of four samples of rice based traditional alcoholic beverages prepared by Ahom community of Assam have been evaluated by using NBT method. The samples showed good/significant/profound inhibitory effect against xanthine oxidase. In order to identify the antioxidant constituents in the beverage samples, HPLC-DAD method was employed. The chromatographic separation was done on a semipreparative HPLC system equipped with a manual injector, programmable wavelength (200-400 nm) photo diode array detector (DAD) and a column packing with a modified silica gel (C_{18} column). The mobile phase was a binary solvent system consisting of A, water: acetonitrile (91:9) and B, water: acetonitrile (80:20) with 2% acetic acid at 26°C. The flow rate was 1 ml/min. Beverage samples were directly injected to determine the antioxidant constituents by this method. The identified compounds are gallic acid, catechin, coumaric acid, sinapic acid, quercetin, gentisic acid, kaempferol and protocatechuic acid. This method could be applied for rapid determination of constituent compounds in beverages.

Keywords : Traditional alcoholic beverages, XOD inhibition, HPLC-DAD, phenolic compounds

a. Department of Chemistry, DHSK College, Dibrugarh - 786001, Assam, India

b. Department of Chemistry, Dibrugarh University, Dibrugarh – 786004, Assam, India

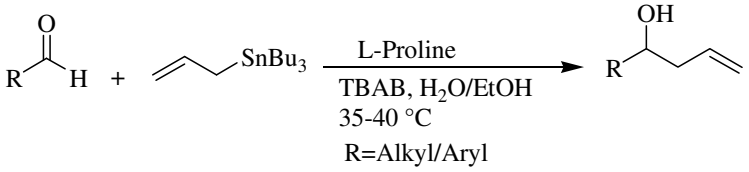
**E-mail:jghandique@rediffmail.com*

CPP49

216. Efficient and facile allylation of aldehyde with allyltributylstannane using L-Proline as a cheap catalytic source.

H. Atoholi Sema and Ghanashyam Bez*

Allylation of carbonyl compounds is an important organic reaction yielding homoallylic alcohols. Homoallylic alcohols find wide applications as building blocks in the field of organic total synthesis and pharmaceutical research and also in the synthesis of bioactive natural products. Henceforth, many methods are reported in the literature to achieve the homoallylic alcohols through diverse routes like the metal-mediated allylations and Berbier-type allylations in aqueous media. But those reported reactions suffer serious drawback mainly due to the catalysts used for the reaction, such as Lewis acids are highly moisture sensitive ($BF_3.Et_2O$, $SnCl_4$, $TiCl_4$, etc.), and very expensive (transition metal complexes, such as AgOTf, $ReBr(CO)_5$, and $Sc(OTf)_3$), and also palladium and platinum complexes are inconsistent in terms of reaction yields and require either high temperature or long reaction time besides being highly expensive. In this paper we report that allyltributylstannane reacts with aldehydes in water and ethanol for liquid and solid aldehyde source respectively in presence of TBAB (n-Tetra Butyl Ammonium Bromide) as a phase transfer catalyst and L-proline as a cost effective catalytic source to afford the corresponding homoallylic alcohols in high yields. Moreover this reaction is operationally simple and environmental friendly because the use of metals and hazardous solvents are avoided.



Department of Chemistry, North-Eastern Hill University, Shillong,

Meghalaya 793022, India.

E-mail:atoholis@gmail.com

CPP50

217. Synthesis of N-doped nano-crystalline photocatalyst and decolourisation of methylene blue dye

Dhruba Chakrabortty*, Susmita Sen Gupta

Nano-crystals of nitrogen doped anatase TiO_2 have been synthesized by a very simple method. The material has been characterized by x-ray powder diffraction (XRD), transmission electron microscopy (TEM), uv-visible diffused reflectance spectroscopy (DRS) and x-ray photoelectron spectroscopy (XPS). XRD pattern of the prepared material revels the formation of highly crystalline anatase titania. Both XRD and TEM study indicate that the particle size of the material is in the nano-range. The DR-spectra shows a red shift of minimum 0.3 eV in the N-TiO_2 sample compared to the TiO_2 sample. The BET surface area of N-TiO_2 is larger (176 m^2/g) in comparison to the pure anatase TiO_2 (150 m^2/g). XPS spectra show that N1s electron with peak at the binding energy of 400 eV which reveals the presence of nitrogen in N-Ti-O environment. The material is active for visible light photo-catalysis with respect to decolourization of methylene blue solution. It has been found that the catalytic decolourization methylene blue with N-TiO_2 is higher by ~14 % compared to undoped TiO_2. The increase of catalyst dose increases the extent of decolourization.

Department of Chemistry, B N College, Dhubri, Assam, India

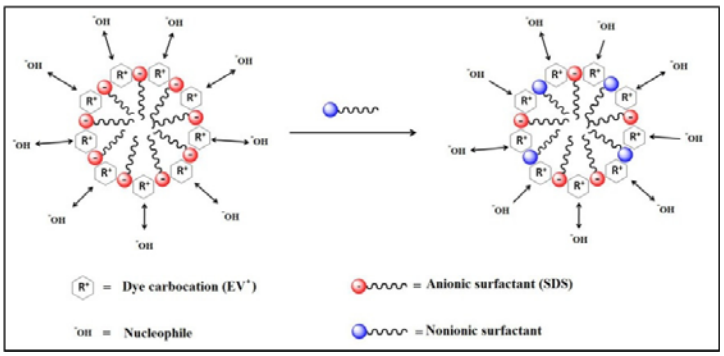
e-mail: chakraborttydhruba@gmail.com, susmita2101yahoo.co.in

CPP51

218. Dye decolourisation reactions in mixed micellar systems of sodium dodecyl sulphate with Tween-20, Tween-80 and Triton X-100: Quantitative analysis

Kimkholhing Lunkim, S. K. Srivastava

The reaction of triphenylmethane dye (ethyl violet) with hydroxyl ion has been investigated in absence and presence of micelles. In micellar solutions, the solubilisation of dye carbocation is observed. The reaction rate constant follows pseudo-first order kinetics with respect to the nucleophile. In presence of SDS micelles, an inhibitory effect is observed due to non-approachability of the nucleophile to the strongly bound dye carbocation in the negatively charged SDS aggregate. The presence of non-ionic surfactant reduces the inhibitory effect of the anionic SDS micelles. Quantitative analysis of the micellar data obtained has been done by applying positive cooperativity model of enzyme catalysis. The value of n (index of cooperativity) has been found to be greater than 1 for all the systems under study. The presence of solvents such as ethanol, n-propanol, n-butanol reduces the inhibitory effect of the micelles.



Department of Chemistry, Manipur University, Manipur-795003, India.
kim_lumkim@yahoo.com

CPP52

219. Synthesis of First Generation Dendritic Polyphenol Through Schiff Base

Lekha Rani Borah, Jyotirekha G. Handique*

Schiff bases represent valuable intermediate in organic synthesis. A few dendritic polyphenols were synthesised from different phenolic aldehydes and amines by reductive amination through Schiff base synthesis. Phenolic aldehydes such as vanillin, 2,5-dihydroxybenzaldehyde, 3,5-dihydroxybenzaldehyde as building blocks and different linear amines such as ethylenediamine, 1,4-diaminobutane, 1,6-diaminohexane or star type amine like tris(2-aminoethyl)amine were taken as core. Aldehyde groups of terminal/ peripheral building block were reacted with the amino groups of the core forming imine. The resulting imine bonds were subsequently reduced with $Na(OAc)_3BH$ to form secondary amines. The secondary amines were further reacted with additional aldehyde groups, forming tertiary amines with a well-defined dendritic structure after reduction by $Na(OAc)_3BH$.

Keywords: Dendritic polyphenol, Schiff base, Reductive amination

Synthetic Organic and Natural Products Laboratory

Department of Chemistry, Dibrugarh University

Dibrugarh – 786 004, Assam, India

**E-mail : jghandique@rediffmail.com*

CPP53

220. Ionic Conductivity and Association Studies of Novel P-2VP-HCl-Co-AN Polyelectrolyte synthesized from P-2VP-Co-AN

Niloy Paul, Priyanka Dutta, Bedanta Gogoi, N.N. Dass and N. Sen Sarma

The object of this work is to synthesize poly(2vinylpyridine-co-acrylonitryl), P-2VP-Co-AN and its salt P-2VP-HCl-Co-AN. The formation of P-2VP-Co-AN and its salts were confirmed by IR and ^{1}H NMR techniques. Conductivities of these were determined in solid state at various temperatures from 30^{o}C to 80^{o}C. The thermal behavior and stability was determined with the help of DSC and TGA analysis. Observation indicated that the formation of the salt affects the ionic behavior of P-2VP-Co-AN. Molecular mass and polydispersity index were determined by GPC method. The total ionic transport number and activation energy of the polymers were also determined. The result shows that the salt of P-2VP-Co-AN behaves as a very good polyelectrolyte.

Keywords: Copolymer, ionics, P-2VP-Co-AN salts, conductivity, polymer electrolyte.

Polymer Section, Physical Sciences Division, IASST, Paschim Boragaon

Guwahati 781035, Assam, India.

E mail : np3905@gmail.com

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CPP54

221. A process for purification of Oxaliplatin by adsorptive separation to meet specification as per USP/BP

Pradipta Kumar and Vilas G. Gaikar*

Oxaliplatin was first reported by Kidani, is an alkylating agent frequently used in cancer therapy. Oxaliplatin prepared this way is accompanied with various synthetic impurities like, oxalic acid, Ag^+, analogous dimeric and trimeric platinum-complexes. However the major disadvantage is having Ag^+ as one of the impurities, since unlike others this cannot be removed by crystallization process. Silver content as per USP/BP should be ≤ 5 ppm. The conventional method for removal of silver requires NaI/KI. However a serious drawback is, the iodides parallelly react with Oxaliplatin to produce cis-di-iodo platinum(II) as a side product. This method causes a considerable loss in the yield of Oxaliplatin due to formation of side products. Thus there exists a great demand for an effective method for purification of Oxaliplatin. In the present invention, we made a successful attempt to synthesize two polymeric adsorbents with styrene back-bone cross-linked with 2%DVB for selective removal of silver in presence of platinum. The equilibrium adsorption capacity (Q_{av}) and the distribution coefficient (K_d) for both the metal ions were calculated from batch adsorption studies. Q_{av} (mg/g) towards silver were found to be 100 and 67.75 respectively with a very high value of separation factor (α = 1200 and 320) over platinum. This is further supported by higher adsorption constant value for silver calculated by using adsorption isotherm. Use of above adsorbents not only reduced the silver content of the drug as per the required specification but also minimized the formation of side products thus improving the % yield.

Department of Chemical Engineering, Institute of Chemical Technology,

Matunga, Mumbai-19, India.

kumarpradipt@gmail.com

CPP55

222. Rapid biosynthesis of gold nanoparticles using *Camellia Sinensis* and kinetic studies.

Sontara Konwar Boruah*, Prabin Kumar Boruah, Pradyut Sarma, Chitrani Medhi and Okhil Kumar Medhi.

We report biosynthesis of gold nanoparticles (AuNPs) by using fresh young leaves and leaf buds of *Camellia Sinensis*.

Bioreduction of $HAuCl_4$ by polyphenolic biomolecules present in *Camellia Sinensis* extract at room temperature provides AuNPs. The UV-Vis. spectrum of AuNPs in *Camellia Sinensis* extract shows two bands at around 534 and 752 nm, which results from transverse and longitudinal surface plasmon resonance (SPR) respectively. In fluorescence (FL) spectroscopy study, AuNPs in *Camellia Sinensis* extract shows FL emissions at 450 and 705 nm, when excited at 350 nm. The kinetics of the reaction ($Au^{3+} \rightarrow Au^{o}$) with respect to time was studied with the help of UV-Vis. and FL spectroscopy. The pseudo-first order reaction rate evaluated with the help of UV-Vis. and FL spectroscopy were found to be almost similar in results. The kinetics of the reaction suggests that the reaction was fast and completed in 28 minutes. The physical properties, particle size and morphology of bioreduced AuNPs were characterized employing XRD, FESEM, HR-TEM and FT-IR techniques. The bioreduced AuNPs have size in the range ~ 2.94 – 45.58 nm with average of 13.14 nm.

Keywords**:** Gold nanoparticles; *Camellia Sinensis*; Biosynthesis; Surface plasmon resonance.

Department of Chemistry, Gauhati University, Guwahati-781014, Assam, India

Corresponding author: Tel: (+91)9864276237, E-mail: sontarak.boruah@gmail.com

CPP56

223. Conductivity study of polymer electrolyte based on polyvinylalcohol and imidazolium ionic liquid

Samadrita Goswami and Aradhana Dutta*

This work is concerned with the conductivity study of polyvinylalcohol (PVA) based ion conducting polymer plasticized by N-vinylimidazolium tetrafluoroborate as ionic liquid (IL) and NH_4BF_4 as salt. PVA:10wt %NH_4BF_4 + x IL with varying concentration of IL; x= 0,10,20,30,40,50,60,70,80,100,120 wt% have been prepared and characterized by FTIR, Differential Scanning Calorimetry, X-Ray Diffraction. The conductivity measurements are done by varying frequency (0.001-100KHz) and temperature (30^0-90^0C). Temperature dependence of ionic conductivity exhibits Arrhenius behaviour. Room temperature conductivity is found to be the highest for PVA: 10wt % NH_4BF_4 + 80wt% IL with the value 4.59×10^{-4} S cm^{-1}. The polymer electrolyte is shown to be a predominantly ionic conductor with $t_{ion} \approx 0.85$.

Polymer Research Laboratory, Department of Chemistry, Dibrugarh University,

Dibrugarh-786 004, Assam, India

E-mail address: gsamadrita@yahoo.com

CPP57

224. Correlation study of radical scavenging properties and total phenolic contents of some medicinal vegetables of North East India and their RP-HPLC analysis

Manas Pratim Boruah and Jyotirekha G. Handique*

Fruits and vegetables are rich sources of phenolic compounds and antioxidant activity (AOA) and increased consumption of fruits and vegetables is associated with a lower risk of chronic degenerative diseases. Present study was taken up to determine the AOA and constituent phenolic compounds of three indigenous leafy vegetables of North East India viz., *Polygonum microcephallum, Oxalis corniculata* and *Portulaca oleraceae*, which are used by local people for having prophylactic values. Sequential extraction was done with solvents with increasing polarity viz., hexane, ethyl acetate and methanol and the AOA of each extract was evaluated by spectroscopic method using 1,1-diphenyl-2-picryl hydrazyl (DPPH) radical. The total phenolic content was measured by Folin-Ciocalteu method and was expressed as mg of gallic acid equivalent (GAE) per g of dry extract. It was observed that among the three extracts, the methanol extracts of all have shown the highest antioxidant activities and high value of total phenolic contents. Reversed phase HPLC was employed for the identification of the phenolic antioxidants present in the polar extracts which revealed the presence of phenolic acids and flavonoids in the plant extracts. The most abundant phenolic acids were gallic acid, protocatechuic acid, *m*-coumaric acid and sinnapic acid whereas catechin, quercetin and kaempferol were the flavonoids present.

Keywords : Medicinal vegetables, antioxidant activity, phenolic compounds

Synthetic Organic and Natural Products Laboratory, Department of Chemistry

Dibrugarh University, Dibrugarh-786004, Assam, India

**E-mail:jghandique@rediffmail.com*

CPP58

225. Liquid crystalline properties of the mesogenic monomer Cholesteryl-3,3-dimethylacrylate and its polymer

P. Dutta[a], N.Paul[a], B.Gogoi[a], N.N.Dass[a], N.Sen.Sarma[a,*]

Cholesterol derivatives are known to generate the liquid crystalline "cholesteric phase". The cholesteric phase is, in fact, a chiral nematic phase, and it changes colour when temperature in its mesophase changes. This makes cholesterol derivatives useful for indicating temperature in liquid crystal display thermometers and in temperature-sensitive paints. This paper focuses on the synthesis, characterization, thermal and liquid crystalline properties of the monomer Cholesteryl-3,3-dimethylacrylate (CHDMA) and its polymer Polycholesteryl-3,3-dimethylacrylate (PCHDMA). The mesogenic monomer is prepared by esterification of 3,3-dimethylacryoyl chloride with cholesterol. The monomer undergoes free radical polymerization when heated with AIBN at 70^{o}C. Both the monomer and the polymer are characterized by IR and ^{1}H-NMR Spectroscopy. The thermal properties are studied by TGA and DSC techniques. The Tg of the monomer is found to be 122^{o}C and that of the polymer is 101^{o}C. The liquid crystalline phases are detected under hot stage microscope and their crystalline characters are studied using X-Ray crystallography. The number average molecular weight (M_n) of the polymer PCHDMA is found to be 57,400 Daltons by GPC analysis.

Keywords: Cholesteryl-3,3-dimethylacrylate; Mesogenic monomer; Hot stage microscope; Liquid crystalline property.

[a]*Polymer Laboratory, Physical Sciences Division, Institute of Advanced Study in Science and Technology,*

Paschim Boragaon, Guwahati-781035, Assam, India

E-mail - priyanka_2600@yahoo.com

**Corresponding author*

E-mail address: neelot@sify.com

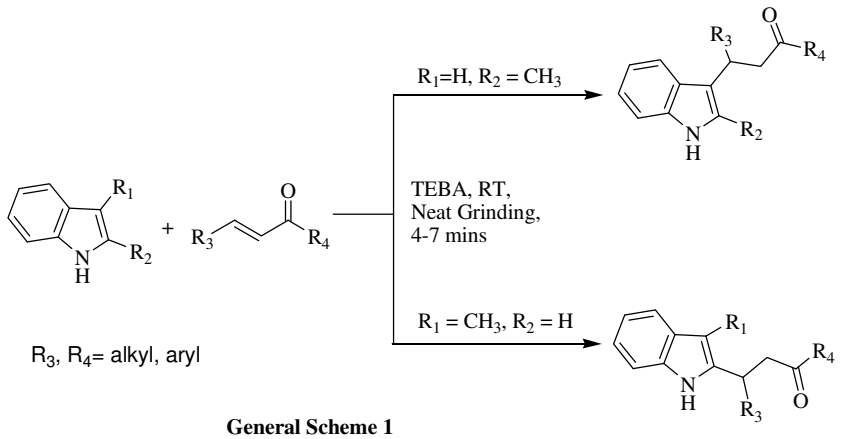
Ph no-9435330307 Fax (0361)2740659

CPP59

226. Room temperature grinding methodology for the Michael addition of indoles with α, β unsaturated carbonyl compounds under solvent-free Phase Transfer Catalytic conditions.

Shokip Tumtin and R. L. Nongkhlaw*

Solvent-free organic reactions have been applied as a useful protocol in organic synthesis. Solvent-free conditions often lead to shorter reaction times, increased yields, easier workup, matches with green chemistry protocols, and may enhance the regio- and stereoselectivity of reaction. Moreover, solvent-free condensation of indoles with carbonyl compounds is scarce in the literature. The important highlight of this work is the ease with which reactions can be carried out with bare minimum requirements like a mortar and pastel. In terms of green considerations, not only costly equipments (microwave reactors) but also hazardous organic solvents are avoided. Thus, a room temperature mediated facile method of Michael addition of indole/substituted indole using a phase Transfer catalyst (Triethyl Benzylammonium Chloride, TEBA) with α, β- unsaturated carbonyl compounds are reported. The substitution of indoles occured exclusively at the 3-position and products of N-alkylation has not been observed. The carbon-carbon bond formation at C-3 of indoles takes advantage of the electron rich nature of this position, which can be viewed as possessing enamine-like character. Furthermore, 3-substituted indoles are components of many drugs and are commonly found in molecules of pharmaceutical interest in a variety of therapeutic area. However, when the 3-position of indole is blocked, reactions occured at the 2-position.



General Scheme 1

Department of Chemistry, North-Eastern Hill University, Shillong, Meghalaya 793022, India.
E-mail:shokiptumtin@gmail.com

CPP60

241. Composition of Biodiesel Prepared from *Gmelina arborea* and *Tabernaemontana divaricata* Seed Oils

Sanjay Basumatary and Dibakar Chandra Deka*

Biodiesel, an alternative and renewable fuel for diesel engines, consists of alkyl esters of long chain fatty acids, more commonly methyl esters and is typically made from biological resources such as vegetable oils, animal fats or even used cooking oils by transesterification with methanol in the presence of a catalyst. Biodiesel is receiving worldwide attention because of its renewability, biodegradability, nontoxicity and carbon neutrality.

Composition of biodiesel prepared from *Gmelina arborea* and *Tabernaemontana divaricata* seed oils were determined by IR, NMR and GC-MS analysis. Biodiesel from *Gmelina arborea* consists of 15.09 wt.% of methyl palmitate (C16:0), 44.88 wt.% of methyl oleate (C18:1), 11.16 wt.% of methyl stearate (18:0), 15.95 wt.% of methyl gondoate (C20:1), 4.21 wt.% of methyl arachidate (C20:0) and 8.67 wt.% of methyl behenate (C22:0). The composition of biodiesel from *Tabernaemontana divaricata* seed oil is estimated as 27.0 wt.% methyl palmitate (C16:0), 10.54 wt.% methyl linoleate (C18:2), 56.23 wt.% methyl oleate (C18:1), and 6.20 wt.% methyl stearate (C18:0).

Department of Chemistry, Gauhati University, Guwahati-781014, Assam, India

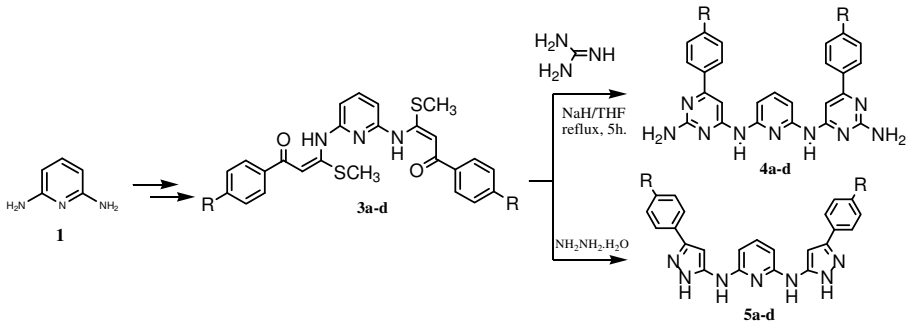
Email: waytosanjay12@gmail.com

CPP61

243. Polyaza Enaminones: Synthesis, Crystal Structure and Cyclocondensations to Polyaza Pyrazoles and Pyrimidines

Okram Mukherjee Singh,* Laishram Ronibala Devi

Polyaza heterocyclic ligands have been used extensively in many self-assembly reactions involving metal ions and the synthetic strategies for these compounds have been a central theme in supramolecular chemistry. However, synthetic methods of polypyridines and polypyrimidines are extremely limited. We are reporting a new general synthetic method of polyaza heterocyclic ligands using certain polyaza enaminones. Polyaza enaminones **3a-d** were prepared in good yields by treating ketene dithioacetals **2a-d** with 2,6-diaminopyridine in presence of *n*-butyl lithium. They are used as synthetic intermediates in subsequent cyclocondensations with guanidine nitrate and hydrazine hydrate to afford polyaza pyrimidines **4a-d** and polyaza pyrazoles **5a-d** respectively (**Scheme-1**).



Scheme 1

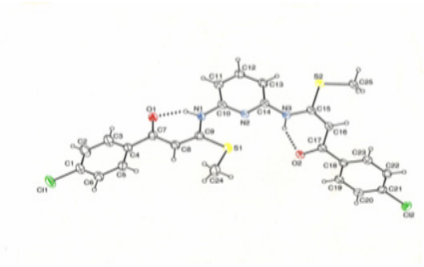
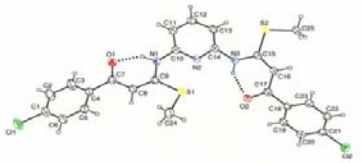


Figure 1. An ORTEP view of **3b** with the atom labelling scheme, illustrating the intramolecular hydrogen bonds by dashed lines.

Hydrogen bonding geometry:



Department of Chemistry, Manipur University,

Canchipur, Imphal–795003, Manipur. E. mail: ok_mukherjee@yahoo.co.in

CPP62

244. Development of a novel cigarette smoke sensor from naturally occurring biomaterial-curcumin

B. Gogoi, P. Dutta, N. Paul and Neelotpal Sen Sarma*

Polymers with extended conjugation can be used as chemical sensors for various toxic gases and smoke including cigarette. We observed that polymers prepared from curcumin can be used for such purposes. The synthesis, characterization and sensing behavior of the polymer polycurcumin methacrylate (PCUMA) and polycurcumin acrylate (PCUA) are reported here. The polymers are characterized by FT-IR and UV –Vis spectroscopy whereas its thermal behavior is studied by TGA. The molecular weight of the polymers is determined by GPC method. From transport number determination it is found that the conduction is non ionic. The sensitivities are observed by monitoring the impedance response by exposing the polymers to the smoke. Since cigarette smoke contains the compounds like nicotine, PAH, CO_2 etc, the sensitivity towards the smoke is an indication that the polymers can interact with these compounds except CO_2 by electronic or structural mechanisms. No notable change in the impedance value is observed in CO_2 environment. The sensitivity of these polymers are reversible in nature which can be confirmed by impedance response as well as by FT-IR spectra in which no appreciable change in the characteristic peak positions are observed. Hence it can be said that the synthesized polymers are potential cigarette smoke sensors.

Keywords: PCUMA, PCUA, electronic conduction, esterification, sensitivity.

Polymer lab, Physical Science Division, Institute of Advance Study in Science and Technology,

Paschim Boragaon, Guwahati 781 035, Assam, India

E-mail: gogoibedanta6@gmail.com

**Corresponding author*

E-mail address: neelot@sify.com

Ph no-9435330307 Fax (0361)2740659

CPP63

245. Radio frequency plasma assisted polypropylene grafting on muga silk fibres

D. Gogoi, J. Chutia*, A. R. Pal, A. J. Choudhury

The muga silk fibres known for its unique properties are cleaned by radiofrequency Ar plasma treatment followed by polypropylene (PP) grafting (thin coating) on the cleaned silk fibre surface by rf plasma assisted CVD process using a plasma of Argon and propylene gases. The effect of deposited coating on silk fibres are analysed by X-ray Photoelectron Spectroscopy (XPS), Fourier Transform Infrared spectrometry (FTIR), Scanning Electron Microscopy (SEM), contact angle measurement and universal tensile testing. The diagnostics of the processing plasma is done using self compensated emissive probe and Optical Emission spectrometry (OES). The properties of the deposited coatings are correlated with the plasma process parameters. Enhanced tensile strength and hydrophobicity of polypropylene coated PP coated muga silk over virgin fibers are observed. The modified properties of the fibres are found to be dependent on atomic concentration, surface morphology of the silk as well as impinging ion energy during treatment. The grafting mechanism between propylene and muga yarn is proposed by considering the charge-transfer initiation through the formation of electron-donor-acceptor (EDA) complex.

Physical Science Division

Institute of Advanced Study in Science and Technology, Paschim Boragaon, Guwahati - 781035, Assam, India

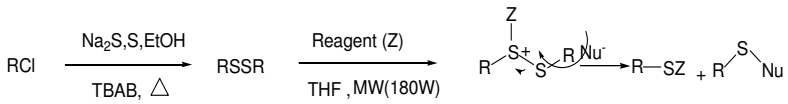
E-mail address: dollygogoi2010@rediffmail.com

CPP64

246. Synthesis of symmetrical disulfide derivatives and their sulfenylation reactions with C-centred electron rich compounds

Prasanta Gogoi, Pranjit Barman*

A convenient and efficient method for the synthesis of symmetrical disulfides, catalyzed by quarternery ammonium bromide is reported. Then silver cation (Ag+) mediated generation of sulfenyl cation under microwave irradiation from disulfides and its sulfenylation towards carbon centred nucleophiles are successfully achieved. Advantage of these methods involves simple workup, moderate- high yield, low reaction time and no harmful emission.



R = $C_6H_5CH_2$,p-$ClC_6H_3NO_2$,p-$NO_2C_6H_3NO_2$,o-$NO_2C_6H_4$,p-$NO_2C_6H_4$

Nu-= nucleophile,Z=Ag+

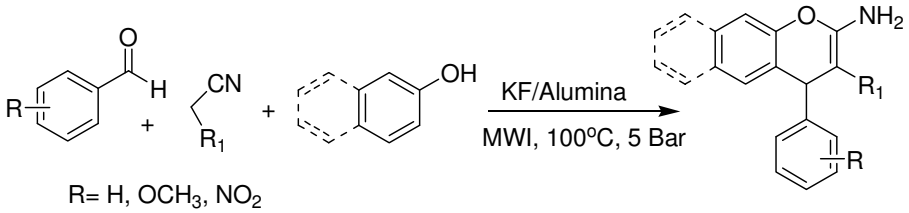
Department of Chemistry, National Institute of Technology, Silchar-788010, Assam, India
E-mail: prasantagogoi799@gmail.com

CPP65

247. Reusable KF/Alumina as solid support catalyst for the synthesis of 2-amino chromenes.

Chingrishon Kathing and R. L. Nongkhlaw*

The development of environmentally benign, efficient and economical methods for the synthesis of biologically interesting compounds remains a significant challenge in synthetic organic chemistry. Heterogeneous catalysts are advantageous over conventional homogeneous catalysts as they can be easily recovered from the reaction mixture by simple filtration and can be reused after activation, thereby making the process economically viable. Among the heterogeneous basic catalysts, KF/Alumina is a versatile material used as catalyst for several base-catalyzed organic transformations. Moreover, the utility of fluoride salts as potential bases in a variety of synthetic reactions has been well recognized in recent years. But low solubilities of fluoride salts in ordinary solvents hamper their wide applications in organic synthesis. Hence, our methodology provides an interesting route of solid support catalyst wherein reactions occur without requiring solvent(s) and after extraction of the product, the catalyst can be reused upon activation. In recent years, there has been increasing use of inorganic solid support as reagents and due to the immense potential of 2-amino chromenes in the field of medicine, new catalysts and/or methodologies are always welcome which can improve the previously existing methods. Hence, one-pot synthesis of 2-amino chromenes from aromatic aldehydes, active methylene compounds and activated alcohol is reported.



General Scheme 1

Department of Chemistry, North-Eastern Hill University, Shillong, Meghalaya 793022, India.
E-mail:ckathing@gmail.com

CPP66

263. Low molecular weight organogels and their application in the synthesis of CdS nanoparticles

Pradipta Kumar, Mahesh M. Kadam and Vilas G. Gaikar*

Organogels are aggregation of gelators in organic liquids to produce viscoelastic semi-solid materials that resemble in rheology with solids. Due to non-covalent nature of the interactions involved among the aggregates, the gelation is a theromoreversible process and gelator is said to be efficient if it can immobilize the solvent at concentration ≤ 2 wt%. Due to their numerous applications in the areas like photochemistry, organic templates for designing inorganic nano-materials, electrochemistry, molecular recognition, lubrication and healthcare , the organogelators contribute an important facet to chemical industry. However, the progress in the field of nano-material synthesis is attracting attention of many researchers. For which, development of inexpensive and efficient organogelators is of great interest. Two novel fatty acid based derivatives containing carboxylate and amide functions with different alkyl chain lengths were synthesized and their properties as low molecular weight gelators for organic solvents such as nitrobenzene, chlorobenzene, dichlorobenzene and dioxane are evaluated with minimum gelation concentration ≤ 0.2 wt%. Rheological properties like amplitude sweep, frequency sweep relaxation time spectrum and Cole-Cole measurements of the gels were performed to verify the viscoelastic behaviour of the gel which is further supported by the SEM studies reflecting formation fibre like networks with approximate diameter 1-2 µm extending upto more than 100 µm. The gel-capping technique was used to synthesize CdS nanoparticles with good uniformity in shape and size. The average particle diameter was found to be between 10-20 nm and appeared as spherical in shape. Nanoparticles were characterized through TEM, UV-Vis and FTIR spectroscopy.

Department of Chemical Engineering, Institute of Chemical Technology,

Matunga, Mumbai-19, India.

kumarpradipt@gmail.com

CPP67

264. Carotenoid distribution in naturally occurring algae in three districts of Assam

C.R.Sarkar, B.Bhagawati, L.Das, B.C.Goswami*

Red algal blooms were collected from different ponds located in Kamrup, Marigaon and Mangaldoi districts of Assam. The collected algae were identified under microscope. The carotenoid pigments present in the algae were identified and estimated by using TLC, UV-Visible, HPLC and NMR spectroscopy Delia et.al. The major carotenoids found were lycopene and asthaxanthin. Lycopene and astaxanthin act as good antioxidants and have already been proved as a good source of food colorant and nutraceuticals Dufossea et. al.

Key words: Algae, carotenoid, lycopene, astaxanthin.

Department of Chemistry, Gauhati University, Guwahati-14(Assam)

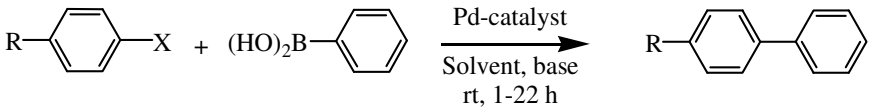
Email:crs.2010@rediffmail.com

CPP68

265. Development of Pd(II) complexes with P^N and N-donor ligands as catalyst for room temperature Suzuki-Miyaura cross-coupling reaction

D. Boruah, G. Borah*, G. Sarmah and U. Bora

The Suzuki-Miyaura cross-coupling reaction have found to be one of the most efficient strategies for the preparation of diversified biaryls, which have wide range of applications in pharmaceutical as well as agrochemical industries. In the catalyzed systems the selection of ligands play an important role in overall performance of the catalyst and till now, study of different phosphine based ligand systems such as triarylphosphines, hemilabile (P-O/P-N) type phosphines have done extensively, but the use of Pd complex bearing both chelated P^N donor and imidazole as ligand in Suzuki-Miyaura reaction is limited. In this article we report the synthesis of four Pd(II) complexes of molecular formulae [PdCl(PPh_2py-P,N)(MeIm)](PF_6) **1**, [PdCl(PPh_2py-P,N)(BuIm)](PF_6) **2,** [PdCl(PPh_2Etpy-P,N)(MeIm)](PF_6) **3**, [PdCl(PPh_2Etpy-P,N)(BuIm)](PF_6) **4** {MeIm=1-Methylimidazole, BuIm=1-Butylimidazole, PPh_2py=Diphenyl(2-pyridylphosphine) and PPh_2Etpy = 1-(2 pyridyl)-2-(diphenylphosphino)ethane} and their catalytic activity. The complexes have been synthesized by reacting one molar equivalent of the precursor [$PdCl_2$(PPh_2py-P,N)] and [$PdCl_2$(PPh_2Etpy-P,N)] with equi molar amount of MeIm, BuIm and NH_4PF_6 to afford the complexes **1, 2, 3** and **4** respectively. The resulting complexes have been characterized by FTIR, UV-Vis, NMR(^{1}H and ^{31}P{^{1}H}), ESI(+)MS spectroscopy, cyclic voltammetry and conductivity measurements. These complexes are found to be very effective catalyst for the reaction of aryl bromides with aryl boronic acids at room temperature. The efficiencies of the complexes follow the order 2>1>4>3.



X= Br, Cl

Department of Chemistry, Dibrugarh University, Dibrugarh, 786004, Assam, India

E-mail: devajani5bboruah@gmail.com

CPP69

266. Antidyslipidemic agents from *Wrightia tomentosa* leaves

Ranjani Maurya[a], Anuj Srivastava[b], Anju Puri[b], Prem P. Yadav[a,]*

W. tomentosa is a small sized deciduous shrub commonly known as dudhi in hindi. It is distributed throughout the warmer part of India. Different parts of plant have been used in traditional medicine since ages. Their leaves have been used for treatment of hypertension, antimycobacterial effects, antihyperglycemic, antioxidant activity, anti-allodynic, toxicity studies and antinociceptive activity, antiplasmodial and antimicrobial activity. The bark and root-bark are believed to be useful in snake-bite and scorpion stings. In continuation of our research on medicinal plants in India we have found that the ethanolic extract of *Wrightia tomentosa* Roem. & Schult (Apocynaceae) leaves showed promising antidyslipidemic activity in high fat diet (HFD) induced dyslipidemic hamsters. Activity guided isolation resulted in identification of antidyslipidemic compounds β-AA and β-AP. Compounds β-AA and β-AP decrease the levels of LDL by 36% and 44%, and increase the HDL-C/TC ratio by 49% and 28% respectively at a dose of 10mg/kg. In addition, the isolated compounds β-AA and β-AP showed significant HMG-CoA-reductase inhibition.

[a]*Medicinal and Process Chemistry Division, CSIR-Central Drug Research Institute, Lucknow- 226001, India*
[b]*Biochemistry Division, CSIR-Central Drug Research Institute, Lucknow- 226001, India*
Email: ranjani.maurya@gmail.com

CPP70

267. Identification of Glyceride Composition in Some Seed Oils

Kajal Dutta, Priyanka Barua, Monmi Saikia, Pranita Das and Dibakar Chandra Deka*

In the present work, the triacylglyceride (TAG) compositions of some seed oils with respect to the fatty acids are analysed. The TAGs profile of a seed oil was characterized by reversed phase HPLC where the mechanism in separating the TAGs involves the chain length and degree of unsaturation of the fatty acids (Gutierrez and Barron, 1995). TAG peaks were identified based on the retention time of available commercial TAGs standard. HPLC chromatograph of linseed oil, palm stearin and soybean oil obtained under same analytical condition were used as comparison guide in identifying the TAG peaks in the seed oils.

To analyse the fatty acid composition oils are first transesterified into fatty acid methyl esters (FAME) using a base catalyst and then subjected to GC-MS analysis. In the process we discovered a novel catalyst derived from banana plant. Efficacy of the catalyst in transesterification reactions has been compared with other reported catalysts and found to be at per with the best among the already reported catalysts.

Key words: seed oil, triacylglyceride, fatty acid, transesterification

Department of Chemistry, Gauhati University, Guwahati – 781014

Email: dcdeka@rediffmail.com, kajaldutta0112@rediffmail.com

CPP71

268. Physico-chemical Properties and Antioxidative Potentials of Honeys from North India

Sumitra Maurya* and Ajeet Kumar Kushwaha

To determine the antioxidative principles, the honey and its ethyl acetate extracts were evaluated in a variety of model system using several different indices because the effectiveness of such antioxidant material is largely dependent on the physical and chemical properties of the system to which they are added and a single analytical protocol adopted to monitor lipid oxidation may not be sufficient to make a valid judgment. Hence, the free radical scavenging activity was measured with their reaction with stable DPPH (1, 1-dihenyl-2-picryl hydrazyl) and their ferric ion reducing abilities would be determined by the ferric ion reducing antioxidative potential (FRAP) assay. Results from this preliminary study will provide a better understanding of antioxidant properties of these plants and allow the identification of the plants having strong antioxidant activity for further investigation. In addition to this Folin-Ciocalteu method was used to determine total phenolic content and the total flavonoid content was determined using the Dowd method as adopted by Arvouet-Granda et al., 1994 {1]. Moreovre, the solid phase microextraction followed by GC and GC-MS analysis technique was applied for volatile compounds analysis.

Chemistry Department Brahmanand PG College, Kanpur- 208 004, Uttar Pradesh, INDIA

Email: s_m_maurya@yahoo.com

CPP72

269. Study of the Catalytic Property of Natural Kaolinite Clay of Karbi-Anglong District of Assam

Jinamoni Sarma, Dr.Archana Sarma Goswami

Clay minerals occur abundantly in nature. Various properties of these minerals like high surface area, sorptive and ion-exchange properties are responsible for their catalytic properties. Solid clay catalysts are used as catalytically active agents. In the present study clay minerals collected from Na-Dewri Gaon of Karbi-Anglong district was utilized as a catalyst in the microwave assisted oxidation of several organic compounds. The clay was first characterized through XRD, SEM-EDX, FTIR and TGA analysis and it was found that the clay sample contains kaolinite minerals. The clay samples were prepared first and then utilized for the oxidation reactions of aniline, benzoin, anthracene, propane-2-ol and butanol in the formation of nitrobenzene, benzyl, anthraquinone, acetone and butanal respectively. The results show that the catalytic activity of synthetic and natural kaolinite clays is comparable and the natural clay can, therefore, be used as catalyst in some reactions. The use of natural clay as catalyst in organic synthesis is expected to be a more eco-friendly process than the use of synthetic clays.

Department of Chemistry, Cotton College Guwahati -781001

Email- jinamonisarma@gmail.com

CPP73

270. Interparticle Coupling Effect on the Surface Plasmon Resonance of Copper Nanoparticles

Mohammed Ali and Sujit Kumar Ghosh*

Colloidal solution of noble metals, namely, copper, silver and gold, show characteristic surface plasmon resonance (SPR) that have received considerable interest of researchers because of their many interesting potential technological applications in optical sensing, cancer chemotherapy and surface enhanced Raman spectroscopy. The physical origin of the light absorption by metal nanoparticles is the coherent oscillation of the conduction band electrons induced by the interacting electromagnetic field. An absorption band results when the incident photon frequency is in resonant with the collective oscillation of the conduction band electrons. The resonance frequency of this SPR is strongly dependent upon the size, shape, interparticle coupling, dielectric properties and local environment around the nanoparticles. In the present work, we have studied the interparticle coupling affect of small copper nanoparticles under different experimental conditions e. g., pH, concentration of stabilizing agent/reducing agents, in presence of electrolytes, amino acids etc. Smaller nanoparticles of copper do not exhibit surface plasmon band but it is seen while number of particles are bonded together. The emission behaviour of fluorescein isothiocyanate molecules in copper-fluoroprobe hybrid assembly have been studied in detail.

Department of Chemistry, Assam University, Silchar-788011 India

E mail: mali7652@gmail.com

CPP74

271. Effect of Cooking on Antioxidant Activity and Total Phenolic Content of Some Indigenous Leafy Vegetables of North-East India

Pankaj saikia and Dibakar Chandra Deka*

Dietary antioxidants, including, vitamin E, vitamin C, carotenoids and polyphenols / flavonoids, are believed to be the effective nutrients in the prevention of oxidative stress related diseases including cardiovascular diseases, cancer, diabetes mellitus, ageing and neurodegenerative diseases, Fu et al. North-East part of India is rich of plant biodiversity and the people of this region use different types of untapped wild plants as their food and medicine. The antioxidant activity of aqueous methanolic extract of some wild edible plants has been determined by DPPH (1,1-diphenyl-2-picrylhydrazyl radical), ABTS (2,2'-azinobis(3-ethylbenzothiazoline-6-sulphonicacid) and FRAP(ferric reducing antioxidant power) assay. Total phenolic content were measured using Folin- Ciocalteu assay. Cooking can affect antioxidant activity and the total Phenolic content of vegetables, Turkmen et al. The effect of cooking on antioxidant activity and total Phenolic content are also examined. The main aim of this study was to screen some wild plants species of North- East region of India with respect to their antioxidant activity and total phenolic content as potential source of natural antioxidants.

Keywords: Antioxidant activity, Total phenolic content, DPPH, FRAP, ABTS

Department of chemistry, Gauhati University, Guwahati-14

Email: dcdeka@rediffmail.com, pankajsaikia1980@yahoo.com

CPP75

272. Comparative soil and groundwater analysis for fluoride content and innovative method of defluoridationin Guwahati region

Uddipana Kakati*, Abhilasha Lahkar, Debarshi Raj Borah, Kakoli Roy, Kasturi Sarma and Remya ParameswarIyer

Soil and Groundwater contamination by fluoride (F) can result from the natural dissolution of minerals from subterranean strata. This inorganic contaminant in soil and drinking water is known to cause serious health problems when the maximum contaminant level (MCL) exceed 1.5 mg/L. Cases of fluorosis has been reported in 24 developed and developing countries including India where 19 states are facing acute fluorosis problems. While Assam is in the 5th position within India, Kamrup district ranks 3rd within the state of Assam in respect to fluoride contamination.The present study compares the soil and groundwater quality of plains and foot hills (10 areas of each) in Guwahati region during pre-monsoon season with reference to fluoride contamination. Except for two places i.e. Hengerabari (0.0.2 mg/l) and Borjhar (1.24mg/l), fluoride level in soil is found below detection level. However in groundwater, fluoride contamination is recorded above detection level in all places which higher in foot hills (0.02-1.15mg/l) in comparison to plain areas (0.22-0.79 mg/l). A preliminary examination of defluoridation by using inactivated rice husk charcoal has shown positive result (purification level ranging from 11% to 62.7%) and is considered to be a low cost and easily available adsorbent to effectively remediate fluoride-contaminated water. An intensive survey conducted in a highly contaminated area (Patharquarry having 1.15 ppm) of Guwahati revealed that only 34% of the people are aware of fluoride contamination and the diseases caused by it.Hence awareness campaigns have been carried out in various educational institutions and villages in Sonapur and Patharquarry areas to educate the students and the masses regarding fluoride contamination.

KendriyaVidyalaya, Khanapara, Guwahati

e mail :uddipana.kakati@gmail.com

**Presenting and Corresponding author*

CPP76

273. Assessment of Surface Water Quality of one of the World's Largest River Island, Majuli, Assam, India

Dipti Goswami[1], and K. G. Bhattacharyya[2]

Majuli is one of the largest river island in the world (area 924.6 sq km) situated in the upper reaches of the river Brahmaputra in Assam, India within $26^0 45'$N to $27^0 12'$N latitudes and $93^0 39'$E to $94^0 35'$E longitudes. The island is known for its rich cultural heritage being the abode of neo- Assamese Vaishnavite culture introduced by the saint Shankardeva. The island is being threatened continuously by the constant erosion by the mighty Brahmaputra. No report has appeared in literature on water quality of this island. In the present study surface water samples were collected from 15 sites in the island, 5 from the tributary Tuni and 10 from different wetlands or beel which are in abundance in the island. Samples were collected in three seasons namely pre-monsoon, monsoon and post-monsoon spreading over a period of two years. The water quality is found to be dependent on chemical composition of minerals making up the soil, runoff characteristics, agricultural practices, land use and water disposal methods, and also various anthropogenic influences. The results have been discussed on the basis of these factors impacting on water quality. The water of Majuli is found to be slightly alkaline in nature and also moderately hard. All the major cations, Ca, Mg, Na, K, were present within the acceptable limit, but iron content was higher than the WHO guideline value of 0.03 mg/L in almost all the sampling sites irrespective of any season. The major anions Cl, HCO_3, SO_4, NO_3, F, PO_4 were present within the permissible limits. From the values of the Trophic State Index (TSI) of water in different wetlands of Majuli, it is observed that the general quality of the water has not degraded to a state of serious concern and the water can now be classified as oligotrophic. The water contains heavy metals like As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb and Zn in almost all the sites; but except cadmium, all the other metals are present within the limit. The concentration of cadmium exceeds the WHO guideline value in several sites. Although As is found within the permissible limit of 10 µg/L according to WHO, yet in the water of Alengmari Beel (site no 5) As is found to approaching the maximum permissible limit (9.5 µg/L). It is a matter of concern.

Key words: surface water, river, wetlands, heavy metals, water quality.

[1]*Department of Chemistry, Bahona College, Jorhat.*
[2]*Department of Chemistry, Gauhati University, Guwahati, Assam.*
Email: diptigoswami@yahoo.co.in (Poster)

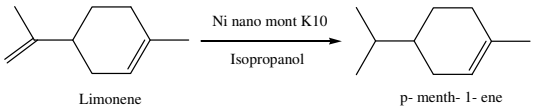
CPP77

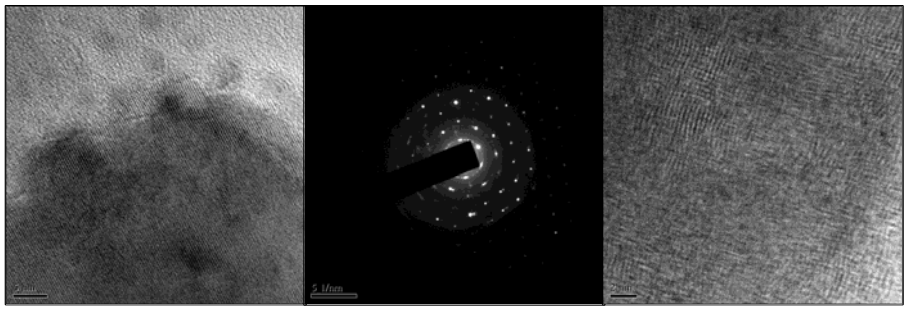
318. Nickel (0) - Nanoparticles Supported on Montmorillonite K 10: An Ecofriendly Catalyst for Transfer Hydrogenation of Limonene

Sangeeta Agarwal and Jatindra Nath Ganguli*

Nickel nano particles were synthesized in the interlamellar space of Montmorillonite K 10 clay by ethylene glycol reduction method. For this, <2µm fraction of commercially available Montmorillonite K 10 was separated. BET surface area for this fraction of clay was found to be 298 m^2/g and average pore diameter was 5nm. 1g of the clay was impregnated with 1mM Nickel acetate, dried in a rotavapor and the solid mass obtained was subjected to ethylene glycol reduction. The resultant solid was washed with methanol several times and dried in a vaccum oven. It was characterized by PXRD, FTIR, DRS and HRTEM, SAED and BET Surface area analysis. HRTEM images and SAED Pattern revealed the formation of Ni nano particles of average 5nm diameter in the nanopores of Montmorillonite K10. These spherical nano particles supported on clay showed good catalytic activity in transfer hydrogenation of Limonene using 2 - propanol as hydrogen source [Alonso et al]. The product formation was monitored by GCMS. About 88% conversion of Limonene to p- menth - 1- ene was obtained within three hours at 75°C temperature and atmospheric pressure.

Keywords: Nickel nano particles, Montmorillonite K 10, Transfer Hydrogenation, Limonene.





Department of Chemistry, Gauhati University, Assam, India- 781014

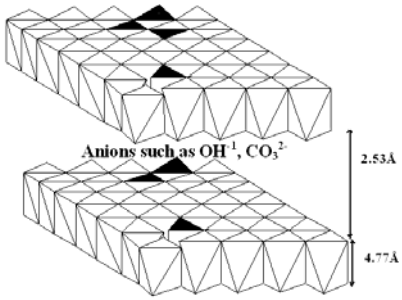
E-mail: agarwalsangee@gmail.com

CPP78

319. Intercalation of Prussian blue in NiAl Layered Double Hydroxides

Hemaprobha Saikia and Jatindra Nath Ganguli*

A Nickel Aluminum carbonate LDH was synthesized by mixing Ni $(NO_3)_2.6H_2O$, Al $(NO_3)_3.9H_2O$, and a NaOH and Na_2CO_3 solution at PH 9. The suspension was centrifuged, washed and transferred into a Teflon-lined autoclave with 80 ml water and heated at 150^0C for 10hrs. The suspension was dried in an oven at 70 ^{0}C [Corine and Dessislava]. The NiAlLDH was characterized by XRD, FTIR, SEM, EDX, DRS and TGA. Prussian Blue was intercalated in the NiAlLDH by ion exchange process. This intercalated compound was characterized by XRD, FTIR, SEM, EDX, DRS and TGA. The TGA study of NiAl LDH shows two weight losses in the temperature ranges between 30°C-240°C and 240°C-700°C but in Prussian blue intercalated NiAlLDH four weight losses in the temperature ranges between 30°C-110°C, 110°C-240^{0}C, 240°C-440°C, 440°C-700°C were observed. The XRD study shows the basal spacing of NiAlLDH as 7.39Å and of Prussian Blue intercalated NiAlLDH as 8.14 Å. The SEM image shows the morphology of the LDH. The EDX, IR and TGA study confirms intercalation of Prussian blue in NiAlLDH.



Keywords: NiAl carbonate LDH, Intercalation

Department of Chemistry, Gauhati University, Assam, India-781014

E-mail: saikiahemaprobha@gmail.com

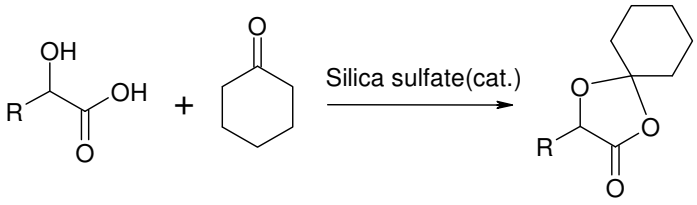
CPP79

320. A green approach for protection of α-hydroxy acids using cyclohexanones

Bishwapran Kashyap, Kamal Krishna Rajbongshi and Prodeep Phukan*

Protection of functional group is an important and routinely utilized transformation in organic synthesis. In many organic synthetic methods, protection of α-hydroxy acids is a necessary process to carry out a multi-step organic synthesis. Various methods have been developed in recent years for protection of α-hydroxy acids in presence of a catalyst. However all these procedures were reported under homogeneous condition. To best of our knowledge, there is no report of protection of α-hydroxy acids using heterogeneous catalyst. According to the principle of green chemistry the use of heterogeneous catalyst and solvent-free reaction condition are vital factors to address the green chemistry requirements.

Silica sulfate has been found to be an effective catalyst for protection of α-hydroxy acids under mild reaction conditions. Although the reaction can be carried out in diethyl ether as solvent, a remarkable rate enhancement was observed when the reaction was carried out under solvent free condition. Reaction could be carried out smoothly just by mixing the reactants in a mortar. After the reaction the catalyst could be recovered and reused for three times without any significant loss of its reactivity. Various α-hydroxy acids could be protected using cyclohexanone derivatives in high yield in presence of a catalytic amount of silica sulfate at room temperature.



Department of Chemistry, Gauhati University, Guwahati-781014, Assam

E-mail: pphukan@yahoo.com, bishwapran@yahoo.co.in

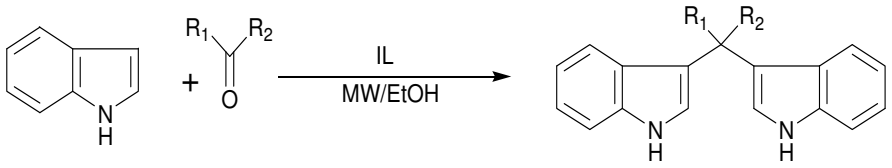
CPP80

322. Secondary amine based ionic liquids as catalyst for the synthesis of Bisindolylmethanes (oral)

Jupitara Das, P. J. Das*

Bisindolylmethanes (BIMs) are compounds having unique symmetrical structures and they are reported to be biologically important. Because of their wide utility, the synthesis of BIMs has attracted the attention of organic chemists. Several methods for the synthesis of symmetrical BIMs have been reported in literature. Lithium perchlorate, I_2, modified Zirconia are the catalyst which have been used for the synthesis of BIMs.

Herein, we wish to report that BIMs can be easily synthesized using cheap and simple ionic liquids(IL) prepared from the secondary aliphatic amines. Three different type of ionic liquids derived from diethyl, diisopropyl and di-n-propyl amines were prepared and these ILs catalyzed the electrophilic reaction of indole with several aldehydes under the influence of microwave (MW) irradiation. The procedure used here appears to be more attractive considering that the reaction could be carried out in a short time and yields obtained were high. Furthermore, the ILs used could be recovered and reused.



Indole Carbonyl compound Bisindolylmethane

IL = $[n\text{-}Pr_2NH_2][HSO_4]$, $[iso\text{-}Pr_2NH_2][HSO_4]$, $[Et_2NH_2][HSO_4]$

Department of Chemistry, Gauhati University, Guwahati-781014

Email: pjd123@sify.com, jupitaradas@yahoo.co.in

CPP81

323. Study of Polyelectrolyte Complex formation of Chitosan/Gelatin with Sodium Carboxymethyl Cellulose for Microencapsulation

N. Devi*, D.K.Kakati

Microparticles containing a solid antitubercular drug, isoniazid and a natural liquid pesticide neem (*Azadirachta Indica A.Juss*.) seed oil (NSO) were prepared by using polyelectrolyte complexation of natural polymers chitosan/gelatin and sodium carboxymethyl cellulose. The efficiency of complex coacervation was followed by measuring viscosity, coacervate yield and turbidity of the test solutions. Maximum coacervation for gelatin/SCMC was found to occur at pH=3.5 and Sodium carboxymethyl cellulose/gelatin ratio of 1:2.33 in the mixture. Effective coacervation for chitosan/sodium carboxymethyl cellulose was realized over the pH range of 2.5-3.5 using the ratio of 1:2.33.

Microencapsulation of NSO/Drug was carried out at this ratio of the polymers and pH of the mixture. The encapsulation efficiencies of NSO/drug were dependent on the amount of crosslinker, oil/drug loading and polymer concentration. Scanning electron micrographs showed the formation of agglomerated to free flowing spherical microparticles. The size of microparticles tends to increase with the increase of the concentration of the polymer. For same amount of crosslinker used, drug release behaviour was governed by the differences in swelling of the microparicles in different pH media. Thermogravimetric analysis showed the improvement of thermal stability with crosslinking. Fourier Transform Infrared Spectroscopy study showed that there was no significant interaction between NSO/drug

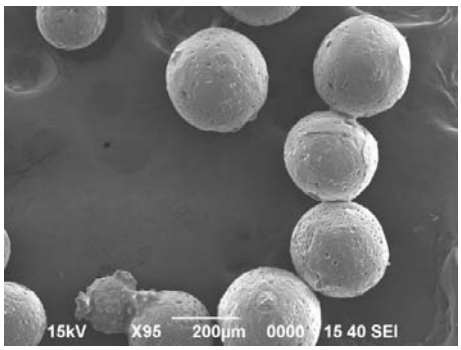


Fig.1. SEM image of spherical microparticles and chitosan/gelatin and sodium carboxymethyl cellulose complex.

Keywords: Microparticles; Chitosan; Gelatin; Sodium carboxymethyl cellulose; Complex coacervation; Crosslinking

Department of Chemistry, Gauhati University, Guwahati-781014, India

**E-mail: nimi262002@yahoo.co.in*

CPP82

325. Synthesis of liquid crystalline copolysulfones and their conducting behaviour.

Samiul Hoque*, Narendra Nath Dass and Neelotpal Sen Sarma

The monomer cholesteryl 4-pentenoate (CHPE) is prepared by the esterification of cholesterol and 4-pentenoyl chloride. The polymerization of CHPE is carried out in chloroform and liquid sulphur dioxide mixture in presence of t-butyl hydroperoxide by free radically to give polysulfone (PCHPES). The copolysulfone (PCHPESH) of CHPE with 1-hexene are also prepared by the same method as done in polymerization. The liquid crystalline phases are observed under hot stage fitted with polarizing optical microscope. The polysulfone and copolysulfone are characterized by IR, ^{1}H-NMR, DSC, TGA and XRD. The elemental analysis for confirmation of sulfone group in polysulfone and copolysulfone is determined by SEM (EDX) analysis. The qualitative amount of sulfur element were found in PCHPES and PCHPESH11 are 4.95 weight (%) and 5.71weight (%). The molecular weights are determined by GPC system using solvent THF. The number average molecular weight of the PCHPES is 5951 Daltons and the molecular of the copolysulfones are higher than the polysulfone, PCHPES. The I-V characteristics of these materials are determined by 2 probe machine. The breaking voltage of the polysulfone is found to be around 5 volts and for copolysulfone is slightly greater than 5 volts. Conductivity is calculated by measuring the bulk resistance of the 25 m thin film of the polysulfone and copolysulfone by LCR meter. It shows that the conductivity of CHPE is almost constant but the conductivity of polysulfone and copolysulfones gradually increases with the rise of temperature.

Keyword: Cholesteryl 4-pentenoate, pentenoyl chloride, polysulfone, copolysulfone, hot stage, elemental analysis, polarizing optical microscope etc.

Physical Science Division, Institute of Advanced Study in Science and Technology, Gorchuk, Paschim Boragaon, Guwahati-35, Assam, India.

E-mail: hosamiasst@yahoo.co.in

CPP83

326. Soy Flour Green Nanocomposites for Controlled Drug Delivery: Effect of Crosslinker and Nanoclay

Nibedita Banik, Murshid Iman and Tarun K.Maji*

Bionanocomposite plays an important role in the envisaged horizon of drug delivery applications in the current scenario of scientific research and industrial applications. The interest for biodegradable polymers as drug delivery systems, which control and prolong the action of therapeutic agents, has attracted attention of researchers. Soy flour can be readily used for drug delivery due their high availability, biodegradability and non cytotoxicity. Efforts have been made to develop soy flour-Montmorillonite (MMT) nanocomposites crosslinked with glutaraldehyde and using Isoniazid as the model drug. The nanocomposites have been characterized by FTIR, XRD, SEM and TEM. The effect of MMT and glutaraldehyde on the nanocomposites were assessed with regard to swelling, encapsulation efficiency and consequently to the release of isoniazid in different mediums. The drug release mechanism has been assessed in different time periods by UV-visible spectrophotometer. Cytotoxicity test were performed by MTT assay analysis. The results imply that the nanocomposites can be exploited as potential drug carrier for controlled release applications.

*Department of Chemical Sciences, Tezpur University, Napaam, Assam, India-784028.

*e-mail address: tkm@tezu.ernet.in, nibi123@tezu.ernet.in

CPP84

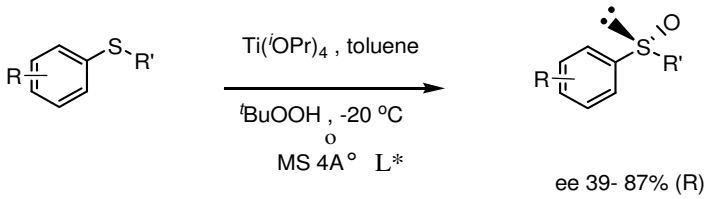
327. A novel 1,3 diol with a benzyl backbone as a chiral ligand for the asymmetric oxidation of prochiral sulfides

Paramartha Gogoi, Trimurthulu Kotipalli, Kiran Indukuri, Somasekhar Bondalapati,

Anil K. Saikia*

Chiral sulfoxides are found in many natural products and pharmaceuticals, they are important chiral ligand and act as chiral auxiliary. Over the years many approaches have been developed for the synthesis of chiral sulfoxides using metal complexes with chiral ligand such as DET, BINOL, TADDOL, SALEN etc. Here a new chiral 1,3-diol with a benzyl backbone has been synthesized and effectively used for asymmetric oxidation of sulfides to sulfoxides. Moderate to good yields and enantioselectivities (upto 87% ee) were observed.

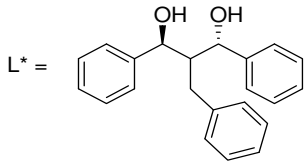
Scheme:



ee 39- 87% (R)

R= H, Me, OMe, Br

R'= alkyl, allyl, benzyl



Department of Chemistry, Indian Institute of Technology Guwahati, Guwahati 781039, India

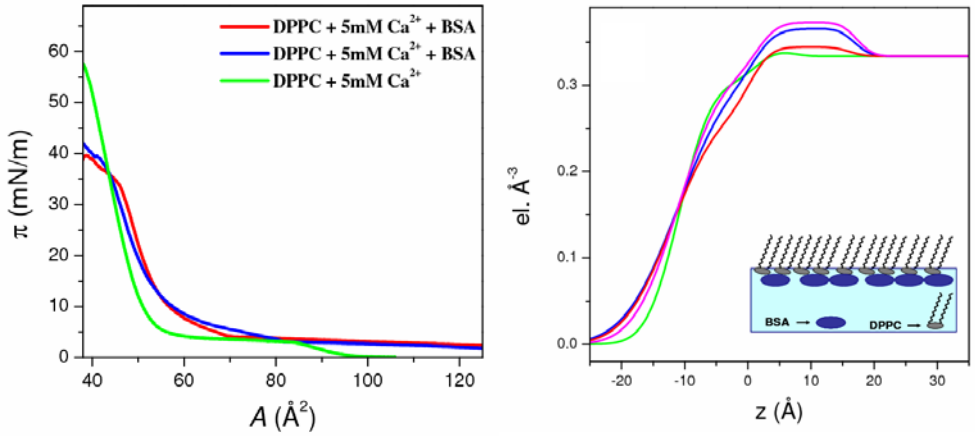
e mail: p.gogoi@iitg.ernet.in

CPP85

328. Zwitterionic lipid (DPPC)-protein (BSA) complexes at the air-water interface

Sarathi Kundu*[,a], H. Matsuoka[b], H. Seto[c]

Complexation of zwitterionic lipid, dipalmitoyl-*sn*-glycero-3-phosphocholine (DPPC) and protein, bovine serum albumin (BSA) at the air-water interface has been studied by surface pressure (π) – mean molecular area (*A*) isotherms and X-ray reflectivity. Although BSA has isoelectric point nearly at pH ≈ 4.8, possibility of complex formation with lipid molecules has been investigated from low (≈ 4.0) to high (≈ 9.0) pH range in presence of divalent cation, Ca^{2+} in the water subphase. Both the isotherm and reflectivity analysis show that the interaction of BSA with lipid monolayer takes place from that low to high subphase pH range, i.e., complexation occurs both below and above of the isoelectric point. Only one layer of BSA forms below the lipid monolayer and electrostatic interaction is the main reason for such complex formation.



[a]*Physical Sciences Division, Institute of Advanced Study in Science and Technology,*

Vigyan Path, Paschim Boragaon, Garchuk, Guwahati 781035, Assam, India.

[b]*Department of Polymer Chemistry, Kyoto University, Kyoto 615-8510, Japan*

[c]*High Energy Accelerator Research Organization, Tsukuba 305-0801, Japan*

E-mail: sarathi.kundu@gmail.com

CPP86

329. Title: Role of naturally occurring terpenes on skin permeation of rofecoxib from transdermal gel for topical application.

Authors: Abdul Baquee Ahmed[1] and Anupam Sarma[1]

The objective of this study was to determine the effect of naturally occurring terpenes to the skin permeation of rofecoxib from the transdermal gel prepared with Sodium alginate-Carbopol 940 for topical application. Using *in-vitro* techniques, three different types of naturally occurring terpenes (α-terpineol, + limonene and camphor) were evaluated for the skin permeation of rofecoxib from gel formulations. The effect of concentration of terpenes on the rate of drug permeation from the gel formulations were examined through rat skin mounting on a Keshary-Chien diffusion cell. All the terpenes showed good permeation of rofecoxib from gel formulations however, α-terpineol at 3% w/w was more effective enhancer with enhancement ratios up to three fold compared with the formulation without terpenes, where as the camphor was much less efficient. The physicochemical properties of the prepared gel formulations were in good agreement with those of a marketed product indicating feasibility of the topical gel formulation of rofecoxib.

Keywords: rofecoxib, Sodium alginate, Carbopol 940, skin permeation, terpenes.

[1]Girijananda Chowdhury Institute of Pharmaceutical Science,
Hathkhowapara, Azara, Guwahati-781017
Email: puntulla@gmail.com

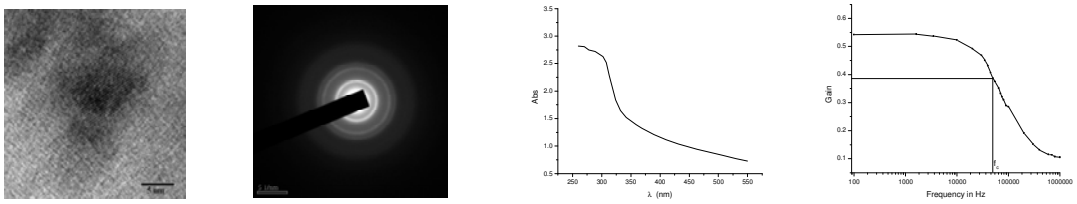
CPP87

330. Synthesis, Characterization and Low Pass filter behavior of PVA/ZnS Quantum Dots

Hirendra Das[1], Suparna Bhattacharjee[2], Trishna Moni Das[2], Susmita Rabha[2], Pranayee Datta[*]

Zinc Sulphide (ZnS), a group II-VI inorganic compound semiconductor material with a direct band gap of 3.68 eV at room temperature, has attracted considerable research interest due to its extensive usage in thin film electroluminescent devices (Devi et al.), Infrared windows, Flat panel displays (Han et al.), Sensors and Lasers. In this paper, we report the synthesis, characterization and possible application of PVA/ZnS quantum dots as Low pass Filter (LPF).

The synthesis of PVA/ZnS nanocomposites is carried out by chemical method at room temperature. PVA is used as a matrix because it provides uniform gaps that are very close to each other distributed in the form of an array. The as-synthesized nanocomposites are characterized by UV-Vis, PL, HRTEM and SAED.



(a) (b) (c) (d)

Fig: (a) HRTEM of the PVA/ZnS nanoparticles, (b) SAED image, (c) UV-Vis spectroscopy, (d) Low pass filter characteristics of ZnS quantum dots.

The HRTEM images ensure nanoformation of the samples. SAED picture shows a single crystal structure of the nanoparticles. The particle average size estimated from HRTEM is in the range 8 to 15 nm. From Uv-Vis spectra the band-gap is estimated to be in the range 3.79 eV to 3.85 eV (3.68 eV for bulk ZnS). UV-Vis specturm shows maximum absorption at 297 nm. The Photoluminesence of ZnS quantum dots shows an emission peak at 395 nm. Thus, characterization results confirm formation of PVA/ZnS quantum dots with weak quantum confinment.

The as-synthesized nanocomposites exhibit Low pass filter characteristics as shown in fig. (d). So far our knowledge goes, no such application for ZnS nanocomposites is reported till now.

Keywords: Quantum Dots, Characterization, Low Pass Filter

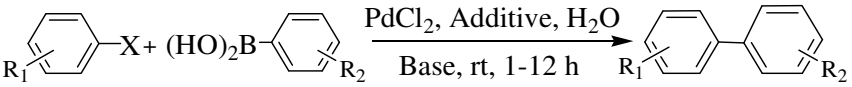
[1, *] *Department of Electronics & Communication Technology, Gauhati University, Ghy-14, Assam, India.*

CPP88

331. An Efficient Protocol for Palladium-Catalysed Ligand-Free Suzuki-Miyaura Coupling In Aqueous Medium

Manoj Mondal, Utpal Bora*

Palladium-catalyzed Suzuki-Miyaura cross coupling reaction involving aryl halides and aryl boronic acids represent the most powerful methods for the synthesis of complex and functionalized organic molecules and they have a myriad of application in pharmaceutical, materials and agricultural chemistry. Most of the catalyst systems for these transformations composed of Pd(0) or Pd(II) derivatives associated with appropriate ligands in conventional organic or biphasic media. In most of the cases these reactions are performed in organic solvents. However from environmental and economic points of view, the use water as an environmentally benign and economically favorable alternative to organic solvents in organic synthesis has got tremendous interests, because water is a cheap, readily available, non-toxic and non-flammable solvent. In this respect, the development of catalysis in pure water seems particularly suitable for the Suzuki–Miyaura reaction due to the excellent stability of boronic acids in aqueous media. The main objective of the present study is to develop efficient palladium-based catalyst system for Suzuki-Miyaura reaction in aqueous medium under ligand-free, room temperature conditions.



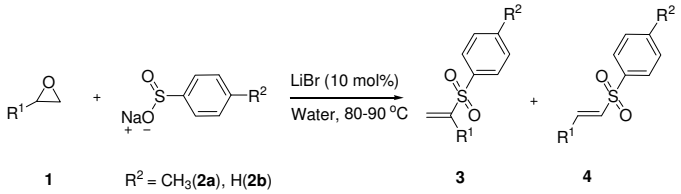
Department of Chemistry, Dibrugarh University, Dibrugarh, Assam-786004
E-mail: utbora@yahoo.com, manojjmondal@gmail.com

CPP89

333. The first one-pot synthetic route to vinyl sulfones from terminal epoxides in aqueous media

Ruchi Chawla and Lal Dhar S. Yadav*

A highly efficient LiBr catalysed regioselective synthesis of vinyl sulfones from readily available terminal epoxides and sodium sulfinates in a one-pot procedure using water as a reaction medium has been developed. Vinyl sulfones are interesting target molecules because of their potential biological activities and marvellous synthetic utilities. An extensive literature survey reveals that there are relatively fewer methods to synthesise terminal vinyl sulfones as compared to the other regioisomers and to the best of our knowledge, vinyl sulfones have never been prepared directly starting from epoxides using sulfinate salts. Our strategy for developing a one-pot synthesis of vinyl sulfones, especially terminal ones, is outlined in Scheme 1.



Scheme 1 Synthesis of vinyl sulfones in aqueous media.

Considering the analogy in structure between the aldols and β-hydroxy sulfones, we envisaged the synthesis of vinyl sulfones via a facile dehydration of β-hydroxy sulfones which are easily accessible from epoxides and arenesulfinates. The generality of the protocol was demonstrated across a range of terminal epoxides using two sulfinate salts. All the synthesised compounds were well characterized by their spectral and elemental analyses. The present protocol is adorned with several attributes of green chemistry like recycling of the catalyst, atom-economy and aqueous medium.

Department of Chemistry, University of Allahabad, Allahabad 211 002, India

E-mail:ldsyadav@hotmail.com, ruchichawlaoct@gmail.com

CPP90

334. Acoustical Studies of Some Pyrazole Derivatives in Dmf&Dmso at 308.15 K

Dipti Namera, Shipra Baluja* , Falguni Karia*

Density(ρ), Ultrasonic velocity(U) and Viscosity(η) of some pyrazole derivatives have been studies in dimethyl formamide(DMF)& dimethyl sulphoxide(DMSO) at 308.15 k. From the experimental data, various acoustical perameter such as specific Impedance(Z), isentropic compressibility(Ks), Rao's molar sound function(Rm), vander waals constant(b), relaxation strength(r), intermolecular free path length(L_f), internal pressure(π), solvation number(Sn), etc. have been evaluated, which helps in understanding the molecular interaction occuring In these solutions.

Department of Chemistry, Saurashtra University

Rajkot- 360005, (Gujarat), India.

diptinamera22@gmail.com

CPP91

335. Absorption, fluorescence and FTIR spectra of fifteen medicinal plants leaves and a co-relation between characteristic features.

Mitali Konwar

In the present work we report the absorption, fluorescence and FTIR spectra of fifteen plants leaves of medicinal important. The plant leaves of medicinal important selected for the work are *Vinca major Linn, Paederia foelida Linn, Clitoria ternatea Linn, Clerodendron Colebrookianum, Monochoria vaginalis presel, Mesua ferrea L, Occimum canum sims.syn,Hibiscus rosa sinensis L, Terminalla arjuna (Roxb), Spilathes acmella, cinnamonum tamala nees, Centalla asiatica Linn, Curcuma Longa L*, *Terminalia chebula Retz* and *Zingiber officinalis Rox* Fifteen bands originating from different groups (N-H, O-H, C-H, C=O, C=C and C=N) may be termed as key bands and one can follow their absorption characteristics and differentiate individual plant leaves or tissues. These observations also make it evident that the manifestation of bands in the infrared region results primarily from the chlorophyll molecules masking or suppressing the appearance of all other bands due to other molecular origin, which if at all appear, it does with extremely low intensities. In the present work we have also co –related the fluorescence intensity from the chlorophyll extract of the medicinal plant leaves with the absorption band width by a simple empirical relation.

Department of Physics, Moran College, Sibsagar,Assam-785670, India

Email: mitalikonwar@rediffmail.com

CPP92

336. Assessment of Iron concentration of underground water in and around Silchar town and removal of that using Tea waste – as an adsorbent

Ruhul Amin Reza[a], Dr A K Sil[b] and Dr M A Zaman[c]

Underground water is one of the main sources of water for domestic purpose in Barak Valley region of southern Assam. Underground water generally contains high amount of heavy metals like Fe, As, Ca, Mg etc and other organic compounds. In this study mainly concentration of heavy metal Iron is quantitatively determined by modified colorimetric method using HNO_3 as oxidizing agent in various places in and around Silchar town. The profile shows that the concentration of Iron is in the range of 1.5 ppm to 22.5 ppm, which is very high according to Safe Drinking Water Act. This study also emphasized on adsorption of iron from aqueous solution using activated tea waste as a low cost adsorbent. The adsorbent was characterized with proximate, ultimate analysis and also by FTIR spectra. Adsorption behavior was examined by various parameters like Batch studies, effect of adsorbent dose, and effect of other ions on adsorption and column studies. The equilibrium data were modeled by both Langmuir and Frendlich. The regression coefficient for Langmuir is greater than Frendlich indicating the adsorption of iron on ATW followed the Langmuir model. The adsorption capacity exhibited by adsorbent was found to be 19.23 mg/g.

Department of Chemistry, National Institute of Technology, Silchar, Assam-788010, India
[a] *ruhul.reza@gmail.com*
[c] *md_a2002@rediffmail.com*

CPP93

337. Effect of number of CTC cut on pigment profile and generation of volatile flavour components during fermentation of black tea manufacturing.

*Deepika Baruah, ** Mridul Hazarika

Black tea is a variety of tea that is more oxidized than the oolong, green, and white varieties. All four varieties are made from leaves of the shrub, Camellia sinensis. Black tea is generally stronger in liquor and contains more caffeine than the less oxidized teas. Curling, Tearing and Crushing (CTC) is an important step in production of CTC tea. It is considered by some as a significantly improved method of producing black tea to the orthodox through the mincing of withered tea leaves. Tea leaves are converted to smaller particles during this step. The present tea manufacturing experiment was designed to study the non-volatile pigments profile to assess the optimum exposure to cut surfaces and volatile components responsible for flavor of three different types of processed leaf samples due to different no. of CTC cut. In this experiment samples were processed in ECM (environmentally controlled manufacture) system by putting tea leaves in CTC machine to prepare three different no. of cuts, viz. one cut (C1), two cut (C2) and three cut (C3). Chemical reactions involved during fermentation process of CTC tea depends on the number of cuts. With increase in number of cuts the particles become smaller and surface area is increased which gets better exposure to oxygen and in consequence the oxidation increases. TF and brightness was found to be maximum in three cut CTC tea sample whereas flavor quality was found to be the highest in two cut CTC sample. With increase in no. of cut, oxidation increases leading to the degradation of some of the essential and characteristic aroma components particularly terpenoids.

Keyword: CTC ,TF, Non-volatile, Volatile Components, Aroma components.

** Associate Professor, Department of Chemistry, Bahona College, Jorhat, Assam*

*** Director, Tocklai Experimental Station, Tea Research Association, Jorhat , Assam*

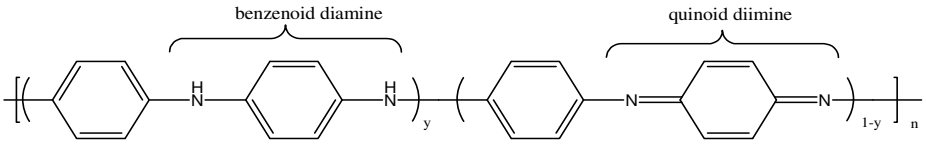
Email: deepika_baruah@rediffmail.com

CPP94

338. Plasma Polymerized Aniline: An Optically Promising Material

Bimal K Sarma, Arup R Pal, Heremba Bailung, Joyanti Chutia

Conjugated polymers are important class of materials due to the interesting electronic and optical properties. Polyaniline, unlike most of the conjugated polymers have non-conjugated carbon backbone due to the presence of nitrogen atom between two phenyl rings and in base form, it exists at different oxidation levels as:



where y can be varied from 1 (completely reduced) to 0 (completely oxidized). Leucoemeraldine (LB), emeraldine (EB) and pernigraniline base (PNB) refer to the different oxidation states where y = 1, 0.5 and 0 respectively. Plasma polymerization of aniline is carried out in a radio-frequency plasma reactor chamber and the effect of polymerization time, input power and working pressure is examined in the structural and optoelectronic properties of the deposited films. Plasma polymerization takes place in low pressure, low temperature glow discharge through an organic gas or vapour where the structure of the material can be tailored by the processing conditions, viz. monomer flow rate, system pressure, discharge power, geometry of the system, reactivity of the monomer etc. Plasma polymerized aniline (PPA) exhibit retention of aromaticity, confirmed by the presence of strong intensity IR band at 1498 and 1601 cm^{-1}, assigned to C=C stretch of benzenoid and quinoid units respectively. The films are highly transparent in the near-IR region, and hence could be promising candidates for IR optics applications. PPA shows the broad absorption in UV and visible region. None of the characteristic peaks of EB (330, 630 nm), LB (343 nm) and PNB (283, 327 nm) is distinguishable, the optical absorption spectra provide the evidence of the differences in the structure of the PPA films when compared to chemically or electrochemically synthesized polyaniline.

Physical Science Division, Institute of Advanced Study in Science and Technology, Paschim Boragaon, Guwahati 781035, Assam, India

E-mail: bimalkrsarma@iitg.ernet.in

CPP95

339. Seperation of amino acids and fatty acids from traditionally used antiepileptic plants - Brahmi

Manash Barthakur and Dipak Kowar

Epilepsy is a major neurophysiological disorder. Pharmacologically although a large number of antiepileptic drugs are available but their effectiveness in control all types of seizure is still in doubt. Traditionally the medicinal plants are found in use in our society to control the seizure, but pharmacological study and biochemical analysis of such plants are not done properly. Brahmi is an herb used by the people for control of seizure and other neurological disorder. In the present work, isolation and biochemical analysis of different chemical constituents of brahmi were done. Different chemical constituents of brahmi were separated by solvent extraction, column and paper chromatography methods. Amino acids and fatty acids which were presumed to be the active component in controlling the seizure and other neurological disorder were separated and identified with the help of rf values.
Key words: antiseizure, brahmi, amino acid, fatty acids.

PubKamrup College, Baihata Chariali, Kamrup, Assam, Pin 781381
ritmoni@rediffmail.com

CPP96

340. Transesterification with a Novel Catalyst derived from Banana Plant

Swarnali Pathak[a] and Dibakar Chandra Deka*[b]

Transesterification is an important class of organic reactions where an ester is transformed into another through interchange of the alkoxy moiety. It involves the exchange of the alkoxy group of an ester with that of an alcohol. Transesterification process is a must in the production of biodiesel. Biodiesel is an oxygenated fuel that is produced by transesterifying triglycerides such as animal fats or vegetable oils with alcohol in the presence of a homogeneous or heterogeneous catalyst. Transesterification processes can be catalyzed by an acid, a base or a biocatalyst among which base catalysis is considered to be the best.

Here, we have developed a highly active heterogeneous basic catalyst from post-harvest banana plant for use in transesterification reactions. Heterogeneous catalysis appears as an interesting alternative to avoid inherent difficulties of homogeneous ones. The catalyst is renewable, easily separable and cost effective for application in industries such as biodiesel industries. The catalyst can be used effectively for the transesterification of aromatic esters. Several such esters have been successfully transesterified in our laboratory. Results along with methodology, composition and procedures will be discussed.

Keywords: Banana plant, transesterification, biodiesel.

[a]*Department of Chemistry, Girijananda Chowdhury Institute of Management and Technology, Azara, Guwahati-781017*

[b]*Department of Chemistry, Gauhati University,Guwahati-781014*

Email: swarnaliaims@rediffmail.com

CPP97

341. Fabrication and application of nano CdS-Ag Schottky barrier

[1]Jumi Kakati, [2]Pranayee Datta

This paper reports synthesis of CdS and Silver nanoparticles embedded in PVA matrix and fabrication of nano CdS-Ag schottky barrier.Chemical route is followed for both CdS and Silver nanoparticle synthesis.Sizes and shapes of CdS and Silver nanoparticles are obtained from UV-VIS, XRD, SEM and TEM.A nano device for schottky barrier is fabricated with ITO and Aluminum as electrodes. I-V characterization of the device is investigated for application as photo detectors.

Key Words: Schottky barrier, photo detector, CdS and Silver nano particle.

[1,2]Department of Electronics and Communication Technology,Gauhati University

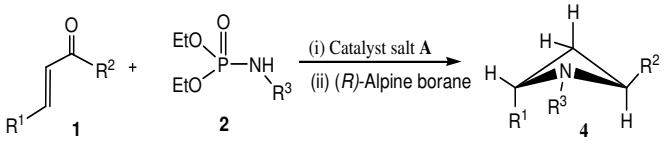
[1]jumikakati@gmail.com, [3]pranayee_d@yahoo.com

CPP98

342. Organocatalytic Asymmetric Synthesis of 1,2,4-Trisubstituted Azetidines by Reductive Cyclization of Aza-Michael Adducts of Enones

Ritu kapoor and Lal Dhar S. Yadav*

An efficient and highly enantioselective organocatalytic aza-Michael addition of *N*-substituted phosphoramidates to enones generates aza-Michael adducts which undergo intramolecular reductive cyclization with (*R*)-Alpine borane to afford 1,2,4-trisubstituted azetidines in a one-pot procedure. These optically active products are obtained in good to high yields 67-93% with excellent stereocontrol (78-96% ee) from a vast variety of enones. Over the years, functionalized aza-heterocycles, which are at the heart of many essential pharmaceuticals and physiologically active natural products, have attracted the attention of organic chemists. Amongst chiral nitrogen heterocycles, azetidines have received much attention during the last decade because of their utilization as ligands and their biological and pharmaceutical activities.



[R^1 = Ph, Me, Bn, Et; R^2 = Ph, Me, Bn, Et, *n*-propyl; R^3 = Ts, Ph, Bn, *o*-tolyl]

Scheme 1 one Pot Organocatalytic Asymmetric synthesis of azetidines **4**

The protocol features an efficient and highly enantioselective organocatalytic aza-Michael addition of *N*-substituted phosphoramidates to enones followed by intramolecular reductive cyclization with (*R*)-Alpine borane to afford 1,2,4-trisubstituted azetidines in a one-pot procedure. Operational simplicity, good to excellent chemical yields and the first application of organocatalysis via iminium ion formation coupled with synergistic benefits of ACDC to enantioselective aza-Michael addition of phosphoramidates (weak nitrogen nucleophiles) to enones are additional interesting aspects of the present methodology.

Green synthesis Lab

Department of Chemistry, University of Allahabad, Allahabad 211 002, India

E-mail: ritu_ldy@yahoo.com

CPP99

384. Protein Structure Prediction using Digital Image Processing Techniques

Sanyukta Chetia, Hemashree Bordoloi and Kandarpa Kr. Sarma

The prediction of protein structure has become an increasingly important activity in bioinformatics. The knowledge of structural information can help probe the protein function to comprehend various biological processes and hence is useful for drug design and biotechnology. Experimental techniques such as X-Ray crystallography and Nuclear Magnetic Resonance (NMR) spectroscopy for protein structure prediction can provide high resolution structural information of proteins. Unfortunately these methods are expensive, tedious, time consuming and at times inaccessible. In this scenario, efficient computational techniques, which aid biologists in protein structure prediction, are in great demand. The Artificial Neural Network (ANN) is one such tool which is used for predicting the structure of protein. This method is a machine learning approach in which ANNs are trained to make them capable of recognizing various structures of protein. Different 3D images of proteins are collected from Protein Data Bank (PDB). The ANN is first trained with the images of secondary structures of protein namely alpha, beta and coil. Then from the 3D structure of proteins, the possible number of each secondary structure is found out. The final structure is obtained from a majority selection from the protein structure.

Deptt. of Electronics & Communication Engineering

Gauhati University, Guwahati-781014, Assam, India

e-mail: sanyuktachetia@gmail.com, hbmaini@gmail.com and kandarpaks@gmail.com

CPP100

385. An Efficient Protocol for the Synthesis of Phenols from Arylboronic Acid under Mild Reaction Conditions

Ankur Gogoi and Utpal Bora*

Phenols and its derivatives have been found in numerous naturals products and well known precursors for the synthesis of valuable organic products such as pharmaceuticals, polymers and naturally occurring compounds.[1] Consequently the synthesis of phenols continues to attract attention of organic chemist and wide variety of methods have been developed for synthesis of phenols over the years. Among them nucleophilic aromatic substitution of activated aryl halides, copper-catalysed transformation of diazoarenes and benzyne protocols are dominant ones.[2] However these methods suffer from some sort of disadvantages such as harsh reaction conditions, and diazotization requires the conversion of amino groups to diazoarenes, which is often not compatible with many other functional groups. In recent years arylboronic acid derivatives are immersed as one of the most powerful synthon in organic chemistry.[3] There are some reports where $CuSO_4$-phenanthrolin, H_2O_2-Poly(N-vinylpyrrolidone), NH_2OH, and potassium peroxymonosulfate have been effectively utilized for of hydroxylation of arylboronic acid. In the present study we wish to report the use of iodine as an extremely powerful promoter for oxidative *ipso*-hydroxylation of arylboronic acid at room temperature under metal, ligand and base free conditions.

Department of Chemistry, Dibrugarh University, Dibrugarh-786004, Assam,

E-mail: utbora@yahoo.co.in, monigogoi6@gmail.com

CPP101

406. Effect of glutaraldehyde cross-linking on *in-vitro* release characteristics of biodegradable guar gum nanoparticles.

Jayanta K Sarmah[a], Rita Mahanta[b], Saibal Kanti Bhattacharjee[a*]

Glutaraldehyde (GTA) is a bifunctional reagent used as a cross-linking agent in pharmaceutical formulations. We report here the effect of variable concentrations of glutaraldehyde on the *in-vitro* release characteristics of guar gum (GG) nanoparticles (NPs). Guar gum nanoparticles were produced following a nanoemulsification polymer cross-linking method. Tamoxifen Citrate (TMX) was used as a model drug. Four different concentrations of GTA, 0.5-2%(w/w) were used in nanoparticle preparation. The GTA cross-linking was evaluated by FTIR analysis. In-vitro release of TMX from GG NPs in phosphate buffer (PB) suggested zero order kinetics with diffusional release. Increase in cross linking density reduced the rate of release of drug (measured as cumulative release percent) from the nanoparticles. It was observed that percent cumulative TMX release in phosphate buffer (PB) of pH 7.4 decreased from 51.38 to 23.08 in 6 hrs with an increase in GTA concentration from 0.5% to 2.0% (w/w). The observed release characteristics may suggest potential application of the prepared cross-linked nanoparticles in drug delivery.

Key Words: Nanoparticles, glutaraldehyde (GTA), cross-linking, guar gum, tamoxifen citrate, *in-vitro* release, drug delivery.

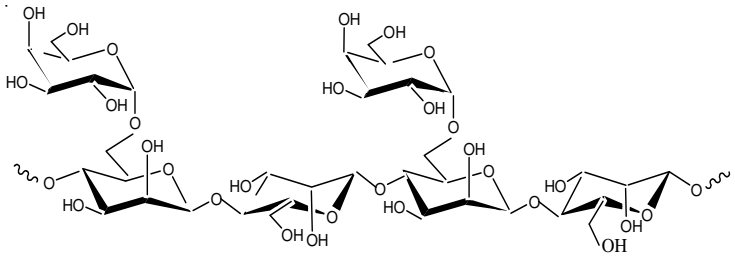


Figure: Structure of guar gum

[a]*Department of Chemistry, Gauhati University, Guwahati, Assam, India.*

[b]*Department of Zoology, Cotton College, Guwahati, Assam, India.*

Email: jayantaiitg@gmail.com

CPP102

407. Synthesis and characterization of platinum incorporated SBA-15

Neel Kamal Kalita[a] and Jatindra Nath Ganguli[b]*

Platinum incorporated SBA-15 is synthesized by a short time hydrothermal process. Characterization of the as synthesized and calcined Pt-SBA-15 is done by low and high angle X-ray diffraction studies, DRS, FT-IR and Thermo-gravimetric analysis. The X-ray diffraction shows characteristic reflections (100), (110) and (200) between 2 theta values 1-4. The characteristic peaks for platinum incorporation is found between 30-80 2theta values. The surface area (BET) of the calcined product is determined by N_2 adsorption-desorption isotherm. The pore volume and particle size are determined by BJH method. The resulting product shows high surface area which provides opportunity for use as efficient catalyst for hydrogenation of alkenes.

[a]*State Public Health Laboratory, Bamunimaidam, Guwahati-781021*
[b]*Department of Chemistry, Gauhati University, Guwahati, Assam-781014*
Email: dreamzchm@gmail.com
Keywords: SBA-15, mesoporous, Pt-SBA-15.

CPP103

408. Kinetics and mechanism on laccase catalyzed synthesis of poly (allylamine) catechin conjugate

Parikshit Gogoi[a], N. N. Dutta[b] and P. G. Rao[c, *]

The conjugation reaction of catechin with poly (allylamine) has been studied using free, immobilized and cross-linked enzyme crystals (CLEC) of laccase from *Trametes versicolor* with particular emphasis on the effect of pertinent variables and kinetic aspects of the reaction. The reaction was studied in 11 different solvents in order to deduce the solvent effect through an attempt to correlate the initial reaction rate with solvent properties such as hydrophobicity (logP) and water solubility ($\log S_w$). The initial rate was found to exhibit reasonable correlation with logP and $\log S_w$. The study revealed, in general that polar solvents favour the initial reaction rate. The organic solvent neither interferes with the laccase-substrate binding process nor with the catalytic mechanism. The kinetics of the conjugation reaction conformed to the so-called Ping-Pong-Bi-Bi mechanism with catechin inhibition. The stability of the CLEC was better than that of the free and immobilized enzymes for practical application. In case of immobilized laccase system marginal diffusional limitation could be inferred from the experimental data. The kinetic parameters estimated by non-linear regression analysis were found to be Km_{PAA}(mM) = 0.75, 1.8967, 2.135 and Km_{cat} (mM) = 11.769, 15.1816, 29.489 for free, immobilized and CLEC laccase respectively.

[a]*Chemistry Department, Nowgong College, Nagaon, Assam*

[b]*Chemical Engineering Division, North East Institute of Science and Technology,*

Jorhat – 785 006, Assam

[c]*North East Institute of Science and Technology, Jorhat – 785 006, Assam*

Correspondence to

[b*]*Director, North East Institute of Science and Technology,*

Jorhat – 785 006, Assam, I ndia

Phone: ++913762370012, Fax No: ++913762370011

e-mail: raopg@rrljorhat.res.in, pgrao24@hotmail.com, parikshit@iitg.ernet.in

CPP104

409. Effect of Salinity on Growth and Fatty Acid Yeild of Scenedesmus Dimporphous of North East Assam

Amrita Difusa[1], K.Mohanty[1, 2], V.V. Goud*[1, 2]

Microalgae have been known as a potential source of attraction for biofuel production and various value-added products. *Scenedesmus dimorphous,* a fresh water alga is known as a potent species for various commercial applications. The valuable fatty acid composition of the species is also a promising addition to its high lipid content. In this study, *Scenedesmus dimorphous* was cultivated in various salt concentrations to assess its growth and lipid production. The isolated species was cultivated in batch mode for 11 days in BG11 medium containing a series of sodium chloride salt ranging from 10mM to 100mM. The species survived at high salinity of 100mM with maximum specific growth rate of 0.973 d^{-1} and a minimum doubling time of 16.8 hr. Although, from various salt concentrations experimented in this study, the species grown in 30mM, 50mM and 80mM showed maximum specific growth of 1.137 d^{-1}, 1.102 d^{-1}, 1.128 d^{-1} respectively. The maximum lipid content of *Scenedesmus dimorphous* was found to be in 80mM salt containing medium with 37.8% comparative to species grown in BG11 medium with 36.2%.

Scenedesmus dimorphous have been also known for its rich essential fatty acids. Besides its potentiality of biofuel production, the species is also useful as food additive and useful in various fields of biomedical applications. These numerous commercial applications of *S.dimorphous* have enlightened the further way of research on development of new production systems.

[1]*Centre for Energy, Indian Institute of Technology Guwahati, Assam-781039, India*
[2]*Department of Chemical Engineering, Indian Institute of Technology Guwahati, Assam-781039, India*
**corresponding author e-mail- vvgoud@iitg.ac.in*
amrita difusa <amritadifuza@gmail.com

CPP105

410. Molar Conductance of Ephedrine Hydrochloride in Water and alcohol at 310.15 K

Bal Jadhava, Kailash Karadkarb and Atam Tekaleb*

Drug ephedrine hydrochloride is a potent drug. Keeping in view unavailability of data in specified experimental conditions, electrolytic conductance of ephedrine hydrochloride has been measured in water and alcohol in the vicinity of normal human body temperature 310.15 K and atmospheric pressure. Experimental data has been used for calculating specific conductance, molar conductance, limiting molar conductance. Experimental results have been explained on the basis of Debye Huckel Onsagar equation.

Key words: electrolytic conductance, molar conductance, limiting molar conductance, Debye-Huckel-Onsagar equation.

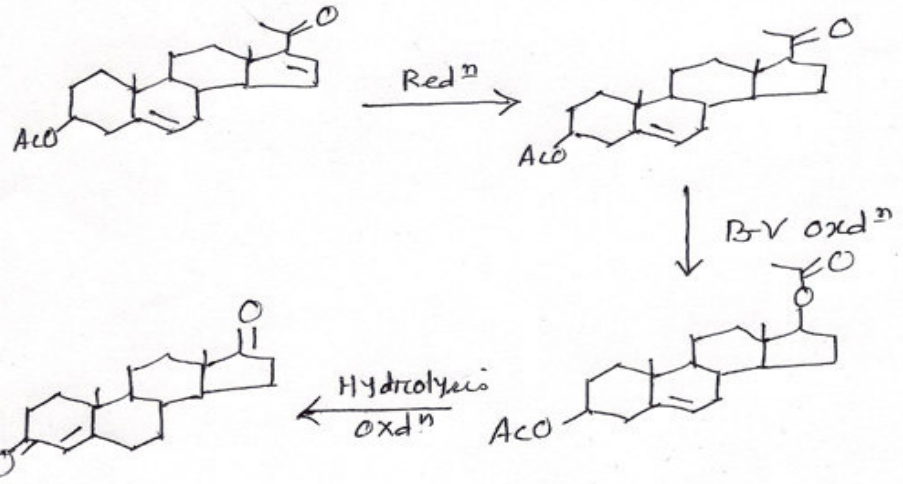
aDepartment of Physics, Shri Shivaji College, Parbhani:431401 India
bDepartment of Chemistry, Shri Shivaji College, Parbhani:431401 India
email:abtekale@gmail.com

CPP106

SYNTHESIS OF ANDROST – 4 ENE – 3,17- DIONE FROM 16- DPA

Dr. Parinita Borah
Department of Chemistry
Bahona College, Bahona

3 β -acetoxypregna – 5,16 diene – 20 one known as 16 – dehydropregnenolone – acetate (16-DPA) is an important intermediate for the synthesis of various steroidal drugs including corticosteroids, sex-hormones, oral contraceptives[1] and antitumor steroids[2]. The conversion of 20 – keto steroids to 17 – keto androstanes of male sex hormone series (androgens) is an important area of research in field of steroidal drugs and hormones[3] which includes androsterone and its derivatives, testosterone and its ester and their modification. Besides this type of keto-steroids is the key intermediates for the synthesis of various steroidal drugs like formestane.



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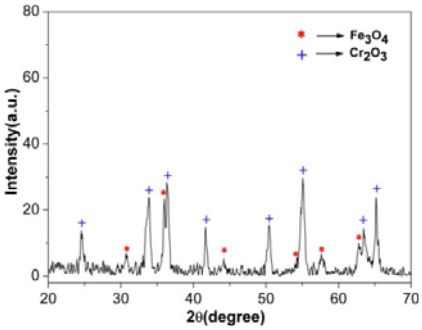
CPP107

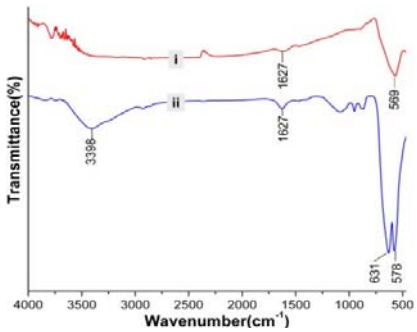
414.SYNTHESIS AND CHARACTERIZATION OF Fe_3O_4–Cr_2O_3 MAGNETIC FLUORESCENT NANOPARTICLES AND ITS PROPERTIES.

K.K. Singh, C. Borgohain, and K.C. Sarma.

Department of Instrumentation and USIC, Gauhati University
Gopinath Bordoloi Nagar, Guwahati 781014, Assam, India.
E-mail: kesho@iitg.ernet.in

Abstract. In this paper we described a simple, easy and cost efficient chemical method to synthesized magnetic fluorescent, Fe_3O_4-Cr_2O_3 core-shell structure nanoparticles. Initially Fe_3O_4 nanoparticles were synthesized by well known Massart's method, in which coprecipitation of Fe (II) and Fe (III) (molar ratio 1:2) in alkaline aqueous solution [1]. Second step involved in coating a layer of Cr_2O_3 on the surface of Fe_3O_4 NPs so as form a Fe_3O_4-Cr_2O_3 core-shell structure nanoparticles. These magnetic core-shell NPs become fluorescent when calcined at 1200 ^oC. Crystalline structure of the sample was characterized by powder X-ray diffractometer (XRD), Infrared data were recorded in a FT-IR spectrometer and particle size and microstructure were confirmed by field emission scanning electron microscope (FE-SEM), elemental compositions were analyzed by energy dispersive x-ray spectroscopy (EDX). Magnetic and Fluorescence properties were studied by vibrating sample magnetometer (VSM) and Fluorescence Spectrophotometer (FSP). Fe_3O_4-Cr_2O_3 particles catalyzed the decomposition of hydrogen peroxide solution. The fact that the superoxide ion appear in an aqueous phase during the decomposition of hydrogen peroxide over metal oxide catalysts shows the participation of free radical





intermediates involving the superoxide ion in the decomposition mechanism[2,3].

CPP108

420. Removal of Cationic Dye from Aquous Solution using Lawsonia Inermis and Banana Pith

Bijoy S Gowami & Sangeeta Neog
Department of Chemistry, B. Borooah College, Guwahati-781007, Assam
Email : bijoy112@sify.com

Abstract :

Dyes are widely used in industries such as textiles, rubber, paper, plastics, cosmetics, etc., to colour their products. The dyes are invariably left as the major waste in these industries. A significant portion of the dyes remains unconsumed and, therefore, let out in the effluent. The presence of dyes in aqueous effluents poses a serious ecological threat. Due to their chemical structures, dyes are resistant to fading on exposure to light, water and many chemicals and, therefore, these are difficult to be decolorized once released into the aquatic environment. There are more than 100,000 dyes available commercially. Many of the organic dyes are hazardous and may affect aquatic life and even the food chain. The removal of dyes from industrial waste before they are discharged into the water bodies is therefore very important from health and hygiene point of view and for environmental protection

In this study, low- cost locally available *Lawsonia inermis (Jetuka Leaf)* and banana pith were studied for its potential use as adsorbents for removal of a cationic dye (methylene blue,MB) from aqueous solution. The principle objective of the present study is as under – (i) Physical characterizations of adsorbents in terms of pH, Bulk Density, Conductance, Surface Area. (ii)XRD ,IR and SEM Characterization (iii)Batch experiment study in terms of initial dye concentration, pH, contact time, adsorbent dose, Temperature (iv) The equilibrium Isotherm Model Study using the Langmuir, Freundlich and Temkin isotherm models (v) The kinetic parameters and intraparticle diffusion study (vi) Thermodynamic study.

Lawsonia inermis has shown excellent adsorption potential compared to many other non-conventional adsorbents. Therefore, it can serve as an attractive low-cost adsorbent. Adsorption of MB on *Lawsonia inermis* was favored by increase in pH. The experimental results reveals that the colour of aqueous methylene blue solution was removed upto 91% at pH 12. Adsorption of MB on *Lawsonia inermis* was favored by increase in concentration. The experimental results reveals that the colour of aqueous methylene blue solution was removed upto 88% at 5ppm dye concentration. Adsorption of MB on *Lawsonia inermis* was favored by increase in agitation time. The Langmuir isotherm model and pseudo-second order model were found to be the best fitting isotherm and kinetic models. Thermodynamic analysis indicated that the adsorption of MB onto *Lawsonia inermis* was: Exothermic (ΔH was negative, -11.7 kJ/mol at 10pm dye conc.).Feasible and Spontaneous (ΔG = -8.25, -8.13, -8.02 kJ/mol).

The Langmuir and Freundlich isotherm parameters confirmed that the adsorption of MB on banana pith was favorable. Adsorption of MB on banana pith was favored by increase in pH ,concentration and agitation time. Thermodynamic analysis indicated that the adsorption of MB onto banana pith was exothermic (ΔH was negative, -46kJ/mol at 10pm dye conc.), Adsorption is chemisorptions($\Delta H \geq 30$ KJ/mol,-46KJ/mol), Feasible and Spontaneous (ΔG = -11.4, -10.3, -9.2 kJ/mol). The study showed that the Langmuir isotherm, Freundlich isotherm and Tempkin isotherm models are the best fitting isotherms. The adsorption equilibrium data that fit the Langmuir isotherm, indicating monolayer adsorption on a homogenous surface .Pseudo-second-order and intra-particle diffusion models model can be used to predict the adsorption kinetics.

From this study, it was found that banana pith has a higher adsorption efficiency compared to *Lawsonia inermis* at the any given initial dye concentration. Banana pith and *Lawsonia inermis* are cheap and easily available in the nature, so they have the potential to be used for the small scale industries which produced dyes as their effluent than the commercially available materials.

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CPP109

421. PRESENCE OF TRACE METAL IN VEGETABLES; A MARKET BASKET SURVEY AT GUWAHATI, ASSAM.

Bijoy S Gowami & Muktadir Rahman
Department of Chemistry, B. Borooah College, Guwahati-781007, Assam
Email : bijoy112@sify.com

Abstract

Problem section
Heavy metals deposition are associated with a wide range of sources such as small scale industries, brick kilns, vehicular emissions, resuspended road dust and diesel generator sets. These can all be contributes to the contamination found in vegetables. Additional potential sources of heavy metals can include unsafe or excess application of pesticides, fungicides and fertilizers such as sewage sludge. It was clearly observed that the concentration of all the heavy metals is higher in wastewater-irrigated vegetables than fresh water-irrigation. Phosphate fertilizers are manufactured from rock phosphate and according to their origin, they may contain various trace and minor elements.

Vegetables take up heavy metals and accumulate them in their edible and inedible parts in qualities high enough to cause clinical problem both to animal and human beings consuming these metal-rich vegetables. Heavy metal may be present as a deposit of the surface of the vegetable, or may be taken up the crop roots and incorporated into the plant tissue

Approach :
In Total 10 different vegetable samples has been collected from three most popular vegetables market based in Guwahati city viz.Machkhowa bazaar, Beltola bazaar and Singimari bazaar (About 15 km from Guwahati). The Machkhowa and Beltola bazaar is mostly dominated by commercial vegetables while the Singimari bazaar is famous for local variety of vegetables.

The 30 numbers of vegetable species from three different locations has been studied with respect to the eight heavy metal contents such as Pb, Mn, Fe, Cu, Co, Zn, Ni, and Cd. The cations such as Ca^{2+}, Mg^{2+}, Na^{+} and Mg^{+} are also studied for each the vegetables.

Results :
In this present study among eight heavy metals, Fe content is appeared to be high while the Cd content is low for the most of the vegetables. The cations such as Calcium, Magnesium, Sodium and potassium were also substantially present in all the vegetable samples. It has been observed that sodium and potassium content was high in the vegetables of Machkhowa and Beltola Bazar while the calcium and magnesium content was high in the vegetables of Singimari Market. Most of the heavy metals are within the permissible level excepting the few ones. Zn , Fe, Cu, Mn, Pb, content was considerable while the Co, Cd and Ni is appreciably present in most of the vegetables.

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CPP110

422. ESSENTIAL TRACE METAL CONTENT IN MEDICINAL PLANTS. A CASE STUDY FROM DARANG DISTRICT, ASSAM.

Bijoy S Gowami & Nripen Kalita

Department of Chemistry, B. Borooah College, Guwahati-781007, Assam

Email : bijoy112@sify.com

Abstract

The World Health Organisation (WHO) estimated that 80% of the population of developing countries relies on traditional medicines, mostly plant drugs, for their primary health care needs. The traditional medicines are derived from medicinal plants, minerals and organic matter; the herbal drugs are prepared from medicinal plants only. Crude drugs are usually the dried parts of medicinal plants (roots, stem wood, bark, leaves, flowers seeds, fruits, and whole plants etc.). Plants are good source for bioaccumulation of heavy metals.The presence of heavy metals beyond the allowed upper and lower limits can cause metabolic disturbance. Thus both the deficiency and excess of essential micronutrient (e.g. iron, zinc, copper) may produce undesirable effect. Effect of toxic metals (Cd, Cr, Pb, Ni etc) on human health and their interaction with essential trace element may produce serious consequence.

In the present study in total 25 different medicinal plants were selected on the basis of wide use and available in Darang District particularly in Mangaldai. The part of the medicinal plants such as bark and leave, fruit and root samples are collected. The samples were dried, grinded and digested with tri acid mixture ($HClO_3$ + HNO3 + H_2SO_4) and an extract was prepared. The plant materials were analyzed with respect to Fe, Pb, Cd, Zn, Mn, Cu, Co, Ni, and Cr.

In the present study it has been observed that the concentration of Zn and Cu is much lower in comparison to specified limits. Fe content is also within the permissible level excepting only one. In case of Mn and Cd, 10.7 % of the total medicinal plant samples exceed the permissible level. The Pb content is also within permissible level for almost all the samples excepting very few ones. It has also been observed the metal contents are quite low in comparison to the other country. The present study conclusively gives brief base line information for 25 different medicinal plants based on city and adjacent areas.

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BIOLOGICAL
POSTER PRESENTATION (BPP)

BPP1

102. The oxidant/antioxidant balance in cows with foot and mouth disease*

Rita Nath, Ram Lakhan Prasad, Sankar Sarma and Manas Senapatti

Oxidative stress (OS) is an active field of research in Veterinary medicine and has been implicated in numerous disease processes. OS is extremely dangerous as it does not exhibit any symptoms and is recognizable with great difficulty by means of laboratory methods. So by estimating the biomarkers of OS we can save the animal population. At present a very limited work has been documented relating to OS during foot and mouth disease (FMD).The aim of the study was to compare the oxidant/antioxidant balance between cows with FMD and healthy controls by the measurement of different oxidative biomarkers by spectrophotometry methods. After statistical analysis it was observed that the mean malonyl dialdehyde (MDA) concentration increased non significantly in the cows with FMD from 1.904±0.132 to 2.287±0.371 nmol/g Hb in hemosylate. Kawther and Ahmed and Ghanem and Hamid reported a significant ($P < 0.05$) increase in MDA level during FMD in cattle. The glutathione peroxidase (GSH-Px) activity showed a non significant decrease in the cows with FMD (113.224±7.005 U/g Hb) while superoxidase dismutase (SOD) and glucose-6-phosphatase (G6PD) activity showed a significant ($P<0.05$) decrease ie 337.756±9.502 U/L and 8.872±0.687 U/g Hb respectively in the FMD group. Our result is in good agreement with the results of Ahmed et al. β carotene concentration were almost same in both the groups. Ascorbic acid is a chain breaking antioxidant and it decreased significantly ($P<0.05$) from 11.229±0.814 to 8.856±0.603 mg/dl in the FMD affected cows. Albumin and uric acid is part of the antioxidant pool and they showed a highly significant ($P<0.01$) decrease from 4.325±0.222 to 3.320±0.251 g/dl and 2.927±0.159 to 2.525±0.166 mg/dl in FMD affected cows. A positive significant ($P<0.05$) correlation was observed between protein and albumin and SOD, between albumin and ascorbic acid and between MDA and ascorbic acid but a negative significant ($P<0.05$) correlation was observed between uric acid and ascorbic acid whereas between MDA and SOD, there was a highly significant ($P<0.01$) negative correlation. It was concluded that the disturbed oxidative status of the animals affected with FMD reflected that they were in oxidative stress condition. The depletion in the body's antioxidant resource have resulted from its action to counter balance the toxic effects of the oxidants which is produced in increased amount during FMD. The present work summarizes the knowledge of oxidative stress in ruminant physiology and production during FMD and highlighting the need for continued research on oxidative stress in ruminant medicine since it is still in the early stage of development. The FMD affected animals should be provided with supplements rich in trace minerals (eg Fe, Cu, Zn, Co etc.) and antioxidant vitamins (eg Vit A, Vit C, Vit E) which would be beneficial for the antioxidant defence system.

Deptt. of Vety. Biochemistry, Ranchi Veterinary College, Birsa Agriculture University, Ranchi, India.

BPP2

103. Effect of fermentation on some local cassava (*Manihot esculenta*) varieties of Assam vis-à-vis quality attributes

P. Deka, A. J. Das*, S. C. Deka and P. Khawas

Cassava (*Manihot esculenta*) plants are grown worldwide particularly in the African and Asian countries [1]. The roots of these plants are rich reserve of starch and they are used for consumption in many countries [3]. The nutritional value of this crop is found to increase if it is being subjected to fermentation [2]. The present study was carried out to examine the effect of fermentation in cassava in relation to the quality parameters both biochemical and microbiological. Three locally available varieties of cassava of Assam were fermented with the species of *Lactobacillus plantarum* and *Saccharomyces cerevisiae* Also the dried chips of these cassava varieties were being fermented with the starter culture used for rice beer preparation in Assam. The population of *L. plantarum* showed a gradual increase and showed a maximum count of 7.27 log CFU/g in one of the samples. The population of *S. cerevisiae* in one of the samples was however, maximum on the 5th day. The ash content did not show much variation, whereas the content of crude fibre decreased on the 5th day and again was found to increase on the 10th day. The protein content was found to be highest in all the samples on the 5th day with the highest value of 5.59% with the sample fermented with *S. cerevisiae*. The total carbohydrates present in the samples were in the range of 78%, which gradually decreased in all the cases to 13%-32%. Also the concentration of starch and reducing sugars decreased gradually. The percentage of phenolic compounds was found to remain constant throughout the fermentation process with the range of 0.006%-0.007%. In the samples fermented with mixed microbial inoculums, the general aerobeic population increased up to 6th day from 7.15 to 8.34 log CFU/g and then decreased on the 9th day to 7.92 log CFU/g. *Lactobacillus* sp. were found to increase gradually from 6.83 log CFU/g to a maximum count of 8.48 log CFU/g in the 10th day sample. Initial yeast count showed a decrease in load in the 0th hour of incubation than the starter culture then however, it gradually increased to a maximum value of 7.9 log CFU/g. Moulds count was found to decrease gradually starting from 7.61 log CFU/g in the starter culture and did not appear on the 10th day. The protein content in the samples fermented with the mixed culture gradually increased from 1.09% to a maximum value of 1.41%, where as the starch and total carbohydrate decreased gradually. HPLC profile of organic acids in the samples showed that lactic acid was present in the highest amount (6311.19 - 11704.69 ppm) followed by tartaric acid (4354.7 – 7654.9 ppm). Other acids like succinic, pyruvic, formic, citric and propionic were all found to be present in variable amounts in the fermented samples. This study has shown that cassava roots which are usually not consumed in the raw form can be easily fermented with commonly occurring microbes, which enhances its nutritional value and serves as a cheap source of nutrition especially to economically poor people.

Department of Food Engineering and Technology, Tezpur University
Napaam, Tezpur, Assam, India
**arupdas@tezu.ernet.in*

BPP3

104. Effect of Three Conventional Cooking Methods on the Biochemical Compositions of '*kachkal*' (*Musa* ABB) of North-East India

P. Khawas, S. C. Deka and A.J. Das

Kachkal (*Musa* ABB) is the only culinary banana unique to North-East India. A study was conducted to find out the variations in biochemical constituents of *kachkal* subjected to three different cooking treatments viz. blanching (75^0C for 10 min), boiling (100^0C for 8 min) and microwave cooking (600Hz for 4 min). Depending on the type of method employed, the study revealed that all the three cooking treatments lowered the various nutritional components as compared to control. Boiling at 100ºC showed a more pronounced effect on the reduction of ash from 5.388 % to 1.973 %, carbohydrate components from 80.301% to 68.015 %, cellulose from 1.062 mg/100g to 0.440 mg/100g, tannin from 0.045 mg/100g to 0.40 mg/100g, phytic acid from 12.150 mg/100g to 3.600 mg/100g compared to blanching and microwave cooking. Microwave cooking caused reduction in crude fibre from 2.665 % to 1.034 % and lignin content from 1.576 mg/100g to 0.421 mg/100g. Starch content remained almost constant throughout all the treatments. Likewise, blanching at 75^0C lowered the protein content to a maximum level from 4.999 % to 3.323 %. Vitamins were greatly reduced as a result of cooking. Among all the three cooking methods used, microwave cooking was found to retain maximum nutrients, compared to blanching and boiling. Looking at the backdrop of using *kachkal* as medicinal food in this region from time immemorial the present study will be useful in determining the best cooking conditions with minimum losses in nutrients and also in developing high value added products and neutraceuticals.

Keywords: *Kachkal*, cooking, boiling, blanching, microwave, North-East India

Department of Food Engineering and Technology.
Tezpur University, Napaam-784028, Assam, India.
(Email: prerna@tezu.ernet.in)*

BPP4

106. Importance of Soybean (*Glycine max*) in nutraceuticals and functional foods

Dhan Prakash* and Charu Gupta

Reactive oxygen species (ROS) are highly reactive to damage nucleic acids, proteins, lipids and carbohydrates that consequently affect the immune functions. ROS are capable to oxidize biomolecules, resulting in mutagenic changes, tissue damage, cell death and play significant pathological role in cancer and various other degenerative diseases. Phytochemicals with antioxidant properties like flavonoids, carotenoids, terpenoids, vitamins C, E and polyphenols protect from oxidative stress and have the ability to quench free oxygen radicals. Soybean (*Glycine max* L) has various biologically active phytochemicals, like isoflavones, coumestrol, phytate, saponins, lecithin, phytosterols and vitamins E that provide several health benefits including protection against oxidative stress. It is also an important source of phytoestrogens like daidzein and genistein that are known to have estrogenic, anti-carcinogenic, antiviral, antifungal, anti-osteoporotic and antioxidant activities. The present studies were conducted to evaluate total phenolic contents (TPC), antioxidant (AOA) and free radical scavenging activities (FRSA) of the seeds and agri-wastes of some varieties of soybean for their possible utilization in nutraceuticals, functional foods or as pharmaceutical supplements. The TPC showed wide variation from 15.9 to 125.6 mg GAE/g and AOA from 11.2 to 82.1%. The leaf extracts of some varieties were with high amounts of TPC (91.6-125.6 mg GAE/g) and AOA (53.7-82.1%). In general leaves of most of the varieties were found with higher TPC and antioxidant activity followed by seeds and pod pericarp. They were further subjected to FRSA assayed by DPPH free radicals and expressed in terms of IC_{50} (inhibitory concentration) that ranged from 0.07 to 1.78 mg/ml, EC_{50} (efficiency concentration) from 3.0 to 77.3 mg/mg DPPH and anti-radical power from 1.2 to 32.9.

*Amity Institute for Herbal Research & Studies, Amity University UP, Sector-125, Noida-201303, India(*Corresponding author Email: dprakash_in@yahoo.com)*

BPP5

109. Physical and physicochemical properties of three local rice (*Oryza sativa* L.) varieties of Assam with different amylose contents as affected by two hot soaking times

Himjyoti Dutta[a]* and Charu Lata Mahanta[a]

Three local rice varieties, viz. *Ranjit*, *Kola chowkua* and *Bhogali bora,* falling under high amylose, low amylose and waxy varieties were hot soaked at 100°C for 1 and 3 minutes. Hot soaking significantly changed the properties of the rice samples. Increased kernel hardness as measure by a texture analyzer also resulted in higher head rice yield on milling while differences were observed in the dimensional ratio (L/B) and degree of gelatinization amongst the varieties which may be attributed to kernel morphology and structure. While equilibrium moisture content (EMCS, %, db) at room temperature was highest for the processed *Bhogali bora* samples, *Kola chowkua* samples showed highest water uptake on cooking and increased peak viscosity (*PV*) during rapid viscosity analysis (RVA). Lower gelatinization resulted in lower recystallization as reflected by the crystallinity calculation from the X-ray diffractograph (XRD). The basic A-type pattern however remained unchanged on soaking. Shifting of Bragg angle (2Θ) depicting increase in the interplanar distances in most cases and increase in domain length responsible for the peak at 2Θ near 17.1 were obtained. In addition, changes in the microstrain values, corresponding to lattice distortions were also studied.

Keywords: Hot soaking, Texture, RVA, XRD, Crystallinity

[a] *Department of Food Engineering and Technology, Tezpur University, Napaam, Assam, 784028*

E-mail: himdfpt@tezu.ernet.in Ph: 09707016378

BPP6

114. Sorbitan Ester Niosomes For Topical Delivery Of Rofecoxib

Malay K Das* & Narahari N Palei

The aim of the present investigation is the formulation and *ex vivo* evaluation of niosomal gel for sustained therapeutic action of rofecoxib after topical administration. Niosomes were prepared by lipid film hydration technique and were analyzed for size, entrapment efficiency and drug retention capacity. Niosomal vesicles were then incorporated into blank carbopol gel to form niosomal gel Fig.1). The *ex vivo* permeation study across pig skin was performed using Keshary-Chien glass diffusion cell. The size and entrapment efficiency of the niosomal vesicles increased with gradual increase in HLB value of nonionic surfactants used. Maximum drug entrapment was observed with Span 20 with HLB value of 8.6 and drug leakage from vesicles was less at refrigerated condition than at the room temperature. Higher proportion of cholesterol made the niosomal formulation more stable with high drug retention properties. The niosomal gel showed a prolong drug release behavior compared to plain drug gel (Table 1). Differential scanning calorimetric study of drug loaded gel and pig skin after permeation study confirmed inertness of carbopol gel base toward rofecoxib and absence of drug metabolism in the skin during permeation study, respectively. The niosomal formulations were successfully prepared by lipid film hydration technique using cholesterol and Span as nonionic surfactant. Presence of cholesterol made niosomes more stable with high drug entrapment efficiency and retention properties. The lower flux value of niosomal gel as compared to plain drug gel across pig skin assured the prolong drug release behavior with sustained action (Table 1).

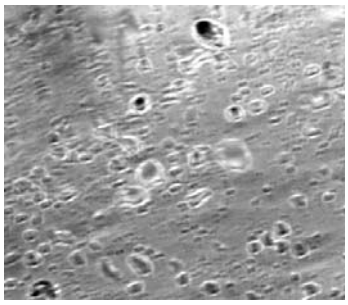


Fig. 1: Photomicrograph of niosomal gel.

Table 1: Permeation parameters from rofecoxib gel

F.N. Code	Cumulative amount permeated (µg/cm^2)	Flux (J, µg/cm^2/h)	Permeability coefficient (Kp, cm/h × 10^3)	Lag time (t_L, h)
GF	544.80 ± 25.31	55.23 ± 2.17	11.05 ± 0.89	-
NG	166.76 ± 5.34	20.93 ± 1.79	4.18 ± 0.30	0.33

Keywords: Rofecoxib, Niosomes, Niosomal gel, Topical delivery.

Department of Pharmaceutical Sciences, Dibrugarh University, Dibrugarh 786 004, India

****Presenting author, e-mail: du_mkd@yahoo.co.in***

BPP7

118. Chemical and functional properties of *Samanea saman* leaf protein concentrate

Satyabrat Gogoi[1] and Vikas Rana

Leaf protein concentrate (LPC) is a concentrated form of the proteins found in the leaves of plants and is acquiring greater importance as a human or animal food source, because of its potentiality as the cheapest, most abundant and sustainable source of available protein. Leaf protein concentrate was produced from the leaves of *Samanea saman.* The LPC was produced using low cost fractionation techniques. Both leaf meal (LM) and LPC of *Samanea saman* were characterized to their nutritive composition and functional properties for their best end use in food products. Chemical analysis of *Samanea saman* LPC indicated 3.32% moisture, 2.88% ash, 8.78 % lipid, 4.28 % crude fibre and 54.25 % protein. The values for water absorption capacity, bulk density and water dispersibility was determined as 1.533 ml/gm, 0.573 gm/ml and 75.00 % respectively. The solubility and foaming properties were examined at different p^H scale (2-12). The LPC samples had varying solubilities as well as foaming properties with multiple maxima and minima with changes in p^H; solubility being minimum at p^H 6 and maximum near p^H 2 and 12 . Foaming capacity was minimum at p^H 6 while foaming stability was maximum at p^H 6 .

Key words: *Samanea saman* LPC, functional properties

Bio-prospecting & Indigenous Knowledge Division,
Rain Forest Research Institute, Jorhat, Assam
gogoisb@gmail.com (SG), ranav@icfre.org (VR)

BPP8

120. Kseera Basti In The Management Of Ulcerative Colitis

Dr. Chatan Lowang***,Dr. Yein Kham Hailowng**,Dr. Bishnu Prasad Sarma*

Panchakarma is a speciality of Ayurveda having diversified preventive, curative and promotive actions. The procedure adopted in Panchakarma purify various systems of the human body & expel out accumulated toxic metabolites from the body, maintain normal functioning of tissue, digestion, metabolism, mental functions etc. So, we can define Panchakarma as a biocleansing regime, which facilitates the body system for better bioavailability of the Pharmacological therapies, besides achieving homeostasis of doshas. It also increase the acceptability of body to various dietary regimens, rejuvenation therapy (rasayana) etc. Among the fine folds of Panchakarma, Basti being one of them and Kshena basti shows very good result in the management of Ulcerative colitis.

Dr. Chatan Lowang, *PG Scholars, Deptt. Of Kayachikitsa, Govt. Ayurvedic College, Guwahati-14, E-Mail - chtnlwng@gmail.com,*

Dr. Yein Kham Hailowng, *PG Scholars, Deptt. Of Kayachikitsa, Govt. Ayurvedic College, Guwahati-14, E-Mail - dr.yein@gmail.com, Dr. Bishnu Prasad Sarma, MD (Ay), IMS, Ph.D, FCCP, DIP. Yoga (BHU), ANRAP FELLOW (DHAKA), Associate professor, Deptt. of Kayachikitsa, Govt. Ayurvedic College, Guwahati, Assam*

BPP9

121. Fatty acids composition and physico-chemical analysis of *Melia azedarach* L. Seed Oil

Vikas Rana

Physical and chemical characteristics of oil extracted from *Melia azedarach* L. seeds are presented in this work. The results indicate that *Melia azedarach* seeds constituted 39.6% crude oil. The specific gravity, refractive index, saponification value, and unsaponifiable matter content of *Melia azedarach* seed oil were found to be 0.80 g/cm^3, 1.36 $\left(n_D^{40}\right)$, 84.15 (mg KOH/g) and 0.71 (%w/w) respectively. Elemental analysis of oil by AAS and Titration method shows that it contains Ca (1230 mg/100g), Mg (990 mg/100g), K (121 mg/100 g), Zn (3.12 mg/100 g), Mn (3.4 mg/100g), Fe (19.52 mg/100g) and P (213 mg/100g). The extracted oil was methyl-esterified and analyzed by GC and GC-MS. The major fatty acids reported here, in *Melia azedarach* seed oil, are Palmitic acid (5.68%), Linoleic acid (74.57%), Oleic acid (16.39%), Stearic acid (3.33%). This work might be useful for developing applications for *Melia azedarach* L. seed oil.

Key words: *Melia azedarach*, seed, oil.

Bio-prospecting & Indigenous Knowledge Division,
Rain Forest Research Institute, Jorhat, Assam
ranav@icfre.org

BPP10

123. Lactoserum: A Complete Nutraceutical

[1*]Charu Gupta, [1]Dhan Prakash, [2]Sudha Goyal and [3]Sneh Gupta

Lactoserum, a byproduct of cheese industry, contains lactose, nitrogenous compounds, protein, salts, lactic acid and small amounts of vitamins and minerals. It is of high nutritive value and its products can be used as functional ingredients in food and pharmaceutical applications and as nutrients in dietary and health foods. Whey protein is a complete, high quality protein with a rich amino acid profile. It contains the full spectrum of amino acids including essential amino acids and branched-chain amino acids which are important in tissue growth and repair. The health and nutritional value of the components of lactoserum include high quality nutritional source of amino acids, anti-microbial compounds like lactoferrin (Lf), lactoperoxidase (Lp), glycomacropeptide (GMP) and sphingolipids; prebiotic property for growth enhancement of gut microflora such as *Bifidobacteria*, immuno-enhancing properties by boosting glutathione (GSH) levels, control of specific diseases including cancer and antitoxin activity. It is rich in S-containing amino-acids (cysteine and methionine) that are utilized in glutathione synthesis which is a substrate for enzymes that catalyze detoxification compounds and bind mutagens and carcinogens, facilitating their elimination from the body. Whey proteins derived from lactoserum plays an important role in weight management, body's antioxidant defense system in various tissues, protects cells against free radical damage, pollution, toxins, infections and UV exposure. In addition, lactoserum can be used as valuable food ingredients with diverse functional properties as they can modify organoleptic, visual, hydration, surfactant, structural, textural and rheological properties of food. Thus lactoserum has many human applications and promises to be a complete nutraceutical for the future generations.

Keywords: Lactoferrin; Lactoperoxidase; Probiotic; Rheological properties

[1]*Amity Institute for Herbal Research & Studies, Amity University UP, Sector-125, Noida-201303, India*

[2]*Department of Chemistry, R.G.P.G. College, Chippi Tank, Meerut-250001, India*

[3]*Department of Zoology, R.G.P.G. college, Chippi Tank, Meerut-250001, Meerut, India*

**Email: charumicro@gmail.com*

BPP11

127. Development of a novel toxoid vaccine of *Salmonella* Typhimurium

Ramie Husneara Begum[1*], Habibur Rahman[2] and Giasuddin Ahmed[3]

Development of a single effective vaccine against non-typhoidal salmonellosis is very challenging due to the presence of hundreds of serovars of *Salmonella* which are antigenically different from each other. The *Salmonella* enterotoxin (Stn), a common virulence factor occurring amongst a wide range of serovars was used to develop a common vaccine. Partially purified Stn of *Salmonella enterica* serovar Typhimurium (DT 193) inactivated with 40kGy of gamma (γ) rays was used to formulate a vaccine (ITST) and its efficacy tested in Krouiler birds against homologous and heterologous serovars (*S.* Typhimurium and *S.* Gallinarum). No mortality was recorded in birds vaccinated with the ITST following the challenges. The mean (± SE) serum antibody titre for ITST peaked (3.143 ± 0.031) in six weeks post- primary vaccination after which it slowly declined, but till the 10th week was still maintained at a protective level. The overall protective index (PI) was found to be 95.83. In the control groups 100% mortality was recorded for both the challenges. Thus, the gamma irradiated toxoid vaccine (ITST) prepared from partially purified *Salmonella* enterotoxin was found very effective in protecting poultry birds against homologous as well as heterologous serovars of *Salmonella.*

[1]*Dept. of Life Sciences, Assam University, Diphu Campus,*

[2] *Sikkim Center, ICAR research complex for NEH,*

[3]*Dept. of Biotechnology, Gauhati University*

**E-mail: ani.ara73@gmail.com*

BPP12

129. Morphological and Molecular Level of Genetic Diversity among Pongamia (*Pongamia pinnata* (L) Pierrre) Accessions

Sudhir kumar, Rajeev Ranjan, S. K. Pandey, S.P. Ahlawat, R.V.Kumar* and S.K. Dhyani

A thorough and extensive germplasm exploration survey was undertaken and 18 high yielding candidate plus trees (CPTs) of *Pongamia pinnata* were selected from different agro ecological regions covering four different states of India for the study of genetic variability at morphological and molecular level. Significant trait differences were observed in pod and seed character as well as for growth characters. In general, phenotypic coefficient of variation was higher than genotypic coefficient of variation indicating the predominant role of environment. High heritability (broad sense) and genetic gain observed for pod width, seed length and pod thickness indicated preponderance of additive gene action. Principal component analysis (PCA) revealed that first five PC axes explained 86.8% of the total multivariate variation. Growth characters *viz*., plant height and collar diameter and pod and seed characters *viz*., pod width and seed width were the major determinant of the genetic diversity in the collection. Cluster analysis identified two main clusters based on the morphological characters indicating the diversity could be mainly due to diverse agro-climatic conditions. To assess the molecular genetic diversity in *Pongamia* accessions Random Amplified Polymorphic DNA (RAPD) marker system was employed. The 40 random primers produced 396 RAPD loci (average of 9.9 bands per primer) across the 18 accessions studied, out of which 341 loci (86.2%) were polymorphic. Primer informativeness was measured by utilizing four marker utility parameters *viz*. Polymorphic Information Content (PIC), Resolving power (Rp), Effective Multiplex Ratio (EMR) and Marker Index (MI). RAPD primers *viz*. 10, 34 and 35 having resolving power of 25, 22 and 21 were able to distinguish most of the *Pongamia* accessions under the study. The average Shannon index (*H*) of 2.1 indicated a relatively high genetic variation in the germplasm collection. Cluster analysis based on Jaccard's similarity coefficient using UPGMA grouped all the 18 accessions into two major clusters. Distribution of the accessions among the clusters did not result in comprehensively distinct clustering patterns based on their geographical origin. The pair wise genetic similarity among 18 accessions ranged from 0.39 to 0.76 with an average of 0.61, suggesting that the current germplasm collection preserved the vast majority of the natural variation in *Pongamia pinnata*. Grouping of accessions using cluster analysis and principal coordinate analysis (PCoA) were similar and no discrepancy was observed. The result of the study showed that the analyzed accessions have wide range of diversity at morphological and molecular level. The investigations will also be very useful in choosing the precious accessions for further breeding programs. The observations demonstrate the usefulness, limitations and resolution power of molecular markers in comparison to classical morphological descriptors for analyzing the *P.pinnata* genome for which no prior genome sequence information is available.

Key words: *Pongamia pinnata*, Candidate Plus Trees, Genetic Diversity, RAPD

National Research Centre for Agroforestry, Jhansi-284003, U.P., India
Indian Grassland and Fodder Research Institute, Jhansi-284003, U.P., India

BPP13

130. Study on Medicinal Plants in a Flood Plain Wetland In Barpeta District, Assam

R.M.Deka , B.K.Baruah And J.Kalita*.

This paper presents the medicinally important macrophytes of Kapla beel a freshwater flood plain wetland. The Kapla beel is located in Barpeta district of lower Assam. The macrophyte community comprised of 36 species belong to 24 families. The study showed 12 plant species have medicinal properties namely *Acorus calamus* L, *Sagittaria sagittifolia* L, *Typha latifolia* L, *Sparganium erectum* L, *Lemna minor* L, *Spirodella polyrrhiza* (L)schleid, *Vallisneria spiralis* L, *Hydrilla verticellata* (L.F.) Royle., *Mentha aquatica* L, *Polygonum amphibium* L, *Trapa bispinosa* L, *Eichhornia crassipes (Mart.) solms.* The study indicates the importance of conservation of aquatic vegetation of flood plain wetland in Assam.The conservation efforts of aquatic vegetation will facilitate the conservation of medicinal plants too.

Key words:- Kapla beel, Medicinal plants.

Department of Zoology, Cotton College, Guwahati, India.

**Department of Zoology, Gauhati University, Guwahati, India.*

BPP14

131. Use of Certain Growth Promoters in Broiler Chickens: I. Effect on Zootechnical Parameters

Jyoti Doley, D Sapcota, T N Upadhyaya and J D Mahanta.

An experiment was carried out for 6 weeks on the use of 3 growth promoters (probiotic, acidifier, and nucleotide) on zootechnical parameters of broiler chickens. Commercial chicks (n= 140) were randomly distributed into 4 groups containing 35 in each. Four dietary treatments were formulated as per BIS and were assigned to these groups as: T_0 (no growth promoters in feed i.e., control), T_1 (control with probiotic @ 50g/ton of feed), T_2 (control with acidifier, @ 2 kg/ton of feed) and T_3 (control with nucleotide, @1 kg/ton of feed).

The probiotic fed group significantly improved the body weight gain. Among the growth promoter fed groups the highest feed was consumed by acidifier group, followed by nucleotide and probiotic groups. These groups showed better feed efficiency as compared to control group; among them probiotic fed group showed the best result followed by nucleotide and acidifier fed groups. The dry mater retention was significantly increased due to incorporation of probiotic as compared to control group; however, no impact was found with acidifier and nucleotide. The crude protein retention was highest in the probiotic and nucleotide supplemented groups; whereas, acidifier showed no improvement. Feeding probiotic or nucleotide showed the best retention of ether extract or calcium, but acidifier rendered no improvement. All the growth promoters showed better but equal effect on phosphorus retention. Dietary growth promoters did not have any effect on the crude fibre retention. The broiler performance efficiency factor was highest in the probiotic group followed by nucleotide, acidifier and control groups. The livability percentage was observed to be 100 per cent in all the experimental groups.

College of Veterinary Science, Khanapara, Guwahati-22

debensapcota@yahoo.com

BPP15

132. Use of Certain Growth Promoters in Broiler Chickens: II. Effect on Haemato-Biochemical Parameters

Jyoti Doley, D Sapcota, T N Upadhyaya, J D Mahanta and S Sarma.

The effect of feeding 3 growth promoters (probiotic, acidifier and nucleotide) were studied on the haemato-biochemical parameters of broiler chickens. For this purpose 140 numbers of commercial Cobb-100 chicks were randomly distributed into 4 groups containing 35 in each with 5 replicates of 7 in each group. A control ration (T_0) was prepared with conventional feed stuffs as per BIS. From this, 3 rations were prepared: T_1 (T_0 with probiotic @ 50g/ton of feed), T_2 (T_0 with acidifier, @ 2 kg/ton of feed) and T_3 (T_0 with nucleotide, @1 kg/ton of feed) and feeding was accomplished for 6 weeks.

The entire growth promoter fed groups showed significantly ($P< 0.05$) reduced cholesterol level, however the result of probiotic fed group was more prominent. The serum glucose level in the probiotic fed group was found to be significantly ($P<0.05$) higher than that of control group to the extent of 68.75 per cent. The acidifier and nucleotide groups also noted a significant increase to the extent of 50.00 and 62.5 per cent, respectively as compared to that of control group. The aspartate aminotransferase (SGOT) level in the probiotic fed group decreased significantly ($P<0.05$) to the extent of 14.19 per cent as compared to that of control group. However the values in acidifier and nucleotide fed groups remained comparable to that of control group.

The uric acid level in the probiotic, acidifier and nucleotide fed groups were found to be significantly decreased to the extent of 53.85, 25.98 and 55.62 per cent, respectively as compared to that of control group. Thus, among the growth promoter fed group the effect in nucleotide group was the best followed by probiotic and acidifier groups. All the growth promoters did not have any influence on blood serum protein, alanine aminotransferase , alkaline phosphatase, urea, albumin and globulin levels.

College of Veterinary Science, Khanapara, Guwahati-22

debensapcota@yahoo.com

BPP16

133. Use of Certain Growth Promoters in Broiler Chickens: III. Effect on Carcass Quality

Jyoti Doley, D Sapcota, T N Upadhyaya and J D Mahanta.

A study was conducted to find out the growth promoting effects of 3 natural feed supplements (i.e. probiotic, acidifier and nucleotide). Day-old chicks (n=140), divided into 4 equal treatments groups were used in the study of 6 weeks. A control ration was prepared with conventional feed stuffs as per Bureau of Indian Standards and 3 experimental diets were prepared by incorporating growth promoters: T_1 (control diet with probiotic @ 50g/ton of feed), T_2 (control diet with acidifier, @ 2 kg/ton of feed) and T_3 (control diet with nucleotide, @1 kg/ton of feed) and feeding was accomplished for 6 weeks under battery cage system of management.

It was revealed that the dressing yield was increased up to an extent of 4.48, 2.79 and 4.21 per cent for probiotic, acidifier and nucleotide groups, respectively as a result of incorporation of growth promoters. The eviscerated yield increased significantly to the extent of 4.18 and 3.16 per cent in probiotic and nucleotide fed groups, respectively as compared to that of control group; however, no impact was observed of feeding acidifier in broilers. Acidifier treated group had a comparable result to that of the control group. No influence of growth promoters was found on the gizzard weight since the values remained comparable to that of control group. Feeding of probiotic and nucleotide resulted in significantly higher liver weight of broilers; however, no impact of feeding acidifier was observed.

College of Veterinary Science, Khanapara, Guwahati-22

debensapcota@yahoo.com

BPP17

134. Use of Certain Growth Promoters in Broiler Chickens: IV. Effect on Intestinal Length, Weight, Ph and Bacterial Load

Jyoti Doley, D Sapcota, T N Upadhyaya and J D Mahanta.

An experiment was carried out on the use of certain growth promoters (probiotic, acidifier, and nucleotide) on weight, length, pH and bacterial load in the intestine of broiler chickens. One hundred and forty day-old commercial Cobb-100 chicks were randomly distributed into 4 groups containing 35 in each with 5 replicates of 7 in each group. Four dietary treatments were formulated as per BIS and were assigned to the above groups as: T_0 (no growth promoters in feed i.e., control), T_1 (control diet with probiotic @ 50g/ton of feed), T_2 (control diet with acidifier, @ 2 kg/ton of feed) and T_3 (control diet with nucleotide, @1 kg/ton of feed) and feeding was accomplished for 6 weeks under battery cage system of management

Growth promoters have significantly increased the weight of intestine. Among the various additive fed groups, the highest intestinal weight was found in probiotic group, followed by nucleotide and acidifier groups. Feeding growth promoters have significantly decreased the intestinal length of probiotic or nucleotide fed broilers. Dietary growth promoters lowed the intestinal pH. Though pH in the gizzard was found to be lowest among all the segments (crop, proventriculus, gizzard, duodenum, jejunum and ileum) excepting the duodenum. Different parts of the intestine did not show any trend of pH change due to feeding growth promoters. The broilers fed probiotic had the lowest bacterial load followed by acidifier, nucleotide and control broilers.

College of Veterinary Science, Khanapara, Guwahati-22

debensapcota@yahoo.com

BPP18

136. Development of Whey Based RTS Health Beverage by Combining Orange Juice and Whey

Nandan Sit, Hrishikesh Gayan, Sankar C. Deka

Whey is the fluid milk product obtained during the manufacture of cheese, casein, or similar products by separation from curd after coagulation of milk. Whey contains almost all nutrients of milk except casein and fat, thus making it highly nutritious. Whey is also known to suppress the growth of pathogenic and spoilage microorganisms. Whey proteins are high quality protein sources that contain all of the amino acids in the proportions that the human body requires. The production of a beverage by combining whey and fruit juice has been shown to have good commercial potential. Therefore, the study was taken to develop whey based ready to serve (RTS) health beverage by combining orange juice and whey in the ratio of Whey : Orange juice as 0:100, 10:90, 20:80, 30:70 and 40:60. The combinations were analyzed for TSS, acidity, ascorbic acid, ash and protein content. Sensory analysis and storage study was also carried out. The results showed that the TSS and acidity decreased from 12.8 to 11.4 ºBrix and 0.48 to 0.38% respectively when proportion of whey was increased from 0:100 to 40:60. Ascorbic acid content also decreased from 44.7 to 36.5 mg/100g juice, and Ash and Protein contents increased from 0.23 to 0.44% and 0.26% to 0.34% respectively when proportion of whey was increased which are significant. The results of sensory analysis and storage study indicated that the ratios 10:90, 20:80 and 30:70 are acceptable and the beverage can be stored safely up to 3 months by adding KMS at the rate of 150 ppm. So, Whey may be incorporated in orange juice up to the ratio of 30: 70 to prepare RTS beverage having reasonable amount of vitamins, minerals and high quality protein which will be acceptable to consumers and may serve as health drink.

Key words: Whey, Orange Juice, RTS Beverage

Department of Food Engineering and Technology, Tezpur University, Assam-784028, India

E-mail: nandansit@yahoo.co.in

BPP19

139. Effects of Fermentation on Neutraceuticals and Probiotics in Edible Bamboo shoots of Assam

Pallab Kumar Borah, Laxmikant S. Badwaik*, Kankana Borah and Sankar C. Deka

Neutraceuticals have certain health benefits and help cure diseases in humans. The present study was done in order to investigate the neutraceutical properties of four edible varieties of bamboo shoot species growing in Assam, namely, *Bambusa balcoa, B. tulda, B. pallida* and *Dendrocalamus hamiltonii.* The effect of fermentation was studied in three of these varieties. Fresh and fermented bamboo shoots were analysed for protein, fiber, fats, ash, vitamin C, carbohydrates, total phenols, Antioxident activity and probiotic LAB. The protein content, vitamin C, fiber, mineral content, carbohydrates and fat percentage ranged between 3.44-3.72g/100g, 1.42-2.45mg/100g, 3.54-3.97g/100g, 0.85-0.99g/100g, 4.10-6.92g/100g and 0.31-0.76g/100g of fresh shoot. Among the four, phenolic content was the highest in Dendrocalamus hamiltonii (97.5 g/100g) and the antioxidant activity was the highest in Bambusa balcooa (29.59%). The probiotic LAB load in fresh samples ranged from log cfu/g 5.39- log cfu/g 5.22. It was seen that protein, fat and carbohydrate decreased on fermentation, whereas, fiber, anti-oxidant activity, total phenol and Vitamin C increased during fermentation. The changes in antioxidant activity, phenols and probiotic LAB was studied in real-time for 12 days. HPLC analysis of fresh and fermented bamboo shoots was also carried out for detection of carbohydrates. The study shows a promising neutraceutical potential in bamboo shoots.

Keywords: Bamboo shoots, Neutraceuticals, Fermentation, Lactic acid bacteria, HPLC.

Department of Food Engineering and Technology, School of Engineering, Tezpur University,

Napaam-784028, Assam (India)

laxmikantbadwaik@gmail.com

BPP20

140. Studies on Production of Crude Cellulase and Pectinase from *Aspergillus niger* Using Different Agricultural Wastes

Sumi Barman, Nandan Sit

Pectinase are a group of enzymes that break down pectic polysaccharides of plant tissues into simpler molecules like galacturonic acids. It has long been used to increase yields and clarity of fruit juices. Microbial cellulases also find application in various industries and constitute a major group of the industrial enzymes. The increasing energy demands have focused worldwide attention on the utilization of renewable resources, particularly agricultural and forest residues as substrates. Several microbes are capable of using these substances as carbon and energy sources to produce a vast array of enzymes. The study includes Crude Pectinase production and Cellulase production using submerged fermentation and various parameters like using different substrate such as Rice (Ahu) straw, Lemon (Kaji Nemu) peels, Banana (Bhim Kol) peels renowned as agro-wastes and effect of storage time on activity to obtain the maximum yield of the mentioned crude enzymes. *Aspergillus niger* species was being used in this work for the production of Pectinase as well as Cellulase Enzyme. From the study it can be observed that Rice (Ahu) straw and Banana peels as substrate has got higher Pectinase activity of 0.0155U/ml and 0.0120 U/ml respectively as compared to Lemon peels 0.0090 U/ml whereas in case of cellulase activity it observed that Lemon peels has got the highest acceptance as substrate as there is highest cellulase activity of 12.407U/100ml as compared to Banana and Rice straw 5.065U/100 ml and 2.634U/100 ml respectively. It is also observed that activity of both the enzymes decreases with storage. Therefore, it can be concluded that these agricultural wastes has a potential to be used as a substrate in production of cellulase and pectinase.

Key Words: *Aspergillus niger*, Agricultural waste, Cellulase, Pectinase

Department of Food Engineering and Technology, Tezpur University, Assam-784028, India
E-mail: sumi.gswm@gmail.com

BPP21

143. Effect of Time and Temperature on Drying of *Xanthosoma sagittifolium* Cubes in Tray Dryer

Pallabi Borah, Nandan Sit

Xanthosoma sagittifolium is an herbaceous, perennial, tropical herb grown for its edible starch-filled corms and cormels. The rhizome-like cormels, the part most often consumed, arise from the base of the corm below the soil surface (0'Hair and Asokan, 1986). *Xanthosoma sagittifolium*, popularly named "tannia "or "cocoyam," originally came from tropical America *(*Facciola 1998). The mineral and vitamin content of *Xanthosoma* is high in comparison to other roots and tubers and the starch is also highly digestible and can be used in preparation of baby foods. The drying of its tubers is one of the important processes to extend its shelf life as well as to minimize its space requirement for storage. The cubes of the tubers are dried at three different temperature (50°c, 60°c and70°c) and time (4h, 6h and 8h) in a Tray Dryer. The dried cubes are used for the analysis of different physical parameters final moisture content (dry basis), rehydration coefficient, peak viscosity and colour (L value) using Response Surface Methodology (RSM). From the analysis, it is found that the effect of time is greater than temperature on all the parameters except peak viscosity. Peak viscosity is largely affected by temperature and decreased with increase in temperature. Finally, the optimization is done using desirability function to obtain minimum moisture content and maximum values for rehydration coefficient, peak viscosity and L-value. The optimum conditions for time and temperature obtained were 7.77 h and 50.14ºC with a desirability of 0.61 and the values for moisture content, rehydration coefficient, peak viscosity and colour at the optimum condition are 4%, 0.71, 4038 cP and 87.8, respectively.

Key words: *Xanthosoma sagittifolium*, Drying, Optimization, RSM

Department of Food Engineering and Technology, Tezpur University, Assam-784028, India
E-mail: pallabibrh@gmail.com

BPP22

149. A Comparative Study of Porosity & Permeability with Depth with Special Reference to Bhogpara Oil Field

Mrs. Borkha Mech Das

This work will experimentally study the porosity and air & liquid permeability of Bhogpara core samples obtained from a depth of 3837-3847m. The air permeability curves plotted using Klinkenberg theory to find the liquid permeability. The porosities are measured for different core samples using Helium Porosimeter. The results are then analysed with depth to find out the feasibility of carrying out oil recovery in that depth horizon. The result obtained proves that with increase in depth, porosity and permeability increases, thereby leading to enhanced oil recovery.

Assistant Professor, Department of Petroleum Technology

Dibrugarh University

BPP23

164. Studies on some properties of starch from two different varieties of *Colocasia esculenta*

Devastuti Baruah, Nandan Sit*

Tuber Crops are the most important food crops after cereals which find an important place in the dietary habits of small and marginal farmers in Assam. Physico-chemical properties of starches from two varieties of Colocasia namely *Colocasia esculenta var. esculenta* and *Colocasia esculenta var. antiquorum* from Assam were studied and compared with starches from potato and corn. Starch was extracted by peeling, grinding, mixing with water, filtering, sedimentation and drying of the extract. The studies showed that that the starch content of the Colocasia varieties ranged between 88.67±1.1421-89.9±1.414% d.b which is less compared to potato and corn(93.8±2.121-95.3±0.956% d.b). Amylose content ranged between 16.20±0.78-34.2±1.21% d.b. and the moisture content of the samples ranged from 3.63±0.720-11.93±0.233% d.b. Ash ranged from 0.067±0.0042-.43±0.021% d.b. with potato and corn being the highest and the lowest respectively. Protein and lipid content was too low in all the samples and ranged between 0.64±0.007-2.97±0.057% d.b and 0.014±0.0014-0.12±0.0152% d.b respectively. The solubility and swelling power ranged between 0.055±0.0042-.48±0.042g/100ml and 12.46±0.791-21.24±1.40g/g respectively with *C. antiquorum* being the highest soluble and potato having the highest sewlling power. Absorbance ranged between 0.058±0.0063-0.916±0.017 at 630nm, corn having the highest pure. Pasting properties showed pasting temperatures between 68-88°C and peak viscosities ranging between 2730-10359cP, with potato starch being the highest. The study concluded that the Colocasia species resembled with potato and corn in starch properties and hence can be used to make different products. Also Colocasia being a locally grown tuber of Assam is easily available.

Keywords : *Colocasia esculenta,* corn, potato, physico-chemical properties.

Department of Food Engineering and Technology, Tezpur University, Assam-784028, India

**Email: nandan @tezu.ernet.in*

BPP24

165. Gelatin Based Delivery Systems for Cancer Gene Therapy

S.S. Parikh[×] and H.H. Mehta

Gelatin is a natural, biocompatible, and nontoxic macromolecule obtained by the partial hydrolysis of collagen derived from the skin, white connective tissue, and the bones of animals. Recently it has been used for the delivery system of such gene therapeutic entities as plasmid DNA. The review discusses the current and future prospects in *in vivo and in vitro* studies using gelatin for the delivery of therapeutic genes to cancerous cells. Current complexes of therapeutic DNA with a modified gelatin possibly offers a safe and efficient strategy for systemic administration of therapeutic genes to solid tumors compared to the injection of naked plasmid DNA which lacks in both efficiency and specificity. The methods for the gelatin based delivery system for cancerous cells includes DNA-gelatin nanospheres prepared by controlled water-ethanol solvent displacement method and cationized gelatin hydrogels. Such development will be coordinated by improving the chemical structure of the polymer to make it more cationic, resulting in more efficacious interactions with anionic nucleic acid sequences. The future of these promising approaches lies in the development of the better techniques for preparing gelatin-gene complexes with the aim of a gelatin-based cancer gene therapy with comparable efficiency to viral vectors but with the added advantage of biosafety of patients.

Department of Medical Biotechnology

Shree P. M. Patel Institute of Integrated M.Sc. in Biotechnology, Anand

E-mail: - ***barodablaze117****@gmail.com*

BPP25

167. Use of essential oil in Mosquito Repellent formulations.

L.K. Thakur* & Paras Jain

Various essential oils, from neem (Azadiracta indica), basil (Ocimum basilium), citronella (Cymbopogon nardus), clove (Syzygium aromaticum) and turmeric (Curcuma longa), have been reported in literature as Mosquito Repellent. These essential oils can be formulated as mosquito repellents in various forms such as cream, lotion, candle etc, to replace DEET (N,N-dimethyl-3-methyl benzamide), the most common chemical repellent currently available.

Oil of Citronella is a biopesticide (biochemical) with a non-toxic mode of action. It is registered as an insect repellent/feeding depressant and as an animal repellent. It is extracted from a hardy grass, native to Sri-Lanka & Java. Its main component is citronellol, which is also an effective antiseptic, bacteriocidal and deodorant. This study aims to make suitable cream & lotion formulations of tulsi, turmeric and citronella oils by using cost effective and biodegradable surfactants, preservative & stabilizers.

Key words: Citronellol, surfactant, preservatives, cream, lotion, bacteriocidal, biopesticide, mosquito repellent.

Institute of Pesticide Formulation Technology, Sector-20,
Udyog Vihar, Gurgaon-122 016
Haryana (India)
e-mail: thakurlk1964@rediffmail.com

BPP26

168. Seasonal Pattern of Abundance of Dengue vector mosquitoes in Urban and Industrial Areas of Dibrugarh District, Assam

S. Baruah and P. Dutta*

In Dibrugarh district, one of the most populous districts of Assam, there is a potential risk of dengue virus transmission by the mosquito *Aedes aegypti* and *Aedes albopictus* during the autumn. The seasonal patterns of oviposition activity and abundance of breeding sites of this vector were studied in two areas of the district. From January 2010 to December 2010, we examined a total of 767 ovitraps and 6562 water filled containers. Both study areas showed high percentages of positive ovitraps (64.6% and 65.8%) and positive breeding sites (74% and 72.2%) for *Aedes* mosquitoes with similar seasonal abundance patterns. In industrial areas, percentages of breeding sites and positive ovitraps for *Aedes aegypti* were high as compared to *Aedes albopictus*(positive ovitraps:45.08 % and 20.8%, breeding sites:53.5% and 18.6%) but in urban areas an opposite result with high percentages of *Aedes albopictus* was found(positive ovitraps:46.4% and 18.2% , breeding sites51.2% and 22.8%) .The percentages of breeding sites and the positive ovitraps are high in autumn as compared to the other seasons. In both the areas and with both the methodologies the highest infestation levels were registered in October (ovitraps: 95.2% and 93.1%, breeding sites: 93.5% and 89.5%). These highest abundances took place after heavy rainfall. A sharp decline in oviposition activity was observed when monthly room temperature decreased to16ºc with low rainfall (38mm).

Key words: - Seasonal abundance, ovitraps, breeding sites, *Aedes aegypti, Aedes albopictus,* rainfall, Dibrugarh.

Regional Medical Research Centre, N E Region (ICMR), Post Box 105, Dibrugarh-786001, Assam, India

Email ID- sangeeta1chaya@gmail.com

BPP27

170. Marine Diversity with Special Reference to In-Vitro Studies on Production, Optimization and Purification of Thermostable Xylanase Enzyme From Marine Sponge Derived Fungi and its Application

Atlanta Majumdar

Biodiversity refers to the number of species types in a particular ecosystem and Marine biodiversity refers to the species richness and abundance in the world's oceans and seas. The marine environment comprises 71 % of the earth's surface, and consists of extreme and contrasting habitats, ranging from tropical reefs to ice-shelves of the polar seas, and to black smokers in the deep sea. The biodiversity in the world's oceans is immense, e.g., of 33 known animal phyla 15 are exclusively marine, and 32 of them have marine representatives. These marine resources on Earth have the potential to sustain life indefinitely, if used with caution. However, when exploited, the resources can be lost forever. Marine organisms contribute to many critical processes that have direct and indirect effects on the health of the oceans and humans.

Marine Sponges associated fungi serve as rich sources of Xylanase enzyme. Microbial xylanases are the preferred catalysts for xylan hydrolysis due to their high specificity, mild reaction conditions, negligible substrate loss, and side product generation. However, the cost of the enzymatic hydrolysis of a biomass is one of the main factors limiting the economic feasibility of this process. Therefore, the production of xylanases must be improved by finding more potent fungal or bacterial strains or by inducing mutant strains that can excrete greater amounts of enzymes, In the present study, fungi from the marine sponge samples from significant regions of Kanyakumari and Ramanathapuram coast will be investigated to isolate novel strains of Fungi and their efficiency to produce Xylanase enzyme that are applied industrially. The culture conditions will be optimized to produce optimum quantity of thermostable Xylanases. The objective of this research was to investigate xylanase production by filamentous fungi to determine the best cultivation conditions in the process, aiming toward optimization of enzyme production. The best temperature, as well as the best carbon source and nitrogen source, for biomass production was determined. The enzyme activity of this fungus was separately evaluated. Temperature effects, salt and solvent precipitation effect was also evaluated. The study demonstrated not only the importance of the nature of the substrate in obtaining a system resistant to catabolic repression, but also the importance of the culture conditions for biosynthesis of the enzyme which showed a high potential for xylanase production under the conditions presented in these assays. Thus exploiting the marine sponges provide a variety of products and services which are essential to man's survival and well-being. Without marine biodiversity the production of food, ingredients for biotechnology and pharmaceuticals, and even the composition of some parts of land would be either severely diminished or depleted. So there is the utmost need to protect the marine environment and consciousness of mankind would play the major role to implement these goals.

M.TECH (Biotechnology)
atlanta4u@rediffmail.com

BPP28

173. Cloning and comparative binding of two Carbohydrate Binding Modules of Family 35 (Cthe2811 and Cthe0032) from *Clostridium thermocellum*

Arabinda Ghosh[1], Carlos M.G.A. Fontes[2] and Arun Goyal[1]

Family 35 Carbohydrate Binding Modules (CBM35) are generally appended to xylanase, mannanase galactanase and pectate lyase catalytic domains (http://www.cazy.org/GH26.html). The ligand affinity of CBMs may significantly alter the activity of the associated catalytic domains. In this study the genes encoding two CBM35s modules of *Clostridium thermocellum* cellulosomes were cloned and expressed in *Escherichia coli*. The CBMs were purified through immobilized metal-ion affinity chromatography (IMAC). Both CBMs bind galactomannan (Carob), galactomannan (Locustbean), glucomannan (Konjac) although *Ct*CBM35 (Cthe2811) displayed a slightly higher potency on binding. The association constants (K_a) of *Ct*CBM35 (Cthe2811) were 14.28 C^{-1}, 19.23 C^{-1} and 41.66 C^{-1} whereas K_a values for *Ct*CBM35 (Cthe0032) 14.0 C^{-1}, 10.0 C^{-1} and 33.33 C^{-1}, respectively, for galactomannan (Carob), galactomannan (Locustbean) and glucomannan (Konjac). The associated catalytic domains were found to comprehend typical mannanases. Thus this study suggests that CBM35 found in *C. thermocellum* mannanases target the associated catalytic domains into their target substrates promoting higher rates of polysaccharide hydrolysis.

[1]*Department of Biotechnology, Indian Institute of Technology, Guwahati, Guwahati, 781039 Assam, India.*
arabinda@iitg.ernet.in

[2]*CIISA-Faculdade de Medicina Veterinaria, Avenida da Universidade Técnica, 1300-477 Lisbon, Portugal.*

BPP29

174. Development and Evaluation of a Mucoadhesive Nasal Gel of Fluorouracil Prepared with mucoadhesive substance of *Vigna mungo* seeds

Pranjal Saikia[1], Bhanu Pratap Sahu[1], Mira Debnath [2], Hemanta K Sharma [3].

The present study involved development of gel from natural mucoadhesive agent extracted from *Vigna mungo* (VM) seeds for nasal delivery of flourouracil .The adhesive substance were isolated and characterized in terms of pH, viscosity, swelling and mucoadhesiveness. The gels were characterised for pH, viscosity and compatibility. The permeation of drug through excised goat nasal mucosa was studied. The results were compared with the gel prepared from synthetic polymer HPMC.

The pH of a 4% aqueous solution of VM was found to be 6.46. The Vigna mungo (VM) extract showed better swelling behavior in water in comparison to HPMC, showing Swelling Index of 480 % and 380% respectively.The viscosity of the formulations were found to be satisfactory in the range of 110-150 cp. All the preparation showed similar permeation profile showing a sudden permeation of up to 25%-40%% in the first 300 min which remained more or less constant thereafter. Preparation containing 4% VM Extract (F3) showed better nasal permeation up to 39 % in 300 min compared to preparation containing 4%HPMC (F1) which showed permeation up to only 27% in 300 min. The FTIR studies showed no incompatibility in their physical mixture.

It may be concluded that adhesive substance obtained from seeds of Vigna mungo can be used for preparation of gels of fluorouracil for nasal delivery. This may be effective in increasing the systemic availability of the drug thorough nasal administration without use of synthetic polymers.

Keywords: Nasal gel (•).Mucoadhesive substance (•).Vigna mungo (•).HPMC(•).

1.Department of Pharmaceutics ,Girijananda Chowdhury Institute of Pharmaceutical Science (GIPS) , N.H.37, Hatkhowapara, Azara, Guwahati- 781017, Assam, India.(Date of Birth:01-05-1986)
2. Centre for Biotechnology, Dibrugarh University, Dibrugarh, 786004,Dibrugarh, India.
3. Department of Pharmaceutical Sciences, Dibrugarh University, Dibrugarh, 786004,Dibrugarh, India.
E-mail(s): gallen2011@rediffmail.com

BPP30

175. Microbiota of Agricultural Land under Sugarcane Cultivation in Karbi Anglong District of Assam

P Hazarika[1*], RH Begum[1], AK Tamuli[1]

Soil microorganisms provide precious life to soil system influencing plant growth and health. The combination of microorganisms of soil varies from place to place depending on longitude, latitude, climate topography *etc*. About 85% of the microbial flora of soil is beneficial for plant life. Species like *Bacillus, Micrococcus etc.* are known for increasing soil fertility while species like *Agrobacterium, Pseudomonas etc.* are pathogenic. A detailed knowledge of the microbiota of agricultural soil ensures maximum protection and productivity of the crops. Keeping in view the above, the present study was conducted for identification of the microbial flora of top soil and sub soil from high, medium and low lands of agricultural lands of Kheroni area in Karbi Anglong district of Assam extensively under sugarcane cultivation. A total of 51 Gram negative microbial isolates were obtained, out of which 40 were found to be *Bacillus* and 11 were *Coccus*. Biochemical analysis showed that 100% of the isolates were catalase and citrate positive, amylase negative and endospore forming bacteria. Thirty eight (74%) of the isolates showed lactose fermentation, 48 (94%) isolates were able to utilize glucose and sucrose was utilized by 47 (92%) isolates and the remaining showed no reaction. Thus, it can be concluded that the sugarcane cultivated field of Kheroni harbours a good number of *Bacillus* as well as other groups of bacteria although the contribution of these isolates to sugarcane growth and productivity is yet to be ascertained.

[1] Assam University: Diphu Campus, Assam, India
pallabihazarika.2010@rediffmail.com, ani.ara73@gmail.com, aktamuli1960@gmail.com

BPP31

176. Traditional use of medicinal plants by the Mising tribes of Dhemaji district of Assam, a North Eastern state of India

M. Narah[1], J.C. Kalita[2] and J. Kotoky[3]

Assam is prodigious in plant biodiversity as well as in ethnic diversity and has a pristine traditional knowledge on the therapeutic sources of medicinal plants. It is inhabited by the largest number of tribes and they lead an intricate life totally dependent on forest plants. The Mising is the major section and second largest tribal community of Assam. From ancient time Mising people use indigenous plants as food and for curing diverse form of ailments. The study has been undertaken, during the period January-July 2011, through structural questionnaires in consultation with the Mising traditional practitioners of Dhemaji district of Assam and has resulted in the documentation of 26 medicinal plant species belonging to 19 families. Traditional Mising practitioners use these plants for curing diseases like jaundice, diarrhea, diabetes, fever and blood pressure. From this study, we emphasize to select a few important plants to evaluate the usefulness and efficacy against the diseases claimed by the practitioners of that region. This study underlines the ethnomedicinal importance of potential plants used by the Mising community and its future perspective pertaining to the proper utilization of medicinal plants for the greater benefit of mankind.

Keywords: Mising people, Traditional practitioners, Diseases, Ethnomedicinal.

[1,2]*Department of Zoology, Gauhati University, Ghy-14, Assam*

[3] *Division of Life Sciences, IASST, Paschim Boragaon, Garchuk, Ghy-35, Assam*

Email: anownarah@gmail.com

BPP32

177. Assessment of Molecular, Physical and Biochemical risk factors associated with development of psoriasis- A pilot study

Rituraj Bharadwaj[*, ***], Subhash Medhi[**], Manab Deka[**], Sujoy Bose[***]

Background: Psoriasis is a chronic, non-contagious skin disease with a predicted auto-immune etiology, and limited success with the available medical interventions. Therefore a clear understanding of the underlying molecular or immunological manifestations and other external and internal risk factors is indispensable for future therapeutic approaches and success. Psoriasis is a global problem, and there is a huge load of patients nationally and in Northeast India. Therefore the present pilot study was planned to assess the risk factors associated with the development of psoriasis. **Methodology**: Blood samples were collected from clinically diagnosed psoriasis patients (n=7) and age and sex matched healthy controls (n=3), with detail history of smoking, alcoholism, medication, blood proofing etc. Differential mRNA expression for IL-12, IL-10 and TNF-α was studied by Real-time PCR method. IL-2 and IL-4 expression was studied by ELISA. Statistical analysis was performed by SPSSv13 software. **Results**: Differential mRNA expression showed many fold increase in IL-12 and TNF-α (Th1 markers) as well as IL-10 (Th2); whereas protein based expression of IL-2 and IL-4 showed statistically significant up regulation and down regulation respectively compared to controls. Smoking and alcohol drinking habits were found to play an associative role with immune deregulations in the development of psoriasis along with use of drugs such as anti-diabetic, antibiotics and higher serum cholesterol levels. **Conclusion**: Our present data proves that altered immuno-modulation status is critical for psoriasis development, and the risk factors for the disease may be multi-factorial with smoking, alcoholism etc playing an associative role in psoriasis development.

Key words: psoriasis, IL-12, IL-10, TNF-α, risk factors

**Department of Pharmaceutical Sciences, Dibrugarh University.*

***Department of Biological Science, Gauhati University.*

****Department of Biotechnology, Gauhati University.*

bharadwajrituraj@gmail.com

BPP33

178. Free Radical Scavenging, Antioxidant and Anti- Bacterial Activity of Four Medicinal Plant of North-East India

R R Doley[1*], R Dutta[2], P Saikia[3], P Kalita[1], R Hanse[1], Md. K Zaman[3]

Medicinal plants serve as source of many pharmacologically active compounds having no or low side effects. In this study four medicinal plants *Adhatoda vasica , Terminalia arjuna, Oroxylum indicum* and *Myrica esculenta*, were screened for different phytochemical constituents, antioxidant activity, total phenolic content and the antimicrobial activity. Crude extracts from leaves of these plants were used for the experiments. Extractions were done using different solvents by sequential extraction method in the order of increasing polarity using soxhlet apparatus. Preliminary phytochemical analysis revealed the presence of alkaloids, glycosides, flavonoids, flavanols, phenols, saponins and terpenoids in all the plants. The scavenging activity of methanol extracts showed high potency compared to the other solvent extracts. The antioxidant activity of methanolic extracts were studied using the free radical scavenging activity assay (DPPH method), reducing power assay, nitric oxide scavenging activity, hydroxyl radical scavenging activity and H_2O_2 scavenging activity. These were expressed as IC_{50}. A high correlation between antioxidant activity and total phenolic content indicated that phenolic compounds could be the main contributor of the antioxidant activity of these plants. Antibacterial activity of these plants studied with respect to different pathogenic bacteria *viz, Bacillus subtilis, Escherichia coli, Pseudomonas aeruginosa* and *Bacillus feacalis* by disc diffusion method showed that methanolic extract of *Termanalia arjuna,* was most effective against the tested microorganisms. The present study provides evidence that *Termanalia arjuna* extract, shows potential antioxidant, free radical scavenging activity and antimicrobial than the other plants tested.

[1] Assam University: Diphu Campus Diphu-782460, Karbi Anglong, Assam, India
[2] Tezpur University Napaam, Tezpur-784028, Assam
[3] Dibrugarh University, Dibrugarh-786004, Assam
rhituraj_doley@yahoo.com

BPP34

192. Microalgae: a potent candidate for biomitigation and biofuel production in North Eastern states, India

Rajiv Chandra Dev Goswami[1], Nitumani Kalita[1] , Bornali Baishya[1], Pranjan Barman[1], Mohan Chandra Kalita[*]

Biological CO_2 mitigation approaches have drawn much attention as they lead to production of biomass energy in the process of CO_2 fixation through photosynthesis. Microalgae are photosynthetic microorganism that is able to use solar energy to combine water with carbon dioxide to create biomass. As these cells grow in aqueous suspension, they have more efficient access to water, CO_2 and other nutrients. They offer several advantages over higher plants, including their higher photosynthetic efficiency, higher growth rates and higher biomass production compared to energy crops. Microalgal- CO_2 fixation is environmentally sustainable when combined with other environmental-protecting processes, such as wastewater treatment or heavy metal removal. A combination of CO_2 fixation, biofuel production, and wastewater treatment may thus provide a very promising alternative to current CO_2 mitigation strategies. So search for an efficient microalgae strain is in high demand so as to design a conceptual technique for CO_2 fixation system that combines solar energy and waste water treatment to convert CO_2 into different downstream products via photosynthesis. Many microalgal species were isolated and screened for oil content and CO_2 mitigation in this North Eastern region, India. Some of them are *Scenedesmus dimorphus, Scenedesmus quadricauda, Chlorella sp., Selenastrum sp. etc.* Their growth behavior is being investigated in different nutritional conditions in order to produce lipids that can be transformed into biodiesel fuel. Different concentrations of bicarbonate salts, carbon dioxide gas, also various salts like sulfate salts, nitrate salts, urea, salinity etc are some of the parameters considered for analysis of biomass production and lipid content. The *Chlorella sp*. and *Scenedesmus dimorphus* are found to be very potent in biomitigation and biofuel generation respectively. The microalgal species found in Assam, North East India, has the promising potential to serve as resource base for biotechnological output in increasing the bioactive output and initiating commercial exploitation in future. So the need of research involving the isolation and screening of freshwater microalgae of Assam in search of potential strains for sustainable production of renewable biofuel and to develop technology for mitigation of harmful green house gases is primary agenda of this region

Keywords: microalgae, lipid, biofuel, biomass

[1]*Department of Biotechnology, Gauhati University, Guwahati-14*
**Prof., Dept. of Biotechnology, Gauhati University, Guwahati-14*
rajivgoswami23@gmail.com, nitumani.kalita86@gmail.com, bornali2009@gmail.com, pranjan.barman@gmail.com, mckalita@sify.com

BPP35

193. Screening of *Houttuynia cordata* (Thunb): A magic plant of Assam

Dr. S. Das*[1], Sanjay Yadav[2], Mukesh Dubey[2]

Historically India had very strong and well acclaimed system of health care. It is universally known that during course of civilization, at one time nearly all therapeutic agents were derived from biological resources. Even today, they remain vital and as much as 67-70% of modern drugs are derived from natural products. Plants have attracted scientists from ancient times. However, until recently an insignificant part of the plants has been scientifically evaluated for their medicinal values. Diarrhoea is important health problem worldwide. W.H.O. estimates that, diarrhea is second leading cause of death @ 5 million/year deaths were caused by diarrhoea. *Houttuynia cordata* commonly known Mashundhari is a magic plant of Assam and traditionally highly used in loose motion. It was collected from surrounding to Dibrugarh city and authenticated at NBRI. Lucknow (NBRI/CIF/145/2010). Literature survey & traditional use have revealed that *H.cordata* having antidirrhoeal activity but not reported. The plant material was defatted and then extracted with methanol. The methenolic extract was evaluated for anti-diarrhoeal activity in albino rats. Overnight fasted albino rats (either sex) were used for castor oil induced diarrhea & gastric transit time. One group (Control) received vehicle. Second & third groups, received orally methanolic extract of *H.cordata* 200 & 400mg/kg, respectively. Fourth group (Standard) received orally Lopramide hydrochloride in dose of 3mg/kg. The methenolic extract of *H.cordata* at a dose of 400 mg/kg significantly reduced the total number of faeces as well as the total number of diarrhoeic faeces in a dose- dependent manner. This was compared with the loperamide. These results were shown to be statistically significant ($P < 0.001$). This biologically active extract was subjected to column chromatography using silica gel as stationary phase and increasing order of polarity of mobile phase (C_6H_{14}, C_6H_{14}:$CHCl_3$, $CHCl_3$:MeOH) and isolated a single compound (Rf = 0.36) at 327 to 377 fraction, M.P. was found to be 105-115 ^{0}C.

1. Professor & Head, Department of Pharmaceutical Sciences, Assam University, Silchar
2. Deptt. Of Pharmaceutical Sciences, Dibrugarh University Dibrugarh, Assam.
Sanjay Yadav , mpharmfaculty@gmail.com

BPP36

194. Different pharmacological effects of the extract of *Bauhinia variegata*

Dr. Tikendrajit Sarma[1], Mahua Bhaumik Singha[2],

Bauhiniavariegata is a moderate sized deciduous tree found throughout India. It is used inthe Indian system of medicine. Research Databasereports studies on the management of different types of goitre by standard Ayurvedic compound *Kanchnara guggulu*, where a major constituent is Bauhinia. Some study of its wide range of activity is summarised below:-

- Mali RG*et al*evaluated the effects of extract of *Bauhinia variegata* against milk-induced eosinophilia in mice in 2011.
- Prashar Yash *et al* evaluated the effects of plant extracts in high fat diet induced obesity in rats in 2010.
- Pandey Sonam *et al*observedelastogenic analysis of the bark extract usingmicronucleus assay in mouse bone marrow cellsin 2010.
- Pandey Sonam *et al*reported apreliminary study on the effect of the bark extract on DMBA-induced mouse skin carcinogenesis in 2009.

- Rajani G.P.reported *in vitro* antioxidant and antihyperlipidemic activities of the plantin 2009.
- GuptaRajesh studied antibacterial activity of extract of the leaves in 2009.
- Mohamed MA*et al* evaluated antinociceptive and anti-inflammatory activities of triterpene saponin fromthe leaves in 2009.
- Rao Yerra Koteswara *et al*studied anti-inflammatory activities of flavonoids and a triterpene caffeate isolated from the plantin 2008.
- Ghaisas MM *et al* evaluated the immunomodulatory activity of the extract of the stem bark in 2008.

Apart from the above work, there is also ample scope for study of the plant *Bauhinia variegata* in different fields like action in gland e.g. Thyroid and prostate gland etc.

[1]*Associate Professor, Department of Sharir Rachana, Government Ayurvedic College, Guwahati, Assam. Email: tikendrajit77@rediffmail.com*
[2]*Lecturer, Institute of Pharmacy, Gauhati Medical College, Guwahati, Assam. Email: mahuabsingha@gmail.com*

BPP37

195. Removal of Lead through accumulation in *Eichhornia crassipes* : An eco friendly approach

Sangita Baruah, K. P. Sarma*

Environmental contamination of the aquatic systems by toxic metals is a serious problem. Unlike organic pollutants, toxic metals are not degradable by chemical or biological processes. Lead (Pb) is one of the most toxic heavy metals and a potent environmental pollutant.

Phytoremediation, a plant based green technology, has received increasing attention after the discovery of hyperaccumulating plants which are able to accumulate, translocate, and concentrate high amount of certain toxic elements in their above-ground/harvestable parts.

The possibility of using *Eichhornia crassipes* as natural bio-filters for treatment of Pb in the aquatic system is explored. Pb uptake, localization within and around root, petiole and leaf of *Eichhornia crassipes* grown hydroponically in a $Pb(NO_3)_2$ solutions were studied by Scanning electron microscopy coupled with elemental X-ray analysis (SEM-EDX) at different increasing concentrations of Pb. This analysis showed upward Pb transport by root vascular tissues to leaf. Important changes in surface morphology of root and metal binding mechanism were also studied by using SEM/EDX. The photosynthetic rate of *Eichhornia crassipes* sharply decreased when grown in aquatic medium containing Pb. Extracellular adsorption and intracellular metal uptake can be analyzed separately by washing the biomolecules by EDTA. Pb adsorption in the roots of *Eichhornia crassipes* before and after EDTA wash was also studied by SEM-EDX.

Department of Environmental Science
Tezpur University, Napaam, Tezpur-784028, Assam, India
E-mail: sangita@tezu.ernet.in

BPP38

196. Biosurfactant for recovery of hydrocarbons from refinery sludge

Rashmi Rekha Saikia[a], Debahuti Goswami[a] , Suresh Deka[a] , Manab Deka[b]

Biosurfactants are surface active molecules/compounds capable of reducing viscosity of heavy oils thereby facilitating recovery, transportation and pipelining. In the present study investigation of recovery of hydrocarbons from refinery sludge was carried out by using isolated *Pseudomonas aeruginosa* RS29 strain.

Bacterial cultures were isolated from crude oil contaminated soil of Lakowa oil fields, Assam. The most potent biosurfactant producing strain was screened out by measuring surface tension of the culture medium and identified as *Pseudomonas aeruginosa* RS29 by 16S rDNA sequencing. The strain was cultured in mineral medium with glycerol as carbon source and production of biosurfactant was measured. For recovery of hydrocarbons, refinery sludge was mixed with river sand to effect sludge concentrations 5%, 10% and 15% (w/w). The sterilized mixtures were added to the abovementioned whole bacterial culture. Recovery of hydrocarbon was calculated from the difference between the initial and final oil content of the sand-sludge mixture through soxhlet extraction method. A maximum of 67% hydrocarbon recovery was observed from 10% sand-sludge mixture whereas 40% and 50% of hydrocarbon was recovered from 5% and 15% sand-sludge mixtures respectively. While extracted from the culture medium and characterized by biochemical as well as spectral analysis, the produced biosurfactant was identified as rhamnolipid.

[a] *Life Sciences Division, Institute of Advanced Study in Science & Technology, Paschim Boragaon*

Guwahati-781035, Assam, India

E-mail: rashmi.saikia@gmail.com, sureshdeka@yahoo.com

[b] *Department of Biotechnology, Gauhati University,*

Guwahati-781014, Assam, India

E-mail: d_bhaity@rediffmail.com

BPP39

197. Conservation and Medicinal Importance of Citrus Indica (Endangered Species)

Dr. Ratan Chakraborty

Citrus indica is a wild endangered species of Citrus found in North – East India specially in Nokrek (Meghalaya). It belongs to Rutaceae family. It is locally known as Me′mang Narang and is used as a medicine for dysentery, cholera and diarrhoea. Tribal people also use it as a curative for various type of skin diseases.

Nokrek was declared National Citrus Gene sanctuary after Indian wild oranges (Citrus indica, Tanaka) was found in 1984. Nokrek is situated between 25°8′and 26°1′ of North latitude and 89°49′ and 91°21′ of East longitude. The mother germoplasm of Citrus indica has been discovered within the Nokrek range. This discovery led to the establishment of the National Citrus Gene sanctuary cum Biosphere Reserve covering an area of 47 sq km.

Nokrek Biosphere Reserve is situated in the West Garohills district of Meghalaya. A virgin canopy of thick, tall and lush green forests cover the Nokrek and its environs. It is a buffer zone for Citrus indica . The area is noted for its wild varieties of Citrus fruits that provide a gene-pool for commercially produced Citrus.

This Citrus plant is infected by the following pathogen like Ganoderma, Fusarium, Phytopthora and Colletotrichum.

Keywords: Need for Conservation, Medicinal importance of Citrus indica, Nokrek Biosphere Reserve, diseases of Citrus indica.

Associate Professor,

Head of the Department (Botany), Don Bosco College, Tura.

Dist. West Garo Hills,Meghalaya - 794002

e-mail : rtnchkbrty @ rediffmail.com

BP40

227. Physical Changes in Bamboo Shoot (*Bambusa balcooa*) During Hot Air Drying

Monisha Choudhury, Pallab Kumar Borah and Laxmikant S. Badwaik

Department of Food Engineering and Technology, School of Engineering, Tezpur University,

Napaam-784028, Assam

laxmikantbadwaik@gmail.com

Bamboo shoot plays an important role in diet of North East population. It evolved different indigenous techniques of processing like slicing, shredding, fermenting, pickling and drying. Effect of hot air drying on physical changes of bamboo shoots (*Bambusa balcooa*) was studied. Shoot cubes with the dimension of 1×1×1 cm^3 were prepared (untreated) and dried in tray dryer at 60°C as well as 70°C for 6 hours. Simultaneously some shoots cubes were boiled in hot water for about 30 min (treated) and dried in similar manner. Each sample was taken out from dryer at interval of 1hour. Moisture content and degree of shrinkage were calculated at each hour of drying and on this basis drying kinetics and shrinkage pattern were studied. Moisture removal rate for both types of samples were found similar and it is higher at 70°C. Shrinkage of shoots cubes was more for treated samples but shrinkage pattern is nearly similar for both treated and untreated samples.

Keywords: Bamboo shoots, Moisture Ratio, Shrinkage, Drying

BPP41

228. Process optimisation and quality analysis of prepared Carambola wine

S K Paul[1], B J Hajarika[2], S Ahmed[2]

Extracted Carambola (***Averrhoa carambola L.***) juice was used as the principal raw material for the production of wine. Processing conditions were optimised and found that the TSS: 24 ºB, pH: 4.5, temperature: 26 ºC and inoculum size of 12 % (v/v) was ideal for fermentation. Physicochemical analysis of the prepared wine revealed that the wine is a good quality table wine having ethanol percentage of 12.15±0.28 % (v/v). Other parameters like titratable acidity, total sugar, reducing sugar, TSS (ºB) were found as 0.76±0.21 %, 2.84±0.22 g, 2.65±0.16 g, 4.6±0.06 ºB in 100 g of the wine which resembles to that of other fruit wines but the pH which was found as 3.94±0.17 is very slightly higher than that of generally acceptable limit. The sensory evaluation report suggests that the wine have a very good aroma, colour and superior acceptability.

Keywords: Carambola, wine, fermentation, physicochemical, sensory evaluation, aroma

Department of Agricultural Engineering, Assam University, Silchar[1]
Department of Food Engineering and technology, Tezpur University, Tezpur[2]
E-mail: sankumarpaul@gmail.com
sankumarpaul@yahoo.com

BPP42

229. Studies on some microbiological and biochemical properties of different varieties of rice beer from North-East India

A.J.Das*, S.C.Deka, P.Khawas & N.Sit

The preparation of rice beer by many of the tribal communities of North-East India is an age long tradition. This fermented alcoholic beverage has significant association with the socio- cultural lives of the people of this region. Microbiological and biochemical analysis of nine different varieties of rice beer samples collected from four states of North-East India was carried out. The general plate count showed organisms in the range between 3 x 10^2 to 3.1 x 10^9 CFU ml^{-1} of sample. The count of yeasts in all the samples ranged from 2.7 x 10^6 to 2.1 x 10^8 CFU ml^{-1}, while *Lactobacillus* species were found to be present in all the samples with the highest count being 3.5 x 10^7 CFU ml^{-1} in one of the samples. Members of the *Enterobacteriaceae* family were found to be present in one of the samples and four of the samples were found to contain *Staphylococcus* species in low count. Moulds were found to be absent from all the samples. The samples had pH values ranging from 3.35 to 5.07 and titrable acidity from 0.32 to 0.76 (% of lactic acid), while the highest volumetric ethanol content was found to be 4.39%. The ash, protein, fats, total sugars, reducing sugars, starch and amylose content varied from 0.016% to 0.37%, 1.02% - 0.25%, 0.06% - 0.86%, 0.63% - 8.47%, 0.201% to 3.47%, 0.74% - 1.38% and 0.48% - 1.21% respectively. The concentration of total phenolic compounds and ascorbic acid was recorded at highest levels of 10.06 mg/100gm and 2.78 mg/100gm of samples respectively. The free radical scavenging activity of the samples against DPPH free radicals had a lowest value of 44.38% and a highest value of 90.95%. HPLC analysis of the organic acids content showed that lactic acid was present in high concentration in all the samples ranging from 620 ppm to 9105 ppm, while other acids showed variations with samples. The overall study indicated that this traditional product has fine nutritional values and dietary requirements.

Department of Food Engineering & Technology, Tezpur University, Napaam, Sonitpur, Assam-784028, India
**E-mail: arupdas@tezu.ernet.in*

BPP43

231. Antagonistic activity of endophytic fungus *Colletotrichum gloeosporioides* against the isolates of *Pestalotiopsis theae* (tea pathogen)

Aparna Jyoti Rabha[1*], A. Naglot[1], Dr. H. K. Gogoi[1], Prof. G. D. Sharma[2], Dr. L. Singh[1]

Tea plant (*Camellia sinensis*) is the major cash crop in North-East India, which belongs to the Camellia genus of the theacae family. Tea plant is attacked by numbers of pathogens; among them the fungal Phytopathogen *Pestalotiopsis theae* is very common which causes 'grey blight' on the leaves of the tea plant. Different chemical treatment is provided as a control measurement of the disease. But the decreasing efficacy of the fungicides as well as risk associated with fungicides residues on leaves and fruits have highlighted the need for a more effective and safer alternative control measure. In recent years, endophytes have received increasing attention as a promising supplement or alternative to chemical control according to Waffa M. Haggag. An endophytic fungus isolated from healthy tea plant showed considerable antagonism activity against *P. theae.* The endophyte was identified as *Colletotrichum gloeosporioides* on the basis of morphological and molecular characterisation. Morphological identification was done according to their characteristic colony and microscopic morphology. Molecular identification was carried out by PCR amplification of ITS region of *C. gloeosporioides*. Six different methods of surface sterilization were taken for isolation of endophytes and the effectiveness of surface sterilization was checked by using a vitality test according to Petrini et.al. *C. gloeosporioides* was screened *in vitro* for antagonism against *P. theae* by using dual culture and cell free extract. Dual culture showed 43% *in vitro* antagonism against *P. theae* and cell free extract showed 60% antagonism activity.

[1] *Biotechnology Division, Defence Research Laboratory, Tezpur (Sonitpur), Assam-784001*

[2] *Professor of Life Science and Bioinformatics, Assam University, Silchar, Assam-788011*

**e-mail: aparna_mirza@yahoo.co.in*

BPP44

232. Analysis of a protein putatively involved in *Plasmodium falciparum* apicoplast segregation

Aiman Tanveer and Saman Habib

The malaria parasite *Plasmodium falciparum* belongs to the phylum Apicomplexa whose members harbour a relict plastid, the apicoplast. In *Plasmodium* species the apicoplast divides during the process of schizogony. *P. falciparum* lacks homologs of both ARC5 and FtsZ which play an essential role in bacterial cell division suggesting that the apicoplast division is mechanistically different from previously studied plastids. Another member of the *fts* gene family, FtsH, is predicted on the *P. falciparum* genome. Of the three FtsH homologs in the parasite, PFL1925w shows maximum identity with the predicted FtsH of the related apicomplexan, *Toxoplama gondii*. We thus investigated the processing and function of FtsH in *Plasmodium*. The ATPase and protease domain of *Pf*FtsH was cloned and expressed in *E. coli* and analysis of protease activity using α-casein as substrate suggested that it is a weak protease. The antibody against this domain was raised in both rabbit and mice. Western-blotting of the parasite lysate with anti FtsH serum revealed the full-length protein (100 kDa) with the major band at ~66kDa. Pulse-chase analysis further showed that the ~100kDa full-length protein is processed to a mature protein of ~66kDa. Thermolysin protection assay indicated organellar localization of *Pf*FtsH. *Pf*FtsH was unable to complement the *E. coli* FtsH mutant AR423 possibly due to low levels of expression. However, a fraction of bacterial cells (~7%) exhibited defective cytokinesis upon expression of *Pf*FtsH, suggesting an antagonistic effect of the *Plasmodium* protein on *E. coli* FtsH that is indicative of conservation of function.

Molecular and Structural Biology Division, CSIR-Central Drug Research Institute, M.G. Marg, Lucknow.

e-mail: aimancdri@gmail.com

BPP45

234. Optimization of the extraction of light-coloured protein from rapeseed press-cake

Anasuya Barthakur, Manashi Das Purkayasthya, Dr. Charulata Mahanta*

Present investigation was undertaken to improve the yield and colour of protein extracted from rapeseed press-cake. Preliminary investigations were done in the laboratory for determining the effect of different extraction pH levels on yield and colour of crude protein extract. Maximum protein extractability was observed at pH 11-12. Response Surface Methodology (RSM) in conjunction with Rotatable Central Composite Design (RCCD) was used for assessing the optimum yield and colour of protein from the treated meal (partially dephenolized) at pH 11. RCCD matrix consisted of four independent variables (extraction time, solvent/meal ratio, sodium chloride and sodium sulfite concentrations), and each variable examined at five different levels (-2, -1, 0, 1, +2). Selected responses (dependent variables) were protein yield and absorbance value of protein solution (at 350 nm). Protein yield was primarily affected by solvent/meal ratio, whereas absorbance value was affected by solvent/meal ratio and sodium sulfite concentration. Maximum yield was obtained when extraction time, solvent/meal ratio, sodium chloride and sodium sulfite concentration were 1 hr, 27.17 (v/wt), 0.05 M and 0.32 % respectively. The adequacy of the model was confirmed by extracting the protein under suggested optimum values given by the Design Expert software (v 8.0.6). These conditions resulted in protein yield of 142.564 mg/ g dry meal and its absorbance value was found to be 0.062. These results help in designing the process of optimal protein extraction and minimum absorbance values from partially dephenolized rapeseed meal.

Department of Food Engineering and Technology, Tezpur University, Napaam, Tezpur, Assam, Pin- 784028. Email : anasuya_barthakur2001@yahoo.com

BPP46

235. A preliminary survey on the medicinal plants used for primary healthcare system of the Koch Rajbangshi community of North Salmara Subdivision, Assam.

Ashoke Kumar Das[1], Manabendra Ray Choudhury[2], Gajen Chandra Sarma[3]

We did a preliminary inventory on the medicinal plants used by the Koch Rajbangshi people of the North Salmara sub-division, Bongaigaon District, Assam. The traditional healers of three Koch Rajbangshi dominated villages were interviewed. A total of 73 plants were found to be used in the healing practice of 36 types of diseases including diabetics, heart problem, and neurological disorders. Use of leaf was found to be more than other parts of plant. Among the plants 49 species were found to be common in occurrence, while 19 species were less common and 5 species viz. *Aristolochia indica* L., *Asparagus recemosus* Eilld., *Cissus quadrangularis* L., *Garcinia morella* (Gaertn.) Desv and *Rauvolfia serpentina* Benth. were rare in the study area.

Key words: Koch Rajbangshi, medicinal plants, healing practice.

1. Department of Botany, Abhayapuri College, Abhayapuri.

2. Department of Ecology & Environment Science, Assam University Silchar.

3. Department of Botany, Gauhati University, Guwahati.

Email: das.ashoke09@yahoo.co.in

BPP47

236. Studies on interaction of anti TB drug molecules using docking and hybrid (QM/MM) methods

Kalyan Kr. Hazarika[1], Ramesh C. Deka[2] and Nabin Ch. Barua[*3]

The front-line antituberculosis drug isoniazid (INH) is one of the most common and efficient drugs used in the treatment of tuberculosis. Even after some 50 years of its discovery this potent and highly selective agent is still an attraction of therapy. Despite of this, searching for new antimycobacterial agents has relevance because of the serious side effects of these anti-TB drugs, drug resistance, and lack of efficacy in immunodepressed patients.

Although several mechanisms of action of INH were reported explaining the exceptional and highly selective potency of INH against *Mycobacterium tuberculosis*, the exact mode of action of INH is not yet fully understood. It is well established that isoniazid itself is not the true drug. It gets oxidized to an active species and then acts as a drug. Isoniazid inhibits InhA, the NADH-dependent fatty acid biosynthesis enoyl ACP-reductase from *M. tuberculosis*, via formation of covalent adducts with nicotinamide adenine dinucleotide (NAD).

Knowing the mechanism of action is important for drug design. The predictions of ligand–protein interactions at the molecular level can be of primary importance in elucidating the mechanisms of action of INH. We explore the modes of interaction and binding energy of INH and another structurally similar antituberculosis drug molecule pyrazinamide (PZA) placed in the active site of InhA with the help of various molecular modeling techniques. Interaction of INH-NAD and PZA-NAD adducts with the active site of the enzyme are investigated using docking as well as hybrid QM/MM techniques.

[1]*Department of Molecular Biology & Biotechnology*

[2]*Department of Chemical Science, Tezpur University, Napaam, Tezpur - 784028, Assam, India*

[3]*Natural Products Chemistry Division, CSIR-North East Institute of Science & Technology, Jorhat, Assam, India*

E-mail: kalyan@tezu.ernet.in

BPP48

237. Targeting Redox System of Leishmania Parasite for Drug Discovery

Anil Kumar Shukla, Sanjukta Patra, ***Vikash Kumar Dubey****

Leishmaniasis is a neglected tropical disease caused by a protozoan parasite *Leishmania sp.* which belongs to order kinetoplastida. The parasite is transmitted to humans via blood feeding sandflies of genera *Lutzomia* and *Phlebotomus.* According to current WHO statistics, 12-15 million cases of infection are reported with an annual recurrence of 1.5-2 million new cases. Trypanothione reductase (TryR) is an unique, non-human homologous enzyme in redox metabolism of leishmania parasite. It helps in removal of reactive oxygen species and DNA synthesis in parasitic. Absence of TryR in human host makes it ideal target for drug discovery. Using integrated computational and biochemical approaches, we have identified few antitumor agents (doxorubicin and mitomycin C) as competitive inhibitors as well as subversive substrates of TryR enzyme. These antitumor agents subvert biological function of TryR making it pro-oxidant from anti-oxidant which leads to generation of oxidative stress instead of its removal . This subversive substrate mechanism was investigated using various methods like FT-IR analysis and enzyme activity. Further, these candidate drugs were screened for their mode of action (inhibition studies, ROS generation, apoptosis, cytotoxicity studies on parasite and human cell lines, etc.). The current study points out towards potential application of doxorubicin and mitomycin C as anti-leishmanial agents. Likewise, encapsulation of these antitumor agents has been done for their specific delivery, deliberate release and high efficiency.

Department of Biotechnology, Indian Institute of Technology Guwahati, Guwahati-781039

**Corresponding author e-mail: vdubey@iitg.ernet.in*

nlshukla87@gmail.com

BPP49

248. Purification and characterization of glucansucrase and glucan by *Pediococcus pentosaceus* CRAG3

Rishikesh Shukla and Arun Goyal

Purification and characterization of glucansucrase and glucan from a cucumber isolate, *Pediococcus pentosaceus*, CRAG3 was carried out. The isolate was grown in enzyme production medium described by Tsuchiya *et al.*, 1952 at 25°C and 180 rpm for 6h. The cells were removed by centrifugation and the cell free supernatant (0.67 U/mg) was purified by fractionation with different concentrations of polyethylene glycols (PEGs). Amongst various PEGs, PEG-400 (33%), PEG-1500 (10%) and PEG-8000 (5%) gave higher enzyme activity, however 10% PEG1500 showed maximum glucansucrase activity (20 U/mg) with 16% yield and 30 fold purification. The PEG-1500 (10%) purified enzyme with 20 U/mg specific activity was used for the production of glucan. The glucan produced was purified by ethanol precipitation. The precipitated glucan was structurally characterized using FT-IR, ^{1}H-NMR, ^{13}C-NMR and SEM analysis. The FT-IR results confirmed the presence of C-H stretching and C-O bonding in glucan structure while ^{1}H-NMR and ^{13}C-NMR data confirmed the presence of α(1→6) linear chain with α(1→3) and α(1→4) branching. The peak analysis of ^{13}C-NMR gave the number of chain extending residues per branch point residue as 2.76 for α(1→4) and 4.31 for α(1→3) which meant that the α(1→4) branching was present after every third glucose residue while α(1→3) branch at every forth glucose unit. The SEM analysis confirmed the porous structure of glucan. The results in details will be presented.

Department of Biotechnology, Indian Institute of Technology Guwahati, Assam, India

Email: r.shukla@iitg.ernet.in, arungoyl@iitg.ernet.in

BPP50

249. Development of Laccase Based Biocathode for Biofuel Cell Application

Madhuri Das[1], Leepakshi Barbora[1], Priyanki Das[1], Pranab Goswami*[2]

Laccase based electrodes are attracting considerable attention due to potential application in biofuel cell . Laccase has the ability to oxidize both phenolic and non phenolic lignin compounds as well as some toxic environmental pollutants with simultaneous reduction of oxygen to water. We report on oxygen reduction in a buffer solution (0.1 M sodium citrate, pH 4.7, 25^0 C) by *Trametes versicolor* laccase, co-immobilized with osmium tetroxide on poly(4-vinylpyridine) and multiwalled carbon nanotube(MWCNT) as a mediator, on glassy carbon electrode. This fabricated biocathode was electrochemically characterized by using FE-SEM and its redox and catalytic properties were investigated by voltammetric methods. Such oxygen cathode yielded current densities of 0.485 mA at 0.230 V vs Ag/AgCl. The biocathode shows good and reliable response characterictics for oxygen with optimum storage stability and operational stability upto 20 days and exhibits a better tolerance to temperature changes.High catalytic efficiency of the immobilized enzyme, which may be possible for monitoring oxygen in solution.Considering the above findings the laccase based biocathode fabrication approach is envisaged to have potential application for developing biofuel cell.

Key words: Multiwalled Carbon nanotube(MWCNT)

[1]Centre for Energy, IIT Guwahati,[2]Department of Biotechnology, Indian Institute of Technology Guwahati, Guwahati 781039, Assam, India. E mail: madhuridas@iitg.ernet.in

BPP51

250. In vitro antioxidant and in vivo antihyperlipidemic activity of a di-herbal formulation of *Clerodendron colebrookianum* Walp and *Allium sativum* in hyperlipidemic rat.

Ankita Hazarika, Dulal Chandra Boruah, Rajlakshmi Devi*

In vitro antioxidant and in vivo hypolipidemic activity of a di-herbal formulation (HF) of Clerodendrnon colebrookianum (CC) and Allium sativum (AS) was studied in hyperlipidemic rats induced by Triton-WR-1339 and high fat diet. Phytochemical investigation of the HF revealed the presence of high levels of polyphenolic compounds which were further confirmed by FT-IR analysis. The in vitro antioxidant activity of the HF in different ratios (CC:AS, 1:1, 4:1, 8:1 and 10:1) was tested by using various well established methods viz 1, 1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging activity, total reducing power and thiobarbituric acid reactive substances (TBARS) assay. In all the three in vitro assays 8:1 ratio of the HF showed highest antioxidant activity. In in vivo study hypolipidemic effect of HF was tested in two different hyperlipidemic model viz Triton-WR-1339 and high fat diet induced rats. Five Different groups viz control, hyperlipidemic, hyperlipidemic plus HF (100mg kg-1 bw), hyperlipidemic plus HF (200mg kg-1 bw) and Hyerlipidemic plus Fenofibrate treated group were studied in both the experiments. Lipid profile increased significantly ($p < 0.01$) in hyperlipidemic group which was reduced in HF treated groups in a dose dependent manner. Moreover, prominent lowering effects on the Atherogenic index (AI) and Coronary risk index (CRI) was also noticed after feeding of HF. So the results obtained in the present study clearly indicated the beneficial effect of widely used di-herbal formulation of North eastern region of India and indicated that it is a potent source of natural antioxidant and is beneficial against oxidative stress.

Institute of Advanced Study in Science and Technology (IASST)

(An Autonomous Institute under Deptt. of Science and Technology)

Life Science Division (LSD)

Ministry of Science and Technology,Government of India

Vighyan Path, Paschim Boragaon,

Garchuk, Guwahati – 781035

BPP52

252. Comparative nutrient analysis of different leaf types of primary and secondary host plants of *Antheraea assamensis* Helfer in Nagaland

B.T.Kakati*[1] and L.N.Kakati[2]

Rearing of *Antheraea assamensis* Helfer (muga culture) is comparatively new to the hilly state of Nagaland (25°26´ - 27°40´ N latitude and 93°20´- 95°15´E longitude) and is conducted on the primary food plantation of *Persea bombycina* King (Som) raised in government and private farm, however the state is a repository of abundantly grown natural plantation of *Litsea citrata* Blume (Mejankori), the important secondary host plant. The larvae of *Antheraea assamensis* being reared on Mejankori produces creamy-white glossy silk, while in Som produces golden yellow silk which reflects on the palatability of different leaf types having shown the variation of foliar constituents of both host plants. Hence seasonal variation of nutrient constituents in different leaf types of these primary and secondary food plants are estimated in muga producing area of Mokokchung, Nagaland. Highly significant variation is observed between leaf types for all foliar constituents viz. moisture content, total carbohydrate, crude fibre, total nitrogen, crude protein, total ash and total soluble and reducing sugar. Moisture content was recorded be minimum during spring and autumn season in Som than Mejankari, however the trend is found to be reverse in case of nitrogen, crude protein and crude fibre which are found to be less during summer in Som than Mejankori. Further percentage of carbohydrate, soluble sugar, reducing sugar and total ash are recorded to be maximum in all seasons in Som than Mejankori. While nitrogen, Crude protein, crude fibre, carbohydrate, soluble sugar and total ash were higher in som during autumn, Mejankori retained higher percentage of these constituents during summer season except for carbohydrate which is maximum in spring season. The results suggest for both individual and combined effect of leaf types, seasons and host plants on the nutritive value of leaves and revealed that, with low percentage of crude fibre and high amount of moisture, nitrogen, protein and carbohydrate, Mejankori is also at par with Som to improve on rearing performance and cocoon production in different seasons.

[1]*Regional Office, Central Silk Board, Ministry of Textiles, Govt. of India P.O. Assam Sachiwalaya, Guwahati-781028,Assam.* e *mail b.kakati@yahoo.com*

[2] *Department of Zoology, Nagaland University, P.O.NU Lumami -798627, Nagaland.*

e *mail : kakati_ln@yahoo.com*

BPP53

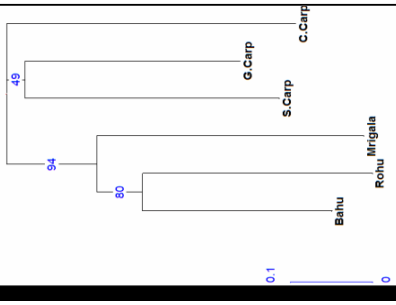
253. Molecular Identification of Indigenous and Exotic Carp Species of Assam

Nilakshi Borah, Sangeeta Borchetia, Sourabh Kumar Das, Nilave Bhuyan

Cyprinoids are the fastest growing, most important commercial fresh water fishes of Assam. The Brahmaputra riverine system in Assam abounds in indigenous major Carps of ***Labeo rohita*** (Rohu), ***Catla catla*** (Catla) and ***Cirrhinus mrigala*** (Mrigala), but increased demand for fishes has led to the introduction of exotic carp species of ***Ctenopharyngodon idella*** (Grass Carp), ***Cyprinus carpio*** (Common carp) and ***Hypopthalmichthys molitrix*** (Silver Carp). Exotic species are cultured in reservoir fisheries, but some of them may in-variably escape into the river system due to annual flooding causing changes in predation, competition for food, introduction of diseases and genetic contamination. Consequently, the native population may be exposed to natural selection. Biotic homogenization as a result of exotic species and extinction of native species is now recognized as one of the main threats to biodiversity and ecosystem function (Garcia-Berthou *et. al.*[1]). Molecular studies of the genetic structure and predicting gene interaction are of immense scientific and practical interest. Hence, to identify the genic variation and molecular documentation of the Exotic and Indigenous Carp species, we have initiated a molecular marker based diversity analysis in the Brahmaputra basin to identify their polymorphic regions of DNA.

Indigenous carps were collected from the Brahmaputra in Majuli, while the Exotic species were collected from reservoir water bodies of Jorhat district. High quality genomic DNA was isolated using modified SDS-Pepsin lysis buffer from each fish tissue. 14 RAPD primers were used in the study out of which 7 primers produced reproducible bands. Experiments were conducted in triplicates and out of the total 70 numbers of bands amplified, 69 were polymorphic showing a high degree of variation. Primer OPC 05 amplified the highest number of 12 bands while Primer OPA 19 produced the lowest of 7 bands. The primers showed high degree of polymorphism across all species with a polymorphism percentage of 90.9-100%. In the RAPD profiles studied, 9.8% were specific to each species while the exotic carp species showed a polymorphism of 80.29 % and the indigenous Carp species showed a polymorphism percentage of 88.74%. High degree of genetic variation was observed between the exotic and indigenous carp species as well as among each species in both the groups.

Fig1: Dendrogram of the 6 Carp species



The RAPD scores were used for constructing a Dissimilarity matrix for comparing frequencies of all polymorphic RAPD markers using Nei and Li (2) genetic distance (Dice coefficient) and constructing a UPGMA (unweighted pair group method of arithmetic means) dendrogram of 6 Carp varieties using Darwin computer program. Phylogenetic analysis (Fig.1) demonstrated that Rohu was closest to Bahu and both of these two species share similarity with Mrigala. However, the indigenous carp species Rohu, Bahu and Mrigala do not group with the exotic species; hence no loss in genetic diversity due to genetic contamination has occurred between them till now. Although close relationship was observed between Silver Carp and Grass Carp it, was seen that Common Carp falls as a total out-group from all the species of carps considered in the study. In the indigenous varieties, 50% similarity was observed between Rohu and Bahu (0.49 similarity) and in the exotic species, 50% similarity was observed between Grass Carp and Silver Carp (0.429 similarity). The dissimilarity matrix showed the lowest similarity of 0.197 between Rohu and Common Carp. The highly reproducible RAPD markers identified in the present study can be used in assessment of genetic diversity among the different commercial Carp species, hybrid identification and in captive breeding aquaculture programmes. Moreover they can be used for addressing concerns about escapes or releases from aquaculture farms into natural populations and conserving genetic resources of the commercial carps of Assam.

Centre for Biotechnological Studies, J.B.College, Jorhat, Assam, India – 785001

BPP54

254. Enhancement and scale up of dextran production by *Weissella confusa* using Response surface methodology

Shraddha Shukla and Arun Goyal

Dextran are a class of polysaccharides of varying structure with contiguous α(1→6) glycosidic linkages in the main chain and varying percentage of α(1→2), α(1→3), and α(1→4) linkages. Recently *Weissella* sp. has drawn attention for its high dextran production capacity and linearity in dextran formed. In our earlier report *Weissella confusa* isolated from fermented cabbage was explored for its dextransucrase and dextran production capacity. Sequential optimization strategy based on statistical experimental designs was employed to enhance dextran production by *Weissella confusa*. A two-level Plackett–Burman design was employed, where six variables were studied for their influence on dextran production. Sucrose and K_2HPO_4 were significant variables for dextran production. The combined effect of these nutrients on dextran production were studied using a 13 full-factorial central composite design, a second-order polynomial was established to identify the relationship between the dextran production and the two medium components. The optimal concentrations of variables for maximum dextran production were 5.14% (w/v) sucrose and 1.52% (w/v) K_2HPO_4. The maximum concentration of dextran obtained by predicted model was 97.0 mg/ml. The dextran production medium was validated at shake flask level which was in perfect agreement with the experimental determined value (97.5 mg/ml). This value of dextran concentration was 2.9 fold higher as compared to un-optimized medium that gave 34.0 mg/ml of dextran. The dextran production from *Weissella confusa* was scaled up in a 3l bioreactor. At bioreactor level, *Weissella confusa* efficiently utilized the medium sucrose and produced 105 mg/ml dextran with 99% of dextran yield.

Department of Biotechnology, Indian Institute of Technology Guwahati,
Guwahati 781 039, Assam, India
Email: shraddha@iitg.ernet.in, arungoyl@iitg.ernet.in

BPP55

255. Effect of Cycloheximide and Ampicillin on Yeasts isolated from traditional starter cultures and their unusual carbon source utilization

Deep Prakash Parashar[1], Jintu Rabha[1], Bhaben Tanti[2], Dhruva Kumar Jha[2], Jibon Kotoky[3] and Hridip Kumar Sarma[1]*

In an attempt to characterize indigenous yeast isolates from traditional fermentation starter cultures of the regional tribes in the region, yeasts were isolated and basic characteristics were studied (reported elsewhere). In the present investigation, 17 of the yeast isolates characterized from the starter materials used for indigenous fermentation by the Ahom (AH) and Bodo (BO) tribal communities of Assam were subjected to some preliminary investigations. 17 of the isolates were selected for the studies and were provided with laboratory strain designations viz. (BO104, BO205, BO206, BO301, MU108, IN109, IN707, AH402, AH303, AH210, BO202, BO103, IN201, BO304, AH304, AH113, AH010) which were retrieved from original mother cultures. These were analyzed for their morphological variation under stress and their ability to withstand tolerance to antibiotics Actidione (Cycloheximide) and Ampicillin. The antimicrobial activity of the isolates AH210, AH402, AH303, AH304, AH113, AH010, BO206, BO104, BO304, IN201 and IN707 tested were found to be resistant to both Cycloheximide and Ampicillin. Isolate AH010 showed highly resistant to cycloheximide while Bodo isolate BO301 depicted the highest sensitivity and could not grow at all. Isolates BO205, MU108 were found to be moderately resistant to Cycloheximide. The ade^- mutant isolate MU108 and BO205 from Bodo starter culture showed sensitivity Ampicillin. In the second experiment, the isolates were analyzed for their unusual carbon sources utilization viz. Maltose, Cellibiose, Raffinose, Melibiose, Arabinose, Trehalose, Inositol, Mannitol, Mannose, Rhamnose, Fructose and Galactose under culture conditions. The isolate BO206 could be retrieved in almost all the carbon sources used while the rest of the isolates did not show utilization of mannitol. Poor growth characteristics could be observed for raffinose, cellobiose, inositol and trehalose where response of the isolates to their utilization potential was poor, although not negligible. It can be inferred from the studies that these isolates are capable of utilizing wide range of sugars which include hexoses, hemicelluloses and pentoses (Hayn *et al*., 1993). With such variable range of substrate utilization, some isolates (subjected to further research) could be considered as potential industrial isolates for producing bio-ethanol from renewable lignocelluloses feedstock from agriculture and forestry (Tong, 1979; Rosenberg, 1980) and also for innumerable industrial processes.

[1] *Department of Biotechnology, Gauhati University, Guwahati-14, Assam*
[2] *Department of Botany, Gauhati University, Guwahati-14, Assam*
[3] *Department of Life Sciences, Institute of Advanced Studies in Science and Technology, Guwahati-35, Assam.*

** Corresponding author: Dr. Hridip Kumar Sarma, Department of Biotechnology, Gauhati University, Guwahati-14, Assam*
E-mail: hridip123@yahoo.com
Cell: 9613861702

BPP56

257. Hydrocarbon Degrading and Nitrogen Fixing bacteria isolated from oil contaminated soils

Pori Deka, Nakul Sharma and Debabrat Baishya*

Contamination of soil by crude oil is a major concern in the present world, which represent severe hazardous effects on the ambient environment. In an effort at developing active microbial strains that could be of relevant in bioremediation of oil contaminated soil, a feasibility study was conducted to isolate bacteria from oil contaminated soil having both hydrocarbon degrading and nitrogen fixing ability. In the present investigation, four samples were collected from the refinery sites in Guwahati, Assam. From these samples, a total of six cultures were isolated having hydrocarbon degrading ability using enrichment medium (M3 media), where paraffin oil was used as a sole carbon source. Out of these six hydrocarbon degrading bacterial isolates, three hydrocarbon degrading bacterial isolates were found to grow in nitrogen free medium. These bacterial isolates were subjected to colony morphology and microscopic study.Thus the present investigation was a preliminary study to screen some of the potential bacterial isolates from oil contaminated soil having hydrocarbon degrading and nitrogen fixing ability so that a consortia of potent bacterial strains can be used for bioremediation.The significance of the study lies in enrichment of consortia capable of hydrocarbon degrading under N_2 – limited conditions.

Keywords:- Hydrocarbon degrading bacteria, nitrogen fixing bacteria, bioremediation

*Department of Biotechnology and Bioengineering, Institute of Science and Technology, Gauhati University, Guwahati-14, Assam. *Email: dbaishya_22@sify.com*

BPP57

258. Antidermatophytic and Antioxidant activity of *Naravelia zeylanica* and *Ranunculus sceleratus* leaves collected from North Eastern Region of India.

Sharma K. K.[1], Kotoky J.[1]*, Mudoi T.[1], Barthakur R.[3], Kalita J. C.[2], Devi R.[1]

Dermatophyte fungi are the main agents of skin diseases of man and remain a threat to public health mainly in the tropical countries. The incidences of such infections have been increasing in recent years due to a growing number of high-risk patients, particularly immunocompromised hosts [1, 2]. Again oxidative stress is among the major causative factors in the induction of many chronic and degenerative diseases including atherosclerosis, ischemic heart disease, diabetes, cancer, immunosuppression etc. The most effective way to eliminate free radicals which cause the oxidative stress is with the help of antioxidants. Currently, there has been a growing interest toward natural antifungal and antioxidants agents largely because of lesser side effects of herbal resources [3]. In the present investigation the *in vitro* antifungal activity of the Chloroform and Methanol extracts of *Naravelia zeylanica* (L.) DC. and *Ranunculus sceleratus* Linn. (Ranunculaceae) leaves collected from North East India was evaluated against five strains of dermatophytes viz., *Trichophyton rubrum*, *Trichophyton mentagrophytes*, *Trichophyton tonsurans*, *Microsporum gypseum* and *Microsporum fulvum* by Agar well diffusion method [4]. The inhibition diameter of fungal colonies and the percentage inhibition of the fungal growth were determined. The MIC of the extracts, determined by broth macro dilution method [5] found ranging between 1.25-10mg/ml. The antioxidant activity of the extracts was measured on the basis of the scavenging activities of the stable 1,1-diphenyl-2-picrylhydrazyl (DPPH) free radical [6]. *N. zeylanica* showed 51% and 65% whereas *R. sceleratus* showed 46% and 61% DPPH scavenging activity for Chloroform and Methanol extracts respectively. The IC_{50} values for the extracts were determined and compared with the standard Ascorbic acid. The results suggest the anti-dermatophytic and antioxidant nature of the plants.

Key Words: antidermatophytic, antioxidant, MIC, DPPH.

[1] *Division of Life Sciences, Institute of Advanced Study in Science and Technology, Guwahati-781035. Assam, India.*

[2] *Department of Zoology, Gauhati University, Guwahati-781014. Assam, India.*

[3] *Department of Botany, DKD College, Dergaon-785614. Assam, India.*

Corresponding Author: Jibon Kotoky. Division of Life Sciences, Institute of Advanced Study in Science and Technology. e-mail: jkotoky@yahoo.com*

BPP58

259. Evaluation of *in vitro* Antidermatophytic activity of *Solanum indicum* L. from North East India.

Kotoky J.[1]*, Sharma K. K.[1], Barthakur R.[2], Kalita J. C.[3],

Dermatophytic fungi are one of the main agents of skin diseases of man and animal and remain a threat to public health in the tropical countries like India. Although a large number of synthetic allopathic drugs are present to treat dermatophytosis, the increasing incidences of fungal resistance towards these synthetic drugs combined with their associated side effects and limited efficacy has forced scientists to search for new antimicrobial substances from natural sources. In the present study Chloroform, Methanol and Water extract of *Solanum indicum* Linn. (Solanaceae), a widely used food and medicinal plant of Assam, India was investigated for its i*n vitro* antifungal activity against five different dermatophytic fungi viz., *Trichophyton mentagrophytes*, *Trichophyton rubrum*, *Trichophyton tonsurans*, *Microsporum gypseum* and *Microsporum fulvum*. Agar well diffusion method was used to determine the inhibition zone of the different extracts of the plant. The minimum inhibitory concentration of the extracts was determined by broth dilution method. When compared, the Chloroform extract of the plant was found to be highly active against all the tested fungi followed by the methanol extract. The water extract was found completely inactive against *T. mentagrophytes* and *T. rubrum* while it showed weak activity against *M. gypseum*, *T. tonsurans* and *M. fulvum* at the tested concentration. The results suggest that the leaves of *S. indicum* possess some antifungal compounds that can be used for treating dermatophytosis.

[1] *Division of Life Sciences, Institute of Advanced Study in Science and Technology, Guwahati-781035. Assam, India.*

[2] *Department of Botany, DKD College, Dergaon-785614. Assam, India.*

[3] *Department of Zoology, Gauhati University, Guwahati-781014. Assam, India.*

Corresponding Author: Jibon Kotoky. Division of Life Sciences, Institute of Advanced Study in Science and Technology.*

e-mail: jkotoky@yahoo.com

BPP59

260. Protective Efficacy of Dietary Mycosorb in Experimental Aflatoxicosis of Broiler Chickens

M. R. Wade*, D. Sapcota*, K.K.Barua* and Urwashi Verma[§]

An experiment was conducted to study the effect of Mycosorb (esterified glucomannan) in counteracting induced aflatoxicosis in broiler chickens from 3 to 42 days. Day-old broiler chicks (n=270) were randomly distributed in 6 groups having 45 numbers each viz., To, T_x, T_xM_1, T_xM_2, T_xM_3 and T_0M_2. T_0 group (control) was fed normal diet containing no aflatoxin, whereas, Tx group was given dietary 300 ppb aflatoxin B_1. From Tx three rations were prepared by mixing Mycosorb, @ 0.25g/kg of feed (T_xM_1) or 0.50g/kg of feed (T_xM_2) or 1.00 g/kg of feed (T_xM_3). In the T_oM_2 group normal diet containing mycosorb ,@0.5g/kg of feed was given (positive control).Dietary Aflatoxin significantly ($P<0.05$)depressed body weight, feed consumption, feed conversion efficiency, decreased percent retention of dry matter, crude protein, ether extract, calcium and phosphorus. However inclusion of Mycosorb showed ameliorative effects improving the retention of dietary nutrients during aflatoxicosis. Cost of feeding per kg live weight was found to be lowest in control group (Rs.19.58) whereas highest in toxin alone fed group (Rs.35.87); nevertheless, dietary Mycosorb reduced cost of feeding, acted as counteracting agent. The cost difference over control was noted to be highest in aflatoxin alone fed birds. However the difference in cost over control was reduced appreciably when the aflatoxin mixed diet was fortified with Mycosorb and result was found to be dose dependent. The highest performance index was noted in control group whereas the lowest in toxin-alone fed group. Among the various treatments, 1.0g/kg of Mycosorb gave the best results.

Department of Poultry Science, Collage of Veterinary Science, Khanapara, Guwahati* ***and* *[§]Department of Poultry Science, PGIVAS, Akola, Maharashtra.* debensapcota@yahoo.com

BPP60

261. Experimental Aflatoxicosis in Commercial Broiler Chickens, Amelioration With Mycosorb: Heamato-Biochemical Studies

M. R. Wade*, D. Sapcota*, K.K.Barua* and Urwashi Verma§

A study was conducted to find out the beneficial effect of dietary Mycosorb (esterified glucomannon) in experimental aflatoxicosis of broilers. For this purpose 270 number of day-old Anak 2000 chicks were procured and divided into 6 equal treatment groups and were studied for a period from 3 to 42 days. A control ration (T_0) was prepared with conventional feed stuffs and an experimental diet (T_x) was prepared from this ration after incorporating aflatoxin (AF) @ 300 ppb ,produced on rice using *Aspergillus flavus* : NRRL 2999 strain . From T_x three rations were prepared by mixing Mycosorb @0.25 g/kg of feed (T_xM_1) or 0.5g/kg of feed (T_xM_2) or 1.0 g/kg of feed (T_xM_3) .A positive control diet ($T_0 M_{2)}$ was prepared by mixing Mycosorb @ 0.5g/kg of feed of control ration. Heamatobiochemical parameters were studied at the end of experiment. Significantly ($P<0.05$) reduced level of serum cholesterol and serum protein levels were observed in aflatoxin alone fed group; whereas increase surge of glucose, triglyceride and activities of serum enzymes viz., serum glutamate oxaloacetate transaminase, serum glutamate pyruvate transaminase, alkaline phosphatase and triglyceride levels were improved towards normalcy when Mycosorb was added in the contaminated diet ,particularly at 1.0g/kg level.

Department of Poultry Science, Collage of Veterinary Science, Khanapara, Guwahati* ***and* *§Department of Poultry Science, PGIVAS, Akola, Maharashtra.* debensapcota@yahoo.com

BPP61

274. Changes in certain biochemical parameters in response to artificially induced rot disease (Flacherie) in Eri Silk worm (*Samia ricini Boised*).

Devid Kardong, Manashi Changmai and R.N.S.Yadav.

The activities of Alanin aminotransferase (AAT, E.C.2.6.1.2) and Aspartate aminotransferase (AsAT, E.C. 2.6.1.1) alongwith total protein and carbohydrate content were studied in various tissues of normal and artificially induced flacherie diseased *S. ricini Boised* (V^{th} instar larval stage). The activities of both the enzymes showed tissue specificity and responded independently to the disease. The activity of the enzyme AAT decreased significantly in silk gland while activity of both AAT and AsAT recorded significant increase in the fat body. However, neither of the two enzymes showed significant changes in the hemolymph. Though, total protein content in both silk gland and fat body showed stability, a significant decrease in total carbohydrate content was recorded in the two tissues (silk gland and fat body). On the other hand, significant increase in the total protein and carbohydrate content was recorded in the hemolymph. In the present study, the host-disease interaction with respect to certain biochemical parameters has been discussed.

Key words: Biochemical, silk gland, fat body, Alanin aminotransferase, carbohydrate, protein.

Deptt. Of Life Sciences, Dibrugarh University, Dibrugarh, Assam-786004
E.mail. kardongdevid@yahoo.co.in

BPP62

276. *In vitro* seed culture of orchids and their post transplant studies under natural environment

Dr Nabanita Dutta Bordoloi

The seeds of three species of commercially important local orchids namely *Cymbidium aloifolium*, *Vanda terrace* and *Rhyncostylis retusa* were selected for *in vitro* propagation and multiplication. A well developed regeneration system both *in vitro* and *in vivo* was established. Unripe green mature pods of these three species were used as explants and the minute seeds were inoculated in the KnC medium (Knudson L., 1951), MS medium (Murashige and Skoog, 1962) and VW medium (Vacin and Went, 1949) with different concentrations of plant growth regulators. The seeds were germinated with protocorm like bodies within one month of incubation. The result showed that the percentage of seed germination of these three species was almost 99 percent in culture grown on medium containing KnC macronutrients and micronutrients with IBA (1.0 µg/ml) and BA (2.5 µg/ml) and incubated under photosynthetically active radiation (PAR). PAR was also found to promote shoot multiplication on KnC medium with IAA (1.0 µg/ml) and BA (5.0 µg/ml) followed by VW medium and MS medium with cool fluorescent light (CFL). Germinated seeds were transferred in to cytokinin and auxin based medium for rapid multiplication as well as subsequent growth of plantlets. The rate of multiplication was also higher i.e. about 20 plantlets were multiplied from a single shoot within 4 weeks of incubation.

Highest rooting success was obtained in half strength medium of KnC or MS with IBA (2 µg/ml) under PAR or CFL. Plantlets thus formed were transferred in to the natural environment with different types of potting media viz. brick bats, charcoal, dry leaves, fern roots, stem barks, water hyacinth etc. after a series of hardening.

(*The research work supported and catalysed by Science & Society Division of DST Govt. of India is highly acknowledged*.)

Purvottar Development Society
Saraswati Market Complex, 2nd Floor
Jaswanta Road, Panbazar, Guwahati-781001, Assam
E mail: nabanitadb@sify.com

BPP63

277. *In vitro* shoot tip culture of local banana cultivars for their conservation and commercialization

Dr Nabanita Dutta Bordoloi

Banana occupies the first position in production among all the fruit crops grown in Assam. A large number of commercial, semi wild and wild banana germplasms are found in the plains and hills of Assam and adjoining states. This part of the country is well known as one of the largest natural germplasm bank for banana. The main bottleneck encountered in expansion of commercial banana cultivation is the shortage of quality planting materials (suckers). The major hurdle encountered in cultivation of local cultivars is shy /low capacity of sucker production.

Considering the plant growth, yield and fruit quality, three local cultivars have been identified viz. Bharatmoni(AAA), Amritsagar (AAA) and Kanaibasi (AA), for experimentation which have higher potentiality to grow on commercial basis. Shoot tips of 2-3 months old suckers of these varieties were cultured on modified MS (Murashige and Skoog, 1962) medium containing different concentrations and combinations of auxins and cytokinins. Maximum frequency of explants were survived and resume growth on modified MS medium with 3 µg/ml BA (6-Benzylaminopurine) and 1 µg/ml IAA (Indole-3-acetic acid) along with 0.3 % activated charcoal. After 4 weeks, the growing explants were transferred to same basal medium with BA (5µg/ml) and IAA (0.1µg/ml) for shoot multiplication. About 20-25 plantlets were multiplied from a single shoot within 4 weeks of incubation. Addition of activated charcoal (0.3 %) and casein hydrolysate (0.05%) in multiplication media resulted in better growth of shoots. Healthy Root system was observed within fifteen days by sub culturing shoots in to half strength modified MS medium with 2 µg/ml IBA (Indole-3-butyric acid). Regenerated plantlets could be transferred to soil under natural condition after 1-2 months of hardening.

(*The research work supported and catalysed by SEED Division of DST Govt. of India is highly acknowledged.*)

Purvottar Development Society
Saraswati Market Complex, 2nd Floor
Jaswanta Road, Panbazar, Guwahati-781001, Assam
E mail: nabanitadb@sify.com

BPP64

278. Antigenic Relationship of Field Isolates of Fmd Virus Type 'O' with Vaccine Strain 1525

Bornali Borah*, A.K. Hazarika[1], and K. Sharma[2]

A study was undertaken to isolate foot-and-mouth disease virus (FMDV) type 'O' from different field outbreaks and to characterize the field isolates for antigenic relationship with vaccine virus strain by suitable serological methods.

Liquid phase blocking ELISA (LPBE) and two dimensional-micro neutralization test (2D-MNT) were employed to determine the antigenic relationship between the field isolates and reference vaccine virus strain.

In LPBE**,** the 'r' values of FMDV type 'O' isolates obtained by comparing with that of reference virus strain (IND R2/75) ranged from 0.32 to 1.00. The reaction profile of the field isolates with reference virus antiserum in LPBE revealed that, out of eight isolates, five (IND 387/10, PD 164/10, PD 165/10, PD 182/100 and PD 177/1O) were closely related to the vaccine strain, whereas other three (IND 411/09, PD 183/10 and IND 414/09) were also antigenically related to the vaccine stain.

In 2D-MNT, the 'r' values of FMDV type 'O' isolates obtained by comparing with that of reference vaccine strain ranged from 0.39 to 1.00. The reaction profile of the field isolates with reference virus antiserum in 2D-MNT revealed that, all the isolates (IND 387/10, PD 164/10, PD 165/10, PD 182/10, IND 411/09, PD 183/10, IND 414/09 and PD 177/1O) have antigenic similarity with the vaccine strain (IND R_2/75).

The comparison of antigenic relationship by LPBE and 2D-MNT revealed that the 'r' values obtained by 2D-MNT were marginally higher than the values obtained by LPBE. Majority of the isolates were found to be closely related with the in-use vaccine strain IND R_2/75 in both the assays. The values obtained by the two tests did not differ significantly.

Department of Microbiology, College of Veterinary Science, Assam Agricultural University
Khanapara::Guwahati::India 781022
bornalib97@gmail.com

**Ph D Scholar; 1. Professor 2. Scientist In Charge, AICRP on FMD*

BPP65

279. The impact of Arsenic compounds on *Channa punctatus* and its revival by phytochemical compounds

Nargish sultana Hazarika, Kokila Patowary, Dr.Mamata Goswami.

Many arsenic compounds are often considered highly toxic but inspite of that a wide variety of arsenic compounds are produced naturally and are metabolized by numerous organisms. Arsenic is a moderately abundant element on the earth's crust, and high concentration of arsenic has been found in many areas of Assam. To find out the toxicity and biochemical and chromosomal interference of arsenic compound, experiments were carried out in laboratory conditions in *Channa punctatus*.*Channa punctatus.*were exposed to different concentrations of sodium arsenite ($NaAsO_2$) ranging from 0.5mM to 2mM.Behavioural and morphological manifestations were recorded in a definite interval after being exposed to $NaAsO_2$..Micronuclei and chromosomal studies were carried out and found alteration in it. Significant changes in enzyme activities were observed. Treated fishes were then exposed to phytochemical products namely garlic extract and turmeric extract along with vitamins and significant survival from arsenicosis has been observed.

Keywords-Arsenic, *Channa punctatus*, Behavioural manifestation, Phytochemical, arsenicosis.

Department of Zoology, Cotton College, Panbazaar, Guwahati.

Email:rumipatowary@yahoo.com

BPP66

280. Abundance and distribution of soil and litter microarthropods in two contrasting forest sites of Lakhimpur District.

Minati Borah and Dr. L. N. Kakati

Seasonal Abundance and distribution of soil and litter microarthropods in natural and degraded forest ecosystem at Lakhimpur District of Assam (at 26º48´- 27º 53´N latitude and 93º42´- 94º 20´E longitude, altitude 101 above msl covering 2953 sq. kms) were studied for one year. The first dominant major group of soil and litter Acarina and second group Collembola in both sites exhibited a peak of population density in later monsoon period. Rich abundant diversity of soil and litter microarthropods during rainy season was observed in two contrasting forest sites closely followed by canopy with vegetation cover and optimum physico-chemical factors that favour optimum growth of acarine population in natural site while having less vegetation in degraded site. Soil and litter arthropods aid in the regulation of rates of nutrient cycling, decomposition and energy flow (Petersen Luxton 1982, Wallwork 1983, Seastedt 1984, Persson 1989, Wardle and Giller 1996). The total litter microarthropods population was recorded to be 3.6 times higher in the natural forest (3536.88 x 10^2 m^2) than the total soil microarthropods population (987.41 x 10^2 m^2) in natural forest. The total litter microarthropods population was recorded to be 3.9 times higher in the degraded forest (2504.19 x 10^2 m^2) than the total soil microarthropods population (643.43 x 10^2 m^2) in degraded forest. The positive correlation between soil temperature and Soil microarthropods such as Collembola and Acarina in natural and degraded forest ecosystem has been reported by Chitrapati (2002) from Imphal Valley. Physical factors showed significant positive correlation with the changes in the abundance of soil microarthropods in both natural and degraded sites. During investigation period some Litter microarthropods showed negative correlation with different physico-chemical factors in natural forest ecosystem while was positive relationship in degraded site.

Key: Soil and Litter microarthropods, abundance, distributin, two contrasting sites of forest.

Department of Zoology, Nagaland University,

Head quarters: Lumami, Mokokchung- 798601, Nagaland.

minatibora@rediffmail.com

BPP67

281. Studies on the Lipid Content of Different Biological Samples and their Transesterification to Biodiesel

Bornali Baishya[1], Rajiv Chandra Dev Goswami[2], M.C.Kalita*

Biofuel has become more attractive recently because of its environmental benefits and the fact that it is made from renewable resources. Biodiesel may be cost effective if produced from low cost feedstock such as animal fats, restaurant waste oil and frying oil, which contains high amount of free fatty acids (FFA). Any fatty acid resource may be used to prepare biodiesel. Since the price of edible vegetable oils are higher than that of diesel fuel, waste vegetable oils and non edible crude vegetable oils are preferred as potential low priced biofuel sources. Lipid content of some non edible oil genous plant seeds, waste cooking oil and some animal fats were considered for the study. And the most commonly used method to make biodiesel is transesterification. Plants seeds (mostly non edible) were collected as well as two animal fat were also considered, and they were processed to extract oils. The oil percentage found were Castor (red variety) 38.8%, Castor (green variety) 34.8%, Pongamia *pinnata* 33.7%, pig fat 46.4% and goat fat 42.3%. For determining whether the oils can be transesterified directly, the acid value is the most important property that must be known. Highest acid values among plants were found to be castor red 18.8, and goat fat has highest free fatty acid 17.2. Lastly thin layer chromatography was done for qualitative analysis and to verify complete conversion process. A TLC plate was prepared and it iwas divided into two parts, on one part of the plate pure oils (non converted) and on the other side, converted transesterified oils were taken, when TLC plate was observed carefully it was noticed that clear spots were seen on both the sides of the plate but there were less no of spots on the side where transesterified oils were run. So from a chemical point of view, oils from different sources have different fatty acid compositions. The fatty acids are different in relation to the chain length, degree of unsaturation or presence of other chemical functions Biodiesel properties are strongly influenced by the properties of the individual fatty esters. It therefore appears reasonable to enrich it with certain fatty esters with desirable properties in the fuel in order to improve the properties of the whole fuel. It may be possible in the future to improve the properties of biodiesel by means of genetic engineering of the parent oils, which could eventually lead to a fuel enriched with certain fatty acids, possibly oleic acid, that exhibits a combination of improved fuel properties.

[1]*Department of Biotechnology, Gauhati University, Guwahati-14*
[2] *Departments of Biotechnology, Gauhati University, Guwahati-14*
**Prof., Dept. of Biotechnology, Gauhati University, Guwahati-14*
bornali2009@gmail.com
rajivgoswami23@gmail.com
mckalita@sify.com

BPP68

282. Bioprospecting and conservation of medicinal plants of India with special reference to North East India

R. Kandali* and R. K. Goswami[2]

Bioprospecting and conservation are two important aspects need to be considered simultaneously in recent times for sustainable growth of the medicinal plant sector in India. In the process of bio-prospecting to obtain novel pharmacotherapeutic leads for bioactive compounds, the application of new bioinformatics data-mining systems to herbal texts can play a greater role. Since, Indian subcontinent is well known for its diversity of forest products and the age-old healthcare traditions; there is an urgent need to establish these traditional values in both national and international perspectives realizing the ongoing developmental trends in traditional knowledge. There are about 17,000 species of higher plants, and 7,500 of them are known for medicinal uses (Kala *et al*., 2006). About 2,000 drugs used in the country are of plant origin (Dikshit, 1999). The flora of the North Eastern Region is among the richest in the world and naturally a sizeable number of medicinal plants of tropical and subtropical nature grow here. The North Eastern Region of India harbors more than 130 major tribal communities of the total of 427 tribal communities found in India (Sajem and Gosai, 2006). A great deal of traditional knowledge on the use of various plant species is still intact with the indigenous people living in less accessible mountainous areas. The natural products derived from these medicinal plants have proven to be the abundant source of biologically active compounds, many of which have been the basis for the development of new pharmaceutical molecules. The continuous increase in the demand and expanding trade on medicinal plants worldwide, have jeopardized the survival of several plant species due to indiscriminate harvesting of natural flora including those in forests. According to the World Conservation Monitoring Centre under the United Nations Environment Programme, the current extinction rates of plants and animals mean that the world is losing one major drug every two years (Groombridge and Jenkins, 2002). Exploration of this huge traditional knowledge and sustainable use of the medicinal plants through biochemical and biotechnological interventions in the process of bioprospecting will ensure the economic prosperity of the region.

*Department of Biochemistry and Agril. Chemistry
[2]Department of Crop Physiology
B. N. College of Agriculture, AAU, Biswanath Chariali 784 176, Assam
Email: ranjan_kandali@yahoo.com

BPP69

283. Wicking Performance of Muga Silk Fabric Treated With Natural Products

Mamata B. Sarma*, Subrata B. Gogoi **, Depali Devi ***, B.Goswami****

To keep the body comfortable, the fabric must be able to transport the moisture away from the skin either through diffusion or wicking to the surface to evaporate.This paper investigated wicking behavior of Muga Silk fabrics treated with natural products. Muga silk fabrics investigated by using vertical water wicking test method revealed that wicking abilities improved after treatments with solutions obtained from natural products Kolakhar and Reetha. The t- test results of the experimental study suggested that wicking abilities increased but the effect significantly depended on the treatments with different natural products. The study also revealed the differences of wicking effect in warp and weft directions of the Muga silk fabric.

Key words: Wicking, Muga Silk,

*Corresponding Author, SMOI,RO, Central Silk Board, Guwahati-6, Assam.e- mail mamtabs@sify.com

** Associate Professor, Seri biotech Unit, Institute of Advanced Study in Science and Technology. Assam, India.

*** Associate Professor, Dept. of Petroleum Technology, Dibrugarh University,Assam,India.

**** Professor, Dept. of Chemistry, Guwahati University,Assam,India

BPP70

284. Molecular Modeling, Synthesis and Biological Evaluation of Phenylamino Acetic Acid Benzylidine Hydrazides as *Plasmodium falciparum* Enoyl-Acyl Carrier Protein Reductase (*pf*ENR) Inhibitors

Vijay M Khedkar[1*], Ramanuj P Samal[1], Raghuvir R S Pissurlenkar[1], Angela Gono Bwalya[2], Deniz Tasdemir[2], Ramesh Joshi[3], P. R. Rajmohan[3], Evans C Coutinho[1]

The spread of multidrug resistance in *P. falciparum* species creates a grave need to employ novel strategies in the fight against malaria. *pf*ENR (FabI) is one of the crucial enzymes in the plasmodial type II fatty acid synthesis II (FAS II) [1, 2] and a promising target for liver stage malaria infections making FabI inhibitors as causal malarial prophylactic agents. The work presented here reports the design, synthesis, structural characterization and biological evaluation of a new class of *pf*ENR inhibitors. Using virtual screening and docking a lead was identified and modified to give a series of phenyl amino acetic acid benzylidene hydrazides. The most promising molecules were synthesized and characterized by IR, multinuclear and multidimensional NMR. NMR studies revealed the existence of conformational/configurational isomers around the amide and imine functionalities. The NMR spectra also indicated the presence of an impurity in most compounds which was deduced as an imidazoline-4-one derivative based on ^{1}H-^{13}C/^{1}H-^{15}H HMBC and NOESY spectra. In the solid state, the molecules have a completely extended conformation and form helical structures that are stabilised by strong hydrogen bond interactions. The molecules were screened for *in vitro* activity against recombinant *pf*ENR enzyme by a spectrophotometric assay. Four molecules, *viz.* 4, 6, 7 and 17 were found to be active at 10, 12, 8 and 7μM concentration respectively. Further, a QSAR classification model using recursive partitioning (RP) [5,6,7] helped highlight structural characteristics that could be tuned to improve activity. The model is being used to design candidates with even better activity and selectivity profiles.

[1]*Department of Pharmaceutical Chemistry, Bombay College of Pharmacy, Kalina, Santacruz (East), Mumbai 400 098, India.*
[2]*Department of Pharmaceutical & Biological Chemistry, The School of Pharmacy, University of London, 29–39 Brunswick Square, London WC1N 1AX, United kingdom.*
[3]*National Chemical Laboratory, Pashan Road, Pune 411 008, India.*
email: *vijaycpn@gmail.com*

BPP71

285. Development and Validation of Hptlc Method for Ursolic Acid in *S. Laurina* Samples

Sofia Banu[a,b], Rasika Bhagwat[a], Kandarpa Kr. Saikia[a], Rituparna Borah[a] and Vidya S Gupta[b]

Symplocos laurina (Wall.) commonly known, as Lodhra is a medicinal plant widely used in indigenous system of medicine. The plant contains many different alkaloids such as loturine, loturidine and colloturine along with phenolic glycoside, symplocoside and triterpenoids such as betulin, oleanolic acid and Ursolic acid. Ursolic acid exhibits wide range of pharmacological action such as hepatoprotection, anti-inflammatory, anti-microbial, anti-artherosclerotic and anti-tumor activity. Among the complex mixture of biologically active compounds in the leaves of *S. laurina*, ursolic acid, a constituent of the leaves, has been used as an analytical marker indicative of the quality of the plant. There is no chemical synthesis reported for this compound, owing to its complex chemical structure, in such situation plants are the only source available for the isolation of this therapeutically and commercially important compound. In the study a simple and, sensitive HPTLC method has been developed for Ursolic acid content variation in 25 methanolic extract of leaves of *S. laurina* collected from six locations from South India. Chromatographic separation was performed on silica gel HPTLC plates with petroleum ether-acetone, 8 + 2 (v/v), as mobile phase. The plates were scanned densitometrically at λ = 540 nm. The percentage of Ursolic acid in crude extracts was calculated by using the regression equation obtained from calibration curve. The content of ursolic acid as found to vary significantly 105 mg/ kg to 600.9 mg/kg. The content of ursolic acid was found to be unrelated to the geographical location of the plant.

[a] *Department of Biotechnology and Bioengineering, Gauhati University, Guwahati 781014, India*

[b] *Plant Molecular Biology Group, Biochemical Sciences Division, National Chemical Laboratory, Pune 411008, India*

sofiabanu2@gmail.com

BPP72

286. Synthesis and characterization of dextran-coated superparamagnetic iron oxide nanoparticles for MRI and drug delivery

Ashim Borah and Arun Goyal*

Superparamagnetic iron oxide nanoparticles (SPION) possess unique magnetic properties and the ability to function at the cellular and molecular level of biological interaction making them an attractive platform as contrast agents for magnetic resonance imaging (MRI) and as carriers for drug delivery. We have presented a controlled co-precipitation method, which demonstrates the feasibility of synthesizing monocrystalline nanoparticles of magnetite with a few diameters. SPIONs were synthesized by the co-precipitation of Fe^{2+} and Fe^{3+} using ammonium hydroxide. The obtained SPIONs were characterized by various physiochemical means such as X-ray powder diffraction (XRD), transmission electron microscopy (TEM), field emission scanning electron microscopy (FESEM), fourier transform infrared (FT-IR) spectroscopy, vibrating sample magnetometer(VSM) and thermogravimetric analysis(TGA). In order to prepare a biocompatible water-based magnetic fluid, the nanoparticles were modified by dextran through a one-step method. The surface of magnetite coated with dextan can reduce the aggregation of magnetite and help form colloid suspension in water. The average size of the dextran-coated iron oxide nanoparticles as obtained from the TEM micrographs was found to be around 15-20 nm with narrow size distribution. The specific saturation magnetization value of the dextran-coated magnetic nanoparticles (~35emu/g) is found to be lower than that for the uncoated magnetic nanoparticles (~68emu/g). The crystalline structure of magnetic nanoparticles was confirmed by XRD and SAED patterns. The attachment of the dextran on the magnetic particle surface was confirmed by FTIR spectroscopy and thermogravimetric analysis (TGA). These nanoparticles exhibit superparamagnetic behavior and can be useful for relevant bio-medical applications.

Department of Biotechnology, Indian Institute of Technology Guwahati, Assam, India
Guwahati 781 039, Assam, India
E-mail: ***arungoyl@iitg.ernet.in***, ashimbiotechnologist87@gmail.com

BPP73

287. Mining of ACC deaminase producing fluorescence pseudomonads from green gram (*Vigna radiata* L.) rhizosphere

Rupak K Sarma[1], Rajal Debnath[1], Ratul Saikia[1*], Pratap J Handique[2], Tarun C Bora[1], Archana Yadav[1]

Eighty numbers of bacteria were isolated from rhizospheric soil of green gram in Kings B agar medium. PCR amplification by Pseudomonas specific 16S-23S rRNA spacers (ITS) primers identified 50 numbers of bacteria as fluorescence pseudomonads as described by Locatelli et al. Pseudomonas isolates were screened for ACC deaminase production in M9 minimal medium containing ACC as sole nitrogen source and 10 isolates were found to be positive. The enzyme activity was assessed as described earlier by Honma and Shimomur. BOX-PCR genotypic analysis and 16S rDNA-RFLP fingerprinting revealed huge genetic diversity among the ACC deaminase producing isolates. Among the 10 isolates, RP101 showed highest enzyme production. PCR assay for *acdS* gene showed that RP101 carry sequences similar to the recognized *acdS* gene. *In vivo* experiment with green gram showed that RP101 has significant role in root and shoot elongation, increase in leaf chlorophyll as well as efficient biomass production.

[1] *Biotechnology Division, North-East institute of Science and Technology (CSIR), Jorhat 785006, Assam India*

[2] *Department of Biotechnology, Gauhati University, Guwahati 781014, Assam, India*

e-mail: rsaikia19@gmail.com

BPP74

288. Antibiogram Assay of Certain Bacterial Isolates from Soils of Guwahati

Smita Das, Shyamasree Saikia, Rituparna Bora and Debabrat Baishya*

Antibiotic resistance has become an increasing public health concern because the organism that causes infections in humans and animals are becoming less receptive to the healing aspect of antibiotic drugs. The soil dwelling bacteria has developed mechanisms to resist against a number of antimicrobials, especially because of improper disposal of such drugs. The present investigation was aimed at isolation of soil bacteria from certain locations of Guwahati, Assam to study their antibiogram assay. Four different bacterial isolates designated as SL1, SL2, SR1, SR2 were studied for their colony morphology and microscopic characterization. These four isolates were then subjected for antibiogram assay using disc diffusion method and antibiotic sensitivity pattern was documented for five antibiotics viz. Tetracyclin, Chloramphenicol, Vancomycin, Gentamycin, Kanamycin. Microscopic studies revealed negative Gram's reaction in all the four isolates with coccus shape arranged in chain. All the four bacterial isolates showed resistance against Vancomycin while found to be sensitive to rest of the antibiotics. Therefore, this preliminary investigation signifies the need of proper disposal of such antimicrobial drugs so as to avoid the risk of resistance by the soil dwelling bacteria.

Department of Biotechnology and Bioengineering, Institute of Science and Technology, Gauhati University, Guwahati-781014, Assam
**E-mail:dbaishya_22@sify.com*

BPP75

289. Preparation and Nutritional Analysis of a Ready-to-Eat Instant Breakfast cereal Mix

M. Boruah[1], D.K. Das[2], N. Das[2], S. Deka[2] and N. Sit[2*]

A breakfast cereal is a packaged breakfast food. These were originally sold as milled grains that required further cooking. In this century, due to efforts to reduce the amount of in-home preparation time, breakfast cereal technology has evolved from the simple procedure of milling grains for cereal products that require cooking to the manufacturing of highly sophisticated ready-to-eat products that are convenient and quickly prepared. The breakfast cereal industry has gross profit margins of 40-45%, 90% penetration in some markets, and steady and continued growth throughout its history. It promotes the maintenance of healthy body weight and nutrient intakes in children and adolescence. Keeping all in mind for the Globalization of Indian food and its culture an effort was taken to produce a ready-to-eat (RTE) breakfast cereal mix. Eight different ingredients namely Parboiled rice, Popped rice, Flaked rice, Corn, Bengal gram, Peanut, Sugar and Milk were selected as the key ingredients of the product. All the eight ingredients are processed separately as per convenience using the standardized procedures. Sugar is cleaned by using magnetic separator. Milk is mixed to the product at 60°C. The ingredients are first cleaned for the removal of dust, stones and metallic contaminants. All the ingredients are roasted individually for a particular temperature and time. The Bengal gram is first germinated and then roasted. The ingredients are then grinded. After that these are mixed in specified standardized proportions. Finally the mixed product is vacuum packaged and stored at room temperature. The ingredients are mixed for several proportions in five different series and after watching the consistency, mouthfeels, taste and other sensory properties, the proportions of the fifth series were standardized. Carbohydrate content, protein content and fat content of the final product were estimated as per the standard procedures. These were found very high as 52.28 g/100g, 12.62 g/100g and 8.56 g/100g respectively. Energy supplement was found to be 343.128 kcal/100g.

***Key Words*:** Instant Breakfast, Ready-to-Eat, sophisticated, nutrient intake, vacuum package, energy supplement.

[1]*Rain Forest Research Institute, Deovan, Sotai, Jorhat, Assam, India-785001*

[2]*Department of Food Engineering and Technology, Tezpur University, Napaam, Assam, India*

E- mail: meetmandakini@gmail.com

BPP76

290. Antidermatophytic activity and chemical constituents of *Piper longum* Linn. leaves

J. Das[1], D. K. Jha[2], J. Biswakarma[3], R.S. Policegoudra[1], A.H. Mazumder[1], A. K. Chaurasia[1], M. Das[4], P. Chattapadhyay[1] and L. Singh[1]

As a part of preliminary screening, the methanol extract from *Piper longum* leaves was tested for antidermatophytic activity against *Trichophyton mentagrophytes*, *T. rubrum*, *T. tonsurans*, *Microsporum fulvum* and *M. gypseum*. The extract was found to be active against the dermatophytes with inhibition zone of 37-42 mm at 200mg ml^{-1} and MIC value of 12.5mg ml^{-1} in agar well diffusion and agar dilution method respectively. Subsequent bioassay of different solvent extracts of *P. longum* leaf, obtained by sequential extraction, revealed better antidermatophytic activity of chloroform and methanol extracts with MIC value of 0.5 mg ml^{-1}. Activity-guided fractionation of chloroform extract by column chromatography yielded nine major fractions of which four fractions (fraction-1, 4, 5 and 7) showed higher antidermatophytic activity. MIC values of the fraction-1 against *T. mentagrophytes* and *T. rubrum* were found to be 0.625 and 2.5 mg ml^{-1} respectively in broth microdilution method. Phenolic compounds and methyl ester of fatty acids were found to be the major constituents of the fraction-1 based on HR GC-MS analysis.

[1]*Defence Research Laboratory, Post Bag No. 2, Tezpur-01, Assam, India*

[2] *Microbial Ecology Laboratory, Department of Botany, Gauhati University, Guwahati-14, Assam, India*

[3]*Hiyoshi India Ecological Services Pvt. Ltd., Chennai, Tamilnadu, India*

[4]*Christ University, Bangalore-29, India*

[1]*E-mail: jayshree_bio@rediffmail.com*

BPP77

291. Ethnobotany of religious and sustain traditional cultural practices of the Mishing tribes of Assam

Shyamanta Pegu, Satyanath Doley and Uma Kanta Sharma*

Plants are used in many ways including worshipping gods and goddesses for the protection and betterment of human life. In every human society worship is performed with traditional rituals for well-being. Many tribal communities preserve this tradition through folklore and worship their deities' right from the occasion of birth to mourning death. They perform specific worship with pressie offerings. Various plant parts like bark, twigs, leaves flowers, fruits and seeds are offered to gods, which also have medicinal properties. There are many plants grown near the different religious institutions are regarded as sacred plants by different ethnic groups of the country. They preserve the plants by all means which are used in different rituals. There is an inextricable link between indigenous and biological diversity. All over the world the indigenous people have protected the biodiversity with which they have symbiotic relationship. It has been an undeniable fact that the knowledge of indigenous people is invaluable in the present day context of biological diversity conservation and its sustainable utilization. Various religious beliefs and folklores help in the prevention of destruction of plants. In Assam alone the percentage of tribal population is 12.83. More than 25 communities, mostly tribal and mainly depending on plant resources for their day to day life inhabit in the different parts of the state. Assam has enormous ethno botanical wealth hand in hand with a rich cultural heritage but work on such aspects is very rare. From the different literatures so far published from this region it is known that there is a very little work done on the tribal people of Assam. There is no specific work done so far on the plants used by the tribal people of Assam in different religious and traditional cultural practices. It is in this background that the present study has been undertaken, which is aimed at the documentation of the plants related with religious and traditional cultural practices of Mising people of Assam and their conservational practices.

Department of Botany, Dhemaji College, Dhemaji- 787057, Assam
E-mail: s_pegu@yahoo.co.in

BPP78

292. Development and Identification of Molecular Markers in Sesame (*Sesamum indicum* L.) and Their Utilization.

Padminee Das, Swagata Ghosh, Nanda Madhab Bhattacharyya and Somnath Bhattacharyya

Sesame (*Sesamum indicum* L.) is an important oil yielding plant grows usually in rainfed condition. Genomic information and molecular technologies specific to this crop is very limited. To grow better knowledge of this genome, development of microsatellite (simple sequence repeat, SSR) markers both by enrichment and *Alu*I cut partial genomic library screening is reported. Enrichment is made by hybridization of *Mse*I cut genomic fragments with biotin labeled di or tri nucleotide repeat followed by magnetic separation of SSR containing clones. Screening of Alu*I* genomic library of sesame for identification of SSR containing clones is efficient and cheaper than enriched library. 90 SSR containing sequences are submitted on GenBank for further uses. Initial analysis by RAPD and ISSR analysis of a few genotypes which are in the multilocation yield trail (AVT) for forthcoming release in India as well as in state is also reported. Fifteen ISSR and Twenty six RAPD polymorphic markers with high reproducibility are identified. Molecular markers and morphological characters including earliness are considered for assessing diversity among the 32 accessions of sesame as received from NBPGR, New Delhi to find suitable parental combination. F_1 seeds of 28 different parental combinations are developed for deciphering relationship between molecular markers and heterosis for further improvement of this crop.

Crop Research Unit, Department of Genetics, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia,West Bengal-741252. *runa_bckv@yahoo.co.in*

BPP79

294. Determination of zinc concentration in some organs of normal, Dalton's lymphoma bearing and Dalton's lymphoma bearing BRH2 treated white mice.

S. A. Razzak, Associate Professor, Department of Zoology, Rangia College, Rangia.

Zinc (Zn) play an important role in promoting tumor cell growth. Zn is important in some forms of neoplastic growth and is responsible for nucleic acid biosynthesis.

The present study was designed to determine the Zn concentration in the tissue of liver, spleen, kidney and bone marrow of normal, lymphoma implanted & lymphoma implanted BRH_2(a copper based anticancer complex) treated white mice (C_3H/He strain). The Zn concentration in the liver, spleen, kidney and bone marrow on 10^{th} & 20^{th} day DAL(Dalton's lymphoma) implanted mice were found to be significantly elevated by 16.3% and 81.3% in liver, 80.2% and 104.8% in spleen, 14.0% and 43.8% in kidney and 21.4% and 45.4% in bone marrow respectively over the control. Among the lymphoma implanted BRH_2 treated liver on 35^{th} day exhibited 30.5% depletion of Zn concentration from that of respective control. Though significantly higher Zn level was noted in the lymphoma implanted BRH_2 treated spleen, kidney and bone marrow on 20^{th} day and 35^{th} day then control is yet lower than the DAL implanted spleen, kidney and bone marrow. The removal of Zn from the nucleic acid would lead to retard the DNA synthesis and as a result, multiplication of the tumor cell will be arrested. Zn depletion after introduction of BRH_2 in white mice on 20^{th} and 35^{th} day possibly be seen as an detention of inhibitory effect on DNA synthesis in the tissues.

E-mail: abdur.razzak473@gmail.com

BPP80

295. Insomnia and its Management

Dr. Suman Bharali

Insomnia is the complaint of inadequate sleep. Most of the people suffer from insomnia at different times in their lives. To recover from it we should have a proper knowledge about it.

Insomnia is classified into different types, like; Primary insomnia- a chronic insomnia without identifiable cause; Psychophysiologic insomnia- patients are preoccupied with a percieved inability to sleep adequately at night; Altitude insomnia (acute insomnia) ; Comorbid insomnia- insomnia associated with mental disorders; Insomnia associated with neurologic disorders; Insomnia associated with medical disorders; Medication; drug or alcohol-dependent insomnia.

Many modern pharmaceutical preparations are available for different insomnias. But now a days, many nonpharmacological management techniques mentioned in Ayurveda are gaining widespread popularity. They can be physical like, samvahan (body massage), abhyanga (application of medicated oils on head and body), udvartan over body and mouth, tarpana (nourishment to eyes with medicated oil or ghee), lepa (application of medicated paste on face and head), murdha and karna puran (application of medicated oil and ghee into ear and scalp), utsada (dry massage), snana (bath) and sirodhara (consistant stream of medicated oils etc. falling over forehead). Other treatments targeting the mind are also there like; fixed sleep and wake time, happiness of mind, pleasant music, pleasant fragnances, etc. Proper diet also helps in the management of insomnia. Diet should comprise of sweet and unctous substances. Bed should be comfortable clean and prepared. Their efficacy has been observed, if proper study on mode of action and constituents of preparations is done they will be accepted globally. (A.S. su. 9/55, Ca. su. 21/52-54, Su. Sa. 4/42-45)

M.D. Scholar P. G. Department of Kayachikitsa, Govt. Ayurvedic College & Hospital, Jalukbari, Guwahati – 14
e-mail: bharali.suman@rediffmail.com

BPP81

296. Multi elemental characterization of Road deposited sediments of NH-37

Upasona Devi*, K.P. Sharma and R.R.Haque

Heavy metals are of serious concern due to their toxicity and accumulative behavior. These elements are non bio-degradable and undergo a global eco-biological cycle, Pardo. They posed risk to the entire biota once introduced in the environment. The road dust has often been used as an indicator of heavy metal pollution in the environment, Markus and McBratney; Wilcke et al. Heavy metals arises from various sources in the highways viz. water-transported material from surrounding soils and slopes, dry and wet atmospheric deposition, biological inputs, road surface wear, road paint degradation, vehicle wear (tyres, body, brake lining, etc.) and vehicular fluid and particulate emissions, Sutherland and Tolosa.
The present study would focus on the characteristics of heavy metals originating from highway, NH- 37, in the stretch of Kaziranga National park (KNP) region and thereby would explore the ecological risk posed by the heavy metal pollution.

Total 14 road deposited sediment samples were collected during the pre monsoon period of 2009. The sampling is done depending upon the environmental settling along NH-37 in the stretch of KNP region. The sampling site covers an area of 40 Kms. The various metals analyzed are Co, Cr, Cu, Fe, Mn, Pb, Ni and Zn. The metals concentrations were determined with the help of ICP-OES as per the standard method for both total element and various geochemical fractions.

Key words: heavy metals, road deposited sediments.

Deptt. Of Environmental Science, Tezpur university, Tezpur, Assam, India

Corresponding author address

upasona@tezu.ernet.in

BPP82

297. Seroprevalence of Brucellosis in Yaks of Arunachal Pradesh

D.K. Bhattacharyya*[a], G.K. Saikia*[a], P. Chakraborty*[b] and Mrinal Jyoti Bora*[a]

Prevalence of Brucellosis in Yaks (*Poephagus grunniens*) of Arunachal Pradesh, India was studied. A total of 176 serum samples from Yaks maintained at National Research Centre on Yak, Indian Council of Agricultural Research, Dirang, West Kameng district of Arunachal Pradesh and by local Yak breeders of Dirang Valley zone were collected and tested for brucellosis by Serum Agglutination Test (SAT) and Indirect Enzyme linked Immunosorbent Assay (i-ELISA), of which 9.15 per cent were found positive by SAT and 15.22 per cent by i-ELISA. Higher incidence of brucellosis was recorded in aborted Yak cows (44.8%) followed by non pregnant repeat breeder (19.4%) and pregnant animals (6.7%). Percentage of sero-reactors was much lower (2.2%) in Yak heifers. The prevalence was higher in female (16.2%) in comparison to male yaks (10.81%). Various measures adopted for prevention and control of brucellosis in yaks have been evaluated. Relation of changes in climate or vegetation with the incidence of the disease could not be established. The possible roles played by other domesticated livestock in the transmission of this disease to Yaks have also been discussed.

*[a] *Department of Microbiology, College of Veterinary Science, Assam Agricultural University,*

Khanapara, Guwahati, 781 022 India.

*[b] *Principal Scientist, National Research Centre on Yak, Indian Council of Agricultural Research, Dirang, Arunachal Pradesh, India.*

E-mail: dilipbhatta@live.com

BPP83

298. Emergence of carbapenemase producing *Klebsiella pneumoniae* in urinary isolates from a tertiary care referral hospital in Northeast India

Arijit Bora[1], Giasuddin Ahmed[*], Nava Kumar Hazarika[2], Kashi Nath Prasad[3], ***Sanket Shukla[3].***

Carbapenems, a group of β-lactam antibiotics, are typically used as last line of defense against life-threatening infections caused by *Enterobacteriaceae* producing extended spectrum β- lactamases (ESBLs). However, the emergence of carbapenem hydrolyzing β-lactamases, known as carbapenemases among the members of *Enterobacteriaceae*, particularly in *Klebsiella pneumoniae* heralds in a new era of antibiotic resistance. We determined the carbapenemase production in urinary isolates of *K. pneumoniae* collected from a tertiary care referral hospital in Northeast India. A total of 111 *K. pneumoniae* isolates were recovered from the urine samples of the patients with significant bacteriuria. Out of 111 urinary isolates, a total of 19 isolates were screened for carbapenemase production on the basis of their reduced susceptibility to meropenem or ertapenem by disk diffusion susceptibility testing following clinical and laboratory standards institute (CLSI) guidelines. All screened isolates were further phenotypically confirmed for carbapenemase production by modified Hodge test and detection of metallo-β-lactamase production was carried out by using combined-disk test. Both the phenotypic confirmatory tests showed positive results for all screening positive isolates, although weakly positive reactions in modified Hodge test were observed for few isolates. Our findings indicate a high probability of carbapenemase production in urinary isolates of *K. pneumoniae* with reduced susceptibility to meropenem or ertapenem. Early recognition of carbapenemase-producing organisms is crucial for appropriate choice of antimicrobial therapy and infection control measures.

Keywords: *K. pneumoniae*, ESBLs, carbapenemase, bacteriuria.

[1]*Department of Biotechnology, Gauhati University, Guwahati, Assam, India .*
[2]*Department of Microbiology, Gauhati Medical College and Hospital, Guwahati, Assam, India.*
[3]*Department of Microbiology, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, Uttar Pradesh, India.*
**Professor, Dept. of Biotechnology, Gauhati University, Guwahati, Assam, India.*

BPP84

299. Screening of PHB producing methylobacteria in brackish water Chilka lake

Manish Kumar, Kamlesh K. Meena, Dilip K. Arora

Methylotrophs are a group of microorganisms utilizing reduced carbon compounds as source of carbon and energy. The production of poly-β-hydroxybutyrate (PHB) is one of the characteristics of methanol utilizing methylobacteria. Isolation of PHB producing methylotrophs, recognition of brightly refractile cytoplasmic inclusions, staining with Sudan Black and chemical extraction of PHB were used as a culture dependent approach for the detection of PHB producing methylobacteria. The methanol oxidizing methylotrophic bacterial community DNA was extracted and *mxaF* gene (coding large subunit of methanol dehydrogenase) was amplified. The *mxaF* gene amplification shows their methylotrophic origin. At five different locations, the observed PHB producing capability of methylobacteria was different. The 16S rRNA gene sequencing of PHB producing strains at different locations reveals the identification of *Methylobacterium extorquens*, *Methylobacterium mesophilicum* and *Methylobacterium spp*. The population of PHB producing methylotrophs was observed maximum at a site nearer to the sea mouth.

Key words: Methylobacteria, PHB (poly-β-hydroxybutyrate), *mxaF*

National Bureau of Agriculturally Important Microorganisms, Mau Nath Bhanjan, U.P. 275101

E mail: manishgsrivastava@gmail.com

BPP85

300. Comparative Genomic Analysis of Cyanobacteria for Thermophilic Adaptations

Ratna Prabha, Vivek Keshri, Dhananjaya P. Singh, Dilip K. Arora

The basis of thermostability of genome and proteome of thermophilic organisms has long been a question of debate [Linden and Farias 2006]. Temperature has profound effect on the physiology and cellular processes of organisms and it is obvious that organisms have evolved various mechanisms at genomic, proteomic and other levels for adaptations to different temperatures. Many different parameters have been evaluated at genomic and proteomic level which has provided an insight into the adaptation of these organisms at high temperatures. Cyanobacteria are a group of bacteria that obtain their energy through photosynthesis. Cyanobacteria are arguably the most successful group of microorganisms on earth. They flourish in water that is salty, brackish or fresh, in cold and hot springs, and in environments where no other microalgae can exist. Currently, complete genome sequences are available for 42 cyanobacteria including 3 thermophilic species i.e. *Thermosynechococcus elongatus*, *Synechococcus sp. JA-2-3B'a(2-13) and Synechococcus sp. JA-3-3Ab* which belongs to two different genus i.e. Thermosynechococcus and Synechococcus. We performed a comparative analysis of three thermophilic cyanobacteria at various levels, with respect to their thermophilic behavior. At genomic level, we evaluated GC content, dinucleotide and oligonucleotide frequency, total codon count, Relative Synonymous Codon Usage (RSCU) [Lynn et al, 2002] and J_2 Index [Kawashima et al. 2000] whereas at the level of proteins, parameters like frequency of individual amino acids and their specific combinations [Szilagyi and Zavodszky 2000], Amino Acid Usage [Zeldovich et al, 2007], CvP bias [Suhre and Claverie, 2003] and E+K/Q+H [Farias and Bonato, 2003] were considered. In our study, we identify the factors which have major impact on thermophilic behavior of these cyanobacteria. Furthermore, we studied each genome individually to identify specific factors involved in thermophilic trait of these organisms. For instance, in case of *Thermosynechococcus elongatus* genome some other factors were identified which seems to impart in thermophilic adaptations such as presence of additional genes for heat-shock proteins, absence of genes for fatty acid desaturases which is popular in many thermophiles, 28 copies of group II introns, heat- induced groEL2 gene. Now we have investigated the rest of two genomes i.e. *Synechococcus sp.* JA-2-3B'a(2-13) and *Synechococcus sp.* JA-3-3Ab for their thermophilic behavior. Through this study we have been able to identify and understood mechanisms ruling for thermophilic behavior of these cyanobacteria.

National Bureau of Agriculturally Important Microorganisms (ICAR),
Kushmaur, Mau, U. P., India
ratnasinghbiotech30@gmail.com

BPP86

301. Induction of volatile chemical emission from *Litsea monopetala* (Roxb.)*Pers*. upon herbivory by *Antheraea assamensis* Helferi.

Bhabesh Deka and Dipsikha Bora

Emission of volatile chemicals by plants might function as induced defense caused by herbivore feeding. These volatile chemicals are known to be released only at the time of attack to attract enemies of the herbivores. Plants thus may adopt a flexible management of inducible defensive resources to minimize costs of defense and to maximize fitness in response to unpredictable herbivore attack.

The present investigation was carried out to identify the volatile organic compounds released by host plant, *Litsea monopetala* during different intervals of feeding by *Antheraea assamensis* .Fifth instar *Antheraea assamensis* larvae were allowed to feed the leaves of its host plant *Litsea monopetala,* under both 'in situ' and 'ex situ' conditions for different intervals up to 144 hrs. The green leaf volatile compounds released from the host plant after feeding and mechanically damaged were trapped using synthetic polymer adsorbent Porapaq-Q and analyzed by GC/GC-MS. The investigation revealed that leaves of *Litsea monopetala* during feeding by *Antheraea assamensis* released several types of volatile chemicals (alcohols, aldehydes, their esters, monoterpenoid and sesquiterpenoid hydrocarbons and organic acids) in higher amount and were different in comparison to undamaged leaves as well as mechanically damaged leaves.

Thus the study shows that feeding by *Antheraea assamensis* caterpillars on the host plant *Litsea monopetala* triggers the release of green leaf volatile compounds from the onset of feeding up to several hours.

Keywords—*Antheraea assamensis, Litsea monopetala,* volatile organic compounds.

Department of Life Sciences. Dibrugarh University,
Dibrugarh-786004, Assam, India.
Email: bhabesh.deka@gmail.com

BPP87

302. Study on the Taxonomy and Floral Biology of Threatened Plant Mejankori (Litsea *Cubeba* Pers)

*Dr. Maanjit Gogoi and Chitralekha Gogo

Unique Muga (*Antheraea assama* Ww) being multivoltine and polyphagus species, feed on various types of plant leaves. Among these, the secondary food plant Mejankori (*Litsea cubeba* Pers), is an ethnobotanically important, plant of NE India. It is a dioecious, semi evergreen, aromatic plant and has dwell potentiality in industrial and rural aspect. Several causes are responsible for decreasing of Mejankori plant.e.g habitat destruction, ONGCL drilling operation, and small tea growers' extension activities etc.Information regarding morphology and floral biology involving opening time of flowers, opening and closing behaviour of tepals, dehiscence of anthers, and viability of pollen grains and receptivity of the stigma were reported. The inflorescence is penicle. Flowering starts from the last week of February and continue up to the middle of March. The maximum anthesis is recorded at12 noon, when temperature and humidity of the day is optimum. Pollen fertility is 80%, receptivity of the stigma remained from 45 to 140 minutes after opening of inner tepals.

Keywords: Taxonomy, Floral biology, Mejankori, Antheraea assama Ww.

**Associate Professor, Department of Botany, Gargaon College, Simaluguri, Sivasagar, Assam.*

Research Scholar, CMJ University, Shillong, Meghalaya

E-mail: mgogoi51@yahoo.com

chitralekhagogoi18@gmail.com

BPP88

303. Prevalence and Charecterization of *Clostridium perfringens* in Animals, Birds and Foods of Animal Origin

Archana Nath[1] and Rajib Sharma[1]*

In the present investigation, isolation of *Clostridium perfringens* was tried from various samples collected from clinically affected and apparently healthy animals and birds, irrespective of age and sex. Isolation of *C. perfringens* was also attempted from different types of food of animal origin in the present study. The isolated organisms were identified as *C. perfringens* on the basis of their morphological, cultural and biochemical characteristics. The isolates were also characterized in respect of certain virulence characteristics like, haemolysin, deoxyribonuclease (DNase) and phospholipase C production. Plasmid profile of representative isolates was also studied. Detection of some of the gene encoding some major toxin of *C. perfringens viz. cpa, cpb, etx, iA* and *cpe,* in randomly selected isolates was also carried out by PCR.

[1]*Department of Veterinary Microbiology*

College of Veterinary Science, Guwahati , Assam

archananath3@gmail.com

BPP89

304. Studies on Cultivar Variation of Chemical Parameters Related to Tea Quality in North Bengal

A.K. Gogoi *and A. B. Sen

Quality of tea always have chemical basis, which originates in biosynthetic reaction sequences during growth periods. The biosynthetic reactions are regulated by genetical, soil conditions and environmental factors, field-cultural practices as well as manufacturing techniques. Chemical constituents in tea shoots and quality parameters of corresponding CTC (Crushing Tearing Curling) teas under North Bengal conditions were found to vary with cultivars. Varietal variation in fermentation time was also observed among the cultivars. Considerable cultivar variation on chlorophylls, total polyphenols and soluble sugars content in tea shoots was observed. Chlorophylls content in shoots of Stock 491, 520 and Cambod variety clones viz. TV 9, TV 18, TV 23 TV 25, TV 26, TV 28, TV 29 and TV 30 were comparatively higher than Assam hybrid clones viz. TV 1, TV 2, TV 14, TV 16, TV 17 and S3A3. Quality parameters such as theaflavins (TF), thearubigins (TR), brightness and total colour in made teas were significantly higher in Assam hybrid cultivars including Teen Ali 17. Significant cultivar variation on caffeine, soluble solids, crude fiber and total ash content in made teas were also observed. Blackish appearance in made teas of stock 491, 520, Teen-Ali 17 and most of the cambod variety clones was observed. Tea taster preferred the made teas processed from Assam hybrid cultivars.

Tocklai Experimental Station, Tea Research Association, Jorhat-785008, Assam, India
Nityananda Path, Old Amolapatty, Golaghat – 785621, Assam
Mail – anandagogoi2011@gmail.com
Mobile - 08011508631

BPP90

305. Detection of Virulence Genes of *Salmonella* by Polymerase Chain Reaction

Geetima Barman[1], G K Saikia[2], D K Bhattacharyya[3] And P Roychoudhury[4]

Forty one *Salmonella* strains including 34 (82.92%) *Salmonella* enterica serovar Typhimurium and 7 (17.07%) *Salmonella* enterica serovar Enteritidis isolated from diarrhoeic as well as apparently healthy calves, piglets and birds were screened for presence of virulence genes viz., *stn, invA, sopB* and *sefC by* polymerase chain reaction. All the isolates (100%) irrespective of serovars tested positive for *stn*, 63.41 per cent for *invA*, 87.80 per cent for *sopB* and 14.63 per cent for *sefC*. The *sef*C gene was present only in *Salmonella* Enteritidis. The virulence genes were detected in *Salmonella* recovered from both diarrhoeic and apparently healthy calves, piglets and poultry. More number of isolates recovered from clinically affected animals/birds (34) harboured virulence genes in compare to the isolates from apparently healthy (7) animals /birds.

Department of Microbiology, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati, Assam Pin-781022

1 Research Associate, ICAR RC for NEH Region, Umroi Road, Umiam, Meghalaya. Email: g_gbk@rediffmail.com

2 Professor, Department of Veterinary Microbiology, College of Veterinary Science, AAU, Khanapara, Guwahati, Assam. E mail – saikiagk@yahoo.com

3 Associate Professor, Department of Veterinary Microbiology, College of Veterinary Science, AAU, Khanapara, Guwahati, Assam. E mail – dilipbhatta@live.com

4 Assistant Professor, Department of Veterinary Microbiology, College of Veterinary Science & A.H, Selesih, Aizawl, Mizoram. E mail – parimal74@yahoo.com

BPP91

307. Purification and Characterization of a Lectin from Acorns, Ingestion of which Causes Poisoning In Humans

S. Sunil Singh, H. Rully, S. Jibankumar Singh, L. Rupachandra Singh, and S. Kunjeshwori Devi†

Acorns are the fruits of oak trees belonging to the *Quercus* species. An acorn consists of a single-seeded, thick-walled nut set in a cuplike base called cupule. Ingestion of too many acorns leads to poisoning in humans. The clinical signs of the poisoning include pitting edema of the feet, irregular pulse, nausea, and malaise. The poisoning has been mainly attributed to the polyphenolic compounds such as gallotannin and pyrogallol present in acorns. However, one or more of carbohydrate-binding proteins called lectins, often acting as anti-nutritional factors, may be present in the acorns. It is possible that such proteins play a role in causation of the acorn poisoning. In the present investigation, a new magnesium ion requiring *N*-acetyl-D-glucosamine specific lectin, designated QIL, has been purified to electrophoretic homogeneity from the seed part of acorn of the oak tree *Quercus ilex* L. and subsequently characterized.

Key words: acorn, acorn poisoning, *Quercus ilex*, lectin, *N*-acetyl-D-glucosamine specific lectin, magnesium ion requiring lectin

Laboratory of Protein Biochemistry, Biochemistry Department, Manipur University, Canchipur, Imphal-795003, India.
†To whom correspondence should be addressed. Fax: +913852435145
Email: kdsanjenbam@yahoo.com, rslaishram@yahoo.com

BPP92

308. Medicinal use of small indigenous fish species in Assam

Gayotree Agni Bora

In many parts of South and Southeast Asia, including India a large diversity of small indigenous fish species are found in freshwater system .Out of 750 species of freshwater species found in India, a large number of them are familiar only to local population (Daniels, 2002).These fish has not only the stuff to eat and relish, it also provides a good source of quality of protein, vitamins, minerals, fewer calories, fat and cholesterol. People have traditionally dependent on various varieties of indigenous fish species ,easily available from nearby water bodies as a source of nutrition and they also use as a medicine either directly or along with herbs for curing ailments, such as pain killer and also certain gynecological problems. These species serve as medicine suffering from malnutrition and are believed to have beneficial effect in increasing RBC content of blood specially to cure anemia.

BAHONA COLLEGE, JORHAT-785101
gayotriagnibora@rediffmail.com, dr.prasannadutta@rediffmail.com

Ph.No.-9435353172

BPP93

309. Endangered Aromatic Plant Species of Sivasagar District, Assam: A Profile

Nipun Baruwati and *Dr. Maanjit Gogoi

Sivasagar district is biologically warm area of north eastern India with varied vegetation type. It lies $94^0 15^/$-$95^0 45^/$east longitude and $26^0 45^/$ -$27^0 15^/$ north latitude. The total geographical area of the district is 2668 sq. km. with tropical monsoon climate. This climatic condition is suitable for diverse plant species.

This paper highlights the environmental impact and the present status of aromatic plants of Sivasagar district. During study about 120 aromatic plants were recorded belonging to 62 families. Out of these 25 aromatic plant species belonging to 19 families are regarded as endangered due to natural and some anthropogenic causes such as ONGCL drilling operation, uses of chemical pesticides, deforestation, small tea growers, land use pattern etc.

Key words: Endangered, Sivasagar district, Aromatic plants

Research scholar, UGC Major Project Gargaon College, Simaluguri, Sivasagar, Assam

**Associate Professor, Department of Botany, Gargaon College, Simaluguri, Sivasagar, Assam*

E-mail: mgogoi51@yahoo.com, chitralekhagogoi18@gmail.com

BPP94

310. Green Synthesis of Silver Nanoparticles Using Leaves of *Cinnamomum tamala* and Studying its Anti Bacterial Activity

Aparajeeta Kalita, A. Bora, B. Dey, N. Sharma, D. Baishya, S. Banu, K.K.Saikia & Rituparna Borah*

The metallic nanoparticles have great attention of Chemists, Physists, Biologists and Engineers who wish to use them for development of new generation nanodevices. Metallic nanoparticles are traditionally synthesized by wet chemical synthesis techniques where the chemicals used are quite often toxic and flammable. Recent Development of biologically inspired experimental processes for the synthesis of nanoparticles is evolving into an important branch of nanotechnology. In this present study silver nanoparticles were synthesized from *1mM AgNo3* solution through a simple and eco-friendly route using leaf extract of dried *Cinnamomum tamala* as a reductant and stabilizer. Aqueous extract of dried *Cinnamomum tamala* leaves is used for the bio reduction of silver nitrate (Ag^+ to Ag^0). The synthesis of silver nanoparticles was investigated using UV-Visible spectrophotometer, TEM (Transmission Electron Microscope) and XRD (X ray- diffraction). The size of silver nanoparticles formed was found to be $\leq$ 100 nm. The silver nanoparticles formed were found to be very effective against *E.coli, Klebsiella spp* and *S. aureus*. The aqueous solution of silver nanoparticles showed high antibacterial activity against *E.coli*, *Klebsiella spp* and *S.aureus* with the zone of inhibition was observed within 200mm in diameter. The bactericidal property of nanoparticles was analyzed by measuring the growth curve of bacteria.

Department of Biotechnology and Bioengineering, IST, Gauhati University. Guwahati . Assam

**Email: rituborah@gmail.com*

BPP95

311. Larval Taxonomical Traits of Native Population Of *Antheraea Assamensis* Helfer (Muga Silkworm) Of Assam, India

Ramesh Nath* and Dipali Devi

The sericigenous Saturniid *Antheraea assamensis* Helfer, 1837, (muga silkworm) having the lowest chromosome number n=15 is known as the ancestral form of the genus *Antheraea*. This insect is exclusively confined to the Brahmaputra valley of Assam and some parts of neighboring states of NE region of India due to its unique ecological niche. Although it is a monotypic species, it has four distinct larval color morphs, namely green, blue, orange and yellow and these are non diapausing multivoltine in nature. A diapausing wild morph is also found in the forests of this region. Lack of systematic study on taxonomical trait of this natural population instigated to study the distinguished morphological characters in larva. Significant variation was observed in respect of voltinism, geotropism, larval tubercle, setae number in between the color morphs and the wild morph. Based on this study the three color morphs viz. green, blue and orange could be clubbed together and the wild morph remains separately. It is expected that this study will help in designing the breeding programme to improve hybrid vigor as the population is suffering from inbreeding depression. It will help in maintaining the stable and sustainable population, thereby saving the precious germplasm of *A. assamensis* from extinction.

Key words: Taxonomical traits, Native population, *Antheraea assamensis*, morphs, germplasm

* *Department of Zoology, Dhing College, Dhing-782123, Assam, India*

Seri-biotech Lab, Life Sciences Division, Institute of Advanced Study in Science and Technology

Paschim Boragaon, Guwahati-781035, Assam, India.

**Corresponding author: rameshnathdhing@gmail.com*

BPP96

312. Synthesis of silica nanoparticles from grasses, its optimization, characterization and application in agricultural pest control

**Arup Jyoti Borah, * Dr. V.A Selvi

Silica is the abundant component in grasses, higher than in dicotyedonous plants. Silica can be used as nanocomposites in nanotechnology because of its innate properties(Tan *et al.,* 2004) -melting point(1600-1725 °C), boiling point(2230 °C), solubility in water when the concentration rises 0.079 g L^{-1}, high surface area around 800 m^2/g that support good absorbant property which makes it suitable for use in nanotechnology with potential effect in electronics, medicine(Glom 2005;Chan 2006;Boisselier *et al*.,2009), drug delivery and agri-nanotechnology such as to eradicate the problem of pathogen interaction involving plant disease(Meyer *et al.,* 2002,2003;Kordan *et al.,*2005), efficient nutrient utilization and enhanced plant growth. Many of these grasses forms their habitat in the wastelands, some of them are weeds like *Pennisetum purpureum* and others like *Pennisetum setaceum* contribute to wildfires. It can be ascertained that these grasses is of no much use to the society apart from forming a part of the stable ecosystem. Therefore an attempt has been made in the current study to utilize these grasses for the use in nanotechnology and also attaining sustainability at the same time without disturbing the ecosystem.

Based on such literature survey biochemical analysis has been conducted on eight different grass samples. Ash content which determines the mineral content was found to be more in sample 6 (Pennisetum setaceum). The samples were then qualitatively tested with molybdate method to estimate the amount of silica and also treated chemically to extract silica quantitatively. Thus *P.setaceum* have given better yield of silica comparatively with respect to other grass samples both qualitatively and quantitatively. The sol based extraction procedure without any surfactant has been optimized by pretreatment with various biological, chemical and physical parameters to develop a method of nanosilica preparation (Tzong *et al*., 2011) that enhances the economic benefits and also extract more amount of silica. Both biological and chemical treatment gives better results. The precipitation method was used to extract silica nanoparticles by increasing the concentration of HCL and NaOH. The nanoparticles obtained were characterized by XRD and particle analyzer. The silica nanoparticle is then treated with different pest found in cereals and vegetables. Various physiological parameters of the pest like overall and fatal body weight, inactivation and mortality time, and percentage liquid loss were monitored continuosly with respect to time. It was observed that increase in silica concentration had a profound effect in reducing the life span of the pest. Studies have revealed that it can also replaced the place of carbon contain in the insecticide (Sieburth *et al.,1990*). Moreover as stated prevention is better than cure. Silica can also be used as a fertilizer since it is reported that the presence of silica in plants enhance the growth of the roots and fruits. And also add nutrient supplements to animals.

*Environment management Division (EMD), Central institute of mining and fuel Research (CIMFR, CSIR) Dhanbad ; email: arupjyoti88@gmail.com

**Arup Jyoti Borah, JRF, Dept of Biotechnology, IIT, Guwahati

BPP97

313. *In Vitro* propagation of Ginger (*Zingiber officinale* Rosc.) cultivars- Majhuley, Bhaisay and Sanuaduwa of Sikkim Himalaya

Sushen Pradhan[1], Pratap J Handique[2] and Bharat C. Basistha[1]

Present experiment was fulfilled with an efficient, simple micropropagatoin methods for *Zingiber officinale* cv *Majuley, Bhaisay and Sanuaduwa* for the production of disease free and rapid multiplication of planting material of ginger micro-propaogules and conservation of germplasm resources of ginger cultivator variety of Sikkim. MS medium with 3 % of sucrose with different concentration of hormone showed the suitable medium for multiplication of ginger. A total of 37 different concentrations of growth hormone/ cultured medium were examined. The maximum number of shoots and roots were observed on GM 23 (MS+ sucrose 30 g + BAP 2.5mg/l+0.5 NAA+2mg/l activated charcoal) and second was GM 24 (MS+ 30g sucrose + BAP 3mg/l+0.5 NAA + 2mg/l activated charcoal). The maximum number and length of mean shoots, roots and leaves were recorded on the combination of growth regulator 2.5mg/l BAP and 0.5mg/l NAA with shoots numbers and lengths 19.98 ± 0.01 and 4.09 ±0.04, root number and length were 06.78 ± 0.21 and 05.53 ±0.05 and mean number of leaves 06.96 ±0.03 per. Less number of shoots was observed in single growth regulator GM 14 (09.25 ±0.4 in 2.5 mg/l BAP) and GM 4 (06.65 ±0.2 in 2.0mg/l in Kinetin) were used in the treatment. After individually subcultured on same fresh medium, adventitious buds were initiated after 10–15 days of culture, complete plantlets developed within 40 days and maintained for 18 months without decreasing the multiplication rate. The combination of cytokinins and auxin in the culture medium enhanced the response in a number of species in terms of shoot and root growth*s,* with 100% ***in*** *vitro* multipled plantlets were successfully transferred into field**.**

Sushen Pradhan, Age- 29, email: sushenpradhan@gmail.com

[1]*State Council of Science and Technology, Gangtok, Sikkim and*

[2]*Department of Biotechnology, Gauhati University, Assam.*

BPP98

314. Total Carotenoids and Identification of its Genes in Chilli Pepper: A Preliminary Study

Lakhimee Bharali, Nilave Bhuyan, Sourabh Kumar Das, Sangeeta Borchetia

Chillies are berries of genus *Capsicum* of family Solanaceae which are cultivated in different parts of the world. The fruit of *Capsicum* has a variety of names depending on place and type of fruits. Accurate identification of **Capsicum** species is very difficult because traditionally, identification and characterization of **Capsicum** species have been based on morphological characters. Chillies are important for their nutritional value, flavour, aroma, texture and colour. Their nutritional value is due to presences of numerous chemicals including, capsaicinoids and carotenoids. The pericarp of chillies is a rich dietary source of carotenoids. Carotenoids with provitamin A are credited with beneficial effects to human health such as reduction of the risk of degenerative diseases such as cancer, cardiovascular diseases, cataract and muscular degeneration. Carotenoids especially α-carotene, β-carotene, cryptoxanthin, lutein, zeaxanthin and lycopene have been suggested as a natural source of antioxidants, specifically due to their ability to quench singlet oxygen and interact with free radicals. As the fruits of chilli pepper are rich sources of pro-Vitamin A, quantification of carotenoids and identification of its genes in local varieties is very important for development of nutritious food and further gene manipulation. Moreover identification of varieties using molecular markers will help to study the genetic variation at the molecular level. With this objective, the present study was conducted in ten replicates of 5 different varieties of *Capsicum* spp. namely Khorika, Khut, Ghee, Bhot and Mem. Genetic variation was observed among the varieties using RAPD markers. Significant varietal differences were evident in carotenoid accumulation which was detected by absorbance at 450 nm. The carotenoid content ranged from 6µg/gm in ripened Bhot variety to 0.98 µg/gm in Ghee variety. The quantity of carotenoids varied with the type of solvent used for extraction. Using Principle Component Analysis, the correlation between different contributing factors were studied and a positive correlation was found between colour and accumulation of carotenoids. For further characterization, genes of the carotenoid pathway were amplified using gene specific markers. Phytoene synthase (Psy) and phytoene desaturase (Pds) genes showed a high percentage of similarity in different varieties. The flavour genes amplified only in the Ghee and Bhot chilli variety.

Centre for Biotechnological Studies, J.B.College, Jorhat, Assam, India – 785001
Email: coordinatorbiotechcentre@jbcollege.org, sborchetia@yahoo.com

BPP99

315. Purification and Characterization of Glucansucrase produced by *Lactobacillus plantarum* DM5 isolated from a fermented beverage Marcha of Sikkim

Deeplina Das and Arun Goyal*

Glucansucrase are extracellular enzymes elaborated by several lactic acid bacteria of the genera *Lactobacillus*, *Leuconostoc*, *Lactococcus, Pediococcus, Weisella* and *Streptococcus* belonging to glycoside hydrolase family 70. These enzymes have enormous industrial value for their capacity to hydrolyse sucrose and synthesize glucan. To discover novel glucansucrase, an isolate *Lactobacillus plantarum* DM5 (GenBank accession number: JF681367.1) showing higher glucansucrase activity was screened from the traditional fermented beverage Marcha of Sikkim. The isolate was grown in enzyme production medium as described by Tsuchiya *et al*. 1952 to produce glucansucrase. The optimum temperature for enzyme production was 27°C under static condition. The cell-free supernatant of *L. plantarum* DM5 gave enzyme activity, specific activity and glucan concentration of 2.8 U/ml, 0.53 U/mg and 10.2 mg/ml, respectively at 27°C. The enzyme production was also compared with different shaking condition, such as 90, 120, 150 and 180 rpm, respectively at 27°C. At 120 rpm, the maximum enzyme activity of 2.6 U/ml and specific activity of 0.5 U/mg was obtained at different shaking condition. The crude enzyme from cell free extract was purified by fractionation using different percentages of PEG 400. A maximum specific activity of 6.7 U/mg and 14 fold purification was obtained with 36% (v/v) PEG-400. Molecular weight of the glucansucrase from the isolate DM5 was determined by denaturing SDS-PAGE and it was approximately, 128 kDa. The *in situ* activity of enzyme was confirmed by Periodic acid staining using non-denaturing SDS-PAGE incubated with 10% sucrose. No band appeared after activity staining upon incubation of gel with raffinose, thus excluding the presence of fructosyltransferase. The results in detail will be presented.

Department of Biotechnology, Indian Institute of Technology Guwahati,

Guwahati 781 039, Assam, India

Tel: +91 361 2582208, Fax:+91 361 258 2249, e-mail: r.aruna@iitg.ernet.in, dasdeeplina@gmail.com

BPP100

316. Sustainable utilization of Bio-resources of Tasar silkworm in East Siang district of Arunachal Pradesh

Arup Nama Das, *Dr. Rezina Ahmed

The northeast region of India is well known as the unique reservoir of bio-resources of various sericigenous insects including the Tasar silkworm and the forest / wasteland based food plants. Tasar silk is a forestry product and comes under Agro-forestry as the major host food plant is the Oak trees of Northeastern region specially an untouched area of this Tasar silk production is the East siang district of Arunachal Pradesh. Mostly the village women of these districts preserving this endangered Tasar silk production. The silkworm *Antheraea proylei* is largely in these areas which supports the growth of Tasar silk production. Another fact that East siang district is naturally blessed with the Oak trees (Quercus spp.). The whole tribal people of this belt is mainly depends upon the Tasar silk. The village textile industry in this district has the unique support for the wild Tasar silk and its food plants.

The East siang district of Arunachal Pradesh forms the easternmost district of the state located between 27º43' and 29º20' N Latitude and 94º42' and 95º35' E Longitude. Altitude of 1550m ASL, Humidity ranges from 68% - 85%. The annual rainfall is approximately 2500mm and the temperature varies from 6ºc to 25ºc.

In this region the rare silkworm mostly *Antheraea proylei Jolly* is limited and produces the poor peoples silk. So, to explore the prospects of Tasar culture are need to conduct an extensive survey to reveal the natural existence of Tasar silkworm and its host plants along with strategies for utilization of these bio-resources for sustainable growth of rural economy.

Keywords: - Sustainable utilization, Bio-resources, Tasar silkworm.

Research Student , C.M.J. University, arupn8@gmail.com

Deptt. Of Zoology, Cotton College, Guwahati-1, rezina_2008@yahoo.com

BPP101

317. Use of Wetland Flora as Traditional Medicine

P.K.Dutta & T. K.Gogoi

Wetlands are among the most precious natural resources on earth. Wetlands are natural areas where water accumulates for major part of the year by diversion of Hydrological cycle. Wetland supports high level of biological diversity and has tremendous potential for fish production. One of the characteristic features of wetlands is the presence of aquatic macrophytes. Many of these macrophytes decrease fish production and also deteriorate wetland ecosystem in natural way. But many of this plant community have been used by neighbouring people as traditional medicine in curing common ailments. Some others are used as fruits and vegetables which supplements the vitamin and mineral requirements of poor villagers and fishermen community in special. The present paper deals with such plants found in the wetlands of Jorhat district.

Bahona College, Jorhat-785101
dr.prasannadutta@rediff

Ph.No.-9435713575

BPP102

343. Studies on neutraceuticals in a simple processed product developed from banana (Cv Bhimkol).

Devi, R[1].; Das, P.[1]; Sarmah, T.C.1; Changmai, M.[2]; Boro, R.[2] and Dutta Sinha, A.[3]

The banana (Cv Bhimkol) fruit is considered as a good natural source of baby food among the rural masses of North Eastern region of India. The crop is available through out the year. However, the processed form of this neglected fruit is very negligible. Considering nutritional status of the fruit and to impart place, consumer and form utility, a dehydrated beverage powder was prepared and its, mineral content(potassium, calcium, iron and phosphorus), microbial load, sensory qualities and antioxidant activity were determined up to six months of storage in glass container, both at refrigerated condition and room condition. The result showed better retension of minerals and antioxidant activities in refrigerated condition than in room storage. Reduction of minerals might be due to hygroscopic nature of the beverage powder as sugar was added to the dehydrated banana powder at 1:1 ratio. Result of the microbial count did not show health hazard, however, sensory evaluation revealed that the consistency quality (solubility) of the processed form can be improved further.

[1]*Department of Biochemistry and Agril Chemistry,*
[2] *Department of Agril Biotechnology,*
[3]*Department of Agril Engineering,*
Assam Agricultural University, Jorhat:785013, Assam
priyanka.aau@gmail.com

BPP103

344. Molecular identification of a probiotic strain *Pediococcus pentosaceus* CRAG3 isolated from fermented cucumber

Rishikesh Shukla, Rwivoo Baruah and Arun Goyal

The aim of this investigation was to identify and characterize strain of lactic acid bacteria (LAB) isolated from fermented cucumber. A total of 45 strains of LAB were isolated and screened on the basis of their glucansucrase and glucan producing ability. The isolated strain with maximum glucansucrase activity and glucan concentration named CRAG3 was selected and morphologically characterized using Gram's reaction and SEM analysis. CRAG3 was Gram's positive and cocci shaped cells. It was then identified using 16S rDNA sequence analysis and polymerase chain reaction (PCR) using universal primers. The genomic DNA was isolated and PCR was used to amplify full length (1.5kb) 16S rRNA gene using forward primer 8F and reverse primer 1492R. The PCR products were purified, extracted and cloned into cloning vector, pGEM-T-Easy. The positive clones were confirmed by PCR reaction using 8F and 1492R primers and forward and reverse DNA sequencing reaction of PCR amplicon was carried out using BDT v3.1. The isolate CRAG3 was identified as *Pediococcus pentosaceus* and assigned the Genbank accession number JN944736.1. It was further checked for its probiotic characteristics like resistance to biological barriers (gastric juice, lysozyme and bile salts), deconjugation of bile salts and antibacterial activity. Interestingly the strain showed tolerance to lysozyme, gastric juice and bile salts with 75%, 55% and 56% survival, respectively and bile salts hydrolase activity with yellow halo around colonies. CRAG3 also showed antibacterial activity against pathogenic strains like *Escherichia coli* and *Staphylococcus aureus*.

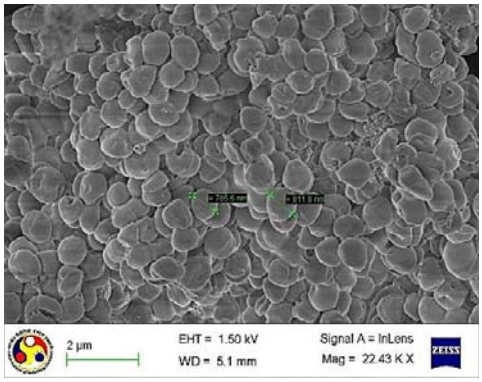


Fig. 1 Scanning Electron Microscopic image of *Pediococcus pentosaceus* CRAG3

Department of Biotechnology, Indian Institute of Technology Guwahati, Assam, India

Email: r.shukla@iitg.ernet.in, arungoyl@iitg.ernet.in, rwivoo@iitg.ernet.in

BPP104

345. Study of Antioxidant Activity of Two Fruits in North East, India.

Dr. Rajlakshmi Devi, Minakshi Das, Tilluttama Mudoi, Kaustav Sharma

In this study, antioxidant activity of two fruits was investigated in cooking and non-cooking form for its free radical scavenging activity by adopting various *in vitro* methods. The antioxidant activity was investigated by DPPH (1,1-diphenyl -2- picrylhydrazyl) radical scavenging activity, reducing power, H_2O_2 radical scavenging activity, *in* vitro lipid peroxidation *etc.* Percentage inhibition of free radical was observed and IC_{50} value compared with standared. Both the fruits showed good antioxidant activity in non-cooking state.

Antioxidant Labortory, Life Sciences Division, Institute of Advanced study in Science and Technology (IASST), Paschim Boragaon, Guwahati-35, Assam, India.

BPP105

346. Curtailing the Over Expression of E2f3 in Breast Cancer using *Sirna* (E2f3) Based Gene Silencing

K. Vimala, S. Sundarraj M.V. Sujitha and S. Kannan

Background: The E2F3 transcription factor flatly claims its role in controlling cell cycle progression. As reported earlier that the nuclear E2F3 overexpression represents a mechanism which drives the development of human bladder cancer and that determines aggressiveness in human prostate cancer. We have proposed a model in which E2F3 overexpression co-operates with removal of the E2F3 inhibitor, facilitate cancer development. We wish to assess to what extent E2F3 would be overexpressed in the breast cancer and other classes of human cancers.

Aim of the study: The present findings highlight the relevance of E2F3 overexpression in the biology of breast cancer. The efficacy of *SiRNA* targeted to E2F3, a pivotal protein in the transcription regulation as well as to prevent breast cancer. When considered together with published data our observations indicated that E2F3 overexpression may represent a mechanism of development of breast carcinomas.

Results: The novel axis and of E2F3 itself in a large set of 11 breast cancer cell lines. For this purpose E2F3 were measured by RT-PCR. E2F3 overexpression and *SiRNA* inhibited gene reconfirmed by western blot analysis. E2F3 isoforms were overexpressed in the cancers, but only E2F3 expression was positively correlated with tumour stage.

Conclusion: Thus, the current study applied *SiRNA*-mediated E2F3 gene silencing which identified the effects of E2F3 knockdown on cell proliferation. E2F3 is a newly identified diagnostic and therapeutic target in breast cancer. *SiRNA* is playing an important role as an alternative of diagnosis and treatment of breast cancer.

Key words: Breast cancer; E2F3 transcription factor; Overexpression; RT-PCR; SiRNA

Proteomics and Molecular Cell Physiology Lab, Department of Zoology, School of Life Sciences, Bharathiar University, Coimbatore-641 046, TN, India
Corresponding author: sk_protein@buc.edu.in
vimala5484@gmail.com

BPP106

347. Phytochemical Composition and *In Vitro* Hemolytic Activity of certain Medicinal Plants of Assam, a North Eastern State of India.

Sharma K. K., Kalita S., Kotoky J.*

The North Eastern region of Indian comprising of Arunachal Pradesh, Assam, Meghalaya, Manipur, Tripura, Mizoram, Nagaland and Sikkim is a store house of medicinal and aromatic plants naturally grown and available in the forests. The region is known for its high ethnic and biological diversity and is often referred to as biological hotspot. The state of Assam alone has about 2000-3000 species of medicinal plants useful in indigenous medicine. The use of medicinal and aromatic plants for curing various diseases is an age old process here, mainly by the various ethnic tribes. The present study is conducted to evaluate the major phytochemical groups and hemolytic activity of some such ethno-medicinally important plants of the region. The hemolytic activity was conducted by modified spectroscopic method towards human erythrocytes at four different concentrations (125, 250, 500, 1000 µg/ml). The extracts exhibited very low hemolytic activity towards the human erythrocytes. The hemolytic activity of the different extracts was found in the following order: *Naravelia zeylanica*> *Cinnamomum porrectum*> *Ranunculus sceleratus*> *Piper betel*> *Allamanda cathertica*> *Randia uliginosa*> *Solanum melongena*> *Solanum indicum*. Phytochemical screening of the leaves was carried out according to standardized method. Analysis showed the presence of phytosterols, glycosides, carbohydrates, phenolic compounds, saponins, alkaloids, flavonoids and tannins as major phytochemical groups.

Keywords: hemolytic activity, erythrocytes, phytochemical analysis

Division of Life Sciences, Institute of Advanced Study in Science and Technology, Guwahati-781035. Assam, India.

Corresponding Author: Jibon Kotoky. Division of Life Sciences, Institute of Advanced Study in Science and Technology.*

e-mail: jkotoky@yahoo.com

BPP107

348. Purification and characterization of recombinant L-aspraginase II of *Erwinia carotovora* from *E. coli*

Rachna Goswami[a], Venkata Dasu Veeranki*

L-asparaginase (E.C.3.5.1.1) is an imperative remedial enzyme for treatment of acute lymphoblastic leukemia due to its potential to hydrolyze the L-asparagine to L-aspartic acid and ammonia. In addition, L-asparaginase is utilized as a processing aid for reducing acrylamide (a suspected carcinogen) formation in starchy food products. In the present study, we have purified the recombinant L-asparaginase II of *Erwinia caratovora* from *E. coli* using Ni-NTA column. SDS-PAGE and native PAGE of the purified enzyme revealed that molecular mass of the subunits and native enzyme is approximately 37.5 kDa and 150 kDa, respectively. Recombinant L-asparaginase II enzyme has shown maximum hydrolysis of L-asparagine in the range of pH 7.5– pH 8.5, and its optimum range of temperature was observed to be 47-52 °C. The recombinant enzyme is very specific for its natural substrate (L-asparagine). The activity of recombinant L-asparaginase II is enhanced by mono cations and different effectors including Na^+, K^+, L-cystine, L-histidine, glutathione and 2-mercaptoethanol while it is moderately inhibited by various divalent cations and thiol group blocking reagent. Furthermore, kinetic parameters K_m, V_{max}, k_{cat} and K_m/K_{cat} of purified recombinant L-asparaginase II were determined. The purified recombinant L-asparaginase II possesses no partial glutaminase activity, which is prerequisite to reduce the possibility of side effects during the course of anti-cancer therapy.

Biochemical Engineering Laboratory, Department of Biotechnology, Indian Institute of Technology Guwahati, Guwahati 781039, Assam, India

Email: rachna@iitg.ernet.in, veeranki@iitg.ernet.in

BPP108

349. Title: Kshar-Sutra -The herbal thread, for the management of Fistula-in-ano, W.S.R. to Bacteriological study

Author: Dr. Namita Baishya M.S.*, Dr. Bhabesh Das M.D. Ph.D.**

Fistula in ano ,one of the most annoying diseases in the ano- rectal region has condemned as a brain teaser for the patients as well for the medical fraternity. The contemporary surgical procedure can not gain popularity till today due to its higher complication and lower success rate. On The contrary Kshar-Sutra the magical thread has earned an eminency as an excellent Ayurvedic remedy and as a choice of treatment for fistula-in-ano. So further research on Kshar-Sutra is a demand of time.

Considering al these, the present study was taken up with the objective of evaluating the efficacy of Nimba Kshar-sutra and Apamarga kshar-sutra in the management of Fistula-in-ano on scientific basis through a bacteriological study. Total 30 patients were treated during the study, dividing equally in two groups, either with Nimba kshar-sutra or Apamarga kshar-sutra, subsequently a bacteriological study has been performed to find out the presence of bacteria in the fistulous tract and to perceive whether it hampers healing procedure. Recovery of all patients was assessed by improvement in criteria like pain, swelling, tenderness, pus discharge, gradual reduction of thread length, U.C.T., and bacteriological status. At the end of the study both the kshar-sutra found significant, though significant earlier recovery was observed in Nimba Kshar-sutra treated group. Details will be elaborated during presentation.

Key words: Fistula in ano, Nimba Ksharsutra, Apamarga Ksharsutra, UCT, bacteriological study.

Deptt: Department of Shalyatantra

Institute: Govt. Ayurvedic College and Hospital, Jalukbari, Guwahati- 14.

e-mail: nomita3gmail.com

**Ph.D Scholar*

***Prof.& HOD, Deptt. of Shalyatantra, Govt. Ayurvedic College, Guwahati-14,Assam.*

BPP109

350. Dissolution and characterization of the Golden Hued Muga Silk fibre using certain solvents

Manasee Choudhury, Dipali Devi*, K.C.Baruah

The golden coloured muga silk , the pride of Assam, is a natural polymer produced by the silkworm *Antheraea assamensis* (Lepidoptera : Saturniidae)**,** an endemic species of the North East region of India. High tensile strength and the inherent golden yellow colour are some of the unique characteristics of the muga silk. Due to strong molecular bonding the fibre is very difficult to dissolve completely using conventional method. The present study reported the modified method of dissolving the muga fibre using certain chemical solvents such as Lithium thiocyanate and NaOH. U.V. , Raman spectroscopy and FT-IR studies shows characteristic peaks which confirms the inherent property of muga silk. FT-IR and Raman spectra shows the presence of α helix and β sheet conformation with negligible shifting compared to the native muga fibre. Outcome of this study will help in further characterization of muga silk fibre.

Keywords : *Antheraea assamensis*, U.V. spectroscopy, Raman spectroscopy, FT-IR

Seri-biotech Laboratory, Life Science Division, Institute of Advanced Study in Science and Technology, Paschim Boragaon , Guwahati 781035, Assam, India.

E mail : manasc25@gmail.com

**Corresponding author . Email : dipali.devi@gmail.com*

BPP110

351. FEREMNTATION OF GUAVA JUICE BY SELECTED STRAINS OF LACTIC ACID BACTERIA

[1]Dipankar Kalita, [2]Manabendra Mandal, [1]Charu Lata Mahanta*

[1]Department of Food Engineering and Technology, Tezpur University, Tezpur-784 028

[2]Department of Molecular Biology and Biotechnology, Tezpur University, Tezpur-784 028

Email: dkalita@tezu.ernet.in

Abstract

In this research, production of probiotic juava juice through its fermentation by two strains of lactic acid bacteria (LAB) *viz. Lactobacillus plantarum* (ATCC 8014), *L. rhamnosus* GG (ATCC 53103) as single culture and in combination was examined. Fermentation was carried out at 37 °C for 72 h under microaerophilic conditions. Changes in pH, titrable acidity, sugar content, microbial population and antioxidant properties were measured during the fermentation period and the viability of all strains was also monitored during storage time at 4 °C and 25°C within 4 weeks. The results indicates that *L. plantarum* increased the pH at the initial stages of fermentation and sugar consumption was also higher in comparison with other stain, better microbial growth was also observed for both the strains during fermentation. *L. plantarum* showed higher viability during the storage time. Viable cells remained at maximum level within 3 weeks but decrease after 4 weeks. Guava juice was proved to be a suitable media for production of a probiotic fruit drink.

Keywords: Guava juice, Probiotic, Fermentation, LAB

BPP111

352. Study of aquatic medicinal plants of Borbeel wetland of Dibrugarh Assam – India

Dr Bhanu Prova Saikia
Department of Botany, Moran College
P/O Moranhat, Sivasagar Assam 785670
bhanudutta@yahoo.co.in

Abstract

Nature has provided a rich store house of herbal medicine to cure human ailments. It has been estimated that out of 2000 drugs that have been used in curing diseases about 1500 are of plants origin. The use of medicinal plants as traditional medicine is well known in rural areas of many developing countries. The northeastern regions of India have diversity of medicinal plants which are found in different ecological habitats. Many aquatic plants with medicinal properties are found in wetlands of Assam. This paper deals with the study of some aquatic plants of Borbeel wetland which have medicinal values and traditionally used as vegetables and medicine. Borbeel is the wetland situated in the Dibrugarh district of Assam at a distance of 3 km northwest of NH 37 and 2 km southwest of the river Buridihing. The beel is covered with aquatic plants like Nymphaea, Pistia, Ipomea, Jussiaea, Trapa, Cyperus, etc which have medicinal importance. The leaves of *Ipomea digitata* are applied externally for rheumatism. *Monocharia vaginalis* is a small erect herb and roots are used for stomach troubles and diseases of liver. *Jussiaea repens* is an effective remedy for jaundice

During the experimental period about 18 plants were identified with different medicinal values in the study area Borbeel (wetland)

Key word – medicinal plants, aquatic plants, wetland

BPP112

353. Degumming of Muga Silk Fibre With Papain enzyme

Mousumi Saikia, Bijit Talukdar and Dipali Devi

Seri-Biotech Unit, Life Sciences Division, Institute of Advanced Study in Science and Technology, Vigyan Path, Paschim Boragaon, Guwahati- 781035, ASSAM, INDIA.

Abstract

The precise purpose of degumming is to remove the gum (sericin) from the silk and to improve its handle. Boiling with soap and alkaline solution is the conventional method of degumming of silk. However, the hydrolysis reaction performed by such chemical substances with harsh conditions affect the quality of silk fibres. Muga silk produced by *Antheraea assamensis*, the indigenous non-mulberry silkworm of N.E. region of India has been degummed with soda (conventional method). In this study, muga silk was degummed by papain enzyme with the aim to improve its quality. The experiment was performed at various time intervals and concentrations for optimization of degumming effect. After degumming the morphology of the fibers were characterized by SEM and tensile strength were measured and compared with the fibers degummed by conventional method. The result signifies that 1 unit/g concentration of papain treated for 20 minutes is suitable for degumming the muga silk fiber showing surface smoothness and higher tensile strength.

Keywords: degumming, papain, SEM, tensile strength, percent weight loss, muga silk.

BPP113

355. NUTRITIONAL AND ANTIOXIDATIVE COMPONENTS OF CURCUMA SPECIES FOUND IN MANIPUR

Kananbala Sarangthem* and Mangvung Jamkhoneng Haokip

Plant Physiology Section, Department of Life Sciences

Manipur University, Canchipur, Imphal 795003, Manipur, India

E-mail: kananbala_s@rediffmail.com

Abstract

Curcuma species (Zingiberaceae) have been used as a spice, food preservative and are well-known indigenous medicine. Four different species were analysed for their proximate composition and antioxidant components. Bioactive components are responsible for several pharmacological activities and medicinal applications. In the present study, the bioactive components such as curcuminoids content ranges from17mg/g to185.75mg/g , phenolics(60mg/g to 220mg/g), flavonoids (20 to 132mg/g) alkaloids (43.3 mg/g to 104.25 mg/g) and anti oxidant activities, volatile oil, fiber content, protein, amino acids were also determined in the rhizomes of these *Curcuma* . Further studies for structural elucidation of these secondary metabolites are still in progress.

Key words: Curcuma species/nutrients/antioxidant/Manipur

*Corresponding author

BPP114

356. "A Study on Present Status of Muga Silkworm (*Antheraea assama*, westwood, family – Saturniidae) Production in Sivasagar District, Assam and strategy of conservation".

Minakshi patra[1] & Dr. Manjit Gogoi[2] (FHAS)
2. Associate professor, Department of Zoology, Moran College, Moranhat, Sivasagar, Assam – 785670
1. Associate professor, Department of Botany,
Gargaon College, Simaluguri, Sivasagar, Assam – 785646.

ABSTRACT

Assam is a part of global bio-diversity hot spot, rich in serigenous insects and their host plants. It occupies a remarkable position for the muga culture. Muga cocoons are unique wealth and a monopoly business of this region. Rearing of *Antheraea assama* has been practiced in this region since the time immemorial, an inseparable part of soci-economic activities of the Assamese society. The first official record of muga silkworm relates to 1662. Sivasagar district, the upper Brahmaputra valley is suitable habitat for muga silk moth and host plants. The district is comprises with three sub-divisions viz. Charaideo, Nazira and Sivasagar, situated in between $26^0 45^/$ North to $27^0 15^/$ North latitude and $94^0 25^/$ East to $95^0 20^/$ East longitude. Sivasagar district has five reserve forests and more than twelve grazing land. The wild variety of muga silkworms are available in some areas of this district. The study revealed that within a short period of last two decades, small tea cultivation ushered into an era of evolution bringing a long term soci-economic changes in this region but these changes also brought in certain ill consequences. It has gradually replaced the existing forest and grazing area by mono cropping of tea. Many brick industries, stone crushing centres, ONGCL drilling operation field are responsible for continued degradation of forest cover in this region which threats to lost of bio-diversity of muga silkworm and their host plants.

To build up the population of muga silkworm, it requires a strategic and integrative approach for strengthening the muga silkworm production to enhance the productivity of muga cocoons. It is high time to conserve the disease free muga seed cocoons for continuation of muga culture.

Keywords : bio diversity, serigenous, hot-spot, *Antheraea assama*.

BPP115

357. Phytochemicals from Spices: Food Additive to Nutraceuticals

Dr. Bula Choudhury

Guwahati Biotech Park, IIT Guwahati, Guwahati-39, Assam, India,

e-mail: b.choudhury@guwahatibiotechpark.com

Neutraceuticals are currently of great research interest due to their commanding influence in the human health and strong market potential. A number of novel phytochemicals have been isolated, characterized and evaluated from natural sources. Among the estimated 250,000-400,000 plant species in the world, only 6% have been studied for their biological activity, and about 15% have been investigated phytochemically [1]. Many of these phytochemicals are found in spices which may have tremendous importance as nutraceuticals. Spices have also been recognized to possess medicinal properties and their use in traditional systems of medicine has been on record for a long time. Among phytochemicals: terpenoids, polyphenols, glucosinolates, phytosterols, thiosulfonates, anthraquinones, capsaicin, piperine, chlorophyll, betaine, pectine, oxalic acid etc. are currently used in the nutraceutical industry based on the pioneering experimental research involving both animal studies and human trials. These studies documented digestive stimulant action, hypolipidemic effect, antidiabetic influence, antilithogenic property, antioxidant potential, anti-inflammatory property, antimutagenic, and anticarcinogenic potential of spices. Several groups of phytochemicals are currently used in the nutraceutical industry which serve as excellent templates for new drug discovery and have already played a significant role in the development of drugs. A review has been presented in this paper on the recent research activities on neutraceuticals from different plant species with special emphasis to those available in the North eastern part of India.

1. B M Lee Fundamentals of Food Biotechnology. VCH Publishers Inc, New York (1996)

BPP116

358. Genotoxicity studies in four species of freshwater fishes found in polluted water bodies of Manipur

S. Sanjabihari Singh, Ch. Brajakishor Singh* and Gusheinzed Waikhom

Institute of Bioresources and Sustainable Development, Imphal-795001, Manipur, India
(An autonomous institute under Department of Biotechnology, Govt. of India)
Corresponding author*: Tel: 0385-2446122, Fax: 0385-2446120
Email: kishore.ibsd@nic.in,gushein_w@yahoo.com

Fish is one of the most important and the largest groups of vertebrates in the aquatic system. It is widely consumed as a source of cheap animal protein. The aquatic environments of Manipur are heavily polluted with large disposal of municipal, anthropogenic and agrochemical waste including organic and inorganic pollutants such as endosulfan, malathion, DDT and various toxic heavy metals incorporated in pesticides and insecticides which are genotoxic to the aquatic organisms, including fishes. Though, people are aware of the pollution in these water bodies,people are still consuming these fishes without knowing its effects. Genotoxic effect of the pollutants on fishes inhabiting those polluted water bodies has not been studied so far. Cytogenetic studies were carried out in four species of freshwater fishes namely, *Channa gachua*, *C. punctata*, *Trichogaster labiosus* and *Mystus ngasep* using conventional hypotonic spreading method (Manna and Prasad, 1968). For each species, twenty specimens were collected and metaphase spreads were analyzed for chromosomal aberrations at a magnification of 100x10 under oil immersion, selecting 10-20 metaphases from each slide. Chromatid deletion, fragments, acentric fragments and ring chromosomes were observed in *Channa gachua* specimens collected from the Lamphelpat, a polluted wetland of Manipur.

Keywords: *Genotoxicity, chromosomal aberration, freshwater fishes*

BPP117

359. A Study on Histopathological Impact of Endosulfan on Liver, Stomach and Intestine Of *Channa Punctatus* (Bloch.)

Kishor Haloi, Monikankana Kalita, Dr. Aparajita Borkotoki*

A large number of pesticides are drained in water bodies where fish encounter with them and develop various metabolic abnormalities. They accumulate in fish and affect human health too via ecological cycling and biological magnification. Environmental factors of both natural and anthropogenic origins have been known to induce alteration of different magnitudes in the physiological and biochemical status of animals. The present study deals with the impact of Endosulfan on **histopathology** of Liver, Stomach and Intestine of ***Channa punctatus***. In the laboratory condition fisher are divided into control and experimental groups. The LD_{50} value of **Endosulfan** for ***Channa punctatus*** is calculated which 0.0004 ppm is. For the experiment two concentrations are selected 0.0002 ppm and 0.0004 ppm and **Channa punctatus** exposed for 24hrs, 48hrs, 72hrs, 96hrs. The fish showed severe histological changes in Liver, Intestine and Stomach. The degenerative changes included in the Liver are haemorhhage, swelling **hepatocytes**, necrosis of hepatocytes; liver cells become irregular shaped, balloon shaped hepatocytes. In Stomach and Intestine fused microvilli, the outer membrane of microvilli are broken, haemorhhage in the sub mucosa region, cells swelling, vacuoles recorded in an increasing order towards the higher tested doses.

Key Words: Endosulfan, Histopathology, *Channa punctatus,* Hepatocytes.

**Professor Department of Zoology, Gauhati University, Guwahati- 781014*

Email: a_borkotoki@yahoo.com, kishorhaloi@yahoo.in

BPP118

360. Polycystic Ovarian Syndrome in Women of Assam with Special Reference to the Teenage Group of Guwahati in Relation to Junk Food.

*Uma Dutta[1], Devidatta Das[2], Mayurakshi Deka[1]

The Polycystic Ovarian Syndrome (PCOS) is a multi-factorial endocrine disorder in females. PCOS affects almost 5% -10% of women in India and is highly prevalent in Assam. In Guwahati, a pilot study was conducted taking randomly selected schools and colleges focusing on girls between 14-19 years and 20-25 years of age, through personal interactions, using a standard questionnaire involving dietary and lifestyle analysis. Other case studies were carried out in fertility clinics for married women where the clinical investigation was based on the Rotterdam's Criteria of 2003.

Case studies in the schools and colleges showed that out of 300 cases, 25 cases had a medical history of PCOS. In the fertility clinics, out of 55 cases, 15 cases were diagnosed with PCOS. Dietary analysis in the teenage group revealed a high consumption of junk food and aerated drinks which led to obesity. Lifestyle analysis revealed a sedentary lifestyle with little exercise and academic stress. The case studies indicate an increasing trend of PCOS.

From these investigations, junk food may be implicated for PCOS. This needs thorough research and may even trace out its prevalence with uterine carcinoma and infertility amongst the women of Assam.

Keywords Polycystic Ovarian Syndrome, junk food, infertility, teenage.

1. Department of Zoology, Cotton College, Guwahati, Assam, India.

2. Department of Biotechnology, St. Xavier's College, Kolkata, West Bengal, India.

dekamayurakshi@gmail.com

BPP119

361. Isolation and Screening of Biosurfactant Producing Bacteria from Hydrocarbon Contaminated Soil and Characterization of the Biosurfacants Produced

Kaustuvmani Patowary, Dhanmoni Kalita, Sanjeev Mishra, Sandip Kumar

Biosurfactants are surface active compounds which are produced by microorganisms. These surface active compounds reduce surface tension between aqueous solution and hydrocarbon mixtures. Biosurfactants are produced during hydrocarbon degradation by bacteria and they influence the degradation rate. In this study isolation and partial characterization of bio surfactant producing bacteria were assessed. For this study we collected the soil sample from different garages from Vellore. To confirm the ability of isolates in biosurfactant production haemolysis test, emulsification test, drops collapse assay, oil spreading test were conducted. The results revealed that among the eight isolates four of the isolates showing the positive result. The isolated strains are characterized by BPB (Bio surfactant producing bacteria). Among the positive isolates BPB4 and BPB2 gives good results for E24%. In the present study, an attempt on the significance role of bacteria in the production of bio surfactant was made.

Keywords: Biosurfactants, surface tension, hydrocarbon degradation, oil spills, BPB (Biosurfactant producing bacteria).

Coresponding author: Mohanasrinivasan.V
School of Bio Sciences and Technology, VIT University, Vellore - 632014, Tamil Nadu, India
k4kaustuv@gmail.com, +919864394580

BPP120

362. Study of Alterations in Certain Trace Elements Profile and Histopathomorphological Abnormalities in Benzophenone Induced Pulmonary Toxicity in Albino Rat

Uma Dutta[1] and Karabi Dutta[*2]

Among various suntans, the most popular and frequently used chemical sunscreen in the market today is benzophenone (BZ) [C_{12} H_{10} – CO] – a photosensitive aromatic hydrocarbon. Owing to its widespread application in various cosmetic preparation, millions of consumers are exposed to this chemical on a daily basis. Chronic exposure to BZ at a dose of 15 mg/ml/kg body wt./day for 17 weeks was studied to evaluate the effect of the chemical on the gross microscopic and submicroscopic lesions in the lung along with certain trace element profile following routine techniques.

Histopathologically striking changes manifested in the lung were congestion emphysema, extensive hemorrhages with heart failure cells, peribronchial lymphoidal and bronchial hyperplasia. Presence of broncogenic carcinoma in some larger bronchioles characterized by hyperchromic neoplastic cells with few mitotic bodies forming a solid sheet-like structure was another marked feature. SEM revealed various disorganization in lungs were severe perforation, lesion, swelling and thickening of alveolar septa. Presence of hyperplastic oviodal or cuboidal pneumocytic cells covered by microvilli along with money-roll formation of erythrocyte were also seen. A significant increase in the amount of Zn, Fe, Mg, Mn observed in lung tissue and level of Cu declined significantly whereas amount Ca remain unchanged.

The result of the present study suggested that BZ has potent pneumotoxic effect. The analyses of the trace element profiles in the lung indicated that BZ exerted toxic stress and altered the balanced chemical coordination of trace elements in this vital organ and have direct correlation with neoplastic and carcinogenic changes.

Keywords: Benzophenone, pneumotoxicity, trace element, bronchogenic carcinoma

[1] *Dept. of Zoology, Cotton College State University, Panbazar, Guwahati 781001, Assam, India*

Email : umadutta@yahoo.com

[2] *Cell and Molecular Biology, Dept. of Zoology, Gauhati University, Guwahati 781014, Assam, India*

BPP121

363. *In vitro* anti-bacterial activities of leaf extracts of *Strobilanthes cusia* (Assam Indigo)

The antibacterial potentiality of different solvents of mature leaf of *Strobilanthes cusia* (Nees) Kuntze (Acanthaceae) against six reference bacteria viz. *Staphylococcus aureus* MTCC 96, *Baccilus subtilis* MTCC 441, *Enterobacter aerogenes* MTCC 111 , *Escherichia coli* MTCC 739, *Klebsiella pneumonia* MTCC 432, *Pseudomonas aeruginosa* MTCC 424 was evaluated. The *in vitro* antibacterial activity was performed by well diffusion method followed by the determination of MIC (Minimal Inhibitory concentration) by broth dilution method against sensitive bacteria. The petroleum ether was found to be most effective against *Staphylococcus aureus, Baccilus subtilis* and *klebsiella pneumonia* (inhibition zone 35mm,18mm,12mm respectively), ethyl acetate was found to be most effective against *Staphylococcus aureus, Baccilus subtilis, Enterobacter aerogenes , Escherichia coli* (19mm,29mm,10mm,15mm), acetone was found to be most effective against *Staphylococcus aureus, Baccilus subtilis, Escherichia coli*, *Klebsiella pneumonia*(27mm,17mm,7mm,7mm), methanol extract was found to be effective against *Staphylococcus aureus, Baccilus subtilis, Enterobacter aerogenes , Escherichia coli*, *Klebsiella pneumonia* (50mm,17,10mm,10mm,10mm), ethanol extract was found to be most effective against *Staphylococcus aureus, Baccilus subtilis, Enterobacter aerogenes*, *Klebsiella pneumonia* (37mm,17mm,10mm,10mm) and aqueous extract was found to be most effective against *Staphylococcus aureus, Baccilus subtilis* and *Pseudomonas aeruginosa* (30mm, 15mm, 34mm). All extract at higher concentration gives varying degree of inhibitory against all bacteria. Its leaf extract can also be used as a lead molecule in combating the disease caused by the bacterial strain studied.

Keywords: Antibacterial activity, *Strobilanthes cusia, leaf,* zone of inhibition.

R. Shahni, P.J.Handique

(03/11/85), Poster presentation

Department of Biotechnology, Gauhati University, Guwahati , Assam - 781014

Email: rubanib4u@yahoomail.com

BPP122

365. Phytochemical and Antimicrobial Evaluation of Some Medicinal Plants of North-East Region

S Sakthi[1], R. Borah[2], S. Banu[2], M.C. Kalita[2], M. Lahkar[1] and K.K. Saikia[2]

Plants and plant-based medicaments are the basis of many of the modern pharmaceuticals we use today for our various ailments. The study was aimed at identification of biochemical constituents and to evaluate antimicrobial activity present in traditionally used medicinal plants of North-East Region *Moringa oleifera* and *Ziziphus jujube*. The phytochemical screening of previously prepared plant extracts was carried out by chemical, thin-layer chromatographic methods. The *in vitro* anti bacterial and fungal activity of extracts against clinical isolates bacterial and fungal strains was evaluated by disc diffusion method and food poison technique, respectively. The extracts were tested against clinically important drug resistant microorganisms.Of the various different extracts tested, acetone extract of *Moringa oleifera and Methanolic extract of Ziziphus jujuba* showed most effective against multi drug resistant microorganisms. The present identifies Moringa, Ziziphus as potent plants that can be used against in drug resistant cases can be candidate for identification of plant metabolites imparting this characteristic.

National Institute of Pharmaceutical Education and Research, Guwahati
Department of Biotechnology and Bioengineering, Gauhati University
Email: kksaikia@gmail.com

BPP123

366. Identification and quantification of (+)-Catechine, (-)-Epicatechin and (-)-Epigallocatechin gallate in anther derived callus cultures of TV21 cultivar of *Camellia sinensis* (L.) O. Kuntze var. *Assamica*

Vijay K. Mishra[a] and Rakhi Chaturvedi[*a]

Camellia sinensis (L.) O. Kuntze var. *Assamica* or tea of the family Theaceae is a widely used beverage throughout India and China. It is popular in various indigenous system of medicines like Ayurveda, Unani and Homoeopathy. Tea and tea components possess various biological effects, such as antioxidant, antibacterial and anti-carcinogenic properties. The existing *Camellia* species are genetically highly heterozygous due to strict cross-pollinating nature, resulting uneven metabolite production. In an attempt to produce homogeneous production of secondary metabolites, in the present study, androgenic haploids of TV21 cultivar of tea were established, for identification and quantification of (+)-Catechin, (-)-Epicatechin and (-)-Epigallocatechin gallate. The haploid status of these cell lines were confirmed by flow-cytometry. Extractions were done in hot water (80ºC for 20 min.), methanol, ethyl acetate and hexane. From regenerated callus, maximum extraction yield (17.59%) was obtained from hot water. Correlation coefficients for calibration curve of all the compounds were in the ranges of 0.97 to 0.99. Optimum separation of these compounds was achieved by reverse-phase high-pressure liquid chromatography on a C_{18} column with acetonitrile:ethyl acetate:0.05% H_3PO_4 (12:2:86) mobile phase and detected at 280nm UV detector. With this route, an yield of 1.28% (+)-Catechin, 2.93% (-)-Epicatechin, and 8.38% (-)-Epigallocatechin gallate per gram dry weight was obtained from cultures. Compare to this, leaves from parent plant (control) resulted in an yield of 1.83% (+)-Catechin, 3.25% (-)-Epicatechin and 8.48% (-)-Epigallocatechin gallate per gram dry weight

[a] *Department of Biotechnology, Indian Institute of Technology- Guwahati*

Guwahati - 781039, Assam, India

Tel: +91-361-2582211 (off)

Fax: +91-361- 2582249; 2690762

Email: rakhi_chaturvedi@iitg.ernet.in

rakhi_chaturvedi@yahoo.co.uk

BPP124

367. Genetic diversity and relationships in *Kaempferia galanga* L. cultivars revealed by RAPD/ISSR marker assays and kaempferol content studies

Kh. Devala Devi[1], N. Samarjit Singh, S. Brojendro Singh, H. Sunitibala Devi and Ch. Brajakishor Singh*

Kaempferia galanga L., a member of the family Zingiberaceae is used as a medicinal plant for remedy of nasal blocks, asthma, hypertension, rheumatism etc. Eight cultivars – seven from Manipur and one from Meghalaya in North-East India were subjected to genetic diversity estimation using RAPD and ISSR analyses. Twenty five RAPD primers were used for amplification of the genomic DNA. Out of these, thirteen primers yielded polymorphic bands generating distinct bands in all the cultivars. Twenty ISSR primers were used out of which eleven produced prominent and scorable bands. On average, 5.38 bands per primer were observed by RAPD and 6.54 bands per primer by ISSR markers. The polymorphic bands were used to estimate genetic variability with Dice Similarity Co-efficient using NTSYSpc2.2 software. A dendrogram was constructed using UPGMA algorithm based on the similarity index for the taxa. Cluster analysis by RAPD and ISSR markers revealed clear distinct diversity between cultivars.

Kaempherol, one of the important molecule of *K. galanga* L. was studied from the collected varieties using the HPLC(waters).The result shows that kaempferol content among the collected varieties of *K. galanga* L varies from place to place and location.

Keywords: *Kaempferia galanga*, RAPD, ISSR, Kaempferol

Medicinal plant and Horticultural Resources Division
Institute of Bioresources and Sustainable Development, Imphal-795001, Manipur, India
(An autonomous institute under Department of Biotechnology, Govt. of India)
[1]Date of Birth: 04/03/1986
Corresponding author: Tele: 0385-2446122, Fax: 0385-2446120*
Email: kishore.ibsd@nic.in

BPP125

368. Optimal Conditions for Antimicrobial Metabolites Production from a Micromonospora sp. Isolated from North East region of India

Madhumita Talukdar[1], S Talukdar[1], A.Duarah[1], M. Buragohain[1], A Yadav[1], D.K. Jha[2], T.C. Bora[1*]

Microbial natural products are the origin of most of the antibiotics (Zhao et al. 2009) drug intermediates, novel enzymes and inhibitors available in the market today. North—Eastern India is best known for its rich biodiversity and its un-tapped bioresources have been identified as the Indo-Burma Mega Hot Spot (Myers et al. 2000). An actinomycete strain was isolated from soil samples of this mega biodiversity hot spot region of India and identified as a *Micromonospora* species on the basis of its morphological, biochemical, cultural characteristics and 16S rRNA data. The strain showed positive activity against human pathogens *Staphylococcus aureas, Bacillus subtilis, Proteus vulgaris* and *Pseudomonas aeroginosa*. Attempts were made to optimize the culture conditions for the production of antimicrobial metabolites by this strain. Antimicrobial metabolites production was started after 7 days of incubation of culture broth and reached its maximum levels after 10 days and thereafter gradually decreased. The maximum production of antimicrobial metabolites was obtained when the culture medium pH was adjusted to 7.5. The optimum temperature for antimicrobial metabolites production was 28±2˚C. Basel medium supplemented with ionositol and yeast extract as carbon and nitrogen sources, respectively, was proved to be the best for the production of bioactive metabolites. Maximum production of bioactive metabolites was when NaCl concentration was 1% .

KEYWORDS : Antimicrobial activity, Optimization of condition, 16S rRNA, *Micromonospora* sp.

[1]*Biotechnology Division, North East Institute of Science & Technology (CSIR)*

Jorhat-785006, Assam, India

[2]*Botany Deptt. Gauhati University*

Contact number: 9864568041

E-mail ID: talukdarmadhumita@gmail.com

BPP126

In Vitro propagation of Ginger (*Zingiber officinale* Rosc.) cultivars- Majhuley, Bhaisay and Sanuaduwa of Sikkim Himalaya

Sushen Pradhan[1], Pratap J Handique[2] and Bharat C. Basistha[1]

Present experiment was fulfilled with an efficient, simple microprpagatoin methods for *Zingiber officinale* cv *Majuley, Bhaisay and Sanuaduwa* for the production of disease free and rapid multiplication of planting material of ginger micro-propaogules and conservation of germplasm resources of ginger cultivator variety of Sikkim. MS medium with 3 % of sucrose with different concentration of hormone showed the suitable medium for multiplication of ginger. A total of 37 different concentrations of growth hormone/ cultured medium were examined. The maximum number of shoots and roots were observed on GM 23 (MS+ sucrose 30 g + BAP 2.5mg/l+0.5 NAA+2mg/l activated charcoal) and second was GM 24 (MS+ 30g sucrose + BAP 3mg/l+0.5 NAA + 2mg/l activated charcoal). The maximum number and length of mean shoots, roots and leaves were recorded on the combination of growth regulator 2.5mg/l BAP and 0.5mg/l NAA with shoots numbers and lengths 19.98 ± 0.01 and 4.09 ±0.04, root number and length were 06.78 ± 0.21 and 05.53 ±0.05 and mean number of leaves 06.96 ±0.03 per. Less number of shoots was observed in single growth regulator GM 14 (09.25 ±0.4 in 2.5 mg/l BAP) and GM 4 (06.65 ±0.2 in 2.0mg/l in Kinetin) were used in the treatment. After individually subcultured on same fresh medium, adventitious buds were initiated after 10–15 days of culture, complete plantlets developed within 40 days and maintained for 18 months without decreasing the multiplication rate. The combination of cytokinins and auxin in the culture medium enhanced the response in a number of species in terms of shoot and root growth*s,* with 100% ***in*** *vitro* multipled plantlets were successfully transferred into field**.**

[1]*State Council of Science and Technology, Gangtok, Sikkim and*

[2]*Department of Biotechnology, Gauhati University, Assam.*

Presenting author: Sushen Pradhan, Age- 29, email: sushenpradhan@gmail.com

BPP127

370. Evaluation of Polyphenol Content and Free Radical Scavenging Activity of Different Extracts of *Leucas Aspera*

Pronab Mudoi[1], Jitu Buragohain[2]

Leucas aspera is an erect, small, annual herb that is traditionally used as medicine to alleviate different ailments. Leaf juice is given as nasal drops in sinusitis. If taken as vegetable the plant is useful in stomach ailments. An attempt has been made to evaluate the polyphenol content and free radical scavenging activity of different extracts of *Leucas aspera.* The extracts of the above ground parts of the plant were prepared using Acetone, Methanol, Chloroform and n-Hexane. The polyphenol content was found to be more in Methanol extract as compared to other three solvents. The FTIR analytical data also suggested the presence of ascorbic acid, gallic acid and catecin in the extracts indicating the antioxidant potential of the plant.

Key word – *Leucas, aspera*, antioxidant, polyphenol

[1]*Department of Molecular Biology and Biotechnology, Tezpur University, Napaam, Assam, India*
[2]*Department of Botany, Namrup College, Dibrugarh, Assam, India*
pmudoi@tezu.ernet.in

BPP128

371. Antifungal activity of leaf and bark extracts from *Xylosma longifolium* Clos.

W. Radhapiyari Devi, S. Brojendro Singh, Ch. Brajakishor Singh*

Xylosma longifolium Clos. is a tree found near swamps and stream or at the foot hills, belonging to the family Flacourtiaceae. It is called as Nongleisang (Manipuri), Dandal (Hindi) and Mota-Koli (Assamesse). In Manipur, the fresh leave extracts was used for curing ringworm, scabies and acne. Bark is used for stomach pain and intestinal worms by the Karbis of Assam. The present study was designed to evaluate the in vitro anti-dermatophyte activity of crude petroleum ether, chloroform, methanol extracts from leaves and barks of *X. longifolium* Clos. Antifungal bioassay was carried out using Agar dilution and minimum inhibition concentration (MIC) methods. The extracts exhibited antimicrobial activities with the zone of inhibition ranging from 10 to 13mm, 10 to 14mm and 10 to 19mm for crude leave extracts of petroleum ether, chloroform and methanol respectively whereas 10 to 13mm, 10 to 13mm and 12 to 15mm for crude barks extracts of petroleum ether, chloroform and methanol respectively. The MIC of the crude extract of petroleum ether, chloroform and methanol was between $1.25x10^3$ to $2.25x10^3$mg/ml, $0.5625x10^3$mg/ml to $2.25x10^3$mg/ml and 0.140625x103 to $1.125x10^3$mg/ml respectively while that of crude bark extracts of petroleum ether, chloroform and methanol was between $0.565x10^3$ to $2.25x10^3$mg/ml, $0.5625x10^3$mg/ml to $1.125x10^3$mg/ml and $0.28125x10^3$ to $1.125x10^3$mg/ml respectively. The ability of the crude leaf and bark extracts of *Xylosma longifolium* Clos. to inhibit the growth of dermatophytic fungi is an indication of its broad spectrum antimicrobial potential which may be employed for the treatment of microbial infection and drug development.

Keywords: *Xylosma longifolium* Clos., Antifungal activity, Agar dilution, Minimum inhibition concentration

Medicinal plant and Horticultural Resources Division
Institute of Bioresources and Sustainable Development, Imphal-795001, Manipur, India
(An autonomous institute under Department of Biotechnology, Govt. of India)
Corresponding author: Tel: 0385-2446122, Fax: 0385-2446120*
Email: kishore.ibsd@nic.in

BPP129

372. Determination of biotransformation of styrene oxide using gas chromatography following liquid phase extraction

Aparajita Duarah[1], M. Talukdar[1], S. Talukdar[1], M. Buragohain[1], A. Yadav[1], B. K. Gogoi[1], S. Sarma[2], T. C. Bora[1*]

Epoxides are important building blocks for production of diols. Important biocatalytic reactions involving epoxides include epoxide hydrolase (EH) catalysed reaction. In this study, styrene oxide (SO) is used for biotransformation by microorganisms. Screening of microorganisms was carried out using a colorimetric assay. The positive strains were cultured in shake flasks. The fermentation broth was extracted and used for analysis. Thin layer chromatography followed by gas chromatographic studies revealed that SO is converted to phenyl-1, 2-ethanediol (PED) by a filamentous fungus TF1. Thus, EHs from this strain could be purified and reaction conditions may be optimised for biotransformation of styrene oxide to industrially important phenyl-1, 2-ethanediol.

[1]*Division of Biotechnology, CSIR-NEIST, Jorhat-785006, Assam*

[2]*Biotechnology Department, Gauhati University, Guwahati-781014, Assam*

E-mail: aparajitasduarah@rediffmail.com

BPP130

373. Trypanothione Synthetase: A validated drug target enzyme from *Leishmania donovani*

Prakash Saudagar and Vikash Kumar Dubey*

Trypanothione synthetase (TryS), a key redox enzyme unique to parasitic trypanosomatids catalyzes the biosynthesis of trypanothione [$T(SH)_2$], a metabolite involved in defense against chemical and oxidant stress and other biosynthetic functions. We here report cloning, expressing, characterization and inhibition studies of Trypanothione synthetase from *Leishmania donovani* (*Ld*TryS). The purified recombinant *Ld*TryS enzyme obeyed Michaelis-Menten kinetics. High substrate inhibition was observed with glutathione (K_m= 33.24 µM, K_{cat}= 1.3s^{-1}, K_i= 866 µM). Enzyme obeyed simple hyperbolic kinetics with fixed glutathione concentration and with other substrates limiting K_m values for Mg ATP and Spd of 14.2 µM and 139.6 µM, respectively. *Ld*TryS was also screened for inhibitors. Tomatine, conessine, uvaol and betulin are identified as inhibitors of the enzyme. The inhibitors are tested for leishmanicidal activity. Finally, effect of *Ld*TryS inhibitors on redox homeostasis of parasite gave a broader picture of their action against parasite.

Department of Biotechnology, Indian Institute of Technology Guwahati, Assam, India- 781039
**Corresponding author: vdubey@iitg.ernet.in, saudagar@iitg.ernet.in*

BPP131

375. A study on use of insects as medicine and food in traditional knowledge system of certain tribes of Dibrugarh District.

Sudakshina Das

Wild animals and their products constitute essential ingredients in preparation of drug in traditional medicines (Adeola, 1992; Gaski and Johnson, 1994, Dedekeet at 2006). It had also estimated that of the 252 essential chemicals selected by the world health organizational, 8.5% comes from animals (Dedeke et.al 2006). Besides traditional medicines, wild and domesticated animals play a major role in nutrition. But as the wild animals are becoming scare against the rising graph of population, the focus is now on ethno-entomophagy practice. Insects cover more than 3/4th of the entire world fauna, and some of the edible insects are rearable too. According to Costa-Neto, 1999 and Kakoti and Duolo 2002,. Insects have played an important part in the history of human nutrition in Africa, Asia, latin America (Bodenheimer-1951).

Dibrugarh District is situated at the eastern part of Assam, The district comprised of several tribes, who can boast a long and valued knowledge of using wild animals, particularly insects for nutrition and medicinal purposes.

This study reveals that more than 18 types of insects are used for various traditional medicine and nutritional practices by Tai Ahoms and Sonowal Kacharies of Dibrugarh Districts. Data are collected by questionnaire-guided ethno-zoological random survey, personal interview and group discussion. This study also reveals that such traditional practices are facing challenges due to several factors like loss of habitat due to deforestation, erosion, changing pattern of land use and agriculture, industrialization and urbanization, pollution, heavy use of insecticides, changes in socio-cultural behavior of people, etc.

Zoology Department ,D.H.S.K.College, Dibrugarh-1,Pin-786001

Email address:- *sdasbordoloi@gmail.com*

BPP132

376. Biodiesel: Global Economic and Environmental Implications

Deveshwari Singh* and Seema Bhadauria

Alternative fuels and energy sources are an issue of increasing importance not only among the scientific and engineering community, but also in economics and public policy. Alternatives need to be compared on scientific and economic terms. Science and engineering fields are increasingly disciplinary. The biofuel industry has been rapidly growing around the world in recent years. Lessons on biodiesel can demonstrate that clearly, by showing the overlapping of biology, chemistry, and physics in studying this and other alternative fuels. It can also demonstrate that science is not independent of economics, and advancements in science can yield considerable benefit to the general public i.e. shifting from petroleum fuels to domestically produced biofuels would create millions of jobs, improve our economy, reduce pollution enormously, and eliminate a key strategic concern for all countries - the dependence on foreign fuels.

The interest in biofuels obtained from renewable vegetable sources has greatly increased in recent years. The reasons are the increasing demand for mineral oil as well as the environmental problems linked with burning fossil fuels. Biodiesel can be made from various oils: canola, mustard, soybean, corn, and even waste greas. Due to concern on the availability of recoverable fossil fuel reserves and the environmental problems caused by the use those fossil fuels, considerable attention has been given to biodiesel production as an alternative to petrodiesel. However, as the biodiesel is produced from vegetable oils and animal fats, there are concerns that biodiesel feedstock may compete with food supply in the long-term. Hence, the recent focus is to find oil bearing plants that produce non-edible oils as the feedstock for biodiesel production.

KEYWORDS: Biofuels, biodiesel, petrodiesel, non-edible plant oils

Microbiology and Biotechnology lab, Department of Botany, R.B.S College, Agra
Email id- deveshwarisingh@gmail.com, reenasingh030985@gmail.com

BPP133

377. Functionally Relevant Microsatellites in Biotic and Abiotic Stress Induced Unigenes in Tea.

Sushmita Gupta[1], Raju Bharalee[2], Priyadarshini Bhorali[3], Bornali Gohain[4], Tirthankar Bandyopadhyay[4], Parveen Ahmed[4], Niraj Agarwal[4], Arun kumar Handique[5] and Sudripta Das[4].

In the face of global warming, growing population and decline in availability of agricultural suitable land, tolerance to abiotic stresses such as drought, salinity and low/ or high/temperature and biotic stress such as insect infestation and fungal infection has become very urgent breeding objectives to maintain sustainability of crop performance. The present study was undertaken to mine the available in/house collection of abiotic and biotic stress induced transcripts of tea plant to understand the tandem repeat structure and distribution in the expressed genic component of the genome, analyse frequency and distribution, assess their functional significance, develop novel genic SSR markers and validate the developed markers for detection of polymorphisms in cultivated tea germplasms, as well as their interspecific or intergeneric transferability. The probable relation/role of SSRs in the expressed genic component with stress tolerance i.e. functional significance of number and type of repeat motifs was also studied.

A total of 12,200 tea ESTs generated in/house were selected after the initial processing which represents approximately 4496.834 kb of putative abiotic and biotic stress related functional tea transcriptome. MISA base repeat search detected a total of 1950 SSRs and 670 minisatellites in 2001 (16.4 %) ESTs (ESTs containing micro/ and mini/satellites). A set of 483 primer pairs were developed from unique SSR/ESTs and /or contigs of which about 5% primer pairs were also tested for their potential use as genic/SSR markers. The present study generates essential knowledge and molecular tools that will be useful in improving investigations at the molecular level in tea towards abiotic and biotic stress tolerance.

[1]*Institutional Biotech Hub, Handique Girls Colege, Guwahati – 781001, India ;*

[2]*Department of Biotechnology, TERI, Guwahati - 781 036, India;*

[3]*Department of Agricultural Biotechnology, AAU, Jorhat-785013, India;*

[4]*Department of Biotechnology, TES, TRA, Jorhat-785008, Assam, India;* [5]*Department of Biotechnology, GU, Guwahati, India*

sgpakhi27@gmail.com

BPP134

378. Total Phenolic and Flavonoid content, Antioxidant and Antimicrobial Activity of methanolic extract of *Mirabilis jalapa* L.

J Gogoi[1], K S Nakhuru[1*], A K Rai[2], P. Chattophadhay[1], H.K. Gogoi[1] and L Singh[1]

This study was designed to evaluate the antioxidant and antimicrobial activity of methanolic extract of *Mirabilis jalapa* L and to estimated the total phenolic and flavonoid content. 2,2 Diphenyl 1 Picryl Hydrazine (DPPH) and 2, 2' – Azinobis(3-ethylbenzothiazoline-6-sulfonic acid) (ABTS) assays was used to evaluated antioxidant activity. IC_{50} values were found to be 60µg/ml and 80µg/ml using DPPH and ABTS assay respectively. Agar well diffusion method was used for evaluation of antimicrobial potential against *Staphylococcus aureus, Streptococcus mutans, Escherchia coli, Klebsiella pneumonia, Proteus mirabilis, Pseudomonas aeroginosa, Salmonella enterica* and *Candida albicans*. The extract was most active against *S. mutans* and *E. coli*. The extract was weakly sensitive to *Klebsiella pneumonia, Proteus mirabilis* and *Pseudomonas aeroginosa*. It had no activity against *Salmonella enterica*. Total phenolic content was assayed by using Folin – Ciocalteu assay. Phenolic content was 6.5 mg gallic acid equivalent /100 g fresh weight. Total flavonoid content was assayed by Aluminium chloride colorimetric assay. Flavonoid content was 10.16 mg rutin equivalent / 100 g fresh weight. This shows that presence of phenolics and flavonoid, may be the potent source of natural antioxidants and antimicrobial activity.

Key words : *Mirabilis jalapa*, antioxidant activity, antimicrobial activity, total phenolic content, total flavonoid conent.

[1]*Defence Research Laboratory, Tezpur-784001, Assam, India*

[2]*Department of Life Sciences, Dibrugarh University, Dibrugarh-786004, Assam, India*

[*]*Email: nakhuru@gmail.com*

BPP135

379. Wound Healing Activity of Crude Methanolic Extract of *Potentilla Polyphyla* on Rat

K S Nakhuru*, J Gogoi, D Goyary, P Chattophadhay, H K Gogoi and L Singh

Wistar albino rats of approximately same age and weighing between 150-180g were used for the study. The animals were divided into five sets of five animals each. Wound was created on ketamine (25mg/ kg body weight, i.p) anesthesized rats by excising a circular piece of skin of full thickness on a predetermined, shaved and cleaned area on the back of rats. Treated set was given 5% W/W extract, prepared in gel base, topically for seven days. Reference control set and control set received micogent cream, 1% W/W and base respectively in an identical manner. Wound tissue collected on 8th day of post wounding was used to analyze antioxidant enzymes (superoxide dismutase and catalase) and malondialdehyde levels. Colony forming unit on wound swap was checked. Treated group showed significant increase in levels of antioxidants (superoxide dismutase and catalase) as compared to control ($p < 0.05$) while the malondialdehyde level was reduced as compared to control. Colony forming unit count decreases with the increase of treatment days. The results revealed that crude methanolic extract of P. polyphyla possesses wound healing property.

Key words: wound healing, excision wound model, antioxidant enzyme, colony forming unit

Defence Research Laboratory, Tezpur-784001, Assam, India

**E-mail: nakhuru@gmail.com*

BPP136

380. Mining and functional characterization of simple sequence repeats in genes of *Puccinia triticina*

Author: Sonia Sheoran, Bharati Pandey, Ravish Chatrath

Puccinia triticina, the causative agent of wheat leaf rust (brown rust of wheat), is one of the most serious diseases of wheat throughout the world. The genome size of *P.triticina* is 162.95 Mb and the genome sequences are available at Broad Institute of MIT and Harvard was used for the study. Out of 11,638 available genes; Hypothetical proteins were maximum in number (8220), followed by predicted protein (2584), and conserved hypothetical protein (187), unknown proteins (32) and 615 well known proteins. The purpose of present study was to understand the organization and abundance of SSRs in the well known proteins of *P.triticina* and its functional characterization. Gene sequences of *P. triticina* were used for the study and repeats were identified using SSRIT software. Only 30% well known protein showed SSR repeats. Dinucleotides repeats were the most abundant repeats in the genome accounting 50.5% of SSRs followed by trinucleotides SSRs (44.2%). Tetra-and penta- repeats were the least frequent repeats accounting 5.3% of SSRs. Genes were annotated under the gene ontology system. We found that, for cellular component, most of the genes coding for proteins localized in large ribosomal subunit, cytosol & nucleoplasm. In the molecular function category, most of the genes encoding proteins involved in structural constituent of ribosome, ATP binding and protein serine/threonine kinase activity. In the biological process category, genes involved in signal transduction and translation were frequently observed. The results provide general source of molecular markers that could be useful for a variety of applications such as population genetics because of highly polymorphic nature of SSRs and strain identification of fungal organisms.

Plant Biotechnology, Directorate of Wheat Research, Post Box 158, Karnal-132001

E-mail: sheoran_sonia@yahoo.co.in, pandey.bharati15@gmail.com

BPP137

381. Role of Ethnomedicine in Health Care Practices among the Mishing Community of Assam.

Jinti Panging and Dr.Rezina Ahmed*

The knowledge of Ethnomedicine, basic principles of Indian system of medicine, which includes traditional science and technology, economic sustenance of related locals, provides basic material necessities for all human beings for an indefinite period. Indigenous knowledge is valuable for resource management which distinguishes one community from another. The concept of natural product in Indian medicine has helped Biomedical researchers understand new disciplines, such as pharmacogenomics. The knowledge of Ethnomedicine guided Biomedicine which is an integrative knowledge system built on such an appreciation that could improve public health.

In recent times with the increased information of life and polish of the tribal communities, the shared scientists are taking interest in ethno-remedial studies. North Lakhimpur district, one of the district of Assam is one of the richest sites of plant biodiversity, boosting in thousands of medicinal plants. The present study in due course would be helpful to find out potential medicinal plants or chemicals extracted from them that can be of tremendous use in primary health care. The use of some Ethnomedicine that gain support from religious beliefs help to cure people suffering from various diseases and disabilities.

NothLakhimpur district of Assam is situated between 26°48' and 27°53' north latitude and 93°42' and 94°20' east longitude. The district covers an area of 2277 sq.km, out of which 2257 sq.km is rural and 20 sq.km is urban area.

During the field study 30 plant species have been recorded which are commonly used by the local people. The decoction of the roots, leaves, bark, fruits, seeds and flowers are the most commonly used.
The study thus underlines the potentials of herbal practice and the need for documentation of indigenous knowledge pertaining the medicine utilization for the greater benefit of mankind.

Key words: Ethnomedicine, Health care, Mishing community.

Deptt.of Zoology, Cotton College.
Guwahati. Assam, India.
Email: jintip841@gmail.com
rezina_2008@yahoo.com

BPP138

382. Study on PAHs concentration in soil of Guwahati city

J.Kotoky*, A.Barman[1], B.K.Baruah[2], D.K.Patel[3]

The distribution of polynuclear aromatic hydrocarbons (PAHs) in the soil samples of rural, suburban and urban areas of Guwahati City was studied; HPLC with UV detection was used for the determination of PAHs. The separation was acquired by an ODS column and acetonitrile-water as the mobile phase. Total concentration of the PAHs ranged from 0.411 to 12.175 µg/g dry weight. According to observed molecular indices, PAHs concentration in the soil of this city seems to be originated both from the high temperature pyrolytic process as well as from the petrogenic source, indicating a mixed PAH input pattern.

Keywords**:** Polynuclear aromatic hydrocarbons (PAHs), Guwahati, distribution, soil

[1]*Lifesciences Division, Institute of Advanced Study In Science & Technology;*
[2]*Department Of Zoology, Cotton College;*
[3]*Analytical Chemistry Section, Industrial Toxicological Research Centre;*
**Corresponding Author : email: jkotoky@gmail.com or jkotoky@yahoo.com, ananya.barman@gmail.com*

BPP139

383. Procerain B: an industrially important cysteine protease; Purification, characterization and cloning

Abhay Narayan Singh and Vikash Kumar Dubey*

Proteases are one of the most important industrial enzymes which can hydrolyze polypeptides into smaller oligopeptides and amino acids. These are involved in several physiological reactions from simple digestion to highly regulated cascades. In case of plants these are involved in ripening of fruits, senescence and defense from pathogens etc. Now a day's proteases became an integral part of food, detergent, leather, pharma and several other industries. Owing to its high industrial and physiological importance, lot of research is running around proteases and people are always involved in search of new proteases with broader functional and stability range and with unique cutting sites. In the continuity of search for better protease with unique properties and cleavage sites, we have purified and characterized a novel cysteine protease, procerain B from the latex of a medicinal plant *Calotropis procera*. It has broad pH and temperature optima with high thermal stability where most of the other enzymes are not active. Procerain B was also screened for several possible applications. In order to increase its applicability procerain B was immobilized on glutaraldehyde activated chitosan beads. The immobilized form of enzyme was found to be more stable and suitable for industrial purposes. For recombinant production and further improvement in catalytic properties by protein engineering the cDNA coding for procerain B was cloned in pET-28a(+) vector and expressed in BL21 expression system. The recombinant procerain B was expressed in the form of inclusion bodies and the conditions were optimized to solubilise the protease. The soluble fraction was purified with the help of Ni affinity chromatography.

Indian Institute of Technology Guwahati, Guwahati – 781039 Assam, India

* *Correspondence: vdubey@iitg.ernet.in, an.singh@iitg.ernet.in*

BPP140

387. Indigenous Knowledge of Usage of Bamboo Shoot (*Bambusa Vulgaris*) in Relation to Female Reproductive Disorder In Certain Districts Of Assam

Tarali Kalita, Uma Dutta*, Nabanita Medhi

Bamboo shoot is an essential ingredient in dishes of many Asian countries and is very much popular among different ethnic groups in NE India. It is low in fats and cholesterol but very high in potassium and antioxidant property. At the present day, exposure to various genobiotic components through food and environment has caused an increased trend of infertility all over the world. Phyto-remediation may be an effective measure to combat with these problems. Therefore, a preliminary survey study was carried out to evaluate the indigenous knowledge of bamboo shoot among 100 women (both working and nonworking) of Nalbari, Darang and Kamrup districts through personal interaction by standard questionnaire. The result of the case studies depicted that working women those who rarely eaten bamboo shoot have problems like irregular menstruation cycle, heavy bleeding, miscarriage during pregnancy etc.Working and nonworking women using bamboo shoot frequently are found to have comparatively less reproductive disorders. 10 cases showed striking relief from menstrual disorders after using bamboo shoot as an indigenous treatment to these problems. The analysis of the case studies clearly revealed that bamboo shoot may be act as an inducer of hormonal balance in the body which in turn plays an important role in maintaining a healthy reproductive life. It can also be suggested that indigenous usage of bamboo shoot may reduce the upcoming infertility problem. Therefore, a thorough investigation in this line as well as biochemical mechanism of property of bamboo shoot on reproductive disorder in vivo model is required.

Key words: infertility, bamboo shoot, antioxidant, phyto-remediation

Presenting author: Tarali Kalita, Deptt. Of Zoology, Gauhati University

Other authors: Uma Dutta, Deptt. of Zoology, Cotton College*

Nabanita Medhi, Deptt. Of Zoology, Gauhati University

**Corresponding author E-mail: tarali_river@yahoo.com*

BPP141

388. Biodegradable Protein Fibre Composites : Modification Through Graft Copolymerization

A M Das* & Dr. P G Rao

Modification of biodegradable protein fibre composites - *Anthearea assama* silk (SH) has been carried out by graft copolymerization using methylmetacrylate with cerric ammonium sulphate. The thermal properties have been characterized by thermogravimetric analysis (TGA), differential thermogravimetry, differential thermal analysis and differential scanning calorimetry techniques. The kinetic parameters have been studied using Broido method with FORTRAN 77 computer programming and calculated the activation energy. And also the influence of the reactants on the resulted product has been examined. In comparison with the conventional SH, the resulted SHMMA have improved thermostability properties. The strategy described here a potential alternative to the new technique for thermostable grafted products. The structural changes of SHMMA, changes of the crystalline and amorphous ratio after grafted with MMA- Ce^{IV} initiator has been studied in relation to the weight gain and X-ray diffraction curves.

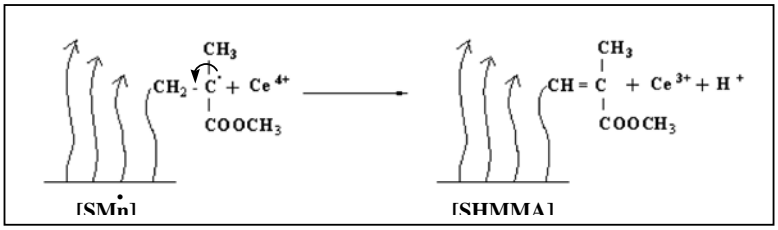
Key Words: Fibre composites, Activation energy, *Antheraea assama*, Broido method, Graft copolymerization, Kinetic parameters, Methylmethacrylate, Vinyl monomer.

North East Institute of Science & Technology, Jorhat – 785 006, Assam, India.
Email: amd_das2001@yahoo.co.in

**To whome all the correspondence should be addressed.*
Tel. : (0376)2371283 (off) Fax : (0376)2370011, 2370115

E-Mail : amd_das2001@yahoo.co.in

Graphical Abstract :



BPP142

391. Role of endophytic microbes from wild *Zingiberaceae* family of NE India: A potential impact towards therapeutic application

S. Indira Devi & Momota P

The search for new antibiotics to cure the rapidly appearing multidrug resistant human pathogens and appearance of new diseases has been rapidly increasing around the world. NE India is totally a virgin area where not much work has been done on the exploitation of endophytic microbes from wild zingibers for therapeutic applications. Realizing the importance of microbes for the production of diverse bioactive molecules and the existence of unexplored microbial diversity, research on isolation and screening of endophytic microbes for discovery of novel metabolites against some human pathogens, viz. *Pseudomonas aeruginosa, Escherichia coli, Klebsiella pnuemonia* and *Staphylococcus aureus* have been studied from three Zingibers namely *Curcuma longa, Alpinia galanga* & *Zinger zerumbet.* The endophytes were isolated using four different media *viz.* PDA, MEA, OMA & YEMA. Altogether 84 fungal endophytes belonging to 8 genera were isolated from the three medicinal plants. Out of which, 85.71% were obtained as filamentous forms and 14.29% as yeast colonies. Species of *Curvularia, Fusarium, Alternaria* and *Penicillium, Clavicep purpurea* were isolated as dominant endophytes. Out of 72 fungal endophytes, (44.44%) could display antimicrobial activity inhibiting at least one of the test pathogens. Among the potent strains, 12.8% exhibited the AFA against all the test pathogens. An endophytic fungus identified as *Fusarium* sp. displayed significant antimicrobial activity. The crude extract of this endophytic strain was very effective against the gram +ve and gm –ve bacterial pathogens. The study reinforced the assumption that endophytes of wild *Zingiberacea* medicinal plants could be a promising source of novel antimicrobial substances.

Microbial Resources Division, Institute of Bioresources & Sustainable Development, Department of Biotechnology, Govt. of India, Takyelpat Institutional Area, Imphal-795001 E.mail: sidevi1@yahoo.co.in

BPP143

392. *Sarcochlamys pulcherrima* (Roxb.) Gaud. (Urticaceae), a shrub used by tribes: A target for antioxidant and antimicrobial compound

A. H. Mazumder[1, 2], H. K. Gogoi[1], J. Das[1], P. Chattopadhyay[1], L Singh[1] and S. B. Paul[2]

Objective: To target antioxidant and antimicrobial natural product from *Sarcochlamys pulcherrima* leaves.
Methods: Sequential solvent fractionation of methanolic extract from leaves of *S. pulcherrima* was done using petroleum ether, ethyl acetate, n-butanol and water. Dipheny picryl hydrazyl radical (DPPH) assay was used to evaluate *in vitro* antioxidant activity. Total phenolic content (TPC) was measured by Folin Ciocalteu's method. Antimicrobial activity was tested against the *Staphylococcus aureus*, *Escherachia coli* and *Candida albicans* using agar well diffusion method.
Results: In DPPH assay n-butanol fraction (B) was found the most active (EC_{50}=12.73ppm) followed by ethyl acetate fraction (E) (16.67ppm) and petroleum ether fraction (P) (455.32ppm). However, total phenolic content was highest in E (350.76) followed by B (331.58) and P (26.71). Phytochemical analysis revealed the presence of flavonoid and saponin in B.
Gram positive bacterium *S. aureus* was the most susceptible to all the fractions (zone of inhibition: 28-18 mm at 20%, MIC: 0.625-5%). E caused maximum zone of inhibition (28-16mm) followed by n-butanol fraction (24-14mm). Test fractions were less active against Gram negative bacterium *E. coli*, however B showed some activity. *C. albicans* was found to be the most susceptible towards all the fractions and n-butanol fraction exhibited highest activity with zone of inhibition: 30-15mm at 20-0.625%.
Conclusion: The fractions have shown varying degree of activity. Phenolic content has a positive correlation with antioxidant and antimicrobial activity. Overall E and B showed better activity and thus highlighted their suitability for isolation of antioxidant and antimicrobial compounds.

Keywords: *Sarcochlamys pulcherrima*, antimicrobial activity, MIC, DPPH, TPC.

[1] *Defence Research Laboratory, Post Bag No. 02, Tezpur, Assam, India-784001*
[2] *Department of Chemistry, Assam University, Silchar, Assam, India-788011*
E-mail: mdafjal123@rediffmail.com

BPP144

393. An Epidemiological Study on Gall Stone Contributed To Cancer in Assam

Uma Dutta[1], Nabanita Medhi[2] and Tarali Kalita[2]

Gallstones are lumps of hard material, formed inside the gall bladder due to precipitation of Cholesterol, Calcium and bile salts from the bile. Formation of gallstone is probably associated with the diet containing fatty acid. The natural history of gallstone reveals that after their development they either remain silent asymptomatic or shows symptoms of biliary obstruction. It is a leading problem throughout the world. In recent years, formation of asymptomatic gallstone contributed to different cancer in different percentile level. Assam is not lagging behind it. In India, it has been reported in Kamrup Urban districts that among 10,000 people 10.2% (female) are suffering from gallstone. Recently Gallstone and Cancer are two most commonly prevailing problems in Assam and many people died due to this severe problem. Therefore, to find out whether there is any correlation between cholecystectomy and cancer, the present study was conducted. It was done by study of recorded cases of patients from different regions of Assam, from the cancer hospitals followed by personal interview and standard questionnaire. The result showed that among the 42 cases studied with gallstone (15 males and 27 females); 12 cases (4 males, 8 females) showed asymptomatic silent gallstones discovered at necroscopy, which leads to cancer of nearby organ such as liver and stomach. About 9 cases (3 males, 6 females), where early gallstones were removed by surgery, showed development of cancer in later periods (after 3-4 years). Another 13 cases (5 males, 8 females) showed the formation of lumps in the lining of gall bladder that spreads out to liver, stomach, intestine and colo-rectal region and metastasized to different parts. Remaining cases of patients of gallstone showed no sign of development of cancer. This study attempted to established gallstone as a potential risk factor of cancer where diet and metabolic factors are important contributor. Therefore, a thorough observation and epidemiological study for several years is required in this line.

Keywords: cholecystectomy gallstone, cancer.

1- Department of Zoology, Cotton College, Guwahati, India

2- Department of Zoology, Gauhati University, Guwahati-14, India

Email:- nabanitamedhi97@gmail.com

BPP145

394. Ethnomedicinal plants used in the treatment of inflammation and wound healing by the tribes of Dehang Debang Biosphere Reserve of Arunachal Pradesh, Eastern Himalaya

R. Kagyung, P. Rethy, P.R. Gajurel

Most of the tribal communities of Dehang Debang Biosphere Reserve of Arunachal Pradesh, Eastern Himalaya depend on herbal medicines to treat many diseases including inflammation-related ailments such as bone fracture, cuts and wounds, burn by fire and hot water, swelling of muscle, insect bites, scorpion sting and muscle pains. An ethnobotanical study has been carried out to document ethnomedicinal plants of Dehang Dehang Biosphere Reserve, their ecological status, traditional medicinal uses, morphological parts used and mode of administration. The ethnobotanical information on herbal medicinal plants used for management of inflammation-related ailments by the tribes of the biosphere reserve was based on extensive field survey, through personal interview and semi-structured questionnaires. Investigation reveals that 56 plant species belonging to 51 genera and 48 botanical families are used in the treatment of inflammation-related ailments. Among them 23 species were herbs, 13 species were trees, 12 species were shrubs and 8 species were climbers. It was revealed that 5 major inflammation-related ailments have been treated by local practitioners among which 9 species were used in inflammation caused by fire and water burns, 33 species in cuts and wounds, 3 species in dermatitis and eczema, 9 species in abscesses and allergy and 10 species used in the treatment of inflammation caused by unknown agents. Botanical families such as Asteraceae, Euphorbiaceae, Rubiaceae and Zingiberaceae were represented by the highest numbers of species reported to be used in the treatment of various inflammation related ailments.

Key words: Dehang Debang Biosphere Reserve, inflammation, bone fracture, cuts, wounds, burn by fire and hot water, muscle swelling, dermatitis, eczema, abscesses, allergy, muscle pains.

Department of Forestry

North Eastern Regional Institute of Science and Technology (Deemed University)

Nirjuli-791109, Arunachal Pradesh

Email: rajibkagyung@gmail.com

BPP146

395. Heart Disease & Herbs

*Dr. Prajyalika Sarma, ** Dr. Bishnu Prasad Sarma

19th Sept. 2011- New WHO report Global atlas on cardiovascular disease Prevention & control state that cardiovascular disease are the leading cause death & disability in the world. Largest ever study of deaths shows heart ailments have replaced communicable disease as the biggest killer in Rural & urban India.

Although a large proportion of cardiovascular disease – is preventable, they continue to rise mainly because of preventive measures are inadequate. But there are healthy life-style choices that can be made & science has come a long way in the early detection of heart disease.

According to American heart Association, the leading factors that put us at risk for coronary artery disease & heart attack includes- Age, being male, Family History, Race, smoking, High cholesterol, high- blood pressure, sedentary life style, excessive weight, diabetes.

Herbs have been used as medical treatments since the begining of civilization and some- derivatives (e.g. aspirin, reserpine & digitalis) have become main stays of human pharmacotherapy. More than 2000 plants have been listed in the traditional (Herbs/alternative) system of medicine & some of these are providing comprehensive relief to the people suffering from cardio- vascular disease, specially Hyperlipidaemic & Ischaemic Heart Disease.

WHO report indicate that around 80% of the Global population still relies on botanical drugs & several medicines have advanced to clinical uses in modern times. But still continuing research is necessary to elucidate the pharmacological activities of the many herbal remedies now being used to treat cardio- vascular- diseases.

Keywords: Hyperlipidaemic, Ischaemic Heart Disease, Coronary Artery Disease

Lohit Sarma <sarma.lohit@gmail.com

**Dr. Prajyalika Sarma, M.D. Scholar, Deptt. Kayachikitsa, Govt. Ayurvedic College & Hospital, Jalukbari, Guwahati-14, Assam, India. E-mail- sarma.lohit@gmail.com, Ph.No. 9707796211, 9435080926*

***Dr. Bishnu Prasad Sarma, Associate Professor Deptt. of Kayachikitsa, Govt. Ayurvedic College & Hospital, Jalukbari, Guwahati-14, Assam, India.*

BPP147

396. Evaluation of toxicity of essential oil compounds against *Exorista sorbillans* (Diptera: Tachinidae), a parasitoid of silkworm

Bulbuli Khanikor and Dipsikha Bora*

Management of uzi fly, *Exorista sorbillans*, a parasitoid of silkworm is a major problem in sericulture industry. Synthetic insecticides although give immediate and effective result against pest, these are not always recommended because of their ill effects on environment, non-target organism, development of resistance, health hazards etc. Specially in sericulture field, use of synthetic insecticide is not advocated because of possible adverse effects on silkworms. Currently renewed interest has been focused on essential oil and its constituents for effective pest management programs all over the world owing to their environment friendly nature. Initial investigation of essential oil of some aromatic plants had shown positive response against *E.sorbillans*. Considering that these natural products may be promising candidate against the fly ,in the present investigation 22 commercially available essential oil compounds were assessed for their toxicity against adults of *Exorista sorbillans* using contact residual film technique and topical application. The compounds under study were terpenes and coumarin. Most of the compounds were toxic to *E. sorbillans* but their toxicity varied with the bioassay method. The LC_{50} values of effective compounds as contact fumigant, namely citral, geraniol, nerol, carvacrol, eugenol, isoeugenol, l-citronellol, carvone, coumarin, α-caryophyllene and terpinen-4-ol were 110.23, 124.11, 135.75, 194.53, 207.25, 266.40, 267.24, 299.23, 364.70, 533.02 and 1213.43 ppm respectively. Topical application showed a different order of toxicity of the compounds. We recommend the compounds found effective in this study for further studies to develop viable control agent against *E. sorbillans*, which is lacking at present.

Key words: Essential oil, monoterpenes, coumarin, *Exorista sorbillans*, silkworm.

Department of Zoology, Gauhati University, Guwahati, Assam-781014, India
Department of Life Sciences, Dibrugarh University, Assam-786004, India.
khanikorbulbuli@yahoo.co.in and dipsikhaora03@yahoo.com

BPP148

397. Nutritional and Antioxidative Components of Curcuma Species Found in Manipur

Kananbala Sarangthem* and Mangvung Jamkhoneng Haokip

Curcuma species (Zingiberaceae) have been used as a spice, food preservative and are well-known indigenous medicine. Four different species were analysed for their proximate composition and antioxidant components. Bioactive components are responsible for several pharmacological activities and medicinal applications. In the present study, the bioactive components such as curcuminoids content ranges from17mg/g to185.75mg/g , phenolics(60mg/g to 220mg/g), flavonoids (20 to 132mg/g) alkaloids (43.3 mg/g to 104.25 mg/g) and anti oxidant activities, volatile oil, fiber content, protein, amino acids were also determined in the rhizomes of these *Curcuma* . Further studies for structural elucidation of these secondary metabolites are still in progress.

Key words: Curcuma species/nutrients/antioxidant/Manipur

Plant Physiology Section, Department of Life Sciences

Manipur University, Canchipur, Imphal 795003, Manipur, India

E-mail: kananbala_s@rediffmail.com

**Corresponding author*

BPP149

398. Morphological and biochemical changes in *Channa punctatus* due to arsenic toxicosis

Kokila Patowary, Nargish sultana Hazarika, Dr.Mamata Goswami.

Some elements found in nature in many forms are toxic to the living organism and arsenic is such an element. Although the toxicity of arsenic compounds varies greatly, in general, inorganic trivalent arsenic compounds are highest toxic followed by organic trivalent compounds .Arsenic binds with sulfhydryl groups and disrupts sulfhydryl containing enzymes. Some of the areas of lower Assam indicated high level of arsenic in drinking water as reported in the survey conducted by the PHE department. To assess the impact of arsenic toxicity in laboratory conditions, experiments were carried out taking *Channa punctatus* as a model animal.*Channa punctatus* were treated with different concentrations of sodium arsenite ($NaAsO_2$) to determine lethal and sublethal doses.The morphological changes caused by arsenite were studied. To find out the affect of arsenite on chromosomes, micronuclei assay was carried out and along with that change in chromosome was also studied. A substantial increase in the micronuclei was observed. Prominent changes in chromosomes were also seen. Significant alterations in the marker enzymes like-alkaline phosphatase, GOT, GPT as well as in LDH were observed. Changes were also observed in histochemical localisation of enzymes of gills, liver, kidney and intestine of *Channa punctatus*.

Keywords-Arsenic, Sodium arsenite, *Channa punctatus,* Sulfhydryl groups, Alkaline phosphatase, GOT, GPT, LDH.

Department of Zoology, Cotton College, Panbazaar, Guwahati.

Email:rumipatowary@yahoo.com

BPP150

399. Screening of antioxidant activities of methanolic extract of certain medicinal plants from North Eastern (NE) region of India.

Rajlakshmi Devi, Meetali Deori, Kaustav Kalyan Sharma, Tiluttama Mudoi, Dulal Chandra Boruah, Jibon Kotoky*.

In *vitro* Antioxidant activity of the methanolic extract of ten medicinal plants *Amaranthus spinosus* Linn. (Amaranthaceae), *Jatropha curcas* Linn. (Euphorbiaceae), *Lawsonia inermis* Linn. (Lythraceae), *Nyctanthes arbor-tristis* Linn. (Oleaceae), *Pongamia pinnata* Pierre (Fabaceae), *Streblus asper* Lour. (Moraceae), *Solanum indicum* Linn. (Solanaceae), *Solanum melongena* Linn. (Solanaceae), *Vinca rosea* Linn. (Apocynaceae), and *Xanthium strumarium* Linn. (Asteraceae) was tested using two well-establised methods, the DPPH (1, 1- diphenyl-2-picryl-hydrazyl) free radical scavenging activity and the Reducing power assay. Ascorbic acid was used as standard and positive control for both the analysis. IC_{50} value of plant extract of *Lawsonia inermis*, *Solanum melongena*, *Solanum indicum*, *Pongamia pinnata* etc were calculated out and the values were found to be 0.177, 0.414, 0.625, 1.826 respectively whereas IC_{50} value for ascorbic acid was found to be 5.795. The methanolic extracts of all the plants showed a concentration dependent antioxidant activity. Polyphenol contents of those medicinal plants were tested by the Folin ciocalteu method and found high amount of those compound in these plants. *Lawsonia inermis* plant was found to have the highest phenolic content followed by *Solanum indicum*, *Pongamia pinnata* and *Nycyhanthes arbor tristis*. This indicates that these plants are of therapeutic potential due to their high free-radical scavenging activity.

Key words: Antioxidant, DPPH, polyphenols.

**Corresponding author:*
Life Sciences Division, Institute of Advanced Study in Science and Technology (IASST)
Vigyan Path, Paschim Boragaon, Garchuk, Guwahati-781 035, Assam, India

Email id: mitu.deori@gmail.com

BPP151

400. Land evaluation for Tea and Rubber suitability in older alluvium areas of Brahmaputra valley, Assam

Diganta Goswami and Dulal C. Goswami

Older alluvium areas of Brahmaputra valley in Assam were identified using maps based on satellite images supplemented with ground truth verification. Three representative locations were identified in the area namely Majuligarh, Negheriting and Makri from three agro climatic zones. Soil samples were collected horizon wise from three exposed pedons of each location. The morphological and physicochemical properties of older alluvium reveal its unique characteristics. Older alluvium soil profiles are very deep, well-drained and highly developed. These are believed to be formed during the Pleistocene time. The soils are dark yellowish brown to reddish brown in colour and finer in texture. Soils are sticky on wetting and hard when dry and compact. Soils vary considerably in surface organic matter (1.3-3.6%), Cation exchange capacity (3.2-5.6me/100g), exchangeable cations and base saturation. The soils are very strongly to extremely acidic (P^H-4.0-4.9) in nature. Land evaluation was done through Land capability and Land suitability classification. Suitability of land were evaluated using the variables like temperature, rainfall, slope, drainage, flooding, depth of ground water table, soil texture, soil depth, soil reaction and organic matter. Rating for soil and site parameters for tea and rubber were computed as per crop requirements. Older alluvium pedons of all the three locations were found to be suitable for plantation crops of tea and rubber. Favourable climatic condition, acidic nature and high depth of the soil made the older alluvium area suitable for plantation crops.

Department of Environmental Science, Gauhati University, Guwahati-781014, Assam, India

BPP152

401. A study on use of insects as medicine and food in Traditional Knowledge system of certain tribes of Dibrugarh District.

Sudakshina Das

Wild animals and their products constitute essential ingredients in preparation of drug in traditional medicines (Adeola, 1992; Gaski and Johnson, 1994, Dedekeet at 2006). It had also estimated that of the 252 essential chemicals selected by the world health organizational, 8.5% comes from animals (Dedeke et.al 2006). Besides traditional medicines, wild and domesticated animals play a major role in nutrition. But as the wild animals are becoming scare against the rising graph of population, the focus is now on ethno-entomophagy practice. Insects cover more than 3/4th of the entire world fauna, and some of the edible insects are rearable too. According to Costa-Neto, 1999 and Kakoti and Duolo 2002, insects have played an important part in the history of human nutrition in Africa, Asia, latin America (Bodenheimer-1951).

Dibrugarh District is situated at the eastern part of Assam, The district comprised of several tribes, who can boast a long and valued knowledge of using wild animals, particularly insects for nutrition and medicinal purposes. This study reveals that more than 18 types of insects are used for various traditional medicine and nutritional practices by Tai Ahoms and Sonowal Kacharies of Dibrugarh Districts. Data are collected by questionnaire-guided ethno-zoological random survey, personal interview and group discussion. This study also reveals that such traditional practices are facing challenges due to several factors like loss of habitat due to deforestation, erosion, changing pattern of land use and agriculture, industrialization and urbanization, pollution, heavy use of insecticides, changes in socio-cultural behavior of people, etc.

Zoology Department, D.H.S.K.College,

Dibrugarh-1,PIN-786001

Email address:- sdasbordoloi@gmail.com

BPP153

402. Sustainable Utilization of Bio-Resources of Muga Silk Worm A*ntheraea Assamensis* Helfer in North East India

Jyoti Kamal Hazarika, Mitali Saikia

North – Eastern region of India (Longitude : 77°E - 90°E and Latitude : 22°N-28.5°N) is one of the 35 hot spots declared in the World with rich biodiversity. The region is an active center of Organic evolution. The region is also well known as the unique reservoir of bio-resources of various sericigenous insects viz. muga, eri, mulberry and tasar and also several other equally important wild silk moths. The muga silkworm *Antheraea assamensis* Helfer the most important commercially exploited seri-bio resources for human utilization, particularly in Brahmaputra valley of Assam has been facing serious challenges in recent years due to climate change and other natural calamities. The existence of wild counterpart of this species which was once found abundantly in hilly states of North East India is dwindled because of anthropogenic reasons and unabated destruction of natural habitat. As such, the wild Seri-genetic resources are in danger of extinction. Hence, both cultivated and wild population needs proof conservation strategy and sustainable utilization.

The paper deals on the biodiversity of Muga Silkworm along with strategies for utilization of these bio-resources for sustainable growth of rural economy.

Department of Zoology, Darrang College, Tezpur, Assam

Department of Geography, L.O.K.D. College, Dhekiajuli, Assam

BPP154

403. *In vitro* activity of Medicinal Plants against fungal pathogens of Ginger.

Medhi S.[1], Kotoky J.[1*], Sharma K.K.[1], Sarma T.C.[2]

Ginger is one of the widely used spices and has been traditionally used as antimicrobial, antioxidant, anti-inflammatory, anti-fungal etc agents. However postharvest diseases in Ginger caused by various fungi and bacterial pathogens accounts for a major loss in Ginger production. Such pathogens includes *Fusarium oxysporum*, *Aspergillus niger*, *Aspergillus flavus*, *Monillia fructicola* etc. Although, chemicals are available for the management of these diseases, continuous, inappropriate and non-discriminative use of such synthetic chemicals is known to cause undesirable effects such as residual toxicity, development of resistance, environmental pollution, health hazards to humans and animals. Instead, plant pathologists have focussed their attention to develop environmentally safe, long-lasting and effective biocontrol methods for the management of plant diseases. The exploitation of plant products as biocontrol agents for the management of plant diseases have achieved greater significance in recent times due to its readily available nature, antimicrobial activity, easy biodegradability, non-phytotoxicity, besides inducing resistance in host. Plants contain alkaloids, tannins, quinones, coumarins, phenolic compounds and phytoalexins, which are known for antifungal activity.

In the present investigation the Methanolic extracts of certain Medicinal plants from North East India has been evaluated for their *in vitro* efficacy against some common fungal pathogens of Ginger by Agar cup diffusion method. Results showed that the methanol extract *Phyllanthus niruri*, *Achras zapota*, *Datura stramonium*, *Eucalyptus globules*, *Polyalthia longifolie*, *Lantana camara* etc *were* active against the tested fungi at different concentration. Maximun inhibition was shown by *A. zapota* followed by *D. stramonium*, *E. globules* and *P. longifolia* respectively.

Key Words: Ginger, agar cup diffusion, antifungal.

[1]*Division of Life Sciences, Institute of Advanced Study in Science and Technology, Guwahati-781035. Assam, India.*

[2]*Department of Botany, Gauhati University, Guwahati-781014. Assam, India.*

Corresponding Author: Jibon Kotoky. Division of Life Sciences, Institute of Advanced Study in Science and Technology.*

e-mail: jkotoky@yahoo.com

BPP155

404. Frontier in biosensor research for rapid, selective and sensitive detection of cholesterol in biological samples

Urmila Saxena, Pranab Goswami*

Department of Biotechnology, Indian Institute of Technology Guwahati, Guwahati-781039, Assam, India

Correspondence: Tel.: 91-361-2582202 Fax: 91-361-2582249 Email: pgoswami@iitg.ernet.in (Prof. P. Goswami)

Abstract

Elevated level of plasma cholesterol concentrations, known as hypercholesterolemia, may lead to an increased chance of developing various clinical disorders such as, coronary heart diseases, arteriosclerosis, etc. This correlation of blood cholesterol levels with the life threatening diseases aroused the need for rapid, sensitive and selective determining cholesterol in blood for the diagnosis of these diseases. The conventional enzymatic assay methods utilized in clinical laboratories for measuring cholesterol have several disadvantages such as the methods involve high cost, low sensitivity, time consuming, need skilled technician and special equipment facility. The enzyme based amperometric biosensors are rapidly growing since last decade owing to their unbeaten sensitivity, selectivity, lower detection limit, faster response time, long term stability and inexpensiveness. The research on the cholesterol biosensors though got momentum since last one and a half decade an efficient and commercially viable biosensor is yet to develop so far. Current research on the cholesterol biosensors is growingly shifted to develop 3rd generation biosensors to reach the goal. The research based on this concept has got impetus since the parallel development of advanced material research such as, nano materials, conducting polymers, and allied growth on the microelectronic domains. We briefly describe here the current international status and the progress made so far on the amperometric cholesterol biosensors research in our laboratory at IIT Guwahati.

Correspondence: Tel.: 91-361-2582202 Fax: 91-361-2582249 Email: pgoswami@iitg.ernet.in (Prof. P. Goswami)

BPP156

405. Effect of pH on solvent production by immobilized whole cells of *Clostridium pasteurianum* utilizing biodiesel glycerol as a carbon source

Swati Khanna[a], Arun Goyal[b], Vijayanand S. Moholkar[c*]

Glycerol is a major byproduct of biodiesel industries. The availability of surplus amount of this glycerol has led to a quest for finding alternative routes for utilizing and converting it into value added products. The conventional catalytic routes require stringent reaction conditions and hence a more viable as well as renewable option is the use of biocatalysts for carrying out this conversion. Silica immobilized *Clostridium pasteurianum* cells were used as biocatalysts for converting both pure and crude glycerol to alternate fuels (biobutanol, and bioethanol) and a commodity chemical 1,3-propanediol under different pH conditions. The initial pH of the optimized media was set at 3.0, 5.0 and 7.0 respectively. Various concentrations of pure and crude glycerol (5 g/L, 10 g/L and 25 g/L) were studied for production of solvents. Maximum production of solvents occurred at pH 7.0 followed by pH 5.0. Only traces of ethanol were observed at initial pH 3.0. pH 5.0 media predominantly produced ethanol with little quantity of 1,3-PDO. Butanol was formed only at pH 7.0.A change in concentration of substrate at each pH led to a change in product profile as well as a particular solvent was formed in major amount only at particular initial substrate concentrations. A higher amount of solvents was produced with pure glycerol as a substrate than crude glycerol probably due to inhibition caused by methanol and other impurities present in crude glycerol.

Keywords:, *Clostridium pasteurianum*, ethanol, glycerol, 1,3-propanediol, butanol

[a]*Center for Energy,* [b]*Department of Biotechnology and Center for Energy,*
[c]*Department of Chemical Engineering and Center for Energy,*
Indian Institute of Technology Guwahati
Guwahati – 781 039, Assam
** - Author for correspondence. E-mail: vmoholkar@iitg.ac.in; Phone: 0361-258 2258 (O), 258 4258 (R); Fax: 0361-269 0762*

BPP157

413. Fabrication and Characterization of 2-D film from silk gland protein of *Samia Cynthia Ricini* as potential biomaterial

Saranga Dutta[1], Rupjyoti Bharali[2], Dipali Devi[1*]

The present study discusses the possibilities of liquid silk (Silk gland silk) of *Samia cynthia ricini* (Eri Silkworm) as a potential biomaterial in biomedical applications. Silk protein fibroin of *Bombyx mori*, commonly known as mulberry silkworm, has been extensively studied and is used as versatile biomaterial, whereas non mulberry silks *viz*. Muga and Eri still remain unexplored. Fibroin was extracted as liquid silk from the posterior silk gland of full grown fifth instars larvae and 2-D film was fabricated using standard methods. The film was characterized using SEM, Dynamic contact angle test, FT-IR, XRD, DSC and TGA and compared with respective fiber. The SEM images showed the presence of globules and filamentous structure. The film showed the presence of α helical conformation, hydrophobic in nature and unaffected by organic solvents. Varied thermal properties were recorded in fibers and films. Fibers were thermally stable than the films. This study provides significant insight into a new arena of research in biomaterials from liquid silk of Eri silkworm**.**

Keywords**-** Fibroin, liquid silk, films, biomaterials**.**

[1]*Seri-biotech Laboratory, Life Sciences Division*

Institute of Advanced study in Science and Technology

Paschim Boragaon, Guwahati- 781035, Assam, India.

[2] *Department of Biotechnology, Gauhati University,*

Guwahati- 781014, Assam, India

[*] ***Corresponding Author-***

Dr. (Mrs.) Dipali Devi

Associate Professor, IASST.

BPP158

415. Determination of Total Protein Content In Three Different types of healthy and infected Onion (*Allium cepa* L.) in Guwahati

Juri devi, J. Kotoky and T.C Sarma

Department of Botany

Gauhati University

Email: juridevi99@gmail.com

Abstract

Onion (*Allium cepa* L.) is one of the most important vegetable worldwide . Due to its high moisture content and rich in nutrient it is very much prone to fungal infection. In Assam onion is imported from other states and its hot and humid climatic condition favours fungal infection to a great extent under storage and market condition. Therefore an investigation was carried out to determine the total protein content in three types of onion viz. red , white and yellow in healthy and infected condition by Bradeford Method. It was found that total protein content was higher in case of healthy onion in comparision to infected onion. However no significant difference was found regarding protein content in three different types of onion.

Key words: Protein, onion, Bradford

BPP159

416. A study on fish diversity in Rangagarha beel with special reference to their ornamental status.

Pori Devi*, Gitartha Kaushik**, S.K.Sarmah***

pori_devi@yahoo.com

Abstract:

Wetlands are most productive natural resources with ecological and socio-economical importance. They support a vast majority of faunal diversity by providing them suitable habitat and food. Wetlands of North-East are very rich for different indigenous fishes. Rangagarha beel of North Guwahati, Assam is also famous for different fish species, where most of them have ornamental status. There are 22 numbers of fish species were recorded at the time of study namely *Chanda nama, Pseudoambassis ranga, Colisa lalia, Mystus vittatus, Xenentodon cancila, Botia dario, Lepidocephalus guntea, , Channa orientalis, Chela cachius, Esomus danricus, Parluciosoma daniconius, Puntius conchonius, Puntius sophore, Punitus ticto, Rasbora rasbora, Glossogobius giuris, Macrognathus aral, etc.* This paper deals with the fish diversity of Rangagarha beel along with their ornamental status.

Keywords: Wetlands, Natural resources, Ecological, Rangagarha, Fish diversity.

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*Asst. Professor, Abhayapuri College, Bongaigaon.Assam.

**Research Scolar, Gauhati University, Guwahati, Assam.

***Associate Professor, Guwahati College, Assam.

BPP160

417. AN INVESTIGATION ON THE CONTRACEPTIVE EFFECT OF CAREYA ARBOREA ROXB.

E. Kalita[1*], J.C.Kalita[2] & A.K. Haloi[3]
[1*] Assistant Prof, Dept of Zoology, Handique Girls' College, Guwahati,781001,
[2] Associate Prof, Dept of Zoology, Gauhati University, Guwahati,781014,
[3] Assistant Prof, P.G. Dept of Zoology, Bajali College, Pathsala, 781325,
*** Corresponding author**
e-mail: evaranikalita@yahoo.com

There are large numbers of medicinal plant, some of which enhance fertility and other induces infertility. It has been established that many plants exert their fertility/anti-fertility effects through substances known as phytoestrogens. Currently, there has been an enormous surge of interest in the potential effects of such estrogenic chemicals present in our environment. Due to serious adverse effects produced by synthetic steroidal contraceptives (Bingel and Benoit, 1973a, 1973b; Li *et al.*, 1995), attention has now been focused on indigenous plants for exploring their possible contraceptive effects. This traditional use of cheap and safe phytotherapeutic medicines awakes the researches and scientists alike to make much more efforts to find out human health-friendly substitutes for contraception. From many years, the root of *Careya arborea* Roxb. has been traditionally used as oral contraceptive agent after delivery, by a group of tribal people of Nalbari district, Assam (present survey report). In view of the current interest, the present study were designed to investigate the antifertility effect of the root extract in normal cyclic mice.

In the present experiment, the root extract showed a significant dose-dependent pregnancy inhibitory activity. After 1st mating, in the animal group receiving 250mg/kg bw of root extract, only 40% pregnancy was inhibited. Animals in groups receiving 500mg, 750mg and 1000mg/kg bw of the root extract respectively, showed 100% inhibition of pregnancy. By the end of the repeated 2nd mating (i.e. after 22days of 1st mating), in group receiving 250mg/kg bw, the animals which were not pregnant after 1st mating became pregnant. In group receiving 500mg and 750mg/kg bw of the extract respectively 40% and 50% of the treated animals fail to conceive after 2nd mating. On the other hand, the group receiving 1000mg/kg bw exhibited 100% antifertility activity even after the repeated 2nd mating. By the end of the repeated 3rd mating (i.e. after 22days of 2nd mating), in groups receiving 500mg and 750mg/kg bw of the root extract, the animals which were not pregnant after 2nd mating became pregnant. But the animals of the group receiving 1000mg/kg bw of the extract exhibited 80% pregnancy inhibitory activity even after this repeated 3rd mating. Therefore, animals in the exposed group exhibited a strong inhibitory activity in comparison with the controls. The present study also used 17β-estradiol (E_2) as positive control. At the dose level 10μg/kg bw of E_2 exhibited 100% inhibitory activity after 1st mating. In this group 60% of the treated animals did not conceive even after 2nd mating. But, by the end of the repeated 3rd mating (i.e. after 22days of 2nd mating), the animals who didn't conceive after 2nd mating,now became pregnant. On the contrary, all the animals of group I (control) and II (vehicle control) became pregnant normally by the end of 1st mating.

Keywords: Phytoestrogen, Careya arborea, Antifertility, Contraceptives

BPP161

418. Screening and identification of a glucansucrase producing lactic acid bacterium *Weissella cibaria* isolated from apple

T. Jagan Mohan Rao and Arun Goyal*

Department of Biotechnology, Indian Institute of Technology Guwahati,

Guwahati 781039, Assam, India.

Lactic acid bacteria have immense potential application as probiotics and for producing prebiotics. As it produces several exopolysaccharides, antioxidants and bacteriocins with tremendous potential in pharma and food industry. In the present study bacteria were isolated from fruits samples (apple, orange, sugarcane and banana) and they were screened on $CaCO_3$ treated MRS agar plates containing glucose. Based on acid producing abilities the colonies were selected from 10^{-8} dilution plate and further screening was done by their glucansucrase producing ability. Among the four fruit samples bacterium isolated from apple and orange were selected based on maximum glucansucrase activity of 5.2 U/ml and 4.3 U/ml respectively, at 28°C under static conditions. Based on glucansucrase activity the strain isolated from apple was selected for further optimization of temperature. The maximum activity of 5.8 U/ml was observed at 24°C and 12 h of incubation under static condition. From the biochemical characterization the isolate was found to be Gram positive, short rod, catalase negative and vancomycin resistant. The results were further confirmed by 16S rRNA analysis and the isolate was found to be *Weissella cibaria.* The results in detail will be presented.

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BPP162

419. Micronuclei in red blood cells of *Heteropneustes fossilis* (Bloch) after Bisphenol-A treatment

Saptadeepa Roy[1], Jogen Chandra Kalita[1], Jibon Kotoky[2]

[1]*Physiology and Biochemistry Laboratory, Department of Zoology, Gauhati University.*

[2] *Division of Life Sciences, I.A.S.S.T.,Vigyan Path, Pachim Baragaon, Guwahati.*

Abstract

Exposure to endocrine-disrupting chemicals (EDCs) is currently regarded as one of the most serious anthropogenic threats to ecosystems and biodiversity. EDCs are defined as an exogenous substance that causes adverse health effects in an intact organism, or its progeny, consequent to changes in endocrine function. Bisphenol A (BPA) is an industrial chemical, used to manufacture polycarbonate and numerous plastic articles and was shown to have estrogenic effects as early as 1936. It is the building block of many plastics that are used in a number of consumer goods items such as polycarbonate plastics, food can linings, white dental sealants, electrical sheathings, adhesives and polyvinyl chloride. However recent studies have shown that it can leach out of certain products, including the plastic lining of cans used for food, polycarbonate baby's' bottles and tableware and white dental filling and sealants. BPA is also able to leach into water and food. Moreover low level BPA have also been found to cause biological effects, and its mode of action appears to mimic that of the female hormone estrogen. The present work dealt with the *in vivo* study on the genotoxic effects of Bisphenol A with Micronucleus assay. Fishes were exposed to different concentrations of BPA for 24 h, 48 h and 7 days and genotoxicity was evaluated thereafter. Though micronucleus frequency increased at all exposure schedules, significant increase was observed in the longer duration study of 7 days.

Keywords: EDC, Micronuclei, Genotoxicity, Bisphenol A

BPP163

135.Probiotic lactobacilli as a potential candidate to cure metabolic inflammatory disorders

Raj Kumar Duary [a], Virender Kumar Batish [b] and Sunita Grover [b]

[a] Dept of Food Engineering and Technology, Tezpur University, Napaam, Assam, India-784028.

[b] Molecular Biology Unit, Dept of Dairy Microbiology, National Dairy Research Institute, Karnal, Haryana, India-132001.

Choice of mode: Podium or Oral.

E-mail: rkduary@gmail.com, duary@tezu.ernt.in

Lactobacilli constitute the normal component of the intestinal microflora in both human and animals and are acclaimed as the key member of probiotics. Probiotic therapy can be utilized to prevent several diseases like ulcerative colitis, Traveler's diarrhea, Crohn's disease, etc. Quantification of genes encoding specific physiological attributes at transcriptional level is an important criterion to know gene functionality. Initially, seven putative indigenous probiotic *Lactobacillus* isolates along with standard culture *L. plantarum* CSCC5276 were screened based on their hydrophobicity and cell adhesion property on human adenocarcinoma cell lines namely HT-29 and Caco-2 cell lines. Two of the probiotic cultures namely Lp9 and Lp91 were able to exhibit immuno-modulatory properties by up regulating MUC2 expression and the key anti-inflammatory cytokines (IL-10, IFN-α and TGF-β) and regulating the pro-inflammatory markers (IL-8, TNF-α, IFN-γ and IL12p35) and other signaling molecules (COX-1, COX-2 and Hsp70). Maximal MUC2 gene expression in HT-29 cells was recorded with Lp5276 closely followed by Lp91 under both pre and co-culture treatments with probiotics and LPS. Lp91 was rated as the most effective by significantly up regulating IL-10 and IFN-α expression in HT-29 cells under pre-culturing conditions. However, Lp9 was the most potent by evoking the maximal expression in HT-29 cells under co-culture conditions. Lp91 was also found to be the most effective probiotic as immunosuppressant as it was able to significantly down regulate the expression of all the four cytokines i.e. IL-8, TNF-α, IL12p35 and IFN-γ in HT-29 cells under both the conditions. Hence, it can be concluded that Lp91 and Lp9 were the most promising indigenous probiotic strains and can be explored as potential probiotics for boosting gut health and immunity.

BPP164

423. Evaluation of effect of Neem Leaf Oil in the management of Infected Wounds.

Author: Dr. B. Kalita *
Dr. B. Das **

Deptt.: Deptt. of Shalya
Institution: Govt. Ayurvedic College & Hospital
Guwahati-14, Assam
E-mail: drbinodkalita75@gmail.com

There are lots of treatment modality mentioned in the classics of Indian System of Medicine for the management of different wounds and ulcers, called as Dustavrana in Ayurveda. Lots of medicines, mostly topical have been tried clinically for the management of dusta vrana with varying efficacy. In an attempt to establish an indigenous medicine with scientific evidence for the management of dusta vrana, which may have both antibacterial as well as healing effect the study has been undertaken. The medicine has been prepared in the Rasashala of Govt. Ayurvedic College. The expressed juice of leaves of Nimba (Azadirachta Indica) has been processed with til taila after murcharana and collected and preserved for application. The cases of infected wound are taken from the OPD of Govt. Ayurvedic College and Hospital after thorough examination and investigation. Sterile Gauge is soaked with oil and applied ever the wound daily and the findings in relation to culture of organism, size of wound, discharge etc. have been documented for statistical analysis at the interval of 3 days. In the study it has been found that the Nimba taila has significant effect in treatment of infected wound.

Keywords: Dustavran, Nimba Taila, Murchana, Rasashala etc.

Reference:

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* Ph. D. Scholar

** Prof. and Head, Deptt. of Shalya, Govt. Ayurvedic College and Hospital, Guwahati-14, Assam

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VIGYAN PATH, PASCHIM BORAGAON , GARCHUK,GUWAHATI-781035, ASSAM, INDIA
PHONE: (0361)2912073; FAX: (0361)2279909
DIRECTOR: (0361)2279929; FAX: (0361)2279912
REGISTRAR: (0361)2912075
website : www.iasst.in