RASHTCP-2016

Recent Advances and Scope in Herbal Technology: Challenges and Prospects
Venue : Bipin Chandra Pal Auditorium, Assam University

ABSTRACT-cum-SOUVENIR

Department of BioTechnology, Government of India

सत्यमेव जयते

Organized by

Department of Pharmaceutical Sciences,
Assam University, Silchar

Sponsored by:

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Proceedings of Seminar

NATIONAL SEMINAR

ON

RECENT ADVANCES AND SCOPE IN HERBAL TECHNOLOGY: CHALLENGES AND PROSPECT (RASHTCP-2016)

09-10th SEPTEMBER 2016

Organized

By

DEPARTMENT OF PHARMACEUTICAL SCIENCES
ASSAM UNIVERSITY, SILCHAR, ASSAM, INDIA.

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Technical session schedule

NATIONAL SEMINAR
ON
RECENT ADVANCES AND SCOPE IN HERBAL TECHNOLOGY: CHALLENGES AND PROSPECT

09-10th SEPTEMBER 2016

Organized By

DEPARTMENT OF PHARMACEUTICAL SCIENCES, ASSAM UNIVERSITY, SILCHAR-788011

PROGRAM SCHEDULE
(BIPIN CHANDRA PAL AUDITORIUM, ASSAM UNIVERSITY)
Day 1: 9 th September 2016 (Friday)

Time	Particulars
9.00 - 9.30 a.m.	Registration
9.30 - 10.15 a.m.	Inauguration Session
10.15 - 10.30 a.m.	High Tea
Technical Session -I	Session-chairman : Prof. Sanjay Singh, Dept. of Pharmaceutics, IIT-BHU, Varanasi-221005
Invited Lecture – I 10.30-11.00 a.m.	"Changing Perspective in Herbal Technology" Prof. Arup Mukherjee, Department of Chemical Technology, University of Calcutta 92 APC Road
Oral presentation 11.00a.m. -01.00 p.m.	OL-1,3,5, 7,9 ,11,13,15,17,19
01.00-2.00 p.m.	LUNCH BREAK
Technical Session -II	Session-chairman : Prof. (Dr.) Subhash C. Mandal, Jadavpur, University, Dept. of Pharmaceutical Technology, Kol-32
Invited Lecture – II 02.00-02.30 p.m.	"Application of Traditional Knowledge in Search of Potential Leads for Drug Discovery" – Dr. Rakesh Maurya Chief Scientist, Medicinal and Process Chemistry Division, CDRI, Lucknow CSIR-Central Drug Research Institute
Oral presentation 2.30p.m. -04.30 p.m. :	OL-2,4,6, 8,10 ,12,14,16,18,20
Technical Session -III	Session-Chairmans : Dr. Rakesh Maurya, Prof. Arup Mukherjee, Prof. Sanjay Singh, Prof. (Dr.) Subhash C. Mandals, Dr. H. Lalhlenmawia
Tea break and Poster presentation 3.30 p.m. -4.45 p.m.	All odd number of posters (from PP-1 to PP-71)
4.45 p.m. to 6.00 p.m.	Cultural program

Day 2: 10 th September 2016 (Friday)

Time	Particulars
10.00-10.30	High Tea
Technical Session -IV	Session-chairman : Prof. Arup Mukherjee, Department of Chemical Technology, University of Calcutta, 92 APC Road
Invited Lecture – III 10.30 -11.00 a.m.	"Nanotechnology for Efficient Utilization of Herbal Drugs"- Prof. Sanjay Singh, Dept. of Pharmaceutics, IIT-BHU, Varanasi-221005
Oral presentation 11.00p.m. -12.00 p.m.	OL-21,23,25,27,29
Technical Session -V	Session-chairman: Dr.Rakesh Maurya Chief Scientist, Medicinal and Process Chemistry Division, CDRI, Lucknow
Invited Lecture – IV 12.00-12.30 a.m.	Drug Discovery and Traditional Medicine: Learning it my way through ethnic society and cultures using a holistic approach: : Prof. (Dr.) Subhash C. Mandal, Jadavpur, University, Dept. of Pharmaceutical Technology, Kol-32
Oral presentation 12.30a.m. -01.30 p.m.	OP-22,24,26,28,30
01.30-2.30 p.m.	LUNCH BREAK
Technical Session -VI	Session-chairman : Prof. Sanjay Singh, Dept. of Pharmaceutics, IIT-BHU, Varanasi-221005
Invited Lecture – V 02.30-03.00 p.m.	"STANDARDIZATION OF HERBAL MEDICINES"- Dr. H. Lalhlenmawia,Head, Department of Pharmacy, Regional Institute of Paramedical and Nursing Sciences, Zemabawk, Aizawl, Mizoram,
Oral presentation 3.00p.m. -03.30 p.m. :	OL-31.33,35,37,39
Technical Session -VII	Session-Chairmans : Dr. Rakesh Maurya, Prof. Arup Mukherjee, Prof. Sanjay Singh, Prof. (Dr.) Subhash C. Mandals, Dr. H. Lalhlenmawia
Tea break and Poster presentation 3.30 p.m. -4.45 p.m.	All even number of posters(from PP-2 to PP-74)
Technical Session -VIII 3.45-4.30 p.m.	Session-Chairmans: Prof. Sanjib Das, Dr. Nirupam Das, Dr. Partha Palit OL-32, 34,36,38,40,42, 44,47,49,51
Technical Session -IX 4.30-5.15 p.m.	Session-Chairmans: Dr. Supratim Ray, Abhishek Bhattacharjee, Dr. Laldusanga Pachuau OL-41,43, 45,46, 48,50
Valedictory Session 5.15-6.00 p.m.	Chairman : Prof. Arup Mukherjee, Department of Chemical Technology, University of Calcutta 92 APC Road

प्रोफेसर दिलीप चन्द्र नाथ
Prof. Dilip Chandra Nath

कुलपति
Vice-Chancellor

असम विश्वविद्यालय
(एक केंन्द्रीय विश्वविद्यालय)
सिलचर 788011 असम, भारत
ASSAM UNIVERSITY
(A Central University)
Silchar 788011, Assam, India

MESSAGE

It gives me immense pleasure to share that the Department of Pharmaceutical Sciences, Assam University, Silchar, Assam, India is going to organize a National Seminar On "Emerging Herbal Technology" on 9th and 10th September, 2016 entitled **"RECENT ADVANCES AND SCOPE IN HERBAL TECHNOLOGY: CHALLENGES AND PROSPECT(RASHTCP-2016).** Moreover, It is most exciting to me to know that this conference is organized by the Dept. of Pharmaceutical Sciences for first time , since the inception of their department in this University.

The topic chosen for the seminar is very appropriate. Herbal products once served humankind as the source of all drugs, and higher plants provided most of these therapeutic agents. Today natural products (and their derivatives and analogs) still represent over 50% of all drugs in clinical use. The World Health Organization estimates that 80% of the people in developing countries of the world rely on traditional medicine for their primary health care, and about 85% of traditional medicine involves the use of plant extracts. This means that about 3.5 to 4 billion people in the world depend on plants as source of drugs. Now a days , herbs are using as alternative sources of development of natural pesticides, bio-fertilizers, bio-fuels, bio-preservatives , bio-adsorbents , water purifier etc apart from its medicinal application. These approaches are very significant compared to synthetic agents related to safety issues.

I believe this seminar will provide our young researcher and students an excellent platform for their talent exposure and acquire knowledge from this emerging technological discussion.

This will also open up a very effective scope for interaction and exchange of views with the participating eminent researchers and experts which undoubtedly be of immense value to the students and researchers and also the others attending the seminar .I extend my warm greetings and felicitation to all the participants, delegates and convey my best wishes for the grand success of this seminar.

Date : 24.08.2016

(Prof. Dilip Chandra Nath)

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प्रकाश जावडेकर
Prakash Javadekar

सत्यमेव जयते

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मानव संसाधन विकास
भारत सरकार
MINISTER
HUMAN RESOURCE DEVELOPMENT
GOVERNMENT OF INDIA

Message

I am glad to learn that the Department of Pharmaceutical Sciences, Assam University, Silchar, Assam, India is going to organize a National Seminar On "Emerging Herbal Technology" on 9th and 10th September, 2016 entitled "RECENT ADVANCES AND SCOPE IN HERBAL TECHNOLOGY: CHALLENGES AND PROSPECT (RASHTCP-2016). This seminar is being organized to create awareness and share scientific knowledge related to herbal technology among young researchers and students in national level. This seminar will focus the exploration of flora and fauna of North-East Region with herbs for natural medicine, herbal pesticides, bio-fuels, bio-fertilizers, bio-adsorbent development.

The topic chosen for the seminar is very significant. I wish grand success of this conference and convey my heartiest congratulation to the organizing committee of Assam University, Dept. of Pharmaceutical Sciences for organizing such wonderful auspicious event.

(Prakash Javadekar)

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डॉ. एस. चंद्रशेखर एफएनएएससी, एफएएससी, एफएनए
निदेशक

Dr. S. Chandrasekhar, FNASc, FASc, FNA
Director

Message

I am extremely glad to learn that a National Seminar on "**Recent Advances and Scope in Herbal Technology: Challenges and Prospects"** is being organized by the Department of Pharmaceutical Sciences, Assam University (A Central University), Silchar. I appreciate the organizer's choice of a topic which is highly appropriate and important to the region as the Northeast India is being recognized as one of the biodiversity hotspot with a plethora of unexplored and untested flora and fauna. It is highly important to this day that all the problems of the society, be it health and diseases, household and other applications be solved through a green and clean resources that have minimal impact on the environment. It is a step towards contribution for the "Swastha Bharat" mission of our Honorable Prime Minister **Sri NARENDRA MODI**.

I sincerely hope that this seminar would contribute towards finding those new areas of applications and encourage the new generation to pursue such a scientific endeavour. I extend warm greetings to the convener and organizing committee members and wish them great success in hosting and arranging the seminar.

(S.Chandrasekhar)

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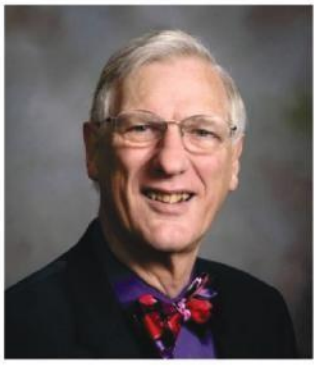
August 17, 2016

Natural products from plants have a long and distinguished record as drugs and drug leads. This is illustrated both by older drugs such as morphine and quinine, and also by newer drugs such as the anticancer agent Taxol® and by the antimalarial drug artemisinin. The study of herbal medicine is an important part of the discovery process for new drugs, and so it is with pleasure that I welcome the participants to the national seminar hosted by the Department of Pharmaceutical Sciences at Assam University on "Recent Advances and Scope in Herbal Technology: Challenges and Prospect".

I wish all the participants an enjoyable and exciting seminar.

David G. I. Kingston
University Distinguished Professor



Message

With the dawn of ages of civilization, mankind was bestowed with plants on earth for several purposes. Plants served man in several ways such as food, shelter and clothes. Civilization brought the idea of studying the plants macroscopically. Today 4, 00,000 plants are recorded on the earth that is serving in multipurpose ways in everyman's walk of life. The plant remains inexhaustible source of healing for suffering humanity from prehistoric time. The plant used as folk medicines is a valuable source for search and development of new and useful therapeutic agent. WHO has listed over 21000 plant species used around world for medicinal purposes. In India, about 2500 plant species belonging to more than 1000 genera are being used in indigenous system of medicine. Only 40 plant species (29 indigenous & 11exotic) are currently used by the pharmaceutical industries. Similarly, aroma chemical industry currently is using 42 plant Species for aromatic properties. Advancement of technologies developed various discipline to exploit plats at maxim for human welfare. A number of scientific investigations have highlighted the importance and the contribution of many plant families. Medicinal plants play a vital role for the development of new drugs.

The typical agroclimate and soil condition of Northeastern (NE) India and South Assam particularly endowed the region with vast amount of natural flora which is the major source of medicines still today for the different ethnic groups. Right from the ancient times in India, in Greece and in several other countries of the world, seminars and discussions have been in the centre stage of academics. The take-home values of seminars are boundless. It is indeed relevant that a national seminar on "Recent advances and scope in herbal technology: Challenges and prospect" is being held at Assam University, Silchar on 9-10th September 2016.

The Seminar is being going to be organized first time by the Department of Pharmaceutical sciences. I am sure that the seminar would add new dimension in academic activity. It is expected that scientists are participating from different parts of India. The seminar will provide a unique opportunity to the faculty members, Research scholars and students to participate in academic deliberation. I hope that the deliberations in the conference will help researchers from academia and industry and the seminar will provide a platform for initiating collaborative research.

I am highly indebted to the ever-encouraging University authority, DST, DBT, my hard working faculty and students for their co-operation in creating such opportunity. I hope this event will motivate and profit everybody.

Professor Sanjib Das

Organizing President and Dean, SSMPS, Assam University (A Central University)

Message

Plants are the major source of natural products as they can synthesize a large number of compounds. Exploring nature for its wonders has become curious maneuver to the human kind which includes both the researchers and the customary folk. The so-called "green wave" triggered by a growing ecological awareness has resulted in an increased interest in the formulation with natural products throughout the world. The Department of Pharmaceutical Sciences of Assam University has taken an initiative to organize a national seminar on the topic "Recent advances and scope in herbal technology: Challenges and prospect" considering the importance of natural products and its application. This area of North East India is enriched with several kinds of medicinal plants which are still unexplored and needed to be explored for the betterment of mankind. This seminar provides a platform for intellectual exercise about herbal technology between eminent experts, researchers and students. The organizing committee extends sincere thanks to the University authority, DST, DBT for encouragement and sincere support though Department is organizing a national seminar for the first time. I hope that the seminar will be a great success.

Dr. Supratim Ray

Organizing Chairman and Head, Department of Pharmaceutical Sciences, Assam University, Silchar

FOREWORD

Assam University, Department of Pharmaceutical sciences, Silchar feel honour to organize this National Seminar on "RECENT ADVANCES AND SCOPE IN HERBAL TECHNOLOGY: CHALLENGES AND PROSPECT." The meeting are being organized to discuss on the proper utilization and application of the herbal resources for the benefit of humankind. Changing perspectives of herbal technology from natural drug development to herbal bio adsorbent, bio fuels, bio fertilizers, colour, herbal nutrients, and pesticides will going to be focus in this seminar to explore the herbal factories of North- East India's hot-spot. Our Department is organizing this auspicious meeting for the first time with limited man-power at its infancy stage, since its inception in this University. We have introduced such theme in this seminar to create awareness, convey the message of significance, efficacy, and safety of herbal technology among students, researchers, scientists, and academicians. The implementation of the theme was encouraged by the award of the 2015 Nobel prize in medicine by three Distinguished Professors.

On behalf of the Organizing Committee, I am very gratified to Our Assam University Authority, DBT, and DST to arrange this gala meeting for their financial and administrative support. It is exciting for me to share that enormous hard work and contribution from all of my beloved students, my other faculty colleagues, and office staffs help to develop such scientific abstract booklets and organizing this seminar at National level. I believe that this seminar would be Productive and Successful. I wish all the attendees like eminent scientists, researchers, and students around the Nation a Stimulating and enjoyable meeting. This seminar will be a remarkable and cherished experience for all participants for exchange of innovative ideas, creation of a networks and friendships. Thank you.

Dr. Partha Palit
Organizing Secretary cum Convenor
Assistant Professor, Dept. of Pharmaceutical Sciences, Assam University

Invited Lectures

IL1. Changing Perspective in Herbal Technology,

Arup Mukherjee, Ph.D., FRSC, Division of Pharmaceutical & Fine Chemical Technology, Department of Chemical Technology, University of Calcutta 92 A P C Road, Kolkata-700009 , e-mail: arupm1234@gmail.com

Abstract: Plants are superb chemical factories. Herbal technology takes an attempt to explore and exploit a range of chemical resources that are available within the Kingdom '*Plantae.'* Exploring herbal resources for health care is one very avidly studied area. The 'history of pharmacy' is in fact a record of herbal formularies. Herbal medicines are also linked directly to the changing needs of every civilization. Galenicals of 1st century are now highly regulated science and technology under the WHO guidelines. The pacific yew tree *Taxus brevifolia* gave way to taxol and that provided scaffold for newer cancer drugs development like Docetaxel. Currently, 'herbal technology' does not restrict to medicines only but encompass areas like bio-fertilizers, natural dyes, pesticides and bio-fuels. Health is but one universal aspiration and a human right. Health providing originated in regional biodiversity and globalization has extended the benefits throughout. Plants presently provide unique scaffolds for drug discovery, nutrients to combat newer degenerative diseases, green chemistry resources and alternative tools for approaching different disease modifying mechanisms. Plant drugs are applied in safe nanomedicines synthesis, enhanced per oral drug delivery, cancer chemotherapy, parasite infection management, immunity bolstering and viral control. Himalayan region is a biodiversity hot spot. Applications of new age herbal technology will surely support a growth and development in this region. Our experiences in plant drug delivery, disease management, and green chemistry applications will be exampled in the deliberations.

IL2. Application of Traditional Knowledge in Search of Potential Leads for Drug Discovery,

Rakesh Maurya, Division of Medicinal and Process Chemistry, CSIR-Central Drug Research Institute, Lucknow- 226 031, India. E-Mail: mauryarakesh@rediffmail.com

Abstract : A vast number of prescribed drugs are derived or synthesized from natural products, which include plants, animals, marine and micro-organisms. Plant derived drugs are being used in treatment of most of the diseases, such as diabetes, osteoporosis, cancer, tuberculosis, malaria, jaundice, stress etc. Activity guided extraction, fractionation and isolation of bioactive compounds for antistress, osteogenic and antidiabetic activities form medicinal plants will be presented. Isolated compounds were characterized using spectroscopic (FAB-MS, ^{1}H-NMR, ^{13}C-NMR, COSY, HSQC, HMBC) methods. Indian medicinal plants namely *Ocimum sanctum, Butea monosperma* and *Pongamiapinnata* have been investigated to isolate active principals and assessment of their respective pharmacology such as antistress, osteogenic and antidiabetic has been made. Active principals have been transformed in order to increase their claimed activities. Three new compounds, **OS 1, OS 2** and **OS 3**, were isolated from n-butanol fraction of the ethanolic extract of the leaves of *Ocimum sanctum*, together with two known compounds (**OS 4, OS 5**). Antistress effects of compounds **OS 1-OS 5** is studied at 40 mg/kg body weight on stress-induced changes in the rat adrenal gland, plasma corticosterone levels, plasma glucose levels, and plasma creatine kinase levels. **OS 1** displayed promising antistress effects. **OS 5** is modified in order to enhance the antistress activity. The ethanolic extract of stem bark of *Butea monosperma* presented significant osteogenic activity. Along with three new compounds **BM 1**, **BM 2** and **BM 3**, nineteen known compounds were isolated from the title plant, out of which five compounds showed promising osteogenic activity. Active compounds are modified to enhance the osteogenic potential. Eight new furanoflavnoid have been isolated from the fruits of *Pongamia pinnata*. The two compounds showed significant inhibition on postprandial rise in hyperglycemia post sucrose load in normoglycaemic rats as well as streptozotocin-induced diabetic rats. The two compounds were also evaluated for oral glucose tolerance in db/db mice. These two compounds were chemically modified and evaluated for their antidiabetic potential.

IL3. Nanotechnology for Efficient Utilization of Herbal Drugs.

Prof. Sanjay Singh, Dept. of Pharmaceutics, IIT-BHU, Varanasi-221005.

Abstract : Herbal technology is a recent concept incorporating modern scientific discoveries with traditional knowledge for profitably managing the plants around us. It is presently cutting edge research for development of herbal therapies for different diseases. Herbal drugs are used as single phytochemical or as standardized extract. An extract is the result of a solvent acting on plant material and dissolving some of its components. That solution, once separated from the insoluble plant materials, is the extract that can be left in liquid form, or the liquid removed to produce a solid extract. Phytochemicals are chemical compounds that occur naturally in plants. Some are responsible for color and others for organoleptic properties. Phytochemicals are non-nutritive plant chemicals that have protective or disease preventive properties. Some of the limitations of herbal drugs are complexity in phytochemicals, difficulty in standardization, higher doses, and delayed onset of action. The limitations associated with herbal drugs can be overcome by using modern technologies. One of them is Nanotechnology. This can be applied for making the herbal preparations/ drugs more effective and safe. In addition to above, the talk will also cover some case studies demonstrating role of Nanotechnology for better utilization of herbal drugs.

IL4. Drug Discovery and Traditional Medicine: Learning it my way through ethnic society and cultures using a holistic approach.

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Abstract: Drug discovery from natural product research is at its peak of popularity now. Even though, there have been many scientific developments in proteomics and genomics pertaining to drug discovery from natural products, but a huge hidden treasure of natural leads still remains unrevealed and we need to learn it from the ethnic cultures and society. When it comes to drug discovery from traditional medicine history has always shown the path and have provided vital information leads in shaping the future. Ethnic cultures have revealed the secret of synergism thus bringing out a new concept of polyherbal medication than looking for totally new entities. The fact that traditional medicines has being in use for ages with positive effects makes the drug discovery process a sure success affair. Collection of ethnobotanical leads is not a child's play and need enormous experience and patience. Botanists who conduct field work in areas where use of medicinal plants is a way of life are not trained to fully understand the disease state. The information gathered is generally inadequate for the laboratory scientist to evaluate in terms of selecting plants for expensive biological investigations. For example, the literature in ethnobotany and ethnopharmacology usually documents the following information: (a) the Latin binomial of the plant used, (b) common or local names of the plants used, (c) plant part and (d) geographical area where used. Data that are required in an ethnobotanical writing for assessment of the value of the plant medicine are (a) method of preparation of the medicine, (b) dosing, (c) source of information (which if not mentioned is difficult to trace), (d) route of administration and the symptomatology of the disease. If ethnobotanical information states that a plant is used to allay thirst and since thirst is one of the many symptoms of diabetes, follow-up questions should be asked to see if the user urinates frequently, is susceptible to fungal infections or has any other characteristic symptoms of diabetes. Users of traditional medicines often perceive a relationship between the shape, color and odor of plant materials and features of their diseases. This prompted the use of such plants for afflictions related to these factors. This is known as the doctrine of signatures. Some examples might be that a plant which exudes a red sap or resin, or plants that are red in color, may be useful for hemorrhages, for menstrual or blood related disorders. The point is that if ethnomedicinal information is to be of value in drug discovery, it must be collected in more detail. Otherwise, this approach is no better than random selection followed by targeted biological screening. However, development of ethnobotanically trained personnel through inclusion of this subject in the pharmacy curriculum can solve the problem to a great extent.

IL5. STANDARDIZATION OF HERBAL MEDICINES,

Dr. H. Lalhlenmawia,Head, Department of Pharmacy, Regional Institute of Paramedical and Nursing Sciences, Zemabawk, Aizawl, Mizoram, Pin: 796017, mail:Lhlenmawia@gmail.com

Abstract: The uses and practices of Herbal medicines for treating diseases is probably one of the oldest existing methods that humanity has used to try to cope with illness. Till today, there is an increasing awareness and general acceptability of the use of herbal medicines in medical practice. The World Health organisation (WHO) has reported that, about 80% of the world population is relying on traditional medicines for primary health care. WHO also encourages, recommends and promotes traditional/herbal medicines in natural health care programme because these drugs are easily available at low cost, safe and people have faith in them. The widespread and global acceptance and utilization of herbal medicines is suggestive of their safety and efficacy. For this reason, medicinal plants have been used therapeutically all around the world. At the same time, the rise in the popularity of herbal medicines has led to various forms of abuse and adulteration. This leads to disillusionment of consumers, manufacturers and in some instances may cause fatal consequences. Due to these enormous challenges, the global herbal market has become unsafe. Herbal medicines have several chemical constituents which are responsible for their pharmacological effects. However, the lack of assurance of safety and efficacy of herbal medicines to a large extent is due to insufficient pharmacokinetics, pharmacological and clinical data on the majority of the herbal medicinal product. Standardisation of herbal formulations is therefore, essential in order to assess quality drugs. The quality assessment of herbal formulations is of paramount importance in order to justify their acceptability in modern system of medicine. In facing these challenges, the presentation in this programme seeks to enlighten stakeholders in herbal medicine on the need to establish quality parameters for collection, handling, processing and production of herbal medicine as well as employing such parameters in ensuring the safety of the global herbal market.

Oral presentations

OL1. "Exploration of natural compounds for development of novel strategy in attenuating bacterial biofilm." *Surajit Bhattacharjee, PhD[1*], Department of Molecular Biology & Bioinformatics, Tripura University (A Central University), Tripura, 799022. ,* presenting author.*

Abstract*:* In nature, most bacteria can exist either as planktonic form or as a part of a community called biofilm. In planktonic form, microorganism exists as discrete and free living whereas in biofilm, microorganisms grow closely associated with each other embedded by exo-polysaccharide (EPS) and develop complex colony. In biofilm form, bacteria secrete a variety of virulence factors which causes pathophysiologic changes and immune modulation in the host. In addition, biofilm form of bacteria also develop drug resistance as well. Several agents has already been tested against bacterial biofilm but attenuation of bacterial quorum sensing, virulence and biofilm formation still remain an issue. In this direction we have screened a series of plant derived compounds and plant extracts against model biofilm forming organism *P. aeruginosa* and *S. aureus*. We have screened flavone group of compounds like vitexin, baicalein, chrysin, triterpenoid lupeol, naphthoquinone plumbagin, a new triterpenoid 2*α*, 3*β*, 19 *α*, 23-tetrahydroxyurs-12-en-28-oic-acid, irridoid glucosides, 3-amino-4-Aminoximidofurazan derivatives, amide derivative of flavone compounds, amine derivatives of flavone compounds and a few other plant extracts. Antibiofilm activity was evaluated by staining, biofilm protein extraction, microscopy, quantification of EPS, gene expression study and *in vivo* models using sub-MIC doses. Various quorum sensing (QS) mediated phenomenon such as bacterial motility, azocasein degrading protease activity, pyoverdin and pyocyanin production, LasA and LasB activity of the bacteria was also evaluated. *In vivo* and *in vitro* toxicity of compounds was evaluated on mouse as well as on murine peritoneal macrophages and murine RBCs. From the observations of this study it can be concluded that vitexin and plumbagin might act as potent biofilm inhibitors through attenuation of quorum sensing mediated biofilm formation of these model organisms. This was also found that all natural compounds are non-toxic in their active antibiofilm dose. In addition this was also observed that ethyl acetate seed extract of *Parkia javanica* execute higher antibiofilm efficacy at lower doses and vice versa. The present work on bacterial biofilm explores a potent antibiofilm agent intended for pharmaceutical application.

OL2. "Phytochemical and Pharmacological Exploration of Genus *Sida. L.* " *Niranjan Das[a,*] and Biswanath Dinda[b] [a]Department of Chemistry, Netaji Subhas Mahavidyalaya, Udaipur-799 114, Gomati Tripura, India [b]Department of Chemistry, Tripura University, Suryamaninagar-799 022, West Tripura, India, mail: ndnsmu@gmail.com*

Abstract: A variety of ethnomedicinal uses of *Sida* Linnaeus (Malvaceae) have been found in India and other countries. Phytochemical investigation of this genus has resulted in identification of more than 142 chemical constituents, among which alkaloids, flavonoids and ecdysteroids are the predominant groups. The crude extracts and isolates have exhibited a wide spectrum of *in vitro* and *in vivo* pharmacological effects involving antimicrobial, anti-inflammatory, neuroprotective, cardiovascular and cardioprotective, antimalarial, antitubercular, antidiabetic and antiobesity, antioxidant and analgesic activities among others. Ethnopharmacological preparations containing *Sida* species in India and African countries possess good efficacy in health disorders. From the toxicity perspective, only three *Sida* species have been assessed and found safe for oral use in rats. Pharmacological results supported some of the uses of *Sida* species in the traditional medicine. Alkaloids, flavonoids and other phenolics were perhaps responsible for the activities of extracts of the plants of this genus. No clinical study was reported. The detailed study on mechanism of action of isolates and extracts and their clinical study are needed for their use in modern medicine. More attention should be paid to *S. acuta*, *S. cordifolia* and *S. rhombifolia* in the domain of diarrhea and dysentery, malaria, rheumatism, skin and mucosa ailments, cardiac and bronchial problems. Furthermore, detailed study on quality and safety assurance data on available ethnopharmacological preparations is needed for their commercial exploitation.

OL3. "*In vitro* antioxidant activities and acute toxicity study of root extract of *Asparagus racemosus* Linn." *Amit Kundu [a*]Prasanta Dey[b] [a]Division of Toxicology, School of Pharmacy, Sungkyunkwan University, South Korea. [b] Dept. of Pharmaceutical Chemistry, C. L. Baid Metha College of Pharmacy, Chennai, India*

Abstract: The purpose of the study is to investigate potential of antioxidant property of ethanolic root extract of *Asparagus racemosus* Linn. *In vitro* evaluation antioxidant property of the extract was done using various methods like DPPH scavenging activity, hydroxyl radical scavenging activity, nitric oxide scavenging activity. HPTLC fingerprint analysis was performed for qualitative determination of possible number of components from the ethanolic extract. 0.96% yield was derived from ethanolic root extract. A concentration of 468.57 ± 3.002 µg/ml of probable antioxidant material from *Asparagus racemosus* Linn. root extract was required to scavenge 50% of DPPH. The IC_{50} value of the extract were found to be 508.17 ± 7.37 µg and 416.57 ± 5.08 µg when determined by hydroxyl radical and nitric Oxide scavenging assay respectively. The reducing powers of ethanolic root extract of *Asparagus racemosus* Linn. was 0.295 ± 0.0037 at 125

µg/ml and increased to 0.934 ± 0.0005 at 500 µg/ml. HPTLC fingerprint data supports several basic informations like isolation, purification, quality evaluation and standardization. The obtained data highlight the potential role of *Asparagus racemosus* Linn. as a source of natural antioxidants.

OL4. "Sesquiterpene Lactones as Bioactive Agents."

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Abstract: Sesquiterpene lactones are a class of chemical compounds; they are sesquiterpenoids (built from three isoprene units) and contain a lactone ring, hence the name. They constitute a large group of secondary metabolites that are widely distributed in several angiosperm plant families and a few bryophytes, including liverworts. These metabolites are particularly diversified in the family Asteraceae, in which more than 5,000 compounds have been reported so far. They can cause allergic reactions and toxicity if overdosed, particularly in grazing livestock. Sesquiterpene lactones are a recognized class of terpenoids with a wide spectrum of biological activities such as anti-bacterial, anti-fungal, antitubercular, anti-viral, anti-HIV, anti-parasitic, anti-malarial, antitrypanosomal, anti-protozoal, anthelmintic, insecticidal, anti-ulcer, hepatoprotective, anti-oxidant, anti-diabetic, anti-diarrheal, anti-depressant, analgesic, antipyretic, acetyl cholinesterase inhibitory activities, effects on the central nervous and cardiovascular systems as well as allergenic potency. They also have some allelopathic potential. In addition to the anti-inflammatory response, sesquiterpene lactones have been found to sensitize tumor cells to conventional drug treatments. In recent years there is an increasing interest in sesquiterpene lactones, mostly because of their cytotoxic and anticancer activity. Their wide structural diversity and potential biological activities have made further interest among the chemists.

OL5."Economically unimportant plants challenge medicinally important plants": An unconventional approach towards alternative medicines.

S. Saha, and R. Bhattacharyya* Microbiology Research laboratory, Department of Life Sciences, Presidency University, 86/1 College Street, Kolkata – 700 073, West Bengal, India.

Abstract: Plants, even mere weeds are rich in a wide variety of secondary metabolites, and often proved to confer a strong antimicrobial activity against many pathogens. To combat human pathogens, plant materials are used globally as home remedies, over the counter herbal drugs and raw materials for the pharmaceutical industries.In this present study, an attempt was made to assay the antimicrobial potentialities of two unexplored weeds, against two dominant uropathogens. Two common weeds of eastern India, namely, *Lippia nodiflora* and *Lippia alba* were chosen for investigating their antimicrobial activity against *Klebsiella pneumoniae* and *Pseudomonas aeruginosa.* Investigation of the antioxidant content of the plant extracts and green synthesis of Silver Nanoparticles (AgNP) were also done. Antimicrobial susceptibility tests of the weed extracts in ethanol were performed against the two chosen clinical isolates following standard disc diffusion method. Both the ethanolic extracts exhibited significant antimicrobial effect against both the test organisms. Qualitative determination of different secondary metabolites like phenols, and flavonoids and DPPH scavenging activity of the weed extracts were done following standard protocols. Ethanolic extracts of *L.alba* showed significant phenolics and flavonoid content in comparison to exracts of *L. nodiflora. L.alba* also showed higher DPPH scavenging activity of 60%, than *L.nodiflora*. Silver nanoparticles were synthesized using the weed extracts as the reducing agent from silver nitrate solution, and the antimicrobial activity of the AgNP were also measured. UV-Vis spectroscopy of *L.nodiflora* mediated AgNP showed peak at around 420nm confirming the production of AgNP. These nanoparticles produced by *L.nodiflora* also showed more significant antimicrobial activity against the test organisms than *L.alba* mediated AgNP. These common weed extracts and their AgNP showed satisfactory antimicrobial activity against both the uropathogens and antioxidant content as well. Further investigations are needed to isolate these active compounds responsible for the antimicrobial potentialities of the weed extracts. Characterization of these isolated compounds from the weed extracts can be an option of alternative medicines.

OL6. "Formulation and Evaluation of Herbal Mosquito Repellentwiththe Essential Oil of the Fruits of *Zanthoxylumacanthopodium* DC collected from Meghalaya."

India H.K. Sharma*and Monawara Begum Department of Pharmaceutical Sciences, Dibrugarh University, Dibrugarh-786004, Assam.
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Abstract: Synthetic mosquito repellents exhibit toxicities including brain swelling in children, anaphylactic shock, and low blood pressure. Therefore it was thought to be worthy to formulate herbal mosquito repellent ointment with the essential oil extracted from *Zanthoxylumacanthopodium*DC. The fruits of *Zanthoxylumacanthopodium*DC. (Family: Rutaceae) were collected from Shillong, Meghalaya.The oil was extracted by hydro-distillation method using the original

Clevenger-type apparatus. The ointment was formulated taking Simple ointment I.P. as base with different concentrations of oil and was evaluated for various parameters including mosquito repellent activity and dermal toxicity. The mosquito repellent activity was evaluated by Hand-in-Cage method against*Aedesaegypti*, and *Culexquinquefasciatus.* The mosquito repellentactivity of the prepared formulations was compared with mosquito repellent activity of a marketed product. The results of this study exhibited good spreadibility, viscosity and no acute or sub-chronic dermal toxicity and the pH range was within the normal skin pH. The formulations also exhibited better mosquito repellent activity in comparison to the marketed product. On the basis of the results, it can be concluded that the effort of formulating mosquito repellent ointment was successful and carries potential for commercialisation and can also be tested for other insects.

OL7. "Identification of natural lead molecules of *Centella asiatica* and *Azadirachta indica* targeting cholera toxin through structure based drug design." ***Kishore Sarma[1], Shubhadeep Roychoudhury[2] and Biswajyoti Borkakoty[1,] *[1]Regional Medical Research Centre North East, Indian Council of Medical Research, Post Box. 105, Dibrugarh, 786 001, Assam, India,[2]Department of Life Science and Bioinformatics, Assam University, Silchar 788011, Assam, India,Corresponding author Email: biswaborkakoty@gmail.com***

Abstract: *Vibrio cholerae*, the causative organism of cholera infects the small intestine and can lead to death if untreated. Cholera toxin (CT) is primarily responsible for exhibiting the cholera symptoms. This study aims to screen compounds from *Centella asiatica* and *Azadirachta indica* in order to prospect active principles which preferably bind to CT. A ligand library of reported compounds from these two plants was prepared and was used for molecular docking against three putative drug targets of CT. Progressive knowledge of computer aided drug designing approach was employed to screen out novel lead candidates. Comparative molecular docking analysis inferred that kaempferol 7-O-glucoside had the highest binding affinity with two of the selected drug targets and third best binding affinity with the third drug target of CT. *In silico* ADME/Tox profiling showed least toxicity with low bioavailibility. This study suggested that kaempferol 7-O-glucoside has the highest binding affinity with the identified ligandable sites of active CT and may be considered as a candidate molecule to fight against cholera infection.

OL8. "Application of Simulation techniques in Fluidisation," ***Sudhansu Sandhibigraha[1], TarunKanti Bandyopadhyay[1*]Biswanath bhunia[2] [1]Department of Chemical Engineering, National Institute of Technology, Agartala, -799046, India, [2] Department of Bio Engineering, National Institute of Technology, Agartala, -799046, India, * Corresponding author Tel No: 0381-2346-360, Fax No: 0381-2346360, Email: tarunkantibanerjee0@gmail.com***

Abstract: Fluidization refers to those gas-solids and liquid-solids systemin which the solid phase is subjected to behave more or less like a fluid by the upwelling current of gas or liquid stream moving through the bed of solid particles. The flow of Non-Newtonian pseudo plastic fluid (SCMC solution) inside a vertical helical coil is very complex in that, it is governed by conservation of mass and momentum in the laminar flow condition. The Non-Newtonian Power law modelis used in this study. A first order differentiating scheme was employed to discretize all equations and the solution was obtained using the iterative "guess and correct" procedure of the implicit method for pressure linked equations (SIMPLEST) algorithm. The radial basis function network was trained to predict the pressure drop of fluid in both packed and fluidized bed. Three different MLP algorithms named Back-Propagation, Leven-Berg-Marquardt and Scaled Conjugate Gradient were used for our analysis.

OL9. "Isolation and Characterization of Novel Xylanase producing fungal strain," ***Uma Shankar Prasad Uday[1], Tarun Kanti Bandopadhyay[1], Biswanath Bhunia[2]*[1]Department of Chemical Engineering, National Institute of Technology, Agartala, -799046, India, [2] Department of Bio Engineering, National Institute of Technology, Agartala, -799046, India. * Corresponding author Tel No: 0381-2346-360, Fax No: 0381-2346360, Email: bbhunia@gmail.com***

Abstract: Enzymes play a key role in chemical and biological process. Xylanase is one of the most important industrial enzyme and its wide application in chemical and biochemical process. Xylanase can be produced by several source such as bacteria, fungi, Actinomycetes and yeast. However, xylanase produced from filamentous fungi is most important from an industrial point of view. In the present investigation, a novel xylanase producing potent strain was isolated from soil sample of Baramura forest, Tripura west, India. The experiment was carried out in shake flask (250ml) containing 50 ml working volume. a 5% seed culture was inoculated in production media composed of (g/l, w/v): Xylan, 1; KNO_3, 5; $MgSO_4$, $7H_2O$, 2.5; NaCl, 2.5 and a 1000X trace element solution, 1 ml/l (pH 7) and it was incubated at 28 ^{0}C in a rotary shaker at 150 rpm for 5 days.

OL10. "Modulation of phenylpropanoid pathway to enhance rosmarinic acid biosynthesis via signal transduction and oxidative stress in in vitro regenerated Solenostemon scutellarioides," ***Saikat Dewanjee, Advanced Pharmacognosy Research Laboratory, Department of Pharmaceutical Technology, Jadavpur University, Kolkata 700032, India***.

Abstract: *Plant tissue culture offers an enormous scope of alternative production of economically important secondary metabolites without burdening the natural germplasm. Solenostemon scutellarioides* (L.) Codd. (Lamiaceae) is an economically important ornamental plant containing significant quantity of rosmarinic acid (RA). RA is considered to be an important dietary antioxidant used in many commercially available oral supplements. This study aimed to improve RA bio-production in the whole plant culture of *S. scutellarioides* through elicitation with phytopathogenic fungi, yeast carbohydrate fraction (YCF), methyl jasmonate (MJ), salicylic acid (SA) and inorganic salts. Amongst selected elicitors, fungi (*Aternaria alternata*), YCF, MJ and SA caused significant elevation ($p < 0.05$-0.01) in RA accumulation with ~1.2-1.7-folds enhancement than control. However, MJ (50 µM) and *A. alternata* (50 µg l^{-1}) have been found to be most effective and intracellular RA content reached almost 1.7 and 1.6-folds ($p < 0.01$) higher in day 6, respectively. Therefore, MJ (50 µM) and *A. alternata* (50 µg l^{-1}) were selected for mechanism evaluation. A significant increase in tissue H_2O_2 and lipid peroxidation coupled with depletion of antioxidant enzymes viz. superoxide dismutase and catalase indicated augmented oxidative stress associated with these biotic interactions. Reversed transcriptase-polymerase chain reaction (RT-PCR) analysis revealed significant up-regulation of the genes encoding the RA biosynthetic enzymes. The expressions of phenylalanine ammonia lyase (PAL) and tyrosine amino transferase (TAT) were significantly ($p < 0.01$) up-regulated, while, no significant change was observed in the expression of rosmarinic acid synthase (RAS) following *A. alternata* (50 µg l^{-1}) elicitation. The expression of hydroxyphenylpyruvate reductase (HPPR) was slightly improved in *A. alternata* (50 µg l^{-1}) elicited plants. On other hand, the expressions of PAL, TAT and RAS were significantly ($p < 0.05$-0.01) up-regulated without any change in HPPR expression in MJ (50 µM) elicited plants. Reversed phase-high pressure liquid chromatographic quantification of aforementioned biosynthetic enzymes further confirmed the RT-PCR data. Therefore, it could be concluded that MJ and *A. alternata* elicited the biosynthesis of RA via signal transduction coupled with oxidative stress and associated mechanisms.

OL11." Exploration of antidiabetic potential of methanol extract of *Melia azadirachta* L. (Meliaceae) leaf", ***Sujata Barma, Swarnalata Joardar, Saikat Dewanjee Advanced Pharmacognosy Research Laboratory, Department of Pharmaceutical Technology, Jadavpur University, Kolkata 700032, India.***

Abstract: *Melia azadirachta* L. (Meliaceae) leaf has been claimed to possess antidiabetic activity in the ethno-medicinal literature in India. Therefore, present experiment was undertaken to explore the protective role of methanol extract of *M. azadirachta* leaf (MA) against experimentally induced type 2 diabetes mellitus (T2DM) in Wistar rats. MA was chemically characterized by GC-MS analysis. Antidiabetic activity of MA (100 and 200 mg/kg, orally) was measured in high fat diet (ad libitum) + low-single dose of streptozotocin (35 mg/kg, intraperitoneal) induced type 2 diabetic (T2D) rat. Phytochemical screening of the crude extract revealed the presence of phenolic compounds, sugar alcohols, sterols, amino acids, flavonoids within SR. T2D rats exhibited significantly ($p < 0.01$) higher fasting blood glucose level with respect to control. Alteration in serum lipid profile ($p < 0.01$) and increased levels of lactate dehydrogenase ($p < 0.01$) and creatine kinase ($p < 0.01$) in the sera revealed the occurrence of hyperlipidemia and cell destruction in T2D rats. T2D exhibited significant ($p < 0.05$-0.01) up-regulation in the serum inflammatory markers viz. interleukins, tumor necrosis factor α, monocyte chemo-attractant protein 1, intercellular adhesion molecule 1, vascular endothelial growth factors. Besides, T2DM altered the redox status ($p < 0.05$-0.01), in the pancreatic tissues of experimental rats. However, oral administration of MA (100 and 200 mg/kg) could significantly ($p < 0.05$-0.01) reduce hyperglycemia, hyperlipidemia, membrane disintegration, oxidative stress and vascular inflammation. Histological studies following immunohistochemistry of pancreatic tissues supported the protective characteristics of MA.

OL12. "In vitro antioxidant activity of methanol extract of Quercus lanata," ***Mainak Chakraborty, Suchandra Mazumder, Poulami Majumder, Pallab Kanti Haldar Department of Pharmaceutical Technology, Jadavpur University, Kolkata, West Bengal, India***

Abstract: *Quercus lanata* or woolly-leaved oak is native to southern and southeastern Asia mainly found in Himalayas, Assam, Bhutan and Nepal. The different parts of the plants are traditionally used for various diseases. The present study evaluates the antioxidant activity of methanol extract of *Quercus lanata*. The antioxidant activites of MEQL were measured by different *in vitro* standard methods like 1,1-diphenyl 1-2-picrylhydrazil (DPPH) radical, superoxide anions, nitric oxide, hydroxyl radicals and total phenolic content. The extract contains 391.7 µg of phenolic compound in 10 mg of the extract which is accounted for its free radical as well as antioxidant activity. The extract exhibited antioxidant activities in a dose dependent manner. The IC_{50} values of MEQL for DPPH, Superoxide, Nitric oxide and Hydroxyl radical

are 12.74 ± 0.64 µg/mL, 33.30 ± 1.22 µg/mL, 53.56 ± 1.42 µg/mL and 14.96 ± 0.62 µg/mL. From the above study it is concluded that the methanol extract of *Quercus lanata* is a source of natural antioxidant.

OL 13. "Sub acute toxicity study of selected fraction of *Barleria prionitis* and *Lasia spinosa*",

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Abstract : Despite ethnomedicinal benefits of *Barleria prionitis* and *Lasia spinosa*, very few studies have described the potential toxicity. The aim of the present study was to evaluate the subacute toxicity of butanol fraction of *Barleria prionitis* (BFBP) and ethyl acetate fraction of *Lasia spinosa* (EALS) . To determine sub acute (28 days) toxicity, healthy wistar albino rats, weighing between 140-180gm, of both sexes were divided into three groups comprising of 10 animals (Five male & five female) in each group. Group I received vehicle (0.5% CMC) 1ml / 100 g body weight. Group II and III received EALS and BFBP at dose of 200 mg/kg. All the animals were observed for body weight and once daily for morbidity/ mortality for the entire observation period. At the end of study, animals were euthanized by chloroform for blood collection through retro-orbital puncture for observation of hematological, biochemical and urine analysis, thereafter animals were sacrificed by cervical dislocation for organ study. After 28 days of treatment, there were no treatment-related changes in haematological parameters between control and BFBP and EALS treated groups, indicating that the BFBP and EALS were non toxic to circulating red cells, nor interfered with their production and that of platelets. Most of the biochemical parameters were not also altered by the BFBP and EALS. No significant alterations in the levels of ALT, AST, Bilirubin, Total Cholesterol, glucose, albumin, urea and creatinine, which are good indicators of liver & kidney functions and metabolism rate, suggests that sub-chronic administration of BFBP and EALS neither altered hepatocytes and kidneys nor the normal metabolism of the animals. In urine analysis study, urine volume and pH was increased, it indicates the excretion of samples through kidney and presence of basic compound in urine. These changes may not be indicated the toxicologically sign of kidneys. No significant change was found in the weight of the various organs in BFBP and EALS treated groups as compared to normal control. None of the animals showed any macroscopic lesions and histological study of various organs were found that no change in cellular part. Haematological, biochemical, urinalysis and histological results demonstrate that the BFBP and EALS are safe when administered orally for 28 days in both sex of experimental rats.

OL14. "Chemical constituents of Boerhavia diffusa",

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Abstract: *Boerhavia diffusa* Linn. (Syn. *Boerhavia repens* Linn., Fam: Nyctaginaceae) popularly known as 'Punarnava' is an important rejuvenative drug of Ayurvedic system of medicine in India[1, 2]. Previous reports indicate the presence of many rotenoids, a dihydroisofuroxanthone, an anti-fibrinolytic phenolic glycoside, punarnavoside, lignans and a purine nucleoside with cardiovascular actions and flavonol glycosides possessing anti-osteoporotic activity[3]. Amongst all the phytochemicals, isoflavones have been widely shown to prevent risk of bone loss and fracture. In a continued we report a flavonol disaccharide, Eupalitin 3-*O*-*b* -D-galactopyranosyl-(1¾2)-galactopyranoside (**1**) from the aerial parts of the plant. Significant quantitative variations of (**1**) and its bioactive monogalactoside Eupalitin 3-*O*-*b*-D-galactopyranoside (**2**) in samples of the plant collected from different regions of India were highlighted.

OL15. "Comparative study of Thalidomide and Ambisome in American Tegumentary Leishmaniasis.",

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Abstract: American tegumentary leishmaniasis (ATL) is a major health concern in South America given its high incidence and morbidity rate that warrants for an effective and improved treatment. Thalidomide, a potent immunomodulator approved by the US Food and Drug Administration (FDA) for the treatment of cutaneous manifestations of moderate to severe erythema nodosum leprosum in leprosy, has not been studied for its curative role in the new world leishmaniasis. In the present study, we have compared the anti-leishmanial activities of Ambisome and thalidomide alone or with a combination of Ambisome-Thalidomide in *Leishmania amazonensis* infected susceptible BALB/c mice. Furthermore, thalidomide was also administered to 2 CTL patients who were unresponsive to 1st and 2nd line antileishmanial drugs. Our findings suggest that Thalidomide alone fails to restrict parasite growth in cutaneous leishmaniasis although it reduces the lesion thickness in infected mice. On the other hand, Ambisome (optimal dose) alone or in combination with thalidomide was able to control parasite growth. These results are particularly important for planning future therapeutics based on the use of thalidomide as a combinatorial therapy with known antileishmanial drugs for ATL.

OL16. "A breakthrough path for nanomaterial in drug delivery: Synthesis, functionalization and biomedical application of carbon nanotube*",*Suraj Sharma and KetousetuoKuotsu, Department of Pharmaceutical Technology, Jadavpur University, Kolkata-700032*

Abstract : Carbon nanotubes (CNTs) have explored as one of the important and advanced nanocarrierfor the effective drug delivery system due to their remarkable physico-chemicalproperties. Over the last few years, CNTs have been appeared in almost every single cancer treatment procedure, including drug delivery, targeted chemotherapy, infection therapy,gene therapy and as a diagnostic tools.The biomedical application depends on their compatibilitywith hydrophilic environments; thus, are considered one of the most promising nanomaterialhave potential of both detecting the cancerous cells and delivering drugs or small therapeutic molecules to the targeted cells.Functionalized CNTs which render them extremely flexible through the incorporation of various functional groups and targeting molecules at the same time. Purification and functionalization of CNTs appear to exhibit very low toxicity. In this present scenario, we will focuson the production of CNTs,purification, functionalization and its application in biomedical field.

OL 17. "Design, Development, Characterization and Evaluation of Metoprolol Succinate Loaded gelatin Nanoparticles", **Sweet Naskar and KetousetuoKuotsu Department of Pharmaceutical Technology, Jadavpur University, Kolkata-700032*

Abstract: The aim of this study was to prepare and optimize the biodegradable gelatin nanoparticles (GNPs) loaded with metoprolol succinate to overcome the poor absorption, frequent administration and subsequently compare *in vitro* as well as *ex vivo* release profiles with pure drug and commercially available Toprol XL tablets. GNPs were prepared by nanoprecipitation method by using lutrol F68 as a stabilizer and glutaraldehyde as cross-linking agent along with a number of variables were optimized. Particle sizes of the prepared nanoparticles were less than 100 nm, zeta Potential of the formulations were -0.261 and 1.09 mV and drug entrapment efficiency 85.70 and 96.03%. Zeta Potential value of ±30 mV suggests that the particles would remain in suspended state for a longer period and are not susceptible for quick agglomeration in the liquid state. However, the experimental ZP values suggest that the prepared nanoparticles should be stored in a lyophilized state and should be reconstituted only before use. Fourier transform infrared spectroscopy of pure drug, drug with excipients mixture and excipients mixture was done. Pure drug showed the peaks at 1050 – 1150 cm^{-1} due to OH bending, peak at 1500-1600 cm^{-1} due to NH bending. *In vitro* result showed sustained release with 80 % of drug over a period of 24 h. However, further studies related to topic are in progress.

OL18. "DESIGN, FORMULATION AND EVALUATION OF PULSATILE RELEASE TABLETS OF RAMIPRIL WITH SWELLING AND RUPTURABLE LAYER", **Sanjit Kr Roy and KetousetuoKuotsu Department of Pharmaceutical Technology, Jadavpur University, Kolkata-700032*

Abstract: In recent years pulsatile drug delivery systems are gaining a lot of interest in the field of pharmaceutical research and development because of their multiple advantages over conventional dosages forms. These systems are designed according to the circadian rhythm of the body where the drug is released rapidly and completely as a pulse after a lag time. Various disease like asthma, hypertension, ischemic heart disease show circadian variation in their pathophysiology. Treatment of these types of diseases require a time controlled, pre-programmed drug delivery systems which will exactly matches the circadian changes in the body. Chronomodulated pulsatile drug delivery system is a novel system which can be used successfully for the treatment of such types of diseases. The objective of the present study is to formulation and evaluation of pulsatile release mini tablets of ramipril where active substance will be present as a number of small independent subunit in a hard gelatin capsule. The systems will be consists of a core mini tablets which will be coated with an inner swelling layer that will contain a superdisintegrant by direct compression method and an outer enteric coating layer which will act as a barrieror time-controlled layer. When the barrier layer will dissolve or rupture after a certain period of time or lag time by an expanding force caused by the inner swelling layer then drug will release rapidly from the inner reservoir core tablets. The effect of core composition, level of swelling layer and rupturable coating layer will be investigated.

OL 19. "Algae based biofuels – challenges and opportunities for North-East India"

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Abstract : Algae have emerged as one of the most promising resource for biofuel production in view of the current oil crisis and fast depleting fossil fuel reserves. Algae are the highest yielding feedstock for biofuel which provide multiple times more oil than the other feedstock and contain 30 per cent of lipid and fattyacids as membrane compounds, storage products , metabolites and source of energy. The advantages of deriving biofuel from algae are the rapid growth rate,incredible space efficiency, high per acre yield, sulphur free fuel, nontoxicity, high biodegradability and ecofriendly in nature. North-East India , a biodiversity hotspot zone is geographically interesting and harbour a rich and diverse group of

algae including green and blue-green algae with varying characteristic features. The present paper describes on the scope and opportunities of different algal species growing in this region for biofuel production. The prospects of some oleaginous algae like *Chlorella* sp. *, Scenedesmus* sp. , *Euglena* sp. , *Botryococcus* sp. , and other filamentous algae have been described for biofuel production. Development in large scale Algal Culture Systems like Open pond & Raceways and Photobioreactors (PBS) in controlled facilities and downstream processing enhancing costeffectiveness is discussed for a profitable algae-based fuel. The modern biotechnology tool to increase the biofuel efficiencies has also been highlighted to harness this magnanimous resource into a less pollution sourceof renewable energy.

OL20. "HYPOTENSIVE ACTION OF *ALLIUM HOOKERI*: A PROMISING MEDICINAL PLANT OF NORTH EAST INDIA", *Khumanthem Deepak Singh*, Dipak Chetia, Department of Pharmaceutical Sciences, Himalayan University, Itanagar, Arunachal Pradesh, INDIA, Department of Pharmaceutical Sciences, Dibrugarh University, Dibrugarh, Assam, INDIA Email: kh.deepaks@gmail.com*

Abstract: *Allium hookeri* (Family: Liliaceae) is a herbaceous plant, and locally known as "Maroi napakpi" widely used by the local people of Manipur as a recipe to garnish cooking. The leaf of this plant has been used as a home remedy in their folklore medicine as a cardioprotective agent. Hypertension was induced to rats by 2K-1C model. During the experimental period, 8% sodium chloride solution was administered orally with drinking water for three weeks to elevate the systolic, diastolic, pulse rate, mean arterial blood pressure and heart rate. The rats were then treated with the methanolic extract of *Allium hookeri* (200 mg/kg and 400 mg/kg) for 21 days and blood pressure parameters were recorded. Biochemical assays including serum urea, serum creatinine, triglycerides, cholesterol, blood glucose and serum protein were also performed to assist the hypothesis. After treatment for 21 days, *Allium hookeri* extract reduces blood pressure and heart rate. It also reduced the lipid and glucose levels thereby increasing serum protein level. From the above study, it suggest that daily oral administration of methanolic extract of *Allium hookeri* for 3 weeks exhibit antihypertensive activity.

OL21. "Synthesis and DNA binding Studies of Copper(II) Complexes of Bisscorpionate Ligands", *Sabeel M. Basheer*, A. Sreekanth Bioiorganic and Material Chemistry Lab, Department of Chemistry, National Institute of Technology, Tiruchirappalli, Tamil Nadu, India-620015 sabeelmb@gmail.com*

Abstract : The copper(II) complexes, [copper(II) bis(pyrazol-1-yl)borane, complex 1 and copper(II)bis(benzotriazol-2-yl)borane] have been isolated and characterized byelemental analyses, and UV-Visible, FT-IR, EPR and mass spectroscopic techniques. The molecular structure of the complexes are cationic. The interaction of the new complexes with DNA has been explored using spectral and viscosity studies, indicating the complexes bind to DNA via partial intercalation. The interaction of the Cu(II) complexes with calf thymus DNA (CT DNA) was explored using absorption and fluorescence spectroscopic methods. The results revealed that the complexes have an affinity constant for DNA in the order of $10^5 M^{-1}$and the mode of interaction is non-covalent intercalation.A predominantly hydrolytic cleavage of supercoiled pUC19 plasmid DNA was confirmed through an experiment performed. Furthermore, the interactions of the complexes with serum albumin (BSA) were also investigated using fluorescence spectroscopic methods. The efficiency of the complexes in arresting the growth of human cervical cancer cells (HeLa), human breast cancer cell line (MCF-7) and human liver carcinoma cells (Hep G2) has also been studied. The cationic complex 1 has higher cytotoxic activity than complex 2. AO–EB/DAPI staining assays, Annexin V-FITC and FACS analyses indicated that the complex 1 induces cell death only by apoptosis.Furthermolecular docking technique was employed to understand the binding of the complexestoward the molecular target DNA.

OL22. "Antidiabetic activity of the Hydroalcoholic leaf extracts of *Diplazium esculentum (Retz.)* a Traditionally used North-Eastern Indian vegetable", **Julfikar Ali Junejo, Department of Pharmaceutical Sciences, Dibrugarh University, Dibrugarh, Assam.*

Abstract: Diabetes mellitus (DM) is a metabolic disorder characterized by hyperglycemia arising as a consequence of a relative or absolute deficiency of insulin secretion, resistance to insulin action or both. The present study aims to evaluate the hypoglycaemic activity of hydro-alcoholic (3:7) leaf extracts of *Diplazium esculentum* (Retz.) to streptozotocin induced diabetic wistar albino rats. The blood glucose level was measured using single touch blood glucose test strips and glucometer on weekly intervals until the end of 21st day. Other blood parameters like total lipid and liver profiles were investigated after oral administration of extracts to diabetic rats after the treatment of three weeks. Daily oral administration of hydro-alcoholic leaf extracts (250 mg/kg & 500 mg/kg body weight daily for 3 weeks) and metformin hydrochloride (5 mg/kg body weight) showed improvement effect on blood glucose level as well as hyperlipidaemia and liver functions due to streptozotocin induced diabetes (Type II). The extract has beneficial effects to maintain the animal body weight and has the regenerating power to pancreatic cells. The hydro-alcoholic leaf extracts dose fractions of *Diplazium esculentum* (Retz.) exhibited significant anti-hyperglycemic activities. The extract showed improvement in parameters like body weight and lipid profiles as well as regeneration of β-cells of pancreas and so might be of value for the treatment of diabetes (Type- II).

OL23. "ULCER-PROTECTIVE ACTIVITY OF *DILLENIA PENTAGYNA*", *Zothanpuia[1], P.Golmei[1*], BB Kakoti[2]*

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Abstract: *Dillenia pentagyna* Roxb. commonly known as Kaihzawl in Mizo, Karmal in Hindi and Akshiin Assamese, is a medium sized tree belonging to the family Dilleniaceae. Mizoram state (Mizo tribe) commonly used the stem bark of this plant as a traditional home medicine for gastric cancer and other stomach ailments which is a decoction prepared by boiling the bark of *Dillenia pentagyna* Roxb. The forest of Mizoram belongs to one of the bio-diversity hotspots of India, and is a potential source of phytomedicine. However, there is no investigation in terms of ulceration. With the increasing popularity of natural products from plants asa safe and effective source of medicine, this study aimed at evaluating the traditional uses *of Dillenia pentagyna* by the Mizo tribe for its effectiveness in prevention of ulcers and provide an alternative source of medicine for ulcers. For evaluation, different animalmodels were employed using methanolic extract of the bark namelyAspirin,Ethanol, Pylorus ligation induced ulcers. The results shows that *Dillenia pentagyna* can prevent ulcerssignificantly as the standard in aspirin, ethanol and pylorus ligation induced ulcers. The anti-ulcer activity may be due to the presence of phytochemical constituentswhich may be active pharmacologically to inhibit the ulceration. The authors already isolated β-sitosterol and betulinic acid which is known to act as preventing free radical induces inflammatory conditions, so, this study has proved that *Dillenia pentagyna* extract can prevent ulceration induced by the evaluated models.

OL24. "Isolation of β-Sitosterol from Methanol extract of the bark of the plant *Helicia nilagirica* Bedd", *P.C.Lalawmpuii, Jurnal Reang*, R.Vanlalruata, Libonthung R. Shitiri Department of Pharmacy Regional Institute of Paramedical And Nursing Sciences Zemabawk, Aizawl-796017, Mizoram, India*

Abstract: *Helicia nilagirica* Bedd. is a medium sized tree belonging to the family Proteaceae. It is one of the most commonly used traditional medicines among the people of Mizoram. Decoction of the bark or leaves is used to treat various ailments including indigestion, stomach pain, peptic ulcer, scabies and other skin diseases. Preliminary phytochemical screening reveals the presence of glycosides, steroids and terpenoids which may be responsible for its pharmacological activity. The present study deals with isolation and characterization of phytoconstituents from the methanolic extract of the bark of the plant. The plant material of *Helicia nilagirica* were collected from Sesawm Village, Mizoram, India. Authentication of the plant materials was done at Botanical Survey of India, Kolkata (Voucher No. of the specimen: CHN/46/2013/Tech. II). The air-dried powdered bark of *Helicia nilagirica* was extracted using the Soxhlet apparatus successively with petroleum ether and methanol. The methanolic extract was evaporated in a vacuum rotary evaporator and column chromatography was used for isolation of phytoconstituents. The structure of the isolated compound was established on the basis of spectroscopic data from IR, ^{1}HNMR, ^{13}CNMR and Mass.The white crystals obtained from 3% to 5% methanol in chloroform fraction in column chromatography was subjected to spectroscopic analysis and was identified as β-sitosterol. *Helicia nilagirica* contains β-sitosterol and the compound, β-sitosterol is found to possess anti-allergic, anti-inflammatory, anti-pyretic, antiarthritic, anti-ulcer, cholesterol level lowering activities of the plant.

OL25. "*Insilico* approach for identification of novel miRNAs from *Coffea arabica* using Expressed Sequence Tags", *Karam Jayanandi Devi[1], Sreejita Chakraborty[2], Bibhas Deb[2], Ravi Rajwanshi[*1]*

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Abstract: microRNAs (miRNAs) are a class of small non-coding RNAs that play crucial role in regulating gene expression. The medicinal use of coffee based on its diuretic and stimulant property conferred by the effect of caffeine have been known since ancient time. The identification of miRNAs involved in regulating the biosynthesis of secondary metabolites in coffee can widen the knowledge on the biological role of miRNAs in coffee. Additionally, a number of recent reports have shown the involvement of miRNAs in cross-kingdom regulation hence providing clues that miRNAs from medicinal plants might serve as a new bioactive component. Identification of miRNAs is the primary step towards therapeutic applications of plant based miRNAs. In the present study, an attempt was made to identify potential miRNAs from coffee using the publicly available Expressed Sequence Tags (ESTs) sequences in NCBI. A total of 15 potential miRNAs belonging to different miRNA family with MFEI ranging from 0.52-0.87 and mature miRNA sequences appropriately located on one arm of the hairpin-loop structure were predicted. Further studies on functional annotation of the predicted miRNAs by identifying the targets will shed light on the biological roles of the miRNAs.

OL26. "Structural modification of pregnenolone", *Saransh Wales Maurya and Ibadur Rahman Siddiqui[1]* Department of Chemistry, Central University of Allahabad, Allahabad-211002, INDIA Email: dr.irsiddiqui@gmail.com*

Abstract: Steroidal secondary metabolites are widely present in animals and plants having several biological activities. In some cases steroidal drugs are called as life saving drugs. Well known steroid pregnenolone (**1**), which is synthesized in the central nervous system and discovered to have neuroprotective properties. It also work as the precursor of the progestogens, mineralocorticoids, glucocorticoids, androgens, and estrogens.[1] Studies shows that pregnenolone and its derivatives possess different kind of biological activity like cytotoxic, anti-inflammatory, neurosteroids, anti-feedant, lipid lowering and inhibitors of testosterone 5α- reductase.[2] The interesting biological properties of pregnenolone (**1**) attracted several research groups and a number of synthetic reports on the structural modification have been reported.[2, 3] However, very few reports are available to modify the acyl group present in pregnenolone in the construction of heterocyclic compounds.[4] Herein, we report to the synthesis of the novel quinoline and indole based heterocyclic derivatives of pregnenolone *via* Friedlander and Fisher indole synthesis reactions respectively. We also synthesized some pregnenolone derivatives *via* modifications of hydroxyl group at position-3 and double bond at position-5,6.

OL27. "HPTLC fingerprinting of two Dendrocalamus species and its potential in cancer treatment". **Lalnunfela Charles*, Senthil Kumar[2], H Lalhruaitluanga[2]** **Department of Zoology, Mizoram University, Tanhril, Mizoram – 796004 [2] Department of Biotechnology, Mizoram University, Tanhril, Mizoram – 796004 Email: c.lalnunfela@gmail.com*

Abstract: Among the Dendrocalamus species found in Mizoram the selected two species D. hamiltoni and D. longispathus are the most commonly found and highly consumed bamboo shoots in different form. Bamboo contains many bioactive compounds in addition to those that are traditionally considered nutrients. These bioactive compounds are carotenoids, phenolic compounds (flavonoids, phenolic compounds), phytosterols, phytostanols, saponins and non digestible carbohydrates. Phytosterols are sterols occurring naturally in plants. They are similar to cholesterol in structure, but consumption of phytosterols have cardioprotective effect by lowering blood cholesterol levels throughinhibition of cholesterol absorption from intestines. Moreover they also inhibit the production of carcinogens, cancer growth, invasion and metastasis and most importantly promote apoptosis in cancer cells. There are a lot of things to be unveiled in this natural green gold. HPTLC studies were carried out. CAMAG HPTLC system equipped with Linomat 5 applicator, TLC scanner 3, Smart DIGI and WIN CATS-4 software were used. HPTLC finger printing of methanol extract of Dendrocalamus Sp. revealed 4 significant peaks with Rf values in the range of 0.02 to 0.75 in which highest concentration of the phytoconstituents was found to be 77.41% and its corresponding maximum Rf value was found to be 0.02 respectively. Moreover, in comparision with the extract with stigmasterol standard using HPTLC, D. longispathus gives a positive results, which proofs Dendrocalamus suitable for phytosterol screening and analysis. It can be concluded that HPTLC fingerprint analysis of Dendrocalamus Sp. can be used as a diagnostic tool for the correct identification of the plant and it is useful as a phytochemical marker and a good estimator of genetic variability in plant populations. HPTLC Finger print is also suitable for rapid and simple authentication and comparison of subtle differences among samples of identical plant resources. HPTLC offers better resolution and estimation of active constituents can be done with reasonable accuracy in a shorter time.

OL28. "A comparative QSAR study of CYP3A4 Inhibitors: Imidazopyridines using Stepwise MLR, PLS and GFA techniques." *Partha Pratim Roy, Ravi Raushan, Arpit Kumar Gupta, Jagadish Singh Institute of Pharmaceutical Sciences, Guru Ghasidas Vishwavidyalaya, Bilaspur-495009 (India). Email: partha.r.in@gmail.com*

Abstract: A comparative QSAR analysis was carried out on CYP3A4 inhibitors, imidazopyridines derivatives (n=39) reported by Song *et al.* Two different splittings (Biological sorting and K-means clustering) and three different chemometric tools like Stepwise MLR, PLS and GFA regression were used for the model development from 2D descriptors from PaDEL software. All the developed models were statistically robust both internally and externally (Q^2: 0.703 to 0.808; R^2_{pred}: 0.679 to 0.937). The compounds with heterocyclic substitution like pyrrolo pyrimidine and purine as well as flouro and methyl substitution for substituted phenyl urea analogues for showed good CYP3A4 inhibitory activities. Additionally randomization test on the MLR models were also performed. The OECD principle 2 i.e., unambiguous algorithm for selection of descriptors from different input for different statistical methods was studied and commented for the present dataset.

OL29. "Investigation of antioxidant activity and HPTLC fingerprinting of leaf extracts of *Vitex peduncularis Wall.*" *Lalbiakremi F*, Lalhriatpuii TC, Lalawmpuii R, Lalnunfela Charles Department of Pharmacy, Regional Institute of Paramedical and Nursing Sciences, Aizawl, Mizoram-796017 Email: brfanai10@gmail.com*

Abstract: Antioxidant agents of plants origin have continued to attract interest because of the potential they hold in the maintenance of human health accompany with their minimal side effects. In this study, the antioxidant activity of the methanolic leaves extract fraction (8% methanol in chloroform) of *Vitex peduncularis* Wall which belongs to the family

Vernaceae locally known as *Thingkhawihlu* that have been used traditionally by the Mizo tribe for the treatment of various ailments including Stomach ulcer, mouth sore, cancer etc. The antioxidant activity was investigated using scavenging activity of DPPH(1,1-diphenyl-2-picrylhydrazyl) radical method. Also the reducing power, total antioxidant activity as well as the total flavonoid and total phenolic contents of the extract were determined and HPTLC studies were carried out using CAMAG HPTLC system equipped with Linomat 5 applicator, TLC scanner 3, Smart DIGI and WIN CATS-4 software.The extract exhibited high free radical scavenging activity due to its high phenol and flavonoids contents. HPTLC fingerprinting of methanol extract of leaf revealed six significant peaks which revealed the presence of promising and significant chemical constituents. This study suggests that *Vitex peduncularis* Wall is a possible source of natural radicals' scavenger and could serve as a base for future antioxidative diseases drugs. HPTLC fingerprint analysis can be used as a diagnostic tool for the correct identification of the plant and it is useful as a phytochemical marker and a good estimator of genetic variability in plant populations

OL30. "Anti-diabetic Potential of the some Herbal Formulations of Modified Plant Parts."

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Abstract: It is fact that diabetes mellitus becoming a major issue before the scientist society, doctor, govt. and their agencies. There is a continuous and increasing prevalence of diabetes throughout the world. My present studies objective is modification of plant parts for its positive effects on diabetes treatments and preparation of different combination for synergistic anti-diabetic action. Pharmacological result reveling effectiveness of modification and combination of anti-diabetic activity. Modified Methi is main ingredient of all the formulation. A natural starch used as vehicles for making Formulation. All the Formulation having varying degree of ant diabetic activities against streptozocin induce diabetic albino rats Where as PKSM-II has significant activities regarding reduction of blood glucose level and triglyceride level compare to diabetic control.

OL31. "SYNTHESIS OF SOME NEW 1, 3, 4 -OXADIAZOLE DERIVATIVES AND ANTIPROLIFERATIVE ACTIVITY ON EAC ANIMAL MODEL"

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Abstract: Synthesis of some new 5-{m-phthalimido-methyl-(-substituted-phenyl)-2-(-substituted-phenyl)}-1, 3, 4-oxadiazole derivatives (1**e**-5**e**) by using appropriate acid hydrazide, aromatic acid, phosphorous oxychloride and N-hydroxy –methyl-phthalimide to form 2, 5- disubstituted -1, 3, 4-oxadiazole derivatives. The final synthesized compounds were characterized with the help of FT-IR, ^{1}H NMR and C, H, N analysis. The anticancer activity has been evaluated by comparing the ability of the test compounds (50 mg/kg b. wt) to inhibit the tumor weight as well tumor cell count with control group. The result suggests that all the synthesized compounds show significant ($p<0.001$) reduction in both tumor weight and tumor cell count with respect to control group. Compound 5**e** is found to the most potent. 5-Fluorouracil (5-FU) was used as a standard drug (20 mg/kg b. wt).

OL32. "Screening of Indigenous plant components from Northeast India for Anti-plasmodial potential"

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Abstract: Malaria is an ancient vector-borne disease, estimated that around 3.4 billion people are at risk. The disease can be defined with multiple clinical conditions with a complex immune signaling involving many infectious parasitic components. Traditional herbal extract were in practice for ages to boost immunity for clearance of an parasitic infections. Indian traditional medicine system has not been explored fully for similar activities. Major antimalarial drugs like chloroquine and artemisinin were derived originally from herbal sources, namely cinchona and qinghao su. There are substantial gaps in our understanding for malaria parasite due its very complex life cycle within erythrocyte.North East India, being a hot-spot of biodiversity, has a rich tradition of herbal medicine and is a potential source for discovering new classes of anti-malarials. Herbal extact were found to modulate innate immunity with increased cytokine level and expression of maturation markers. Further, research focused to identify and characterize its putative target(s) in *Plasmodium falciparum* in order to decipher mode of action and optimize its therapeutic potential.

OL33. "INTELLECTUAL PROPERTY RIGHTS: AN OVERVIEW AND IMPLICATIONS IN HERBAL TECHNOLOGY", **Dr. Rumi Dhar*, Internal Legal Consultant, Assam University Silchar**

Abstract: Intellectual Property Rights (IPR) refers to the legal rights given to the inventor or creator to protect his invention or creation for a certain period of time. These legal rights confer an exclusive right to the inventor/creator or his assignee to fully utilize his invention/ creation for a given period of time. Laws and regulations evolve with in countries over time, but in recent years, the trend has been toward the globalization of pharmaceutical issues, which affects national legislation. This globalization, exemplified through changes in Inter- National trade, Patent protection and pricing, has resulted in number of initiative that must be considered by countries developing pharmaceutical regulations. Whether or not a national drug policy exists, countries need effective, enforceable legislation and regulation. This legislative acts may take the form of a single national drug law that deals with all the issues or a series of complementary laws, each introduced when the time is right. The main objective behind this study is to identify the present scenario of IPR issues through various statutes, laws, convention and various issues regarding the court decisions and judicial process. The present study furnishes a brief over viewing of Intellectual Property Rights with special emphasis on herbal technology.

OL34. "BIOCHEMICAL SCREENING AND ANTIOXIDANT ACTIVITY OF FOUR CYANOBACTERIAL SPECIES ISOLATED FROM DOMESTIC SEWAGE WATER OF SILCHAR TOWN, ASSAM (INDIA)"

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ABSTRACT Four cyanobacterial species viz., *Oscillatoria subbrevis, Lyngbya cinerescens, Phormidium lucidum, Nostoc linckia* were isolated from the domestic sewage water of Silchar town of the state of Assam in India. The cultures were maintained in BG11 medium. *In vitro* screening for antioxidant activity of methanol and acetone extracts of these cultures were determined by DPPH cal scanvenging activityradi. The study indicated the highest antioxidant potential in *Phormidium lucidum* and minimum in *Oscillatoria subbrevis.* Total phenolic content was maximum in *Oscillatoria subbrevis* and minimum in *Nostoc linckia*. Flavonoid content was maximum in *Nostoc linckia* and minimum in *Phormidium lucidum*. Ascorbic acid (Vitamin-C) content was maximum in*Oscillatoria subbrevis*) 13 µg/ml(and minimum in *Lyngbya cinerescens*. Therefore, mass cultivation of such strains for the production of value added products may be a good strategy.

OL 35. "Ayurvedic formulation in the treatment of Parkinson's disease: An old wine in new bottle."

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Abstract: Parkinson's disease is the most prevalent neurodegenerative motor disorder occurs due to loss of due to degeneration of midbrain dopaminergic neurons that results in decrease in the level of the neurotransmitter - dopamine (DA). Though, James Parkinson first reported the disease as "Shaking Palsy", equivalent Parkinsonian symptoms is found in ancient Indian medical system of Ayurveda under the name '*Kampavata'*. In an around 300 BC, an Ayurvedic literature- "*Charaka Samhita*" introduced about head tremor (*Sirakampa*), generalized tremor (*Kampa*) and suggested a therapeutic formulation which, included powdered seeds of Atmagupta (*Mucuna pruriens*) and Paraseekayavanee (*Hyocyamus reticulatus*) with roots of Aswagandha (*Withania somnifera*) and Bala (*Sida cordifolia*) in cow's milk. Still now the most prescribed therapy of PD includes use of the DA precursor – 3,4-dihydroxyphenylalanine (L-DOPA) to alleviate the motor symptoms of PD. However, long-term L-DOPA treatment is associated with adverse side-effects, such as motor fluctuations, dyskinesia and drug-induced toxicity. It is reported that, efficacy of Ayurvedic formulation have been attributed to the presence of L-DOPA and other neuroactive components in the formulation. In the present study we have discussed the potentials of natural products used in Ayurvedic formulations as alternative/adjuvant to the DA replenishment therapy for PD, and highlighted their molecular mechanisms of action.

OL 36. "Effect of Pomegranate juice on Parkinson's disease: A behavioural and neurochemical investigation."

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Abstract: Pomegranate (*Punica granatum* L.) has been regarded as the mystical plant as because of its beneficial effects in countless remedies. In neurological perspective, pomegranate has been shown to protect from Alzheimer's diseaseby reducingamyloid beta aggregation, oxidative stress, neuroinflammation. Pomegranate also has been reported to rescue human primary neurons from MPTP-induced toxicity. Though, Tapias et al., (2013) in rotenone-rat model of Parkinson's disease has recently reported a negative efficacy of pomegranate and have shown that, oral administration of pomegranate exacerbated the disease pathology. Moreover, outbreak of several diseaseshave been found to be

associated with pomegranate imported from Turkey,had questioned the its justified use in dietary formulation. Here in the present study we have aimed to find out the effect of pomegranate on MPTP-induced parkinsonian mice. Result of which have showed that, oral gavage of pomegranate caused deterioration at behavioural and neurochemical levels in parkinsonian mice. Hence, present study explores the neurodegenerative potential of pomegranate in toxin-induced Parkinsonian mice and questions the rational use of pomegranate in dietary formulation.

OL 37. "Design and Characterization of Diclofenac Sodium Microspheres Prepared by Ionotropic GelationTechnique for Oral Controlled Drug Delivery",**Sarbani Dey Ray, Supratim Ray**

Abstract: Dicolofenac sodium is a well known representative of non steroidal anti-inflammatory drugs (NSAID's) widely used to control pain and inflammation of rheumatic and non -rheumatic origin.Treatment with NSAIDs is observed to have gastrointestinal side effects. The formulation of Diclofenac sodium using biodegradable and biocompatible polymers in the form of microspheres is expected to decrease GI side effects. In the present study,different microsphere formulations of Diclofenac sodium were prepared by ionotropic gelation technique using sodium alginate as carrier and HPMC as release modifying agent. Microspheres of diclofenacsodium prepared in this study were evaluated for flow properties, drug entrapment efficiency as we ll as drug release from the various formulations proposed. Controlled release microspheres of diclofenac sodium were successfully prepared using Ionotropic Gelation Technique. The prepared formulations were found to control the release of the active substance for 12 hours when examined in phosphate buffer (pH 7.4). The obtained results proved the suitability of the prepared microspheres of Diclofenac sodium as controlled release dosage forms. The flow characteristic showed Hausner's ratios of <1.25 and Carrs index of 5-13 % of the systems prepared while those of the drug alone were >1.25 and > 40% respectively indicating good and excellent flow of the systems and extremely poor flowability of the drug alone. Diclofenac sodium content in different formulations was not affected by neither the polymer type nor drug to polymer ratio which was ranged between 79 -90 %. No significant drug polymer interactions were observed in FT-IR studies.The surface morphology of drug-loaded microbeads prepared with sodium alginate and HPMC was spherical in shape and has large bridges observed on the outer surface .There was no significant degradation of diclofenac sodium or change in drug release rate in any of the prepared formulations during a six -month period of stability testing.The in-vitro release studies showed that the release rate of the drug has been modified. This study presents a new approach for obtaining modified release drug delivery system of diclofenac sodium.

OL 38. "Toxic Effect of Methnolic Extract of *Houttuynia cordata* on Kidney, Blood and Liver of Rats", ***Sanjib Das[1], S. K. Ghosh[2], Sanjay Kumar Yadav*[2,] 1.Dept. of Pharmaceutical Sciences, Assam University, Silchar Assam, India ,2.Dept. of Pharmaceutical Sciences, Dibrugarh University, Dibrugarh Assam, India***

Abstract : The plant *Houttuynia cordata* Thunb (*H. cordata*) Family Saururuacea locally known as "Moshundari" is frequently used for medicinal and nutritional purpose in the Assam region of India. It is an erect, annual herbecious plant. It is posses variety of therapeutic and nutritional property such as antibacterial (Hongmei LU, et al., 2006) anti-inflammatory (Weifeng Li, et al., 2011), Anti allergic activity (Eun Hee Han, et al., 2009), Anticancer/Antitumor activity, Antidiabetic activity (Jiangang Fu, et al., 2013) Antioxidant activity (Wenguo Cai, et al., 2012), Antiviral activity (Vijittra L, et al., 2012), Immunomodulatory activity (Lau KM et al., 2008), Anti-obesity activity (Manish Kumar, et al., 2014), Antidiarrhoeal activity (Das et al., 2014) but not yet toxicity study evaluated. On the basis of these activity the present study was initiated 28day sub-acute toxicity of 80%methnolic extract of *H. cordata* on experimental animal to estimate human susceptibility to its toxicity. The Organization for Economic Co-operation and Development (OECD) test guideline 407, for the testing of chemicals was used for toxic evaluation of *H. cordata* plant traditionally used by rural person of Assam. The plant extract did not show any change in the SGOT, SGPT, albumin, creatinine, bilirubin, total leucocytes count, deferential leukocytes count etc the plant extract did not induce any damage to the liver and kidney. Histopathology examination of liver brain and kidney did not reveal major changes indicative of tissue damage owing to test drug administration. The results have demonstrated that the *H. cor*data plant extract at the dose level of 400mg/kg b.w. is safe when administered orally in rats. The findings support an assurance for the medicinal use the plant in folk medicine.

OL 39. Preliminary phytochemical screening and HPTLC fingerprinting of leaf extracts of *Melothria heterophylla (Lour.)* Cogn ***Lalhriatpuii TC*[1], Ghosh SK[2], Lalnunfela Charles [1;] Department of Pharmacy, Regional Institute of Paramedical and Nursing Sciences, Aizawl, Mizoram, India-796017; Department of Pharmaceutical Sciences, Dibrugarh University, Assam, India-786004; [Email: tclalhriatpuii@gmail.com]***

Abstract: *Melothria heterophylla (Lour.)* Cogn belongs to the family Cucurbitaceae locally known as *nauawimu* which have been used traditionally by the Mizo tribe for the treatment of various ailments including fever, malaria, diabetes, to reduce anxiety, to stop baby's crying, constipation, inflammation, toothache etc. In this study, preliminary phytochemical screening and HPTLC fingerprinting were carried out. For preliminary phytochemical screenings, the crude methanol leaves extract of *Melothria heterophylla (Lour.)* Cogn was subjected to various tests to determine the phytochemical

constituents of the extract and CAMAG HPTLC system equipped with Linomat 5 applicator, TLC scanner 3, Smart DIGI and WIN CATS-4 software were used for HPTLC fingerprinting. The results of the preliminary phytochemical screening of the extract revealed the presence of secondary metabolites like steroids, tannins, saponins and flavonoids. HPTLC fingerprinting profile of the extract revealed six significant peaks with the respective maximum Rf values ranging from 0.02 to 1.03 which revealed the presence of promising and significant phytochemical constituents. The presence of certain significant secondary metabolites like steroids, tannins, saponins and flavonoids may be responsible and accountable for its ethnomedicinal uses and the HPTLC fingerprint analysis can be used as a diagnostic tool for the correct identification of the plant. It is also useful as phytochemical marker and a good estimator of genetic variability in plant populations. HPTLC finger print is also suitable for rapid and simple authentication and comparison of subtle differences among samples of identical plant resources.

OL 40. Evaluation of antileishmanial potency, toxicity and phytochemistry of methanolic bark extract of *Sterculia villosa* Roxb.,

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Abstract Visceral Leishmaniasis is a protozoan disease caused by *Leishmania donovani* Parasite. The genus *Sterculia* (Malvaceae) possesses ethnobotanical potentiality against protozoan infection. Methanolic bark extract of *Sterculia villosa* Roxb (**SVE)** was prepared and analyzed by thin layer chromatography (TLC), UV-Vis, IR spectroscopy and biochemical assays. Antileishmanial potentiality of **SVE** against *Leishmania donovani* promastigotes were performed by MTT assay, fluorescent microscopy and IC_{50} dose of **SVE** were determined. To determine the effect of **SVE** on promastigotes, ROS generation, superoxides, lipid peroxidation and DNA fragmentation assays were performed. Molecular aggregation of compounds was determined by atomic force microscopy (AFM). Furthermore, extent of cytotoxicity of **SVE** at IC_{50} dose was determined against RAW 264.7 macrophages, peritoneal macrophages and murine RBC. *In vivo* cytotoxicity of **SVE** was also evaluated in BALB/c mice. Phytochemical screening showed the presence of several phytochemicals in **SVE**. Furthermore, **SVE** exhibited a potent reverse dose dependent antileishmanial activity with IC_{50} value at 17.5 µg/ml. With IC_{50} dose of **SVE**, *L. donovani* promastigotes showed elevated level of ROS, up-regulation of superoxide, increased level of lipid peroxidation and DNA fragmentation. AFM suggests increasing size of molecular aggregation with increase in concentration. The IC_{50} dose of **SVE** was found to be non-toxic *in vitro* and *in vivo* (upto 100 mg/kg body weight). Based on these findings **SVE** can be explored as a phytotherapeutic agent against visceral leishmaniasis.

OL41. Impurity Profiling: An Emerging Approach for Pharmaceuticals",

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Abstract: A pharmaceutical impurity is any unwanted chemical or material that remains with API which may have arose out of synthesis or may be developed during formulation process or upon ageing of API and its formulation. These unwanted, unidentified and potentially toxic impurities even in small amounts may influence the efficacy and safety of pharmaceutical products. Impurity profiling is an emerging approach, the aim of which is detection, identification, structure elucidation and quantitative determination of organic and inorganic impurities and residual solvents in pharmaceutical formulations. Various regulatory authorities like ICH, USFDA, UK-MHRA, Indian CDSCO are emphasizing on the impurity profiling and have formulated the guideline concerning control and limit of impurity. According to ICH guidelines, an impurity present in excess of 0.1% should be identified and quantified. Identification of impurity is done by reference standard method, spectroscopic method, separation method, isolation method and characterization method using chromatographic and spectroscopic techniques either alone or in combination such as LC, GC, HPLC, NMR, LC-MS, GC-MS etc. Impurity profiling has numerous applications in the areas of drug designing, quality monitoring, stability and safety of pharmaceutical compounds that may be produced synthetically, extracted from natural products or produced by recombinant methods. Despite of these benefits, there are certain limitations such as requirement of highly sophisticated equipments for identification of minor components, need for repetition of process with change or modification of instruments in case if impurities are not identified and the high cost of equipment.

OL 42. SOLUBILITY AND DISSOLUTION RATE ENHANCEMENT OF NATEGLINIDE PREPARING SOLID DISPERSIONS: COMPARISON OF NATURAL AND SYNTHETIC POLYMERS,

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Abstract : The study was aimed to improve solubility or dissolution characteristics of nateglinide preparing its solid dispersions (SDs) with modified natural gums (karaya, guar) and synthetic carriers (polyethylene glycol 4000 and poloxamer 407) and characterization of SDs. The solid dispersions were prepared by the melting and solvent evaporation technique at 1: 1, 1: 2, 1: 3 (w/w) of drug to carrier ratios. The physical state of the drug from physical mixture and SDs was characterized by Fourier transform infrared spectroscopy (FTIR), differential scanning calorimetry (DSC), X-ray diffraction (XRD) and scanning electron microscopy (SEM). The results showed an increase in solubility and an enhancement in dissolution of solid dispersions compared to pure nateglinide ($P<0.05$). The modified natural gum karaya showed better drug release than guar gum and PEG 4000. FTIR showed retainment of individual peaks indicated few characteristic groups in the drug structure. The DSC thermograms showed the significant change in melting peak of the nateglinide when prepared as SDs suggesting the change in crystallinity of nateglinide. XRD showed that the drug peak was disappeared in nateglinide-poloxamer 407 SD prepared by melting method. It was concluded that natural modified gum has equal solubilizing capacity with synthetic polymers.

OL 43. "Protective effects of an edible herb, *Enhydra fluctuans* Lour. (Asteraceae), against doxorubicin induced hepatotoxicity", Swarnalata Joardar[1,2], *Tarun K Dua[1], Jyochhana Priya Mohanty[2], Saikat Dewanjee[1] [1]Advanced Pharmacognosy Research Laboratory, Department of Pharmaceutical Technology, Jadavpur University, Kolkata 700032, India. [2]Himalayan Pharmacy Institute, Majhitar, East Sikkim, 737136.*

Abstract: Doxorubicin is a broad-spectrum antineoplastic antibiotic, however, long-term clinical use of doxorubicin is limited due to its serious side-effects. *Enhydra fluctuans* Lour. (Asteraceae), an edible semi-aquatic plant, is traditionally used to counteract with different toxins. The present study was aimed to evaluate the protective role of edible (aqueous) extract of *E. fluctuans* (AEEF) against doxorubicin induced hepatotoxicity *in vivo*. Doxorubicin treatment (3 mg/kg; 3 doses in every alternative day; *i.p.*) significantly ($p < 0.05$-0.01) altered haematological and serum biochemical parameters in experimental rats. Doxorubicin exposure significantly altered the extents of ROS production ↑, protein carbonylation ↑, lipid peroxidations ↑, endogenous antioxidant enzymes ↓ and GSH ↓ in the liver of experimental rats. Immunoblot analysis revealed the establishment of apoptotic damage, apparent from the significantly altered expressions ($p < 0.01$) of apoptotic proteins viz. Apaf-1 ↑, mitochondrial Bad ↑, Bcl-2 ↓, cytosolic Cyt C ↑, cleaved caspases ↑, t-Bid ↑ and Fas ↑ in the liver tissues following doxorubicin exposure. However, AEEF treatment (100 mg/kg; once daily for 7 days; *p.o.*) could significantly ($p < 0.05$-0.01) counteract the doxorubicin mediated abnormalities in the haematological, serum biochemical and the biochemical parameters of hepatic tissues and restored the tested values near to normalcy. Finally, histopathological analysis following immune-histochemistry and ultra-structural assessments confirmed the prophylactic role of AEEF. In conclusion, presence of phyto-antioxidants viz. flavonoids, phenolics, saponins and ascorbic acid within AEEF would offer overall protection through counteracting the redox imbalance.

OL 44. "Involvement of the PI3K/Akt signal pathway in the hypoglycemic effects of *Abroma augusta* L. (Malvaceae) leaf extract in type 2 diabetic rats", *Ritu Khanra, Saikat Dewanjee, Advanced Pharmacognosy Research Laboratory, Department of Pharmaceutical Technology, Jadavpur University, Kolkata 700032, India.*

Abstract: *Abroma augusta* L. (Malvaceae) leaves are traditionally used to treat diabetes in Eastern India. In order to investigate the hypoglycemic effects and probable mechanism of methanol extract of *A. augusta* leaves (AA) on diabetes, type 2 diabetes mellitus (T2DM) was induced by high fat diet (*ad libitum*) + low-single dose of streptozotocin (35 mg/kg, *i.p.*) in Wistar rats. T2D rats exhibited significantly ($p < 0.01$) higher fasting blood glucose level with respect to control group. Besides, significantly elevated total cholesterol and triglycerides levels confirmed the establishment of hyperlipidemia during T2DM. However, Oral administration of AA (100 and 200 mg/kg) could significantly ($p < 0.05$-0.01) reduce hyperglycemia and hyperlipidemia. In search of mechanism, immunoblot analyses were performed with the signal proteins in the skeletal muscle. T2D rats exhibited significant down-regulations ($p < 0.01$) in PI3K (p 85) and membrane-associated GLUT4 expressions in the skeletal muscle. Besides, significant reduction ($p < 0.05$-0.01) in phosphorylations of IRS-1 and Akt were observed in the skeletal muscle of T2D rats. However, AA (100 and 200 mg/kg) could significantly up-regulate PI3K, phospho-IRS-1, phospho-Akt and membrane-associated GLUT4 expressions in the skeletal muscle of T2D rats. Results would suggest that AA could ameliorate the T2DM via promoting glucose uptake by activating PI3K/Akt signal pathway.

OL 45. *"Abroma augusta* L. (Malvaceae) leaf extract alleviates inflammation via inhibiting pro-inflammatory cytokines", *Subhadip Das, Ritu Khanra, Saikat Dewanjee Advanced Pharmacognosy Research Laboratory, Department of Pharmaceutical Technology, Jadavpur University, Kolkata 700032, India.*

Abstract: *Abroma augusta* L. (Malvaceae) leaves are traditionally used as an anti-inflammatory agent. The current study aimed to explore the anti-inflammatory activity of a crude methanolic extract of *A. augusta* leaf (AA) employing established *in vitro* and *in vivo* assays. Phytochemical investigation revealed presence of taraxerol, stigmasterol, flavonoids and phenolic compounds in the AA. In *in vitro* assays, AA inhibited LPS stimulated production of IL-1β, IL-6 and tumor necrosis factor-α (TNF-α) in RAW 264.7 cells in a concentration dependent manner without producing cytotoxicity within the selected range of concentration. In *in vivo* assay, AA (100 and 200 mg/kg, *p.o.*) exhibited significant inhibition of carrageenan ($p < 0.05$-0.01) induced paw oedema, and the reduced the granuloma tissue formation ($p < 0.05$) in experimental mice. AA (100 and 200 mg/kg, *p.o.*) treatment also significantly reduced IL-1β, IL-6 and TNF- α levels in the sera of experimental mice for both the *in vivo* assays. The experimental observation revealed that, AA would produce anti-inflammatory effect possibly by inhibiting the production of pro-inflammatory cytokines.

OL 46. "Cytoprotective and antioxidant effects of an edible herb, *Ipomoea aquatica* Lour. (Asteraceae), against experimentally induced Cadmium intoxication", *Tarun K Dua, Saikat Dewanjee Advanced Pharmacognosy Research Laboratory, Department of Pharmaceutical Technology, Jadavpur University, Kolkata 700032, India.*

Abstract: Ipomoea aquatica Forssk. (Convolvulaceae), an edible aquatic herb, is traditionally employed against toxic effects of heavy metals in India. The present study was planned to discover the protective effect of edible (aqueous) extract of I. aquatica (IA) against experimentally induced cadmium chloride ($CdCl_2$) intoxication both in vitro and in vivo. IA exhibited a concentration dependent cytoprotective effect against Cd-induced cytotoxicity in isolated murine hepatocytes. $CdCl_2$ (30 μM) incubation significantly ($p < 0.01$) altered the extents of ROS production ↑, protein carbonylation ↑, lipid peroxidation ↑, endogenous antioxidant enzymes ↓ and GSH ↓ in vitro. Besides, $CdCl_2$ significantly ($p < 0.01$) induced apoptosis in the hepatocytes ostensible from the altered expressions of apoptotic proteins viz. mitochondrial Bad ↑, Bcl-2 ↓, cytosolic Cyt C ↑, Apaf-1 ↑, cleaved caspase 3 ↑, cleaved caspase 9 ↑, cleaved caspase 8 ↑, t-Bid ↑ and Fas ↑. However, IA (400 μg/ml) could significantly ($p < 0.05$-0.01) attenuate the $CdCl_2$ mediated toxic manifestation in vitro. In in vivo assay, $CdCl_2$ (4 mg/kg) treated mice exhibited significantly ($p < 0.01$) high intracellular Cd content in the liver, kidney, heart, brain and testes of experimental mice. A high Cd-burden within the tissues caused significant ($p < 0.05$-0.01) patho-physiological alterations viz. ROS production ↑, protein carbonylation↑, lipid peroxidation ↑, DNA fragmentation ↑, ATP formation ↑, mitochondrial co-enzymes Q ↓, endogenous antioxidant enzymes ↓ and GSH ↓ within the aforementioned tissues. The haematological and serum biochemical parameters were significantly ($p < 0.05$-0.01) altered in the $CdCl_2$ treated mice. Finally, histological assessments following immunohistochemistry imposed significant toxic occurrence within the selected organs of Cd-intoxicated animals. However, concurrent administration of IA (100 mg/kg) could significantly ($p < 0.05$-0.01) reinstate the $CdCl_2$ mediated toxicity. Presence of metal chelators and phyto-antioxidants within IA would offer overall protection through promoting Cd clearance coupled with restoring redox balance.

OL 47. THE ECONOMICS AND INDUSTRIAL POTENTIAL OF A RARE HIGH VALUED TUBEROUS MEDICINAL PLANT – IPOMOEA MAURITIANA Jacq. FOUND IN NORTHEAST INDIA, *[1]Snehashish Dutta and [2]Sailendra Prasad Borah; [1]Department of Botany, Pandu College, Guwahati – 781012 ;[2]Department of Botany, Gauhati University, Guwahati – 781014*

Abstract: The plant ***Ipomoea mauritiana*** Jacq. is considered to be a very rare high valued plants belongs to the family Convolvulaceae. Varied ethno-botanical aspects of this plant led the traditional herbal drug practitioners mostly amongst the tribes to collect the plant from wild and domesticate it in their herbal gardens. The large underground yellow-brown coloured tuber and the seeds are the most valued portion from which the active components are extracted out and are used differently for curing varied kinds of ailments. Seeing the potentiality of this plant as an additive in the field of herbal medicine, the present research work was undertaken in the laboratory to access the market and industrial potentiality of the plant for varied purpose. The average weight of the tuber is about 500-600 gm and when sliced into pieces white latex ooges out. The market vale of the tuber ranges from Rs. 600 - Rs. 800. The active tuberous extract seems to be muciligenous and bitter in taste similar to jalap resin. These resinous extract are often used by the herbal practitioner as tonic in curing various diseases like leprosy, vomiting, diseases of blood, improving voices etc. The paste made out of it is applied for curing burning sensation and complexion. Often the local Ojah recommend the composition of root in the treatment of scorpion sting and snake bite remedies. The root extract of this plant through DPPH assay showed good scanvenging activity towards free radicals. Substantial amount of seed gum could be extracted out from the seeds of this ***Ipomoea*** plant which showed great pharmaceutical and industrial potential for they can be used as thickener in toothpaste, lotions and also as an exponent to tablets.

OL 48. "Total Steroid and terpenoid enriched fraction from the root of *Euphorbia tirucalli Linn* attenuates nociceptive pain, inflammation, asthma and arthritis by reducing inflammatory cytokines, cyclo-oxygenase 2 and nitric oxide synthase 2 expressions"

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Abstract The plant *Euphorbia tirucalli* Linn has been successfully used for the management of acute inflammatory, arthritic, nociceptive pain and relieves the asthmatic symptom as a tribal folk medicine in India and Africa. The present study was conducted to inspect the anti-inflammatory, analgesic, anti-asthmatic and anti-arthritic from total steroid and terpenoid rich fractions derived from hydro-alcoholic extract of *Euphorbia tirucalli root* (STF-HAETR) to justify the traditional use of this plant. STF-HAETR fraction demonstrated 71.25± 2.5% and 74.25± 5.1% protection against acetic acid-induced pain and central neuropathic pain at 75 mg/kg and 100 mg/kg doses respectively. It showed 96.97% protection against acute inflammation at 100 mg/kg with 1.6 fold better activities than the standard drug. The fraction exhibited such efficacy via inhibition of proinflammatory cytokines TNF-α, IFN-γ, by 61.12%, 65.18 %, respectively at 100 µg/ml. Its analgesic and anti-inflammatory activity were supported by *in-vitro* inhibition of Cyclooxygenase (COX) and Nitric oxide synthase in a dose-dependent manner to elicit the desired pharmacological action, as well. Inhibition cascade of i-NOS and pro-inflammatory cytokines such as TNF-α and IFN-γ were well documented by RT-PCR based m-RNA expression study. The spectrophotometric analysis reveals STF-HAETR induced ameliorative effect against heat-induced denaturation of BSA protein and it's of significant antiproteinase activity. The plant fraction also demonstrated anti-asthmatic activity by displaying 62.45% protection against histamine induced bronchoconstriction or dyspnoea. Our findings suggest that STF-HAETR could be an effective safe therapeutic agent to treat nociceptive pain, acute inflammation, asthma, and arthritis, which may authenticate its traditional use.

OL 49. "Quercetin PLGA nanoparticles against Visceral Leishmaniasis",

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Abstract : Leishmaniasis is a neglected tropical disease (NTD) classified by the World Health Organization (WHO). Chemotherapy of leishmaniasis is constrained due to very low drug specificity, high cost, high toxicity of available chemotherapeutics and emergence of resistant parasites. Quercetin (3,5,7,3′,4′ pentahydroxyflavone, Qr) is one of the most abundant naturally occurring flavonoids. Qr was also reported as one of the most powerful leishmanicidal among all plant flavonoids. Qr though presented a great alternative in the leishmanicidal chemotherapy, it's applications were marred due to solubility and transport limitations. Nanonization in PLGA 50:50 are seen as a solution to it. Quercetin nanoparticles (QCnp) were synthesized by s single emulsion (o/w)–solvent evaporation technique. The average PCS particle size for QCnp was 187 nm and zeta potential recorded was -25.6 mV. AFM trace revealed a smooth external surface and Qr loading efficiency recorded in HPLC analysis was 72%. In vitro dissolution studies showed biphasic release pattern with initial faster release rate for 48 hours and sustained release upto 480 hours. Antileishmanial activity was found to be significant for QCnp (IC_{50} 13±1.8 µM) in about one-third of the dosage of the pure compound Qr (34±3.6 µM). QCnp were encouragingly effective against leishmanial parasite in both the free and macrophage infested conditions. Macrophage uptake of QCnp was complete within an hour as observed in TEM experiments.

OL 50. STUDY OF HALOGEN SUBSTITUENT ON DOCKING AND 3D QSAR PROPERTIES OF ARYL SUBSTITUTED THIOSEMICARBAZONES AS ANTICONVULSANT",

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Abstract: Gamma amino butyric acid (GABA) is a major inhibitory neurotransmitter mainly responsible for action of almost all antiepileptic compounds, Gamma amino butyrate amine transferase (GABA-AT) is one of the most important targets in the design and discovery of successful antiepileptics. Lysine 329A and Arginine 192A are the most widely used residues of GABA-AT for docking studies. In the present paper, twenty one different aryl substituted thiosemicarbazones (PS1-PS21) were studied for interaction with Lys-329A & Arg-192A residues of GABA-AT. Docking studies were carried out using Pyridoxal phosphate (PLP) based method by 'Vlife Molecular Design Suite 3.5' software. Grip at docking method, in which both 1OHV and ligand are flexible, was adopted and the results were compared with standard anticonvulsant drug vigabatrin. In addition, all twenty one molecules were subjected to three dimensional quantitative structure activity relationship (3D QSAR) using Principal Component Regression method (PCR) to design potent anticonvulsant prior to

their synthesis. The model gave r^2 & q^2 values of 0.9587 and 0.9327 respectively for fourteen compounds in training and seven compounds of test compounds with optimum number of components as 2. The model was found to be highly predictive and was further applied to set of ten molecules of aryl substituted thiosemicarbazones. Results of docking studies and 3D QSAR studies have shown that halogen substitution in phenyl ring at Meta position plays important role in protection from seizures. Bromo substituent was found to be more effective as compared to chloro and fluoro substituents. Thus, it would be worthwhile to synthesize bromo substituted aryl thiosemicarbazones and evaluate their anticonvulsant activity.

OL 51. Gastroprotective effects of the various bioactive fractions from *Potentilla fulgens* Linn.: A Bio-activity guided study,

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Abstract ***:*** *Potentilla fulgens* Wall. (Rosaceae) is a potent medicinal plant found in Meghalaya where the roots are traditionally used to treat gastric ulcer, mouth ulcer, diabetes, diarrhoea and cancer. In our previous study, we have scientifically validated the gastroprotective effects of the ethanolic root extract of *P. fulgens* in experimental rats. The present investigation was aimed to examine the gastroprotective effects of the different fractions of *P. fulgens* obtained by successive fractionation from the bioactive ethanolic root extract (EPF). Pharmacologically, four fractions were tested *viz.* chloroform (PFCH), ethylacetate (PFEA), *n*-butanol (PFBu) and aqueous (PFAq). Ulcer was induced in the rats by pyloric ligations and absolute ethanol. Various gastric-ulcer parameters *viz.* gastric juice volume, pH, H^+K^+-ATPase activity, microvascular permeability, histamine and antioxidant levels were determined. Results indicate that from among all the four fractions, PFEA and PFBu showed significant ($p < 0.05$) gastroprotective effect in both the models and the mechanism of action was attributed to the decrease gastric juice volume, microvascular permeability and H^+K^+-ATPase activity. From the present study, it can be concluded that two soluble fractions (PFEA and PFBu) of *P. fulgens* are rich in phenolic components which showed promising gastroprotective activity. Hence, both the fractions can be further subjected to isolation of the active constituents using chromatographic techniques which later be screened for gastroprotective activity.

Posters Presentations

PP1. Phytochemicals screening and antioxidant properties of some macrolichens from North-East, India,

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Abstract: Llichens, an unique symbiotic organism, consist of two different organisms, an algae and a fungi. In adverse conditions lichen thallus are known to produce a vast array of secondary metabolites. In this study we report lichens belonging to foliose and fruticose types from the state of Arunachal Pradesh, Mizoram and Assam. The lichens species were identified based on morphology and chemical analysis. The solvent extract were made using four different solvents *viz.* water, chloroform, acetone and methanol. The phytochemicals were screened qualitatively using standard protocols. Antioxidant properties was analysed with DPPH assay. All the ten different macrolichens selected for antioxidant activity analysis showed good results by way of scavenging the DPPH free radical. The substance *viz.* alectoronic acid, atranorin, gyrophoric acid, lobaric acid, sekikaic acid, stictic acid, usnic acid, zeorin are found to be present in the selected lichens species. The *in vitro* assay indicates that these lichen extracts are an important source of natural antioxidant, which might be beneficial to prevent the various oxidative stresses. The results of the present study can form the basis of discovery of newer lead compounds and herbal drugs.

PP2. "IN-VITRO AND IN-VIVO ANTI-OXIDANT ACTIVITY OF THE METHANOLIC EXTRACT OF *BLUMEA LANCEOLARIA* ROXB.DRUCE",

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Abstract: An extensive range of antioxidants from plant origin has been proposed for use in the treatment of various human diseases. Flavonoids and other phenolic compounds of plant origin have been reported as scavengers of free radicals. Hence, nowadays search for natural antioxidant source is gaining much importance. The present study was therefore carried out to investigate the antioxidant potential of methanol extract of the leaves of *Blumea lanceolaria* Roxb. Druce on different in-vitro as well as in-vivo models. To evaluate in-vitro and in- vivo antioxidant activity of leaves of *Blumea lanceolaria* Roxb.Druce . Leaves were dried and powdered. Successive extraction was carried out by using petroleum ether, chloroform and methanol extract in a Soxhlet Apparatus. The extract was evaporated using Rotary Vacuum evaporator under reduced pressure.The methanolic extract was used for the evaluation of in-vitro Antioxidant analysis such as DPPH, Hydroxyl, Superoxide and Nitric oxide. In-vivo antioxidant activity such as Estimation of lipid peroxidation (LPO), enzymic (CAT, SOD) non-enzymic (GSH) antioxidant system were performed by using Albino Wistar rats. The IC50 values of scavenging activities of MEBL on DPPH, Superoxide, hydroxyl and Nitric oxide were found to be 71.12µg/ml, 104µg/ml, 70.92 and 67.38µg/ml as compared to Ascorbic acid and gallic acid which were 118µg/ml 118.20µg /ml and 52.57 µg/ml, 62.34 µg/ml respectively. The in-vivo antioxidant activity was found to be quite equivalent to that of the normal rats. Administration of MEBL significantly showed higher percentage inhibition in a dose dependent manner.

PP3. "ANTIPYRETIC ACTIVITY OF ETHANOLIC EXTRACT OF *THEVETIA PERUVIANA* IN BREWER'S YEAST INDUCED PYREXIA",

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Abstract: Pyrexia or fever is caused as a secondary impact of infection, malignancy or other diseased states. It is the body's natural defense to create an environment where infectious agent or damaged tissue cannot survive. Normally the infected or damaged tissue initiates the enhanced formation of proinflammatory mediator's (Cytokines like interleukin 1β, α, β and TNF- α), which increase the synthesis of prostaglandin E2 (PG E2) near peptic hypothalamus area and thereby triggering the hypothalamus to elevate the body temperature. Search for safe herbal remedies with potent antipyretic activity received momentum recently as the available antipyretics, such as paracetamol, aspirin, nimusulide etc, which have toxic effect to the various organs of the body. In the present study, the ethanolic flower extract of *Thevetia peruviana* was investigated for antipyretic activity in rats using Brewer's yeast induced Pyrexia. The flowers of *Thevetia peruviana* were collected from North-East and cut into small pieces and shade dried. The dried powdered leaves

(100 gm) were extracted in a Soxhlet apparatus by using 95% ethanol. Albino rats weighing (200-250g) were taken for the experiment divided into four groups of six animals each. Group 1 received 3% aqueous suspension of gum Acacia (1 ml/200g) as vehicle orally, group 2 and group 3 received ethanolic flower extract of *Thevetia peruviana* 100 and 200 mg/kg with 3% aqueous suspension of gum Acacia orally and the group 4 served as standard received paracetamol 25 mg/kg with 3% aqueous suspension of gum Acacia orally. The subcutaneous injection of yeast suspension markedly elevated the rectal temperature after 18h of administration. Treatment with *Thevetia peruviana* extract at a dose of 100, 200 mg/kg decreased the rectal temperature of the rats in dose dependent manner. This effect was maximal at dose of 200 mg/kg and it caused significant lowering of body temperature (P< 0.01) up to 4 hour after its administration. The antipyretic effect started as early as 1h and the effect was maintained for 4h, after its administration. Both the standard drug paracetamol 25 mg/kg and tested drug *Thevetia peruviana* extract were significantly reduced the yeast elevated rectal temperature, at 2nd, 3rd and 4th hour compared to control group. The results of the present study suggest that the ethanolic flower extract of *Thevetia peruviana* in doses of 100 and 200 mg/kg, significantly reduce the temperature of pyretic rats as revealed from the observation that the average percentage of antipyretic activity increased with the concentration of the extracts (200mg/Kg) compared with the control. It is also presumed that the presence of flavonoids may be contributing to antipyretic activities of ethanolic flower extract of *Thevetia peruviana* in addition to the analgesic effect, as in the case of many of the established antipyretics.

PP4. "Fruit pulp of Garcinia sp. protect against behavioural symptoms of Parkinson's disease."

R Nath[1]*, A Choudhury[1], R Paul[1], S Puniya[2], A Borah[1] Institution: [1]Cellular and Molecular Neurobiology Laboratory, Department of Life Science and Bioinformatics, Assam University, Silchar, Assam, India. [2] Microbial and Molecular Immunology Laboratory, Department of Life Science and Bioinformatics, Assam University, Silchar, Assam, India. *Corresponding address: rajatnath17@gmail.com

Abstract: Background: Parkinson's disease (PD) is the second most prevalent neurodegenerative disorder arises due to loss of dopamine containing neurons in substantia nigra (SN) region of mid-brain. Motor behavioral deficits such as tremor, rigidity and postural instability are the cardinal features of Parkinson's disease. The Garcinia sp. has been reported with various protective activities. Though effect of Garcinia sp. in mice model of PD has not yet been studied. Method: The present study was designed to examine the effects of Garcinia morella in the rotenone model of PD. Chronic exposure of mice to rotenone causes a PD-like syndrome, which showed severe parkinsonian behavioral abnormalities. Powder of fruit pulp from Garcinia morella were administer orally in rotenone-induced parkinsonian mice. Result: The parkinsonian mice when administered with fruit pulp of Garcinia morella, significantly prevented the parkinsonian psyhomotor behavioral abnormalities, like: akinesia, catelepsy, swim performance, forced swim test, grid performance. Conclusion: The present study explores the neuroprotective potential of Garcinia morella in toxin-induced parkinsonian mice.

PP5. HERBAL MEDICINE IN THE TREATMENT OF ARTHRITIS

Sharmistha Kundu; BCDA College of Pharmacy & Technology, Kolkata, India.

Abstract: Arthritis is an inflammation in joints,is usually a chronic diseases that result from disregulation of pro-inflammatorycytokines(e.g-tumour necrosis factor) and pro-inflammatory enzyme that mediate the production of prostaglandins & leukotrienes,togather with the expression of adhesion molecules & matrix metalloprotcinases,& hyper proliferation of synovial fibroblasts.Prostaglandins & leukotriens are esosanoids,derived from 20-carbon fatty acid mainly from arachidonic acid in presence of cyclooxygenase & lepooxigenase respectively.All these factors are regulated by the activation of the transcription factor under nuclearfactor kappaB(NF-kB).Thus the agent that suppress the expression of tumour necrosis factor-a,interleukin-1bita,cyclooxygenase-2,lipooxigenase.Metalloproteinases or adhesion molecules or suppress the activation of NF-kB,all have potential for the treatment of arthritis.Numoerous agent derived fromplants can suppress this cell sinaling intermediates.These includes curcumine,resveratrol,tea polyphenols,genistein(soy), quercetin(onions),silymarin(obtained from artichoke),guggulstrrone(obtained from guggul),boswellic acid(obtained from salai guggul) and withanolides(obtained from ashwagandha).Indeed, several preclinical and clinical studies suggest that these agents have potential effect for arthritis treatment.Curcumine obtained from *Curcuma longa*(turmeric)offer therapeutic potential for the treatment of crystal induced arthritis or rheumatoid arthritis.It hasapositive effect in alone or in combination with diclofenac sodium in patients with active rheumatoid arthritis.Curcumine shows hightest percentage of improvement in overall Disease Activity Score(DAS). NF-kB is a pivotal transcription factor involved in the activation of the TNF-alpha and 1L-1bita genes.Activation of NF-kB in synovial cells is feature seenin arthritis patients.Resvevatrol is a polyphenolic,natural phytoalexin found in grape Skin and red wine is potent and specific inhibitor of TNF-alpha and 1L-1bita induced NF-kB activation.Intra-articular Injection of resveratrol may protect cartilage against the development of experimentally induced inflammatoryarthritis.

PP6. "Density functional theory study of structure and reactivity of some antioxidant polyphenols and their mode of interaction with enzymes", *Abhijit Dutta*, Dharitri Das, Paritosh Mondal , Department of Chemistry, Assam University, Silchar, Assam, India-788011, Email: adutta.chem89@gmail.com*

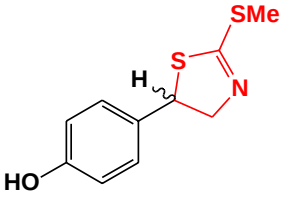
Abstract: Flavonoids are polyphenolic compounds that occur ubiquitously in foods of plant origin are extremely important because of their health effects. They occur in foods as O-glycosides with sugars bound at the C_3 position. They are frequently components of the human diet. Their total dietary intake could be as high as 1 g/d, which is much higher than that of all other classes of phytochemicals and known dietary antioxidants. Flavonoids are an important class of antioxidants. They effectively suppress lipid peroxidation (LPO) in biological tissues and subcellular fractions such as mitochondria, microsomes, liposomes, low density lipoprotein (LDL). Antioxidants are important candidate for the prevention of disease. In this study, Density Functional Theory (DFT) calculation has been performed to investigate the structure and reactivity of some antioxidant polyphenols. We evaluated global reactivity descriptors such as global hardness, electrophilicity and chemical potential values to study the reactivity of some polyphenols. Calculated geometrical parameters agreed well with available experimental values. All calculations have been performed at the hybrid B3LYP/ (6-31G*, CHO) level using GAUSSIAN 03 package. Among the studied polyphenols cucurmin is found to be most reactive. We also carried out molecular docking studies of these polyphenols against highly resistant bacteria pseudomonas putida. Most of the molecules have shown significant binding interaction with the receptor. We found that the cavity of the receptor surrounded by amnio acid residue GLU78, Ser77, Cys137, Asp172, His114, His67, Leu66, Val96, Arg130, Asn110 play crucial rule in binding with the ligands. The docking results provide useful information for future design of more potent inhibitor.

PP7. " Coexistence of Diabetes Mellitus and Hypertension - A Review", *APURBA TALUKDAR[1]* BIPLAB KURMAR DEY[1] [1]Department of Pharmacy, Assam down town University, Panikhaiti, Guwahati, Assam, PIN-781026*

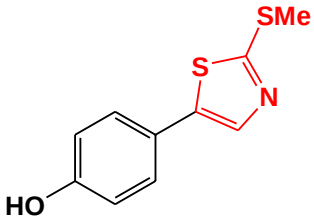
Abstract: Diabetes mellitus and Hypertension are a common disease that is suffered by a huge percentage of total population. The coexistence of these two diseases is at a greater frequency than alone. Hypertension in the diabetic individual potently increases the risk and accelerates the risk of cardiac disease, stroke, peripheral vascular disease, nephropathy and retinopathy. The management of both this disease is equally important and the reduction in cholesterol level have significant role in preventing diabetic complication. Diabetic associated diseases like nephropathy also lead to the development of hypertension particularly in type I diabetic patient. The coexistence of hypertension in both type I and type II diabetic patients can lead to be increased peripheral vascular resistance and the exchangeable sodium ion can be a reason for hypertension in diabetics. The insulin resistance or hyperinsulinemia or elevated insulin can be one of the major pathogenesis of hypertension. In the present study we have reviewed the various literatures related to the coexistence of to life threatening disease that is hypertension and diabetic and it was observed that these two diseases are most commonly associated in a person. Thus there should be some modified treatment procedures for this kind of life threatening associated diseases

PP8. "Bio-inspired Design of new Antibacterial Quinoline-Thiazinane Fused-ring Compound", *Anuradha Roy Choudhury*, Sayta Bhushan Paul, Sudip Choudhury Department of Chemistry, Assam University, Silchar, Assam, India E-mail: sudipch1@gmail.com*

Abstract: Thiazines , thiazolines and oxazolines class of compounds find importance due to their presence in various natural products exhibiting interesting bio-activities.[1] Recently, isolation two new phytoalexins, **Nasturiexin B** and **Tridentatol C** with remarkable activity against some fungal pathogens has been reported. Tridentatol C, is the chemical defence compound present in marine hydroid *Tridentata marginata*, and Nasturiexin B was suggested to be the bio-precursor of that compound.[2]



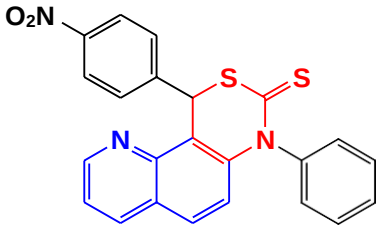
Nasturiexin B



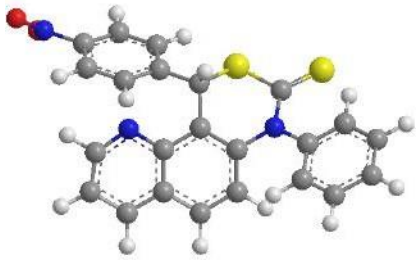
Tridentatol C

With an objective to design of new antibacterial compound taking Tridentatol C as the lead structure, in the present work, it was planned to increase the sulphure contain ring size, along with fusion with a quinoline skeleton. *In silico* docking study has been performed to ascertain the activity of the compounds. The compounds were synthesized by One-

pot **Multicomponent reaction (MCR)** approach, with structural characterization by spectroscopy. One of the compounds (**HQNO2**) synthesized exhibited inhibitory activity against *E. coli* , *K. pneumonia.* , *B. subtilis* and *S. aureus* bacteria.



Structure of Compound **HQNO2**



3D Structure of Compound **HQNO2**

PP9. "A Study on *Oxalis Acetosella* to Evaluate its Antibacterial Activity", *Partha Sarathi Datta, Nilimanka Das, Tarun Kanti Ghosh* Regional Institute of Pharmaceutical Science & Technology Agartala, Tripura - 799 005. *Email- tghosh073@gmail.com*

Abstract: *Oxalis acetosella* plant commonly known as Wood Sorrel belongs to the family Oxalidaceae. The leaves and flower of this plant is generally used for medicinal purpose. The leaves are sour in taste with a characteristic odor. It is used as an anodyne and addresses conditions like scurvy i.e. an anti-scorbutic. It is also used as an astringent, diuretic, emmenagogue, expectorant, febrifuge and stomachic. A decoction of this plant is prescribed in the treatment of fever i.e. as febrifuge. When the leaves are crushed can be applied topically to dispel boils & abscesses for its astringent effect. It is thus very obvious to undertake research on such type of plant to evaluate its antibacterial activity. In the present study we have used the dried leaves of the plant and extracted the constituents using different solvent system. Number of studies were carried out to determine the presence of alkaloid, saponin, flavanoid, glycoside and terpenoid in it. The methanolic extract was found to have sound antibacterial effect against *E.coli* and *S. aurious.* The preliminary studies hold the promise of further investigation of this plant to explore other possibilities.

PP 10. Design of Aloe vera Cosmetic Herbal Hydrogel, *Sajidul Hoque, 3rd year Student, Dept. Pharmaceutical sciences, ASSAM UNIVERSITY, Silchar*

Abstract: Aloe vera has gained attention over the last several decades due to its medicinal properties. Aloe vera is also termed as nature's gift due to its appreciable contributions. Aloe vera contains carbohydrate polymers, notably glucomannas alongwith a range of organic and inorganic components such as vitamins and minerals. Numbers of herbal formulations of aloe vera are available in market. However , these formulations contain very less quantity of aloe vera and herbal components and claiming a wonderful herbal formulation. Present study deals with the development and characterisation of aloe vera cosmetic herbal hydrogel formulations using aloe vera leaf and other natural component. Present investigation deals with the development of aloe vera cosmetic herbal hydrogel formulations using aloe vera leaf, acacia, hydroxy propyl methyl cellulose (HPMC), gelatin, glycerine, tartaric acid, potassium sorbate and sodium benzoate. Aloe vera liquid was prepared by heating at low temperature and the hydrogel was prepared by simple dissolving method of other ingredients in a specific manner. Four formulations were developed which differ in the ratio of hydrogel forming polymers. Formulations AV1,AV2,AV3 and AV4 were composed of acacia , HPMC , gelatin in the ratio of 1:1:1 , 1:2:1 , 2:1:1 and 1:1:2 respectively. All the formulations were evaluated for rheology , viscosity , transparency , smoothness density , pH and microbial growth . on the basis of evaluation parameter formulation AV4 was selected as developed formulation . It is also concluded that aloe vera cosmetic herbal hydrogel may be used for cosmetic purpose .

PP 11. HERBAL PESTICIDES: AN OVERVIEW, *Nitin Agarwalla, Dipankar Dutta, Partha Palit, B.PHARM 3rd SEM, ASSAM UNIVERSITY, SILCHAR*

Abstract: Herbal pesticides are those non-toxic materials which does not contain any synthetic chemicals neither they are man-made; they can only obtained from nature. In ancient days, herbal pesticides were widely used for the treatment of different diseases and to control the plants from pests. Today science have developed many chemicals and machines for the treatment and to control the pests but still the ancient method i.e. Herbal pesticides are preferred because the synthetic chemicals which are used for protecting the cultivated plants from pests, cause many disorders and symptoms in our body as they are very much toxic. Herbal pesticides are generally used in village area as there is no development in science. Herbal pesticides like Neem, ginger, garlic, turmeric, are very common herbal products and used as our household materials has various uses from which we are very much familiar other than this there are many more herbal pesticides which are used for major and minor illness. Herbal pesticides play a great role in our day to day life as it is very much common in use and can be used safely. Since, the use of herbal pesticides is very much important as it is

used in various ways in our daily life; so one must have the knowledge of herbal pesticides; as it is also useful for fruitful healthy body. It can be used for multi-purposes aspect safely. So, review may conclude that herbal pesticides are the emerging pharmaceutical agents for cultivating safe agricultural foods and vegetables.

PP 12. HERBS AS BIOFERTILIZER : AN OVERVIEW, *Anindita dutta roy, Kritideepa Nath, Priyanka kurmi, Abhisek Pal; , B.PHARM 3rd SEM, ASSAM UNIVERSITY, SILCHAR*

Abstract: Bio-fertilizer is a substance which contains living microorganisms which when applied to seed, plant surfaces, or soil, colonizes the rhizosphere or the interior of the plant and promotes growth by increasing the supply or availability of primary nutrients to the host plant.Bio-fertilizer adds nutrients through the natural processes of nitrogen fixation, solubilizing phosphorus, and stimulating plant growth through the synthesis of growth promoting substances.Preferred scientific term for such beneficial bacteria is "***plant growth promoting rhizobacteria" (PGPR).***Bio-fertilizers provide eco-friendly organic agro-input.Bio-fertilizers such as ***Rhizobium, Azotobacter, Azospirilium***, and ***Blue greenalgae(BGA)*** are in use for a long time. Important groups of Bio-fertilizer are-a) Azollaanabena symbiosis- Azolla is a small,eukaryotic, aquatic fern having global distribution. Prokaryotic blue green algae anabena azolla resides in its leaves as a symbiont. Azolla is an alternative nitrogen source.b) Rhizobium- Symbiotic nitrogen fixation by rhizobium with legumes contributes substantially to total nitrogen fixation. Rhizobium inoculation is a well-known agronomic practice to ensure adequate nitrogen. Example of biofertilizers are- Free living nitrogen fixing bacteria. e.g., Azotobacter, Bacillus polymyxa, Clostridium, Beijerinckia. Free living nitrogen fixing cyanobacteria. e.g., Anabaena, Nostoc, Aulosira, Totypothrix, Cylindrospermum, Stigonema. Loose association of nitrogen fixing bacteria. e.g., Azospirillum, rhizosphere. Symbiotic nitrogen fixing bacteria. e.g., Rhizobium leguminosarum, R. lupini, R. trifolii, R. meliloti, R. phaseoli. Symbiotic nitrogen fixing cyanobacter. e.g., Cyead roots, lichens, liverworts, Azolla.Microphos bio-fertilizers. e.g.,Bacillus polymyxa, Pseudomonas striate, Aspergillus species. Mycorrhiza- It is of two types – *Ectomycorrhiza Endomycorrhiza*

PP 13. "Isolation and spray drying of starch derived from Assam bora rice", *Abhishek Bhattacharjee*, Department of Pharmaceutical Sciences, Assam University Silchar, India.*

Abstract: The objective of the research work was to isolate starch derived from Assam bora rice by suitable extraction method. The starch so obtained was spray dried by using spray drier. The micromeretic properties, moisture content, particle size distribution and the physicochemical properties were determined Native unmodified starch obtained from Assam bora rice was found to have poor compressibility index and flow properties. Modification of starch via spray drying technique resulted in increased flowability and compressibility of the starch. The results indicated spray dried Assam bora rice starch can be used as a potential directly compressible excipient.

PP14. "SELECTION-EVALUATION OF DIFFERENT EXCIPIENTS (BINDERS) FOR PREPARATION OF LEFLUNOMIDE TABLETS", *Siddhartha Choudhury. D.Pharm, B.Pharm, M.Pharm(Pharmaceutics), Department of pharmaceutical science, Assam University, Silchar-788011, Assam, India.*

Abstract : DMARDs(Disease Modifying Anti Rheumatic drug) duces the rthat ate of damage to the bone and cartilage.They prevent bone and joint damage from occurring secondary to the uncontrolled inflammation. Leflunomide is lymphocytes in patient with Rheumatoid arthritis. Arthritis symptoms are suppressed and radiological progression of disease is retard. The study was under taken with an aim of Formulation. Development and Evaluation of Leflunomide tablets using excipients , various polymers on pure drugs and granules and results directed for further course of formulation. Based on preformulation studies different batches of Leflunomide were formulated using selected excipients. Granules were evaluated for loss on drying, Angle of repose, Bulk density, Tapped density, Compressibility Index and Hausner's Ratio. Tablets were tested for weight variation, thickness, hardness, disintegration time, In-vitro drug release studies as per specifications. The formulation that has been found to posses ideal characteristics required for Leflunomide 10mg, 20mg tablets, so it was concluded as the final formula for Leflunomide 10mg, 20mg tablets are 150mg, 200mg respectively made by co-precipitation of drug with Polyvinyl pyrrolidione K30. The drug release profile of Leflunomide compared with market sample. From the studies it was concluded that formulation of Leflunomide Tablets containing lactose monohydrate, starch, HPMC K100M, Guar gum, Mg-stearate taken as ideal or optimized formulation of tablets.

PP15. "Prophylactic role of carnosic acid against $NaAsO_2$ induced hepatotoxicity", *Sonjit Das, Saikat Dewanjee Advanced Pharmacognosy Research Laboratory, Department of Pharmaceutical Technology, Jadavpur University, Kolkata 700032, India.*

Abstract: The present study was undertaken to evaluate the prophylactic effect of carnosic acid (CA) against $NaAsO_2$-induced hepatotoxicity. The cytoprotective effect of CA against $NaAsO_2$ (10 µM) was measured on isolated murine hepatocytes. The effect on lipid peroxidation, protein carbonylation, cellular redox markers and signal proteins were

measured after incubating the hepatocytes with $NaAsO_2$ (10 µM) + CA (20 µg/ml). Finally, the hepatoprotective effect of CA (10 and 20 mg/kg) against $NaAsO_2$ (10 mg/kg) was further measured by *in vivo* assay in experimental mice. *In vitro* bioassay on isolated mouse hepatocytes confirmed cytoprotective effect of CA. The $NaAsO_2$ treatment significantly ($P < 0.01$) increased the extents of lipid peroxidation, protein carbonylation with concomitant reduction ($P < 0.01$) of antioxidant enzymes and reduced glutathione levels in hepatocytes. In addition, $NaAsO_2$ significantly ($P < 0.05$-0.01) altered the expression of intrinsic (Bad↑, Bcl-2↓, cleaved-caspase 3↑ and cleaved-caspase 9↑) and extrinsic (Fas↑, t-Bid↑, cleaved-caspase 8↑) transcription proteins participating in the apoptotic event. However, CA treatment could significantly rescue the aforementioned parameters near-normal levels. In *in vivo* bioassay, $NaAsO_2$ intoxication increased ($p < 0.01$) bioaccumulation of As along with the abnormalities in haematological parameters and redox imbalance in the livers of experimental mice. Treatment with CA, however, could significantly ($P < 0.05$-0.01) restore the hematological and redox parameters to the near-normal levels, with histological studies of livers supporting the protective role of CA. In conclusion, CA would produce the effect via scavenging oxidative free radicals and attenuating redox imbalance.

PP16. "Exploration of antidiabetic effect of *Sansevieria roxburghiana* Schult. *&* Schult. F. (family: Asparagaceae) rhizomes", *Niloy Bhattacharjee, Saikat Dewanjee Advanced Pharmacognosy Research Laboratory, Department of Pharmaceutical Technology, Jadavpur University, Kolkata 700032, India.*

Abstract: *Sansevieria roxburghiana* Schult. *&* Schult. F. (Family: Asparagaceae) rhizome has been claimed to possess antidiabetic activity in the ethno-medicinal literature in India. Therefore, present experiment was carried out to explore the protective role of aqueous extract of *S. roxburghiana* rhizome (SR) against experimentally induced type 2 diabetes mellitus (T2DM) in Wistar rats. SR was chemically characterized by LC-MS analysis. Antidiabetic activity of SR (50 and 100 mg/kg; *p.o.*) was measured in nicotinamide (110 mg/kg; *i.p.*) + streptozotocin (65 mg/kg, *i.p.*) induced type 2 diabetic (T2D) rat. Fasting blood glucose level was measured at specific intermissions. Serum biochemical and inflammatory markers were estimated after sacrificing the animals. Histological and ultrastructural studies of pancreas were performed in the controls and SR treated T2D rats. Phytochemical screening of the crude extract revealed the presence of phenolic compounds, sugar alcohols, sterols, amino acids, saturated fatty acids within SR. T2D rats exhibited significantly ($p < 0.01$) higher fasting blood glucose level with respect to control. Alteration in serum lipid profile ($p < 0.01$) and increased levels of lactate dehydrogenase ($p < 0.01$) and creatine kinase ($p < 0.01$) in the sera revealed the occurrence of hyperlipidemia and cell destruction in T2D rats. T2DM caused alteration ($p < 0.05$-0.01) in the serum biochemical markers viz. glycosylated haemoglobin, advanced glycation end products, intercellular adhesion molecule 1, monocyte chemo-attractant protein 1, vascular endothelial growth factor, tumor necrosis factor-α, pro-inflammatory interleukins, urea, uric acid etc. related to diabetic complications. However, oral administration of SR (50 and 100 mg/kg) could significantly ($p < 0.05$-0.01) reduce hyperglycemia, hyperlipidemia, vascular inflammation, membrane disintegration leading to cellular damage. Histological and ultra-structural studies of pancreatic tissues supported the protective characteristics of SR. Presence of substantial quantities of ferulic acid, caffeic acid, oleic acid, ergosterol, stigmasterol, heptadecanoic acid, gallic acid, sinapyl alcohol, 4-hydroxycinnamic acid, protocatechuic acid, 4-hydroxy-3-methoxybenzoic acid, vanillin, hydroquinone and 4-hydroxybenzaldehyde would have exerted the overall antidiabetic effect in combination.

PP17. "DEVELOPMENT OF TAMARIND SEED GUM-HYDROLYZED POLYMETHACRYLAMIDE-G–GELLAN COMPOSITE BEADS FOR EXTENDED RELEASE OF DICLOFENAC SODIUM USING 3^2 FULL FACTORIAL DESIGN", *G. Nandi*, A. K. Nandi, N. S. Khan, S. Pal, S. De BCDA College of Pharmacy and Technology,78, Jessore Road (S), Hridaypur, Kolkata-700127, India.*

Abstract: The drug release characters of ion-induced gellan hydrogels endure from some severe troubles such as low drug entrapment and advanced drug release. In this attempt, we tried to overcome these problems enhancing the degree of cross-linking followed by incorporation of tamarind seed gum in the cross-linked matrix. Development of tamarind seed gum (TSG)-hydrolyzed polymethacrylamide-g-gellan (h- Pmaa-g-GG) composite beads for extended release of diclofenac sodium using 3^2 full factorial design is the main purpose of this study. The composite beads were prepared by ionotropic gelation method. Effects of polymer ratio and $CaCl_2$ on drug entrapment efficiency, drug release, bead size and swelling were investigated. DEE, % drug release at 1h, 2h, 4h, 6h, 10h, release-rate constant, dissolution difference and similarity factors were statistically analyzed by 3^2 full factorial design using Design-Expert software and the factors were then numerically optimized to obtain USP-reference release profile. The optimized formulation showed DEE of 93.25% and an extended drug release profile over a period of 10 h with f_2 = 80.13. Kinetic modeling unveiled case-I-Fickian diffusion based drug release mechanism. This approach of chemical modification of natural polysaccharides and subsequent fabrication into extended release multiparticulate device can be followed for development of efficient sustained release dosage forms.

PP18. "Sodium Alginate Microspheres of Metformin HCl: Formulation and In Vitro Evaluation", *Sarbani Dey Ray, Supratim Ray*

Abstract: Metformin microspheres with sodium alginate alone and in combination with gellan were prepared using an emulsion-cross linking method. The prepared microspheres were evaluated for their physico-chemical characteristics like

particle size, morphology using SEM, incorporation efficiency, equilibrium water content (swelling) and in vitro drug release. The effect of various formulation variables like polymer concentration (sodium alginate; and proportion of gellan in microspheres prepared by a combination of sodium alginate and gellan), drug loading, crosslinking agent concentration and cross-linking time on the in vitro dissolution of the prepared microspheres were evaluated. The results showed that both the particle size and the incorporation efficiency were proportional to the polymer concentration. In case of microspheres containing both sodium alginate and gellan, the mean diameter and the incorporation efficiency were higher than the corresponding microspheres containing only alginate, both increasing with an increase in proportion of gellan. The prepared microspheres were found to be discrete and spherical in shape and were successful in sustaining the drug release for 8 hours. Incorporation of gellan caused a significant decrease in drug release. The release followed a biphasic profile, in all cases, characterized by an initial phase of moderate drug release followed by a phase of higher release. Further, the kinetic treatment of the dissolution data revealed the prevalence of matrix diffusion kinetics.

PP19: "Garcinol a plant component of *Garcinia sp*. ameliorates brain dysfunctions: Relevance to Parkinson's disease"

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Abstract: Garcinol is a plant component derived from *Garcinia sp.* which are abundant in Northeast region of India. Parkinson's disease is a neurodegenerative disorder arises due to loss of dopamine containing neurons in substantia nigra region of mid brain. The present study provided evidences of Garcinol or *Garcinia* extract as a potent neuroprotective molecule to treat Parkinson's disease. The Garcinia extract containing Garcinol showed tremendous antioxidant property in vitro. In animal model of Parkinson's disease *Garcinia* extract reversed the behavioural abnormalities (motor behaviour) which were evident in parkinsonian model. Furthermore, the neurotransmitter dopamine levels in parkinsonian brain was alleviated by*Garcinia* extract. While, *Garcinia* extract did not provide neuroprotection in terms of Tyrosine Hydroxylase immuno-positive neurons in Parkinson's disease model. Moreover, Garcinol has been found to increase dopamine level due to its ability to inhibit the enzyme monoamine oxidase B, which is responsible for dopamine catabolism in brain. Thus, *Garcinia* extract provided protection in terms of behaviour and neurotransmitters without effecting the dopamine containing neurons.

PP20. " REVIEW ON HERBAL DYE: AN EMERGING PHARMACEUTICAL AID",

Subhranil Sen, Bedanta Bhattacharjee, Abhijit Dey and Partha Palit Department of Pharmaceutical Sciences, Assam University Silchar, Silchar-788011 Assam, India. Email- subhranilsenofficial@gmail.com or bedanta1994@gmail.com

Abstract: Herbal dyes are the most promising colouring agent amongst the natural class of dyes. The use of herbal dyes together with therapeutic properties is as ancient as human civilization. The herbal dyes are used in cosmetic industries for their UV rays protecting properties, no side effects, and anti-aging properties. For eg- Saffron (crocin) obtained from the plant *Crocus sativus* Linn. Its active constituent is having anti-convulsant, anti-depressant, anti-inflammatory, memory improving properties. There are many such herbal dyes namely Tomato (lycopene) Beet roots (betanin); Turmeric (curcumin); Safflower (carthamin and carthamidin); alkanets (alkanins); these kind of dyes have many therapeutic properties such as some these are rich in Vitamin-A, some are powerful antiseptic, some are related with curing several chronic diseases or some are related in coloring lip sticks and other cosmetics. Efficiency of this dyes are in also in great extent. Some dyes extracted from plants have important medicinal properties like; antimicrobial activities, antifungal activities. These dyes are usually obtained through soxhlet, supercritical, sub-critical, sonicator based extraction. The present review, describes the detailed information about the chemistry of the major pigments and their medicinal importance from dye-producing plants. These appraches could be helpful for further development of safe and effective excipients of pharmaceutical drugs and cosmetics formulations and commercial food products.

PP21. "Development and Evaluation of Gellan Gum Based Smart Hydrogel for Bio-Sensing Application",

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Abstract: During pregnancy the baby remains protected in mother's womb in a fluid called Amniotic fluid. But many a time unfortunately the amniotic sac ruptures leading to secretion of this fluid and exposing the baby under adverse conditions & even death. As a preventive measure to protect the mother and baby, it is important to identify the liquid secreted from vagina at the earliest. It has seen that the pH of normal vaginal secretion is 3.8-4.5, but the amniotic fluid secreted is having a pH varies from 7.2 to 7.5. Hence our work is focused on developing polysaccharide based polymeric smart hydrogel to sense the fluid secreted from vagina accompanied by instant corresponding color change. Polysaccharide based polymers are known for their unique and tailorable properties. They have carboxylic, amine, hydroxyl and other functional groups which render them unique for application in most contemporary fields in biomedical vicinity. In the present work, attempts have made to develop Bromothymol Blue (BTB) containing Gellan Gum (GG) smart hydrogel using calcium chloride (0.5M) as a crosslinking agent. BTB is a weakly acidic pH indicator that shows color change with environmental pH fluctuations. GG in the concentration range of 0.5% to 2.0% was worked for the development of smart hydrogel. It is observed that 1% GG and 0.1% BTB can produce stable hydrogel that exhibit color changes in the pH range of 1 to 8. The smart hydrogels produce yellow color at pH 4 and blue color

at pH 8. It was also observed that the reaction time was very short (within seconds) when expose to alkaline environment. Thus conclusion may be made that the GG based hydrogel are smart enough to act as a pH sensor to detect the amniotic fluid.

PP22. "Antibiofilm potentiality of *Parkia javanica* against *Pseudomonas aeruginosa*: A study with fruit extract".

M. C. Das[1*], A. Das[1], A. Daware[1], P. Sandhu[2], U. C. De[4], Y. Akhter[2], S. Bhattacharjee[1], Department of Molecular Biology & Bioinformatics, Tripura University, Tripura, 799022. ***presenting author**.

Abstract*: Parkia javanica* is a well-known ethno-botanical plant of north-east region of India. Ethnic communities of the region use several parts including fruits of this plant for the treatment of several ailments like diarrhoea, dysentery, cholera, food poisoning etc. With this background we have proposed to perform chemical characterisation, investigation of antimicrobial and antibiofilm potentiality of ethyl acetate fraction of *Parkia javanica* fruit extract (**PJE**) against model biofilm causing microorganism *Pseudomonas aeruginosa*. **PJE** was initially assayed by IR, UV and HPLC to confirm the presence of compounds. HPLC analysis reveals that **PJE** contain three flavone compounds baicalein, quercetin and chrysin. **PJE** showed very significant antimicrobial activity against *P. aeruginosa* wherein the minimum inhibitory concentration (MIC) was found at 180 µg/ml. Interestingly, the antibiofilm study illustrates that 30 µg/ml concentration of **PJE** exhibited maximum activity whereas 90 µg/ml concentration of **PJE** executed minimum antibiofilm activity respectively. AFM study reveals that aggregates in **PJE** are lesser in size at low concentration than at higher concentrations. This was also observed that baicalein, quercetin and chrysin separately possess less to moderate antibiofilm activity. Molecular docking study explores that baicalein, quercetin and chrysin has good binding affinity with bacterial quorum sensing and motility associated proteins. Furthermore, we have also observed that lower concentration of **PJE** exhibited better attenuation in swarming motility, secretion of proteases and virulence factors like pyoverdin and pyocyanin. Observations in the present study suggest that **PJE** as a whole execute higher antibiofilm property at low concentration whereas individual compound has comparatively lesser antibiofilm activity. This validates the phytomedicinal significance of *Parkia javanica* against bacterial biofilm.

PP23. " FABRICATION OF MATRIX CORE TABLET AS BI PHASIC,DUAL COMPONENT DELIVERY SYSTEM CONTAINING ACECLOFENAC",

Siddhartha Choudhury D.Pharm, B.Pharm, M.Pharm (Pharmaceutics). Department of Pharmaceutical Science, Assam University,Silchar-788011,Assam,India.

Abstract*:* The purpose of the present research was to produce a quick/slow biphasic delivery system for aceclofenac. A dual component tablet made f a sustained release tabletted core and on immediate release tabletted coat was prepared by compression. Both the core and the coat contained a model drug aceclofenac. The sustained release effect was with achieved polymers hydroxypropyl methylcellulose, ethylcellulose and Xanthan gum to sustain the release of drug. The in-vitro drug release profile from these tablets showed the desired biphasic release behavior of aceclofenac, where the fast releasing component was dissolved within 30 minutes and the drug in the core tablet was released over a period of 12 hours from the matrix tablets. It was observed that Xanthan gum is a better release retarding agent HPMC and ethyl cellulose as it delayed the release of the drug for more than 15hrs. The results obtained with the dissolution test shows that the release profile is dependent on the type and amount of polymer in the core tablet.

PP24. "Development of Citronella Oil Encapsulated Alginate Matrix for Antibacterial Activity",

Radhe Yalu[1], Sushanta Ghosh[2], Tarun Ghosh[1], Partha Sarathi Datta[1], Nilimanka Das[1*] [1]Regional Institute of Pharmaceutical Science & Technology, Agartala, Tripura (W), 799 005, India, [2]Tripura University, Suryamaninagar- 799 022, India, Email ID: aandeehere@yahoo.co.in

Abstract: Essential oils (EO) are the volatile lipophilic compounds extracted from plant origin widely used as an antibacterial, antifungal, antioxidant, and insect-repellent products. But the escaping tendency these compounds are a major concern as they reduce the efficacy drastically. Citronella oil is a type of essential oil that contribute different types of remedial properties like antibacterial, antiseptic, fungicidal, antidepressant, antispasmodic, anti-inflammatory, deodorant, insect repellent and many more. However Citronella being volatile, unstable and insoluble in water creates impediments in formulation development. The commercial application of such oil warrant a suitable formulation made of biodegradable materials that protect them from degradation & evaporation and at the same time allows for a sustained effect. The objective of this study is therefore to reduce the rate of evaporation of the oil via microencapsulation and to evaluate this oil impregnated particles for antibacterial activity. Alginate beads containing Citronella oil were formulated using emulsion extrusion method. The beads were hardened with a cross-linking agent, calcium chloride. The effect of three variables i.e. alginate concentration (0.5-3%), cross-linking agent concentration (0.25-1%) and time of cross-linking (5-20 min.) on loading capacity (%) and encapsulation efficacy (EE, %) were studied. The antibacterial activity of the encapsulated oil was evaluated against four of pathogenic bacterial species: *E. coli, K. neumonia, P. neumonia, S. aurious. C. albicans*. The result of the experiments holds the promise that the formulations developed could be used effectively against the specified organisms and ensures sustained delivery.

PP25. "ROLE OF ADAPTOGENS IN HEALTH MANAGEMENT: A REVIEW", *Joyeeta Dutta Choudhury, Puja Debnath, Sanghita Nath Mazarbhuiya Department of Pharmaceutical science, Assam University, Silchar Email: ch.joyeeta189@gmail.com*

Abstract: The term` adaptogen' was first defined by Lazarev, a Russian pharmacologist in 1947.He defined `adaptogen' as agents which help an organism to counteract any adverse effects of a physical, chemical or biological stress or by generating non-specific resistance. Adaptogen support our bodily functions and are unique in helping to modulate the immune system. They are capable of either toning down the activity of overfunctioning systems or strengthening the activity of underfunctioning systems, thus having a normalizing effect. Adaptogens helps in preventing and reducing the incidence of illness. Adaptogenic herbs can be used as the treatment or part of the treatment for stress, exposure to stressors such as high altitude, intensive training, chronic illness, convalescence, chemotherapy, radiation therapy etc. Adaptogens such as Tulsi, Ginseng, Rhodiola, aswagandha etc are cheap, readily available with no side effects. Daily use of adaptogens strengthens our immune system and prevents the chances of attack from lifethretening diseases such as diabetes, cancer, neurodegenerative disorders, hepatistis. Hence it improves the quality of life. Despite of all these advantages, the adaptogens are not in use to that extent, as awareness among the people regarding their uses is limited. Better exploration of such herbs related to standardization of doses and efficacy is required for developing fruitful herbal health tonic.

PP 26. "BURNING ROLE OF HERBS AS NUTRACEUTICALS: AN OVERVIEW", *Silvi Roy and Tirna Paul, 2nd Year, Department of Pharmaceutical Sciences, Assam University, Silchar.*

Abstract: In recent years there is a growing interest in nutraceuticals, which provide health benefits and are alternative to modern medicines. The nutraceuticals have evolved from the recognition of the link between functional food and health. Nutrients, herbals and dietary supplements are the major constituents of nutraceuticals. In India, the most common forms of functional foods and nutraceuticals are available as traditional Indian Ayurvedic Medicines, Heart disease continues to be a primary cause of death in most of the developing countries world-wide, followed by various fatal diseases. Consumers being frustrated with the expensive, high-tech, disease-treatment approach in the modern medicines are seeking complementary or alternative beneficial products. "Let food be thy medicine and medicine be thy food", quoted by Hippocrates about 2500 years ago is certainly the tenet of today. Prebiotics and probiotics are the functional food ingredients, which effect a beneficial modification in the composition and activities of gut microflora of infants by increasing positive flora components. The prebiotic approach aims to increase resident bacteria that are considered to be beneficial for human health, e.g. bifidobacteria and lactobacilli, while probiotics advocates the use of the live micro-organisms themselves in the diet. Both approaches have found their way into infant formula feeds and aim to more closely simulate the gut microbiota composition seen during breast-feeding.

PP27. "Andrographolide mediated necroptotic induction in drug resistant HepG2 cells",

Sujan Chatterjee[1], Dipanwita Sengupta[1], Avik Sarkar[1], Soumosish Paul[1], Ankita Malakar[1], Mriganka Biswas[1], Papiya Datta[1], Gobinda Chandra Sadhukhan[1,3], Kaustuv Dutta Chowdhury[1,2]* [1]Molecular Biology and Tissue Culture Laboratory, Post Graduate Department, Department of Zoology, Vidyasagar College, 39, Sankar Ghosh Lane, Kolkata–700006, [2]Cyto-genetics Laboratory, Department of Zoology, Rammohon College, 102/1, Raja Rammohan Sarani, Kolkata-700009, [3]UGC-Academic Staff College, Jadavpur University, Kolkata–700032, *Email: dutta.kaustuv@rediffmail.com

Abstract: Treatments such as resection, liver transplantation or ablation are followed by chemotherapeutic treatment to reduce probability of recurrence of hepatocarcinoma. Extensive exposures of chemo-drugs lead to generation of drug resistance. In most of the cases, it is relevant to apoptotic defect which is much more complicated than drug transporters mediated drug-effluxing and pose a delicate problem towards mankind. To solve this crisis we have developed cisplatin resistant HepG2CR cell line upon which effect of andrographolide is observed to unravel the possibility of introduction of necroptosis where inductive upstream events are different from apoptosis and therefore all the barriers set up to avoid the latter are no longer able to create any problem for the former. Analysis suggested that andrographolide mediated cAMP-PKA-PP2A axis reduced NF-κβ nuclear translocation resulting reduction in cFLIP expression, activation of caspase8 as well as lysosomal destabilization and tAIF dependent scramblase activation leading to PS exposure, the hallmark of programmed cell death. Therefore it is expected to circumvent apoptotic resistance and that can be utilized during scheming of schedules against apoptosis resistant cancer cells in near future.

PP28. "FORMULATION OF ANTIBACTERIAL AND ANTIFUNGAL GEL USING THE EXTRACT OF *Mimosa pudica* Linn. FOR VULVA-VAGINAL INFECTIONS", *Bhargab Jyoti Sahariah[1], Rama Kanta Sharma[2], Mangala Lahkar[3] , [1]Department of Pharmacy, Assam down town University, Panikhaiti, Guwahati, Assam, PIN-781026, [2] Department of RS & VK, Govt. Ayurvedic College,Guwahati-781014, [3] Department of Pharmacology, Guwahati Medical College, Guwahati-781032, Author for correspondence: bhargabjyoti@gmail.com Mobile: +91-9854547515*

Abstract: The *Mimosa pudica* Linn. is a plant having multi activity and has been using as a single herb or as in polyherbal preparation from the prehistoric time. In Ayurveda, it was mentioned that the decoction of the whole plant was used to wash the vaginal infections. From different literature, it is come to know that in Bangladesh and in Sudan, it was used in UTI and Oral infections. Due to the clear justification of antimicrobial activity, the plant were tested against six microbial strain out of which two were gram positive bacteria, two were gram negative bacteria and two were fungal strain. *Staphylococcus aureus*, *Straphylococcus saprophyticus, Klebsiella pneumonia*, *Escherichia coli, Aspergillus niger & Candida albicans* were the choice of test organisms. The inhibitions of zone were tested using the disc diffusion method. Ciprofloxacin and Fluconazole were used as positive control for the bacterial and fungal strain respectively whereas DMSO was used as negative control. The activity index of both the fungal strain and *Klebsiella pneumonia* were very near to one. Four formulations namely BVF1,BVF2.BVF3 and BVF4 were prepared using the blend of carbopol 934, SCMC, CMC, Propylene glycol, glycerine and the extracts or the supernatend centrifuged decoction of the plant. The BVF4 and BVF1were found having good bioadhesive properties. The pH , spreadibilty, vaginal retention, vaginal irritation were as same as the original formulation even after the accelerated stability studies.

PP29. "SAC and berberine mediated amelioration of chemically induced hepatocarcinoma-an *in vivo* study", *Kaustav Dutta Chowdhury[1,2], Dipanwita Sengupta[2], Sujan Chatterjee[2], Avik Sarkar[2], Soumosish Paul[2], Gobinda Chandra Sadhukhan[2,3] [1]Assistant Professor, Cyto-genetics Laboratory, Department of Zoology, Rammohon College, 102/1, Raja Rammohan Sarani, Kolkata-700009 [2]Molecular Biology and Tissue Culture Laboratory, Post Graduate Department, Department of Zoology, Vidyasagar College, 39, Sankar Ghosh Lane, Kolkata–700006 [3]UGC-Academic Staff College, Jadavpur University, Kolkata–700032 *Email: sadhukhan.g.c@gmail.com*

Abstract: Male swiss albino mice were exposed to environmental carcinogens like diethylnitrosamine (promoter) and carbon tetra chloride (enhancer) to develop chemically induced hepatocarcinoma. After 90days of carcinogenic exposure animals were treated with 8mg/kg body weight berberine (an isoquinoline alkaloid present in *Berberis sp.*, *Hydrastis canadensis*, *Phellodendron amurense*, *Coptis chinensis*, *Tinospora cordifolia* and to a smaller extent in *Argemone mexicana* and *Eschscholzia californica*) and 250mg/kg body weight SAC (S allyl cysteine; an organosulphur isolated from garlic extract) in individual and as well as in combination. Efficacy of the drugs in the amelioration of liver tissue carcinoma was estimated after 30 and 60days of treatment by analysing tissue morphology, histology and the status of programmed cell death pathway with respect to untreated carcinogen exposed group. Data evaluation demonstrated induction of tumour suppressor in parallel to the modification of pro- and anti-apoptotic balance towards cell death resulting effective removal of liver tumour after drug treatment in DEN+CCl4 exposed mice.

PP30." STUDY ON PRACTISE OF ETHNO-MEDICINE BY INDEGENOUS SOCIETIES OF MANIPUR : *PROSPECTS FOR FOOD PRODUCT DEVELOPMENT*", *Daisy Sharma and Sujata Deka, Assistant professor, Dept. of Food Nutrition and Dietetics, Assam down town University*

Abstract: The present study was undertaken with the objectives of documentation of the ethno-botanical plants of Manipur. For the documentation of ethno-medicinal information, a survey was conducted using a standard questionnaire in different villages of Manipur from Imphal-East District i,e Yambem, Top-chingtha, Bisnunaha & Huikap. From the survey it was found that various medicinal plants were frequently used by the local people of Manipur for the treatment of various diseases like diabetes, rheumatic arthritis, gout, urinary tract infections, respiratory disorders and different skin diseases. From the present study it was also observed that the medicinal plants were not only used for medicinal purposes but were also used in the dietary of Manipuri people in the preparation of traditional dishes. Information on 50 numbers of medicinal plants were collected and documented, out of which few selected plants have shown the potential of product development. Since last two decades emphasis have been given in the development of novel fortified value added food products for promoting better health and lifestyle. Several research have reported that medicinal plants play a potential role in treatment of degenerative diseases and metabolic disorder by improving cholesterol-metabolism, preventing the oxidative damage of body tissues and DNA as well as regulate blood sugar etc .therefore these medicinal plants can be used for fortification and development of novel value added products to cater the needs of diseased population.

PP31. ANTIOXIDANT COMPONENTS AND TOTAL ANTIOXIDANT CAPACITY OF FEW COMMON ETHNO-MEDICINAL PLANTS OF ASSAM,

Ananya Kashyap[1] and Pranati Das Assistant Professor, Dept. of Food, Nutrition and Dietetics, Assam Down Town University, Guwahati[1]; Head of the Department, Department of Food Science and Nutrition, Assam Agricultural University, Jorhat[2].

Abstract: The present investigation was an attempt to analyse the antioxidant components and total antioxidant capacity (TAC) of 5 randomly selected popular medicinal plants of Assam. Under antioxidant components, β-carotene, vitamin C and total phenolics were analysed both in fresh and pressure cooked form by following standard method whereas TAC was estimated by using FRAP assay. The β-carotene content in fresh plants ranged from 597.49 µg/100g in *Hydrocotyle sibthorpioides* to 4080.21 µg/100 g in *Alternanthera sessilis* whereas pressure cooked greens ranged from 195.37 µg/100 g in *Paederia foetida* to 1293.60 µg/100 g in *Centella asiatica*. The vitamin C content of fresh greens ranged from 32.11 mg/100g in *Houttuynia cordata* to 60.64 mg/100g in *Alternanthera sessilis* whilst pressure cooked ranged from 21.94 mg/100g in *Centella asiatica* to 39.85 mg/100g in *Paederia foetida*. The total phenolics content of the fresh plants ranged from 496 mg/100 g in *Houttuynia cordata* to 1072.41 mg/100g in *Paederia foetida* where as pressure cooked greens ranged from 174.40 mg/100g in *Alternanthera sessilis* to 1161.48 mg/100g in *Paederia foetida*. The range of TAC in fresh greens was 0.68µM in *Centella asiatica* to 1.22 µM in *Alternanthera sessilis* whilst range during pressure cooking observed from 0.15µM in *Paederia foetida* to 0.83 µM in *Houttuynia cordata*. Large variations were observed in the results of both antioxidant components and TAC in both raw and pressure cooked form.

PP32. "In vitro Evaluation for antibacterial activity of petroleum ether and ethyl acetate extracts of the fruits of Zanthoxylum acanthopodium DC. collected from Meghalaya, India.

Chandana Basumatary[1], K. Zaman[2], A. Hussain[3] N. R. Ghosh Biswas[2], H.K. Sharma[2] , 1 Centre for Studies in Biotechnology, Dibrugarh University, Dibrugarh-786004, Assam. 2 Department of Pharmaceutical Sciences, Dibrugarh University, Dibrugarh-786004,Assam. 3 Department of Molecular Biology and Biotechnology, Tezpur University, Tezpur-784028, Assam.

Abstract: The plant *Zanthoxylum acanthopodium* DC. (Family-Rutaceae), known as lemon pepper, is an important medicinal plant described in Ayurveda. The fruit of the plant possess peculiar coriander flavour and have been used mostly in traditional purpose in various prospectives. In the present work, the antibacterial activity of petroleum ether and ethyl acetate extract of its fruits have been evaluated disc diffusion method by measuring the zone of growth inhibition against the bacterial strains. Three gram positive bacteria viz. *Staphylococcus aureus*, *Streptococcus faecalis*, *Bacillus spp* and two gram negative bacteria viz. *E. coli* and *Pseudomonas spp* were used in this study.The petroleum ether and ethyl acetate extract exhibited varying degree of antibacterial activity against both gram negative and gram positive organisms. Both the extract showed highest activity against *E. Coli*. The demonstrated antibacterial activity of the petroleum ether extract and ethyl acetate extract might be due to the presence of phytoconstituents.

The present work justifies the use of *Zanthoxylum acanthopodium* in traditional herbal medicines and would provide ample opportunities for further studies.

PP33. "*In vitro* study of antimicrobial activities of volatile oil from the plant *Zanthoxylum acanthopodium* DC. of Meghalaya",

Dolly Das[1], W. Lyngdoh[2], H.K. Sharma[3] , Syed Nazrin Ruhina Rahman[3], 1Centre for Studies in Biotechnology, Dibrugarh University, Dibrugarh-786004, Assam. 2 Lady Keane College, Shillong, Meghalaya, 793001. 3 Department of Pharmaceutical Sciences, Dibrugarh University, Dibrugarh-786004, Assam

Abstract : The genus *Zanthoxylum* comprises of deciduous and evergreen shrubs from the family Rutaceae. The genus is a rich source of various secondary metabolites such as alkaloids, amides, flavanoids, lignans, tarpenes etc. *Z. acanthopodium* is a species containing essential oil and fixed oil with traditional medicinal values. In this study the essential oil of the seeds of *Zanthoxylum acanthopodium* DC. collected from Meghalaya was used. The Antibacterial activity of the essential oil was carried out against *Staphylococcus aureus* (MTCC 3160)*, Staphylococcus epidermis* MTCC 6810, *Saccharomyces cerevasie* MTCC 3090, *Pseudomonas aeruginosa* MTCC 6458 , *candida albicans* MTCC 9542 and *Aspergillus niger (*wild). The evaluation of antimicrobial activity was carried out by determining the zone of inhibition. The activity of oil was assayed by the diameter of zone of inhibition. *P. Aeruginosa* was found to be more susceptible to the oil than the other species of microorganisms used in the study. The demonstration of activity against bacteria (Gram-positive and Gram-negative) and fungi indicated that the plant could be a source of bioactive substances that could have a broad spectrum activity.

PP34. "CHOOSE HERBAL , STAY HEALTHY , LIVE LONGER", *Abhik Das, Riya Saikia*

Abstract : Herbs and spices have been used for both culinary and medicinal purposes for centuries. The leaf, root, bark, bud, seed, stigma of a plant or flower used for the purpose of cooking are commonly referred to as **herbs and spices** which were primarily used for and associated with adding to or enhancing the flavour of foods including meats, sauces, vegetables and desserts. The nutritional contribution of these dietary plants were deemed negligible in the past may be because of their relatively small sizes and the fact that they were used consumed as spices in an increased amount. However, within the last decade the view has began to change and the medicinal benefits of the herbs and spices have been fully acknowledged. The basic aim of the abstract is to discuss the medicinal and associated properties of some of the very commonly used spices and the secondary metabolite or the pharmacological constituents within them responsible for producing the therapeutic effects. Furthermore, the abstract aims to aware the readers about the true benefits and the mechanism of actions that makes these common spices efficacious.

PP35."Reconstituted mother tincture of *Gelsemium sempervirens* ameliorates hyperglycaemia in mice model induced by psychological and physical stress", *Partha Palit[1, 3*], Tamal Mandal[2], Sirshendu roy[1], [1]Dr.B.C.Roy College of Pharmacy and A.H.S., Durgapur -713206 and [3]Present address: Assam University, Silchar (A Central University), Dept. of Pharmaceutical science, Silchar-788011, Assam, [2]Dept. of Chemical Engineering, National Institute of Technology, Mahatma Gandhi Rd, A-Zone, Durgapur, West Bengal 713209, CORRESPONDING AUTHOR:- [3]* Dr. Partha Palit, Department of Pharmaceutical Science, Assam University: Silchar (A Central University) Silchar -788011, India, Tel: 91-9401759019, E-mail address: itspartha_p@yahoo.com*

Abstract: Stress related to psychology and emotions plays a key role in the production of hyperglycaemia followed by diabetes. The present study was conducted to design an effective stress-induced diabetic model with modification of earlier scientific reports on the approved model for drug screening. This model was further employed to study the prophylactic anti-diabetic effect of *Gelsemium sempervirens (L.),* being used traditionally for the treatment of anxiety and depression. Different types of psychological and physical stress were applied for 1.5 months to induce the hyperglycaemia in mice in our study. This modified and developed mice model were further undertaken to evaluate the prophylactic anti-diabetic activity of reconstituted tincture extract of gelsemium (0.25 and 0.5 mg/kg, p.o.) by using its anti-stress property. The *in-vivo* experiment, spectrophotometry, western blot analysis were applied as technical tools for evaluation. The study demonstrated that continuous stressors application for 1.5 months induced diabetes in mice from 105.34 mg/dl to 220 mg/dl that further augmented to 255 mg/dl at 3.5 months later, if untreated. *Gelsemium* protected the diabetic mice by reducing plasma glucose by 39.92% and 46.11% at 0.25 and 0.5 mg/kg, p.o. respectively without any recurrence of the syndromes and simultaneously decreased the enhanced cortisol and corticosterone level towards the normal range. During this cascade, it restored the diabetes marker IRS-1^{ser307} phosphorylation in the liver following chronic stress exposure. The observed prophylactic anti-diabetic activity of *gelsemium* may reveal the re-establishment of chronic stress-induced diabetes model. Its prophylactic anti-diabetic activity may be because of the presence of anti-stress compounds like gelsemine, scopoletin and scopolin. This anxiolytic and anti-stress effect of gelsemium may prevent the psychological and physical stress-induced hyperglycaemia by reducing the cortisol and corticosterone levels.

PP36. "Preliminary qualitative phytochemical analysis and acute toxicity study of *Allium ramosum* L., *Oxalis debilis* Kunth and *Pyrus pashia* Buch.-Ham. ex D. Don an thnomedicinal hepatoprotective plants of Manipur.", *Rojini Athokpam*, Meenakshi Bawari, Manabendra Dutta Choudhury, Department of Life Science & Bioinformatics, Assam University, Silchar-788011, Assam, India*

Abstract : The present study was designed to investigate the phytochemical compounds present in the aqueous extract of *Allium ramosum, Oxalis debilis,* and *Pyrus pashia*. The study further aimed to evaluate the acute toxicity effect of aqueous extract of these plants. These plants possess hepatoprotective activity and other medicinal values as per the ethnobotanical knowledge of Manipur. The phytochemical investigation was done according to the standard procedures. Qualitative analysis showed the presence of alkaloids, carbohydrate, phenolic compounds, flavonoids, and saponins. The results of the acute toxicity study showed the LD_{50} of all the plants were greater than 5000mg/kg implying that the extracts were relatively safe. This result will be useful in screening for phytochemicals having hepatoprotective property.

PP 37. REVIEW ON HERBAL BIOFUELS: POWER OF RENEWABLE SOURCE OF ENERGY

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Abstract : Biofuels are solid, liquid or gaseous fuels that are produced from biomass (Giampietro et al. 1997; IEA 2011). The biomass or organic matter that is converted to biofuels may include food crops, dedicated bioenergy crops (e.g., switchgrass or prairie perennials), agricultural residues, wood/forestry waste and by-products, animal manure and algae (Giampietro et al. 1997; IEA 2011).Advantages:Production of overall GHG is less than fossil fuels when they are

burnedThese are alternative sources to fossil fuels - allowing for greater fuel security for countries with little or no oil reserves of their own,may not produce any particulates, such as soot and other fine particles.Renewable source of energy eg algae biofuels are to be used to displace petroleum.Stock of biofuel is not limited ,can be produced from waste. CONCLUSION:In recent years, the production of liquid biofuels has been increasing worldwide, mainly spurred by efforts for greater energy security and to mitigate greenhouse gas (GHG) emissions.Conservation biologists can significantly broaden and deepen efforts to develop sustainable fuels by playing active roles in pursuing research on biodiversity-friendly biofuel production practices and by helping define biodiversity-friendly biofuel certification standards.

PP38. "Physicochemical characterization of Rubus alceifolius Poir. fruits of Mizoram"

Lalduhsanga Pachuau *-Department of Pharmaceutical Sciences, Assam University Silchar – 788011. Assam, India.*

Abstract: The present study reports for the physicochemical and functional properties of the wild berry fruit *Rubus alceifolius* Poir collected from Mizoram, India. The average size, pH, juice content, the fruit acid content and dry matter content were calculated from the collected fruits. The chemical components of the fruit extract such as anthocyanin, β-carotene and lycopene were also determined along with the SPF number of the fruit calculated from Mansur's equation. The fruit was red in color with length varying from 0.9 to 1.8 cm. Determination of the ten-fruit weight indicates that the fruit is comparable in size and weight to other *Rubus* fruits collected from different places. The pH of the juice was 3.28 and the juice content was found to be 66.93 mL per 100g of the fruit. The presence of anthocyanin, β-carotene and lycopene were detected. The presence of ellagic acid and gallic acid were also detected in the acetone-extract. The SPF number of the juice, as determined from Mansur's equation was found to be 1.59±0.03.

PP 39. "In silico identification of natural inhibitor of sperm maturation targeting KATNAL1",

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Abstract: Hormonal based contraceptives have various side effects and therefore non-hormonal contraceptive is the need of the hour. Katanin p60 ATPase-containing subunit A-like 1 protein (KATNAL1) is crucial for sperm maturation in the testes without changing hormone levels. In the absence of experimentally determined 3D structure of KATNAL1, the structure of the protein was modeled using homology modeling. Eighteen different phytochemicals which have previously been used for their efficacy as spermicidal was tested for their drug likeness and ADMETox properties. Ten phytochemicals passed the screening and their binding efficiency against KATNAL1 was tested by molecular docking study. Tinosporide, a diterpenoid furanolactone from *Tinospora cordifolia* showed maximum binding efficiency (-8.24 Kcal/mol) with KATNAL1 among the selected compounds. Further clinical testing of tinosporide which showed the highest binding efficiency with good bioavailability and least toxicity may lead to the discovery of a novel non-hormonal contraceptive in near future.

PP40. "BIOSAFE GOLD NANOPARTICLES AS POTENT ANTIVIRALS AGAINST HSV-1 AND HSV-2 INFECTION",

Asim Halder*[1], Durbadal Ojha [2], Debprasad Chattopadhyay[2] and Arup Mukherjee[1], [1]Department of Chemical Technology, University of Calcutta, Kolkata, India, [2] ICMR Virus Unit, I.D. and B.G. Hospital, Kolkata, India

Abstract : Gold nanoparticles have emerged as potential anti-infective agents due to distinctive physico-chemical properties in the biointerfaces. Tailored gold nanoparticles are also applied as efficient and target specific drug carrier tools. Size directed particle propagation inside the mammalian cells offered an interesting strategy for exploring viral control therapy. Bio-based synthesis and *in-situ* stabilization techniques perfected for low or nontoxic metal nanoparticles dispersion in water was preferred. Gallic acid (GA), a plant phenol, was used in this study for uniform size quasi-spherical gold nanoparticle synthesis and stabilization. Simultaneous reduction and stabilization was achieved under sonication in low temperature controlled conditions. Single step reaction leads to gold nanoparticles with average TEM size of 7.86 nm and plasmonic response at 531nm. Detailed X-ray diffraction showed proved fcc crystalline structure for metallic gold and the fourier transform infrared analysis has confirmed nanoparticles conjugation with GA. The antiviral efficacy of functionalized gold nanoparticles (GAunps) was evaluated against HSV-1 and HSV-2. GAunps found effective on HSV infections in a dose-dependent manner with EC_{50} of 69.5 µM (HSV-1) and 72.6 µM (HSV-2), compared to acyclovir (EC_{50} 11.5 µM for HSV-1, and 12.8 µM for HSV-2). GAunps prominently prevented viral attachment and penetration into cultured Vero cells. Percentage of HSV inhibition varied with nanoparticle exposure time in infected cell while nanoparticles cytotoxicity in Vero cells was significantly lower than acyclovir indicating its safety. Newer uniform size biosafe gold nanoparticles were therefore proposed as an effective and safe alternative in viral chemotherapy.

PP 41. "PHYTOCHEMICAL ANALYSIS OF THE AQUEOUS EXTRACT OF *LANTANA CAMARA* L.: A MEDICINAL PLANT", *H.ASHALATA SINGHA*[*1], MEENAKSHI BAWARI[1], MAHUYA SENGUPTA[21]Department of Life Science and Bioinformatics, Assam University, Silchar [2]Department of Biotechnology, Assam University, Silchar*

Abstract : The presence of phytoconstituents in plants explains the various uses of plants in traditional medicine. In this study, qualitative phytochemical screening of the aqueous extract of *Lantana camara* L. (AELC) was done. *Lantana camara* L. (Verbenaceae) commonly known as wild or red sage is regarded as a medicinal plant since ancient time. It has been documented that various ailments are treated with the decoction of*Lantana camara* L. The medicinal property of the plant can be attributed to the phytocomponents obtained. The qualitative phytochemical analysis was performed following the standard procedures (Evans, 1997; Ramakrishnan et al., 1994; Kokate, 1999; Fisher, 1968; Ruthmann, 1970; Finar, 1986; Harborne, 1998; Wagner, 1993; Mace, 1963). The aqueous extract of *Lantana camara* L. is prepared by cold percolation method .The filtrate thus obtained was concentrated and dried to obtain crude extract which was used for phytochemical screening. The qualitative analysis of the aqueous extract of *Lantana camara* L. was evaluated and the extract showed the presence of alkaloids, carbohydrates, tannins, steroids, phenolic compounds, oils. Therefore, the result of this study provides a scientific basis for the medicinal properties of the plant and modern drugs can be developed after extensive investigation of its bioactivity, efficacy and toxicity.

PP 42. "HPLC Identification of phenolic compounds and Determination of antioxidant activities of the methanolic extract of *Lepionurus sylvestris*", *Malsawmzuala*[*], C. Malsawmtluangi, R.K. Lalchawimawii, H. Lalhlenmawia, Department of Pharmacy, RIPANS, Aizawl, 796017, India Corresponding author: Malsawmzuala Phone: +91-8974583192 E-mail: somtearenthlei@gmail.com*

Abstract : Plants are one of the essential sources of reliable bioactive compounds such as secondary metabolites and antioxidants. *Lepionurus sylvestris* is an indigenous plant found in Mizoram and is commonly known as Anpangthuam in Mizo. Le*pionurus sylvestris* belongs to the family Opiliaceae. In this study, the phenolic compounds present in the methanolic extract of *Lepionurus sylvestris* leaves were identified using a reversed phase HPLC. Four phenolic compounds were taken up for identification. Out of which, gallic acid and catechin were identified. The leaves of methanol extract of *Lepionurus sylvestris* were screened for the potency of antioxidant activity. Total phenolic and flavanoid content of the extract were analyzed using UV-Vis Spectrophotometer. Antioxidant activities of the extract were evaluated by DPPH and H_2O_2 scavenging activities. The DPPH and H_2O_2 scavenging activities increased with increase in the concentration of extract. The methanol extract of *epionurus. sylvestris* revealed a total phenolic content of 4.29mg Gallic acid equivalent per 'g' of extract, and a total flavanoid content of 2.22mg Quercetin equivalent per 'g' of extract. **Key words:** *Lepionurus sylvestris*, HPLC, antioxidant capacity, total phenolic content, total flavanoid content, DPPH, hydrogen peroxide.

PP43. "Antioxident Resveratrol: A review of studies of the grape antioxident resveratrol for skin disorders", *Obaidur Rahman, Department of Pharmaceutical Science, Assam University, Silchar, Assam, India. Email: rahman2294@gmail.com.*

Abstract: Resveratrol(3,4',5- trihydroxystilbene) is found in various plants, including grapes, berries and peanuts. It is also present in wines especially red wines. A large quantity of resveratrol which is present is grapes is very useful for many diseases and disorders including those of skin. Studies have shown protective effects of resveratrol against ultraviolet radiation mediated oxidative stress and skin damages including skin cancer. Major skin disorders are due to harmful effect of ultraviolet radiation and oxidative stress. Antioxident appears to have promise and prospects against a wide range of skin disorders including skin aging and skin cancer. However, there are a few roadblocks in the way of this promising agent. This review discusses the prospects of resveratrol in the management of skin disorders and the associated challenges.

PP44. "BIOCOMPATIBLE HERBAL COSMETICS: A REVIEW", *Minakshi Hore*, Shraboni Bakti*, Sonali Das* Department of Pharmaceutical Science, Assam University Silchar E-mail Address: mhore20.mh@gmail.com*

Abstract : Herbs are the endowment of Mother Nature used for various health care throughout different ages and culture of human history. Nowadays Herbal care industry are more concentrated on herbal cosmetics because of its compatibility with living tissues as it is purely made of herbs .The demands for herbal cosmetics have been increased to many folds because of the excessive use of synthetic based products and chemical substances and their usage causes several health hazards leading to numerous diseases. Biocompatible Herbal cosmetics are those beauty products with physiological activities such as healing, smoothening, enhancing and conditioning properties because of active herbal ingredients which have the quality of being compatible with living tissues by not being toxic, injurious or physiologically reactive and not causing any type of immunological reaction. Many herbs have been scientifically evaluated for the cosmetics potential like *Prunus serrulata, Centaurea cyanus, Rosa carina*, *Ocimum sanctum*, Sandal-wood and *Aloe vera*. *Prunus serrulata,* also known as Japanese Cherry Blossom, which helps to lighten uneven pigmentation by inhibiting

melanin production and leave a brighten and healthy skin. Like cherry blossom, there are more herbs, which are currently used in various cosmetics preparations. The purpose of this review is to focus on the potential of herbal extracts in our everyday life for skin-care, hair-care in eco-friendly and biocompatible manner.

PP45. "SYNTHESIS OF NOVEL FLUORESCENT RESVERATROL DERIVATIVE USING CLICK CHEMISTRY" NASIM SEPAY, *DEPARTMENT OF CHEMISTRY, PRESIDENCY UNIVERSITY, KOLKATA, INDIA*

Abstract : The search for novel and effective cancer chemopreventive agents has led to the identification of various naturally occurring compounds one of which is resveratrol (trans-3,4′,5-trihydroxystilbene), a phytoalexin derived from the skin of grapes and other fruits. Resveratrol is known to have potent anti-inflammatory and antioxidant effects and to inhibit platelet aggregation and the growth of a variety of cancer cells. Its potential chemopreventive and chemotherapeutic activities have been demonstrated in all three stages of carcinogenesis (initiation, promotion, and progression), in both chemically and UVB-induced skin carcinogenesis in mice, as well as in various murine models of human cancers. Evidence from numerous in vitro and in vivo studies has confirmed its ability to modulate various targets and signaling pathways. Present work consisting synthesis of newly designed resveratrol derivative attached with triazole moiety which can be synthesized by "click" reaction. At first p-nitrotolune is refluxed for 12h in presence of light with dry CCl_4 and NBS to get p-nitrobenzylbromide . Then p-nitrobenzylbromide is stirred with PPh_3 in dry diethylether for 5 days. As a result p-nitrobenzyltriphenylphosphonium ylide is obtained. The next step is to prepare trans isomer of p-nitrostillbene using -nitrobenzyltriphenylphosphonium ylide and benzaldehyde at 0-5^{0}C temperature in dry THF. The last step is involving preparation of 7-hydroxycoumarine by the reaction between malic acid and recorcinol. 7-hydroxycoumarine is coupled with propargylbromide in presence of a base. The coupled product thus obtained is then coupled with nitride derivative of p-nitrostilbene by click reaction.

PP46. "Neuroprotective effect of dry fruit extract of *Trapa bispinosa* against mercury chloride induced neurotoxicity", *Pankaj Phukan[*], Mahuya Sengupta[1], Meenakshi Bawari[2]*

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Abstract: The aim of this study was to investigate the protective effect of *Trapa bispinosa* (TB) in mercury chloride ($HgCl_2$) induced neurotoxicity in mice. Levels of malondialdehyde (MDA), catalase (CAT), superoxide dismutase (SOD) and histopathological changes were evaluated in mice brain tissues. Thirty-six adult male Swiss albino mice weighing 25-30g were equally divided into six groups, namely I-VI. Group I received distilled water, group II received mercury chloride (1.5mg/kg), group III received TB extract low dose (150mg/kg), group IV received TB extract high dose (300mg/kg), group V received mercury chloride plus TB extract low dose and group VI received mercury chloride plus TB extract high dose. All the groups received doses orally through oral gavage tube for 14 days. In the present study, mercury chloride exposure resulted in an increase in the MDA level and a decrease in the SOD, CAT activities with respect to the control. Further light microscopic investigation revealed that mercury chloride exposure induced histopathological alterations in the brain tissues. Supplementation of dry fruit extract of TB to mercury-induced groups declined lipid peroxidation, increased SOD, CAT activities. While some histopathological changes were detected in mercury chloride treated group, milder histopathological changes were observed in animal co-treated with TB extract to mercury-chloride treated mice. The results suggested that TB might attenuate $HgCl_2$ induced toxicity by improving antioxidant status in mice.

PP47. "Synthesis& characterization of imino-pyridine ligand:A study towards Pd(II) catalised Suzuki-Miyaura coupling reaction", *Payel Datta, Department of Chemistry, Presidency University, Kolkata, India.*

Abstract : Palladium is arguably the most versatile and most widely applied catalytic metal in the field of fine chemicals due to its high selectivity and activity. The present work describes synthesis and characterization of a number of imino-pyridine bidentate ligands prepared by condensation between pyridine-2-carboxaldehyde and aromatic amines. The synthesized N,N-bidentate ligands were then verified for their efficiency in Pd(II) catalyzed Suzuki-Miyaura coupling reaction with various aryl halides and phenylboronic acid in different solvents.The ligand 1 prepared with aniline,pyridine-2-carboxaldehyde and corresponding palladium complex was subjected to study the reaction time for Suzuki-Miyaura coupling reaction with phenylboronic acid and p-bromoacetophenone in different solvents as below-
Another ligand 2 was prepared with pyridine-2-carboxaldehyde,p-methoxyaniline and corresponding palladium complex was subjected to Suzuki-Miyaura coupling reaction with phenylboronic acid and electronically different aryl halides in dioxane solvent.The yield of product with different halides are mentioned as bellow-
The synthesised ligands and coupling product was confirmed by ^{1}H NMR spectroscopy.Our synthesized ligands could successfully promote Suzuki-Miyaura coupling reaction with activated or non-activated aryl bromides. However, with aryl chlorides, our ligands failed to promote cross coupling reaction. Therefore, for further electronic tuning new ligands need to be synthesized and studied.

PP48."HERBAL MEDICINES IN THE TREATMENT OF ALZHEIMER' DISEASE", *Remya Rajeevan, BCDA College of Pharmacy and Technology*

Abstract: Alzheimer's disease is an irreversible, chronic, and progressive disorder of the brain. It usually starts slowly but gradually, with time gets severe. It destroys the memory and thinking functions and eventually the subject will find it difficult to carry out even the simplest tasks. Alzheimer's disease is currently ranked as the sixth leading cause of death in United States. This disease is named after Dr. Alois Alzheimer, who in 1906 noticed the disease for the first time in a woman who died of an unusual mental illness. Studies indicate that in most cases Alzheimer's disease is caused by a combination of genetic, lifestyle, and environmental factors that may affect the brain over time. The drugs which are currently used for the treatment of Alzheimer's disease have drastic side effects and hence there exist an immense need for the development of safe and efficient alternatives. The Herbal medicines could be regarded as such an alternative. Herbal medicines are botanical medicines in which a plant's seeds, berries, roots, leaves, bark, or flowers are used for medicinal purposes. In the recent years, there has been an immense growth in field of herbal medicines and these drugs are gaining popularity because of their natural origin and less side effects. It has been established that *Ginkgo biloba* (Ginkgo), *Salvia officinalis* (Sage), *Rosmarinusofficinalis*(Rosemarry), *Curcuma longa* (Turmeric), *Chamomillarecutita* (German Chamomile), *Panax ginseng* (ginseng), *Glycyrrhizaglabra* (Liquorice), *Zingiberofficinale* (Ginger), *Salix alba* (White willow bark), *Polygonummultiflorum* (Chinese knotweed), *Urticadioica* (Stinging nettle), *Lepidiummeyenii*(Maca), *Pinuspinaster* (Maritime pine bark), *Melissa officinalis* (Lemon balm), *Crocus sativus* (Saffron), *Terminaliachebula* (Harar), *Convolvulus pluricaulis* (Shankhpushpi), *Withaniasomnifera* (Ashwagandha),*Bacopamonniera* (Brahmi), and *Centellaasiatica* (Gotu Kola) are useful for the treatment of cognitive impairment in Alzheimer's disease. In placebo controlled clinical trials, the extracts of Ginkgo has shown similar therapeutic efficacy as that of drugs such as Tacrine and Donepezil. It has antioxidant, neuroprotective, as well as, cholinergic activities which are in turn connected to the mechanisms of Alzheimer's disease. It also shows the least undesirable side effects. The extracts of plants *Salvia officinalis*and*Melissa officinalis* posses cholinergic activities and are found to improve the symptoms such as lose of memory especially in individuals older than 65 years. Galantamine, an alkaloid extracted from *Galanthusnivalis* is clinically recognised for the treatment of Alzheimer's disease in the United Kingdom. Withanamides obtained from Ashwagandha has the ability to scavenge free radicals generated during the initiation and progression of Alzheimer's disease and also blocked the neuronal cell death triggered by amyloid plaques. Hence, the herbal medicines could be regarded as an efficient and potential treatment option for Alzheimer's disease because of their cognitive benefits, minimum side effects, and most importantly, their mechanism of action with respect to the main pathophysiology of the disease.

PP49. "ROLE OF ADAPTOGENS IN HEALTH MANAGEMENT: A REVIEW", *Joyeeta Dutta Choudhury, Puja Debnath, Sanghita Nath Mazarbhuiya, Partha Palit, Department of Pharmaceutical science, Assam University, Silchar Email: ch.joyeeta189@gmail.com*

Abstract : The term` adaptogen' was first defined by Lazarev, a Russian pharmacologist in 1947.He defined `adaptogen' as agents which help an organism to counteract any adverse effects of a physical, chemical or biological stress or by generating non-specific resistance. It is an agent which helps to adopt against adverse environmental and biological condition. Adaptogen supports our bodily functions and are unique in helping to modulate the immune system. They are capable of either toning down the activity of overfunctioning systems or strengthening the activity of underfunctioning systems, thus having a normalizing effect. Adaptogens help in preventing and reducing the incidence of illness. Adaptogenic herbs can be used as the treatment or part of the treatment for stress, exposure to stressors such as high altitude, intensive training, chronic illness, convalescence, chemotherapy, radiation therapy etc. Adaptogens such as Tulsi, Ginseng, Rhodiola, aswagandha etc are cheap, readily available with no side effects. Daily use of adaptogens strengthens our immune system and prevents the chances of attack from lifethretening diseases such as diabetes, cancer, neurodegenerative disorders, hepatistis. Hence it improves the quality of life. Despite of all these advantages, the adaptogens are not in use to that extent, as awareness among the people regarding their uses is limited. Better exploration of such herbs related to standardization of doses and efficacy is required for developing fruitful herbal health tonic.

PP50. "Molecular docking studies of naturally occurring Xanthone derivatives targeting receptor Topoisomerases IIA." *R. Vanlalruata[1]*, Aparoop Das[2] [1]Department of Pharmacy, Regional Institute of Paramedical and Nursing Sciences, Aizawl-796017, Mizoram, India; [2]Department of Pharmaceutical Sciences, Dibrugarh University, Dibrugarh - 786004, Assam, India* Email: mapuiavl@gmail.com

Abstract : DNA topoisomerases are enzymes that control and alter the topologic states of DNA during transcription. Due to their crucial role in the cell proliferative process, they are the major targets in anti-cancer drug development. Anticancer activity of natural product derivatives isolated from plant family Gentianceae and Clusiaceae against various

human cancer cell lines have been well established and these isolated compounds are of Xanthone derivatives. In this work, naturally occurring xanthone derivatives isolated from Garcinia dioica, G. mangostana, G. subelliptica, Calophyllum inophyllum, and Mammea acuminata which have been tested for their inhibitory activity against Topoisomerase II were subjected to molecular docking studies targeting Topoisomerase2A using Schrodinger Suite Glide - v7.1 software. The most potent compound shows hydrogen bonding interactions with Gly 164 and Ala 167 amino acid residues. It also shows strong electrostatic interaction with Mg ion of the receptor. Good hydrophobic interactions were also observed with Ala 167 and Ile 125. Ligands with intermediate and least potency show lesser interaction with the receptor protein.

PP51. "NEUROBEHAVIORAL STUDY OF AQUEOUS EXTRACT OF SENNA ALATA (L), A MEDICINAL PLANT OF TRIPURA, INDIA"

SANJIT NAMASUDRA* AND MEENAKSHI BAWARI, Department of Life Science and Bioinformatics, Assam University, Silchar.

Abstract: *Senna alata* (L.) Roxb. belongs to the Fabaceae family and has several therapeutic applications in traditional medicine. This plant has various pharmacological properties such as antihepatotoxic, antimutagenic, antimicrobial and antidiabetic. Neurobehavioural study was performed in adult albino mice treated with aqueous extract of leaves of *S.alata* and further evaluated after treatment with vitamin E. The acute toxicity test for the plant extract was performed in mice. The mice were randomly divided into six groups viz control group; *S.alata* (100mg/kg); *S.alata* (200mg/kg); *S.alata* (100mg/kg)+ vitamin E (50mg/kg); *S.alata* (200mg/kg) + vitamin E(50mg/kg); Diazepam and fluoxetine. The plant extract showed significant increase in immobility time, a decrease in time spent in open arms, a decrease in number of head dips and a decrease in number of squares crossed. Administration of aqueous extract of leaves of *Senna alata* resulted in behavioral changes indicating that this plant extract has significant effect on the nervous system.

PP52. "Antioxidant properties of the acetone fruit extractofRubusalceifoliusPoir. (Rosaceae)"

Nirupam Das* and LalduhsangaPachuau Department of Pharmaceutical Sciences, Assam University, Silchar

Abstract: *Rubusalceifolius*is a simple-leafed Southeast Asian bramble that is considered as a weed in many countries. This plant is found along the roadsides in Mizoram, India. The plant was identified and authenticated at the Department of Pharmacy, RIPANS, Aizawl. The objective of the present work is to evaluate the possible antioxidant capacities of the acetonefruit extract of *R. alceifolius*. Thetotal phenolic content was estimated Folin–Ciocalteu's phenol reagentusing gallic acid as standard (R^2=0.9909) and it was found to be 254.7±0.612 mg GAE/100g of the fruit weight (FW). The flavonoid content was found to be 221.88±0.67 mg CE/100g FW as determined by colorimetric assay using (+)–catechin as standard (R^2=0.9917). The antioxidant properties were screened*in vitro*by TBARS (thiobarbituric acid reactive substances) assay using modified goat liverand DPPH (2,2-diphenyl-1-picrylhydrazyl) assay. At 1000µg/ml, BHA (butylatedhydroxyanisole)was found to exhibit 55.39 % inhibition and acetone fruit extract showed 30.15% inhibition of lipid peroxidation (LPO). The IC_{50} for the DPPH scavenging activities were 50.12 µg/mL and 190.54 µg/mL for BHA and the fruit extract respectively. The reducing power of the standard BHA was found to be significantly higher ($p < 0.05$) when compared to the sample fruit extract. However, the studies suggest that the antioxidants present in the fruit extract caused the reduction of Fe^{3+} to Fe^{2+},thereby displaying its reducing power.

PP53. "Natural colour from herbal sources for pharmaceutical importance: An overview"

EshaniBasu 1*,Department of Pharmaceutical Sciences,Dibrugarh University,Dibrugarh-786004,Assam.

Abstract : Natural colour is generally derived from naturally occurring sources such as insects,plants(eg: indigo and saffron),animals (eg: shellfish) and minerals (eg: ferrous sulphate ,ochre and clay) without any chemical treatment.Nowadays,demands forthe natural colour is of great interest to the world.In India,there are more than 450 plants that can yield colours.Due to the environmental and health hazard problems caused by synthetic dyes, now people are more concerned about the usage of natural dyes during the last two decades.Colourant may be required to prolong the stability or to produce standard preparation or for identification of a particular formulation. Thus, the prime priority of colourant is to increase the aesthetic appearance of the pharmaceutical product, says the colurant is the cosmetics for the pharmaceutical formulations.Among all the natural colours,plant-based pigments have wide range of medicinal values.Some natural colourants from herbal sources used in pharmaceutical formulations are Riboflavin and Anthracyanins,Annatto,Curcumin,Beet-root red,Caramel (formerly called as burnt sugar) ,Cochineal,Caramine etc. The present review, describes the detail information about basic chemistryof the major pigments and the pharmaceutical importance found in naturally occurring colour,which prove to be advantageous for further development of the pharmaceutical formulations. Natural colour further shows its pharmacological activity.

PP54. "Anti-cytokine and in-vivo anti-inflammatory activity of Dillenia pentagyna bark, a folklore medicine of Mizoram."

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Abstract : For thousands of year's natural products have played an exceptionally important role in health care and prevention of diseases and are one of the greatest source of medicine. Mizoram is a home to a rich variety of flora and fauna however; no systematic survey and documentation had been carried out. *Dillenia pentagyna* is one of the endangered plants which is yet to be explore in terms of anti-inflammatory activity. The Mizo communities use the decoction of *Dillenia pentagyna* Roxb bark to treat different stomach ailments, inflammation and diabetes. In this perspective, methanolic extract of the bark of *Dillenia pentagyna* Roxb. was subjected to evaluate for its anti inflammatory properties. The extract of *Dillenia pentagyna* Roxb. contain the presence of flavanoids, triterpenoids, steroids, phenolics, saponins, fixed oils, etc which exert varied pharmacological activities. The methanolic extract of this plant shows to contain active constituents like betulinic acid, β-sitosterol, etc which are found to actively interact with the inflammatory mediators and suppressed the inflammation when evaluated for its *in-vitro* and *in-vivo* anti-inflammatory activity. The present study data suggests that the methanolic extract of *Dillenia pentagyna* Roxb. bark showed significant anti-inflammatory activity. The study also support the folkloric used of the plant in diseases related to inflammatory condition.

PP55. "Comparison of physicochemical characterisation of essential oils extracted from the dried and fresh peels of *Citrus macroptera* collected from Aizawl, Mizoram"

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Abstract : *Citrus macroptera* is so named because of the large wings on the petiole. The tree, which has thorns, is in 5 m in height. Its fruit is about 6-7 cm in diameter, has a fairly smooth, moderately thick rind, and is yellow when ripe. The juice is very sour, and somewhat bitter. The rind of the *Citrus macroptera* is eaten as a vegetable. The thick rind is cut into small pieces and cooked; either green or ripe, in beef, mutton, and fish curries, as well as in stews. The current study aims to analyse and comparison of the oil, extracted from the fresh and dried peels of *Citrus macroptera* for its physicochemical characteristics. The essential oils were extracted with distilled water using Clevenger apparatus. The total yield of the oil was 1.125 and 2.007%. The oil was clear liquid at room temperature with acid value (40.39 & 88.638 mg KOH/g), saponification value (100.98 & 65.915 mg KOH/g), iodine value (101/100 g oil & 102.2/100g/oil), and peroxide value (82.5 &105). Thirty two compounds were identified in the oils using GC-MS with limonene (60-80%), beta caryophyllene and geranial as main compounds. Both the oils extracted have high fatty acid contents and have less usage for dietary purpose. Saponification value and iodine value were found in the permissible range along with iodine value. Dried peels have higher yield with high acid value, iodine value and peroxide value compared to fresh peels. Limonene and other main compounds were similar in both the extracts.

PP56. "An in silico approach to treat hypertension by targeting angiotensin receptor in the RAAS pathway"

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Abstract : Hypertension exerts a substantial public health burden on cardiovascular health status. Angiotensin Receptor Blocker(ARB) drugs are prescribed for patients who have developed adverse effects from Angiotensin Converting Enzyme(ACE) inhibitor drugs. ARB drugs are more reliable compared to ACE and lowers the risk of many diseases. Therefore, ARB drugs are well tolerated in lowering BP. Agents that selectively and specifically bind to the AT-II receptor could possibly block the RAAS. Angiotensin II is a potent chemical formed in the blood that causes muscles surrounding blood vessels to contract, thereby narrowing the vessels and thus cause high BP. Angiotensin II receptor blockers (ARBs) are medications that block the action of angiotensin II by preventing angiotensin II from binding to angiotensin II receptors, thus decreasing blood pressure. Therefore, angiotensin receptor is an attractive target for novel anti-hypertensive drugs. In an attempt to find new inhibitors of angiotensin receptor in RAAS pathway, a virtual library of 172 photochemicals are created and QSAR is done. These compounds are then docked into the active site of angiotensin receptor and its docking score is observed. The top docking scores of 5 phytochemicals are taken and compared with the docking scores of known inhibitors. Virtual screening produced higher rates, supporting the use of computational methods in future anti-hypertensive drug discovery efforts.

PP57. "A STUDY OF SOME NATIVE PLANTS USED BY TRIBAL COMMUNITIES OF ASSAM DURING EMERGENCY: PROSPECTS FOR NUTRACEUTICAL PRODUCTS DEVELOPMENT." *Sujata Deka and Daisy Sharma, Assistant professor, Dept. of Food Nutrition and Dietetics, Assam down town University.*

Abstract : The present study was undertaken with the objectives of documentation of some edible plant species used by tribes communities in emergency, i.e.during scarcity of food. For the documentation of information about different emergency foods, a survey was conducted using a standard questionnaire in two selected tribal belts in Chandrapur and Sonapur area. From the survey it was found that various wild edible plants and plant parts are frequently used in indigenous folk culture have always made here survival possible in most extreme condition and situation. These communities are very much familiar with the knowledge of wild plant species in their ecosystems also have a proper understanding of the ecological interactions of their resources. Their understanding and dependence are reflected in their traditional culture, local beliefs, folklores knowledge of ethno-botanical importance. Some of the medicinal uses are now incorporated in the organised system of medicine, yet most of the folk medicines have remained endemic since the knowledge are in oral traditions as a guarded secret of certain families. So on these context 15 valuable plants and edible parts were collected and documented, so that it can be used for development of some potentially effective nutraceutical products. Conclusion: Since last two decades emphasis have been given in the development of novel fortified nutraceutical products for promoting better health and lifestyle. Several research have reported on different aboriginal foods which has huge potential role in treatment of degenerative diseases and life style disorder Therefore these potentially valuable plants can be used for effective nutraceutical products.

PP58. "ANTICANCEROUS ACTIVITY OF VINCA ALKALOIDS" *Argha Sarkar BCDA COLLEGE OF PHARMACY & PHARMACY*

Abstract : Cancer is a type of disease which involves the abnormal growth and spread of due to some chemical, biological or physical problems. Cancer starts when altered cell divide uncontrollably to form lumps of tissue called tumors. Tumors can grow and spread within the body and may interfere with normal body function and can alter them. WHO estimates that there are 1.4 million new cases of cancer reported worldwide annually. Studies have shown that the annual financial cost of cancer treatment alone in US per year is about $263.8 million. This is very expensive and hence an alternating way of combating cancer is needed. Certain herbal drugs such as *Vinca, Camptotheca, Taxus brevifolia* etc. Can be used for treating cancer which is usually less expensive and promising. One such herbal drug is *Vinca* of *Apocynaceae* family. Alkaloids obtained from *Vinca* i.e. vinblastin, vincristine, vinroside, vinleurosine are proven to show active anti-cancerous property. An experiment using *Vinca* alkaloids have shown that vinblastin is effective against choriepithelioma, Hodgkin's disease, lymphomas and are beneficial in reducing carcinoma of breast and bronchus, while vincristine has the ability to induce complete haematological remission to the acute leucomias. Biochemical studies performed to date do not reveal any effect on cellular activities. *Vinca* provides a cheap alternative to expensive anti-cancerous drugs with a promising result. Since the present result is not enough for clinical use so more research should be carried out.

PP59. "A STUDY ON NEUROPROTECTION OF ANTIOXIDANT VITAMIN C AGAINST PLUMBAGO ZEYLANICA ROOT EXTRACT IN MICE'' *Paojatong Singson, Meenakshi Bawari Department of Life Sciences and Bioinformatics Assam University, Silchar.*

Abstract : Neurotoxicology is the study of effect on central nervous system, many researcher has reported the adverse effect of medicinal plants toxicity in particularly to the central nervous system. *Plumbago zeylanica* is a medicinal plant rich with medicinal values, different parts of the plant is used for theurapeutic application. Traditionally this plant is used as stimulant, digestant, expectorant and for relieve to various ailments and disease like, malaria, dysentery etc. Besides, the root of this plant is also reported to be a powerful poison by researcher.The present study is an attempt to determine the effect of *Plumbago zeylanica* root extract in mice brain study. Since, the brain is an important part that plays a vital role as coordinating and regulating system for body parts. Behaviour is the first sign of toxicity, behaviour profile like, Hole board test, Forced swim test and Elevated plus maze test would be consider. Biochemical parameters are considered as indication of damage due to free radicals and reactive oxygen. Its parameter like, LDH, CAT, LPO and GDH would be considered for evaluation of *Plumbago zeylanica* root extract toxicity in mice brain. An antioxidant vitamin C would be consider for evaluation of mitigating neurotoxic effect induced by *Plumbago zeylanica* root extract. The present study shows that altered behaviour activity was reversed and altered enzymes activity were restored on vit.C pretreated mice.

PP60. "BENEFITS OF USING HERBAL COLOURS CONTRARY TO SYNTHETIC COLOURS FOR PHARMACEUTICAL PURPOSE" *Ankita Sau BCDA College of Pharmacy and Technology.*

Abstract: Colouring agents are required worldwide in the pharmaceutical industry for increasing acceptability among patients, helps in identification of products, producing standard preparation and also as warning indicator. It can be synthetic or natural product obtained from plants, insects, animals & minerals. Synthetic products are mainly prevalent for its extensive production

in the chemical industries. However, it may cause allergy like symptoms and carcinogenic. Azo dyes are prevented due to its toxicity and red dye 2G is suspended due to its breaking down into aniline which is a carcinogenic. Federal regulation require evidence that each substance is safe at it intended level of use before addition. They are subjected to ongoing safety review as scientific understanding and methods of testing for improvement. As such, the artificial colouring agents which are being used widely in medicines are highly questionable in terms of health effects. Some example of synthetic colours are mentioned. Brilliant blue (E133) made from triarylmethane may cause asthma, Indigotine (E132) from 5,5'-indigodisulfonic acid sodium salt cause high blood pressure which can be substituted by indigo dye (*Indigofera tinctoria*). Fast green (E143) from sea green triarylmethane is tumorigenic. Allura Red AC (E129) from red azo dye cause ADHD trigger. Erythrosine (E127) from organoiodine compound is carcinogenic. Tartrazine (E102) from lemon yellow azo dye causes food intolerance. They can be substituted by herbal colours like paprika (dark red), indigo (blue), annatto (yellowish orange), caramel (dark brown), carotene (red to brown), curcumin (orange yellow), riboflavin (whitish yellow) &carmine (bright red). These colours have greater medicinal importance, mainly antimicrobial properties. Hence reviewing the advantages of herbal colour over synthetic colour and analyzing the basic chemistry of major pigments, medicinal importance, it can be concluded to give them a scope of development for pharmaceutical formulation mainly considering their therapeutical properties.

PP61. "Evaluation of anticancer activity of *Callicarpa arborea* Roxb. against different cancer cell lines"

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Abstract: Cancer is a dreadful disease and it is one of the major causes of deaths in humans. Any practical solution in combating this disease is of importance to public health. In recent times, the trend in cancer research is shifting towards identifying new medicine from natural resources for management of cancer. Many herbs have been evaluated and are currently being investigated phytochemically to understand their anti-tumor actions against various types of cancers. In present investigation, the methanolic leaves extract of *Callicarpa arborea* was evaluated for its anticancer activity. The Sulforhodamine-B (SRB) assay was used to test the anticancer activity of *Callicarpa arborea* against five human cancer cell lines namely breast (MCF-7), colon (HT-29), cervical (HeLa), T lymphoblast; acute lymphoblastic leukemia (MOLT-4) and ovarian (OVCAR-3). The growth curve graphs were plotted and LC50, GI50 and TGI values were calculated. Adriamycin was used as positive control. The results showed that *Calicarpa arborea* exhibited a very high degree of anticancer activity against three cancer cell lines such as HeLa, HT-29 and MOLT-4. However, further studies are needed for evaluating the mechanism of action and to isolate active anticancer compound responsible for this activity.

PP62. "GALLSTONES AND THEIR PROPHYLAXSIS BY HERBAL DRUGS: AN OVERVIEW."

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Abstract: Gallstones are collections of cholesterol, bile pigment, which can form in the gallbladder or surrounded by the bile ducts of the liver. Cholesterol stones are mainly causes due to difference in the production of cholesterol or the secretion of bile. Pigmented stones are mainly composed of bilirubin, which is an element formed due to the normal breakdown of red blood cells. Individuals with gallstones may experience various gastrointestinal symptoms and are also at risk of developing acute or chronic cholecystitis. Cholecystectomy is the most frequently recommended conventional treatment for symptomatic gallstones. Today large number of population suffers from kidney stone, gall stone and urinary calculi. Stone disease has gained increasing significance due to changes in living conditions i.e. industrialization and malnutrition. Medicinal plants have been known for millennia and are highly esteemed all over the world as a rich source of therapeutic agents for the prevention of various ailments. Medicinal plants are used from centuries due to its safety, efficacy, cultural acceptability and lesser side effects as compared to synthetic drugs. Different types of plants used in the treatment of gallstones are *Rhamnus purshiana*, *Silybum marianum,* peppermint, dandelion, grapes, turmeric, apple, olive oil etc. Mechanism may involve either dissolution of bile stones by acids or may be by enhancing the flow of bile which helps in flushing out gall stones. The "gallbladder flush" is a folk remedy said to promote the passage of gallstones. While minimal scientific evidence supports the efficacy of this treatment, anecdotal reports suggest the gallbladder flush may be beneficial for some people.

PP63. "A REVIEW: ANTI-DIABETIC ACTIVITY OF HERBAL DRUGS"

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Abstract: Diabetes mellitus is a dreadful disease and is becoming a serious threat to mankind health. Diabetes mellitus is a group of metabolic diseases characterized by high blood sugar levels that result from defects in insulin secretion, or action, or both. There are lots of chemical agents available to control and to treat diabetic patients, but herbal formulations are preferred due to lesser side effects and low cost. The World Health Organization has listed 21,000 plants, which are used for medicinal purposes around the world. Herbal medicines are highly esteemed source of medicine throughout the human history. Alternative to synthetic agents, plants provide a potential source of

hypoglycemic drugs and are widely used to prevent diabetes. In the present review, an attempt has been made to summarize some of the herbal plants having anti-diabetic activity. The antidiabetic activity of herbs depends upon variety of mechanisms. The mechanism of action of herbal anti-diabetic may be: α–amylase inhibition, inhibition in renal glucose reabsorption, stimulation of insulin secretion from beta cells of islets or/and inhibition of insulin degradative processes. A list of medicinal plants with proven antidiabetic and related beneficial effects and of herbal drugs used in treatment of diabetes is compiled. These include Mangifera indica (Mango), Aloe vera and Aloe barbadensis, Tinospora cordifolia (Guduchi), Allium sativum (Garlic), Acacia arabica(Babhul), Allium cepa (Onion), Azadirachta indica (Neem), Momordica charantia (Bitter gourd).

PP64. "INSULIN MIMETIC PROPERTY OF MOMORDICA CHARANTIA" *Shreya Banerjee ; BCDA College of Pharmacy and Technology.*

Abstract: More than 2.8% of the world's population is suffering from Diabetes mellitus, which is one of the most common endocrine metabolic disorders causing significant morbidity and mortality due to microvascular (retinopathy, neuropathy, and nephropathy) and macrovascular (heart attack, stroke and peripheral vascular disease) complications. By the year 2025 it is predictable to cross 5.4% of the population.Momordica Charantia (bitter melon or bitter gourd) is a flowering vine in the family Cucurbitaceae. M. charantia has antidiabetic effects due to the presence of triterpene, proteid, steroid, alkaloid, inorganic, lipid, and phenolic compounds. This fruits is indigenous to populations of Asia, South America, India and East Africa. The fruits contain high amounts of vitamin C, vitamin A, vitamin E, vitamins B1, B2 and B3, as well as vitamin B9. In particular, four triterpenoids have AMP-activated protein kinase activity which is a credible hypoglycaemic mechanism of M. charantia.Charantin is a typical cucurbitane-type mixture of two compounds, namely, sitosteryl glucoside and stigmasteryl glucoside. Polypeptide-p or p-insulin is an insulin-like hypoglycemic protein, shown to lower blood glucose levels in gerbils, langurs and humans when injected subcutaneously. It works by mimicking the action of human insulin in the body and thus may be used as plant-based insulin replacement in patients with type-1 diabetes.Mormodica charantia water extract was tested on alloxan diabetic rats experimentally. A fall of blood sugar after 3 week's treatment with aqueous extract of fruits of the herb was found to be significant ($p<0.01$). The aqueous extract of fruit was more effective in diabetes (fall of blood sugar 54% after 3 week's therapy) than the powder of the dried fruit (fall 25% nonsignificant). Hypoglycaemic effects in diabetic patients were found to be highly significant ($p<0.01$) at the end of the trial but were cumulative and gradual, unlike that produced by insulin. More investigations must be carried out to evaluate the exact mechanism of action of medicinal plants with antidiabetic and insulin mimetic activity. It is always believed that plant is safe, but so many plant materials are not safe for the human being, that's why toxicity study of these plants should also be elucidated before consumption of these plant materials.

PP65. "*In vitro* anti-microbial and preliminary anti-inflammatory activity of compound isolated from chloroform extract of *Combretum punctatum* var *squamosum*" *K. Thanzami*[*1], N. Jamir[1], BB Kakoti[2] 1. Department of Pharmacy, RIPANS, Aizawl, Mizoram-796017 2. Department of Pharmaceutical Sciences, Dibrugarh University, Dibrugarh, Assam-786004*

Abstract : *Combretum punctatum* var. *squamosum* (Roxb. Ex. G. Don) M.G. Gangop. & Charab., Leihruisen (in Mizo) belongs to the family Combretaceae. Traditionally, the juice of leaves is used to treat wounds and dysentery, decoction of the leaves is used to treat stomach ulcer and decoction of the root is used to treat hypertension and throat cancer. Compound isolated (Compound IV) from the chloroform fraction was determined for preliminary *in vitro* anti-inflammatory activity by protein denaturation method. The compound was also tested for its anti-microbial activity on four different ATCC bacterial strains. Compound IV, after analysing with TLC using mobile phase Chloroform: methanol: Formic acid (6:1:2drops) was found to have an Rf value of 0.5483 and appeared as blue spot with anisaldehyde-sulfuric reagent. Compound IV showed significant anti-protein denaturation activity when compared to the standard diclofenac sodium. As the concentration decreased, the inhibition of protein denaturation decreased and compound IV showed more inhibitory activity than the standard (diclofenac sodium) at lower concentration. The antimicrobial assay of the compound IV also indicated that it exhibited antimicrobial activity against the test microorganisms at concentrations of 50 and 100 µg/disc which was compared with Himedia's Ceftriaxone disc (30 µg/disc) as standard antibiotic. From the studies, compound IV clearly showed remarkable anti-inflammatory and antimicrobial activity. The study gives us idea that the compound could be a good candidate for designing a potent anti-inflammatory and antimicrobial drug. Structural elucidation of compound IV is yet to be done to identify the compound isolated

PP66. "Role of Banana Peel as Bioadsorbent in Water Purification : An overview" *Gitima Deka, Partha Palit* , Dept. Pharmaceutical Sciences, Assam University.*

Abstract : Environmental pollution by toxic heavy metal contamination due to rapid industrialisation is a challenging problem for maintaining the quality and hygiene of water. The discharges of industrial effluents into aquatic environment cause a polution threat to the aquatic life as well as human health,which is a matter of great concern due to their toxic nature and adverse effect. Bioabsorption is a recent eco-friendly technique which gained importance in this decade. The process of bioabsorption has mainly attractive features compared to the conventional method. The present study investigates that sucessful use of eco-friendly absorbants – Banana peel. Fresh banana peels are collected from domestic wastes, as its avilablity and transportation is easy. Banana peel contains Lipid(1.7%), Protein(0.9%),Crude fiber(31%) and carbohydrates(59%). The various minerals present are potassium(78.10 mg/g),manganese(76.20 mg/g),sodium(24.30 mg/g), calcium(19.20 mg/g) and iron (0.61 mg/g). The peels can thus be used efficiently and in a simple process. The peels are washed several times with tap water and followed by distilled water. The washed material is then cut into small pieces and allowed to dry in a hot air oven at 80°C for 24 hours. The dried material was finely ground and screened through the sieves of cut size of 150-212 micrometer. The resulting biomass is used for the Bioabsorption study. The present work explores a new approach of development in the field of purification of water through minimal energy input, less labour and low investment ,also proves to be biodegradable and superior compared to synthetic absorbents and chemicals.

PP67. "In silico Molecular docking and QSAR Study of some Phytomolecules for their Anti-Atherogenic Activities targeting Cholesteryl Ester Transfer Protein (CETP)." *S Banik[1]*, D Das[1], MA Laskar[1], AD Talukdar[1], MD Choudhury[1] [1]Department of Life Science and Bioinformatics, Assam University, Silchar, India shimulbanik0@gmail.com*

Abstract : Atherosclerosis is the leading cause of deaths worldwide. The lipid abnormality is one of the major modifiable risk factors for atherosclerosis. Both genetic and environmental components are associated with the development of atherosclerosis plaques which can lead to various serious cardiovascular complications like heart attack, stroke or even death. A persistent increase in circulating low-density lipoprotein (LDL) levels in the body is one of the most important causes for the initiation and progression of this disease.Cholesteryl Ester Transfer Protein (CETP) is a lipid transfer protein that facilitates the transport of cholesteryl ester and Triglyceride within the lipoproteins in the blood to mediate the way of transfer of cholesterol ester from HDL to LDL and VLDL which should be proatherogenic. Inhibition of CETP is a choice of treatment in the lipid profile related disorder like atherosclerosis. In the present study we have analyzed the inhibitory and bioactivity potential of various phytomolecules against CETP by molecular docking and QSAR study. The study revealed that among all the natural phytomolecules, Curcumin have high CETP inhibiting potential and also low IC50 values as compared to other known CETP inhibitors. Present study explores *in silico*anti atherogenic activites of phytomolecules targeting CETP.

PP68. Nanotechnology as a Novel Approach in Herbal Formulation and Phytotherapeutics : An Overview. *Ranjita Nath[1] Department of Pharmaceutical Sciences, Dibrugarh University, Dibrugarh-786004, Assam. Email: ranjita0505nath@gmail.com*

Abstract : Herbal medicinal and medicines from plant origin have been used all over the globe since time immemorial in a conventional way for their good pharmacological as well as therapeutic values with lesser adverse effects. But in the present day, plant therapeutics need a scientific and more novel approach to deliver drug more specifically and in a sustained manner as well as to combat with various parameters like poor bioavailability, less aqueous solubility, improper intestinal absorption. Various novel phyto-complex carriers such as liposomes, dendrimers, nanoparticles have been reported with successful and more specific activity in the last few decades. Nanotechnology has the property of targeting the specific site without being attached to a ligand.In the present review, integration of the nanotechnology with traditional medicine and herbal drugs like taxol derivatives, curcumin, flavanoids like quercetin etc. have been highlighted for treatment of various chronic as well as acute pathological conditions like diabetes, asthma, cancer etc.

The main reason of this overview is to sum up the importance of nanoparticles for the production of more specific phytoconstituent-carrier complex. Various plants and their parts, products, action and activities of various secondary metabolites, their disadvantages and their conventional uses, processes involved in nanoparticles production along with their therapeutic activity and mode of action have properly been reviewed.

PP 69. EVALUATION OF *IN VITRO* ANTI-DENATURATION ACTIVITY OF CRUDE EXTRACT AND ISOLATED COMPOUNDS OF *Aporusa oblonga* Mull.Arg. *David Fairwell Rapsang*, Dr. Lalzikpuii, C.Lalremruati, Department of Pharmacy, RIPANS, Zemabawk, Aizawl, Mizoram – 796017; Corresponding author: * David Fairwell Rapsang E-mail: davidfrapsang@gmail.com*

Abstract : Inflammation is the common link between debilitating conditions such as Alzheimers, heart disease, cancer, arthritis and others. Protein denaturation is the result of many factors that are known to cause inflammation. *Aporusa oblonga* bark is being used traditionally for treating stomach and intestinal pain and ulcers by means of anti-denaturation activity. An in-vitro test for anti-denaturation activity was made on methanolic extract and isolated compounds viz, vanillic acid and 3, 4-

dihydrobenzoic acid of the plant at different concentrations using bovine serum albumin. Diclofenac sodium was used as a standard drug for the study. In the study, it was observed that the methanolic extract showed maximum inhibition of bovine serum albumin of 80%, where as vanillic acid and 3, 4-dihydrobenzoic acid showed 76.92% and 76.92% inhibition at lowest concentration respectively. Thus, the result indicates that the methanolic extract and isolated compounds exhibited significantly good anti-denaturation activity and therefore good for treating inflammation and other diseases involving inflammation.

PP 70. HERBAL REMEDY FOR KIDNEY STONES COMPLIFICATION: AN OVERVIEW

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Abstract : Kidney stone formation is a complex that results from a succession of several physicochemical events including supersaturation, nucleation, growth, aggregation and retention within the kidneys. Urinary stones affect 10-12 % of the population in industrialized countries. So in the present review aims to give data highlighting the present trends in research of medicinal plants accredited with antiurolithiatic activity.The incidence of nephrolithiasis (kidney stones) is rising worldwide, especially in women and with increasing age. Kidney stones are associated with chronic kidney disease. Preventing recurrence is largely specific to the type of stone (e.g., calcium oxalate, calcium phosphate, cystine, struvite [magnesium ammonium phosphate]), and uric acid stones); however, even when the stone cannot be retrieved, urine pH and 24-hour urine assessment provide information about stone-forming factors that can guide prevention. Managing diet, medication use, and nutrient intake can help prevent the formation of kidney stones. Obesity increases the risk of kidney stones. However, weight loss could undermine prevention of kidney stones if associated with a high animal protein intake, laxative abuse, rapid loss of lean tissue, or poor hydration. For prevention of calcium oxalate, cystine, and uric acid stones, urine should be alkalinized by eating a diet high in fruits and vegetables, taking supplemental or prescription citrate, or drinking alkaline mineral waters. For prevention of calcium phosphate and struvite stones, urine should be acidified; cranberry juice or betaine, citrus, lemon juice, and kulothoo-kalai, pathar-kuchi extract can lower urine pH. It also helps to dissolve the stone and elimination through urine. Antispasmodic herbal medications, ureteroscopy, and metabolic testing are increasingly being used to augment fluid and pain medications in the acute management of kidney stones complification.

PP-71. Herbs (Durva Grass and Marigold) as a Blood Coagulation Promoter and Wound Healer , *Tushar Kanti Malakar, Dept :- Pharmaceutical sciences, B Pharm 5th Sem, ASSAM UNIVERSITY , SILCHAR*

Abstract : More than 80% of the world Population depends upon traditional medicines for various skin diseases. Recently, the traditional use of plants for stopping of bleeding and wound healinghas received attention by the scientific community. Approximately one-third of all traditional medicines in use are for the treatment of wounds and skin disorder compared to only 1-3 % of modern drugs. Plants Durva grass and Marigold is extensively used in clinical practice but it has various pharmacological activities have been learned with persistent finding till date. It is very familiar plants of our surrounding and almost available in all corners of the world. In ethnomedicinal practices, the juice and paste of the plants are used an astringent and is applied to fresh cuts and wounds. The wound healing activities of these plants are described earlier in ayurvedic, the Indian traditional Pharmacopoeia to treat all types of bleeding and skin problem. In ancient Roman days they squeezed the juice form Durva stems and used it as a diuretic and astringent to stop bleeding. In 18th century during the time of civil war the German solders provided the marigold leaves for treatment of bleeding and wound healing. Actually, these plants are alternative to one other for same treatment**.** Wound healing is a process by which damaged tissue is restored as possible to its normal state and wound contraction is the process of shrinkage of the area of the wound. It is mainly dependent upon the type and extent of damage, the general state of health and the ability of the tissue to repair.

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