

# FATIMA MATA NATIONAL COLLEGE

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Fatima Mata National College, Kollam, Kerala  
Postgraduate & Research Department of Botany

Proceedings of the National Seminar  
on  
**FLOWERING PLANT DIVERSITY  
AND  
REPRODUCTIVE BIOLOGY**

**AUGUST 7, 2015**

Sponsored by  
**University Grants Commission**

**PROCEEDINGS**  
**of**  
**The National Seminar**  
**on**  
**FLOWERING PLANT DIVERSITY & REPRODUCTIVE**  
**BIOLOGY**

*August 7, 2015*

**Organized by**  
**Department of Botany**  
**Fatima Mata National College, Kollam**  
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## PREFACE

India is one of the mega biodiversity countries of the world and nurtures enormous plant diversity. However, this treasure is under serious threat mainly due to human interferences in the environment like population growth and resource consumption, climate change and global warming, habitat conversion and urbanization, invasive alien species, over-exploitation of natural resources and environmental degradation. The rapid decline in plant diversity and the growing awareness of the importance of preserving the diversity have given an unprecedented impetus for conservation. A variety of approaches and techniques both *in situ* and *ex situ*, have been proposed and implemented for conservation of plant resources. Still, the present conservation strategies does not appear to coincide with the existing pace in destruction of species. Conservation approaches on rare, endangered and exotic species have to be planned in consideration of the reproductive specialties of them. Association of other plants, animals, microorganisms etc. with the reproductive cycle of the plants undergoing restoration need to be identified for providing special care if needed. Problems often arise in acclimatization efforts done for *ex-situ* conservation due to the drastic change in environment. It may disrupt the close association of the plants and their dependent animals resulting in decoupling of reproductive cycles. Hence, study of reproductive features need to be considered as an integral part of all conservation projects. Since we find so many endemic plants in tropical vegetation, there is an urgent need for integration or coordination between plant systematics and reproductive biology. Taking this into consideration, research forefront in plant diversity has come up with new ideas to explore the reproductive specialties on conservation point of view. In this context, this seminar is an attempt to arrange a platform to discuss and disseminate the latest ideas and concepts on various aspects of Plant Reproductive Biology and Plant Systematics.

Chief Editor

## **ABOUT THE COLLEGE**

Fatima Mata National College was established in 1951 by His Excellency Rt. Rev. Dr. Jerome Fernandez, the first native Bishop of Quilon. The college is run by the Roman Catholic Diocese of Kollam, under the leadership of His Excellency Rt. Rev. Dr. Stanley Roman, Bishop of Kollam. It is an autonomous institution imparting instruction in Sciences, Humanities and Commerce. Fatima College pursues the task of preparing young men and women for life, by providing value based education, and by inculcating in them a scientific temper and a firm commitment to spiritual and moral values, with a view to improving their lives, their homes and the world around them.

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Department of Botany was established in 1952. Under Graduate course in Botany was started in 1952 and the Post Graduate course in 1961. Department is supported by DST, Govt. of India through FIST programme. The University of Kerala has recognized the department as its research centre in the year 2015.

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## **Ethnopharmacological Investigations at Jawaharlal Nehru Tropical Botanic Garden and Research Institute**

Latha P.G.

*Jawaharlal Nehru Tropical Botanic Garden and Research Institute  
Palode, Thiruvananthapuram- 695562*

### **ABSTRACT**

Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI) was found in 1979 by Prof. A. Abraham with the objective of conservation and sustainable utilization of the plant genetic resources of India particularly of Kerala State for the wellbeing of the people. The Ethnomedicine and Ethnopharmacology Division of JNTBGRI was started in 1992, with a view to scientifically validate the important ethnomedicinal claims of the tribal and traditional healers of Kerala, by modern ethnopharmacological methods. Our major research activities include ethnomedico-botanical survey, inventorization and systematic documentation of Traditional Knowledge related to plants used for food and medicine, preparation of database on Ethnomedicine/Traditional Knowledge associated with plants used for food and medicine. Since then, a continuing programme of ethnopharmacological screening of important Indian medicinal plants has been going on at the Division. Over the last 20 years we have scientifically validated several Indian medicinal plants for their anticancer, hepatoprotective, antiulcer, anti-inflammatory, analgesic, wound healing, immunomodulatory, anti-diabetic, antiallergic, aphrodisiac, anti diarrhoeal, antistress and antimutagenic activities. The salient findings of our studies will be presented during the lecture.

### **DNA barcoding for species discrimination in plants**

Deepu Mathew

*Centre for Plant Biotechnology and Molecular Biology, Kerala Agricultural University, Vellanikkara, Thrissur - 680 656, E-mail: deepu.mathew@kau.in*

### **ABSTRACT**

DNA barcoding is a taxonomic strategy designed to provide rapid and accurate species identification using short, standardized genomic regions as species tags. In addition to assigning specimens to known species, DNA barcoding will accelerate the pace of species discovery by allowing taxonomists to rapidly sort specimens and by highlighting divergent taxa

that may represent new species. The DNA barcodes for 7 Indian species of *Momordica* (*M. charantia* L. cv. *charantia*, *M. charantia* cv. *muricata* (wild) Chakrav, *M. dioica* Roxb., *M. sahyadrica* Joseph and Antony, *M. balsamina*, *M. cochinchinensis* Spreng. (Gac.), *M. subangulata* Blume ssp. *renigera* (G. Don) de wild and *M. cymbalaria*.) were developed at KAU, using the chloroplast *matK* gene sequences. The universal primers were employed to amplify the *matK* gene from 25 *Momordica* and 2 *Luffa* accessions and based on the multiple sequence alignment of the sequences, the primers for DNA barcoding in this genus were proposed. Based on the *matK* sequences, the barcodes were generated at BOLD systems, barcode gaps for species discrimination were identified and phylogenetic relations were worked out. *M. charantia*, *M. subangulata* ssp. *renigera*, *M. cochinchinensis* and *Luffa* have yielded definite *matK* barcode gaps and other species requires supplementation with additional loci. *M. charantia* cv. *muricata* is proposed to be the progenitor for the different *Momordica* species in India.

### **Recent trends in crop improvement**

Wilson D.

Department of Plant Breeding and Genetics, College of Agriculture,  
Vellayani, Thiruvananthapuram-695522, Kerala Agricultural University

#### **ABSTRACT**

The fundamental discoveries of Darwin and Mendel established the scientific basis for plant breeding and genetics at the turn of the 20th century. Similarly, the recent integration of advances in biotechnology, genomic research, and molecular marker applications with conventional plant breeding practices has created the foundation for molecular plant breeding, an interdisciplinary science that is revolutionizing 21st century crop improvement.

Plant breeding describes methods for the creation, selection, and fixation of superior plant phenotypes in the development of improved cultivars suited to needs of farmers and consumers. Primary goals of plant breeding with agricultural and horticultural crops have typically aimed at improved yields, nutritional qualities, and other traits of commercial value.

Plant breeding has a long history of integrating the latest innovations in biology and genetics to enhance crop improvement. Despite the immediate recognition among some plant breeders of the importance of Mendelian genetics, full integration was delayed for nearly 20 years until quantitative genetics reconciled Mendelian principles with the continuous variation observed for most traits considered important by most plant breeders.

Subsequent advances in our understanding of plant biology, the analysis and induction of genetic variation, cytogenetics, quantitative genetics, molecular biology, biotechnology, and, most recently, genomics have been successively applied to further increase the scientific base and its application to the plant breeding process.

The plant biotechnology era began in the early 1980s with the landmark reports of producing transgenic plants using *Agrobacterium*. Molecular marker systems for crop plants were developed soon thereafter to create high-resolution genetic maps and exploit genetic linkage between markers and important crop traits. By 1996, the commercialization of transgenic crops demonstrated the successful integration of biotechnology into plant breeding and crop improvement programs. Introgression of one or a few genes into a current elite cultivar via backcrossing is a common plant breeding practice. Methods for marker-assisted backcrossing were developed rapidly for the introgression of transgenic traits. During the past 25 years, the continued development and application of plant biotechnology, molecular markers, and genomics has established new tools for the creation, analysis, and manipulation of genetic variation and the development of improved cultivars.

### **Anatomy as a supplementary tool in the systematics of the genus *Sesamum*L. (Pedaliaceae)**

Akhila H and S Suhara Beevy

*Department of Botany, University of Kerala, Kariavattom,  
Thiruvananthapuram-695581  
s.beevy@rediffmail.com*

#### **ABSTRACT**

Anatomical characterization of 37 accessions in six species of *Sesamum* was carried out to assess the interrelationships in the genus. The study examined the stem, leaf and petiole anatomy and considered 11 quantitative and 17 qualitative traits for one-way ANOVA, Kruskal-Wallis test, cluster analysis and PCA. It was found that the shape of the stem, leaf and petiole were species specific. The shape of the stem ranged from quadrangular with ridges and furrows in *S. indicum*, *S. radiatum*, *S. malabaricum* and *S. alatum* to square shaped (*S. laciniatum*) with slightly quadrangular nature in *S. prostratum*. The c.s of the leaf was C-shaped in the mid rib region with glands and hairs seen more on the adaxial surface except in *S. alatum*. The leaf petiole showed horse-shoe shaped structure

with deeply furrowed upper region with varied number of vascular bundles i.e., from 4 (*S. alatum*) to 10 (*S. malabaricum* and *S. radiatum*). Analysis of quantitative data revealed an increase in the size of tissues in *S. radiatum*, while *S. alatum* showed the least value. ANOVA revealed significant variations at the inter- as well as intra-specific levels. Kruskal-Wallis test displayed significant variations in the characters, such as shape of stem in c.s, surface of the stem, hairs in adaxial and abaxial surface, petiolar surface, nature of bundle sheath in petiole and petiolar trichomes. PCA and cluster analysis suggested the same. A taxonomic key prepared in the study emphasized the significance of anatomical data in the systematics of the genus *Sesamum*.

Keywords: *S.indicum*, *S.radiatum*, *S.malabaricum*, *S.laciniatum*, *S.prostratum*, *S.alatum*, anatomy, Kruskal-Wallis test, ANOVA, PCA.

### **Reproductive biology and seed germination studies in *Gynochthodes umbellate* (L.) Razafim. & B. Bremer (Rubiaceae)**

Anjusha S., Gangaprasad A.\* and Radhamany P. M.

*Plant Tissue Culture and Molecular Biology Lab, Department of Botany,  
University of Kerala, Kariyavattom, Thiruvananthapuram, Kerala, India-695  
581*

*Email: \*gp@keralauniversity.ac.in*

#### **ABSTRACT**

Reproductive biology studies of plants are important and crucial for establishing the appropriate measures for their conservation and for predicting their survival capacity. *G. umbellata* is a medicinally important woody climber belongs to the family Rubiaceae. The distribution of this plant is limited and restricted to some areas like sacred grooves and have some reproductive problems. Present study carried out to analyse the floral morphology, pollen viability and seed germination studies in detail. From the present study it reveals that *G. umbellata* have pistillate and staminate plants separately. Flowers of staminate plant have 4-5 stamens and a style and stigma is completely absent but the pollen produced in this plant shows a high percentage of viability. Whereas flowers of pistillate plant have a style with two stigmatic lobe and 4-5 stamens but here the viability of pollen grains are very low. The seed viability and seed germination percentage is

very low so alternative propagation methods were standardized for the propagation and conservation of this important medicinal plant.

**Stylar lobe micromorphology in *Thottea duchartrei* Sivar., Babu & Indu, and *Thottea idukkiana* Pandura. & Nair- two medicinal undershrubs from Western Ghats.**

Athira M. and Shaiju P.N.

*Post Graduate and Research Department of Botany, Fatima Mata National College, Kollam-1  
shaiju@fatimacollege.net*

**ABSTRACT**

*Thottea* is an Indo-Malayan genus represented in the Western Ghats by eight species. Two among them – *T. duchartrei* and *T. idukkiana* are sharing most of the common vegetative and floral characters except some significant differences in the gynostemium. The present study envisages the detailed micromorphology of the stylar lobes in these two species in order to characterize the stigmatic tissue in this component of the highly complex gynostemium. The light, stereo and scanning electron microscopic studies on the morphology and anatomy of the stylar lobes in these two species clearly differentiate the specific stigmatic portion with characteristic properties. But the present study do not offer any evidences to separate these two species based on their stylar micromorphology.

**Wild ornamental plants of Agasthyamalai Biosphere Reserve endemic to the Western Ghats of the Peninsular India**

Jgadeesan R<sup>1</sup>, Gangaprasad A.\*<sup>1</sup>, Sam P. Mathew<sup>2</sup> and Santhoshkumar E.S<sup>2</sup>

1. *Department of Botany, University of Kerala, Kariyavattom, Thiruvananthapuram, Kerala 695581*

2. *Jawaharlal Nehru Tropical Botanic Garden and Research Institute Palode, Karimankode P.O., Thiruvananthapuram, Kerala 695562.*

*\*Email: agangaprasad@yahoo.com*

**ABSTRACT**

The tropical rainforests occurring on the slopes of the Western Ghats are one of the remarkable strongholds of plant genetic resource in the

country. According to an official estimation, this biogeographical region is the abode of around 5000 species of Angiosperms which include approximately 1500 endemics also. Wild ornamental species of the Western Ghats are one of the lesser-known groups of plants having incredible potential in the field of floriculture and commercial landscaping approaches during future decades. The indigenous ornamental plant wealth of the Western Ghats proclaims with quite a lot of lesser-known wild proto types of several domesticated, semi-domesticated and popular horticultural species of the modern ornamental botanical entities. It is obvious that all present day ornamental species have come from the wild germplasm during the medieval period of human civilization. The wild proto types of these ornamental species have much relevance to the field of floriculture for the varietal improvement as well as genetic modifications of significant ornamental plants. The glimpses on history of wild ornamental plants in the Indian Subcontinent has key role with European invasion in India. European botanists and amateur horticulturists of those days have extensively and intensively explored the Northwest Himalayan forests for popular wild ornamentals like Rose, Primula, Rhododendron, Orchids and other beautiful unknown Indian wild herbs, shrubs and trees for domestication in their home gardens and also to introduce at several European gardens. Burkill (1870-1965), recorded that the famous 'Assam Tea Delegation' of the British regime consisting of Wallich, Griffith and Mc Cleand brought to knowledge on several interesting wild ornamental plants from Northeast India, apart from establishing the wild tea plants. As regards to the Southern Western Ghats, there are no detailed studies on endemic wild ornamentals except a preliminary investigation by JNTBGRI in 1993. The present paper describes outstanding wild endemic ornamental species for domestication in home gardens and landscape practices from the Agasthyamalai Biosphere Reserve. Agasthyamalai Biosphere Reserve, one of the Indian 'hot spots' of biodiversity, located between 8° 8' to 9° 10' North Latitudes and 76° 52' to 77° 34' East Longitudes which cover an area of 3,500.36 km<sup>2</sup> in Kerala and Tamilnadu States. The methodology of the study includes herbarium collection, plant identification and passport data documentation with relevant photographs of as primary phase of the studies in the Kerala region of Agasthyamalai Biosphere Reserve.

## **Calotropis (L) R. Br. (Apocynaceae) diversity**

Abdul Kader S. and Chellakumar M.

*Department of Plant Biology & Plant Biotechnology  
Presidency College (Autonomous) Chennai, Tamil Nadu – 600 005.  
E-mail: sakfri@rediffmail.com*

### **ABSTRACT**

Since ambiguity exist between *C. gigantea* and *C. procera* in the name of Vellerukku among Siddha practitioners in Tamil Nadu, we have undertaken taxonomical and anatomical studies during 2012-2014 not only to document the distribution of different *Calotropis* L. species (Apocynaceae) in South India particularly in Kerala and Tamil Nadu but also to confirm their correct identity. Measurements on morphological characters (both vegetative and reproductive characters) were taken. For anatomical studies and herbarium preparation, specimens were collected and photographs taken. Data were also gathered from the literature. The present study document 3 species of *Calotropis* in India viz., *C. acia* Buch.-Ham., *C. gigantea* (L.) Dryand. and *C. procera* (Aiton) Dryand. Of these, only *C. gigantea* (L.) Dryand. is found in Kerala and Tamil Nadu. *C. acia* Buch.-Ham. is found only in Sikkim Himalayas. In Karnataka, Andhra Pradesh and Telangana both *C. gigantea* (L.) Dryand. and *C. procera* (Aiton) Dryand. are found. The confusion arose due to the inclusion of *C. procera* (Aiton) Dryand in the 'Flora of the Presidency of Madras' by J. S. Gamble and C. E. C. Fischer (1915–1938). It should be noted that while publishing this flora the then Madras Presidency comprises the present 5 southern States namely, Tamil Nadu, Kerala, Karnataka, Andhra Pradesh, and Telangana. Again, the Siddha system of medicine is originated and widely practiced in Tamil Nadu. It is practiced in some parts of Kerala too. Since *C. procera* (Aiton) Dryand is not found in Tamil Nadu and the Siddha system of medicine is purely of Tamil origin, we therefore conclude that the local name Vellerukku mentioned in Siddha Materia Medica is the white variety of *C. gigantea*. The present study reveals that all the 3 species are distinct taxonomically. An intended Key is prepared for easy identification.

## **Diversity of floral morphological characters with special emphasis on stigma features in the family Bromeliaceae**

Kalarani V.S and Radhamany P.M.

*Department of Botany, University of Kerala  
Kariavattom, Thiruvananthapuram, Kerala-695581*

### **ABSTRACT**

The taxonomy of Bromeliaceae is currently in flux and certain aspects of classification are being refined. The understanding of floral morphology and pollination biology is one of the prerequisites to lead to a correct classification of the genus and species. Until recently, characteristics of the gynoecium and androecium have been little utilized in systematic studies Bromeliaceae. The present study aimed to analyse the role of morphological characters with special emphasis on stigma features on the classification of the family Bromeliaceae. For these sixteen taxa (eight genera) under three tribes (Pitcairnioideae, Bromelioideae and Tillandsioideae) were investigated for the present study. The plants used in the present investigation were obtained from the Botanic Garden, Department of Botany, University of Kerala, Kariavattom, Jawaharlal Nehru Tropical Botanic Garden and Research Institute, Palode and different parts of Thiruvananthapuram. Polypetalous condition and polysepalous condition present in all the members of the sub family Bromelioideae and Tillandsioideae except *Guzmania lingulata*. *Guzmania* has gamopetalous and gamosepalous condition. *Dyckia bravifolia* (Pitcairnioideae) has gamopetalous and gamosepalous condition. All the species observed have six stamens arranged in two series; three towards petal and three towards sepal. *Guzmania lingulata* has epipetalous stamens. All the species have dorsifixed stamens. Stigma characters also show great variation. *Aechmea fulgens*, *Aechmea* species 1, genus *Billbergia*, *Ananas* and *Neoregelia* have spirally arranged conduplicate stigma. But *Aechmea bracteata* has free stigma lobes. Also *Cryptanthus*, *Tillandsia* and *Guzmania* genus have free stigma lobes. Genus *Aechmea*, *Cryptanthus*, *Ananas*, *Neoregelia*, *Dyckia* etc. lack hairs on their surface of stigma. But hairs are present in the genus *Billbergia*, *Tillandsia*, and *Guzmania*. The present study concludes that there is a correlation of stigma morphology with previous classification the family Bromeliaceae into three sub families. More detailed analysis of stigma characters will contribute to resolving the problems in the phylogeny and classification of the family Bromeliaceae.



## **Floral morphogenesis in *Coccinia grandis* (L.) Voigt (Cucurbitaceae)**

Raseena N.R. and Suhara Beevy S.

*Department of Botany, University of Kerala, Kariavattom-695581*  
*raseenanrrn@gmail.com*

### **ABSTRACT**

Floral morphogenesis is a complex process which depends on many environmental and developmental signals and the striking diversity of vegetative and floral morphologies in angiosperms raises the question of how development of these traits happened. The candidate species, *C. grandis*, is a eudicot belonging to the family Cucurbitaceae with a strong dioecy and heteromorphism of sex determination. Present investigation was focused on the floral morphogenesis of male and female flowers using both macroscopic and microscopic methods. The study noticed a concentric pattern of flowering in the species. Scanning electron microscopic observations revealed that the developmental events are almost identical in both the sexes at the early stages and the differences were observed in the later stages of development. The study suggests that reproductive characters of the species may be regulated by genetic factors and these genetic and developmental mechanisms govern transitions to functional dioecy in the species.

## **Biochemical evaluation and estimation of anacardic acid in different extracts of *Anacardium occidentale* L.**

Sija.S.L<sup>1\*</sup>, Potty.V.P<sup>2</sup> and Santhoshlal.P.S<sup>1</sup>

<sup>1</sup>*PG and Research Department of Botany & Biotechnology,  
Sree Narayana College, Kollam-691 001, Kerala, India*

<sup>2</sup>*The CEPCI Laboratory & Technical Division, kollam-691 001, Kerala, India*

*\*E-mail: sijasl007@gmail.com*

### **ABSTRACT**

Cashew (*Anacardium occidentale* L.) is one of the economically and medicinally important tropical horticultural crop belongs to the family Anacardiaceae. It is much known for its commercially valuable kernels and also bioactive compounds like polyphenols. In recent times there is more attention towards them; due to the presence of bioactive compounds especially anacardic acid and they have a dynamic role in prevention of various human diseases. The present study was carried out to evaluate

the presence of anacardic acid, total phenolic compound, antioxidant activity and antibacterial activity in methanolic extract of *in vitro* developed callus and various plant parts such as young leaves, flower, shoot and cotyledon in order to discover and to improve the knowledge of traditional medicine. Methanol extract of flower showed the maximum phenolic content ( $260.8 \pm 5.543$  mg/g) whereas the methanol extract of cotyledon ( $16.2 \pm 3.284$  mg/g) showed the lowest total phenolic content. Total phenolic contents were measured by the Folin-Ciocalteu method using gallic acid as standard compound. The action of 1,1-diphenyl-2-picrylhydrazyl (DPPH) on radical scavenging effect of the extracts was determined spectrophotometrically using ascorbic acid as standard compound. All extracts exhibited a DPPH radical scavenging activity and among the extracts, *A. occidentale* flower demonstrated greater antioxidant potential with a low  $IC_{50}$  ( $206.312 \pm 0.38$   $\mu$ g/ml) in comparison with those of the other extracts. Total phenolic contents showed positive correlations with the DPPH radical scavenging activity ( $r = 0.979$ ;  $p < 0.01$ ) and negative correlations with  $IC_{50}$  ( $r = -0.984$ ;  $p < 0.01$ ). The antibacterial capabilities of various extracts were also examined against two common human pathogens of clinical importance, *Escherichia coli* and *Staphylococcus aureus*. Presence of anacardic acid in various extracts was also estimated by using HPTLC method.

Keywords: *Anacardium occidentale*, 2, 4-D, BAP, Callus, Total phenolic contents, Folin-Ciocalteu reagent, Antioxidant activity, Antibacterial activity, DPPH, HPTLC.

### **Diversity of Staminodes in the Genus Cassia Linn.**

Anitha B. and Shaiju P.N.

*Post Graduate and Research Department of Botany, Fatima Mata National  
College, Kollam-1  
shaiju@fatimacollege.net*

#### **ABSTRACT**

The androecial diversity with particular reference to the morphology and distribution pattern of staminodes was analyzed in eight South Indian species of the genus *Cassia*. The morphological characters of staminodes are studied at different levels such as the arrangement of stamens, shape, size and attachment of stamens within the filaments, etc. The study points out the great staminodal diversity in *Cassia* which has been explained as the diversity number, position, arrangements and nature. Most of the data

available in the present study is found taxonomically significant to characterize different species of Cassia. The extreme diversity in the nature, arrangement, number, position and developmental mechanism noticed in the present study can be utilized as a foundation for more extensive phylogenetic analysis within the genus.

### **Diversity, Distribution and status of the genus *Sida* L (Malvaceae) in South India**

Navas M., Mathew Dan and Latha P.G.

Jawaharlal Nehru Tropical Botanic Garden and Research Institute,  
Palode P O, Thiruvananthapuram (District), Kerala, India  
e-mail: navastbg@yahoo.com

#### **ABSTRACT**

The genus *Sida* L. of Malvaceae is represented by about 200 species, widely distributed in the tropical and subtropical regions. In India, there are 20 species of *Sida*, of which 19 are present in South India. *S. beddomei*, *S. cuneifolia*, *S. fryxellii* and *S. ravii* are endemic to south India. Thiruvananthapuram district showed maximum diversity in the genus *Sida*, representing 14 species. Most of the *Sida* species are very similar in morphological as well as floral characters, creating confusion even to taxonomists. Some of the species of *Sida* are medicinally important and due to the close morphological similarity between the species and in order to fulfill the great demand as a drug, several *Sida* species are being harvested in bulk. Thorough explorations were conducted to different regions, located the species and subjected to morphological characterisation. Diversity in habit, habitat, distribution and phenology are discussed.

Key Words: endemic, morphology, South India, *Sida*

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**KOLLAM, KERALA-691001, TEL: 0474-2743387, Fax: 2762025**  
**[www.fatimacollege.ac.in](http://www.fatimacollege.ac.in)**

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## About Kollam.....

Kollam or Quilon, is an old seaport and town on the Arabian Sea coast in Kerala, on Ashtamudi Lake. Kollam, once called Desinganadu, has had a high commercial reputation since the days of the Phoenicians and Romans.

### Tourist Attractions

- Kollam Beach
- Ashtamudi Lake
- Neendakara Fishing Harbour
- Thangasserry Light House
- Thenmala Eco-tourist village

### Climate

A nice, cool weather with an average high of 31 degree Celsius and low of 27 degree Celsius.

Nearest Railway Station: Kollam

Nearest Air Port:  
Thiruvananthapuram



### **Organizing Committee**

Patron: **Rt. Rev. Dr. Stanley Roman**  
Bishop of Quilon

Manager: **Rev. Fr. Anil Jose**

Chairman: **Dr. Vincent B. Netto**  
Principal

Convenor: **Dr. Thomas Bennans**  
Head of the Department

Joint Convenor: **Dr. Shaiju P.N**

Organizing Secretary: **Dr. Sinilal B**

Programme Coordinators

**Dr. Merlyn V.J**

**Dr. Maria Brigit**

**Mrs. Nirmala Jayarani**

**Dr. Rubin Jose A.S**



**FATIMA MATA NATIONAL COLLEGE**

**(Autonomous)**

### **CONTACT ADDRESS**

**Dr. B. Sinilal**  
**Department of Botany**  
**FMN College, Kollam**  
**Kerala State, 691001**

**Phone: +919746180146**

**Fax: 0474 2762025**

**DEPARTMENT OF BOTANY**  
**FATIMA MATA NATIONAL COLLEGE**  
**KOLLAM, KERALA**

## **FLOWERING PLANT DIVERSITY & REPRODUCTIVE BIOLOGY**

## **NATIONAL SEMINAR**

**Sponsored by**

**University Grants Commission**



**7<sup>th</sup> August 2015**

## On The Title.....



India is one of the mega biodiversity countries, nurturing enormous plant diversity. However, this treasure is under constant threat due to various factors. Rapid

decline in plant diversity and the growing awareness of the importance of preserving the diversity have given an unprecedented impetus for conservation. Conservation approaches on rare, endangered and exotic species have to be planned in consideration of the reproductive specialties of them. Study of reproductive features need to be considered as an integral part of all conservation projects.

Since we find so many endemic plants in tropical vegetation, there is an urgent need for integration or coordination between plant systematics and re-



productive biology. Taking this into consideration, research forefront in plant diversity has come up with new ideas to explore the reproductive specialties on conservation point of view. In this context, this seminar aims to provide a scientific platform to discuss and disseminate the latest ideas and concepts on various aspects of Plant Systematics and Reproduction.

## Themes.....

- Systematics of Flowering Plants
- Reproductive Mechanisms in Flowering Plants

## About the College & Department



Fatima Mata National College was established in 1951 by His Excellency Rt. Rev. Dr. Jerome Fernandez, the first native Bishop of Quilon. Fatima College pursues the task of preparing young

men and women for life, by providing value based education, and by inculcating in them a scientific temper and a firm commitment to spiritual and moral values, with a view to improving their lives, their homes and the world around them. The college is imparting instruction in Humanities, Sciences and Commerce. In recognition of its high standard of education and training, the college has conferred autonomous status in the year 2013.



**Department of Botany** was established in 1952. Under Graduate course in Botany was started in 1952 and the Post Graduate course in 1961. At present the department is in the final phase of recognition as a research centre under University of Kerala. This Department is supported by FIST programme of the Department of Science & Technology, Govt. of India.

## Participate....

Researchers and students are welcome to participate. You can present your research findings under the major themes listed. Separate oral and poster presentations will be arranged for the themes. Best oral and poster presentations will be awarded.

Abstracts may be e-mailed to the Organizing Secretary at the earliest. A preliminary screening will be done for selecting the contestants. TA will be provided to the invitees. A registration fee of Rs. 100 will be collected from the participants on arrival. Please find the detailed rules and regulations of presentations in the Registration Form



## Important Dates

### Last dates for

**Submission of Abstracts 20.07.2015**

**Registration 30.07.2015**

**Phone: +919746180146**

**Fax: 0474 2762025**

**E-mail: [sinilalb@fatimacollege.net](mailto:sinilalb@fatimacollege.net)**

**Report of the One Day Seminar**  
**Medicinal Chemistry-Fundamentals and Applications**

**28-03-2017**

**Organized by**  
**Department of Chemistry**  
**Fatima Mata National College, Kollam**

In Association with  
Academy of Chemistry Teachers (ACT)

Sponsored by  
**KERALA STATE COUNCIL FOR SCIENCE, TECHNOLOGY AND**  
**ENVIRONMENT**

**Sasthra Bhavan, Pattom Palace P.O., Trivandrum-695 004**



**Report of the One Day Seminar**  
**Medicinal Chemistry-Fundamentals and Applications**

**28-03-2017**

Fatima Mata National College was established in the year 1951 by His Excellency Rt. Rev. Dr. Jerome M Fernandez with view to providing facilities for the higher education in the Diocese of Quilon. This year the college is celebrating its 65<sup>rd</sup> year of committed service in the field of higher education. The department of Chemistry was started as under graduate department in the year 1952. Later in 1993 BSc Polymer Chemistry was started. In the year 1995 the department was elevated to post graduate department. Recently in the year 2013 the University of Kerala has approved the Department as Research Centre.

The Department of Chemistry, Fatima Mata national College, Kollam has conducted a state level one day seminar on “**Medicinal Chemistry-Fundamentals and Applications**” in association with Academy of Chemistry Teachers (ACT) on 28<sup>th</sup> March 2017. This seminar is financially supported by Kerala State Council for Science Technology and Environment (KSCSTE). The sessions were handled by two eminent resource persons, Ms. Anuroopa (Junior Scientists, Department of Bioinformatics, University of Kerala, Thiruvananthapuram) and Dr. Pushpa VL (Associate Professor, Department of Chemistry, SN College, Kollam)

The seminar was started at 9.30 am with a short inaugural function. Dr. Manohar D Mullassery (Organizing Secretary) welcomed the gathering. Dr. AR Titus (Vice-Principal, Fatima Mata National College, Kollam) presided over the function, and formally inaugurated the seminar by lighting the traditional lamp.

Vice-Principal released the Proceedings of the seminar by handing over the copy to Dr. Harikumar B (HOD, Chemistry, TKM College of Arts and Science, Kollam). Dr. Sheeja Mathews (Head of the Department of Chemistry) delivered vote of thanks.

The seminar was attended by 125 students and 30 teachers from various colleges. Articles were invited for oral presentation and received 17 articles. The seminar was highly informative and beneficial to all. The seminar concluded at 3.30 pm.

**List of Participated Students**

<b>Research Scholars</b>		
Serial No.	Name of Student	College
1.	Surya R	FMN College
2.	Lekshmi V Kumar	DB College
3.	Jyothish Kumar	SN College Kollam
4.	Prathibha B	DB College
5.	Arya S	NCESS, Tvm
6.	Vinu V Dev	NCESS, Tvm
7.	Suja S	FMN College
8.	Lekshmi Priya	FMN College
9.	Fiona Paulose	FMN College
10.	Lekshmi C Nair	MG College, Tvm
11.	Sarika K	University College, Tvm
12.	Binusreejayan	Dept of Chemistry, Kariavattom, Tvm
13.	Deepa JR	Dept of Chemistry, Kariavattom, Tvm
14.	Christa John	Dept of Chemistry, Kariavattom, Tvm

<b>Fatima Mata National College, Kollam</b>		
Serial No.	Name of Student	Class
1.	Julie Johnson	II MSc Chemistry
2.	Alex Antony	II MSc Chemistry
3.	Divya L	II MSc Chemistry
4.	Nijitha G	II MSc Chemistry
5.	Ancy James	II MSc Chemistry
6.	Sr. Jaseentha A	II MSc Chemistry
7.	Athira R Devan	II MSc Chemistry
8.	Geethu Raj	II MSc Chemistry
9.	Sreejith S	II MSc Chemistry
10.	Geethu Johnson	II MSc Chemistry
11.	Anjali Babu	II MSc Chemistry
12.	Reshma Joseph	II MSc Chemistry
13.	Bhagya TC	II MSc Chemistry
14.	Jasmine Joseph	II MSc Chemistry
15.	Teena Paul	II MSc Chemistry
16.	Rincy Xavier	II MSc Chemistry
17.	Manju P	II MSc Chemistry
18.	Nayana Mary PS	II MSc Chemistry

<b>Fatima Mata National College, Kollam</b>		
Serial No.	Name of Student	Class
19.	Athira Anand	II MSc Chemistry
20.	Sajini A	II MSc Chemistry
<b>S N College, Kollam</b>		
21.	Ajesh V	I MSc Chemistry
22.	Amal MP	I MSc Chemistry
23.	Syam Kumar PS	I MSc Chemistry
24.	Chithra GS	I MSc Chemistry
25.	Meenu S	I MSc Chemistry
26.	Reshama F	I MSc Chemistry
27.	Swathi Sree	I MSc Chemistry
28.	Mahendu R	I MSc Chemistry
29.	Sarika S	I MSc Chemistry
30.	Sindhu V	I MSc Chemistry
31.	Vidya S	I MSc Chemistry
32.	Vidya R	I MSc Chemistry
33.	Pooja R	I MSc Chemistry
34.	Akhila Vijayan	I MSc Chemistry
35.	Vidya U	I MSc Chemistry

<b>S N College, Kollam</b>		
Serial No.	Name of Student	Class
36.	Geethu Krishnan	I MSc Chemistry
37.	Athulya Rajan	I MSc Chemistry
38.	Akhila OY	I MSc Chemistry
39.	Sreelekshmi SL	I MSc Chemistry
40.	Anju KR	I MSc Chemistry
41.	Vidya C	I MSc Chemistry
42.	Malavika S	I MSc Chemistry
43.	Geethu Raj	I MSc Chemistry
44.	Aparna PS	II MSc Chemistry
45.	Renju K	II MSc Chemistry
46.	Sini S	II MSc Chemistry
47.	Jisha Johnson	II MSc Chemistry
<b>S N College for Women, Kollam</b>		
48.	Anju VR	I MSc Chemistry
49.	Ashly S	I MSc Chemistry
50.	Anju P	I MSc Chemistry
51.	Asha Mohan	I MSc Chemistry
52.	Alakananda	I MSc Chemistry

<b>S N College for Women, Kollam</b>		
Serial No.	Name of Student	Class
53.	Anju S Chandran	I MSc Chemistry
54.	Aswathy M	I MSc Chemistry
55.	Reeshdevi S	I MSc Chemistry
56.	Prasanthu GP	I MSc Chemistry
57.	Santhini S Prasad	I MSc Chemistry
58.	Revathy S	I MSc Chemistry
59.	Reshma S Nair	I MSc Chemistry
60.	Kavitha Mani M	I MSc Chemistry
61.	Jahnavi C	I MSc Chemistry
<b>S G College, Kottarakara</b>		
62.	Gopika Krishnan G S	I MSc Chemistry
63.	Saranya Karthik	I MSc Chemistry
64.	Mekha Murugan	I MSc Chemistry
65.	Lincy G	I MSc Chemistry
66.	Vishnu R	I MSc Chemistry
67.	Harikrishnan M	I MSc Chemistry
68.	Ashily Shaji	I MSc Chemistry

<b>St Stephens College, Pathanapuram</b>		
Serial No.	Name of Student	Class
69.	Anoosha S	I MSc Chemistry
70.	Aswathy A	I MSc Chemistry
71.	Gayathri R Nair	I MSc Chemistry
72.	Geethu Mohan	I MSc Chemistry
73.	Leethiya S David	I MSc Chemistry
74.	Libin Thomas	I MSc Chemistry
75.	Mumthaz N	I MSc Chemistry
76.	Anila Krishnan	I MSc Chemistry
77.	Nithin N Nair	I MSc Chemistry
78.	Praveena P	I MSc Chemistry
79.	Rahul Nadh R	I MSc Chemistry
<b>DB College, Sastamakottah</b>		
80.	Arya Raj MA	II MSc Chemistry
81.	Arya R	II MSc Chemistry
82.	Anjana Murali	II MSc Chemistry
83.	Bindya Mol	II MSc Chemistry
84.	Ashitha PV	II MSc Chemistry
85.	Parvathy Sankar	II MSc Chemistry
86.	Rakhi Raj	II MSc Chemistry
87.	Revathy Raveendran	II MSc Chemistry
88.	Radhikrishnan U	II MSc Chemistry
89.	Sharija KS	II MSc Chemistry



90.	Soorya Nair	I MSc Chemistry
91.	Anju Alex	I MSc Chemistry
92.	Anjana Rajendran	I MSc Chemistry
93.	Amaldev A	I MSc Chemistry
94.	Neethu S Vasan	I MSc Chemistry
95.	Resmi Raveendran	I MSc Chemistry
96.	Surya U	I MSc Chemistry
97.	Swathi Krishna	I MSc Chemistry
<b>MSM College, Kayamkulam</b>		
98.	Saranya R	II MSc Chemistry
99.	Aneesa K	II MSc Chemistry
100.	Arsha Shahul	I MSc Chemistry
101.	Rubayya VA	I MSc Chemistry
102.	Minimol	I MSc Chemistry
103.	Aswathy Aravind	I MSc Chemistry
104.	Silpa S	I MSc Chemistry
105.	Selma Mol S	I MSc Chemistry
106.	Sabeena BK	I MSc Chemistry
107.	Sanoop MS	I MSc Chemistry
108.	Muhammed Iqbal	I MSc Chemistry

<b>TKM College of Arts and Science, Kollam</b>		
Serial No.	Name of Student	Class
109.	Akhil Krishnan	I MSc Chemistry
110.	Anizha R	I MSc Chemistry

111.	Salini PG	I MSc Chemistry
112.	Rabeeha A	I MSc Chemistry
113.	Raseela R	I MSc Chemistry
114.	Kiran Babu	I MSc Chemistry
115.	Varanya Jayan	I MSc Chemistry
116.	Sreeja Mol S	I MSc Chemistry
117.	Sreelekshmi PB	I MSc Chemistry
118.	Binza P	II MSc Chemistry
119.	Sajna Siyad	II MSc Chemistry
120.	Prajeesha PL	II MSc Chemistry
<b>SN College, Chengannur</b>		
121.	Raja Sree U	II MSc Chemistry
122.	Rakhi A	II MSc Chemistry
123.	Alka PB	II MSc Chemistry
124.	Syamini Das	II MSc Chemistry
125.	Reshmi L	II MSc Chemistry

<b>List of Teachers</b>		
Serial No.	Name of Teacher	College
1.	Dr Sheeja Mathews	FMN College
2.	Dr Suma N	FMN College
3.	Dr Apsara AP	FMN College
4.	Dr Sarau Devi	FMN College
5.	Dr Biju Mathew	FMN College

6.	Dr Manohar D Mullassery	FMN College
7.	Dr Noeline B Fernandez	FMN College
8.	Ms Mary Nancy	FMN College
9.	Ms. Mini V	FMN College
10.	Dr Shibu Joseph	FMN College
11.	Ms Jiji Johnson	FMN College
12.	Mr Ignatius J	FMN College
13.	Ms. Sheena Mary Y	FMN College
14.	Dr Sarlin PJ	FMN College
15.	Ms. Nisha Thomas	FMN College
16.	Dr Suma S	SN College, Kollam
17.	Dr Asha Bhanu	SN College for Women
18.	Ms Renjini S	SN College for Women
19.	Dr Asha S Kumar	SN College for Women

<b>List of Teachers</b>		
Serial No.	Name of Teacher	College
20.	Dr Indose Aravind	DB College
21.	Dr Chithra PG	FMN College
22.	Dr Vijaya Lekshmi	FMN College
23.	Dr Sivakala	FMN College
24.	Dr Siyad ML	TKM College

25.	Dr. Maya Devi	NSS College of Engineering, Palakkad
26.	Dr Anu K	MSM College, Kayamkulam
27.	Dr. Renu Thomas	St Stephens, Pathanapuram
28.	Dr Sheela A	MSM College, Kayamkulam



**1. Dr Mary Nancy, Department of Chemistry singing prayer song**



2. Dr. Manohar D Mullassery (Organizing Secretary and Assistant Professor, Department of Chemistry, Fatima Mata National College) welcoming the gathering



3. Dr. AR Titus (Vice-Principal, Fatima Mata National College) inaugurating the seminar by lighting the traditional lamp.



4. Dr AR Titus, (Vice-Principal, Fatima Mata National College) delivering the inaugural address.





5. Dr AR Titus, (Vice-Principal, Fatima Mata National College) releasing the Proceedings of the seminar by handing over the copy to Dr. Harikumar B (HOD, Chemistry, TKM College of Arts and Science, Kollam)



6. Dr. Sheeja Mathews, Head of the Department of chemistry, offering vote of thanks



9. Participants of the seminar are observing the oral presentations



10. Ms. Anuroopa (Junior Scientist, Department of Bioinformatics, University of Kerala, Thiruvananthapuram) interacting the audience during the forenoon session



11. Dr. VL Pushpa (Associate Professor, Department of Chemistry, SN College, Kollam) during the afternoon session

Seminar on  
**Medicinal chemistry-Fundamentals and Applications**  
**Sponsored by KSCSTE**  
**Organized by**  
**Department of Chemistry, Fatima Mata National College, Kollam**

**Inaugural Function (9.45-10.15 am, 28-03-2017)**

**Programme Schedule**

Prayer song

Welcome Speech	- Dr. Manohar D Mullassery (Organizing Secretary)
Presidential Address	- Dr. AR Titus (Vice-Principal, FMNC, Kollam)
Inaugural Address	- Dr AR Titus
Felicitations	- Dr Harikumar B (HOD, Chemistry, TKM College, Kollam)
Vote of Thanks	- Dr. Sheeja Mathews (HOD, Chemistry)

Technical Session, 1. <b>(10.30 am-12.00)</b>	- Ms. Anuroopa (Junior Scientist, Department of Bioinformatics, University of Kerala, Thiruvananthapuram)
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<b>Oral presentations</b>	<b>(12.00-1.00 pm)</b>
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**Lunch Break (1.00 pm-1.45 pm)**

Technical Session 2. <b>(1.45-3.15 pm)</b>	- Dr. VL Pushpa (Associate Professor, Department of Chemistry, SN College, Kollam)
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<b>Oral presentations</b>	<b>- (3.15-4.15 pm)</b>
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## **Resource Persons**

1. Ms. Anuroopa (Junior Scientist, Department of Bioinformatics, University of Kerala, Thiruvananthapuram)
2. Dr. VL Pushpa (Associate Professor, Department of Chemistry, SN College, Kollam)

### **Outcome of the seminar**

The seminar on Medicinal Chemistry-Fundamentals and Applications was highly beneficial to both students and teachers. Both resource persons were able to discuss the topics based on the MSc. Chemistry syllabus prescribed by the University of Kerala. Research scholars were also found useful as this was a newly emerging topic. Research scholars who want to pursue research in Medicinal Chemistry got a rare opportunity gather ideas from experts in the field. The first session was handled by Ms. Anuroopa (Junior Scientist, Department of Bioinformatics, University of Kerala, Thiruvananthapuram). some of the points she had discussed is highlighted as follows.

Bioinformatics has become an integral and inevitable part of modern chemical, biological and pharmaceutical science to decrypt and depict the hidden information in DNA or protein sequence, that in turn describes and determines it's structure and function. Drug discovery is an interdisciplinary, expensive and time-consuming process when executed on manual bases. Computer Aided Drug discovery is one of the major application of Bioinformatics which aims to supplement wet lab experiments in *in silico* system and thereby enormously reducing the time and cost. In Computer assisted Drug Discovery(CADD), computational techniques are used to simulate drug-receptor interactions. Approaches used in CADD can provide valuable information for target identification and selection, lead identification and design, small-molecule screening and optimization. CADD have manifested promising applications for design of novel drug with minimal side effect and high potency. This session aims at delivering a brief outline on bioinformatics and CADD, biological database, homology modelling, disease target identification, structure retrieval of both target and

ligand, molecular docking, and result interpretation. This is intended to enable the non bioinformaticians to be adept with basic computational techniques in molecular and structural biology.

The second session was handled by Dr. VL Pushpa (Associate Professor, Department of Chemistry, SN College, Kollam). The following areas were given thrust by Dr Puspha.

Drug discovery process is an interdisciplinary area of research. Fruitful conversion of lead candidate to acceptable drug molecule is an intense, lengthy and an interdisciplinary endeavor. General procedure of medicinal discovery requires more than a decade and the cost is in billions of dollars. The process of drug discovery has been revolutionized with the advent of genomics, proteomics, bioinformatics and efficient technologies like combinatorial chemistry, high throughput screening (HTS), virtual screening, *de novo* design, *in vitro*, *in silico* ADMET screening and structure-based drug design. Drug design involves a range of computerized techniques based on theoretical Chemistry and experimental data to predict biological and molecular properties. At present, myriad no. of drug designing software's are available for academic as well as commercial purpose.

#### **What is a disease?**

The abnormal condition of a body is called as disease. A Disease may be arising due to the abnormal synthesis or functioning in the bio molecules such as protein, DNA, carbohydrate etc. For example Cyclooxygenase (COX) is an enzyme that is responsible for formation of important biological mediators called prostanoids (including prostaglandins, prostacyclin and thromboxane) which are responsible for inflammation and pain. Pharmacological inhibition of COX can provide relief from the symptoms of inflammation and pain.

#### **Methods of Drug Development**

A variety of methods exists for the discovery and development of drug. It starts with identifying the disease followed by testing the available compounds/drugs and later an understanding of pharmacodynamics and pharmacokinetics are used to improve drug efficacy. The basic understanding in the pharmacology and mechanism of a path way will also contribute to this research process. The drug is most commonly an organic small molecule which activates or inhibits the function of a biomolecule such as a protein which in turn results in a therapeutic benefit to the patient. So, drug design involves design of small biologically active molecules.



A disease can be suppressed by controlling the function of a protein identified as a target. The preliminary step in drug discovery is the identification of a disease and target protein related to the disease and finding small molecules (usually molecular mass below 300) that can interact and control the action of the target. In proteins, there are some active sites. Medicinal Chemists aims to block these active sites with the help of a putative ligand to get therapeutic effect(s) . Sometimes, scientists find the right compound quickly but usually millions of compounds must be screened. In a series of test tube experiments called assays, compounds are added one at a time to enzymes, cell cultures, or cellular substances grown in a laboratory. The goal is to find which addition shows some desired effect. This process may require testing hundreds of compounds since some may not work, but will indicate ways of changing the compound's chemical structure to improve its performance. This type of wet lab analysis is time consuming and results in the environmental pollution as well as in the wastage of large amounts of chemicals. This disadvantage of traditional method can be overcome by the advent of cheminformatic softwares.

### **Drug Discovery Process**

#### a) Pharmacophore identification

In a drug discovery process, the researchers are in a search of some compounds whose biological response is already found out (bioassay of compounds) in order to get some initial active hits. The method they adopt to search include substructure searches, similarity metrics and pharmacophore searching. Of the three, pharmacophore search is the best in finding a range of chemical structures with viable features. This ability of pharmacophoric feature to find new class of inhibitors from the basis of known class of compounds is called scaffold hopping.

A pharmacophore describes a three-dimensional arrangement of molecular features: hydrogen bond donors and acceptors, bulky groups, etc. being involved in their desirable biological activity. Pharmacophore models are good for finding compounds that fit several constraints. The analysis is very fast, making these models ideal for searching very large databases of chemical structures. Despite certain limitations, pharmacophore searches have a valuable role in the drug design process. When used in an appropriate manner, they are a useful tool for the drug design chemist to find compounds to be assayed that have a reasonable chance of being active.

#### b) Structure activity relationship

Compounds with similar structure to a pharmacologically active molecule are often biologically active. This activity may be either similar to that of original compound but different in potency or unwanted side effects or completely different to that exhibited by the original compound. These structurally related activities are commonly referred to as structure – activity relationships (SAR). The study of SAR of a lead compound and its analogues may be used to determine the functional part of the lead compound responsible for both its beneficial biological activity (pharmacophore) and its unwanted side effects. This information may be used to develop new molecules that has increased activity and fewer side effects. SAR studies are usually determined by making minor changes to the structure of a lead to produce analogues and assessing the effect of these changes on the biological activity. This type of investigation is able to create a broad generalization about the biological effect of specific type of structural changes. These changes can be classified as size and shape of carbon skeleton, nature and degree of substitution and the stereochemistry of the lead. These changes are required to produce analogues of a particular lead. It is believed that structural changes that result in analogues with increased lipophilic nature may exhibit either increased activity because of better membrane penetration or reduced activity due to reduction in their water solubility. Further too big structural analogues of lead cannot be admittable since they are not suit for the target binding site. By the involvement of computer assisted programming in the drug designing process, all the above mentioned problems can be solved.

#### c) Quantitative structure activity relationship

QSAR is conceptually a way of finding a simple equation that can be used to predict some property from the molecular structure of a compound. The molecular properties in a QSAR equation are called descriptors. A descriptor can be any number that describes the molecule. In general, QSAR is best used for computing properties that are a function of nonspecific interactions between the molecule and its surroundings. The QSAR model is an equation for predicting some property from molecular descriptors and coefficients of those variables.

The main properties of a drug that appear to influence its activity are its lipophilic nature, electronic effect within the molecule and steric effects. Lipophilicity is the measure of drug solubility in lipid membrane, which is significant for a drug to penetrate the lipid membrane. The electronic effect of a molecule affect will affect its electronic distribution, which tells how easily a molecule can bind to the receptor protein. Molecule size and shape (steric effect) will tell whether the molecule approached more closely to the target binding site. The parameters used to represent these properties are partition coefficient for lipophilicity, Hammett sigma constant for electronic effect and Taft steric constant for steric effects.

A major factor driving the widespread use of QSPR models is their aid in rational determination of properties of new compounds without the need to synthesize and test them. With the advancement of software technology, several computer programs have become available commercially and academically which enable the rapid calculation of thousands of structural descriptors for a compound in a fraction of a second. In order to process all these molecular descriptors at the same time and to build optimal structure-property models, multi variative statistical methods, have been used. Although thousands of molecular descriptors are already available for the QSPR modeling, the search for the best descriptors suitable to model a property is a major task. Experimentally determined values of many fundamental properties are unavailable in the literature, and their measurement is costly and time-consuming. Many QSPR models have been developed for the prediction of a wide range of properties, such as boiling and melting points, molar heat capacities, heats of vaporization, densities, aqueous solubilities, octanol-water partition coefficients, etc.



## **Total Income and Expenditure Statement**

Programme-

**State Level Seminar on Medicinal Chemistry-Fundamentals and Applications**

**Date-28-03-2017**

**Venue-Fatima Mata National College, Kollam**

**Sponsored by- Kerala State Council for Science Technology and Environment**

**Organized by- Department of Chemistry, Fatima Mata National College, Kollam**

Receipts	Amount	Payments	Amount
1. Amount sanctioned from KSCSTE (to be received)	Rs. 10,000	1. Course Materials	Rs. 1,500
2. Contribution from Department	Rs. 4,115	2. Publication of Proceedings	Rs. 6,990
3. Registration	Rs. 4000	3. Honoraria to resource persons	Rs. 5,000
Sponsorship	Rs. 4000	1. Photographs	Rs. 1,000
		2. Refreshments	Rs. 5,300
		3. Banner	Rs. 700
		4. Travelling expenses	Rs. 500
		5. Generator	Rs. 500
Total	22,115	Total	22,115

**Name and Signature of coordinator**

**Name and Signature of Principal**



**FOSTERING SYNERGISTIC RELATIONSHIPS IN THE HIGHER  
EDUCATION SCENARIO: CAPACITY BUILDING AND  
PEDAGOGICAL INNOVATIONS**

**INTERNAL QUALITY ASSURANCE CELL  
FATIMA MATA NATIONAL COLLEGE  
(Autonomous)  
KOLLAM-1**



Name of the organizing Department : IQAC

Duration of the Programme : Two Days

Level of the Programme : National

Date : 4<sup>th</sup> and 5<sup>th</sup> March, 2016

Total Number of Resource Persons : 06 (Please see the Brochure attached)

Total Number of Participants : 121

### **A brief report of the programme**

A two-day national seminar was organized by IQAC on 4<sup>th</sup> and 5<sup>th</sup> March, 2016, titled “Fostering Synergistic Relationships in the Higher Education Scenario: Capacity Building and Pedagogical Innovations”. The theme of the seminar was capacity building in the higher education scenario and the need for designing pedagogical innovations.

The seminar was inaugurated by Prof. S. Varghese, State Project Co-ordinator, RUSA. The keynote address was given by Dr. Geetha Swaminathan, former Vice Principal, Stella Maris College, Chennai. The topic of discussion was ‘Quality enhancement in higher education: Issues, benchmarks and strategies’. The first technical session was on ‘Curriculum Upgradation’, in which Dr K.P. Isaac delivered on ‘ICT: An Invaluable Tool for Learners and Knowledge Providers’. The second lecture was on ‘Impact of Accreditation’, and was made by Dr. Bedurudhin, Kerala State Co-ordinator, Quality Assurance Cell, NAAC.

The second technical session was on ‘Capacity Building’, on which two lectures were executed- the first one on ‘Promotion of Research’ by Dr P.R. Sudhakaran, University of Kerala and the second one was on ‘Benchmarking; A tool for Identification of Best Practices’.

‘Dynamics in Higher Education’ was the central theme of the third technical session. The first lecture in this session was on ‘Innovations and Best Practices in Pedagogy’ and it was given by Dr M.P. Rajan, NAAC, Bangalore. The second lecture was given by Dr M. Ramachandra Mohan, Bangalore University. The title of presentation was ‘Research Linked with Social and Economic Needs’.

The valedictory address was given by Dr Sali Shadevan, UGC, Bangalore, and the lecture was on ‘Rediscovering Educational Experience’. One hundred and twenty one faculty members participated in the seminar.

The Internal Quality Assurance Cell  
(IQAC)

Fatima Mata National College  
(Autonomous)  
Kollam, Kerala

Cordially invites you to the inauguration of the  
National Seminar on  
"FOSTERING SYNERGISTIC RELATIONSHIPS  
IN THE HIGHER EDUCATION SCENARIO : CAPACITY  
BUILDING AND PEDAGOGICAL INNOVATIONS"

by  
Prof S. Varghese  
(RUSA, State Project Co-ordinator)

Presided by  
Dr Vincent B. Netto  
(Principal)

Keynote  
Dr Ms Geetha Swaminathan  
(Former Vice Principal, Stella Maris College, Chennai)

Venue:

Bishop Jerome Hall  
FMN College, Kollam

9.45 am on Friday, March 4, 2016



March 4, 2016  
9.45 to 11.15 Hrs

*Inaugural Programme*

Invocation

Welcome Address : **Dr Mary Teresa P. Miranda**  
(Organizing Secretary)

Presidential Address : **Dr Vincent B. Netto**  
(Principal & Chairman  
National Seminar)

Inaugural Address : **Prof. S. Varghese**  
(State Project Co-ordinator,  
RUSA & Former Chairman,  
Human Rights Commission,  
Kerala)

Keynote Address : **Dr Ms Geetha Swaminathan**  
(Former Vice Principal, Stella Maris  
College, Chennai)

Felicitation : **Rev. Fr Anil Jose**  
(Manager)

Vote of Thanks : **Dr Ivy Philip**  
(Secretary, IQAC)

National Seminar on  
FOSTERING SYNERGISTIC RELATIONSHIPS IN THE HIGHER EDUCATION  
SCENARIO: CAPACITY BUILDING & PEDAGOGICAL INNOVATIONS  
March 4 & 5, 2016

Fatima Mata National College (Autonomous) Kollam, Kerala

Day 1: March 4, 2016

9:00 – 9:45 AM Registration  
9:45 -10:40 AM Inaugural Session  
Inaugural Speaker : **Prof. S. Varghese**  
RUSA, State Project Coordinator  
10:45 – 11: 30 AM Key note Session  
: **Dr Ms Geetha Swaminathan**  
Asso. Prof. & Former Vice Principal,  
Stella Maris College (Autonomous) Chennai.

Quality Enhancement in Higher Education:  
Issues, Benchmarks & Strategies

Tea Break  
Technical Session 1 : **Curriculum Upgradation**  
11:40 -12:30 PM **Dr K. P Isaac**  
Vice Chancellor, APJ Abdul Kalam  
Technology University, Trivandrum

ICT: An Invaluable Tool for Learners  
& Knowledge Providers

12:35 -1:20 PM : **Dr Bedurudhin**  
Kerala State Coordinator,  
Quality Assurance Cell, NAAC

1:20 -2:00 PM : Lunch  
Impact of Accreditation

Technical Session 2 : **Capacity Building**  
2:00 – 2:30 PM **Dr P. R. Sudhakaran**  
Emeritus Professor, Dept. of  
Bioinformatics & Computational Biology,  
University of Kerala

Promotion of Research

2:35 – 3:20 PM

**Dr S. Kevin,**  
Former Pro -Vice Chancellor,  
University of Kerala

Benchmarking: A Tool for Identification of Best Practices

Tea Break

3:30 - 5:30 PM

Paper Presentations

Day 2: March 5, 2016

Technical Session 3 : **Dynamics in Higher Education**  
9:45 – 10:40 AM **Dr B. Ashok**

Former Vice Chancellor,  
Kerala Veterinary & Animal Science  
University, Wayanad

The Indian University – The Next 50 Years

10:45 – 11:45 AM : **Dr Sheela Ramachadran**  
Former Vice Chancellor,  
Avinasalingam University, Coimbatore  
Curriculum Enrichment

Tea Break

Technical Session 4 : **Higher Education & Pedagogy**

11:50 -12:35AM **Dr M. P. Rajan**  
Academic Consultant & Member Peer team  
NAAC, Bangalore

Innovations & Best Practices in Pedagogy

12:40 -1:20 PM : **Dr M. Ramachandra Mohan**  
Professor & Chairman, Dept of Zoology,  
Bangalore University

Research Linked with Social & Economic needs

1:20 – 2:00 PM Lunch  
2:00 – 3:00 PM : **Dr Saliil Sahadevan**  
Education Officer, UGC, Bangalore

Rediscovering Educational Experience

Valedictory Session





Prof. S. Varghese, RUSA, State Project Co-ordinator, Fostering Synergistic Relationship in Higher education Scenario: Capacity Building and Pedagogical Innovations



Dr. Geetha Swaminathan, Associate professor and Former Vice-Principal, Stella Maris College (Autonomous) Chennai, Topic: Quality Enhancement in Higher education –Issues, Benchmarks and Strategies



Dr. Magdelene Dorairaj, Associate Professor, Fatima College, Madurai, Topic: Role of Teachers in Autonomous Ecosystem

# SEMINAR ON 'SOLAR PHOTOCHEMISTRY-FUNDAMENTALS AND APPLICATIONS'

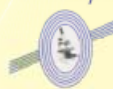
28<sup>th</sup> January, 2016

Post Graduate and Research Department of Botany organized a state level seminar on 'Solar Photochemistry-Fundamentals and Applications' on 28<sup>th</sup> January, 2016 at the Bishop Jerome Hall, in collaboration with Kerala State Council for Science, Technology and Environment and Academy of Chemistry Teachers. Dr. Yusuf Karuvath, Scientist, NIIST and Dr. Ajayakumar G., Assistant Professor, Govt. Womens College, Thiruvananthapuram were the resource persons. Forteen faculty members from FMNC participated in the event.



Dr. Sheeja Mathews (HOD)  
Dr. Suma N.  
Dr. Apsara A.P.  
Dr. Sarau Devi  
Dr. Biju Mathew  
Dr. Manohar D. Mullaseery  
(Organizing Secretary)  
Dr. Noeline B. Fernandez  
Dr. Mary Nancy TE  
Mrs. Mini V.  
Dr. Shibu Joseph  
Mrs. Sherin Mol C. B.  
Ms. Diana Thomas  
Dr. Manoj C. Raj

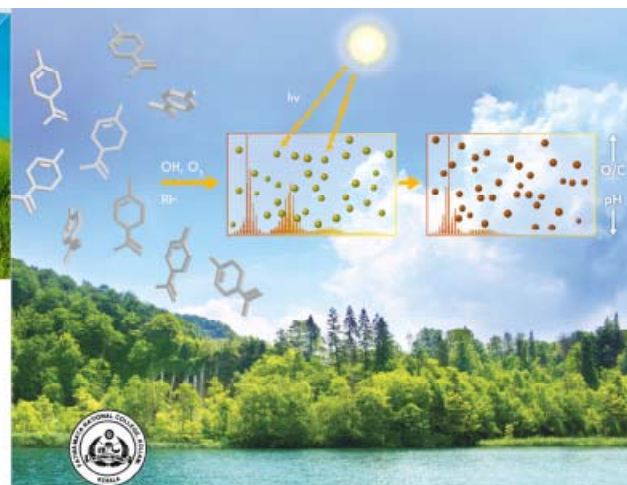
Best wishes from...



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Fatima Mata National College, Kollam - 691001

(Autonomous)

(NAAC Re accredited - 'A' Grade)

State Level Seminar on  
**Solar Photochemistry-Fundamentals  
and Applications**

DATE : 28. 01. 16 THURSDAY

VENUE : COLLEGE AUDITORIUM

Organized by

Post Graduate & Research Department of Chemistry

Sponsored by the

Kerala State Council for Science, Technology  
and Environment

In Association with

Academy of Chemistry Teachers (ACT)

Fatima Mata College was founded in 1951 by His Excellency Rt. Rev. Dr. Jerome M. Fernandez with a view to providing facilities for higher education in the Diocese of Quilon. This year the college is Celebrating its 65<sup>th</sup> year of committed service in the field of higher education.

Dept. of Chemistry was established in 1952 with BSc. Chemistry course. The department now offers BSc. Chemistry, BSc. Polymer Chemistry & MSc. Chemistry. In 2013 the Department was elevated to Research Centre.

Photochemistry is the chemistry induced by light. Sun being the most abundant and widespread light (and consequently energy) source on earth, it is obvious that solar light can also induce chemical reactions. There are several classes of organic pollutants (organic dyes, pharmaceuticals, polycyclic aromatic hydrocarbons, polychlorinated pesticides, polychlorinated dibenzodioxins, dibenzofurans and biphenyls) that by the seriousness of the risks they pose to environment and human health are considered priorities for environmental monitoring by the most important environmental agencies. In this seminar we will show how solar light can be advantageously used for environmental remediation, leading to the destruction of environmentally relevant molecules, especially when they are present in industrial wastewaters. To gain insight to our students into the field of Solar Photochemistry and its applications, the Department of Chemistry, Fatima Mata National College, Kollam is planning to conduct a seminar on Solar Photochemistry-Fundamentals and Applications. The Department extends a very warm welcome to students, researchers and academicians to the seminar.

**Dr. Vincent B Netto**  
Principal

**Dr. Sheeja Mathews**  
H.O.D

**Dr. Manohar D. Mullaseery**  
Organizing Secretary  
Ph: 9447110857  
email: mdmullaseery@gmail.com

## Programme

- 9.00am : Registration  
9.30 am : Inauguration  
10.00 am : Tea Break  
10.15 am : Invited Talk - 1 - **Dr.Yoosaf Karuvath**  
(Scientist, National Institute of Interdisciplinary Science & Technology(NIST), TVM)  
12.30 pm : Lunch Break  
1.30 pm : Invited Talk - 2 - **Dr. Ajayakumar G.**  
(Asst. Prof. of Chemistry, Govt. Women's College, Tvm)  
3.30 pm : Valedictory Function

## Call for Papers

The paper should be submitted as email attachment on or before 22.01.2016 to mdmullaseery@gmail.com.  
The manuscript should be typed in Times New Roman with font size 12.  
1m x 1m space will be provided for poster presentation  
(proceedings will be published)

## Registration Fees:

Students	Rs. 50/-
Research Scholars	Rs. 100/-
Faculty from Educational Institutions	Rs. 500/-