



BSI NEWSLETTER

The monthly electronic newsletter of Botanical Survey of India

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Director's column

During this month, Scientists of BSI published two new gingers, *Zingiber murlenica* and *Z. mizoramensis* from Northeast India and a new fungi, *Sporidesmium bilgiriense* from Biligiri Rangaswamy Temple Wildlife Sanctuary, Karnataka. Besides, three liverworts, *Solenostoma baueri*, *S. fusiforma* and *S. vulcanicola* (Marchantiophyta) were reported as new record for India from Sikkim. The scientists also recorded for the first time an orchid genus, *Pendulorchis* from Nagaland and a lichen genus, *Mycoblastus* from Arunachal Pradesh and three species viz., *Gymnanthemum amygdalinum* (Asteraceae) from Peninsular India, *Solanum diphyllum* (Solanaceae) from Northern India, and *Lejeunea exilis* (Marchantiophyta) from Northeast India.

Apart from these, many species were also reported for the first time from different Indian states, few to mention are: *Peristylus aristatus* and *P. stocksii* (Orchidaceae) from Goa, *Polycarpaea aurea* (Caryophyllaceae) from Jharkhand, *Adiantum latifolium* (Adiantaceae) from Andaman and Nicobar Islands.

The scientists of BSI also discovered a new sub-population of endemic and threatened species, *Cycas beddomei* from southern Andhra Pradesh and published the same with an updated Red List assessment.

'Constitution Day' was observed in all units and regional centres of BSI on 26.11.2015 and preamble of constitution was read.

The scientific officials and research students of BSI participated in 'Silver Jubilee Conference of IAAT' held at University of Calicut, Kerala and bagged four awards. On behalf of BSI family, I congratulate the award winners and also other participants for presenting their research work in the conference.

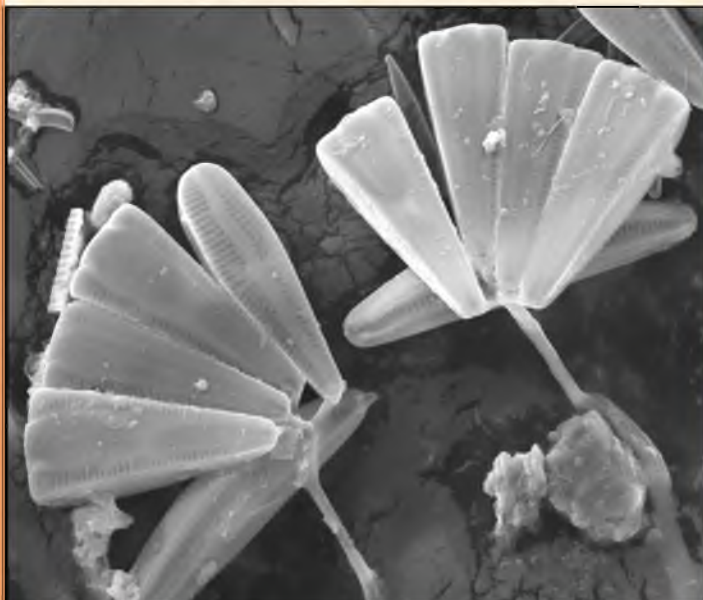
Happy browsing!

Paramjit Singh
Director, Botanical Survey of India, Kolkata

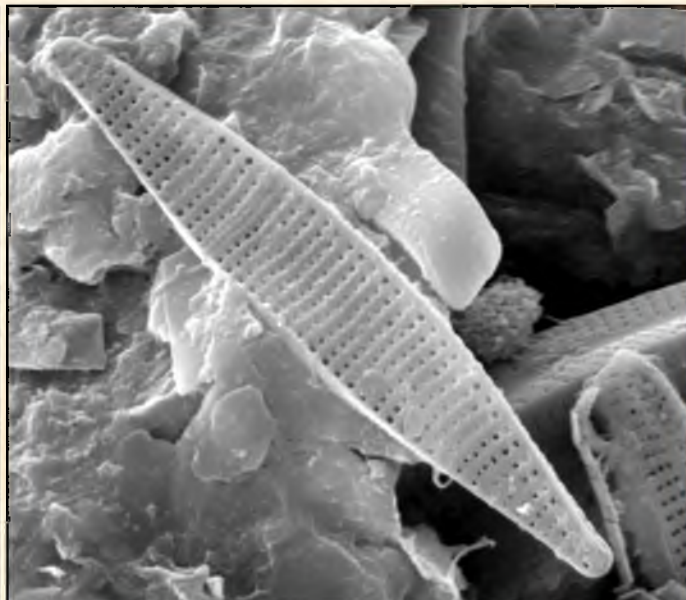


HEAD QUARTERS, KOLKATA

Dr. R.K. Gupta Scientist 'D' and Sri Kaju Majumdar, Pres. Asst. conducted a field tour from 2nd to 9th November 2015 in connection with the 'Algal Flora of Jharkhand' to Chatra and Latehar districts of Jharkhand for collection of algae from various habitats. During this tour, Thermal algae growing between 75° and 78°C also collected from Balbalduary (Chatra). Dr. Gupta also studied 75 samples of algal specimens under SEM and taken micrographs.



Gomphonema olivaceum (Diatom)



Nitzschia recta (Diatom)

Dr. A.B.D. Selvam visited National Botanical Research Institute (NBRI-CSIR), Lucknow from 15th to 19th November 2015 for consultation of Herbarium, Crude Drug Museum and Library in connection with the project, "Pharmacognostic Studies on Medicinal Aconites of India".

Dr. Devendra Kumar Singh, Scientist 'C' prepared the database of 28 specimens collected from Sikkim, whilst Dr. Monalisha Dey, Scientist 'B' prepared database of 89 liverwort specimens from Sikkim. Ms. Pamela Saha, SRF prepared database of 100 moss specimens collected from Darjeeling district.

Accessioned and incorporated two holotype fungi specimens, *Entoloma flavostipitatum* and *E. flavoquadratum* from Kerala and one general fungi specimen, *Paxillus cf. involutus* from Jammu and Kashmir.

Meetings attended

Dr. Paramjit Singh, Director attended the governing body meeting of Birbal Sahni Institute of Paleobotany on 15th and 16th November 2015 at Lucknow; 41st Steering Committee meeting of National Medicinal Plant Board, New Delhi and was guest of honour at the National Conference on Indian Botanic Gardens held at National Botanical Research institute, Lucknow on 18th November 2015. Dr. Singh also chaired the 21st Scientific Advisory Committee meeting of Regional Plant Resource Centre, Bhubaneswar on 28th November 2015.

Public service rendered

Dr. M.N. Aziz, Scientist 'E' confirmed the identity of five mosses sent by Dr. Mousumi Poddar Sarkar, University of Calcutta, collected from Darjeeling district.

Publications

Mukhia, S., Mandal, P., Singh, D.K. and Singh, D. 2015. Evaluation of Anti-Diabetic, Antioxidant Activity and Phytochemical Constituents of Liverworts of Eastern Himalaya. *J. Chem. and Pharm. Sci.* 7(10): 890–900.

Selvam, A.B.D. 2015. Standardization of organoleptic terminology with reference to Description of vegetable crude drugs. *Internatl. J. Pharm. Technol.* 7(2): 3282–3289.

Singh, D. and Singh, D.K. 2015. Three new records of the genus *Solenostoma* (Solenostomataceae, Marchantiophyta) in Indian bryoflora from Sikkim. *Indian J. Forest.* 38 (3) 233–240.

AJC BOSE INDIAN BOTANICAL GARDEN, HOWRAH

Dr. S.P. Panda, Scientist 'B' conducted a tour to Odisha from 10th to 20th November 2015 and collected 5 saplings each of *Lassioacocca comberi*, *Hypericum gaitii*, *Cordia macleioidii*, *Simplocos racemosa*, *Cycas sphaerica*, *Eucactus* sp., *Ferocalamus* sp. and *Mamillaria* sp. from Bhubaneswar for *ex-situ* conservation. Dr. Panda also collected some live plant material for introduction in the garden. Further, Dr. Panda also collected drawings of Orchids of Odisha and India including 3 type specimens from Dr. Sarat Misra, Orchidologist for submission of the same to CNH as gift.

Dr. S.S. Hameed, Scientist 'D' conducted one tour to Uttarakhand from 16th to 22nd November 2015 for the project, "Collection, introduction and multiplication of 20 endemic, threatened, medicinal, ornamental and economically important plants" and collected 17 plant species of medicinally and economically important plants.

The Great Banyan tree developed 12 new roots. 18 encaged roots were repaired with new bamboo caging. 10 aerial roots were also encaged in bamboo cages to train them as prop roots.

Regular maintenance of the plant saplings and orchids collected during the field tours were carried out in the Garden Nurseries and Mist Chamber.

CENTRAL NATIONAL HERBARIUM, HOWRAH

In connection with the Flora of India project, Dr. V.P. Prasad, Scientist 'D' undertaken a herbarium consultation tour to MH, Coimbatore; CALL, Calicut and KFRI, Peechi from 3rd to 29th November 2015. During this tour, Dr. Prasad also conducted field tours to Ponmudi, Coal Paddy fields and certain coastal areas of Trichur district and collected 25 field numbers of Cyperaceae specimens.

Dr. Avishek Bhattacharjee, Scientist 'B' undertook a tour to Calicut and Wayanad districts of Kerala for orchid collections from 22nd to 28th November 2015.

In connection with the Revision of the genus *Fimbristylis* of family Cyperaceae, 'Flora of Vikramshila Gangetic Dolphin Wildlife Sanctuary, Bhagalpur, Bihar', 'Flora of Jaldapara Wildlife Sanctuary, Jalpaiguri, West Bengal, Bihar' and 'Flora of Betla National park, Latehar, Jharkhand' 56 specimens collected from field tours have been identified.

Scanning Electron Microscopy

Total 48 plant samples were micrographed under SEM by the scientists/research scholars of BSI (abaxial surface of bamboo leaves, leaves and pollens of *Rubus* spp., fruits of members of Asteraceae and Acanthaceae, spores of *Pteris* spp. (Pteridophyte), thallus of Bacillariophyceae and Chlorophyceae (Algae), spores of Basidiomycetes (Fungi).

Public Service rendered

Dr. V. Sampath Kumar, Scientist 'D' reviewed an article on *Calotropis* for *Bangladesh Journal of Botany*. Dr. Rajib Gogoi, Scientist 'D' reviewed a manuscript for the journal *Phytotaxa*.

Dr. S. Bandyopadhyay, Scientist 'B' sent PDF of literature to Dr. B.H.M. Nijalingappa, Editor, *Journal of Cytology and Genetics* and also deciphered the annotation 'Kusrant', a local name of *Hedysarum bracteatum*, in Roxburgh's handwriting on a herbarium sheet at BR on request from Dr. Manoj M. Lekhak, Dept. of Botany, Shivaji University, Kolhapur, Maharashtra. Dr. T.K. Paul, Scientist 'B' sent scanned specimen images of *Aponogeton natans* and *Arthromeris himalayensis* to Dr. Deepthi Yakandawala, Department of Botany, University of Peradaniya, Sri Lanka and Dr. Jaideep Majumder respectively. Dr. Paul provided information to Mr. Karin Booij, Naturalis Biodiversity Center & Leiden University (Netherlands), regarding availability of types of the genus *Trigonostemon* (Euphorbiaceae) in Central National Herbarium (CAL).

Publication

Mastakar, V.K., Lakshminarasimhan, P. and Modak, M. 2015. A report on the extended distribution of *Polycarpaea aurea* (Caryophyllaceae), an endemic herbaceous species, to Chota Nagpur Plateau, Jharkhand, India. *J. Threat. Taxa* 7(12): 7950–7952.

Meetings/Seminar/conference attended

Dr. Vinay Ranjan, Scientist 'D' attended one day workshop on 'Biodiversity assessment through people participation' at IBRAD, Kolkata on 04.11.2015.

Dr. V.P. Prasad, Dr. Avishek Bhattacharjee, Dr. Mahua Pal, Bot. Asst., Ms. Bandana Bhattacharjee, SPF, Sri Animesh Maji, SPF, Ms. Saumyashree Pathak, SPF, Ms. Shalini S., SPF attended 'Silver Jubilee conference of IAAT and International Seminar on Advancements in Angiosperm Systematics and Conservation' organised by the Calicut University from 19th to 21st November, 2015. Dr. Prasad, Dr. Bhattacharjee chaired one of the sessions of the lead lectures in the seminar and attended the meetings. Dr. Bhattacharjee also delivered 2 presentations entitled, "A glimpse of Indian *Calanthe* (Orchidaceae) with typification of four names" and "Eight Proposals to amend the Code" in the conference. Dr. Pal and Miss Pathak received 'IAPT Award' for best poster presentation.

Dr. Kumar Avinash Bharti, Scientist 'B' attended a meeting regarding the project entitled "Addressing Life-Style Diseases & Livelihoods, Using Medicinal Plants and its Bio Actives" which was coordinated by Dr. Narain Medury, Director, Council for Sustainable Development, New Delhi at BSI, Hqrs. on 24.11.2015.

Visitors/students

Prof. G.V. Chandhaich, Bangalore University along with 5 other professors; Drs. Susanne Diefrich from Germany and Helen Mell from Australia; Sri Srichand Sharma, CA, MOEF & CC from Delhi; 8 students of M.Sc. along with oneteacher-in-charge of Dept. of Botany, Handique Girls' College, Guwahati, Assam; 15 students of Delhi Public School, Bhagalpur, Bihar and 8 Students and 2 teachers from Calcutta Madrasa, Kolkata visited during this month.

CENTRAL BOTANICAL LABORATORY, HOWRAH

Scientific officials were engaged in processing of voucher specimens collected from Malkangiri district and digitized field data of 331 plants collected from Balasore district of Odisha. Dr. K.A. Sujana identified 52 plant species collected from Malkangiri district, Odisha. Dr. A.K. Verma and Ms. Monika Mishra were involved in cytological investigations on *Abrus precatorius* and digitized data provided in labels of 300 cytological herbarium available in center and chromosome data base of 51 plants of IBG was also prepared. Ms. Sagari Chaudhury, SPF documented 102 ethnobotanical information collected from Purulia district of West Bengal in a prescribed format.

Observation of Constitution Day

Constitution day observed at CBL on 26.11.2015 and report submitted to BSI directorate. On this occasion, Dr. Pankaj Arvind Dhole delivered a talk on contributions of Sri B.R. Ambedkar.

Meetings/ Seminar Attended

Dr. K.A. Sujana attended Participatory Conservation meeting at IBRAD, Kolkata on 02.11.2015. Dr. Sujana also attended 'Silver Jubilee conference of IAAT and International Seminar on Advancements in Angiosperm Systematics and Conservation' at University of Calicut, Kerala from 19th to 21st November 2015.

Visitors/ Students

A total of 8 Students and 2 teachers from Calcutta Madrasa, Kolkata were visited ethnobotanical museum.



Observation of Constitution day at CBL



Dr. Pankaj Arvind Dhole delivering a talk on contributions of B.R. Ambedkar

INDUSTRIAL SECTION INDIAN MUSEUM, KOLKATA

The botanical paintings by Roxburgh are being interpreted with updated botanical nomenclature. Under this project three species of *Eugenia* (Myrtaceae), two species of family Moraceae, and four species of *Bryonia* (Cucurbitaceae) were interpreted with updated nomenclature and description. As a part of making a digital database of BSIS, 94 specimens of Monocot and 284 specimens of dicot were listed and updated the nomenclature. The tour materials of Koraput (Odisha) are being processed for display at the botanical gallery.



Luffa aegyptiaca (CUCURBITACEAE): Pita-taradi (Odia);
Joni (Kondh); Koraput, Odisha



Psophocarpus tetragonolobus (FABACEAE):
Charkonoia-simo (Odia); Koraput, Odisha

ANDAMAN & NICOBAR REGIONAL CENTRE, PORT BLAIR

Dr. Lal Ji Singh, Scientist 'D' & HoO collected seedlings of rare and endemic tree species (*Mangifera griffithii* and *Ficus andamanica*) from Mount Harriet National Park, South Andaman on 23.11.2015 and introduced it in the Dhanikhari Experimental Garden Cum Arboretum (DEGA).

Dr. T.A.M. Jagadeesh Ram, Scientist 'D' studied 82 specimens, Dr. Sanjay Mishra, Scientist 'B' identified 2 species under 2 field numbers, Dr. Sandip Kumar Behera identified 4 species under 4 field numbers, whereas Dr. C.P. Vivek, Bot. Asst. identified 5 species under 7 field numbers at PBL.

Observation of Constitution Day

Constitution day was observed at ANRC on 26.11.2015.

Meetings/programmes attended

Dr. Lal Ji Singh was invited as a Chief Guest in the valedictory function of State Level Exhibition & Project Competition INSPIRE-2015 organized by Director of Education (Science) Andaman and Nicobar Administration in collaboration with the Ministry of Science and Technology, New Delhi on 04.11.2015. Dr. Singh performed duty as an expert to evaluate the Projects for National Children's Science Congress (State Level) at Shiksha Sadan, Office of the Dy. Director Education (Science), Port Blair on 21.11.2015. Dr. Singh attended a meeting on *ex-situ* conservation of plants at Mount Harriet National Park, South Andaman on 23.11.2015.

Visitors

Dr. M. Abbas, Chief Scientist, CDRI, CSIR, Lucknow visited DEGA on 07.11.2015.

Dr. S.K. Das Das, Scientist 'B', WRC, Pune visited DEGA on 19.11.2015.

Dr. Jitendra Kumar, Director, DMAPR, ICAR, Boriavi, Anand, Gujarat visited DEGA on 20.11.2015.

Publications

Yadav, R.B., Kumar, A., Singh, L.J. and Verma, S.K. 2015. Ethnomedicinal weed species of Auraiya District, Uttar Pradesh, India. *Geophytology* 45(2): 227-232.

Behera, S.K., Mishra, S. and Singh, L.J. 2015. *Adiantum latifolium* Lam. (Adiantaceae): An addition to pteridophytic flora of Andaman and Nicobar Islands, India. *Geophytology* 45(2): 261-264.

Mishra, S., Tripathi, A., Tripathi D.K. and Chauhan, D.K. 2015. Role of sedges (Cyperaceae) in wetlands, environmental cleaning and as food material: Possibilities and future perspectives. In: M.M. Azooz and Ahmad, P. (Eds.), *Plant Environment Interaction: Responses and Approaches to Mitigate Stress*. Wiley-Blackwell, pp. 327–338. ISBN: 978-1-119-08099-2



Constitution Day celebration at ANRC



Dr. Jitendra Kumar at the Museum of ANRC



Dr. Jitendra Kumar planting a rare and endemic palm *Bentinckia nicobarica* at DEGA, Nayasahar

ARUNACHAL PRADESH REGIONAL CENTRE, ITANAGAR

Dr. Krishna Chowlu, Scientist 'B' conducted a field/herbarium tour to Tippi, Pinjuli and Sessa from 3rd to 8th November 2015.

Dr. Umeshkumar L. Tiwari, Scientist 'B' conducted a field tour to East Kameng district from 10th to 28th November 2015 and collected specimens of 265 field numbers.

Dr. P. Satyanarayana, Scientist 'D' & HoO, Sri B.B.T. Tham, Botanist prepared descriptions of 20 species for 'Flora of Pakke Tiger Reserve and Wild Life Sanctuary'.

Dr. Vineet Kumar Rawat, Scientist 'C' identified specimens of 7 field numbers and prepared descriptions of 11 species for the family Polypodiaceae of Northeast India.

Dr. Manish Kandwal Scientist 'C' identified specimens of 19 field numbers in connection with the Grass flora of Arunachal Pradesh.

Dr. Krishna Chowlu, Scientist 'B' entered data sheets for three specimens, confirmed their identity as well as geo-coordinates in connection with Red Listing of the orchids of Arunachal Pradesh.

Dr. Umeshkumar L. Tiwari, Scientist 'B' identified 14 species under 30 accessions from the unidentified specimens deposited at ARUN.

Dr. Souravjyoti Borah, Botanist prepared descriptions of 15 species for the Flora of Lohit District and Kamlang Wild Life Sanctuary.

Meeting attended

Dr. P. Satyanarayana attended a meeting of the technical committee for protected areas on 16.11.2015 at the office chamber of PCCF (WL &BD), Itanagar.



Angiopteris crassipes



Dipteris wallichii

ARID ZONE REGIONAL CENTRE, JODHPUR

Sri Vinod Maina, Scientist 'D' & HoO and Dr. Ramesh Kumar, Scientist 'C' undertook a field tour to Navsari District, Gujarat from 15th October to 3rd November, 2015 in connection with the Flora of Navsari District, Gujarat and collected specimens of 671 field numbers.

Following plants were introduced in AZRC botanical garden:

Anacardium occidentale, Andrographis paniculata, Bixa orellana, Butea monosperma, Chlorophytum tuberosum, Cissus quadrangularis, Cordia sebestena, Cymbopogon citratus, Desmodium gangeticum, Euphorbia fusiformis, Hemelia patens, Livingstonia chinensis, Nervilia discolor, Ocimum gratissimum, Oroxylum indicum, Plumbago zeylanica, Pritchardia pacifica, Pterocarpus marsupium, Sabal palmetto, Sterculia villosa, Terminalia bellirica.

Seeds of following species have been collected for introduction in the garden:

Abrus precatorius, Adenantha pavonina, Cassia alata, Centratherum anthelminticum, Indigofera tinctoria, Luffa acutangula var. amara, Lagenaria siceraria, Moringa oleifera, Tephrosia villosa, Uraria picta.

Prepared beds of ornamental plants and planted 16 varieties of winter annuals. Phenological data of 34 species growing at AZRC botanical garden were recorded.



Hyphaene thebaica



Zingiber murlenica - a new ginger species from North-east India



Traditional musical instrument made up of plant produce used in Gujarat

BOTANIC GARDEN OF INDIAN REPUBLIC, NOIDA

Under multiplication programme, altogether 668 ornamental plants were multiplied by cuttings and by germination of bulbs. 38 plant species were introduced in the garden and 31 winter annuals for landscaping and beautification were also planted.

Dr. Kuldip Singh Dogra, Scientist 'C' collected seeds of 2 species and also studied seed germination of 10 species.

Observation of Constitution Day

Constitution day was observed at BGIR on 26.11.2015. Dr. Sheo Kumar delivered a talk on Dr. B.R. Ambedkar, genesis of the Constitution of India and stages of Freedom movements to make India independent. A documentary film on latest development of the garden made by a TV Channel (News Nation) which was telecast on 06.11.2015 was also shown. 'Oath of Preamble' was taken in Hindi by all staff members during the occasion.

Implementation of Online System of Payment

Implemented 'Online Payment System' in BGIR on 01.11.2015 using software developed for 'Public Financial Management System' by the Government of India.

Documentary Film on BGIR

'Sweta Jaya Special Show: 40 Crore Saal ki Mystery@News Nation' was telecast all over world by News Nation on 06.11.2015 and also uploaded by the channel on 'You Tube' (https://www.youtube.com/watch?v=5Jd_45IrsIlg).

Public service rendered

Provided 10 species (31 plants) to Mira Model School, New Delhi for plantation for conservation and educational purposes.

Visitors/students

Total 570 visitors (including 345 students, 6 teachers, 215 Indian and 4 foreign visitors) visited BGIR during this month.

CENTRAL REGIONAL CENTRE, ALLAHABAD

In connection with ongoing project, "Floristic diversity of Parvati Aranga Wildlife Sanctuary and adjoining Tikri forest area, Gonda", a total of 15 species were identified.

In connection with the project, "Taxonomic studies on lichenised non-Thelotretoidean Indian Graphidaceae", a total of 15 species of 38 specimens were identified. Apart from this, a total of 15 species of foliicolous lichens collected from Andaman and Nicobar Islands were also identified.

In connection with the ongoing project, "Lichens of Rajasthan and Kutch, Gujarat", a total of 8 specimens identified into 4 species. In addition, a total of 170 earlier collected specimens housed at BSA were also identified.

Scanning Electron Microscopy

SEM analysis of epidermal biology of leaves and bracts of *Musa indandamanensis*; upper and lower epidermis of leaves of *Digitaria ciliaris* and pollen morphology of *Malvastrum coromandelianum* were micrographed in connection with ongoing projects.

Ex-situ Conservation

Recorded phenological data of eight species from experimental Botanic Garden, CRC, Allahabad.

Public service rendered

Identified seven species collected by Dr. S.P. Tiwari, Kulbhaskar Ashram Degree College, Allahabad.

Meeting attended

Dr. G.P. Sinha, Scientist 'E' & HoO and Dr. Arti Garg, Scientist 'D' attended TOLIC meeting at Income Tax Office, Allahabad on 06.11.2015.

Publications

- Garg, A. and Joshi, B. 2015. Nawabgunj Bird Sanctuary – A versatile miniature wetland ecosystem. *Geophytology* 45(2): 201–208.
- Garg, A. and Josh, B. 2015. Ecosystem sustenance of Upper Ganga Ramsar Site through phytoremediation. *Geophytology* 45(2): 175–180.
- Garg, A. and Singh, R.K. 2015. Notes on the identity and taxonomic status of two endemic taxa of *Pedicularis* L. from India. *Indian J. Forest.* 38(3): 281–282.
- Joshi, B. 2015. Two additional angiosperms for the flora of Madhya Pradesh. *Indian J. Forest.* 38(3): 275–276.
- Joseph, S. and Sinha, G.P. 2015. Two new records of the genus *Opegrapha* sensu lato (lichenized Ascomycota) from India. *Indian J. Forest.* 38(3): 255–257.
- Singh, P. and Singh, K.P. 2015. *Mycoblastus* Norman (Mycoblastaceae): A new generic record for India from Arunachal Pradesh. *Indian J. Forest.* 38(3): 259–251.
- Singh, P. and Singh, K.P. 2015. Additional lichen records of Graphidaceae for Manipur, Meghalaya and Nagaland, North-east India. *Geophytology* 45(2): 1811–194.
- Singh, R.K. and Garg, A. 2015. *Solanum diphyllum* L. (Solanaceae) - A new record for northern India. *Geophytology* 45(2): 253–256.
- Singh, R.K. Garg, A. and Singh, P. 2015. Taxonomy, lectotypification and rediscovery of *Gymnosporia bailadillana* (Celastraceae), a little known, critically endangered taxa of Chhattisgarh state, India. *Phytotaxa* 226(2): 101–118.
- Singh, V. and Srivastava, S.K. (2014) 2015. Utilization of wild plants during Tinchhath festival in eastern Uttar Pradesh. *Ethnobotany* 26(1&2): 101–103.
- Singh, V. 2015. Rare sighting of nearly threatened grey headed fish eagle *Ichthyophaga ichtyaetus* (Horsfield, 1821) from Tikri reserve forest of Uttar Pradesh, India. *Indian For.* 141(10): 1104–1105.
- Sinha, G.P., Gupta, P., Kar, R. and Joseph, S. A 2015. Checklist of Lichens of Rajasthan, India. *Curr. Res. Env. Appl. Mycol.* 5(4): 367–375.

DECCAN REGIONAL CENTRE, HYDERABAD

Dr. L. Rasingam, Scientist 'C' and Sri S. Nagaraju, Bot. Asst. conducted one field tour to Nagarjunasagar–Srisailem Tiger Reserve Wildlife sanctuary from 1st to 10th November 2015 and collected specimens of 78 field numbers. Dr. G. Swarnalatha, Bot. Asst. conducted one field tour to Baripada forest division of Odisha from 1st to 11th November 2015 and collected 102 lichen specimens.



Loeseneriella obtusifolia



Oxystelma esculentum



Typical habitats of lichens in Baripada Forest division of Odisha

Identified 69 species in connection with Flora of Seshachalam Biosphere Reserve (11 species by Sri Nagaraju), Flora of Sacred Groves of Andhra Pradesh (21 species by Dr. J. Swamy, Bot. Asst.), Flora of Satkosia Tiger Reserve (28 species by Sri K. Chandra Mohan, SPF) and Flora of Kawal Tiger Reserve (9 species by Ms. P.S. Annamma, SPF). Dr. Rasingam documented 8 species in connection with Flora of Nagarjunasagar-Srisaillam Wildlife Sanctuary. Sri Alok Chorge, SRF submitted the report Grasses of Odisha to the Director, BSI Kolkata. In connection with digitization of herbarium specimens at BSID, 700 herbarium specimens were scanned and the label data entered.

Public Service Rendered

Dr. Swamy identified 34 plant specimens, 20 of them for MD. Shamim Qureshi, Jawaharlal Nehru Technological University, Hyderabad; 10 specimens to Sri Ravi, SR & BGNR Govt. Degree College, Khammam; specimens to Dr. K. Mallikarjuna, Dept. of Botany & Microbiology, Acharya Nagarjuna University, Guntur, Andhra Pradesh and 2 specimens to Dr. K. Padmaja, Associate Professor, Raghu College of Pharmacy, Bheemunipatnam, Visakhapatnam.

Seminars attended

In the International seminar on Advancements in Angiosperm Systematics and Conservation, held from 17th to 21st November 2015 at University of Calicut, Kerala, Dr. K. Prasad, SERB-Young Scientist presented a paper on "Endemism and Phytogeography of South Indian *Habenaria* (Orchidaceae), India", Sri Alok Chorge presented a paper on "Systematic review of subtribe: Anthistiriinae (Poaceae) (*Iseilema* and *Themeda*) in India and Ms. P.S. Annamma presented a paper on "Floral Diversity and Threats of Kawal Tiger Reserve, Adilabad District (Telangana)".

Visitors

Dr. T.D. Kamble and Sri G.M. Tambde, Research scholars from Department of Botany, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad visited the Herbarium and Library on 16.11.2015.

Publications

Swamy, J., Prabhakar, G., Rasingam, L. and Kamalakar, P. 2015. *Gymnanthemum amygdalinum* (Asteraceae) - A New Addition to the Flora of Peninsular India. *Int. J. Adv. Res. Sci. Technol.* 4 (7): 449–451.

Rao, B.R.P., Naik, M.C., Salamma, S., Babu, M.V.S. and Rasingam, L. 2015. The discovery of a new sub-population and the mapping of threatened *Cycas beddomei* Dyer (Cycadales: Cycadaceae) from southern Andhra Pradesh, India, with updated Red List assessment. *J. Threat. Taxa* 7(12): 7902–7909.

EASTERN REGIONAL CENTRE, SHILLONG

Identified 27 species for Flora of Eastern Nagaland by Dr. N. Odyuo, Scientist 'D' and Dr. R. Daimary, Bot. Asst., for Flora of Amchang WLS by Mrs. Nandita Sarma, Sr. prev. Asst.; for Flora of Yangoupokpi Lokchao WLS (Manipur) by Shri. R. Meitei, Bot. Asst.

In connection with 'Taxonomy, phylogeny and ex-situ conservation of Micro-fungal diversity from north-east India with special emphasis on fungi associated with endemic and threatened plants of Meghalaya' by Dr. Ashish Venkatesh Prabhugaonkar, Scientist 'B', Isolated endophytes and litter associated fungi from *Aquilaria* sp. Nine nos. of Fungi identified up to genus level and photo-documented.

In connection with 'ex-situ conservation of Endemic, threatened and economically important plants of the region and recording phenological data on flowering and fruiting of species growing in the Garden' by Dr. M. Murugesan, Scientist 'B' and Sri L.R. Meitei, Bot. Asst., observed and recorded phenological data of flowering and fruiting of 19 plant species.

For the project, 'Micro-propagation of RET Plants of Northeast India by Dr. A.A. Mao, Scientist 'E' & HoO and L. Ibemhal Chanu, Bot. Asst., inoculation of 50 nodes of *Rhododendron coxianum* (Ericaceae) for nodal experiment was done. Cultured 400 nodes of *R. coxianum* in 1/2WPM, transferred 100 plants of *R. coxianum* to fresh substratum. Planted 200 plants of *Armadorum senapatianum* in greenhouse; prepared a new set up experiment for

A. senapati with coconut, banana, aloe and control in WPM; subcultured *Nepenthes khasiana*.

For Micropropagation, Phytochemical Screening of Medicinal Plants and Molecular Characterization of Selected Species by Dr. Deepu Vijayan, Scientist 'B', DNA was extracted from different species of *Paphiopedilum* viz., *P. druryi*, *P. insigne*, *P. spicerianum*, *P. venustum* (collected from Arunachal Pradesh and Meghalaya). The extracted DNA of *Paphiopedilum* species was quantified on 0.8% agarose gel and documented. Nanodrop analysis was done for all the extracted DNA samples for quantification and checking the purity of samples.

Dr. Ashish V. Prabhugaonkar, Scientist 'B' prepared a proposal for call by DBT under 'Twinning projects for the North East-2015' entitled 'Diversity, Phylogeny and Bio-prospecting of micro-fungi associated with indigenous Palms of North-east.

Public service rendered

Identified 29 samples of specimens received from various institutions and assisted 2 excursion teams.

Meeting/ Programme attended

Dr. A.A. Mao, Dr. S.K. Singh, Dr. N.Odyuo, Dr. Deepu Vijayan, Dr. Ashish V. Prabhugaonkar, Dr. Ranjit Daimary, Shri Dilip Kr. Roy, L. Ibemhal Chanu, Shri S.R. Talukdar, Mrs Nandita Sarma, participated in biodiversity exhibition at 'International Terra Madre' slow food festival at Mawphlang held on 07.11.2015. Dr. A.A. Mao attended ongoing DBT-Project review meeting at Srinagar, Kashmir University on 09.11.2015.

Dr. A.A. Mao, Dr. S.K. Singh, Dr. N. Odyuo and Dr. Chaya Deori attended the MoEF & CC office building inauguration at Shillong by Shri Prakash Javadekar, Hon'ble Union Minister of State for Environment, Forest and Climate Change on 18.11.2015.

Ms. Sangeeta Pradhan, JRF, and Ms. Gargi Prasad, JRF presented posters in a DST-National seminar "Sustainable conservation strategies for Bio-resources of North-east India" held at Arya Vidyapeeth College, Guwahati on 6th and 7th November 2015.

Visitors /students

5 Asst. Professors, 8 Research Scholars, 4 Scientists and 101 students visited the Centre from various Institutions, Colleges and Universities.

Publications

Singh, S.K. and Kumar S. 2015. *Lejeunea exilis* (Marchantiophyta) - new to the Bryoflora of North-east India. *Geophytology* 45(2): 265–268

Singh, S.K., Pocs, T. and Kumar, S. 2015. Notes on four new and noteworthy records of *Lejeunea* from Meghalaya, India. *Acta Bot. Hung.* 57(3–4): 407–418.

Kumar, R., Singh, S.K., Sharma, S. and Triboun, P. 2015. Two new *Zingiber* (Zingiberaceae) species from Northeast India. *Phytotaxa* 233(1): 80–84.

NORTHERN REGIONAL CENTRE, DEHRADUN

Identified 89 species and made description for 56 species of Angiosperm [Flora of Uttarakhand Vol. V, Floristic Diversity and Phytosociological study of Simbalbara National Park, Flora of Nandhour Wildlife Sanctuary, Flora of Sonanadi Wildlife Sanctuary, Revision of family Bignoniaceae, Cyatheaceae and genus *Lepisorus* (Sm.) Ching in India].

Digitisation of Herbarium specimens

Scanned and digitized 185 specimens of the family Brassicaceae and pteridophytes.



***Desmodium motorium* - a rare species from Col. Sher Jung National park, Himachal Pradesh**



***Mimosa rubicaulis* ssp. *himalayana* -a rare species growing in Sonanadi Wildlife Sanctuary**

Meeting /conference attended

Dr. S.K. Srivastava, Scientist 'E' & HoO attended 3rd PMC meeting of All India Co-ordinated DBT project entitled, "Preventing Extinction and Improving Conservation status of Threatened plants using Biotechnological tools" on 09.11.2015 at University of Srinagar, Jammu and Kashmir. Sri Amber Srivastava, JRF (DBT) participated in 3-day National conference on Indian Botanic Garden at NBRI from 18th to 20th November 2015 and Presented a paper on "Ex-situ conservation initiatives of Threatened plants in BSI, Experimental Garden, Dehradun". Sri Srivastava received 'Best Oral Presentation Award' at National conference on Indian Botanic Garden at NBRI, Lucknow from 18th to 20th November 2015.



Sri Amber Srivastava, JRF receiving 'Best Oral Presentation Award' at National conference on Indian Botanical Garden at NBRI, Lucknow

Visitors/students

Eight students from different Colleges visited the centre for consultation of herbarium as well as Library.

Publications

Kumar, B., Joshi, P., Kholia, B.S. and Srivastava S.K. 2015. Extended distribution of the least Moon wart, *Botrychium simplex* E. Hitchcock. *Ind. J. Forestry* 38(3): 241–243.

Panwar, G.S., Srivastava, S.K. and Uniyal, P.L. 2015. *In vitro* propagation of *Eremostachyssuperba* Royle ex Benth. - a critically endangered, medicinal and ornamental herb of the North-West Himalaya. *Medicinal Plants*. 7(4): 275–282.

Jakha, H.Y., Deb, C.R., Singh, S.K., Verma, D., Dey, S. and Jamir, N.S. 2015. *Pendulorchis* (Orchidaceae) - A new generic record for Nagaland, India. *Keanean J. Sci.* 4: 31–34.

Singh, V. and Srivastava, S.K. 2015. Utilization of Wild Plants during Tin chhath festival in eastern Uttar Pradesh. *Ethnobotany*: 26 (1&2): 103–105.

SIKKIM HIMALAYAN REGIONAL CENTRE, GANGTOK

Dr. David Lalsama Biate, Scientist 'B' conducted a local field tour on 17.11.2015 at Kabi and surrounding areas of North Sikkim by covering the localities viz., Kabi-Lungchok, Mum, Rumha, Pamotha and Dalamchen (the highest point at 2676 above m.s.l.), collected 13 orchid species and *Epilobium wallichianum*.

Dr. D.K. Agrawala, Scientist 'C' & HoO finalized 50 specimens at BSHC in respect of their identity, geo-coordinates and made entry in the excel sheet for the project, Red listing of Orchids of Eastern Himalaya as per IUCN criteria.

Dr. Agrawala identified 6 orchid species and also collected and introduced two orchid specimens. Sri S.K. Rai, Pres. Asst. identified 26 species from BSHC herbarium. Sri S. Pradhan, Field man has identified three species from BSHC herbarium.



Epilobium wallichianum



Mahonia napaulensis



Coelogyne fuscescens

Public service rendered

Dr. Agrawala attended ARRI, Gangtok to visit Yuksom on 06.11.2015 for identification of medicinal plants to be displayed during the National Seminar.

Seminar/symposium/programme attended

Dr. M. Shankar Rao, Scientist 'B' attended as a Key note speaker in the National seminar "Uplifting Society through Biotechnological Tools" organized by Govt. Degree College, Srikakulam, Andhra Pradesh held during 4th to 7th November 2015. Dr. Rao delivered a talk on "Sacred groves and its role in Conservation of floristic diversity through Biotechnological tools".

Dr. Agrawala participated in the International symposium on "Next generation approaches for sustainable development of Hill and Up land horticulture" organized by Sikkim University during 5th to 7th November, 2015 and co-chaired a technical session on 'Biodiversity and Conservation'.

Dr. Agrawala participated in the one day 'Awareness programme on Biological Diversity Act 2002 and its provisions' organized by the state biodiversity board, Government of Sikkim on 18.11.2015.

Dr. D.K. Agrawala, Dr. M. S. Rao and Dr. David Lalsama Biate have participated in the national seminar on 'Value addition of Ayurvedic herbal resources through good agricultural and field collection practices' organized by ARRI, Gangtok during 20th to 21st November 2015. Dr. Agrawala co-chaired a technical session in the seminar.

Visitors/students

Dr. R. Devadas and Sri Ravi Kishore, NRCO, Pakyong, Sikkim; Sri M.K. Subba, Joint Director, State Hort. Dept., Govt. of Sikkim; Dr. Srikrishna Bhatt, Spices Board, Gangtok; scholars from Sikkim university visited for herbarium consultation.

Sri S. Kalal, Deputy Director (Budget), MoEF & CC, Govt. of India also visited on 06.11.2015.

SOUTHERN REGIONAL CENTRE, COIMBATORE

Dr. G.V.S Murthy, Scientist 'F' & HoO and Dr. G. Gnanasekaran, Bot. Asst. undertaken two-day field tour to Anamalais and Siruvani areas on 7th and 8th November, 2015 respectively. Dr. J.V. Sudhakar, Bot. Asst. conducted one Field trip to Kolli hills, Namakkal on 07.11.2015 for collection of *Ficus* species. The collected specimen was identified as *Ficus superba* and confirmed it as a new record to Tamil Nadu.

In connection with the project 'ex-situ conservation of endangered and threatened plants' Dr. S. Kaliamoorthy, Scientist 'D' conducted one day local field trip to Shevaroy Temple Hill, Yercaud on 13.11.2015 and collected 10 plant samples of *Smithia bigemina* and *S. hirsuta* each and introduced them into the National Orchidarium and Experimental Garden (NO & EG), Yercaud.

Dr. M. Palanisamy, Scientist, 'D' and Sri S.K. Yadav, Bot. Asst. identified 15 field numbers of seaweed specimens in connection with the seaweed Flora of Karnataka coast. Dr. K.A.A. Kabeer, Scientist, 'D' and Sri A. Ravi Kiran, Bot. Asst. collected relevant literature and identified 30 field numbers for the newly initiated project, 'Floristic studies in Kodaikanal Wildlife Sanctuary, Tamil Nadu, India and prepared the list of endemics and threatened plants from the Sanctuary. In connection with the flora of Malabar Wildlife Sanctuary, Kozhikode, Kerala, Dr. J.H. Franklin Benjamin, Scientist 'B' and Sri R.G. Vadhayar, Bot. Asst. identified 43 field numbers.

Dr. C. Murugan, Scientist 'D' collected the seedlings of *Polygala javana* and *Theriophonum sivaganganum* and cuttings of *Duranta erecta* and *Acalypha wilkiseisana* and introduced in the office garden at SRC, Coimbatore.

Ex-situ conservation

Dr. Kaliamoorthy and Dr. M.Y. Kamble introduced 67 plant saplings of Palms (10 taxa), 5 saplings of *Barleria strigosa* and 56 cuttings of *Barlerias* (6 taxa), obtained from Shivaji University, Kolhapur, Maharashtra. In addition, Dr. Kaliamoorthy and his team multiplied 43 plant samples (including 18 samples of 9 species of orchids and 25 samples of 6 species of other plants), transplanted 15 plants and developed 48 seedlings and 109 cuttings. The team also recorded the phenology of 20 species including 9 species of orchids and 11 species of other Angiosperms. Dr. Kaliamoorthy collected the seeds of *Coelogyne flaccida*, *C. breviscapa* and *Liparis atropurpurea* and sterilized the surface and inoculated onto basal MS medium for the study of its asymbiotic seed germination.

Scanning Electron Microscopy

Dr. Gnanasekaran studied the pollen grains of two species of Andrographinae (Acanthaceae) whereas Dr. J.V. Sudhakar, Bot. Asst. studied seeds (achenes) of *Ficus hirta* and *F. dalhousiae* through SEM.

Database and Digitization

Details of 40 Digital images of *Ficus* species received from Botanical Survey of India, Central Regional Centre, Allahabad have been added to *Ficus* database whereas 112 entries of the genus *Scleria* have been added in Cyperaceae data base for flora of Kerala.

Public Service Rendered

23 plant samples were identified for research scholars and students from various institutions.

Lectures were delivered with the help of PPT by the scientific officials of SRC for the PG students of TNAU on topic related to plant taxonomy (Angiosperm Phylogeny Group Classification; Web/online resources for plant Identification; plant identification methods) and *hands on training* were given by the Mounting section staff of SRC, Coimbatore. In addition, two-day field trip was arranged to visit the National Orchidarium and Experimental Garden, (NO & EG), Yercaud.

10 digital images of *Terminalia* species at MH were sent to WRC, Pune.

Conferences /workshops attended

Dr. J.V. Sudhakar, Dr. G. Gnanasekaran and Sri K. Yarrayya attended 'International Conference on Advancements in Plant Systematics and Conservation' organised by Indian Association for Angiosperm Taxonomy (IAAT) between

19th and 21st November 2015 at Calicut University, Kerala. Dr. J.V. Sudhakar and Dr. G. Gnanasekaran received Prof. K.S. Manilal Award and Prof M. Sabu Award respectively for the best oral presentation. They were also elected as the Fellow of Indian Association for Angiosperm Taxonomy (FIAAT).

Visitors/students

During this month, a total of 85 students, research scholars, scientists and professors visited the herbarium and library of this regional centre, whilst 848 persons in 124 parties visited the National Orchidarium and Experimental Garden, Yercaud.



PG students of TNAU at National Orchidarium and Experimental Garden, Yercaud

Publication

Singh, R.K. 2015. New Plant Records for Karnataka State, India. *Indian J. Forestry* 38(3): 287–291.

WESTERN REGIONAL CENTRE, PUNE

During this month, about 50 angiosperm specimens were identified from protected areas such as Biligiri Rangaswamy Temple (BRT) Wildlife Sanctuary, Sharavathy valley Wildlife Sanctuary in Karnataka and from Madei Wildlife Sanctuary, Goa. Micrographic photographs of 13 fungi were taken and descriptions were written for 53 fungal species.

Observation of Constitution Day

Constitution day was observed at WRC on 26.11.2015. Dr. P. Lakshminarasimhan, Scientist 'E' & HoO read out the Preamble of the Constitution of India.

Public service rendered

Identified and authentication certificates were issued to 24 students from Ph.D., M.Sc., M. Pharm., and B. Pharm. college students.

Dr. P. Lakshminarasimhan conducted a open Viva-Voce examination as an external examiner for award of Ph.D. Degree to Sri Lalnuntluanga Vanchhawng, Research Scholar in the Department of Environmental Science, Mizoram University on 16.11.2015 for his work on "A study on Taxonomical status of Zingiberaceae and Ecological Distribution in Mizoram" under the supervision of Prof. H. Lalramnghinglova.



Dr. P. Lakshminarasimhan greeting Hon'ble Union Minister of MoEF & CC Sri Prakash Javadekar at Van Bhavan, Pune



WRC officials in the meeting conducted by Hon'ble Union Minister of MoEF & CC Sri Prakash Javadekar at Van Bhavan, Pune

Meetings/conference/programme attended

Dr. P. Lakshminarasimhan, Scientist 'E' & HoO and Dr. A. Benniamin, Scientist 'D' received Hon'ble Union Minister of State (IC) for Environment, Forest and Climate Change (MOEF & CC), Govt. of India at Pune airport on 01.11.2015. Dr. P. Lakshminarasimhan, Dr. J. Jayanthi, Scientist 'D' and Dr. S. Bhakta, Bot. Asst. attended a meeting at Van Bhavan, Pune conducted by Hon'ble Union Minister Sri Prakash Javadekar on 14.11.2015 .

Dr. P. Lakshminarasimhan delivered a talk entitled, "An introduction to the Convention on Biological Diversity for people working with botanical collections" on 19.10.2015 at Seminar Hall, Dept. of Botany, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad to commemorate late Prof. V.N. Naik death anniversary and on 16.11.2015 in the Department of Environment Science, Mizoram University .

Dr. Priyanka Ingle, Scientist 'B' attended "Silver Jubilee Conference of IAAT and International Seminar on Advancement on Angiosperm Systematics and Conservation" held at University of Calicut, Kerala from 19th to 21st November 2015 and presented a paper entitled, "*Terminalia elliptica* Willd. in India – A Complex".

Visitors/students

Two professors and 19 students from New Arts, Commerce and Science College Ahmednagar, Maharashtra visited WRC, Pune as part of their educational tour. One Research student from Nowrosjee Wadia College Pune, visited BSI, Pune for library and herbarium consultation.

One Research student from Jividha, NGO from Pune, visited WRC garden and herbarium.

One M.Sc. (Wildlife Biology and Conservation) student from National Centre for Biological Sciences, Bangalore, Karnataka visited Pune for herbarium and library consultation.

Dr. Bhagyashri Kumbhalkar, Junior Scientist from Naoroji Godrej Centre for Plant Research, Shirwal, Satara District, Maharashtra visited WRC herbarium for consultation of genus *Datura*.

A total of 23 visitors from Moshi, Ahmednagar and Pune visited WRC Museum and garden.

One researcher Sri D.K. Londhe from Vivekananda College, Aurangabad visited WRC for consultation of genus *Ipomoea*.

Ms. Shivona Bhojwani from NCBS-TIFR, Bangalore visited WRC for consultation of genus *Ipomoea* and *Polygonum*.

Students of New Arts and Science College, Ahmednagar visited WRC on part of their educational tour.

Two foreign visitors from Textile Industry visited WRC museum and garden.

Sri Sarang A. Bokil, Research Scholar visited WRC for herbarium consultation.

Sri Nilesh Kumar Naik, Research student from Dr. B.A.M.U. Aurangabad visited WRC for consultation of genus *Avicennia* and *Rhizophora*.

Publications

Benniamin, A. Sundari, M.S. and Tripathi, D. 2015. Additions to the fern flora of Nagaland, North East India. *Keanean J. Sci.* 4: 15-18.

Benniamin, A. and Sundari, M.S. 2015. *Ophioglossum pendulum* L. (Ophioglossaceae) A Critically endangered fern rediscovered from Arunachal Pradesh, North East India. *Keanean J. Sci.* 4: 39-42.

Dubey, R. and Sengupta, S. 2015. *Sporidesmium bilgiriense* - A new species of microfungi from Western Ghats of India. *Current Research in Environmental & Applied Mycology* 5(4): 390-393.

Jalal, J.S. 2015. Looks like a bee, but is really an Orchid. *Times of India, Pune* 16th November 2015 edition.

Jalal, J.S., Jayanthi, J. and Lakshminarasimhan, P. 2015. Two species of *Peristylus* Blume (Orchidaceae), new additions to the flora of Goa, Western Ghats, India. *Richardiana* 16: 18-25.

Patil, S. and Lakshminarasimhan, P. 2015. Request for a binding decision on whether *Ceropegia oculata* Hook. and *C. occulta* R.A. Dyer (Apocynaceae) are sufficiently alike to be confused. *Taxon* 64: 1065.



Observation of Constitution Day at Western Regional Centre, Pune

PARTICIPATION OF BSI IN IAAT SILVER JUBILEE CONFERENCE

The scientists, scientific staff and research students of different regional centres and units of BSI participated in the “Silver Jubilee Conference of IAAT and Council Meeting of IAPT and International Seminar on Advancement on Angiosperm Systematics and Conservation” held at University of Calicut, Kerala from 19th to 21st November 2015. Total four Awards were bagged by the BSI delegates.

- ◆ Dr. G. Gnanasekaran (Bot. Asst., SRC): ‘Prof. M. Sabu Award’ for the best oral presentation.
- ◆ Dr. J.V. Sudhakar (Bot. Asst., SRC): ‘Prof. K.S. Manilal Award’ for the best oral presentation.
- ◆ Dr. Mahua Pal (Bot. Asst., CNH): ‘IAPT Award’ for best poster presentation.
- ◆ Ms. Saumyashree Pathak (SPF, CNH): ‘IAPT Award’ for best poster presentation.



Dr. J.V. Sudhakar receiving ‘Prof. K.S. Manilal Award’



Dr. G. Gnanasekaran receiving ‘Prof. M. Sabu Award’



Miss Saumyashree Pathak receiving ‘IAPT Award’



Dr. Mahua Pal receiving ‘IAPT Award’



Ms. Chandani Gupta, SPF delivering a lecture on *Rubus hexagynus-assamensis* complex at IAAT conference



Dr. Bikash Jana, SRF delivering a lecture on Indian *Kobresia* at IAAT conference

PLANT OF THE MONTH



Ipomoea alba L. (CONVOLVULACEAE) Known as Moon flower for its night blooming flower is a native to tropical and subtropical regions of the New World, from northern Argentina north to Mexico and Florida. Planted worldwide as an ornamental climber.

By Dr. B.K. Singh

Looks like a bee, but is really an orchid

Ananya Dutta

Pune: Taking a stroll through the forests of the Western Ghats in February and March, one might spot a bee on a plant growing on tall trees or it might just have been the flower of *Cotonia pendunculata*, commonly called the bee-orchid because of its ability to perfectly mimic the insect.

When in full bloom, the flowers of this orchid resemble the back of a bee. Scientists believe the modification helps to lure pollinators to the flower, enabling a more efficient cross-pollination.

The Bee-orchid is one of more than 300 species of orchids that are found in the Western Ghats. While this orchid is found in Sri Lanka as well, nearly one-third of them are endemic to the Western Ghats (they are not found elsewhere), said Joovan Singh Jalal, senior scientist at the Western Regional Centre of the Botanical Survey of India (BSI).

"Orchids usually require high rainfall and humidity for their habitat. Nearly 30% of orchids are found in evergreen and semi-evergreen forests. With the high levels of rainfall received by the slopes of the Western Ghats, they offer an ideal habitat for orchids," Jalal said.

The geographic location of the mountains could also explain the high degree of endemism. On one side of the mountains lie the coast and the sea. The plains on the other side of the mountain chain comprise dry areas that don't offer a habitat conducive for orchids. Thus over the centuries many unique species have evolved in isolation, he explained.

Perhaps the second largest group of flowering plants in the world, orchids are one of the most ecologically and morphologically diverse families. They thrive on the diverse habitats available within the West-

ern Ghats. There are three kinds of orchids - those that grow on dead and decaying matter, terrestrial orchids that grow on the soil and the epiphytic orchids that grow on other trees, Jalal said.

The laterite plateaus of the Western Ghats for instance are home to several species of terrestrial orchids including endemic species like *Habenaria grandiflora* and *Habenaria sumatrensis*. In the extreme climatic conditions on the plateaus, these plants bloom only in the rainy season, usually in June and July. The tubers of the plant remain underground for the rest of the year and new shoots emerge the next season.

On the other hand, the vegetative parts of the epiphytic orchids can be seen throughout the year, he said. The terrestrial orchids have two modes of reproduction, through the tubers as well as through seeds like other orchids. However, the seeds of orchids are microscopic and do not contain endosperm that nourishes the budding plant. Instead, orchids rely entirely on a group of fungus to provide the germinating seeds with nutrients. This symbiotic relationship is called Mycorrhiza, he added.

"Some orchid species require unique habitat and microhabitats so they are confined to particular elevations and forest types. Some are naturally rare, others are so because of geographic distribution, narrow habitat requirements, and low-density populations," he said.

Some species that were reported earlier from the region have not been found recently, indicating their gradual disappearance due to habitat changes. For instance *Epiphyllum druryi*, which was once found in plenty in Agasthyamalai Hills in southern India is now difficult to locate, Jalal said.



Cotonia pendunculata (Bee orchid)

- Globally orchid species - 24,000 (including 10,000 hybrid/ornamentals)
- Western Ghats - More than 300
- Endemic to the region - 95
- Critically endangered in Western Ghats - 7

Important regions for endemic orchids

- Mahabaleswar-Khandola
- Konkan-Rajgad
- Shimoga-Kannur
- Agasthyamalai Hills
- Anaimalai High Ranges
- Nilgiris-Silent Valley
- Waynaï-Kodagu region



Aerides maculosa (Endemic orchid)

With growing threats to wild orchids, the Botanical Survey of India (BSI) has set up a National Orchidarium in Yercaud. The botanical garden of the BSI at Pune has 70 orchid species, including 22 that are rare and endemic.

PROMOTION

Dr. P. Venu, DRC, Hyderabad promoted to next higher grade, Scientist 'G' w.e.f. 20.11.2015 through *in-situ* promotion under Flexible Complementing Scheme (FCS).



Sri Amber Srivastava, JRF (DBT project) reintroducing *Phlomis superba* (= *Eremostachys superba*) in Mohand forest, Dehradun

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