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ENVIS CENTRE ON FLORAL DIVERSITY

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From Director's Desk

Water is fundamental for life, food security and sustainable development on Earth. Biodiversity maintains the quality and quantity of water resources and also plays a vital role in the water cycle. Knowing the importance of water and biodiversity in the present scenario, the Convention on Biological Diversity has declared "Water and Biodiversity" as the theme for this year's International Day for Biological Diversity.

The theme was chosen to coincide with the declaration of the year 2013 as 'International Year of Water Cooperation' by the United Nations and 'Water Conservation Year' by Government of India. To commemorate the International Day for Biological Diversity, on 22 May 2013, the Botanical Survey of India organised an exhibition of plant resources, poster presentations, lectures, and documentary film shows on biodiversity day theme at the Central National Herbarium, Howrah.

The ENVIS Centre of Botanical Survey of India has been publishing articles on issues and events related to floral diversity, conservation and environment in its official Newsletter. This issue contains articles on occurrence and salient features of a rare root-parasite, *Sapria himalayana*, for the first time in Mizoram; *ex situ* conservation of *Musa aurantiaca* in the Experimental Botanical Garden of Botanical Survey of India, Barapani, Shillong; occurrence of mangroves and mangrove associates in AJC Bose Indian Botanic Garden; notes on *Chrysopogon aciculatus* from Nagaland; ornamental value of *Campsis radicans* in India, and a report on Botanical Nomenclature course.

I greatly appreciate the sincere efforts and hard work put in by the entire team of ENVIS Centre on Floral Diversity in bringing out this informative issue.

(Paramjit Singh)

Director & Scientist 'G'

Botanical Survey of India

Sapria himalayana (Rafflesiaceae) from Mizoram

Griffith (1844) established the genus *Sapria* with a species *S. himalayana* (Rafflesiaceae) from Mishmi Hills of erstwhile Assam, now in Arunachal Pradesh. This genus consists of three species, viz., *S. himalayana* Griff., *S. poilanei* Gagnep. and *S. ram* Bänziger & B. Hansen and is confined to Southeast Asia with restricted disjunctive distribution.

Burkill (1924) enlisted *S. himalayana* in his paper on the Botany of Abor Expedition. Abor hills are now in Siang districts of Arunachal Pradesh. Bor (1938) reported the species from Aka Hills, now in Kameng district of Arunachal Pradesh. Kanjilal & al. (1940) cited the collections of Burkill (from Khasia Hills, N.E.F. Tract) and Bor (from Balipara Frontier Tract). Deb (1961) reported this species from Koupru in Manipur. Adhikari & al. (1983) treated it as a rare and endangered species in the Namdapha National Park. Chauhan (1987) included Arunachal Pradesh (Namdapha), Manipur and Meghalaya under its distribution, and categorised it as a rare species. Bhaumik & al. (1997) recorded this species from Mehao Wildlife Sanctuary, Arunachal Pradesh. This species was also collected from Kopli Hydroelectric area in N. Cachar hills of Assam by Barua during 2006 – 2008.

Recently, the authors have recorded *S. himalayana*, for the first time from Mizoram. Plants were seen in blooming on the shaded forest floor with moist humus soil in the Tawi Wildlife Sanctuary, Aizwal, located in the northeastern part of the state at altitudes ranging from 400 to 1700 m. The fleshy, globose flower buds of this root-parasite are visible only when they emerge from the soil. The flowers persist for 2 – 3 days after blooming and emit a putrid odour. They are unisexual, c. 20 cm in diam., and bright red in colour with sulphur-yellow spots. Gradually they become dark and then decompose slowly. In Mizoram, it flowers during November to December.

Sapria himalayana: **a.** Habitat; **b.** A flower, close-up view.

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Campsis radicans; inset: Flowers

Campsis radicans (Bignoniacaeae) – An ornamental climbing shrub in India

Campsis Lour. is an Eastern Asian genus, represented by two species, namely, *C. grandiflora* (Thunb.) K. Schum. from Eastern Asia and *C. radicans* (L.) Bureau from Eastern United States (Mabberley, 2008). They are deciduous woody climbers with aerial roots. Both these species are cultivated in the gardens as an ornamental in India.

Campsis radicans (L.) Bureau is commonly known as trumpet climber. The specific epithet '*radicans*' refers to the aerial roots. It is locally known as *Latkania* in Hindi. Bor & Raizada (1954) treated this species under the name '*Tecoma radicans* Juss.', and considered it as one of the beautiful Indian climbers and provided a detailed description. They have also stated that 'This species is particularly adapted for covering walls and rocky embankments, as it will climb with aerial rootlets and cling firmly to its support. It is an excellent plant for covering bare trunks of trees.'

It is occasionally grown in the gardens but needs to be popularised as an ornamental plant, as it produces attractive orange-red flowers in clusters, almost throughout the year, except in winter. It causes a burning or itching sensation when come into contact. The plants are usually propagated by cuttings or root-suckers (Bor & Raizada, 1954).

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A Report on Botanical Nomenclature Course

The Botanical Nomenclature Course was jointly organised by the Botanical Survey of India and ENVIS Centre on Floral Diversity – BSI from 11 to 13th January, 2013 at Hotel Presidency Inn Pvt. Ltd., Kolkata. Dr. Kanchi N. Gandhi, Senior Nomenclatural Registrar, Harvard University Herbaria, USA was the Course Director; Dr. Paramjit Singh, Director, BSI was the Course Convenor and Dr. P. Lakshminarasimhan, Scientist 'D', BSI was the Course Coordinator. The late Dr. M.K. Pathak was very much helpful in organising the course. In all there were 96 participants, including Research Fellows from Botanical Survey of India, universities and other research institutes, Professors from universities and colleges and Scientists from various research institutes across the country. During the inaugural function on 11 January 2013, there were two short lectures, viz., (i) The importance of Botanical Nomenclature by Dr. P.K. Mukherjee, Professor (Retd.), University of Calcutta, and (ii) Taxonomy and global strategy for plant conservation by Dr. D.K. Singh, Additional Director, BSI. Two lectures were given by Mr. R.L. Mitra, Scientist (Retd.), BSI, viz., (i) Scientific names of plants – Some facts and misconceptions (on 11.1.2013), and (ii) Type concept and nomenclatural problems (on 12.1.2013). Dr. K.N. Gandhi's lectures were spread into all the three days and he covered the topics, viz., (i) An historical overview of botanical nomenclature from Linnaeus to the Melbourne Code; (ii) Review of the physical structure of the Melbourne Code; (iii) Preamble, Ranks and Names of Taxa, and Effective Publication (appropriate Art. 1 – 31); (iv) Validity of Names Part I (Art. 32 – 45); (v) Validity of Names Part II; (vi) Authorship Citation (Art. 46 – 50); (vii) Rejection of Names (Art. 51 – 60), and (viii) Anamorphic fungal and hybrid names. On the valedictory day Dr. Paramjit Singh, delivered a short lecture on "Floristic Diversity in India: An overview". Subsequently, certificates were distributed to all the participants.

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a) Eminent Guests on the podium; b) Dr. Kanchi N. Gandhi, delivering a lecture on botanical nomenclature to the participants, c) Dr. P. Lakshminarasimhan, Course Coordinator delivering valedictory speech; d) A participant receiving course certificate from Dr. Kanchi N. Gandhi, the Course Director; e) A group photograph of participants, organisers and speakers on the valedictory day of Botanical Nomenclature Course.

A note on *Chrysopogon aciculatus* (Poaceae) from Nagaland

Chrysopogon aciculatus (Retz.) Trin. is a tufted perennial species, distributed widely in the Asia-Pacific regions of the world. It is distributed almost throughout India. Its various ecological roles and uses and impact on the animals in Nagaland are presented here.

It grows gregariously on roadsides in Nagaland. Its dark, reddish purple spikelets are eye-catching. The prostrate, creeping stems resist overgrasing and trampling. It is a good soil binder. It controls soil erosion and also increases the water retention capacity of the soil.

The decoction of the roots is used to cure diarrhoea. Fresh rhizome pounded with 3 – 5 black peppers is made into paste and taken early in the morning in an empty stomach, for curing stomach ache and gastric disorder. Root paste is applied to boils. It is used for making mats, clothes, baskets and mild scent. Due to its diverse uses, efforts are underway to conserve this species.

According to Bor (1960) the grazing animals suffer severely by the barbed fruits that get attached to their hair and pierce into the flesh and cause extensive ulceration in animals. During the present study, it was also observed that dogs frequently develop abscesses between the toes by the caryopsis (fruits) and the germinating seeds can sometimes be pressed out of dog's flesh along with large amount of pus. Local people of Nagaland grow this species in the vicinity of their houses to keep away the dogs.

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Chrysopogon aciculatus: Inflorescences; insets: A portion of inflorescence, close-up view, a spikelet

Notes on *Musa aurantiaca* (Musaceae) and it's *ex situ* conservation in the Experimental Botanical Garden of Botanical Survey of India, Barapani, Shillong

A decade ago one of us (NNR) introduced a wild species of banana collected from Lower Dibang Valley district of Arunachal Pradesh in the Experimental Botanical Garden (EBG) of Botanical Survey of India, Barapani, Shillong. In 2011, this species attracted the attention of one of us (RG) by its showy orange flower buds, borne on erect inflorescence. Later, the species was identified as *Musa aurantiaca* G. Mann ex Baker belonging to sect. Rhodochlamys with the help of literature on *Musa* (Häkkinen, 2002; Häkkinen & Sharrock, 2002; Häkkinen & Väre, 2008). Further, the identity was also confirmed by Dr. Markku Häkkinen, the internationally acclaimed expert on Musaceae.

A description based on plants growing at EBG, Barapani and photographs are provided here.

Musa aurantiaca G. Mann ex Baker, Ann. Bot. (Oxford) 7: 222. 1893; Häkkinen & Väre, J. Syst. & Evol. 46: 89. 2008.

Plant slender, to 1 m high, suckering freely, 30 – 40 cm apart; position vertical; sap watery. Leaves intermediate; petioles to 22 cm long, cannel open with greenish purple margins; lamina elliptic to lanceolate, asymmetric at base, acute at apex, to 60 × 15 cm, green.

Musa aurantiaca: Erect inflorescence; inset: Young infructescence

Inflorescence erect; peduncle to 10 cm long till the first female flowers, c. 1.5 cm in diam., orange with minute white hairs. Female buds c. 15 × 3 cm, lanceolate; 2 or 3 female flowers in each bract in single row; ovary c. 3 × 1.2 cm, light green. Male buds c. 11 × 3 cm, lanceolate, orange, lifting few bracts at a time; male flowers 1 – 3 in each bract. Fruit bunch small with 3 or 4 hands, usually 3, rarely 2 fruits in single row; fruit tip pointing against the gravity, individual fruit to 5 × 1.2 cm, straight, pronounced ridged, blunt at apex, glabrous; immature fruit peel light green; seeds subglobose to globose, c. 4 mm across, slightly wrinkled.

Habitat: Moist ravines in Tropical evergreen forests, 300 – 1200 m.

Distribution: India (Assam and Arunachal Pradesh), China, Myanmar and Tibet (Häkkinen & Väre, 2008). The species has now become extremely rare in the Lakhimpur district of Assam.

Notes: At the Experimental Botanical Garden, Barapani, situated at an altitude of 800 m, the plants are growing in three large population. Recently, the first author has also introduced this species in the garden of Botanical Survey of India, Arunachal Pradesh Regional Centre, Itanagar, where it is thriving well. The species seems to have potential as a horticultural plant.

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Notes on the occurrence of Mangroves and Mangrove Associates in AJC Bose Indian Botanic Garden, Howrah

Attempts were made a century ago to introduce some mangroves/mangrove associates in AJC Bose Indian Botanic Garden, Howrah. Some of these species like *Bruguiera gymnorrhiza* (L.) Savigny (Rhizophoraceae), *Excoecaria agallocha* L. (Euphorbiaceae) and *Heritiera littoralis* Aiton (Sterculiaceae) are still thriving well in Division Nos. 25, 4, 15 of the Garden, respectively. A mangrove gymnosperm, *Taxodium distichum* (L.) Rich. (Taxodiaceae), native of Texas and Florida, is also thriving well with prominent pneumatophores in Division No. 5 of the Garden.

In recent years some interesting mangrove species like *Acanthus ilicifolius* L. (Acanthaceae), *Avicennia alba* Blume (Avicenniaceae), *Lumnitzera racemosa* Willd. (Combretaceae) and *Sonneratia griffithii* Kurz (Lythraceae), and associates such as *Barringtonia racemosa* (L.) Spreng. (Lecythidaceae) and *Derris trifoliata* Lour. (Leguminosae – Papilionoideae) have been noticed growing naturally on the boundaries of AJC Bose Indian Botanic Garden on the bank of river Hooghly. These species are abundant in Sunderbans. AJC Bose Indian Botanic Garden lies in the low lands of Gangetic Deltaic region of West Bengal on the bank of river Hooghly about 150 km away from the Sunderbans. It is assumed that the germinated seeds of mangroves from Sunderbans might have been drifted upstream in high tide and rooted on the banks of the river. This unusual growth of mangroves in this area indicates the increasing salinity in the river Hooghly. This natural invasion of mangroves in the garden through the water ways of the Hooghly is quite an interesting phenomenon, which needs further detailed study.

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Mangroves and Mangrove Associates: **a.** *Bruguiera gymnorrhiza*; **b.** *Taxodium distichum*; **c.** *Acanthus ilicifolius*; **d.** *Sonneratia griffithii*: insets: Flower, Fruit; **e.** *Derris trifoliata*: Inflorescence; inset: Fruits; **f.** *Barringtonia racemosa*.

Release of book published by Botanical Survey of India on Algae of India by Dr. V. Rajagopalan, Secretary, Ministry of Environment & Forests (MoEF), New Delhi on International Day for Biological Diversity (22nd May, 2013).

Third Programme Management Committee meeting held at Central National Herbarium, BSI, Howrah on 8 May 2013 under the Chairmanship of Mr. H.K. Pande, Addl. Secretary, MoEF, New Delhi.

Discussion by the Scientists of Botanical Survey of India and invited Professors from various universities in West Bengal during the brainstorming session on plant taxonomy organised by Botanical Survey of India at Central National Herbarium, Howrah on 25 April 2013.

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Activities of the Centre: The Botanical Survey of India having involved in exploration activity has been collecting diverse data pertaining to floral diversity and its ENVIS Centre proposes to disseminate this information by building databases on the distribution of endemic and threatened plants, documentation of traditional/ethnobotanical knowledge, carnivorous plants and mangroves of India. It is also engaged in publication of state-wise bibliography including abstracts of papers pertaining to plants of India and also selected publications that have relevance both in documentation and conservation.

List of publications brought out so far:

Books:
1. Mangroves, Associates and Salt Marshes of the Godavari and Krishna Delta, Andhra Pradesh – India
2. Diversity of Coastal Plant Communities in India (Priced publication) ₹ 804.00*
3. Red List of Threatened Vascular Plant Species in India
4. A Pictorial Guide to some of the Indian Plants included in CITES and Negative List of Exports
5. Bibliography and Abstract of Papers on Flora of West Bengal
6. Bibliography and Aabstract of Papers on Flora of North East India – I
7. Bibliography and Abstracts of Papers on Flora of West Bengal – II
8. Bibliography and Abstracts of Papers on Flora of Andaman and Nicobar Islands
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10. Bibliography and Abstracts of Papers on Flora of Kerala

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