

## ENVIS CENTRE ON FLORAL DIVERSITY

# ENVIS

## NEWSLETTER



भारतीय वनस्पति सर्वेक्षण  
BOTANICAL SURVEY OF INDIA

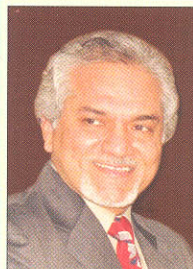
जग है हरियाली  
वही है सुशहाली ॥



Vol. 18(2), 2013

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## From Director's Desk



The biological resources and ecosystem services provided by biodiversity play vital role in supporting life on earth. However, across the world the biodiversity and ecological functions of every ecosystem are at greatest risk due to extensive loss of natural habitats. The United

Nations Food and Agriculture Organisation states that about 40% of the world's economy is directly and indirectly based on the utilisation of biological resources. Knowing the intrinsic values of biodiversity and biological resources, the Government of India has enacted many policies and rules to conserve and manage the existing biodiversity and environment in the country. These biodiversity acts and rules also emphasise the sustainable utilisation of biological resources to reduce decline in the biological diversity and to meet the essential needs of present and future generations.

Like earlier ones, this issue of ENVIS Newsletter also has articles on rare, medicinal and economic plants of India, and interesting distributional plant records from different phytogeographic regions of country. Articles on a new generic record of *Sarcopyramis* for Western Himalaya and recollection of *Parakaempferia synantha* from Arunachal Pradesh are noteworthy. The successful introduction of *Abutilon ranadei*, an endemic and critically endangered species of Maharashtra to Acharya Jagadish Chandra Bose Indian Botanic Garden (AJCBIBG) is given in an article. The various medicinal properties of *Dioscorea deltoidea* and *Pedaliium murex*, their threats and conservation strategies are discussed separately. Apart, this issue has articles on the population of a rare palm species, *Corypha utan*, growing at AJCBIBG; dyeing cotton cloth using extract from *Rhinacanthus nasutus* and a report on the occurrence of massive infructescence in *Musa x paradisiaca* from southern West Bengal.

I am certain that this issue will also be appreciated by its regular readers for its content. I also appreciate the efforts of entire team of ENVIS Centre on Floral Diversity in bringing out this informative issue.

(Paramjit Singh)  
Director & Scientist 'G'  
Botanical Survey of India

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## *Sarcopyramis* (Melastomataceae) – A new generic record for Western Himalaya

In the Himalayan region, the genus *Sarcopyramis* Wall., comprising a single species *S. napalensis* Wall. (Hansen, 1979), was known to occur in moist central and Eastern Himalaya from Nepal to Myanmar, including Sikkim, Arunachal Pradesh and Mizoram in India but not known from the drier Western Himalaya hitherto. During the recent floristic survey in Birthi-Namik-Hiramani glacial valley, 10 populations of *S. napalensis* each consisting of 50 – 250 individuals were located at Birthi-Ruiger forest of Pithoragarh district in Kumaon region of Uttarakhand that constitute the first record of this genus, for the Western Himalaya.

*Sarcopyramis napalensis* Wall., Tent. Fl. Nepal. 1: 32, t. 23. 1824. *S. subramanii* M.P. Nayar, Proc. Indian Acad. Sci., B 66: 279. 1967. *S. humilis* M.P. Nayar, J. Bombay Nat. Hist. Soc. 71: 170. 1974.

Herbs, erect, 10 – 22 cm high. Stems simple or branched, 4-angled, succulent, glabrous. Leaves opposite, broadly ovate to ovate-lanceolate, cuneate to subobtusate or sometimes suboblique and slightly decurrent at base, serrulate or ciliate-serrulate at margins, acuminate or subacuminate at apex, 2.8 – 6 × 2.4 – 3.5 cm, membranous, glabrous or sparsely glabrescent above, glabrescent beneath; secondary veins 1 or 2 on each side from base (apparently 3 – 5-veined at base); petioles 1 – 4 cm long, narrowly winged. Inflorescence a cyme, terminal, 1 – 3-flowered; bracts 2, basal, sessile or subsessile, ovate, foliaceous; pedicels absent or to 2 mm long, 4-angled, narrowly winged on angles. Hypanthium turbinate to campanulate, 4 – 5.5 mm long, narrowly winged on 4 angles. Calyx lobes 4, nearly united, 0.7 – 1 mm long, truncate at apex with a membranous, ciliate-fimbriate-margined disk. Petals 4, obliquely obovate, apiculate, 4 – 7 × 2 – 3.8 mm, pink. Stamens 8, equal; filaments 2 – 3 mm long, flattened, exserted from hypanthium; anthers 0.8 – 1 mm long; connective decurrent, forming a short spur or minute bulge. Ovary inferior with a membranous, repand-margined crown; style 1.8 – 2.2 mm long; stigma capitate. Capsules cupular when young, 4-sided; crown membranous, exserted from hypanthium.

*Flowering & Fruiting:* June – July.

*Ecology:* Common on damp-shaded forest-floor at elevations ranging from 2350 to 2425 m in mixed broad-leaved (*Quercus-Acer-Rhododendron*) forest in Birthi-Ruiger.

*Distribution:* Bhutan, China, India (Arunachal Pradesh, Mizoram, Sikkim and Uttarakhand), Malesia, Myanmar, Nepal, Philippines and Thailand.



*Sarcopyramis napalensis*

*Specimen examined:* India: Western Himalaya, Uttarakhand, Kumaon, Pithoragarh, Birthi forest, Birthi-Ruiger (30°04'082" N, 80°08'644" E), 2396 m, 1.7.2013, P.K. Pusalkar 121856 (BSD).

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Hansen, C. 1979. A revision of the genus *Sarcopyramis* Wall. (Melastomataceae). *Bot. Tidsskr.* 73: 177 – 183.

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### *Parakaempferia synantha* (Zingiberaceae) – Recollected after four decades from Arunachal Pradesh, earlier known only from the type locality in Assam

*Parakaempferia* A.S. Rao & D.M. Verma, an endemic monotypic genus, represented by *P. synantha* was described by Rao & Verma (1971) based on collections made during 1966 in North Lakhimpur district, Assam. The genus differs from its allied genus *Kaempferia* L. in having leaves and inflorescences at the same time. *Parakaempferia synantha* has not been recollected since its type collection.

However, during the course of floristic explorations in West Siang district, Arunachal Pradesh from 2010 to 2013, the first author recollected it in full bloom in Gai riverside subtropical forest in the periphery of Kanhe Wildlife Sanctuary. More than 500 mature individuals were located at a stretch of about 1 km. The present collection is a rediscovery after more than four decades. A brief description based on the present collection and photographs of a live plant are provided here, to facilitate further collection and easy

identification of this species.

***Parakaempferia synantha*** A.S. Rao & D.M. Verma, *Bull. Bot. Surv. India* 11: 206. 1969.

Perennials, rhizomatous; rhizomes compact. Stems tufted, terete, 0.3 – 1.5 m high, green; basal bladeless sheaths 3 – 6, greenish. True leaves 3 – 7, elliptic, acuminate at apex, 5 – 15 × 3 – 6 cm, dark green above, paler beneath; ligule c. 1 cm long, bifurcate. Spikes 1 – 6 in each shoot, radical, linear, 10 – 20 cm long. Flowers solitary in each bract, white, yellow at lip base; bracts alternate, compact on rachis; fertile bracts elliptic, rounded at apex, c. 3.5 × 1.2 cm, green; bracteoles 2, elliptic, c. 10 × 8 mm. Calyx tubular, c. 8 mm long, cleft, white. Corolla tube 2 – 2.5 cm long; outer perianth elliptic, 1.8 – 2 × c. 1 cm, membranous, white. Lip broadly obovate, undulate at margins, emarginate at apex, c. 2 × 1.8 cm, with a yellow patch at middle. Stamen 1; filament c. 2.6 cm long; anther c. 8 mm long. Stigma umbrella-shaped.

*Flowering:* May – June.

*Habitat:* Dense moist, shady places, particularly on slopes.

*Distribution:* India: Assam and Arunachal Pradesh (Kanhe Wildlife Sanctuary; locally abundant).

*Specimen examined:* India: Arunachal Pradesh, West Siang district, Gai riverside forest, 180 m, 28.5.2012, M. Bhaumik 27500 (ARUN).

#### Reference

Rao, A.S. & Verma, D.M. 1971. *Parakaempferia synantha* (Zingiberaceae) – A new genus & species from Assam. *Bull. Bot. Surv. India* 11: 206 – 208.

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*Parakaempferia synantha*: a. Habit; b. Basal portion of plants showing radical inflorescences with white flowers

## *Abutilon ranadei* (Malvaceae) – A Critically Endangered species at AJC Bose Indian Botanic Garden, Howrah

*Abutilon ranadei* Woodrow & Stapf is an endemic species, confined to the northern Western Ghats of Maharashtra. It is locally known as 'Son Ghanta' or 'Ghanti Mudra'. This species is distributed between 16.4° – 19° N and 72° – 74° E on the crest line of the Western Ghats, at elevations ranging from 600 to 1200 m.

Due to its narrow range of distribution (Ratnagiri, Amba Ghat, Kolhapur district) and extreme rarity, this species was earlier categorised as "Rare or Extinct" by Ahmedullah & Nayar (1986) and "Endangered or Presumed Extinct" by Paul & Nayar (1987). Mishra & Singh (2001) categorised it as one of the Critically Endangered species of Maharashtra. However, this species has recently been collected from eight new localities, namely Shilimb, Rajgad, Torna Fort and Purandhar Fort in Pune district, Vasota Fort in Satara, Gothne and Prachitgad in Sangali district, and Amboli in Sindhudurg district of Maharashtra. Tetali & al. (2004) made a comprehensive ecological and conservation studies on this species, including its floral biology, vegetative propagation methods and pests/diseases.

This species was successfully introduced at AJC Bose Indian Botanic Garden, Howrah in February, 2012. The saplings were provided by the Shivaji University, Kolhapur, Maharashtra and two of them growing in division number 1 and 20. Profuse flowering was observed in both the plants, especially the one with three branches, planted in a wide-mouthed shallow pot. Artificial pollination resulted in fruit-setting and seed formation in the plant growing in division number 20.



*Abutilon ranadei*: a. Habit; b. Flower; c. Fruit

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## A rare species of *Corypha* (Arecaceae) growing at AJC Bose Indian Botanic Garden, Howrah

The genus *Corypha* L. is characterised by tall, robust, single-stemmed palms having large crown of fan-shaped leaves and hapaxanthic (= monocarpic) habit. It is represented by 5 species in the world, and its distribution ranging from Southern India and Sri Lanka, to the Bay of Bengal, and from Indochina through Malesia to Northern Australia (Dransfield & al., 2008). In India, the genus is represented by 3 species, viz., *C. taliera* Roxb., *C. umbraculifera* L. and *C. utan* Lam. However, the natural population of all the three species is probably non-existent in India, which is generally attributed to various ecological reasons. Some are infrequent in the semi-wild state, and some are extinct in wild.

*Corypha utan* is often found in lowland along the river bank and in moist, swampy areas. It is one of the few palm species that can sustain extreme water-logged condition. A population of 32 mature individuals (with neither flower nor fruit), 12 after fruit-shedding, 3 in fruiting condition, and many seedlings of this elegant palm is found on the bank of River Hooghly (division number 3) at AJC Bose Indian Botanic Garden. Seeds are disseminated by birds, bats and squirrels that feed on the ripe fruits. Fresh seeds readily germinate under mother plant.

The most distinguishing character of this palm species is the greyish black spiral-marking on the stem surface. Leaf-petiole is longer than the leaf-blade, breaks from the middle when dry and typically ascending from the stem. The coarse fibre from the petioles is used for making ropes. The inner core of the stem yields edible starch.



*Corypha utan*: a. A population; b. A palm in fruiting condition; inset: Fruits; c. A palm after shedding the fruits

#### References

- Basu, S.K. & Jana, B. 2011. Observation on *Corypha* L. (Arecaceae) in India. *Phytotaxonomy* 11: 37 – 44.
- Dransfield, J., Uhl, N., Asmussen, C., Baker, W.J., Harley, M. & Lewis, C. 2008. *Genera Palmarum. The Evolution and Classification of Palms*. Royal Botanic Gardens, Kew.

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#### Dyeing cotton cloths with *Rhinacanthus nasutus* (Acanthaceae)

*Rhinacanthus nasutus* (L.) Kurz is widely used for colouring mats in some rural areas of Purba Medinipur, Paschim Medinipur, Bankura and Purulia districts in West Bengal (Das, 2006). We have dyed cotton cloths using dye extracted from this plant, the method of extraction and the results of various tests are provided here.

Plant material was obtained from Paschim Medinipur district, where this shrubby species with 2-lipped corolla grow commonly on the roadsides and locally known as 'Rangchita'. At first, fresh green plant parts were cut into pieces and soaked in distilled water in the proportion of 10 – 15 gm of sample/100 ml of distilled water and

kept at 80 – 85°C for 30 – 60 minutes. The dye so extracted imparted a reddish brown colour to the water. The coloured water was decanted and used for dyeing. White cotton cloths of c. 8 × 6 cm size were first boiled in NaOH solution (10%) for 20 minutes to remove starch and then washed with cold distilled water, then the cloth was treated with 5 ml of solution [made of 3 gm of alum (as mordant)/100 ml of dye extracted] to allow the dye to 'bite' on to the fabric, making it set, and prevent it from washed out. It was followed by treatment in the dye bath for an hour and dried in sunlight.

The dyed cloth was then tested for light, wash and rub fastness and heat resistance. Light fastness by exposing the dyed cloth to direct sunlight for 12 hours; wash fastness by washing the dyed cloth with nonionic soap water (1 gm nonionic soap/L); rub fastness by rubbing the fibre and checking the fading of colour and heat resistance by keeping the cloth at 50 – 80°C for 30 minutes in the oven without water. It was observed that colour strength increased whenever the quantity of plant parts was increased from 15 to 25 gm per 100 ml distilled water for an hour at 80 – 85°C. It has also been observed that whenever the alum mordant was increased (5 gm of alum/100 ml of dye extracted) there was improvement in the light fastness properties.

Dyeing with *R. nasutus* showed moderate light fastness, good wash fastness, good rub fastness and moderate heat resistance capacity in cloths. The colour on cloth has no side effects on skin or harmful effect on the environment. The whole dyeing process is viable since raw material is easily available.

#### Reference

- Das, N. 2006. Propagation prospects of dye yielding plant *Rhinacanthus nasutus* (Linn.) Kurz. *Nat. Prod. Radiance* 5: 42 – 43.

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*Rhinacanthus nasutus*: a. Habit; inset: Flowers (close-up); b. A reddish brown water extracted from plant parts; c. White cotton cloth; d. Cloth dyed without mordant; e. Cloth dyed with mordant

## *Dioscorea deltoidea* (Dioscoreaceae) – An overexploited Negative listed species in India

*Dioscorea* L. comprising c. 630 species is chiefly distributed in tropical and subtropical regions of the world (Mabberley, 2008). Of which, c. 50 species are occurring in India (Murti, 2001). Species of *Dioscorea* are commonly referred to as medicinal yams.

*Dioscorea deltoidea* Wall. ex Griseb. is a dioecious, clock-wise twining perennial climber with horizontal, ginger-shaped rhizome. It is distributed in Afghanistan, Bhutan, China, India, Myanmar, Nepal, Pakistan, Thailand and Vietnam. In India, it occurs in temperate Himalayas, from Kashmir to Sikkim at elevations ranging from 1000 to 3500 m, and is known by different trade names, viz., Elephant's Foot, Ganj, Harvish, Keerish, Kildri, Kins, Kriss, Kithi, Kitra, Shinglingli and Tarur (Chauhan, 2006).



*Dioscorea deltoidea*: a. Fruits; b. Rhizomes

The non-edible rhizomes are rich in saponin content, thus, they are used for washing silk, wool and hair, and for dyeing. As this plant is one of the richest sources of diosgenin (a steroid sapogenin), it is used in various modern formulations involving cortico-steroids, sex hormonal preparation, tablets and injections including oral contraceptive pills and as anabolic agents (Chauhan, l.c.).

It has been overexploited by local people for its medicinal values. Chowdhery (1988) categorised it as a vulnerable species. This species has also been included in the Appendix II of CITES, and all its trade and export from wild collections have been banned. This plant can be propagated by either seeds or rhizomes; however, plants raised through seeds take a longer time for yielding rhizomes, compared to plants raised from rhizomes.

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## *Pedalium murex* (Pedaliaceae) – An overexploited medicinal plant species in Haryana

During a recent botanical survey in Sultanpur National Park, Gurgaon district of Haryana, it was found that *Pedalium murex* L. has widely been used by the local people for its medicinal properties. It is locally known as 'Gokhru' and 'Vilayati Gokhru'. It is an erect, succulent annual, growing up to 60 cm high. The flowering and fruit-setting take place between September and December. It occurs in grasslands and sandy mounds, and usually associated with *Setaria* species. The various ethnobotanical uses of this species collected from Gurgaon district are given here.

Fresh leaves are washed for two or three times and then boiled in water. The boiled water is cooled and then taken two times a day in empty stomach for about a month to increase the vitality of the sperms. The dried seeds and boiled wheat are fried in ghee; globules



*Pedalium murex*: a. Habit; b. Fruits

are made when the preparation attains brown colour. The globules are taken two times a day with milk for a fortnight to cure leucorrhoea. Seeds are ground and boiled in water, then filtered and stored; one teaspoonful of this preparation is taken with warm water and sugar candy two times a day to cure swelling of the intestine and testes. The ground seeds were boiled in water, and wrapped up with a cloth and gently pressed surrounding the navel portion three to five times a day to cure swelling in that area in children and adults. The five plant parts, viz., root, stem, leaf, flower and fruit, together known as 'Panchang', are dried and ground into fine powder, which is then taken with warm water or milk two times a day for a month to cure liver and stomach disorders.

As the species is locally very rare, and is of high demand among the locals, the forest department/government should promote its cultivation in state-owned nurseries.

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### A report on occurrence of massive infructescence in *Musa × paradisiaca* (Musaceae) from southern West Bengal

The usual size of the infructescence in *Musa × paradisiaca* L. may be up to 5 ft with 400 – 450 bananas in c. 20 tiers. In Medinipur town, Paschim Medinipur district, southern West Bengal, the authors

have come across a *M. × paradisiaca* plant with an infructescence of c. 9 ft containing a total of 1459 bananas in 39 tiers. Occurrence of this kind of massive infructescence is also rare in India. Studies are required to find out the actual cause of high productivity in such rare cases so that it can economically be exploited.

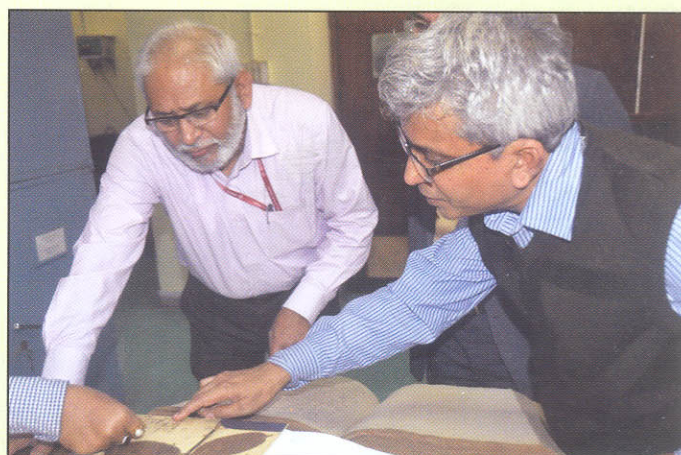
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*Musa × paradisiaca*: A massive infructescence



A visit by Mr. S.S. Mohanty, AS & FA, MoEF, New Delhi, to Central National Herbarium, Howrah on 10 December 2013



Fourth Programme Management Committee Meeting held at Central National Herbarium, Howrah on 6 November 2013 under the Chairmanship of Dr. (Ms.) R. Dalwani, Advisor, CS, MoEF, New Delhi

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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 Abstract 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
  9. Bibliography and Abstracts of Papers on Flora of Maharashtra
  10. Bibliography and Abstracts of Papers on Flora of Kerala

**Newsletters:** Up to Vol. 18(2), 2013

\*Demand Draft (DD) is to be drawn in favour of ACCOUNTS OFFICER, PAO (BSI/ZSI) and to be sent to the address of the ENVIS Centre given above