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Editorial

The ENVIS Centre, BSI continues its regular activities of collection, collation and dissemination of information on floral diversity, its rarity and threats. The centre is periodically publishing Newsletters on the issues of threat to phytodiversity, traditional use of plants, biological control and news & notes on the sensitive issues on biodiversity related areas. In this issue of ENVIS Newsletter articles on an insect repellent plant of traditional use in the paddy field and 'Panilarang' a plant yielding nutrient rich sap to refresh the fatigued forest people are very interesting and can be further explored for potential use. Reports on fragile Deepar Beel, status of the threatened *Beddome's Cycas* the *Cycas beddomei* Dyer are very informative. Other articles on distribution and adaptation of *Psilotum nudum* (L.) P. Beauv. a member of the living fossil family of pteridophytes, correct identity of the 'Peepal' tree which witnessed the history of pre-independent India in the Cellular Jail complex of Andaman & Nicobar Islands, curious Giant Water Lily flourishing in the Indian Botanic Garden, re-discovery of *Gonatopus boivinii* (Decne.) Hook.f. ex Engl. in the Indian Botanic Garden after 100 years, etc. are very interesting.

Hope this issue of ENVIS Newsletter will be informative and useful to the readers.

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CYCAS BEDDOMEI DYER – A NEGATIVE LISTED PLANT ENDEMIC TO ANDHRA PRADESH

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Introduction

The genus *Cycas* belongs to the family Cycadaceae. It is represented by ca. 20 species worldwide. In India, it is represented by 5 species viz. *C. beddomei* Dyer, *C. circinalis* L., *C. pectinata* Griff., *C. rumphii* Miq. and *C. siamensis* Miq. Apart from the aforementioned five wild species, *C. revoluta* Thunb. of Japan is commonly cultivated in the Indian gardens.

The plant *C. beddomei* is popularly known as *Beddome's Cycas*. In Telegu, it is known as *Perita* or *Konda Itha* (Sahni, 1990).

Etymology: The generic name *Cycas* is derived from the Greek word *Kykas*, which means a kind of palm. The specific epithet is to honour Col. R.H. Beddome, a prominent botanist who worked on the Indian flora (Sahni, 1990).

Brief description

A small shrub; trunk short ca. 50 cm high. Leaves 90 - 125 x 15 - 31 cm; rachis subquadrangular; petiole 10 - 17 cm long with few minute spines in the upper part and clothed with tufted tomentum at base; pinnules (leaflets) ca. 50 - 100 per side; pinnules



Cycas beddomei Dyer with mature seeds

9 - 18 x 0.2 - 0.5 cm, strongly revolute at margins; both sides deep green or greyish green. Male cones ovate, tapering at both ends, 22 - 30 x 7.5 - 9 cm, very shortly peduncled; microsporophylls (stamens) oblong-deltoid at base, tapering acuminate at apex. Megasporophylls 15 - 21 cm long, ovules 2 - 4; seeds subglobose, ovoid or globose, 3.5 - 3.7 x 2.8 - 3 cm, yellow or raw sienna in colour.

Phenology: It is learned from the literature that *C. beddomei* bears male cones during November - December and female cones during March - May (Sahni, 1990), but we have observed only female cones (ovules/seeds) in the month of November in Tirumala hills and not male cones.

Distribution: It is endemic to Cuddapah-Tirupati range in the Southern part of Eastern Ghats in Andhra Pradesh. The plant grows in dry deciduous forest on the exposed rocky slopes and in the denuded valleys, between elevations of 300-900 m (Nayar & Sastry, 1987).

Uses: The tender leaves are eaten as vegetables after cooking. The seeds are processed and eaten in mixture with 'Ragi' cereal. The crude flour made out of the pith of this plant is used in large scale for preparing hand made bread (Pal & Banerjee, 1971). The male cones are pruned by the local tribals for its professed medicinal value as a major ingredient in rejuvenating tonics. Further, this plant is horticulturally valued due to the palm-like appearance (Nayar & Sastry, 1987). It was learned from the local people of Tirumala hills that the crude flour made out of the endosperms of the seeds of this plant is used as one of the ingredients in the preparation of Sweet and Dhosa.

Legal status: The plant *C. beddomei* has been included in the Appendix I of CITES. In support to the CITES decision, Government of India has kept this plant species under Negative list of Export, which restricts/bans the trade or export of this plant/plant parts procured from wild sources.

Present status in the wild

The literature survey shows that there has been a continuous change in the status of *C. beddomei* in the wild for the past two decades. This plant was initially considered as a Rare

species (Jain & Sastry, 1980). Later on, this plant was kept under Vulnerable category (Nayar & Sastry, 1987). Recently, this species has been kept under Endangered category and included in the Red list of threatened vascular plant species in India (Rao *et al.*, 2003).

However, after our field survey we are of the opinion that it should be kept under Vulnerable category rather than under Endangered category. The major causes for the decline of this plant in its natural habitat are destruction by forest fire and exploitation by local people for food and professed medicinal values.

Conservation

This plant can be propagated by seeds. The germplasm of this plant has been conserved in some of the gardens across the country. The Andhra Pradesh State Forest Department has taken some steps to conserve this plant in its natural habitat by creating fire-breaking walls and numbering each single plant. Further, it is suggested that the Andhra Pradesh State Forest Department should take necessary steps to create awareness among the common people about this plant and provide its seeds/saplings to the public and traders at a subsidized rate to meet the horticultural needs, so that the wild population could be saved to a certain extent.

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Front view of Cellular Jail

A note on the historic 'Peepal' tree growing in the campus of the Cellular Jail, Port Blair

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The authors recently visited the famous Cellular Jail in Port Blair, South Andaman. As they were working on the family Moraceae for the flora of the Andaman & Nicobar Islands, a very old 'Peepal' tree with broken trunk which grew in the campus of the Cellular Jail drew their immediate attention. It stood near the platform made for 'Light & Sound' programme close by the entrance. It was noted that during the popular 'Light & Sound' programme a note was quoted regarding this 'Peepal' tree that it was a mute witness to the inhuman brutal tortures meted out to the freedom fighters and patriots, and of the untold sufferings and sacrifices of those gallant men who were incarcerated in the Cellular Jail. Further, the tree is directly linked with the several events of our war of independence, as it was known that it was present there even before the construction of Cellular Jail in October 1896. As per Cellular Jail records, too, this tree is aged more than hundred years. Recently, in May 2006 the Centenary celebration of the Jail was held. Thus this historic 'Peepal' tree is not only an eye witness to the construction of the historic Cellular Jail and its centenary celebration but also a mute witness of excessive tortures done by the British rulers to the freedom fighters of India.

On 29th June 1998 due to cyclone and heavy rainfall this tall tree was uprooted and fell on the ground. The Andaman Administration became seriously concerned about it. They consulted various departments including the Botanical Survey of India and after discussions the bigger branches were carefully cut off and the main trunk was lifted by a crane and re-fixed. It was then treated with insecticidal solution and growth hormone. Thirty days after

the treatment the tree sprouted again and presently it is about 6-8 m high.

Rao *et al.* (2001) identified this historic 'Peepal' tree as *Ficus amottiana* (Miq.) Miq. but the present authors have found that it is actually of *F. rumphii* Blume.

The morphological description along with other relevant data are given as follows:

***Ficus rumphii* Blume**, Bijdr. 437. 1825; King in Ann. Roy. Bot. Gard. Calcutta 1(1, incl. Appendix): 54, t. 67B & 84T. 1887-88 et in Hook. f., Fl. Brit. India 5: 512. 1888; C.E. Parkinson, For. Fl. Andaman Is. 248. 1923; B.K. Sinha in Hajra & P.S.N. Rao (eds.), Fl. G. Nicobar Is. 413. 1999. *F. cordifolia* Roxb., Fl. Ind. 3: 548. 1832, non Blume 1825; Wight, Icon. Pl. Ind. Orient. 2(4): 1, t. 640. 1840.

Deciduous trees, 6-8 m high; often epiphytic; bark brownish gray with white spots. Leaves 6-10 x 4.5-7 cm, subcoriaceous, broadly ovate, with a

shortly caudate-acuminate apex, broad and truncate at base, slightly narrowed towards the petiole, entire and undulated at margins, shining glabrous, with 3 distinct and 2 smaller obscure basal nerves; lateral nerves 4-6 pairs; petioles 5-8 cm long, shorter than the lamina; stipules up to 2.5 cm long, ovate-lanceolate. Figs 1-1.5 cm across, globose, sessile, axillary, in pairs, immature ones green with whitish spots, mature ones black. Male flowers few, near the orifice, with solitary anther. Gall and fertile female ones with 3 tepals; style elongate; stigma clavate. Achenes obscurely tuberculate.

The species is common in Andaman & Nicobar Islands and flowers and fruits from September to June.

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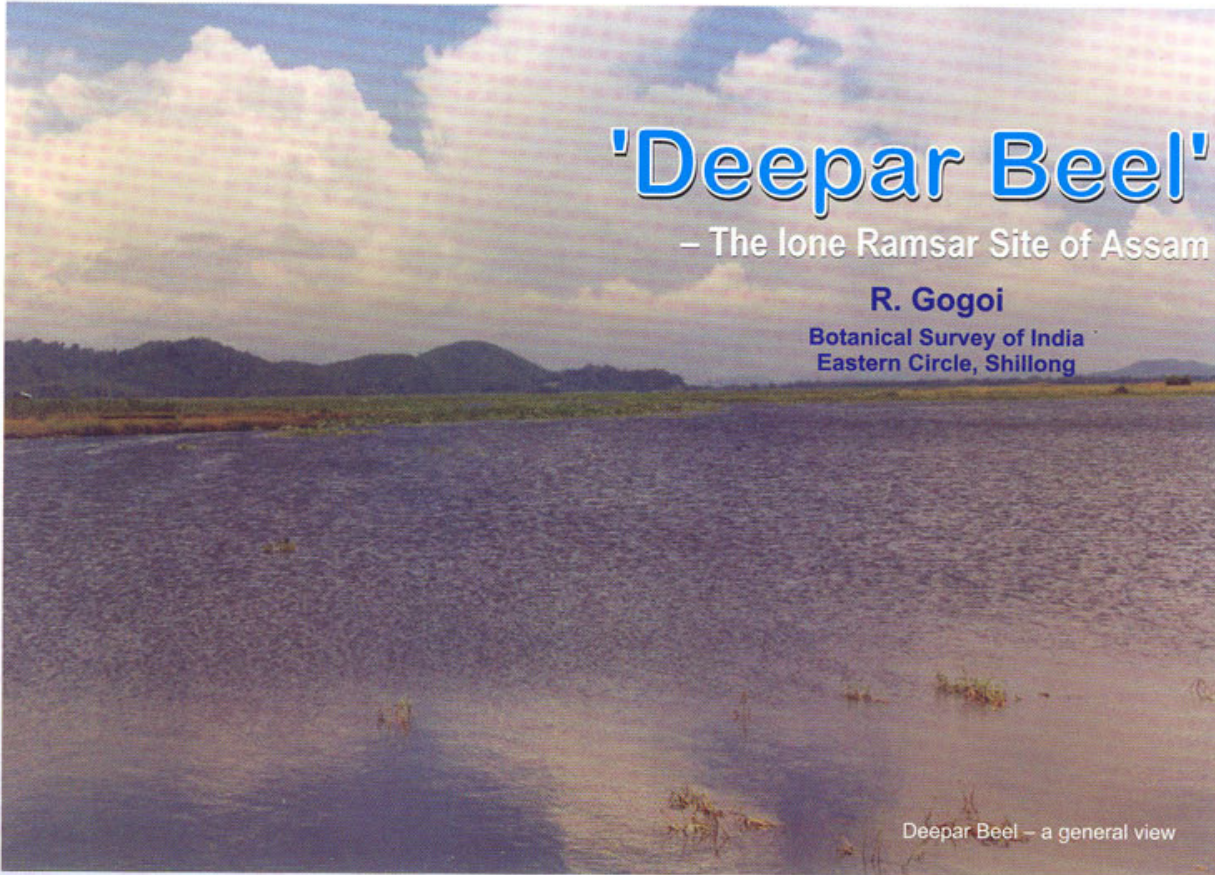
Ficus rumphii Blume inside the Jail
Inset : A twig and syconia of
Ficus rumphii Blume

'Deepar Beel'

– The lone Ramsar Site of Assam

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Deepar Beel – a general view

'Deepar Beel' is a permanent freshwater lake of riverine origin which acts as a storm water storage basin of Guwahati city and is situated 10 km south-west of the city. It extends from 26°03'26"-26°09'26" N and 90°36'39"-90°41'25" E in the south of the mighty Brahmaputra. Deepar Beel is one of the largest of the many such 'beels' in the lower Assam. The beel has an actual perennial water holding area of about 10.1 sq km. However, the total area extends up to 40.1 sq km during flood and its depth increases up to four metres. During the dry season the depth drops to 1 metre. Presently the beel receives water mainly from the stream Pojora of Meghalaya hill and the rivulets Basistha-Bahini in the south and southern part respectively. The beel drains into the Brahmaputra river by river Khonajan in the north and

into the channel of river by river Kalmoni in the west. About half of the beel dries out during the winter months and at this time and the exposed shores are converted into paddy fields to a width of up to 1 km.

On 12th January 1989, Government of Assam has declared the 10.1 sq km area of Deepar Beel as Wildlife sanctuary (Chetri, 1999). About 122 species of seasonal and residential migratory birds visited the beel every year (Saikia & Bhattacharjee, 1989). Hence, Government of Assam has also proposed 4.1 sq km core area of the beel as a Bird sanctuary (Chetri, 1999). The Central Government has nominated the Deepar Beel as the nation's seventeenth important wetland in 1989 (Chetri, 1999) and it was included in the 'Asian Wetland

Directory' (Scott, 1989). Considering the importance of this wetland, Deepar Beel has been declared as Ramsar site, vide Ramsar site no 1207 of 18th August 2002.

Vegetation

Aquatic or hydrophytic vegetation is the most interesting feature of Deepar Beel Wildlife sanctuary. Quite a large area of the sanctuary is a perennial water body where it harbours a good number of aquatic plants (Gogoi & Borthakur, 2002; Gogoi, 2003).

Lemna perpusilla Torr., *Spirodela polyrhiza* (L.) Sch., *Wolffia arrhiza* (L.) Horkel ex Wimm., *Azolla pinnata* R. Br., *Trapa natans* L., *Pistia stratiotes* L., *Ceropteris thalictroides* (L.) Brong. and *Hygroryza aristata* (Retz.) Nees ex Wight & Arn. are some



common free floating macrophytes in the buffer zone of the sanctuary.

Ceratophyllum demersum L. is found to be commonly occurring in the beel which is the most dominating species among the submerged non-anchored hydrophytes during summer along with other species like *Utricularia aurea* Lour., *Potamogeton crispus* L. and *P. octandrus* Poir. The submerged anchored hydrophytes which show profuse growth in summer are *Blyxa aubertii* L.C. Rich., *Hydrilla verticillata* (L.f.) Royle, *Ottelia alismoides* (L.) Pers., *Vallisneria spiralis* L., *Myriophyllum tuberculatum* Roxb. etc. Among anchored floating hydrophytes *Euryale ferox* Salisb. is the most dominant species in the wetland and some other species of this category like *Nymphaea nouchali* Burm.f., *N. pubescens* Willd. and *Nelumbo nucifera* Gaertn. are found to be forming large colonies in the buffer zone of the wetland. *Leersia hexandra* Sw., *Monochoria hastata* (L.) Solms, *Marsilea minuta* L., *Enhydra fluctuans* Lour., *Ipomoea carnea* Jacq., *I. aquatica*

Forssk., *Hygrophila auriculata* (Sch.) Heine, *H. polysperma* (Roxb.) T. Anderson, *Tucium viscidum* Blume, *Paspalum conjugatum* Berg., *Schoenoplectus juncooides* (Roxb.) Palla, *S. mucronatus* (L.) Palla, *Saccharum spontaneum* L., *Phragmites karka* (Retz.) Trin. ex Steud. and *Vetiveria zizanioides* (L.) Nash are some major representative marshy amphibian hydrophytes of Deepar Beel.

Some important tree species of the wetland are *Dillenia indica* L., *Crateva magna* (Lour.) DC., *Ziziphus mauritiana* Lam., *Syzygium cumini* (L.) Skeels, *Barringtonia acutangula* (L.)

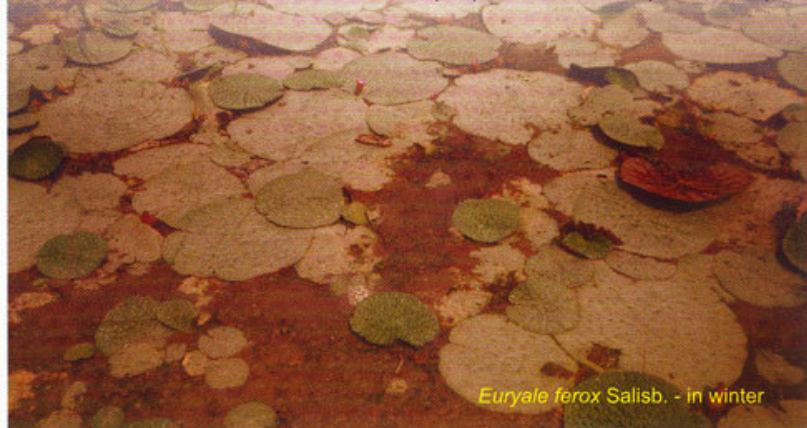
Gaertn., *Cordia dichotoma* Forst. f., *Ehretia acuminata* R. Br. and *Lagerstroemia speciosa* (L.) Pers.

Wildlife of the Area

Being a wetland, Deepar Beel is famous for its rich avian and fish fauna. The beel supports a wide diversity of both resident and migratory waterfowls and this wetland is a paradise for Bird watchers. Some commonly seen avian species are *Leptoptilos javanicus*, *L. dubius*, *Ardea goliath*, *Phalacrocorax niger*, *Ardeola grayii*, *Ixobrychus cinnamomus*, *Dendrocygna javanica*, *D. bicolor* and *Tadorna ferruginea*.

Some common fishes of the rich fish fauna are *Labeo rohita*, *L. ceatetus*, *L. gonius*, *Notopterus chitola*, *N. capirota*, *Channa striatus*, *Opheocephalus gracua*, *Hetropneustes fossilis*, *Wallago attu*, *Anabas testudineus*, *Clarias batrachus*, *Mystus seenghala*, *M. vitatus*, *Kryplopterus biscirrthus*, *Ompole bimaculatus* etc.

Some common mammals of the beel and nearby forests are - fishing cat (*Felis viverrina*), Common Mongoose (*Herpestis edwardsi*) and Indian fox (*Vulpes bengalensis*). Some other animals like Elephant (*Elephes maximaus*) and Leopard



(*Felis bengalensis*) occasionally visit the sanctuary. *Bufo melanostictus* and *Rana cyanophlyctis* are two common amphibians of Deepar Beel.

Conservation Strategies

1. Core area must be protected through prohibition of fishing, cultivation and all other kind of human interference.
2. Educating the local inhabitants about the importance of the beel in their day to day life and the far reaching consequences they may face if the area becomes degraded.
3. Indigenous knowledge system may be utilized for biodiversity conservation strategies.
4. Empowerment of local communities and even joint management policy may be worked out for protection and conservation.
5. NGO's may be given importance for the conservation of the biodiversity of the area by allowing them to play the pivotal role as a link between the Government agencies and people around the beel.

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Euryale ferox Salisb., with other aquatic plants – in summer

Century old treasure in the Central National Herbarium, BSI, Howrah

A sample of electronic restoration of Century old Roxburgh painting made with vegetable dye



Old original painting



Restored painting

ON THE OCCURRENCE OF *PSILOTUM NUDUM* (L.) P. BEAUV. (PSILOTACEAE) IN KOCH BEHAR, WEST BENGAL

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Figs. A-F. Photographs showing *Psilotum nudum* (L.) P. Beauv. growing on the tree trunks of *Polyalthia longifolia* (Sonn.) Thwaites in Narendra Narayan Park, Koch Behar, West Bengal. The trees have been arbitrarily numbered for purpose of their identification.

Psilotum nudum (L.) P. Beauv. (syn. *P. triquetrum* Sw.) was reported to be growing on *Polyalthia longifolia* (Sonn.) Thwaites (Annonaceae) in the main park of Koch Behar, West Bengal first by Biswas in 1956.

Recently in June 2006 a team from ENVIS, Botanical Survey India, Kolkata visited the aforesaid park, now named Narendra Narayan Park, and found that the species is still growing there on the trunks of five very old trees of *P. longifolia*, in association with *Drynaria quercifolia* (L.) J. Sm. (Drynariaceae) and some species of orchids, at heights ranging from 1-6 ft from the ground level. As seen in the photograph, many plants were found to be growing all around the tree trunk in the fourth tree, a few in the first, second, fifth and the sixth tree. In the third tree, however, no plant was seen. The average circumference of the tree trunks at the mean height of 5.6 ft from the ground level was 196 cm.

This species is found throughout India in the hilly regions (Dixit, 1984: 20), but the population is

becoming thin in many areas. Sri P.K. Barman, one of the staff-members of the park, informed the team that the trees of *P. longifolia* are gradually falling down due to their very old age. So, it was felt that the local authorities of Koch Behar should take immediate measures to conserve the plants in the park for *P. nudum* is one of the most primitive members of the living vascular plants.

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Victoria Lindl., the Giant Water Lily in Indian Botanic Garden, Howrah, India

Sheo Kumar & G. S. Giri

**Indian Botanic Garden
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Two species of the genus *Victoria* Lindl. (Family: Nymphaeaceae) namely *V. amazonica* (Poepp.) J.C. Sowerby and *V. cruziana* A.D. Orb. were introduced in the world famous Indian Botanic Garden (IBG), Howrah in 1873 from Brazil and in 1981 from Santa Cruz respectively. At present, these plants are growing luxuriantly in the 6 lakes of IBG and are one of the greatest attractions to the general visitors, botanists and naturalists for their fascinating largest leaves and beautiful flowers.

Among water plants, the *Victoria* bears largest leaves and its canopy coverage is the greatest. That is why it is aptly called the *Giant Water Lily*. First of all this plant was discovered in 1801 in the river Mamore, a tributary of the Amazon by Tadeáš



Haenke, a German (Bohemian) botanist and naturalist. He, however, died without publishing his discovery. Not only this, the plant was also not made public until his death in Philippines during 1817. Later on in 1819, a French physician turned botanist Aime Bonpland along with the German naturalist and adventurer Alexander von Humboldt found the plant near Corrientes, Argentina. Subsequently in 1825, they sent the seeds and full description of the plant to France. The first descriptive account of the fascinating plant was published by Eduard Poepping in 1832 under the name *Euryale amazonica* Poepp. with the perception that it belongs to the genus *Euryale* Salisbury. The German botanist Robert Schomburgk found *Victoria* in the Berbice river in British Guiana in 1836 and the English botanist and horticulturist John Lindley established the genus *Victoria* in 1838 in the honour of Alexandrina Victoria (24th May, 1817 to 22nd January, 1901), the then Queen of the United Kingdom and described the aforementioned Poepping's species with the name *V. regia* Lindl. whose currently accepted name is *V. amazonica*.

Since its discovery up to 1848 several attempts were made to cultivate the plants using various plantation techniques i.e., through transplantation in lakes and streams in Georgetown, British Guiana by Schomburgk, from seeds at Royal Botanic Gardens, Kew by Thomas Bridges and then by rhizomes but none could succeed. Later on, seeds of *Victoria* were sent in a bottle containing freshwater by two English physicians, Rodie and Luckie at Royal Botanic Gardens, Kew where it arrived in February, 1849. The seeds planted in a specially designed and built green house by Joseph Paxton at Duke of Devonshire's estate at Chatsworth, germinated and flowered first on 8th November, 1849 and was presented to the Queen Victoria. After this achievement, seeds were obtained from these plants and were distributed throughout Europe, Asia and America. These plants are now available for botanical use, public and commercial display in different countries/ states/ cities like Australia, Austria, Belgium, China, Colombia, Colorado, Finland, Florida, Georgia, Germany, Illinois, Iowa, Italy,



Victoria cruziana A. D. Orb. In the Indian Botanic Garden

Korea, Louisiana, Missouri, Nebraska, Netherlands, New York, Norway, Ohio, Pennsylvania, Scotland, Sri Lanka, Sweden, United Kingdom and Washington D.C.

The genus *Victoria* is native of South America and distributed in Argentina, Brazil, Colombia, Guiana, Paraguay, Peru and Uruguay. Bigger size plants occur in clear water than those growing in turbid water. The largest *Victoria* was grown and recorded at United States Botanic Garden, Washington D.C. in 1891 under the supervision of George W. Oliver. The spread of the plant was about 14.08 m in diameter and the leaves were up to 2.29 m in diameter.

Plants are annual and green to brownish-greenish, armed with c. 2.5 cm long thorns everywhere except the top surface of the leaves. The light to dark green thorns protects the leaves from herbivorous fishes. The thorns are apparently toxic and are said to be extremely painful if pricked. The stem is rhizomatous, up to 20 cm thick. The peltate leaves are in a rosette, juvenile ones submerged whereas mature ones floating and their ventral surface are marvelled with structural engineering pattern on ribs. Petioles

are very long and their length depends on the depth of the water and spread of the plant. Flowers attain a diameter of 23-40 cm when in full bloom and are with many petals. Numerous seeds are produced. The healthy seeds germinate next year of its formation and grows into a new plant after applying 'nicking' technique i.e. removal of operculum of the seed to facilitate its easy germination.

The leaves are gradually eaten up by insects and after death the plant provides food to the aquatic herbivores, fishes and others. The rhizome and seeds of the plant are edible.

The two species are described as follows:

Victoria amazonica (Poepp.) J.C. Sowerby in Ann. Mag. Nat. Hist. ser. 2, 6: 310. 1850. *Euryale amazonica* Poepp. in Frieries., Notiz. 35: 131. 1832.

Plants brownish-greenish. Leaves large, 1-3 m in diameter, rarely 4 m, orbicular, may bear weight up to 45 kg; rims slightly upturned when young and attains about 5-9 cm in height in adults; surfaces maroon or bronze when they first come out of the water; dorsal

surface brownish-greenish with maturity; ventral surface finally red. Petioles strong, 5-7 m long. Flower buds covered with numerous thorns. Sepals are slightly dark maroon. Flowers usually bloom at night. Petals are white with rounded apices. On second night onwards, they turn to cotton candy (medium) pink to dark ruby red and maroon and pollinated by beetles. Seeds are round, up to 1 cm in diameter, brownish when mature.

This species is the world's largest aquatic plant due to its greatest canopy coverage. It is distributed in Brazil, Colombia, Guiana and Peru and luxuriantly grows in the quiet pools and the inlets of the mighty river Amazon.

Victoria cruziana A.D. Orb. in Ann. Sci. Nat. ser. 2, 13: 57. 1840.



Flower of *Victoria cruziana* A.D. Orb. on 1st day morning



Victoria amazonica (Poepp.) J. C. Sowerby in the Indian Botanic Garden



Flower of *Victoria cruziana* A.D. Orb.
on 1st day evening

Plants green. Leaves large, 1-2.42 m in diameter, orbicular, may bear weight up to 75 kg, thought to be more tolerant to low temperature than *V. amazonica*; rims upturned, ranges from 12-20 cm in height; dorsal surface bright green; ventral surface reddish-purple, particularly the part remaining under water, sometimes covered with fuzz which is lacking in *V. amazonica*; petioles strong, 6-7 m long. Flower buds somewhat pointed, devoid of



Flower of *Victoria cruziana* A.D. Orb.
on 2nd day

thorns on the medium pink sepals. Flowers are with pointed petals, bloom at dusk, remain creamy white on the first night which gradually turn to light pink or delicately flushed pink on the second night and on third night turn to dark pink. First night flowers spread fragrance like pineapple in air in the following afternoon and in the evening pollinated by beetles. Seeds are slightly oval, 9 mm in diameter, greenish, numerous.

This species is distributed in Argentina, Brazil, Paraguay and Uruguay.

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Children weighing about 75 kg sitting on a leaf of *Victoria cruziana* A.D. Orb.

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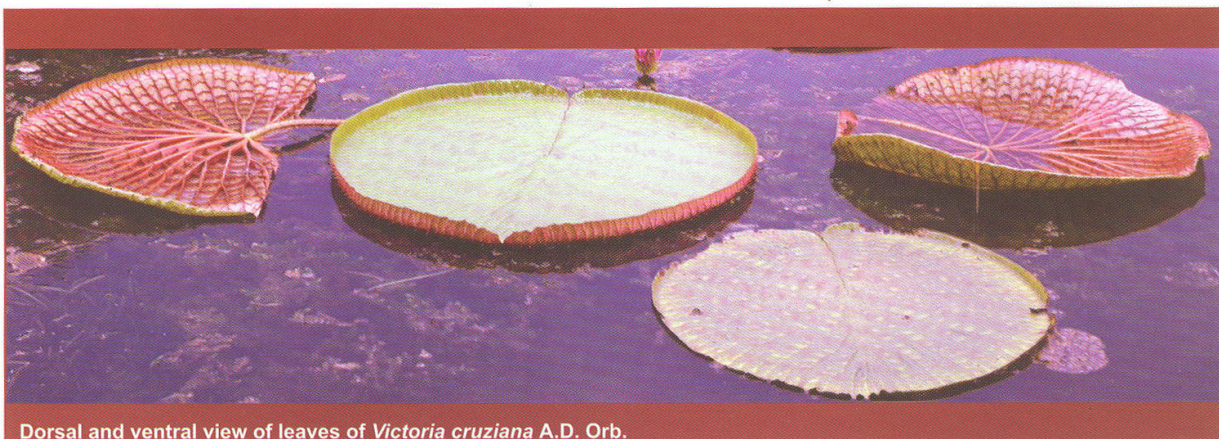
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Dorsal and ventral view of leaves of *Victoria cruziana* A.D. Orb.

Gonatopus boivinii (Decne.) Hook. f. ex Engl.–



An endemic African aroid in Indian Botanic Garden re-discovered after 100 years



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Gonatopus boivinii (Decne.) Hook.f. ex Engl. in the Indian Botanic Garden

Gonatopus boivinii (Decne.) Hook. f. ex Engl. - a species native of tropical East Africa belongs to the family Araceae. All the species under the genus *Gonatopus* are small geophytes excepting *G. boivinii*, which resemble to and often mistaken for *Amorphophallus* and is commonly cultivated and found in private collection. *G. boivinii* is characterized by a swollen articulation (pulvinus) at or near the middle of the petiole. This is because of such unique appearance it is commonly called as "Giraffe's Knees". The species is often grown in the Garden as an ornamental or maintained as a potted house plant both in tropical and temperate areas for its attractive mottled leaves with transversely banded blackish-green stalk possessing a swollen region in the form of a Giraffe's Knee.

This species was introduced in the Indian Botanic Garden, Howrah in the later part of the 19th century from Zanzibar, Africa and had been growing luxuriously in the nurseries during 1890-1896. The species is represented by two sets of specimens, which were collected from the nurseries and deposited at the Central National Herbarium (CAL). One set of collection was made in 1890 (collector unknown), while the other in 1896 by Dr. David Prain. Study

of available records and personal search revealed that the species did not exist either in the nurseries or elsewhere in the Indian Botanic Garden for more than one hundred years.

Surprisingly enough the present authors located this beautiful aroid this year during April under the shade of the trees of *Peltophorum pterocarpum* (DC.) Baker ex K. Heyne near a pit maintained in the garden for preparation of compost in Division no. 22 close to the Pavillion No. 6 A and B. The large population of the species, all in blooming condition during April resemble those of *Amorphophallus*. A short description of this forgotten immigrant is given below:

Annual herb from tuber, tuber depressed globose, 8-15 cm in diameter. Leaf solitary, 60-90 cm long, 3-4 pinnate at maturity, glabrous; leaflets elliptic-ovate or elliptic-lanceolate, 2-5 x 1.5 - 2 cm, apex acuminate, base rounded or cuneate, petiolule short or subsessile; petiole stout with a swollen articulation at the middle, green, transversely banded with blackish-green; in juvenile plant leaf simply pinnate with 3-5 elliptic or suborbicular shortly cuspidate petiolulate leaflets. Peduncles 40-50 cm long, 1-2 from each tuber, occurring with leaf, coloured like petiole. Spathe convolute at base, glabrous, dull green, striate with dark green outside, inner surface pale greenish yellow, tube ca 2.5 cm long, ovoid or subglobose; limb 10-15 x 2.5-4.5 cm, oblong, acuminate into a long subulate point, recurved or revolute. Spadix sessile, basal female part ca 2.5 cm long, male part ca 8.5 cm long, thick, constricted at base. Perianth segments oblong, truncate



Inflorescence of *Gonatopus boivinii* (Decne.) Hook.f. ex Engl.

triangular apex. Male flower: Perianth segments ca 2 mm long, stamens 4, ca 2 mm long, connate into a tube around an abortive ovary, anthers 2-celled. Female flowers: Perianth segments ca 4 mm long, ovary ovoid, ca 2 mm long, narrowed into a ca 2 mm long style, stigma peltate, exerted from perianth, deep green.

Blooming time: April - May

Propagation: The plant is propagated by division of tubers or by seeds.

Cultivation and maintenance: This plant is commonly found in private collections and cultivated in tropical countries as an ornamental, though not very popular due to its short lifetime of vegetative parts. But it can be grown as a houseplant in pots both in warm and cold regions. The soil can be prepared by mixing 2 parts peat soil, 1 part loam and 1 part sand. The pot should be placed in diffuse sunlight or light shade area and be kept moist at all times. It is suggested to use weak fertilizer preferably compost once every two weeks during the growing season. After the growing season the tuber can be lifted and stored like those of *Dahlias*.

THREE INTERESTING PLANT USES FROM JALPAIGURI DISTRICT, WEST BENGAL

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The ENVIS team from Botanical Survey of India, Howrah recently visited in and around Jaldapara Wildlife Sanctuary in connection with the project on ethnobotanical studies.

Three interesting plant uses as told by the Rabha informants, Binod Rabha and Hemal Rabha, are recorded here.

It was told that in the forest one can quench his thirst by drinking water obtained from a plant locally known as 'Panilarang' (*pani* = water; *larang* = climber) which is a species of *Tetrastigma* (Vitaceae). The plants are lianas. They were found to be climbing on tall trees (Fig. 1a) inside the Jaldapara Wildlife Sanctuary, near Kodalbasti. For obtaining water, at first the stem of the plant was completely cut near its base with the help of a sharp kukri at one blow (Fig. 1b) and then it was instantaneously cut again at a distance of about 4-5 feet above the place where it was first cut. The lower end of the piece of the stem that had been removed from the plant was then very quickly placed over the mouth (Fig. 1c). The water (sap) came out from the lower end of the stem at first like running tap water and then continued to drip slowly for sometime. The water was crystal clear, tasteless and without any kind of smell. It was told that the stems might grow to nine inches in diameter and the quantity of water obtained from a fully matured plant could be three glassful. Further, it was known that the plants do not die after they are cut because they continue to

thrive by producing new shoots from the remaining rooted portion of the stem. The stems of the plants were said to have one more use. Four to five feet long pieces of stems are completely cut lengthwise with the help of a kukri into thin strips (Fig. 1d-f). The strips are sun dried and are then used for tying bamboo frameworks of the roofs of thatched huts. The strips serve well for this purpose for six years.

The informants also told that the stems of *Stenochlaena palustris* (Burm.f.) Under. (*Stenochlaenaceae*) (Fig. 1g) are now-a-days collected by some persons coming from outside their area for preparing baskets. They purchase from the local people by paying a price of Rs. 60 per bundle consisting of 100 stems of about 6-7 feet in length. Locally they are also used for tying bamboo frameworks of the roofs of thatched huts. The strips serve well for 10-15 years.



Fig. 1: a-f. *Tetrastigma* sp.; g. *Stenochlaena palustris* (Burm.f.) Under.

'Parashi'-*Cleistanthus collinus* (Roxb.) Benth. & Hook. f.,

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an indigenous insect repellent plant



Cleistanthus collinus (Roxb.) Benth. & Hook. f. belongs to the family Euphorbiaceae. The plant is used as an insect repellent by the tribals and the village people of Purulia and Bankura districts of West Bengal and some places of Orissa and Jharkhand where it is popularly known by the Santali name 'Parashi'.

Etymology

The generic name '*Cleistanthus*' originated from the Greek word '*Kleistos*' means 'closed' and '*anthos*' means 'flower'. The flowers appear or remain partially closed. The specific epithet '*collinus*' means 'pertaining to hills'.

Vernacular names

Parashi (Santali); Garari (Hindi); Karajuri (Bengali); Nilaiappalai, Odaichi (Tamil); Kadishe (Telegu)

Description

A small glabrous tree, usually 5-9 m tall. Leaves 4-9 x 3.5-5.5 cm, orbicular or obovate, entire, retuse or rounded, glaucous beneath; petioles 5-8 mm long. Stipules 2 mm long, ovate. Flowers in small axillary clusters, monoecious; bracts minute, villose; the males in few-flowered clusters, the females usually solitary. Male flowers: calyx segments 5, greenish, 6 mm long; lobes broadly ovate. Petals 5, 3-4 mm, puberulous; disc pulvinate. Stamens 5; filaments connate below in a central column, bearing a pyramidal or 3-lobed pistillode. Female flowers:

calyx and petals as in the male flowers. Ovary broadly ovate, glabrous; disc conical, partly surrounding the ovary; styles 3, each bifid. Capsules obcordate or rounded, 1.4-2.5 cm across, brown, shining, 3-valved, 3-seeded; seeds globose, chestnut-brown.

Flowering time: April - May

Fruiting time: June - August

Distribution

Deccan peninsula northwards up to the Ganges: in rocky places of Karnataka, Andhra Pradesh, Orissa, West Bengal, Jharkhand, Chhattisgarh and Madhya Pradesh.

Propagation

Propagated by seeds. It thrives well on dry rocky places.

Procedure of use as an insect repellent

In Purulia and Bankura districts of

Cleistanthus collinus (Roxb.)
Benth. & Hook.f.

Twigs are inserted in different places in the paddy field

West Bengal, Orissa and Jharkhand, the plant is cut into small pieces with its green leaves and spread out on the paddy fields as an insect repellent. The twigs are also inserted in different places in the paddy fields for repelling the insects. Sometimes the walls of the shed for the cattle are made by the leaves and stem of this plant to protect them against the insects.

Other uses

The root, leaves and bark are used as

fish poison. In Chotanagpur the bark and fruits are considered as a useful application in cutaneous diseases. To cure severe headache, the leaves are steeped in water and then the water is poured on the head and upper part of the body. The root paste is applied to cure boils. The leaves and barks are abortifacient. The stem bark or fruits are crushed in goat's milk. The milk is then taken orally for committing suicide. The active principle in the plant is oduvin (C₂₂H₃₄O₁₂), a yellowish white crystalline glucoside, soluble in alcohol and chloroform; it is painful and slow poison. The stem bark made into paste is applied on the hoof sores of cattle. The wood is used for making house-posts and also can be used as electrical transmission posts.

Selected readings

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Some information about ENVIS Centre

Established	April, 1994.
Subject Area	Floral Diversity.
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Activities of the Centre	The centre has enormous data on many areas and wants to create database and publish the following information. i) Assessment of RET species of different phytogeographical regions of India. ii) Dry & wet coastal ecosystem in India : Vegetation pattern, floristic component, their values in Assessment of Floristic Diversity of Angiosperms in regard to different ecozones in India. iii) Database on indigenous medicinal plants of India and common medicinal plants of West Bengal in regional language. iv) User service will continue.
Future plan	Thrust area of the ENVIS Centre, BSI is the task of disseminating information on Floral Diversity from different eco-regions of India. Entry of data and scanning of photographs and illustrations of the plants included in the Red Data Book of Indian Plants will be continued. Economic and medicinal plants included in red list categories will be given special emphasis. Assessment of plants included in the CITES list will be continued. Preparation of Allergic Pollen Atlas of India with Scanning Electron photographs will also be continued.
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) Rs.804.00 * 3. Red List of Threatened Vascular Plant Species in India. Newsletters : Up to Vol.11. Vol. 12 (in press).



Presentation of Botanical Survey of India in the Evaluation workshop of ENVIS (MoEF) at Shimla : 2006



Experts in the Evaluation Workshop of ENVIS (MoEF) at Shimla : 2006 Dr. D. Bandyopadhyay, Dr. M. P. Nayar, Prof. P. B. Mangla and Dr. J.R.B. Alfred

*DD is to be send in favour of ACCOUNTS OFFICER, P.A.O. (BSI/ZSI) and to be send to the above address of ENVIS Centre