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From Director's Desk

The Botanical Survey of India (BSI) is proud to be celebrating its 125th Anniversary this year. Since its establishment on 13th February 1890, the organisation has been engaged in exploring, identifying and documenting rich plant resources of the country. After the independence, the Government of India reorganised the BSI in 1954, and considerably expanded its activities. At present Botanical Survey of India has pan-Indian presence with 10 regional research centres, 5 units in Kolkata/Howrah, and Botanic Garden of Indian Republic at Noida, including 13 herbaria and 16 gardens, of which 7 are experimental gardens.

The scientific personnel of this organisation through conducting intensive and extensive floristic surveys, collect detailed information on the occurrence, distribution, ecology and economic utility of plants in the country, and publishing the documented plant resources of the country in the form of local (including Protected Areas), district, state and national floras. The organisation plays a pivotal role in developing and maintaining botanical gardens, to conserve the wild plant resources of the country. It also actively involved in documenting the traditional botanical knowledge of various tribal communities in the country. On this historic moment, we remember and salute each and every member of this large family, who has contributed in making Botanical Survey of India what it is today.

Whereas, the ENVIS Centre on Floral Diversity of Botanical Survey of India, established in April, 1994 has been engaged in systematic collection, compilation and dissemination of authentic and valid data (mainly secondary) on "Floral Diversity" through its website (www.bsienvs.nic.in). Newsletter is one of its publications, which publishes articles on rare, medicinal and economic plants of India, interesting distributional plant records from different phytogeographic regions of the country, and issues related to traditional knowledge.

From this issue, two new features, 'Know your Plant' and 'Know your Botanist' are added as additional information to our readers. Like earlier ones, I hope this issue of ENVIS Newsletter will also be well received by its regular readers for its content. I appreciate the efforts of entire team of ENVIS Centre on Floral Diversity in bringing out this informative issue.

(Paramjit Singh)
Director

Botanical Survey of India, Kolkata

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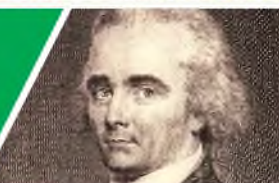
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The Cannon Ball Tree

Botanical Name: *Couroupita guianensis* Aubl.

Family: Lecythidaceae

Common/Vernacular Names: Cannon Ball Tree; Bengali: *Kaman Gola*; Hindi: *Nagalinga*, *Shiv Kamal*, *Tope Gola*; Kannada: *Lingada Mara*; Malayalam: *Nagalinga*; Marathi: *Kailasapati*; Odiya: *Nagakeshar*; Tamil: *Nagalingam*.

General Morphology: A large deciduous tree usually grows to a height of about 35 m. Leaves in clusters at ends of branches, usually obovate in outline, 5–30 cm long and 3–10 cm wide with serrate margins, glabrous above, pubescent on veins beneath. Inflorescences arise from the trunk and main branches, usually unbranched racemes, sometimes branched and paniculate. Flowers 5–6 cm wide, fragrant; petals 6, usually yellow towards apex and pink to dark purple-red towards base inside, except for white bases. Stamens many in 2 rows; one row forms a ring or cup-like structure with white filaments and white or pale yellow anthers around the ovary, the other prolonged on one side like a fringe, white or pale yellow-tinged, and externally pink hood over the pistil. Fruits globose, 12–25 cm, woody, indehiscent, brown; seeds 50–150(– 550), embedded in a six-segmented, fleshy, unpleasant-smelling pulp.

Distribution: It is native to tropical South America; widely

cultivated in gardens of tropical and subtropical regions of the world. In India, it is grown as an ornamental tree in gardens and parks, also planted in temple premises, for its religious significance.

Notes: Flowers are without nectar and are mostly visited by bees in search of pollen; carpenter bees are the chief pollinators. Fruits attain maturity in 12 to 18 months and the cannon ball-like matured fruits crack open upon hitting the ground.



Flowers in close-up (Photo: V. Sampath Kumar)

Religious Significance: In some of the south Indian languages and in Hindi, the flower is known as *Nagalingam*, as the bundle of stamens appears like a hood of a serpent over the gynoecium at the centre of flower that resembles the shape of 'sivalingam' ('nag' means serpent and 'lingam', symbol of Lord Siva). The trees are usually grown in the temple premises, and Hindus worship this tree and its flowers are offered to the god.

Uses: The extracts of various parts of the tree are used in the treatment of hypertension, tumours, pain and inflammation. The plant is also used in the treatment of common cold, stomachache, skin diseases, malaria and toothache.

S. Shalini* & W. Arisdason

Central National Herbarium, Botanical Survey of India, Howrah–711 103, West Bengal.

*E-mail: hai_jane@yahoo.co.in



Tree in full bloom (Photo: V. Sampath Kumar)



Young and mature fruits (Photos: K. Karthigeyan & V. Sampath Kumar)

Arisaema peltatum (Araceae) recollected after type collection from southern Western Ghats, with notes on its taxonomic status

The genus *Arisaema* Mart., commonly called cobra lilies, is the largest genus of aroid family (Araceae) in India with 48 species, 1 subspecies and 12 varieties (Manudev & Nampy, 2014), of which 25 taxa, i.e., 40.98% are endemic. Many of these endemic species are rare and lack proper evidence to have persisting distribution in their confined habitats.

During a floristic exploration in the high ranges of Munnar in Kerala, as part of a taxonomic study on the genus *Arisaema* in India, an interesting specimen was collected. The specimen after the perusal of relevant literature and type specimen was identified as *Arisaema peltatum* C.E.C. Fisch., a species endemic to southern Western Ghats. Fischer (1936) described it based on the collections of Edward Barnes, from the high ranges of Munnar in Kerala. Since then this species has not been relocated from the wild. A brief description based on the present collection and a photograph are provided here for easy identification in the field.

Arisaema peltatum C.E.C. Fisch., Bull. Misc. Inform. Kew 1936: 277. 1936; Chatterjee, Bull. Bot. Soc. Bengal 8: 130. 1955.

Dioecious, perennial herb, to 65 cm high. Corms globose, stoloniferous. Leaf solitary; petiole light green, mottled with brownish streaks; leaflets 5–10, radiatisect, oblong-ob lanceolate, strongly undulate at margins, darker above, glaucous or whitish beneath. Spadix dioecious, not exceeding the height of the leaf. Spathe-tube cylindrical towards base, funnel-shaped distally, purple to brownish towards base, greenish distally with white bands over the veins; limb ovate-lanceolate, yellowish green with hyaline to white stripes, narrowly acuminate at apex, tapering into a slender tail, arching forward and upcurved with erect tip or often drooping. Female spadix sessile, cylindrical with a narrow fertile region, followed by neuters; appendix reaching the mouth of the tube or just exceeding, blunt at apex, green to light green, purplish below; neuters subulate, many, scattered along c. 4 cm at the base of appendix; pistils compactly arranged, subglobose, green; style columnar, 1/3 to 1/4 as long as the ovary; stigma peltate, minutely papillose. Male spadix not exceeding the tube or just reaching the mouth; appendix sessile, slightly thickened at base, flowers scattered over 2–3 cm along the spadix, consisting 2 or 8, shortly sessile, purplish anthers opening by apical pores; neuters not seen. Fruits not seen.

Habitat: Grasslands and shola forests, above 1200 m elevation.

Fl. & Fr.: April–July.

Specimens examined: India: Kerala, Idukki district, Munnar–Poopara road, 23.05.2011, K.M. Manudev & Santhosh Nampy 4432 (CALI); Naimakad gap, 13.04.2013, K.M. Manudev & Santhosh Nampy 135205 (CALI).

Distribution: Endemic to southern Western Ghats.

Notes: *Arisaema peltatum* belongs to the section *Sinarisaema* Nakai, characterised by radiate leaflets, flagellate-caudate limb and rounded, clavate spadix appendix, often with neuters at base. Gusman & Gusman (2006) and Govaerts & al. (2014) treated *A. peltatum* as a synonym of *A. leschenaultii* Blume, along with a few other species from southern India and Sri Lanka. However, this species is quite distinct and can be distinguished from the latter by its sessile, narrow leaflets with strong wavy margins and glaucous underneath; hyaline to white-striped, yellowish-green limb tapering into a slender tail and sessile, slender, spadix appendix with neuters along half the length.

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K.M. Manudev¹ & Santhosh Nampy^{2*}

¹Department of Botany, St. Joseph's College, Devagiri, Kozhikode – 673 008, Kerala.

²Department of Botany, University of Calicut, Thenhipalam, Malappuram – 673 635, Kerala.

*E-mail: santhoshnampy5@gmail.com



Arisaema peltatum

Cheirostylis griffithii (Orchidaceae) – A new record for Mizoram

During a floristic exploration in Murlen National Park, Mizoram in February 2014, one of us (RK) collected *Cheirostylis griffithii* Lindl. Perusal of literature revealed that this species was earlier known from Arunachal Pradesh, Meghalaya, Nagaland, Sikkim, Uttarakhand and West Bengal.

Cheirostylis griffithii is usually a terrestrial herb, to 20 cm high with creeping rhizomes. Flowers 1–3, in terminal racemes; sepals connate up to middle forming a sepaline tube; labellum or lip 3-lobed; column with 2 stelidia and 2 rostellar arms; anther with 2 sectile pollinia, attached with tegula having viscidia at distal end. The species can be distinguished from other Indian species of *Cheirostylis* by its moderately large flowers with 1.4–2.3 cm long labellum, deeply fimbriate-lacinate epichile margin, hypochile with 2 parallel rows of short calli inside and very long pollinarium (c. 9 mm).

The species is found growing on forest floor rich in humus or in shades at forest margins, sometimes near the streams, rarely on moss-covered tree trunk and also found on rock gravels and dry soil at elevations between 500 and 1600 m.

The collections from Mizoram (*Ramesh Kumar & Party* 128729) have been deposited at the herbarium of Eastern Regional Centre, Botanical Survey of India, Shillong (ASSAM). Though the species occurs in seven states (including Mizoram) of India, it is very poorly represented in the Indian herbaria.



Cheirostylis griffithii: Habit; inset: Flowers (side view)

Ramesh Kumar¹, Avishek Bhattacharjee^{2*}, S.K. Singh¹ & Sachin Sharma¹

¹Eastern Regional Centre, Botanical Survey of India, Shillong – 793 003, Meghalaya.

²Central National Herbarium, Botanical Survey of India, Howrah – 711 103, West Bengal.

*E-mail: avibsi@rediffmail.com

Traditional uses and marketing of crude oleoresin (*Jhuna*) of *Shorea robusta* (Dipterocarpaceae) by tribes in Odisha

It was observed that some women of Kondh tribe in Odisha were selling brownish to whitish shining crude resin in the local or weekly markets. The crude resin is known as *Jhuna*, *Jhunda* or *Ral* in local dialect. Later, it was learnt that this resin is collected from the trunk of *Shorea robusta* C.F. Gaertn., which is locally known as *Sad*, *Rengal*, *Sal*, *Sargi*, *Sarjam* or *Sarjom*. The authors observed that the resin is harvested from a few rectangular cuts (about 15 × 20 cm) made by prying off the outer bark on the trunks of sal trees. The resin accumulates either at the bottom of the rectangular cut or on the surface of trunk. The tribal people collect the resin with the help of a knife or axe. The dried resin pieces are graded according to size and colour and are sold @ ₹ 10/- per leaf-bowl containing 18–20 pieces, weighing 200 to 250 gm.

The resin is mostly used as incense (*Dhuna*) during worship or other religious or traditional rituals in the tribal areas of Odisha. It is also burnt to repel mosquitoes and other flies and a charcoal paste prepared after burning the resin is applied as *kajal*.

H. Singh*, P.K. Baske, R. Saravanan & P.A. Dhole

Central Botanical Laboratory, Botanical Survey of India, Howrah – 711 103, West Bengal.

*E-mail: harish_bsi@yahoo.co.in



a. Rectangular cut made by prying off the outer bark of the tree trunk for harvesting resin; b. Resin oozing out from a rectangular cut made on the tree trunk; c. Tribal people collecting resin in Dudhapasi forest, Deogarh district; d. Crude resin immediately after collection; e. Tribal women selling graded resin in market at Deogarh

Report on Intensive National Level Capacity

In continuation of 125th Anniversary of Botanical Survey of India, a eight-day National Level Capacity Building Training Course in Plant Taxonomy was jointly organised by the T.N.B. College, Bhagalpur and University Department of Botany, T.M. Bhagalpur University, Bhagalpur in collaboration with Botanical Survey of India (BSI) and ENVIS Centre on Floral Diversity, Howrah at the Department of Botany, T.N.B. College, Bhagalpur, from 20th to 27th February, 2015. The training was the first of its kind organised at Bhagalpur. There were 60 participants, consisting Under/Post Graduate Students, Research Scholars and Assistant/Associate Professors from the states of Bihar, Assam, Jharkhand, Nagaland, Odisha, Uttar Pradesh and West Bengal. Scientists and other scientific staff-members of BSI and a few Professors from T.M. Bhagalpur University, Bhagalpur and Shivaji University, Kolhapur, Maharashtra served as resource persons.

Dr. Paramjit Singh, Director, BSI was the Chief Guest, Prof. H.K. Chourasia, T.N.B. College, Bhagalpur was the Organising Secretary and Dr. P. Lakshminarasimhan, Scientist 'E' & HoO, Central National Herbarium, BSI, Howrah was the Convener of the training course. A series of lectures were delivered by the resource persons on collection, preservation, identification, classification and conservation of various plant groups such as bryophytes, ferns, orchids, grasses, sedges, bamboos, and also micro- and macro-fungi, lichens and algae. Besides, various techniques related to collection, preservation and identification of each plant group were practically

demonstrated, and field tours were conducted to Mandar Hill, Banka Forest Division, Banka. Lectures were also delivered on monographs and revisions, plant names and typification, application of palynology in taxonomy, conservation of threatened plants through botanical gardens and tissue culture techniques, method of preparing project reports in taxonomy at under/post graduate levels, and Convention on Biological Diversity.

The training course was ended with a valedictory session on 27th February, 2015. Professors R.S. Dubey, Vice-Chancellor, A.K. Roy, Pro Vice-Chancellor and S.K. Varma, former Head, University Department of Botany, T.M. Bhagalpur University, Bhagalpur and Professors D.N. Jha and N.K. Sah, T.N.B. College, Bhagalpur, Dr. P. Lakshminarasimhan and Prof. H.K. Chourasia were the delegates for the valedictory session. Three participants from different academic status shared their feedback orally on the training course, and also received a very positive written feedback from all other participants. Certificates were distributed to all the participants. Vote of thanks was given by Dr. P. Lakshminarasimhan and Prof. H.K. Chourasia at the end of the session.

W. Arisdason* & P. Lakshminarasimhan

Central National Herbarium, Botanical Survey of India, Howrah – 711 103, West Bengal.

*E-mail: dasonaris@yahoo.co.in



Building Training Course in Plant Taxonomy



Panamkutty – A traditional water harvesting system in Wayanad district, Kerala



Caryota urens: a. Habit; b. Inflorescence; c. Stem; d. Panamkutty

evergreen forests of Wayanad district as well as in the farmyards and sacred groves of the area. Panamkutty is usually made in the valleys of hills and in the vicinity of natural springs where the mature hollowed stem of the *Pana* will be plunged deep into the surface of the area selected, so that water inside the stem will not be polluted.

Preparation of Panamkutty is a laborious task as it involves the removal of the entire pith of the mature stem of the palm, which is then plunged deep into the marshy area selected by applying great pressure. The water that oozes at the bottom gets collected in the central hollow portion of this palm stem and can be collected in hand bowls as and when required. Panamkutty has much importance in the rituals of tribal communities. Only the *Moopan* (head of the clan) is allowed to collect water from the Panamkutty on such occasions and the water is taken to the place of the ritual in a procession. Persons with infectious diseases and ladies in their menstrual period are not allowed to collect water from Panamkutty. This water harvesting structure is considered a very highly hygienic place of great sanctity by all local tribal communities even though they have other natural waterbodies such as streams and rivers. Panamkutty could be treated as an ecological indicator as it shows the abundance of surface water and an elevated water table in areas of its construction. This could withstand dry climatic conditions and will not dry up even during severe summer. The life span of a Panamkutty is expected to be 40–60 years depending upon the maturity of the palm used. The strain involved in water collection from Panamkutty is very little and little children, ladies, or even old people could easily collect water from these structures. Panamkutty is of immense value during the present times in view of the changes in climate and irregular rainfall pattern. Necessary efforts are needed to protect these structures as these are axioms of traditional wisdom.

K.A. Sujana¹ & Joseph John²

¹Central Botanical Laboratory, Botanical Survey of India, Howrah – 711 103, West Bengal.

²M.S. Swaminathan Research Foundation, Community Agrobiodiversity Centre, Puthoorvayal, Wayanad – 673 577, Kerala.

*E-mail: sujanakole@gmail.com

Prerequisite for conservation of threatened species of *Crinum* (Amaryllidaceae) from Peninsular India

Crinum is one of the largest genera in the family Amaryllidaceae, which consists of perennial bulbous herbs, represented by 113 species, 2 subspecies and 4 varieties in the world (Govaerts, 2014). The genus is mainly pantropical in distribution but its maximum diversity is restricted in the Old World tropics. *Crinums* are known for their large, beautiful and elegant flowers with pleasant odour. *Crinum asiaticum* L. and *C. latifolium* L. are commonly grown in gardens for their beautiful foliage and pure white to pink-tinged large elegant flowers. The bulbs contain an important alkaloid 'Galantamine' useful in treating symptoms in patients suffering with Alzheimer's disease (Jagtap & al., 2014). The genus is also botanically unique because the chlorophyllous endosperm shows continuous growth. Thus the genus is important for its phytochemicals, botanical and ornamental values.

In India, *Crinum* is represented by 15 species, of which 4 are endemic to Western Ghats, viz. *C. brachynema* Herb., *C. malabaricum* Lekhak & S.R. Yadav, *C. wattii* Baker, *C. woodrowii* Baker ex W. Watson. *Crinum brachynema* and *C. woodrowii* are critically endangered species, and are strictly confined to edges of lateritic plateaus and in semi-evergreen forests on hillslopes of Mahabaleshwar and adjoining areas of Satara district, Maharashtra (Yadav, 1997; Gaikwad & Yadav, 2004). The populations of these species are dwindling day by day due to habitat encroachment and various other anthropogenic activities. Furthermore, the moth caterpillars feed on the flowers and fruits along with the scapes and leaves (Punekar & al., 2004). These species need necessary conservation efforts for their survival.

Crinum brachynema was described by Herbert (1842) from Mahabaleshwar (Kate's Point) in Satara district of Maharashtra. This endemic and critically threatened species is known only from its type locality, which covers about 2 km² area. It is characterised by its fragrant night-blooming flowers with lanceolate corolla lobes, small stamens, short filaments and inserted style. The plant flowers after pre-monsoon showers by the end of May. The plant with large, showy and fragrant flowers are attractive, and can be introduced into gardens as an ornamental. Further, this species requires effective conservation measures, such as micropropagation, reintroduction, and protection of its natural populations.

Crinum malabaricum is a recently described species, so far known only from a fresh water stream bed at Periya region in Kasaragod district of Kerala. The species is represented by a population of about 1000 bulbs, and restricted to about 0.5 km²

area. It grows in tufts on gravelly beds of seasonal stream and flowers and fruits during July–October. The plant parts above ground dries off during November–December, as the stream dries and plants remain dormant throughout the summer and sprout with the onset of monsoon. The ribbon-shaped new leaves attain a remarkable length of 3.65–4.57 m in one month, reported to be the longest leaves in the genus.

Crinum woodrowii is sporadically distributed in the main ranges of northern Western Ghats and good populations are found on hillslopes around Mahabaleshwar and Khandala range. The plant has glaucous leaves and fragrant white flowers, and grows on hillslopes and blooms in night. Flowering begins after pre-monsoon showers by the end of May. The bulbs are very large and are sold in Mahabaleshwar market. However, now the sale of such bulbs in Mahabaleshwar market has been banned by forest department, which has helped to check the exploitation of *C. brachynema* and *C. woodrowii* from natural habitats.

Department of Botany, Shivaji University, Kolhapur had taken initiatives for the conservation of *Crinum* species in India. Survey and documentation of the range of distribution of the



Crinum brachynema: a. Habit; b. Fruits by artificial cross pollination; c. Seeds

species has been undertaken. In 2012, about 20 bulbs of *C. brachynema* were collected from natural habitat and are maintained in the Conservatory of Bulbous, Tuberos and Rhizomatous Plants at Botanical Garden, Shivaji University. All the plants are surviving and flowering in garden. A total of 392 seeds were obtained by artificial cross pollination and all the seedlings raised from seeds are grown in garden. Similarly, bulbs of *C. woodrowii* were collected from Satara, Pune and Phonda Ghat (Kolhapur), and are growing well in botanical garden. A total of 163 seeds were obtained by cross pollination and seedlings are raised in the university botanical garden. Some hybrids are obtained by interspecific hybridization, viz. *C. asiaticum* var. *procerum* (Carey ex Herb.) Baker x *C. woodrowii*, *C. viviparum* (Lam.) R. Ansari & V.J. Nair x *C. woodrowii*, *C. brachynema* x *C. woodrowii*, *C. latifolium* L. x *C. woodrowii*, *C. woodrowii* x *C. asiaticum* var. *procerum*, *C. woodrowii* x *C. brachynema*. *Crinum woodrowii* has given good results as a male parent. *Crinum malabaricum* collected from its type locality is reintroduced in other similar localities (Achirne, Pawas, on the way of Pawas, Maharashtra), and is growing well in streams near Achirne and flowered for last two years.

Crinum brachynema, *C. malabaricum* and *C. woodrowii* are the threatened species of *Crinum* from Peninsular India, which need conservation efforts, such as mass propagation, reintroduction into natural habitats and cultivation in public, institutional and botanical gardens. Perhaps *in situ* conservation may not be possible because of their occurrence in very narrow areas in private estates. Therefore *ex situ* conservation of these species seems to be reliable methods for their conservation.

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V.S. Patil*, A.A. Adsul, A.R. Gholave, S.S. Kambale, M.M. Lekhak & S.R. Yadav

Department of Botany, Taxonomy Laboratory, Shivaji University, Kolhapur – 416 004, Maharashtra.

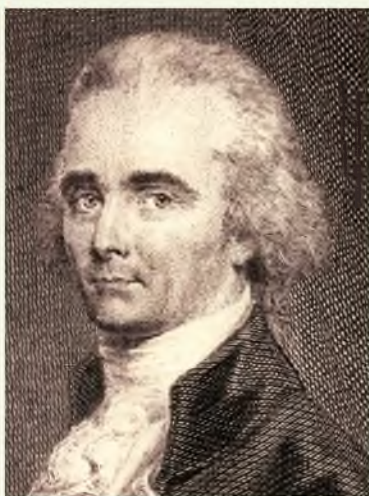
*E-mail: pvaishali1991@gmail.com



Crinum malabaricum: a, b & c. Leaves; d. Inflorescences; e. Flower; f. Fruits

Crinum woodrowii: a. A population on a hillslope; b. An individual plant; c. Inflorescence; d. Fruits and seeds

William Roxburgh: The Father of Indian Botany



William Roxburgh (1751–1815), a Scottish botanist and physician, was born on 29 June 1751 at Underwood, Ayrshire, UK. He studied medicine and botany at the University of Edinburgh. Roxburgh joined the Madras Medical Service as an Assistant Surgeon in 1776 and became a Surgeon in 1780. The East India Company recognised his botanical knowledge, and appointed him as the Superintendent of Samalkot Botanic Garden (at Samalkota, near Kakinada in Andhra Pradesh) in 1781. Subsequently, he was appointed as the first salaried Superintendent of the Calcutta Botanic Garden in 1793, and he continued in the post till 1814. Roxburgh introduced many economically important plant species, namely, Mahogany, Tea, Coffee, Rubber, Indigo, Cinchona, Cinnamon, Cardamom, Teak and established the herbarium in the Garden.

His important publications are “*Plants of the Coast of Coromandel*” in three large folio volumes (1795–1820), “*Hortus Bengalensis*” (1814), and “*Flora Indica*” (1820–1832). He left behind a large collection of 2595 life-size coloured drawings of plant species indigenous to India which was made by the local artists using natural dyes. His drawings are now housed at Central National Herbarium (CAL), The Natural History Museum, London (BM) and

Royal Botanic Gardens, Kew (K). According to “The International Plant Names Index” (www.ipni.org) database there are 426 records of plant names (about 410 species) belonging to 100 different families, and a generic name, *Roxburghia* W. Jones ex Roxb., have been named in honour of William Roxburgh.

Roxburgh laid the foundation of taxonomy in India and established the Calcutta herbarium and hence he is considered to be the ‘**Father of Indian Botany**’. He died on 10 April 1815 in Edinburgh, at the age of 63, due to ill-health.

W. Arisdason* & P. Lakshminarasimhan

Central National Herbarium, Botanical Survey of India, Howrah – 711 103, West Bengal.

*E-mail: dasonaris@yahoo.co.in

Status and distribution of *Panax bipinnatifidus* (Araliaceae) in Mayudia area of Lower Dibang Valley district, Arunachal Pradesh

Panax bipinnatifidus Seem. is represented by var. *bipinnatifidus* and var. *angustifolius* (Burkill) J. Wen. The typical variety is distributed in India, China, Myanmar, Nepal and Thailand. In India, it is found in Arunachal Pradesh, Sikkim and West Bengal (Darjeeling), and has been over-exploited for its high demand in tribal medicine and thus there is a drastic decline in population. The decline in population is also due to various anthropogenic activities, such as random collection of its rhizome, deforestation, road construction and sometimes natural calamities such as massive landslides and forest fire also cause permanent loss of several populations of this taxon.

The forests of Lower Dibang Valley district of Arunachal Pradesh is less affected from human interferences due to its remoteness. During field surveys in the district in 2010 (July–August) the first author found them in 8 small and scattered patches with about 30 plants in total in Mayudia and its surroundings. However, during the second visit to the same area in 2012 (July–August), only 6 plants in 2 locations in the entire area could be seen. The reduction in population in the Mayudia area was mainly due to grazing and trampling by wild and domesticated animals. It is apprehended that the species may not be found in near future in Mayudia and its vicinity, if effective conservation measures are not taken immediately. The Department of Environment and Forest, Government of Arunachal Pradesh should take initiative to locate and protect the remaining populations in Mayudia area. Initiative to conserve the species by *ex situ* methods and its re-introduction in Tiwari Gaon-Mayudia area as well as in other parts of the state will be very effective to conserve this highly threatened variety of Indian *Panax*.

Avishek Bhattacharjee* & P. Lakshminarasimhan

Central National Herbarium, Botanical Survey of India, Howrah – 711 103, West Bengal.

*E-mail: avibsi@rediffmail.com



a. Inflorescence; b. Plant with infructescence



Celebration of 125th Anniversary of Botanical Survey of India held at Asutosh Birth Centenary Hall, Indian Museum, Kolkata, on 13th and 14th February 2015

ENVISCENTRE

Established	: April, 1994	Subject Area	: Floral Diversity
Contact Person	: Dr. V. Sampath Kumar	Phone	: (033) 2668 0667
Address	: Scientist 'D', CNII & Scientist-in-Charge ENVIS Centre, Botanical Survey of India Central National Herbarium P.O. Botanic Garden, Howrah - 711 103	Fax	: (033) 2668 6226
		E-mail	: envis@cal2.vsnl.net.in ; bsi@envis.nic.in
		Website	: http://www.bsienvis.nic.in

Activities of the Centre: The Botanical Survey of India having involved in exploration activity has been collecting diverse data pertaining to floral diversity of the country and its ENVIS Centre proposes to disseminate this information by building databases on various scientific themes such as status of plant diversity in Indian States and Union Territories, Biodiversity Hotspots, distribution of endemic and threatened plants, CITES, interesting plants, carnivorous plants, invasive alien species, wetlands, mangroves, and traditional/ethnobotanical knowledge. 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

I. 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 Abstracts of Papers on Flora of different States and Union Territories (West Bengal I & II, North East India – I, Andaman and Nicobar Islands, Maharashtra, Kerala, Tamil Nadu, Karnataka and Goa)

II. Newsletters: Up to Vol. 20(1), 2015