


**From Director's Desk**

Botanical Survey of India established in 1890 serves the nation by providing scientific basis for conservation and sustainable use of plant diversity through survey, documentation, taxonomic research and environmental awareness. The ENVIS Centre on Floral Diversity, established 17 years ago in Botanical Survey of India has rendered service in dissemination of available information on wild, naturalised and introduced plants of the country. The Centre has been publishing highlights of the results of various research programmes of the Survey and other interesting observations in the ENVIS Newsletter twice a year.

Continuing the tradition, this issue also includes articles pertaining to diversity, economic importance and conservation. The articles on conservation of *Podophyllum aurantiacaule* in Arunachal Pradesh and 'Noni' trees (*Morinda citrifolia*) in West Bengal will certainly create awareness among the people to conserve these species. The article on *Kerriodoxa elegans*, the palm of Thailand, introduced in AJC Bose Indian Botanic Garden in 1997, reports the fruit setting in the garden for the first time. There are articles on cultivation of 'Bengal Coffee' and importance of an exotic arboreal legume species, *Piscidia piscipula* found in AJC Bose Indian Botanic Garden, Howrah. Observations on lac insect infection of *Samanea saman* (Rain Tree) will be useful in saving these trees. This issue also includes articles on medicinal and economic uses of some plant species.

I hope that the efforts of the entire team of ENVIS Centre to bring together this invaluable information will be appreciated by all its readers.

(Paramjit Singh)  
Director

Botanical Survey of India

**ENVIS CENTRE ON FLORAL DIVERSITY**

**United Nations Decade on Biodiversity**


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P. Venu

P. Lakshminarasimban

S. Bandyopadhyay

T.K. Paul

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## *Chlorophytum arundinaceum* (Asparagaceae) leaves used as vegetable in Angul district, Odisha

The tender leaves of *Chlorophytum arundinaceum* Baker are sold in the weekly markets of Boinda and Pallahara in Angul district, Odisha as a vegetable. The leaves are locally known as *Nepayee* or *Musali*. The common people, as well as the tribals such as Kandh, Gond, Kharia, Suda, Chasa, Kisan, Dehuri, Shabar, Juang and Santal collect the leaves from Ghat Tentuli, Majihikholi and Samala Gudapada forest areas of the district. They tie them into bundles weighing 200–300 gm and sell them at ₹ 3–5 per bundle during June–July.

About 200 gm of tender leaves are at first washed and cut into pieces. These pieces are then mixed with about 200 gm of cooked *Moong dal* [seeds of *Vigna radiata* (L.) R. Wilczek] and boiled for another 10–15 minutes in low flame. Finally, it is fried in mustard oil with a mixture of 5 spices [seeds of fenugreek (*Methi*), fennel (*Saunf*), cumin (*Zeera*), garlic (*Lahsun*), ginger (*Adarak*) and chilli (*Mirch*)] which is collectively known in Angul district as *Futano* and served with rice. The preparation tastes like mutton.

Harish Singh & G. Krishna  
Central Botanical Laboratory  
Botanical Survey of India  
Howrah 711103



Bundles of *Chlorophytum arundinaceum* in a local market; Inset: A plant with flowers

## *Coffea bengalensis* (Rubiaceae) in AJC Bose Indian Botanic Garden, Howrah

The plants of *Coffea bengalensis* B. Heyne ex Schult. [synonym: *Psilanthus bengalensis* (B. Heyne ex Schult.) J.-F. Leroy] flower profusely in the AJC Bose Indian Botanic Garden of Botanical Survey of India at Howrah in the winter and the flowers have jasmine-like fragrance. The species is commonly known as *Bengal Coffee*.

This wild species of coffee is cultivated in the garden for its fragrant flowers and for making hedges. The germplasm can be used in commercial breeding programmes with economically important cultivated coffee species.

H.S. Mahapatra, S.S. Hameed & P.V. Sreekumar  
AJC Bose Indian Botanic Garden  
Botanical Survey of India  
Howrah 711103



*Coffea bengalensis*; Inset: Flowers



## Trees of *Samanea saman* (Leguminosae: Mimosoideae) dying in and around Kolkata and Howrah

Recently Sankar Das of Tamluk, Bhupatinagar Thana, East Midnapur and Taju Seth of Kamdevpur, Sankrail Thana, Manikpur Post Office, Howrah came to the AIC Bose Indian Botanic Garden, Howrah for seeking permission from the garden authorities for collecting leaves and young shoots of *Samanea saman* (Jacq.) Merr. On enquiry by one of the authors (KLM), they told that quite a few trees of *S. saman* have died in the AJCBIBG due to infection by lac insects – *Laccifer lacca* (Kerr). They called the lac insect as *Cancer Ponka* (*Ponka* in Bengali means insect). According to them if they are allowed to trim the lac insect infected leaves and small branches then they will be able to extract the lac, the resinous substance secreted as a protective covering by the lac insects. Depending on mild to heavy infection they may be able to collect



Trees of *Samanea saman* which have died in the AJCBIBG because of infection by lac insects

4–10 kg of lac from each tree and if they sell the lac in the market they are likely to get a good amount of money (price not disclosed).

Scrutiny of literature reveals that infection of the trees of *S. saman* by lac insects in AJCBIBG and death of plants in and around Calcutta was first reported nearly 50 years ago.<sup>1</sup> However, in that report only comparison was made between the leaves from the normal and infected trees. The infected leaves were found to have many more leaflets than in the normal ones and the leaflets were

ovate instead of broadly to very broadly ovate.

Sankar Das and Taju Seth also informed that if trimming is done for two consecutive years the trees will not die. If their claim is found to be correct then these majestic trees can be saved from untimely death. The authors observed that the lac insects cannot infect the trees of *S. saman* cultivated by the villagers near their houses as the trees are regularly trimmed for obtaining firewood. Sankar Das and Taju Seth also told that the lac insects spread from the infected tree to the nearby trees of *S. saman* very quickly. Their observations seem to be correct because we have seen that in many places in and around Kolkata and Howrah, including the AJCBIBG, many trees growing nearby have died together.



Branchlets with lac insect infection



Lac insect infection (enlarged view)

### Reference

1. Sen, J. & S.K. Basu. 1963. Varied leaf shape of infected plants of *Samanea saman* (Jacq.) Merr. *Nature* 198: 103.

K.L. Maity, S. Biswa & S. Bandyopadhyay  
Central National Herbarium  
Botanical Survey of India, Howrah 711103



## *Podophyllum aurantiocaule* (Podophyllaceae) needs to be conserved in Arunachal Pradesh

In Gardeners' Chronicle (3<sup>rd</sup> series) 96: 387. Dec. 1<sup>st</sup> 1934 a photograph (fig. 153, labeled as '*Podophyllum versipelle*') of *Podophyllum aurantiocaule* Hand.-Mazz. (synonym: *Podophyllum sikkimense* R.Chatterjee & Mukerjee) was reproduced from Kingdon Ward's original glass plate drawing based on a collection from Delei Valley, Lohit district, Arunachal Pradesh (*pers. comm.*, Julian M.H. Shaw, Royal Horticultural Society, Nottingham, England). Later, this species has been collected from few more localities in Arunachal Pradesh. A.S. Rao collected it from Kameng district during 1956-57 and B. Balodi from Jasep, Lohit district in 2003. One of us (MKP) collected this species from Dibang Valley district in 1998, 2000 & 2002 and from Upper Siang district in 2009 & 2010 and observed that the species is surviving only in isolated pockets. Furthermore, it has been observed that the habitat of *P. aurantiocaule* in some areas of Arunachal Pradesh is gradually shrinking due to anthropogenic pressure like construction of roads, clearing of forests for cultivation and occasional burning of forests.

The Idu tribe in Dibang valley refer this species as *Aukapo* and they know it well as this has caused death of their cattle and pigs when fed with its foliage and stem. This species needs to be conserved in Arunachal Pradesh as it is under anthropogenic pressure and in future might serve as a substitute of the medicinally important plant *P. hexandrum* Royle (synonym: *Podophyllum emodi* Wall. ex Royle) because it has some identical chemical constituents, including Podophyllotoxin<sup>1</sup> which is used for controlling some forms of cancer<sup>2</sup>. *P. hexandrum* is also used as purgative, hepatic stimulant, in the treatment of *Ascaris* infection, in allergic and inflammatory conditions of the skin, in the treatment of soft venereal and other warts<sup>3</sup>.



*Podophyllum aurantiocaule*; Inset : Fruits

The pharmaceutical companies collect the rhizomes of *P. hexandrum* for a cheap source of Podophyllotoxin and consequently because of the overexploitation of the rhizomes, *P. hexandrum* is also under various degrees of threat throughout its area of distribution in India i.e. in the inner range of Himalayas from Kashmir to Sikkim and this species has already been included in the Appendix II of CITES (Convention on International Trade of Endangered species of wild Fauna and Flora).

### References

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2. Anonymous (1969). *Podophyllum*. In: Krishnamurthi, A. et al. (Eds.), *The Wealth of India* 8: 170-175. CSIR, New Delhi.

M.K. Pathak<sup>1</sup>, M. Bhaumik<sup>2</sup> & S. Bandyopadhyay<sup>3</sup>

<sup>1</sup>Central National Herbarium, Botanical Survey of India, P.O.: Botanic Garden, Howrah 711103

<sup>2</sup>Arunachal Pradesh Regional Centre, Shankie View, Itanagar 791111

### Santragachhi Jheel, a birdwatcher's paradise

Santragachhi Jheel, spread over about eight hectares and situated near the city of Howrah in West Bengal, attracts migratory birds in the winter months. The regular winter visitors include Lesser Whistling Duck, the rare Fulvous Whistling Duck & the Baikal Teal, Swinhoe's Snipe, Ferruginous Pochard, Comb Duck, Common Gadwall, Garganey, Northern Pintail, Northern Shoveler, Common Moorhen, Cotton Pygmy Goose and others. Jacanas and Bitterns are the resident breeders.

The Lesser Whistling Duck is the most common visitor here. These ducks inhabit the mounds of dried Water Hyacinth (*Eichhornia crassipes* (Mart.) Solms - Pontederiaceae) which camouflage them.

Photo: C.M. Sabapathy





## Fruit setting in *Kerriodoxa elegans* (Arecaceae), the *White Elephant Palm* of Thailand in AJC Bose Indian Botanic Garden, Howrah

The erstwhile Indian Botanic Garden, currently known as Acharya Jagadish Chandra Bose Indian Botanic Garden, Howrah (AJCBIBG), is well known for its palm collections of S.E. Asia.

*Kerriodoxa elegans* J. Dransf. was first described from Thailand<sup>1</sup>. It is an under storey palm of coastal rainforests of Thailand and was introduced for the first time in AJCBIBG in 1997 for the purpose of conservation through seeds collected by Ms. Inge Hoffman from Thailand in May, 1996. To retain the viability, the seeds were stored adopting proper methodology after collection. The seedlings were first raised in the nursery and thereafter, the raised seedlings were planted in three different places.

*K. elegans* is a spectacular, unarmed fan palm of c. 5 m in height and with c. 2 m across dark green leaves which are silvery white beneath. The pretty leaves make this species as one among the most elegant fan palms of the world.

*K. elegans* is dioecious in nature. Staminate flowers and pistillate spadix are borne on separate individuals.

Timing of anthesis for male flowers remains for 2–3 days only once in a year



*Kerriodoxa elegans*; Inset: Fruits

during January and February. As seen in AJCBIBG, anthesis in female flowers starts just 15–20 days after anthesis in the male flowers. Fruits are of the size of a golf ball, with thin, crunchy, edible epicarp tasting like sour pineapple. The outer surface is with warts on a smooth

surface. The fruits are finally pale yellow with bright orange warts.

A single inflorescence was first observed in one of the plants near the Curator's office in January, 2007 which was then identified as a male plant. Two more inflorescences appeared after a week which lasted for 8–10 days. However, there was no indication of flowering in the second plant which grows nearby. Further, it was not known whether it is a male or female plant. But, after twenty days or so the other plant also started flowering and it was found to be a female plant. After a couple of weeks, fruit setting was also observed in this plant. It took nearly five and half months for the fruits to mature. The viability of seeds of *K. elegans* remains for 2–3 weeks. At present we are trying to multiply this Vulnerable palm by raising seedlings.

### Reference

1. Dransfield, J. 1983. *Kerriodoxa*, a new coryphoid palm genus from Thailand. *Principes* 27: 3–11.

S.S. Hameed, H.S. Mahapatra & P.V. Sreekumar

AJCB Indian Botanic Garden, Howrah 711103

## *Noni* trees should be protected in Basudha Beat, Burdwan district, West Bengal

*Noni*, the popular name for the plant *Morinda citrifolia* L. (Rubiaceae), is native to India and is known as *Indian Mulberry*. A large number of *Noni* trees were found to be growing in the Basudha Beat, Durgapur Forest Range, Burdwan district. The authors found that the local people staying in and around this area are not fully aware of its medicinal properties [see Kirtikar *et al.*, *Ind. Med. Pl.* 2: 1295, 1933 (2<sup>nd</sup> edn.); Chopra *et al.*, *Gloss. Ind. Med. Pl.* 169, 1956; Khare (Ed.), *Ind. Med. Pl.* 421, 2007; K.V. Peter, *Compend. Noni Res.*, 2009; Prajapati *et al.*, *Handb. Med. Pl.* 349, 2010 (repr.)]. They cut the trees for use as firewood. Necessary steps should be taken to protect these trees of medicinal importance in the Basudha Beat.

Tripti Bouri & Ambarish Mukherjee

UGC Centre for Advanced Study, Department of Botany, Golapbag, Burdwan University, Burdwan 713104



*Morinda citrifolia*

Photo: P. Lakshminarasimhan



## *Ruellia prostrata* (Acanthaceae) in the treatment of allergic dermatitis

Ms. Kajal Bera of Khanakul, Hooghly district was suffering from allergic dermatitis in major portion of her right forearm. She was under allopathic treatment and used to get cured after taking 'Tonacard' injections for 2–3 days. The disease, however, relapsed after 3–4 months every time. The treating doctor advised her not to wash her hands, utensils or clothes in the pond water and not to give the fodder to the cattle with bare hands as a preventative measure for allergic dermatitis. Since she was not taking such precautions as advised by the doctor she was getting infected again and again. The doctor warned her that if these injections are taken repeatedly the kidneys may be damaged. One local medicine

woman named Sandhya Mondal, Podrah, Howrah treated her with leaves of *Ruellia prostrata* Poir. [synonym: *Dipteracanthus prostratus* (Poir.) Nees]. She crushed 3–4 leaves with hand in a bowl of water and then washed the infected portion of the skin 2–3 times every day. She referred this skin disease as *Pharinger garol*. Kajal has been completely cured, at least for this time, after undergoing treatment for 15 days. The medicine woman did not disclose the name by which she calls this plant species.



*Ruellia prostrata*

Photo: Amar Mondal

K.L. Maity & P. Baske

Central National Herbarium, Botanical Survey of India, Howrah 711103

## Uses of *Deeringia amaranthoides* (Amaranthaceae) by the Totos

The women of the Mongoloid Toto tribe of Jalpaiguri district, West Bengal have genetic breast milk deficiency after child birth. They eat the leaves of *Deeringia amaranthoides* (Lam.) Merr. (synonyms: *Achyranthes amaranthoides* Lam.; *Deeringia celosioides* R.Br.; *Deeringia baccata* Moq.) after boiling, frying or cooking with fish or meat after child birth for four to five days for augmenting breast milk.

*D. amaranthoides* is referred to as *Myrunsa* or *Mathari* by the Totos. The plants are scandent or semi-scandent shrubs with long weak branches. Leaves are ovate or ovate-lanceolate. The flowers are small, in spikes or in loose panicles. The berries are small and globose, scarlet when ripe.

This medicinal property is of special significance as absence of breast milk diet leads to malnutrition and undernourishment of the new-born.

The Totos also apply the paste of the leaves to cure boils or wounds on the leg and skin. The fruits are used to make a red dye.

A. Sarkar<sup>1</sup>, Samira Dasgupta<sup>1</sup> & T.K. Paul<sup>2</sup>

<sup>1</sup>Anthropological Survey of India, Kolkata 700016

<sup>2</sup>Central National Herbarium, Botanical Survey of India  
P.O. Botanic Garden, Howrah 711103



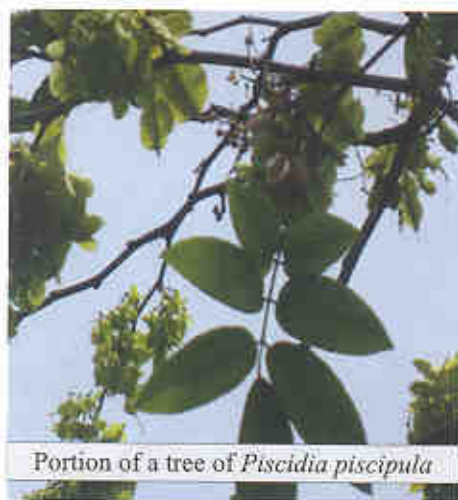
A member of the Toto tribe with *Deeringia amaranthoides*



## *Piscidia piscipula* (Leguminosae: Papilionoideae) in AJC Bose Indian Botanic Garden, Howrah

*Piscidia piscipula* (L.) Sarg. (synonyms: *Erythrina piscipula* L.; *Piscidia erythrina* L.) is commonly known as *Florida Fish-poison tree*, *Jamaican Dogwood*, *Fishfuddle* or *West Indian Dogwood*. It grows on the coastal zones and is endemic to South Florida, the Florida Keys, Texas, Caribbean and Latin America.

In AJC Bose Indian Botanic Garden, Howrah of Botanical Survey of India,



Portion of a tree of *Piscidia piscipula*

this species is cultivated in the Division numbers 10 and 22. It fruits in leafless condition from April – May and the fruits look like that of Combretaceae family. The native Americans of the West Indies first discovered that the extracts from the leaves, twigs, bark and roots of *Florida Fish poison tree* could sedate fish, allowing them to be caught



A compound leaf

by hand. The extract has the same calming effect on human being as it does on fish. The extract from the bitter tasting bark has been used in traditional medicine to relieve pain such as headaches and toothaches and as treatments for insomnia and anxiety. Recent scientific studies in animals suggest that the bark extracts have potential for their anti-inflammatory, sedative and anti-spasmodic effects. The plants are also used as insecticides to control lice, fleas and larvae. Symptoms of overdose in medical treatment include numbness, tremors, salivation and sweating. In these cases immediate medical attention is necessary. Treatment should preferably be done under the supervision of a qualified health care provider. Pregnant and



Flowers

breastfeeding women and elderly persons should never use this plant as a drug.

The yellow-brown, tight-grained wood of fish poison tree is resistant to decay, making its timber suitable for outdoor usage, such as boat building, fence posts, and poles. The wood is also used as a fuel, to make charcoal.



Fruits

### Websites referred:

[http://en.wikipedia.org/wiki/Piscidia\\_piscipula](http://en.wikipedia.org/wiki/Piscidia_piscipula)  
<http://www.umm.edu/sltmed/articles/jamaica-dogwood-000258.htm>

K.L. Maity & S. Biswa

Central National Herbarium

Botanical Survey of India

P.O.: Botanic Garden, Howrah 711103

### Two Endemic and Critically Endangered plant species from Western Ghats



*Toxocarpus concanensis* Hook.f.  
(Apocynaceae:  
Secamonoideae) –  
Endemic to Karnataka

Photo: S.A. Punekar

*Frerea indica* Dalzell  
(Apocynaceae:  
Asclepiadoideae) –  
Endemic to  
Maharashtra

Photo: S.R. Yadav







Dr. M. Sanjappa [Ex-Director, BSI] and Dr. D.K. Singh [Director-in-Charge, BSI] with other experts during the SRLI of IUCN Legume Workshop on 6.4.2011 organized at Botanical Survey of India, Southern Regional Centre, Coimbatore and sponsored by the Royal Botanic Gardens, Kew, U.K.

Dr. Ivan Tatanov and Dr. (Ms.) Irina Illarionova from the Komarov Botanical Institute of Russian Academy of Sciences, St. Petersburg, Russia (who were on study tour to Central National Herbarium, Botanical Survey of India under INSA – Russian Academy of Sciences Bilateral Exchange Programme) at the ENVIS Centre, BSI.



## ENVIS CENTRE

Established : April, 1994

Subject Area : Floral Diversity

Contact person : DR. P. LAKSHMINARASIMHAN

Address : Scientist-D, CNH, BSI & Scientist-in-Charge, ENVIS Centre  
Botanical Survey of India, Central National Herbarium  
P.O. Botanic Garden, Howrah 711103

Phone : (033) 2668 0667

Fax : (033) 2668 6226

e-mail : [envis@cal2.vsnl.net.in](mailto:envis@cal2.vsnl.net.in); [bsi@envis.nic.in](mailto:bsi@envis.nic.in)

Website : <http://www.bsienviis.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 and the ENVIS Centre of BSI 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. Bibliography and abstract of papers on flora of West Bengal
  5. Bibliography and abstract of papers on flora of North East India – I
  6. Bibliography and abstracts of papers on flora of West Bengal – II
  7. Bibliography and abstracts of papers on flora of Andaman and Nicobar Islands

**Newsletters:** Up to Vol. 16(2)

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