



# Plant Archives

Journal homepage: <http://www.plantarchives.org>  
DOI Url : <https://doi.org/10.51470/PLANTARCHIVES.2022.v22.no1.019>

## **CESTRUM BENGHALENSIS SP. NOV. A NEW SPECIES (SOLANACEAE: BROWALLIOIDEAE: CESTREAE) IN INDIA – REVEALED BY HERBARIUM REVISION**

Madhusmita Mallia<sup>1</sup>, C Kalidass<sup>1\*</sup> and P.C Panda<sup>1</sup>

<sup>1</sup>Taxonomy & Conservation Division, Regional Plant Resource Centre, Bhubaneswar-751015, Odisha, India

<sup>2</sup>Centre for Biotechnology, Siksha 'O' Anusandhan University, Bhubaneswar, Odisha, India

\*Email: [kalidassindia@gmail.com](mailto:kalidassindia@gmail.com)

(Date of Receiving : 26-09-2021; Date of Acceptance : 08-12-2021)

### ABSTRACT

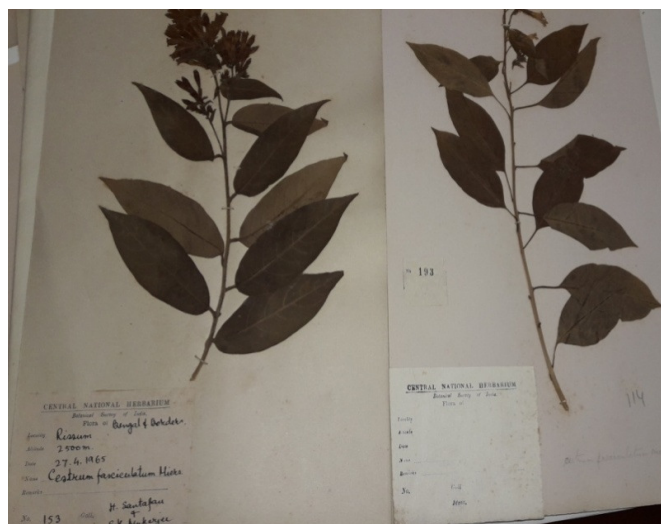
New species of *Cestrum fasciculatum* (Schtdl.) Miers complex from the eastern India, *Cestrum benghalensis* sp. nov. described and depicted. Its specimens were found in the Herbarium of Botanical Survey of India (CAL) in material collected in 1965 by H. Santanu and S.K. Mukherjee, which was collected from Chilapata forest, Rissum, West Bengal and is referred to the Flora of Bengal and Borders.

**Keywords :** Solanaceae, *Cestrum fasciculatum* complex, New species, India.

### Introduction

The Night shade family Solanaceae has 90 genera and 3000-4000 species with great variation in habit and distribution on all continents except Antarctica, most of which are native to Central and South America (PBI Solanum Project, 2014). Compromising of 250 species, the genus *Cestrum* is widely distributed as a pioneer in tropical Central and South America, with high concentrations in Brazil and Andean region. The species belongs to the genus *Cestrum* (Solanaceae) especially small trees, shrubs, vines and robust herbs from the New World tropics from northern Mexico and southern Florida ca. 150 species with southern Chile (Benitez & D'Arcy 1998; Nee 1986, 2001). *Cestrum* is derived from the Greek word 'kestron', because of the similarity to a plant of that name "Kestrum," means for a tool for engraving that bear a resemblance to plant's anther (Motooka *et al.*, 2003). Compared to other countries, the taxonomy of *Cestrum* in India is complicated by a large number of synonyms and unidentified collections. The genus *Cestrum* was first described by Linnaeus (1753) in Species Plantarum, which included two species *Cestrum nocturnum* L., and *C. diurnum* L. Dunal (1852) and Francey (1935, 1936) carried out a revisionary study of the genus, using a tool used to trap the pollen of the *Cestrum*, which is similar to the pollen. Since then many new species have been described and reported. According to the British Flora of India in the fourth suborder included *Cestrineae* with the characters corolla lobes, in duplicate valvate, fruits capsular, seeds

scarily compressed, embryo straight. In this Hooker (1885) discusses the family that came under *Nicotiana*. Later in the tribe *Cestreae* plants absorbed characters such as actinomorphic flowers, small, persistent calyces, long, narrowly tube corollas, small, longitudinally dehiscent anthers held outside the corolla and advanced ovaries (Benitez & D'Arcy 1998). The authors' have revised the materials of the Botanical Survey of India herbarium (CAL) and identified unknown species of *Cestrum fasciculatum*. The plants were collected in 1965 by H. Santanu and S.K. Mukherjee from Rissum, West Bengal. With these particular characters like the petiole 0.6mm; leaf blade lanceolate, 7-9 × 5-6 cm, entire, leaf glabrous, leaf apex acuminate, inflorescences drooping, many-flowered, axillary. peduncles 1cm in length, pedicel 0.1 mm, calyx campanulate 0.6 mm, corolla violet or dark violet 5 lobed and 2 cm in length, tube slightly contracted at throat, the fruits dark violet is clear that that they do not belong to one species to this day. This paper is based entirely on herbarium studies, which revise the Eastern region species of *Cestrum*. A summary of the work with which is unusual morphological characters of the new species and their allied species with their segregation are published in the table of difference. Photographs of the consultant species (Figs. 1) and major distinct characters for the two species are provided.



**Fig. 1 :** Comparison of herbarium *Cestrum fasciculatum* and *C. benghalensis* sp. nov with detailed information.

### Materials and Methods

The authors located an interesting collection of *Cestrum* specimen described in CAL from two different areas West Bengal prior to the Eastern region. In further study they located 13 sheets of *Cestrum fasciculatum* which were restricted in distribution from Eastern region of India. This specimen has little similarity to *C. fasciculatum* but differs by the characters given in tables 1. *C. fasciculatum* was firstly introduced and naturalized in tropical regions like South America, Brazil etc. However, so far we have reported from India. We have studied with a different accession number 153 in Central National Herbarium (CAL) for characterisation of *Cestrum benghalensis* sp. nov. A Comparative study with the relevant description and available herbarium proved here that the specimen mentioned above belongs to a new species of science.

### Results and Discussion

***Cestrum benghalensis* Kalidass & Madhusmita Mallia sp. nov**

Type: India, Eastern Region, The Flora of Bengal and Borders, Rissum, Chilapata forest, 27.4.1965, H. Santanu and S.K Mukherjee, CAL 193. (Fig 2)

#### Description

Shrubs, 0.4–2.5 m. Leaf-bearing stems drying brown, yellow–brown, the internodes 25–55 × 1.375–4.0 mm; stems glabrous. Axillary buds 0.5–1.0 mm, drying dark brown to brown, glabrous, not subtended by a minor leaf. Lamina 5 to 130 mm and width of 20 to 60 mm oblong–ovate, ovate,

ovate–elliptic, drying yellow–green, brown or dull olive green above, paler below; the upper surface glabrous, primary to quarternary veins, (occasionally primary and secondary only) raised and clearly visible to the naked eye; secondary veins 6 pairs, borne 65–80° to the midrib, irregularly and weakly curved, decurrent, the veinlets visible or not, where visible unbranched or branched; base obtuse to decurrent, obtuse, or decurrent; margin entire; apex subcuspidate to cuspidate or acute; petioles 7–25 mm, drying green, dark brown or yellow–brown, glabrous. Inflorescences 1–3 per herbarium sheet, terminal or subterminal panicles, axillary panicles solitary in each axil, ca. 105 mm long, bearing 3–5 flowers borne in 2–6 clusters, each cluster bearing 3 or 4 flowers; peduncle 25–37 × 1.0–1.5 mm, drying green–brown, yellow–brown or brown, glabrous; bracts 3–100 × 0.75–31.0 mm, leaf–like to bracteole–like; bracteoles 3.0–3.5 mm, linear, glabrous. Flowers pedicellate, the pedicels 0.50–0.75 mm; calyx 10 mm, the outer surface glabrous, the lobes 5, 0.50–0.675 mm, erect; corolla violet, the tube 20 mm long, 3.0–3.5 mm in diameter at the mouth, ca. 1.25 mm in diameter at the base, glabrous, the lobes 5, 5–6 mm long; stamens 5, the filaments 22 mm long, equal, adnate for 19.0–20.5 mm of their length, glabrous, a lobe–like appendage present at insertion point, the anthers ca. 1 × 0.675–0.750 mm; style 24.5–26.0 mm, the stigma 0.375–0.50 × 0.75–1.25 mm. Infructescences 25–80 mm long, bearing 5–12 fruit; fruiting calyx 3.5–4.0 × 7–8 mm; fruit dark violet in colour.



**Fig. 2 :** *Cestrum benghalensis* sp. nov. Holotype

**Table 1:** Morphological comparison between *Cestrum benghalensis* sp. nov. and *Cestrum fasciculatum* (Schltdl.) Miers

Characters	<i>Cestrum benghalensis</i>	<i>Cestrum fasciculatum</i>
Leaf lamina	Glabrescent	Pubescent
Inflorescence	Axillary cymose	Terminal cymose
Corolla colour	Violet	Red
Leaf shape	Lanceolate	Ovate
Leaf Size-	8.2×2-5.5 cm, length width ratio 5.5cms of leaf	9-10.5, 5- 6cm, length width ratio 4.2cms of young leaf
Leaf Base-	Obtuse	Round
Calyx length-	Less than 1 cm(0.6 mm)	1cm
Petiole length-	1cm.	0.6mm

**Ecology** – *Cestrum benghalensis* grows in the deep, nutritious clay soil, the Eocene sandstone in Bengal and border region. According to the ecology of Bengal and Borders it is considered to be native species of the original Chilapata forest, which may have changed over time.

**Distribution**- Local to Bengal and Borders.

**Vulnerability**- Risk of extinction due to small population and distribution area and apparent loss of certain areas and the habitats since 1965.

**Etymology**- The specific epithet refers to the type locality in Bengal borders, West Bengal, India.

#### Notes-

The new species of *Cestrum benghalensis* leaf lamina was naturally glossy while the *C. fasciculatum* was fully immature. In addition the petiole length often varies from about 1cm in species. Moreover, the corolla color of both the plants differed with new species being violet and the known being red. Morphologically the plant leaf shape is completely different, it was lanceolate in the whole species and the other plant was ovate shaped. These are some of the characters that can be considered a plant that is completely different from *C. fasciculatum*. The history of detection of *C. benghalensis* is significant and very rare. So, these plants have not been collected since then or have been mentioned in the Flora of Bengal and Border or any other parts of India. After this the plant is focused and collected in subsequent years.

#### Acknowledgements

The author (C.K) expresses grateful thanks to Chief Executive, Regional Plant Resource Center, Bhubaneswar, Odisha, India for encouragement and facilities and also to the Director, Botanical Survey of India, CNH, Howrah for granting permission. Thanks are also due to Forest and

Environmental and Climate Change Department, Government of Odisha, Bhubaneswar for financial support.

#### References

- Benitez de Rojas C. and D' Arcy, W.G. (1998). The genera *Cestrum* and *Sessea* (Solanaceae: Cestreae) in karyotype of cestreae 135 Venezuela. *Annals of the Missouri Botanical Garden*, 85: 273-351.
- Dunal, M.E. (1852). Solanaceae In: De Candolle, A.P, ed. *Prodromus systematics naturalis regni vegetabilis* Paris: *Victor Masson*, 13: 1-690.
- Francey, P. (1935). Monographie du genre *Cestrum* L. *Candollea*, 6: 46- 398.
- Francey, P. (1936) Monographie du genre *Cestrum* L., partie II. *Candollea*, 7: 1-132.
- Hooker, J.D. (1885). *Flora of British India*, Reeve and Co. Ltd., 5: 78-79.
- Linnaeus, C. (1753). *Species plantarum*, ed. Stockholm. Facsimile reprint 1957 by The Ray Society. London.
- Motooka, P.; Castro, L. and Duane, N. (2003). Weeds of Hawaii's pastures and natural areas; an identification and management guide. University of Hawaii ay Manoa, Honolulu, HI, US.
- Nee, M. (1986). Placentation patterns in the Solanaceae In: D' Arcy WG, ed. *Solanaceae; biology and Systematics* New York; *Columbia University Press*, 169-175.
- Nee, M. (2001). An overview of *Cestrum* in Solanaceae V: advances in taxonomy and utilization, eds. R.G. van de Berg, G.W.M. Barendse, G.M. Vander Weerdn and C. Mariani. Nijmegen: *Nijmegen University Press* Pg- 109- 136.
- Ronald G. van den berg; N Groendijk- Wilders, (2014). *The Cab International/ The United States Department of Agriculture, Biosystematics, University of Netherlands.*