



Bonnaya veronicifolia (Retz.) Spreng.(Linderniaceae): A new distributional record from Odisha, India

Rajkumari Supriya Devi, Malaya Prithwiraj Sahoo, Sanjeet Kumar✉

Biodiversity and Conservation Lab., Ambika Prasad Research Foundation, Odisha, India

✉ **Corresponding Author:**

Biodiversity and Conservation Lab.,
Ambika Prasad Research Foundation, Odisha,
India
Email: sanjeet.biotech@gmail.com

Article History

Received: 17 November 2020
Accepted: 29 December 2020
Published: January 2021

Citation


Rajkumari Supriya Devi, Malaya Prithwiraj Sahoo, Sanjeet Kumar. *Bonnaya veronicifolia* (Retz.) Spreng.(Linderniaceae): A new distributional record from Odisha, India. *Species*, 2021, 22(69), 10-14

Publication License



© The Author(s) 2021. Open Access. This article is licensed under a Creative Commons Attribution License 4.0 (CC BY 4.0).

General Note

 Article is recommended to print as color digital version in recycled paper.



ABSTRACT

A new distribution of *Bonnaya veronicifolia* (Retz.) Spreng. is recorded from the Eastern Coastal areas of India. The short description of the species including its taxonomical note, phenology, ecology, and associated species is provided.

Key words: *Bonnaya*, new distributional record, taxonomical note, Eastern Coastal areas

1. INTRODUCTION

The family Linderniaceae traditionally belonged to the family Scrophulariaceae which was disintegrated from the earlier family in its direction to evolution (Fisher *et al.* 2013). The taxa of the assembly of Linderniaceae is controversially discussed with a complex taxonomic history based on *Lindernia* to unite a broadly defined species of genus *Lindernia* and split into 13 different genera. 13 genera are thereafter split with its distinguishing character in this family (Fisher 1992). However, four main genera viz. *Bonnaya* Link & Otto, *Lindernia* Allioni, *Vandellia* Linnaeus and *Ilysanthes* Rafinesque are commonly used (Pennell 1935; Philcox 1968). The above 4 genera are splitted considering the distinguishing character based on androecium, leaf, capsule and calyx (Yi *et al.* 2012). The genus *Bonnaya* Link & Otto is mainly characterized by a single pair of stamens and single pair of staminodes, a linear cylindrical capsule and lobbed calyx (Fisher *et al.* 2013). As described by the previous revisions of the genus *Bonnaya*, it consists of two sections and 14 species. A generalized distinguishing character of the genus *Bonnaya* include Stem quadrangular cross sectional area; Leaves mostly pinnate, leaf blades linear, linear lanceolate, elliptical, obovate or oblong, leaf margin from less than six pairs of serration to less than 16 pairs of serrations; inflorescence raceme subtended by a small linear lanceolate bract; Corolla usually pale purple, pale pink or pale blue with sometimes white or purple spots. Clavate staminodes with minute glandular hairs at the basal parts of the staminodes; Capsule linear cylindrical; Seed angular with several stellate projections (Yi *et al.* 2012; Yi *et al.* 2014).

On 15th July 2020, the authors made an accidental observation of the *Bonnaya* species and is collected for taxonomical examination while travelling the area of Andharua, Khordha District, Odisha. Earlier studies had showed that Shimpale and his co-workers discovered a new species of *Bonnaya* i.e., *Bonnaya milindii* from Western Ghats of India (Shimpale *et al.* 2019). And so, authors have approached Dr. Shimpale Vinod for his expert opinion. Earlier *Bonnaya sanpabloensis* was added to the flora of India (Sardesai *et al.* 2019). After critical characterization of the morphology and key characters of the collected plant species and considering the expert opinion, the collected plant species is identified as *Bonnaya veronicifolia* (Plate 1 & 2). A brief description of the collected species, photographs and associated flora is provided.

2. TAXONOMIC TREATMENT

***Bonnaya veronicifolia* (Retz.) Spreng., Syst. Veg. 1: 41 (1825)**

(Plate 1)

Annual herb; 5-30cm long; branching, slightly creeping; roots at the lower nodes; Stem quadrangular, green but often reddish brown in colour, glabrous; internodes 1-2cm long; Leaves opposite alternate, pinnate, sessile, pulvinus at the base, glabrous, prominent midrib, oblong to obtuse, subacute apex, 1.5-1.9 cm long, 0.4-0.6 cm width, sharply subaristate serrate leaf margin, 4-9 pairs or sometimes unpaired dente, glabrous, secondary veins not visible; Inflorescence raceme with solitary axillary flower, apical part of the inflorescence often redish brown, 2-24 capsule with persistent calyx per inflorescence including floral buds; Bract small linear and lanceolate 0.3-0.4 cm long subtending from pedicel; Pedicel ~0.3 cm long. Calyx 0.4-0.5 cm long, 5 deep lobes; Corolla with dorsal lip, ventral lip and corolla tube, light purple with dark purple spots at the ventral lip, dorsal lobe light purple, oblong, slightly emarginate, sometimes appears to be acute, 0.3-0.4 cm long, ventral lip light purple with dark purple spots, 3 deeply lobbed with acute apex, each lobe 0.4-0.5 cm long, central lobe can be equal or slightly larger than the lateral lobes, corolla tube 0.3-0.5 cm long; Stamens 2, pale purple, fertile, attached to the dorsal lip, opposite angled; Staminodes 2, straight, white in the upper part and pink at the base, attached to the base of ventral lip, glandular, tiny short dense hair present at the base of the staminodes; Capsule cylindrical, lanceolate, reddish brown 0.4-0.7 cm long, attenuate apex; Capsule with persistent calyx 0.6-1.5 cm long; Ovary cylindrical ~1mm long, style ~4mm long; seeds dark brown.

Note: The description of *Bonnaya veronicifolia* earlier showed that the ventral lip of corolla possesses three lobes with apex of central lobe obtuse and apex of the lateral lobes subacute and the central lobe being larger than the lateral lobes (Yi *et al.* 2014). In comparison to it, corolla of the collected *Bonnaya* species also possesses 3 ventral lobes with no much differences in the lobe structure with acute apex of all the lobes. Slight differences of the structure could be due to the ecological variation. The differences are listed in the **Table 1** (Yi *et al.* 2014).

Distribution: It is distributed in Southern India, Sri Lanka and Odisha (Coastal areas).

Flowering & Fruiting: June-July

Habitat: Wetlands of the tropical deciduous forest.



Specimen Examined: India, Odisha, Khordha District, Andharua, 20° 19'37.3"N 85° 45'44.1"E, 28 msl, 15th July, 2020, Sanjeet Kumar 25

Associated Flora: *Drosera burmannii*, *Utricularia caerulea*, *Oropetium thomaeum*, *Alysicarpus vaginalis*, *Aeschynomene indica*, *Striga densiflora*

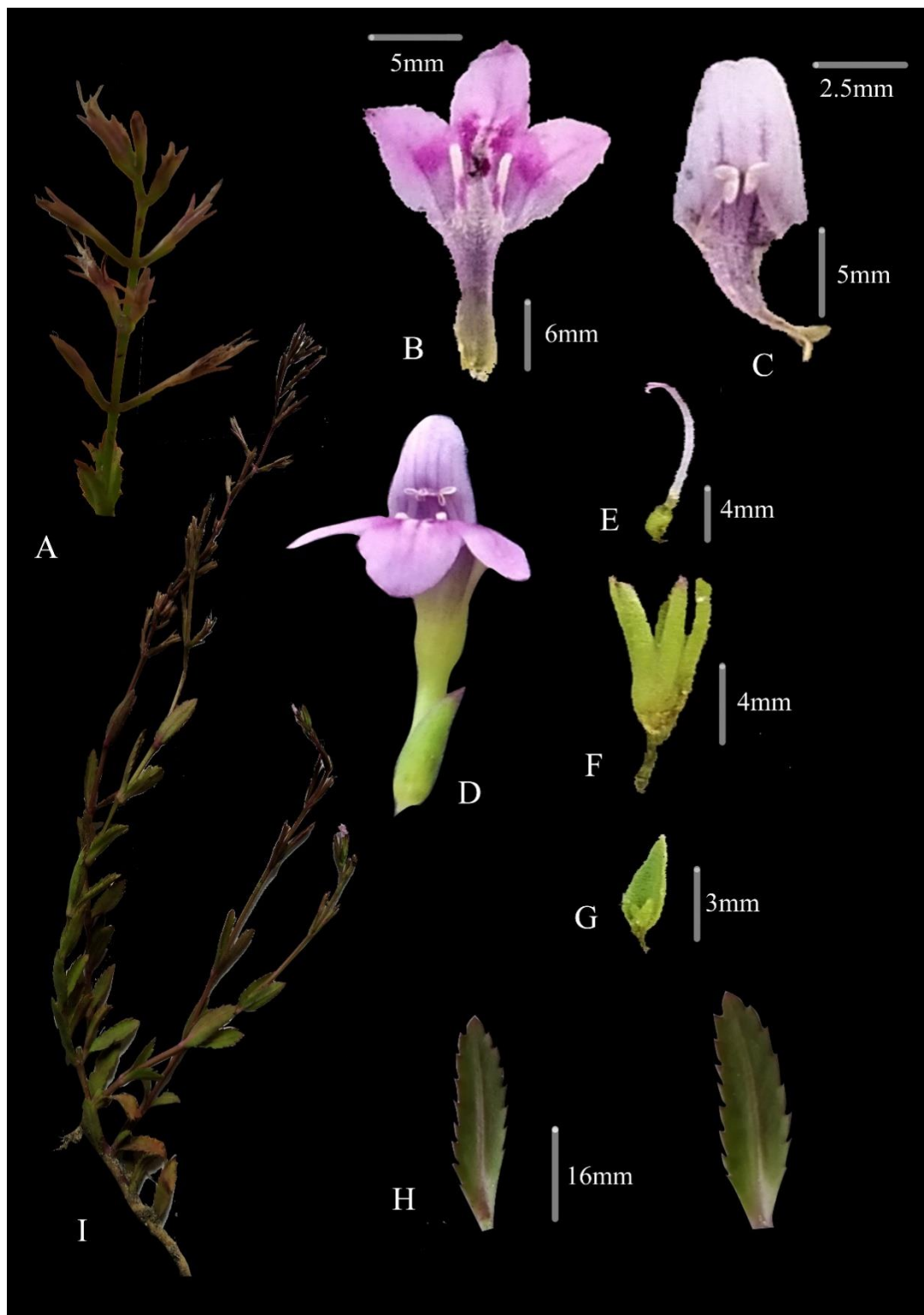


PLATE 1: Vegetative parts of Collected plant species. A. Terminal raceme; B. Corolla lower lip; C. Corolla upper lip; D. Flower; E. Ovary & Style; F. Calyx; G. Bract; H. Leaves



PLATE 2: Field photograph of collecting *Bonnaya veronicifolia*: **A. & B.** *B. veronicifolia* in its habitat; **C & D.** Collection of *B. veronicifolia*. **E & F.** Characterization of *B. veronicifolia* (Floral parts including Corolla, calyx, bract, style, ovary, leaf, capsule, capsule with persistent calyx and seeds releasing from capsule).

Table 1: Morphological difference observed in *B. veronicifolia* due to ecological variation

Characters	<i>B. veronicifolia</i>	Collected <i>B. veronicifolia</i>
Leaf	0.9-2.7 cm long 0.6-1.0cm wide	1.5-1.9cm long 0.4-0.6cm wide
Leaf base	Cuneate base, slightly amplexicaul	Pulvinus at the base
Leaf margin	Sharply subaristate serrate leaf margin	Sharply subaristate serrate leaf margin

	5-11 pairs of dente Glabrous or occasionally with scattered hispid hairs on the lower surface.	4-9 pairs of dente Glabrous only
Inflorescence	Racemes	Racemes The apical part of inflorescence often reddish brown in colour
Corolla	Violet purple lips spotted with dark purple spots.	Light purple with dark purple spots only at the ventral lips.
Ventral lip	3 rounded lobes 5.5-6.0mm long, Central lobe larger than the laterals	3 deep lobes with acute apex, 4-5mm long, Central lobe can be equal or slightly larger than the lateral lobes
Dorsal lip	Dorsal lip emarginate, 4-5.5 mm long, obtuse to truncate at apex	Dorsal lip slightly emarginate, sometimes appears to be acute, 3-4mm long.

Acknowledgements

Authors are thankful to Dr. Shimpale Vinod, Department of Botany, The New College, Kolhapur, Maharashtra, India for identification of the species.

Conflict of interest: The author has no conflict of interest to declare that are relevant to the content of this article.

Funding: This study has not received any external funding.

Ethical approval

The ethical guidelines for plants & plant materials are followed in the study for sample collection & identification.

Peer-review: External peer-review was done through double-blind method.

Data and materials availability:

All data associated with this study are present in the paper.

REFERENCES AND NOTES

- Fisher, E. 1992. Systematik der africanischen Linderniaceae (Scrophulariaceae). *Tropische and Subtropische Pflanzenwelt* 81:1-365.
- Fisher, E.B.; Schaferhoff, B. & Muller, K. 2013. The phylogeny of Linderniaceae- The new genus *Linderniella*, and new combinations within *Bonnaya*, *Craterostigma*, *Lindernia*, *Micranthemum*, *Torenia* and *Vandellia*. *Wildenowia* 43(2): 209-238.
- Pennell, F.W. 1935. The Scrophulariaceae of the eastern temperate North America. *Journal of Academy of Natural Sciences of Philadelphia* 22:1-72
- Sardesai, V.A.; Sathe, S.S. & Shimpale, V.B. 2019. *Bonnaya sanpabloensis* (Linderniaceae): An addition to the flora of India. *RHEEDEA Journal of Indian Association for Angiosperm Taxonomy* 29(2): 178-180
- Shimpale, V.; Vinayak, S. & Sanjay, S. 2019. A new species of genus *Bonnaya* (Linderniaceae) from the Western Ghats of India. *Phytotaxa* 399(4): 291-295.
- Yi- Shuo Liang, A. & Jenn-Che, W. 2014. A systematic study of *Bonnaya* section *Bonnaya* (Linderniaceae). *Australian Systematic Botany* 27:180-198.
- Yi-Shuo Liang, A.; Chih-Hsiung, C. & Jenn-Che, W. 2012. Taxonomic Revision of *Lindernia* All. (Scrophulariaceae sensu lato). *Taiwan Journal of Forest Science* 27(1):95-116.