

Bonnaya succosa (Linderniaceae): A new record to the flora of Odisha, India

Rajkumari Supriya Devi, Sanjeet Kumar*

ABSTRACT

Bonnaya succosa (Kerr ex Barnett) Eb.Fisch., Schäferh. & Kai Müll., is reported from the coastal areas of India as a new distributional record for the state of Odisha, India. The morphological description, taxonomical note, phenology, ecology & list of associated species is provided for easy identification during the field studies.

Keywords: *Bonnaya*, Odisha, Taxonomical characters, Coastal areas

To Cite:

Devi RS, Kumar S. *Bonnaya succosa* (Linderniaceae): A new record to the flora of Odisha, India. *Species*, 2022, 23(71), 178-182

Author Affiliation:

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

*Corresponding Author:

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

Peer-Review History

Received: 18 February 2022

Reviewed & Revised: 20/February/2022 to 09/April/2022

Accepted: 11 April 2022

Published: 14 April 2022

Peer-Review Model

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



© The Author(s) 2022. Open Access. This article is licensed under a [Creative Commons Attribution License 4.0 \(CC BY 4.0\)](https://creativecommons.org/licenses/by/4.0/), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made. To view a copy of this license, visit <http://creativecommons.org/licenses/by/4.0/>.

1. INTRODUCTION

Linderniaceae family was previously belonged to the family Scrophulariaceae which disintegrated from the earlier family (Fisher *et al.*, 2013). The assembly of these family is controversially discussed in a complex taxonomic history with a broadly defined based on the genus *Lindernia* Allioni. It was later splitted into 13 different genera (Fisher, 1992). However, common genera are *Bonnaya*, *Lindernia*, *Vandellia* and *Ilysanthes*. (Pennell, 1935; Philcox, 1968). The above four genera are splitted considering the distinguishing character based on androecium, leaf, capsule and calyx (Yi *et al.*, 2012). The genus *Bonnaya* is characterized by stamens (a single pair) and staminodes (single pair), a linear cylindrical capsule & lobbed calyx (Fisher *et al.*, 2013). As per the previous revisions, the genus *Bonnaya* has two sections having 14 species. The key characters of *Bonnaya* are quadrangular stem, pinnate leaves oftenly, blades are linear, linear-lanceolate, elliptical, obovate or oblong, less than 6 pairs of serration to less than 16 pairs of serrations in margin; inflorescence raceme subtended by a small linear lanceolate bract. It was noticed that corolla usually pale pink, pale purple or pale blue in color with sometimes white or purple spots. Glandular hairs at the basal parts in clavate staminodes with; Capsule linear cylindrical; Seed angular with several stellate projections (Yi *et al.*, 2012; Yi *et al.*, 2014; Devi *et al.*, 2021). On 24th September 2020, the authors made an observation of the *Bonnaya* species during the field survey that was carried out in & around the coastal areas near Konark temple and Chandrabhaga Beach, Odisha. The species was collected for taxonomical examination. Previous studies had showed that Liang Yi-Shuo and his co-workers had made revisions on genera *Bonnaya* and *Lindernia*. A critical characterization was done considering the key characters, authors have

approached Liang Yi-Shuo for his expert opinion and as per his key we concluded that the collected specimen was *Bonnaya succosa* (Figure 1&2). A brief description of the species, photographs and associated plants are provided in this study.

2. MATERIALS AND METHODS

The plant specimens were collected from its habitat around the Coastal areas near Konark temple and Chandrabhaga Beach, Odisha and were morphologically analysed with its key characters (Liang *et al.*, 2014). A herbarium specimen is deposited in the herbarium division of APRE, Odisha, India.



Figure 1: Habitat of *Bonnaya succosa* and its collection sites

3. TAXONOMIC TREATMENT

Bonnaya succosa (Kerr ex Barnett) Eb.Fisch., Schäferh. & Kai Müll., Willdenowia 43(2): 221 (2013), (Figure 2).

Annual herb 3-12 cm long, slightly creeping; rarely multi branched; Stem quadrangular, fleshy, prostrate to ascending, internodes ~2cm long; Leaves opposite alternate, linear, rarely pinnately veined and often uninerved; elliptic, sessile, crenate with 2-4 teeth, glabrous; Flower solitary-axillary or sparsely racemes; often leaf opposite flowers; Bract small, linear, apex acute; Pedicel glabrous; Calyx deeply 5-lobbed, ~1.7mm long, ~0.2mm width; Corolla pale violet ~4mm long, ~4mm width, Corolla tube ~0.2mm long, ventral lip 3 with rounded lobes, adaxially broad, glabrous, white, dorsal lip obtuse at the apex, ~1.2mm width; Stamens 2; Staminodes clavate, Slightly curved, pale violet to white, ~1mm long, sparsely puberulous at base; Ovary elliptic ~ 0.1mm long, style ~ 2mm long (Figure 2).

Distribution and habitat

It is found in the low marshland below 200 m MSL. It is so far been reported from China, North-eastern Thailand and Laos. It has also been reported from Southern part of India.

Flowering

September to October

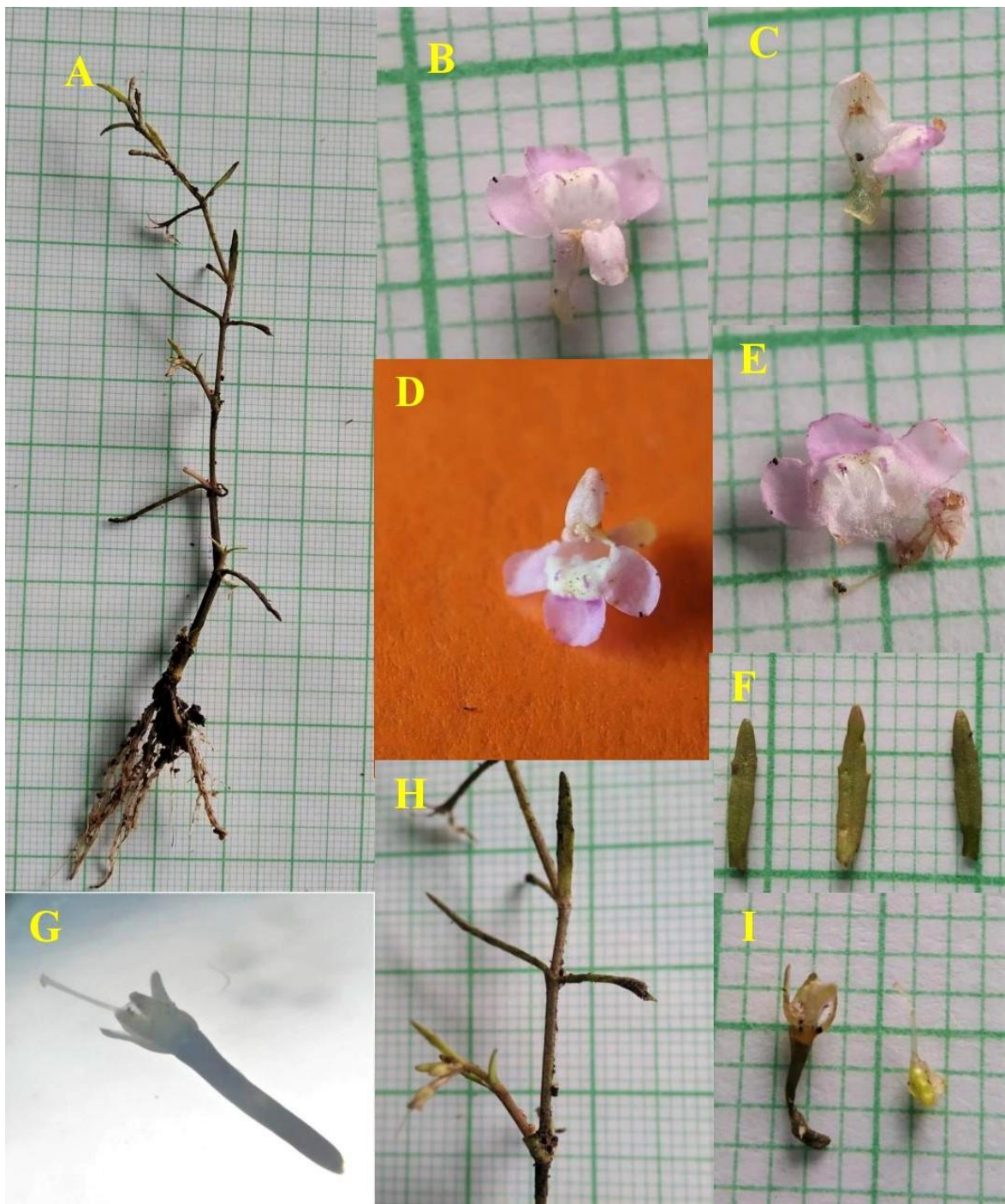


Figure 2: *Bonnaya succosa*, A) Whole plant, B) & D) Flower, C) Dorsal lip, E) Ventral lip, F) Leaves, G) & I) Calyx with Pedicel and Style, H) Stem showing internodes

Specimens examined

INDIA, Odisha, Puri District, Chandrabhaga, Latitude 19°85'99"6 N Longitude 86°08'83"4E Elevation 17.37m MSL, 24th September Sanjeet Kumar & Rajkumari Supriya Devi 40 (APRFH).

Associated flora

Some of the flora associated with *Bonnaya succosa* include *Eriocaulon quinquangulare*, *Rotala indica*, *Utricularia minutissima*, *Utricularia polygaloides*, *Utricularia caerulea*, *Utricularia bifida*, *Utricularia stellaris*, *Centranthera tranquebarica*, *Anacardium occidentale*, *Casuarina equisetifolia* etc. (Table 1).



Figure 3: A) *Utricularia bifida*, B) *Utricularia caerulea*, C) *Utricularia polygaloides*, D) *Utricularia minutissima*, E) *Utricularia stellaris* F) *Centranthera tranquebarica*

Notes

The collected specimen is found near the sea beach having brackish water habitat. It is mostly associated with carnivorous and parasitic plants species (Table 1; Figure 3). In the collected specimen, it was observed that branching is rarely multi branched; rarely

pinnately veined and often uninerved. Liang *et al.* (2014) reported that *B. succosa* possesses pale blue colour corolla and central lobe of ventral lip with white and blue marks whereas the collected specimen possesses pale violet corolla, adaxially broad and white colour in all the 3 lobes. The minor morphological difference might be observed due to the variations in landscape of the habitat.

Table 1: Associated flora of *Bonnaya succosa*

Scientific Name	Family	Vernacular name
<i>Eriocaulon quinquangulare</i>	Eriocaulaceae	Ghana Kadam
<i>Utricularia minutissima</i>	Lentibulariaceae	Bladderwort
<i>Utricularia polygaloides</i>	Lentibulariaceae	Bladderwort
<i>Utricularia bifida</i>	Lentibulariaceae	Bladderwort
<i>Utricularia stellaris</i>	Lentibulariaceae	Bladderwort
<i>Utricularia caerulea</i>	Lentibulariaceae	Bladderwort
<i>Centranthera tranquebarica</i>	Orobanchaceae	Tranquebar Spur-Anther Flower
<i>Rotala indica</i>	Lythraceae	Indian toothcup
<i>Casuarina equisetifolia</i>	Casuarinaceae	Jhau
<i>Anacardium occidentale</i>	Anacardiaceae	Cashew

Acknowledgements

The authors are thankful to Divisional Forest Officer of study areas; local community and Yi-Shuo Liang, Department of Life Science, National Taiwan Normal University, Taiwan for identification of collected plant specimen. Authors are also thankful to the DFO & Forest Officials of the study areas and local communities.

Ethical approval

Bonnaya succosa (Kerr ex Barnett) Eb.Fisch., Schäferh. & Kai Müll., is gathered from the coastal areas of Odisha, India. The ethical guidelines for plants & plant materials are followed in the study for the morphological description, taxonomical note, phenology, ecology & list of associated species identification during the field studies. For identification of collected plant specimen was carried out with the association of local community and Yi-Shuo Liang, Department of Life Science, National Taiwan Normal University, Taiwan.

Funding

This study has not received any external funding.

Conflicts of interests

The authors declare that there are no conflicts of interests.

Data and materials availability

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

REFERENCES AND NOTES

1. Devi RS, Sahoo MP, Kumar S. *Bonnaya veronicifolia* (Retz.) Spreng.(Linderniaceae): A new distributional record from Odisha, India. *Species*, 2021, 22(69), 10-14
2. Fisher, E. 1992. Systematik der africanischen Linderniaceae (Scrophulariaceae). *Tropische and Subtropische Pflanzenwelt*. 81:1-365.
3. Fisher, E.B., Schaferhoff, B. and 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.
4. Liang, Y.S., and Wang, J.C. 2014. A systematic study of *Bonnaya* section *Bonnaya* (Linderniaceae). *Australian Systematic Botany*. 27:180-198.
5. Liang, Y.S., Chen, C.H. and Wang, J.C. 2012. Taxonomic Revision of *Lindernia* All. (Scrophulariaceae Sensu Lato). *Taiwan Journal of Forest Science*. 27(1):95-116.
6. Pennell, F.W. 1935. The Scrophulariaceae of the eastern temperate North America. *Journal of Academy of Natural Sciences of Philadelphia*. 22:1-72
7. Philcox, D. 1968. Revision of the Malesian species of *Lindernia* All. (Scrophulariaceae). *Kew Bulletin* 22:1-72.