



REVIEW ARTICLE

A conspectus of the genus *Pigea* (Violaceae) in India

Parappurakkal Thazhe Arunraj^{1&2}, Divya V. Nair^{3*} & Viswanathamandiram Natarajakaimal Sanjai^{1&2}

¹Department of Post Graduate Studies and Research in Botany, Sanatana Dharma College, Sanathanapuram P.O., Alappuzha, Kerala-688003, India

²Research Centre, University of Kerala, Thiruvananthapuram, Kerala, India

³Department of Plant Sciences, Central University of Himachal Pradesh, Shahpur Campus, Shahpur, Kangra, Himachal Pradesh-176206, India

*Email: divyanair013@hpcu.ac.in

 OPEN ACCESS

ARTICLE HISTORY

Received: 28 August 2024
Accepted: 16 September 2024

Available online
Version 1.0 : 16 October 2024
Version 2.0 : 23 October 2024



Additional information

Peer review: Publisher thanks Sectional Editor and the other anonymous reviewers for their contribution to the peer review of this work.

Reprints & permissions information is available at https://horizonepublishing.com/journals/index.php/PST/open_access_policy

Publisher's Note: Horizon e-Publishing Group remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Indexing: Plant Science Today, published by Horizon e-Publishing Group, is covered by Scopus, Web of Science, BIOSIS Previews, Clarivate Analytics, NAAS, UGC Care, etc See https://horizonepublishing.com/journals/index.php/PST/indexing_abstracting

Copyright: © The Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited (<https://creativecommons.org/licenses/by/4.0/>)

CITE THIS ARTICLE

Arunraj PT, Nair DV, Sanjai VN. A conspectus of the genus *Pigea* (Violaceae) in India. *Plant Science Today*. 2024; 11(4): 889-891. <https://doi.org/10.14719/pst.4848>

Abstract

An updated conspectus of the genus *Pigea* in India is provided based on live and herbarium specimens. We recognize three species, namely *P. enneasperma*, *P. indica* and *P. travancorica* and exclude three species from the National Flora, namely *P. vatsavayae* (\equiv *Hybanthus vatsavayae*), *P. stellarioides* (\equiv *H. stellarioides*) and *P. puberula* (\equiv *H. puberulus*). Detailed notes are provided.

Keywords

Malpighiales; *Pigea*; *Pombalia*; Taxonomy

Introduction

The genus *Hybanthus* Jacq. was published in 1760 (1), to which Saint-Hilaire (2) and Müeller (3) merged *Ionidium* Vent. It is the third largest genus of the family Violaceae, comprises ca. 125 species (4). Thereafter, many acceptable refinements were proposed, resulting in the disintegration of this large genus and the establishment of a few new genera, as well as the reinstatement of some. In India, Banerjee & Paramanik (5) and Kundu (6) reported only two species of *Hybanthus s.l.*, namely *H. enneaspermus* (L.) Muell. and *H. travancoricus* Melch. Reddy (7) described *H. vatsavayae* C.S. Reddy, Kamble et al. (8) described *Afrohybanthus indicus* S.K. Kamble & B.J. Patil and Ramana et al. (9), Sasi et al. (10) and Francisca et al. (11) reported *H. stellarioides* (Domin) P.I. Forst., *H. puberulus* M.G. Gilbert and *H. verticillatus* (Ortega) Baill. respectively from India. *Hybanthus enneaspermus*, *H. travancoricus*, *H. vatsavayae*, *H. stellarioides*, *H. puberulus* and *Afrohybanthus indicus* are now within the genus *Pigea* Ging. (12) and *H. verticillatus* is within *Pombalia* Vand. (13).

We present an updated conspectus of Indian *Pigea*, along with a discussion on observed issues in the reports of three species, resulting in the exclusion of *P. vatsavayae* (C.S. Reddy) P.I. Forst. (\equiv *Hybanthus vatsavayae*), *P. stellarioides* (Domin) P.I. Forst. (\equiv *H. stellarioides*) and *P. puberula* (M.G. Gilbert) P.I. Forst. (\equiv *H. puberulus*) from the National Flora.

Materials and methods

We revise the genus *Pigea* in India based on live and herbarium materials. The type and respective voucher specimens of the recorded members are critically evaluated for the validation of their occurrence in the country.

Taxonomy

Key to the Indian species of *Pigea*

1a. Plant shrubby, more than 1m tall
P. travancorica

1b. Plant herb, less than 75 cm tall2

2a. Corolla orange coloured; stipule up to 2.2 mm long
P. indica

2b. Corolla pink, purple, or orange coloured; stipule up to 4 mm
P. enneasperma

1. *Pigea enneasperma* (L.) P.I. Forst., *Austrobaileya* 11: 29 (2021).

≡ *Viola enneasperma* L., *Sp. Pl.* 2: 937 (1753); *Ionidium enneaspermum* (L.) Vent., *Jard. Malmaison* sub 27 (1803); *Hybanthus enneaspermus* F.Muell., *Fragm. (Mueller)* 10(85): 81 (1876); *Calceolaria enneasperma* (L.) Kuntze, *Revis. Gen. Pl.* 1: 41 (1891); *Afrohybanthus enneaspermus* (L.) Flicker, *Phytotaxa* 230(1): 47 (2015). **Lectotype:** Sri Lanka, Hermann s.n. in Vol. I, p. 19 of *Hb. Hermann* (BM!), designated by Grey-Wilson (14)).

Distribution: A very common weed in peninsular India.

Ecology: It is an adapted weed to survive in wastelands, industrial areas, lateritic plateaus, rock crevices, beaches, etc.

2. *Pigea indica* (S.K. Kamble & Patil) P.I. Forst., *Austrobaileya* 11: 31 (2021).

≡ *Afrohybanthus indicus* S.K. Kamble & Patil, *Phytotaxa* 252: 69-71 (2016). **Type:** India. Maharashtra: Satara district, Karad, Sadashivgad, On the hill slopes along rock margins and in rock crevices, ca. ± 700 m, 17°18'50.99" N, 74°13'32.47" E, July 2013, *Suhas Kamble* s. n. (holotype, BSI n.v., isotype, SUK, n.v.).

Distribution: Endemic to Maharashtra, Karnataka, and Andhra Pradesh.

Ecology: It prefers hill slopes, rock crevices, and lateritic areas for its growth.

3. *Pigea travancorica* (Bedd.) P.I. Forst., *Austrobaileya* 11: 32 (2021); *Ionidium travancoricum* Bedd., *Icon. Pl. Ind. Or. [Beddome]* 55 (1874); *Afrohybanthus travancoricus* (Bedd.) Flicker, *Phytotaxa* 230: 50 (2015). **Type:** India, Travancore, *Beddome* 320 (lectotype K000327683!, designated by Flicker & Ballard (15)).

Distribution: Endemic to Travancore hills (Agasthyamalai and Kalakkad Mundanthurai)

Ecology: It prefers undisturbed evergreen forest for its growth.

Note: Flicker & Ballard (15) designated a lectotype for this name using a well maintained specimen at K (barcode K000327683!). In the designation statement, they stated the type locality as 'Sri Lanka'. In fact, this species is endemic to the Travancore Hills, the southern end of the Western Ghats, India and it was definitely described by Beddome in 'Icon Plantarum India Orientalis' based on specimens from this location. This minor error is corrected here.

Excluded species

Reddy (7) described the species *Hybanthus vatsavayae* (as "*vatsavayii*") based on the collections from Nalgonda, Warangal and Khammam districts of Andhra Pradesh, India. The author did not provide any illustrations, but only a vague photograph of fruiting twig in the protologue. This image is inadequate to support its taxonomic identity. The description in the protologue is somewhat undigestible and many characteristics, such as "*inconspicuous flowers, caducous corolla and only two out of five stamens are fertile*", are contradictory to the generic circumstances of *Hybanthus* s. l. We could not trace any type materials of this name at MH as mentioned in the protologue and no one re-collected this species from anywhere. Ramana *et al.* (9) doubted that this species is closely allied to *H. stellarioides* and discussed the possibility of a formal reduction into synonymy. This doubt might be based on the vague image in the protologue, which somewhat resembles the fruit of *H. stellarioides*. Beyond a doubt, it is a poor call to merge it under *H. stellarioides*. This is a serious case and raises doubts about the existence of this species.

Hybanthus stellarioides is native to Australia and Papua New Guinea. Ramana *et al.* (9) reported this species in India based on the collection from Andhra Pradesh. Subsequently, Kamble *et al.* (16) and Kulkarni *et al.* (17) reported this species in Maharashtra and Karnataka respectively. Later, Kambale *et al.* (2016) reassessed the identity of the specimen reported from Maharashtra and confirmed some stable differences from *H. stellarioides* and then described as a novelty as *Afrohybanthus indicus*. Kambale *et al.* (8) stated that both *H. stellarioides* and *A. indicus* are disjunct, however, a clear statement on the identity of the remaining reports of *H. stellarioides* in India is lacking. Our critical analysis of the remaining reports (9, 17) confirmed that those are nothing but *A. indicus*, not *H. stellarioides*. We conclude that, there is no valid report and collection of *H. stellarioides* in India.

Gilbert (18) described *Hybanthus puberulus* M.G. Gilbert based on specimens from Ethiopia. According to the protologue, this species is allied to *H. ennaespermus* but differs by having a sub-shrubby habit, larger lip, and dense puberulous body including the capsule, as opposed to the mostly herbaceous habit, smaller lip and laxly hairy plant body with always glabrous capsule in *H. ennaespermus*. Gilbert (18) has given a fairly good note on his proposal of novelty. However, in the Indian context, all these mentioned characteristics can be seen as gradually varying in *H. ennaespermus*. There are plenty of intermediates we can see in India. Sasi *et al.* (10), Parthipan & Rajendran (19), Rajendran *et al.* (20), Parthipan *et al.* (21) and Deshmukh & Rathor (22) misinterpreted some Indian materials as *H. puberulus*, which were mainly based on the pubescence of capsule. We here exclude all these as *P. enneasperma* (= *H. enneasperma*) only.

Acknowledgements

VDN is grateful to the authorities of the Central University of Himachal Pradesh for their continuous encouragement during the work.

PTA & VNS are thankful to the Principal and the Head of the Department of PG and Research in Botany, Sanatana Dharma College, Alappuzha. We extend our thanks to the Director, Botanical Survey of India, for opening the way for us to consult various zonal herbaria under BSI.

Authors' contributions

VNS conceived the original idea for the work. PTA performed data collection, data analysis, voucher materials consultation and taxonomic identity confirmation of the specimens. VDN contributed to the voucher material collection, compiled the data, and took the lead in drafting the manuscript. All authors provided critical feedback and helped shape the research, data analysis, and compilation of the manuscript.

Compliance with ethical standards

Declaration: The authors declare that they do not have any conflict of interest.

Ethical Issues: None

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) didn't use any AI support.

References

- Jacquin NJB. *Hybanthus* Enumerado systematica plantarum Caribaeis 1760: (2): 17.
- Saint-Hilaire A.F.C.P. Violacées in tableau monographique des plantes de la flore du Brésil méridional appartenant au groupe (classe Br.) qui comprend les Droseracées, les Violacées, les Cistées et les Frankeniées. *Mém. Mus. Hist. Nat.* 1824:11
- Mueller F.J.H. *Fragmenta Phytographiae Australiae*. 1876; 10 (83)
- Ballard Jr. HE, Paula Souza J, Wahlert GA. Violaceae. In: Kubitzki, K. (Ed.) *The families and genera of vascular plants, Volume XI Flowering Plants. Eudicots. Malpiales*. Springer-Verlag, Berlin. 2014; 303-22. https://doi.org/10.1007/978-3-642-39417-1_25
- Banerjee SP, Pramanik BB. Violaceae. In: Sharma BD & Balakrishnan NP. (Ed.) *Flora of India. Vol. 2. Papaveraceae - Caryophyllaceae*. Botanical Survey of India, Calcutta. 1993; 343-45.
- Kundu SR. A synopsis of Violaceae in the Indian subcontinent: its distribution and endemism. *Roczniki Akademii Rolniczej w Poznaniu. Botanika-Steciana*. 2007;11.3 - 8
- Reddy CS. *Hybanthus vatsavayii* (Violaceae): A new species from Andhra Pradesh, India. *J. Econ. Taxon. Bot.* 2001; 25: 219 - 20.
- Kamble SK, Forster PI, Patil BJ. *Afrohybanthus indicus* (Violaceae): a new species from Maharashtra, India. *Phytotaxa* 2016; 252 (1): 069-072. <https://doi.org/10.11646/phytotaxa.252.1.7>
- Ramana MV, Prasanna PV, Venu P. *Hybanthus stellarioides* (Violaceae), a new record for India. *Rheedea*. 2011; 21 (1): 10-12.
- Sasi R, Sivalingam R, Rajendran A. (2011) *Hybanthus puberulus* M. Gilbert. (Violaceae) - A new record for India. *ZOO's PRINT*. 2011; 26 (12)
- Francisca G, Rajendran A, Parthipan M. *Hybanthus verticillatus* (Ortega) Baill.- Violaceae : a new record for India. *ZOO's PRINT* 2013; 28(3)
- Forster PI. Reinstatement of *Pigea* Ging., an earlier generic name for the spade flowers previously included in *Afrohybanthus* Flicker (Violaceae). *Austrobaileya* 2021; 11: 26-33. <https://doi.org/10.5962/p.366370>
- Paula-Souza J, Ballard HE Jr. Re-establishment of the name *Pombalia* and new combinations from the polyphyletic *Hybanthus* (Violaceae). *Phytotaxa* 2014; 183: 1-15. <https://doi.org/10.11646/phytotaxa.183.1.1>
- Grey-Wilson C. Violaceae. In: Pothill RM. (Ed.) *Flora of Tropical East Africa*. A.A. Balkema, Rotterdam. 1986; 27-37.
- Flicker BJ, Ballard Jr. HE. (2015) *Afrohybanthus* (Violaceae), a new genus for a distinctive and widely distributed Old World hybanthoid lineage. *Phytotaxa* 2015; 230 (1): 39-53. <https://doi.org/10.11646/phytotaxa.230.1.3>
- Kamble SK, Pawar UR, Madane AN, Patil BJ. *Hybanthus stellarioides* (Domin) P.I. Forst. (Violaceae), a new distributional record for Maharashtra. *Zoo's Print* 2014; 29: 28-29.
- Kulkarni LC, Bhat P, Hedge GR. *Hybanthus stellarioides* (Domin) P.I. Forster (Violaceae) - a new record for Karnataka. *Zoo's Print* 2016;31: 6-7
- Gilbert MG. Notes on Violaceae from Ethiopia. *Nord. J. Bot.* 1992; 12: 689-693.
- Parthipan M, Rajendran A. Distribution of *Hybanthus puberulus* M. Gilbert. (Violaceae) - A new record for Karnataka. *ZOO's PRINT* 2013;27(12)
- Rajendran A, Parthipan M, Sasi R. Extended distribution of *Hybanthus puberulus* M. Gilbert. (Violaceae) in India. *ZOO's PRINT* 2013; 28(12)
- Parthipan M, Rajendran A, Kousalya L, Bai N. *Hybanthus puberulus* M. Gilbert (Violaceae) - a new record for Andhra Pradesh. *ZOO's PRINT* 2016; 31(4)
- Deshmukh UB, Rathor OS. *Afrohybanthus puberulus* (M. Gilbert) UB Deshmukh (Violaceae) distributional plant record from Maharashtra state, India. *Bioinfolet* 2019; 16(3): 204-05