Species

To Cite:
Chowdhury S. *Didymoplexis pallens* (Orchidaceae) in Chintamoni Kar Bird Sanctuary: A reappraisal of its occurrence and distribution in West Bengal, India. *Species* 2025; 26: e38s3171
doi: https://doi.org/10.54905/disssi.v26i78.e38s3171

Author Affiliation:
Dept of Zoology, MUC Women's College, Burdwan, West Bengal, India

***Corresponding Author**:
Dept of Zoology, MUC Women's College, Burdwan, West Bengal, India;
Email: wildlifesc@gmail.com
ORCID: https://orcid.org/0000-0003-0940-9809

Peer-Review History
Received: 27 January 2025
Reviewed & Revised: 18/February/2025 to 29/July/2025
Accepted: 07 August 2025
Published: 18 August 2025

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

Species
pISSN 2319–5746; eISSN 2319–5754

Didymoplexis pallens (Orchidaceae) in Chintamoni Kar Bird Sanctuary: A reappraisal of its occurrence and distribution in West Bengal, India

Soumyajit Chowdhury*

ABSTRACT

Didymoplexis pallens Griffith, one of the most unique and rarely observed terrestrial, leafless and mycoheterotrophic orchids was recorded from the Chintamoni Kar Bird Sanctuary in South 24 Parganas district of West Bengal, India on 12 June, 2018. Three plants were recorded on the forest floor of the sanctuary, amidst dense undergrowth with scattered bamboo thickets nearby. Each plant was found to have small white terminal flowers, with a single one bearing fruit bodies (capsules) also. This is the primary report of the occurrence of the species from the sanctuary; and compared to its previous occasional reports from the state, the species have been found to extend its distribution southwards into the greater deltaic part of Sundarbans Biosphere Reserve. D. pallens and its associated habitats are highly threatened due to rapid suburban sprawl around Kolkata, resulting in habitat modification to a greater extent.

Keywords: Chintamoni Kar Bird Sanctuary; *Didymoplexis pallens*; Mycoheterotroph; Orchid; West Bengal

1. INTRODUCTION

The genus *Didymoplexis* Griffith is a primitive and small tropical genus of leafless, mycoheterotrophic and terrestrial orchids (Orchidaceae: Epidendroideae). The genus comprises 20 accepted species distributed over Tropical and South Africa to West Pacific (GBIF Secretariat, 2023; Govaerts, 2023). India hosts only three species of *Didymoplexis*, namely *D. pallens* Griffith, *D. seidenfadenii* C.S. Kumar and Ormerod, and *D. himalaica* Schlechter (Chowdhery et al., 2007; Jalal and Jayanthi, 2013; Misra, 2019; Singh et al., 2019). *D. pallens* was first described by William Griffith in 1844 from specimens collected from a bamboo forest in Serampore in the Hooghly district in the Indian state of West Bengal (Griffith, 1844), situated close to Kolkata metropolis. This species was later reported from few other locations of West Bengal - mostly Howrah and also from Hooghly, Jhargram and Nadia districts (Chowdhery et al., 2007); as well as from other states of India, viz. Andhra Pradesh, Arunachal Pradesh, Assam, Meghalaya, Goa, Karnataka, Kerala, Odisha, Sikkim and Tamil

Nadu (Rao et al., 1979; Chowdhery et al., 2007; Efloraofindia, 2024). On a global scale, the species is reported from Afghanistan, Australia, Bangladesh, Borneo, China, Chinese Taipei, Christmas Is., Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Niue, Papua and New Guinea, Philippines, Sri Lanka, Thailand, Tonga, Vanuatu and Vietnam (GBIF Secretariat, 2023; POWO, 2023).

2. MATERIALS AND METHODS

A small population of previously unreported terrestrial orchid was recorded on the forest floor of Chintamoni Kar Bird Sanctuary (22°42′N, 88°40′E) on 12 June, 2018. These orchids were found amidst dense undergrowth and scattered bamboo thickets, and were photographed (using Nikon D80 and Tamron 90 mm macro lens f 2.8) for documenting their habitat and diagnostic features. However, due to their apparent scarcity and lack of prior records (in accordance with scientific literatures and personal observations) in the sanctuary, no specimens were collected during the study so as to conserve this unique find. Situated in the South 24 Parganas district of West Bengal, Chintamoni Kar Bird Sanctuary spans over a compact 17.19 acres, characterized by its mixed deciduous forests, with scattered bamboo stands and substantial undergrowth (Forest Branch, 2005; Chowdhury, 2022). To the west, the preserve is delimited by the Adi Ganga Drainage Canal (Figure 1). This area is part of the "Lower Gangetic Plains (7B)" Biotic Province under the Biogeographic Zone 7: Gangetic Plains (Rodgers and Panwar, 1988).

Figure 1. Map of occurrence of *Didymoplexis pallens* in Chintamoni Kar Bird Sanctuary, South 24-Parganas district, West Bengal, India.

3. RESULTS AND DISCUSSION

Based on photographic evidence and referencing taxonomic keys and original descriptions (Rao et al., 1979; Chowdhery et al., 2007), all three individual plants recorded in the sanctuary were identified as the terrestrial mycoheterotrophic orchid *Didymoplexis pallens* Griffith. The observed plants were small, erect, and leafless herbs, measuring 9-11 cm in height. Each plant was found in its flowering stage. A single fruiting plant was recorded, holding two fruit bodies along with a terminal flower. The orchid species was overall characterized by (i) a single aerial stem, originating from the branched subterranean tuberous roots; (ii) leafless, slender, glabrous and pale yellowish or reddish-brown coloured stem; (iii) a simple scape bearing a terminal and glabrous raceme of small white flowers opening singly in succession, with slender and bracteate peduncle; (iv) delicate, white, campanulate and bilabiate flowers with basally fused sepals and petals forming a 5-toothed tube that did not open widely; (v) a cuneate labellum with incurved margins having yellow, centrally-arranged callus divided into 2-3 rows that serve as a landing place for the insect pollinators; (vi) brownish fruits in the form of erect, cylindric-fusiform and dehiscent capsules formed at the end of very long pedicels [Figure 2(b-d)].

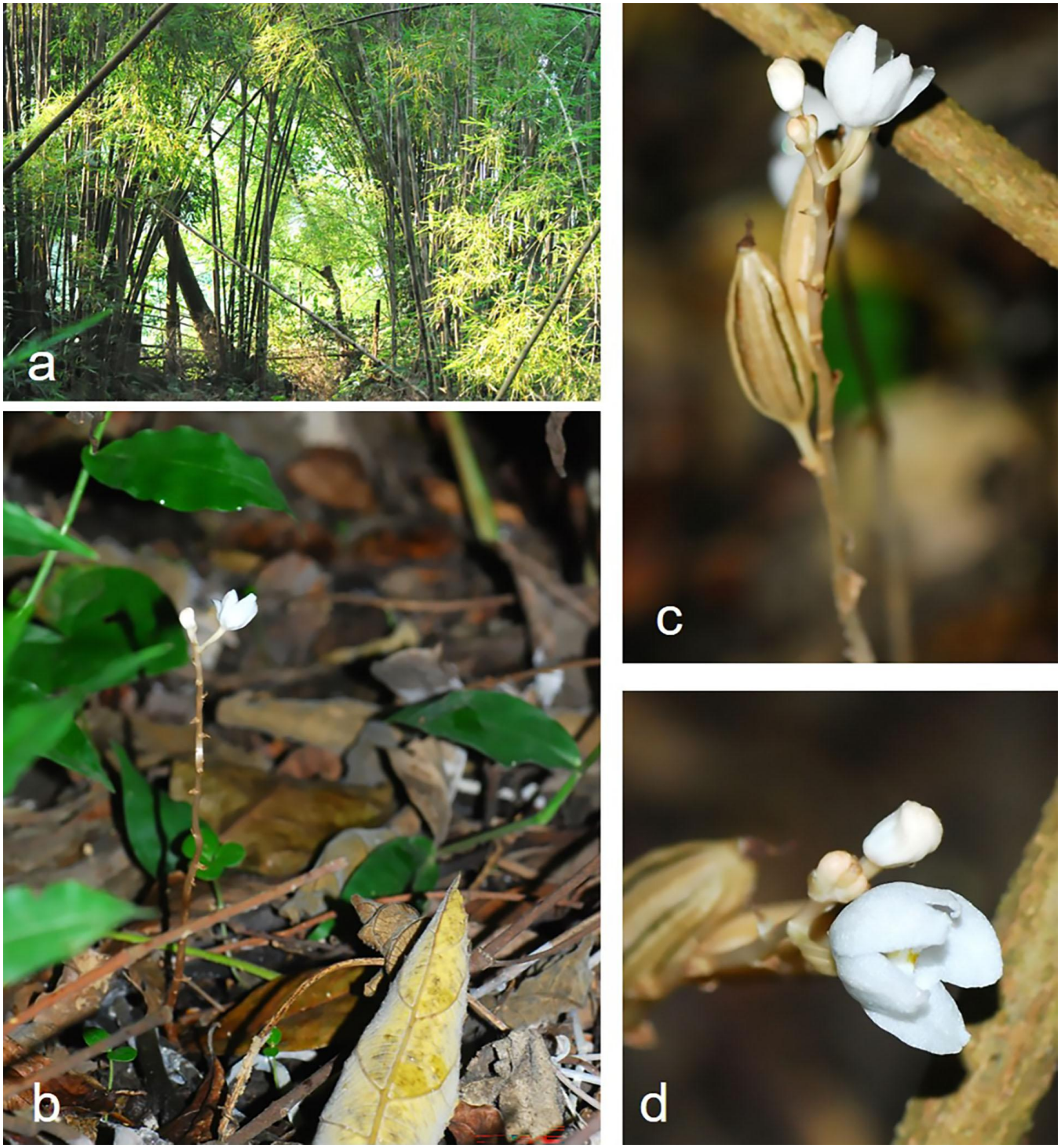

Figure 2. *Didymoplexis pallens*: (a-b) the habitat and habit amidst the bamboo thickets, forest undergrowth and leaf litter, (c) fruiting plant with a single aerial stem, and (d) open flower.

The present article highlights the first occurrence report of the rare *Didymoplexis pallens* from Chintamoni Kar Bird Sanctuary in West Bengal, further adding to its known distribution range – moving further south into the district of South 24 Parganas, closer to the greater deltaic part of Sundarbans Biosphere Reserve. *D. pallens* thus forms a valuable new addition to the known list of angiosperms from the sanctuary (Mukherjee, 1994; Chowdhury, 2022).

This terrestrial and ephemeral orchid species particularly grows aboveground during the rainy seasons for reproductive purposes, demonstrated by flowering and fruiting individuals. In terms of phytogeographical affinity, it shows strong affinity with 'Philippines elements' which includes species from Malaysia, Australia, New Guinea, Philippines, Japan and other Asiatic regions (Mitra, 2021) – thus supporting the possibility of migration, establishment and naturalization of the species in this region from the areas mentioned above. The preferred habitat for the species is damp and well-shaded forest floor, with scattered bamboo thickets and nearby water sources. The leaf litter, with predominance of bamboo leaves, plays a vital role in the occurrence of this species - especially during the wet seasons - by modifying the amount of organic matter and moisture level in soil (Garvita et al., 2022). Leafless and achlorophyllous *D. pallens* illustrates a unique pathway of gaining carbon from the aboveground non-living biomass in a forest ecosystem by maintaining mycoheterotrophic associations with free-living saprotrophic (SAP) fungi. *D. pallens* is a fully mycoheterotrophic plant (MHP) species that remains associated with free-living leaf-litter decaying basidiomycete fungi, mostly belonging to the Marasmiaceae family in order Agaricales. Such topsoil-colonizing fungal species are found to decompose plant leaf litter and other soil organic matter, thereby providing the carbon to the SAP-MHPs (Ogura-Tsujita et al., 2021). The presence of such orchid species among the leaf-litter is a clear indication of a healthy carbon and nutrient cycle operating in a forest ecosystem through the decomposition of plant debris and leaf-litter.

D. pallens is highly threatened in the wild primarily because of habitat deterioration under the current scenario of rapid modification of forests and favourable habitat structure (Garvita et al., 2022). It is listed under Appendix II of CITES (UNEP-WCMC (Comps.), 2021). In West Bengal, it is a much rarely encountered species in the wild (Mitra, 2021). The preferred habitats for this orchid, which includes the bamboo thickets (Figure 2a) once abundant in and around the sanctuary, are now extensively modified and even destroyed at an alarming rate. This directly results from improper habitat management within the sanctuary and rapid suburban sprawl surrounding it.

The key conservation imperatives concerning D. pallens in West Bengal include:

i. Extensive exploration: A detailed field survey throughout its known and preferred habitat range in West Bengal is crucial to map its habitat and population status;
ii. Survey timing: The species appears aboveground only during the wet seasons, with its flowering and fruiting stages for reproductive purposes, as revealed from personal field surveys and previously reported scientific articles (Chowdhery et al., 2007; Garvita et al., 2022). Therefore, field surveys to assess the aforementioned issues should be meticulously planned for the monsoon months in West Bengal, especially targeting its preferred microhabitats.
iii. Habitat management: The ultimate goal is to bring all the identified microhabitats under a definite management scheme as a conservation priority. Moreover, a robust conservation plan is an urgent need for places like the Chintamoni Kar Bird Sanctuary and other such variously protected "green islands" both within and around Kolkata in the present situation of rapid urban encroachment. Conserving such rare floristic jewels and their microhabitats is essential to sustain the intricate food web encompassing such life forms in such rapidly vanishing habitats.

Acknowledgment

I express my special thanks to Dr. Swarnendu Mondal of Department of Botany, MUC Women's College, Burdwan for useful suggestions and providing relevant literature records in support of the present report.

Authors Contributions

Soumyajit Chowdhury contributed solely to the preparation of the entire manuscript, including data collection and photographs related to the habit and habitat of *Didymoplexis pallens* in CKBS, West Bengal.

Funding

The study has not received any external funding.

Conflict of Interest

The author declares that there are no conflicts of interests.

Informed consent

Not applicable.

Ethical approval & declaration

In this article, as per the plant regulations followed in the MUC Women's College, Burdwan, West Bengal, India; the author observed the occurrence and distribution of *Didymoplexis pallens* (Orchidaceae) in Chintamoni Kar Bird Sanctuary. The ethical guidelines for plants & plant materials are followed in the study for species collection & identification.

Data and materials availability

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

REFERENCES

1. Chowdhery HJ, Bhattacharjee A, Agarwala DK. Didymoplexis Griff. – A rare and Interesting Genus of Saprophytic Orchid in India. Indian Journal of Forestry 2007; 30: 113-120.
2. Chowdhury S. First report on the occurrence of medicinally important Yellow Ground Star Curculigo orchioides Gaertn. from Chintamoni Kar Bird Sanctuary, South 24 Parganas, West Bengal. Bionotes 2022; 24: 322-323.
3. Efloraofindia. Didymoplexis pallens Griff., [online]. 2023 [Accessed 10 March 2024]. Available from: https://efloraofindia.com/efi/didymoplexis-pallens
4. Forest Branch. Notification for declaration of Chintamoni Kar Bird Sanctuary [Internet]. Kolkata: Government of West Bengal, Forest Department; 2005. Notification No.: 4170-For. [dated 05.10.2005]. Available from: https://wiienvis.nic.in/userlogin.aspx?Page=west_bengal_chintamoni_kar%20wls.pdf&file=pdf
5. Garvita RV, Tyas KN, Zulkarnaen RN, Wawangningrum H, Latifah D. Characteristics of Land Suitability for Didymoplexis pallens Griff. (Orchidaceae) at Bogor Botanic Gardens. International Journal of Conservation Science 2022; 13: 1393-1400.
6. GBIF Secretariat. GBIF Backbone Taxonomy, Checklist Dataset. [online]. Copenhagen: Denmark; 2023 [Accessed 10 March 2024]. Available from: https://www.gbif.org (doi: 10.15468/39omei)
7. Govaerts R. World Checklist of Monocotyledons Database in ACCESS: 1-71827. The Board of Trustees of the Royal Botanic Gardens: Kew; 2003 [Accessed 10 March 2024]. Available from: https://wcsp.science.kew.org
8. Griffith W. On some plants, mostly undescribed, in the H.C. Botanic Gardens, Calcutta. Calcutta Journal of Natural History 1843; 4: 375-390 (with plate no. XVII).
9. Jalal JS, Jayanthi J. Current status and distribution of mycoheterotrophic orchids of India. Richardiana 2013; XIII-janvier: 137-155.
10. Misra S. Orchids of India - A Handbook, Bishen Singh Mahendra Pal Singh, Dehra Dun, 2019; 652.
11. Mitra S. Diversity of the Orchids Flora of West Bengal, India. Plant Archives 2021; 21: 740-756.
12. Mukherjee K. Narendrapur Wildlife Sanctuary, Prakriti Samsad, Calcutta, 1994; 14.
13. Ogura-Tsujita Y, Yukawa T, Kinoshita A. Evolutionary histories and mycorrhizal associations of mycoheterotrophic plants dependent on saprotrophic fungi. J Plant Res. 2021: 134: 19–41.
14. POWO. Didymoplexis pallens Griff. [online]. The Board of Trustees of the Royal Botanic Gardens: Kew; 2023 [Accessed 10 March 2024]. Available from: https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:629745-1
15. Rao AS, Rathore SR, Srivastava SC. Didymoplexis pallens Griff. – Rediscovery of a rare, saprophytic orchid in the Indian Botanic Garden, Howrah. Bull. Bot. Surv. India 1979; 21: 151-155.
16. Rodgers WA, Panwar HS. Planning a Wildlife Protected Area Network in India. Volume 1: The Report, Wildlife Institute of India, Dehradun, 1988; 341.
17. Singh SK, Agarwala DK, Jala, JS, Dash SS, Mao AA, Singh P. Orchids of India - A pictorial guide, Botanical Survey of India, Kolkata, 2019: 518.
18. UNEP-WCMC (Comps.). Checklist of CITES species. [online]. CITES Secretariat: Geneva and UNEP-WCMC: Cambridge; 2021 [Accessed 04 April, 2024]. Available from: https://checklist.cites.org