



New record of the ghost orchid *Epipogium roseum* (D. Don) Lindl. from Dulung Reserve Forest, Lakhimpur, Assam, India

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Abstract

This paper documents the first recorded occurrence of the ghost orchid *Epipogium roseum* (D. Don) Lindl. in the Dulung Reserve Forest, Assam, India. *E. roseum*, a leafless, myco-heterotrophic, lack of chlorophyll, terrestrial orchid, has a broad pantropical distribution but is rarely recorded in northeastern India. The species was sighted during a floristic survey in 2024. This finding extends the known distribution of the species within the Upper Assam region and emphasizes the ecological significance of the Dulung Reserve Forest as a microhabitat for rare terrestrial orchids.

Keywords: Orchid, *Epipogium roseum*, Dulung Reserve Forest, Lakhimpur, biodiversity hotspot

Introduction

Orchids are one of the largest groups of flowering plants and are globally distributed (Chase *et al.*, 2015) ^[1]. Orchidaceae is most diverse flowering plant family with approximately 25,000 species worldwide, comprising 10% of all angiosperms (Cribb, Kell, Dixon, & Barrett, 2003) ^[3]. In India, Orchidaceae is one of the largest family amongst higher plant also. India accounts for only 7% of world's orchid genetic diversity contributed 1300 species in 184 genera and many more are discovered year after year (ICAR). Out of which 900 species (nearly 69%) are reported from North East India. About 150 species are endemic to North East India (De and Singh, 2015) ^[4]. The distribution pattern in India reveals five major phytogeographical regions that is North Eastern Himalayas, Peninsular region, Western Himalayas, Western ghat and Andaman and Nicobar Islands. Approximately 60% of Indian origin species are epiphyte and rest are terrestrial, some species also adopted to saprophytic mode of life. Certain genera like *Cymbidium* and *Liparis* have both epiphytic as well as terrestrial species. Due to varied climatic conditions, North Eastern India contain large group of temperate and sub-tropical orchids. The diversity is also so large that there are terrestrial, epiphytic and saprophytic orchids. Amongst North East India states, Arunachal Pradesh has maximum number of orchids i.e. 550 species with 126 genera. In Assam it is represented by 293 species with 81 genera. (National Research Center for Orchids, Sikkim).

Assam, in Northeast India, is recognized for its rich orchid flora, with diverse species reported across evergreen and tropical forests of the region. Various surveys in the reserve forests of Assam have documented numerous orchid taxa, reflecting unique habitats and micro-climatic conditions supportive of rare orchids. Among these, mycoheterotrophic orchids, which lack chlorophyll and depend entirely on fungal associations for nutrients, are particularly elusive. *E. roseum* is widely distributed across tropical Africa, Asia, and Australia, but its sightings in Assam are sporadic due to its short flowering cycle (often lasting only a few days) and specific habitat requirements (decaying organic matter in high-humidity forests).

Materials and methods

Study site

The present survey was carried out in Dulung Reserve Forest, located in the Lakhimpur district of Assam, characterized by tropical semi-evergreen and moist deciduous vegetation. It serves as a vital corridor for biodiversity between the plains of Assam and the foothills of Arunachal Pradesh. The Dulung Reserve Forest is a critical 55-sq-km biodiversity hotspot. It serves as a vital corridor for elephants, connecting Arunachal habitats to Assam, and is home to the endemic *Mesua assamica* (Prain) Kosterm. (Sia nahor). However, detailed botanical inventories of orchid diversity in Dulung are limited. The current record of *E. roseum* represents an important addition to the documented flora of this reserve.

Methodology

Field explorations were conducted during the monsoon season of 2024, when *E. roseum* typically emerges. Habitat conditions (soil type, canopy cover, humidity, decaying wood presence) were recorded for each observation site. Specimens were photographed and, where permitted, collected for identification. Specimen identification was carried out using standard taxonomic literature (e.g., Flora of Assam, Orchids of India and Orchids of Arunachal Pradesh) and confirmed with herbarium comparisons and botanical literature. Morphological measurements were taken *in-situ* to avoid disturbing the fragile subterranean rhizomes.

Results and Discussion

During surveys of Dulung Reserve Forest, the ghost orchid *E. roseum* was observed flowering at Latitude 27.449518°, Longitude 94.206742° on 28th April 2024. This occurrence represents a new regional record for the Dulung Reserve Forest and contributes to the expanding knowledge of terrestrial orchid diversity of Assam.

Taxonomic details

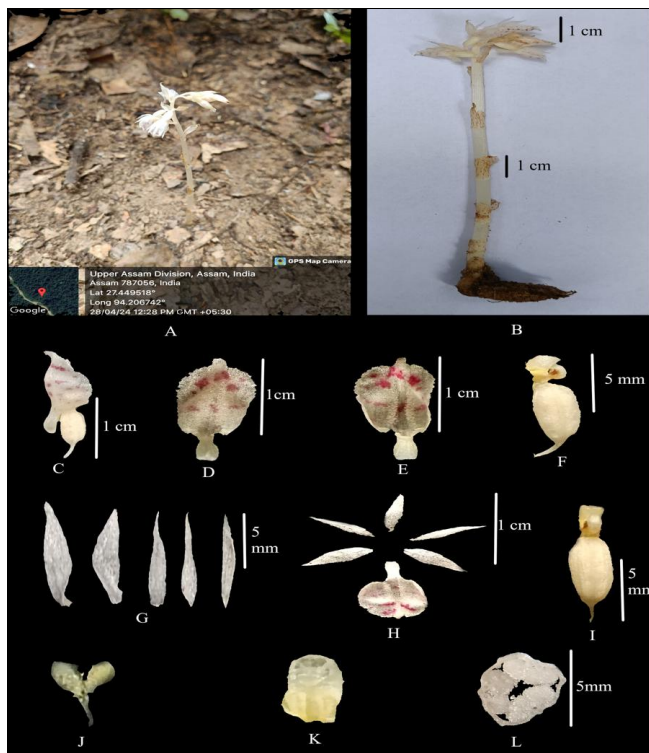


Fig 1: A- Ghost orchid in natural habitat; B- Complete plant with rhizome; C- Side view of flower; D- Front view of labellum; E- Back view of labellum; F and I- Flower without tepal; G- Tepals without labellum; H- Tepals with labellum; J- Pollinia; K- Anther cap; L- Transverse section of ovary

Description

Habit: Aphyllous (leafless), succulent terrestrial herb.

Rhizome: Tuberous, horizontal, and fleshy.

Inflorescence: Erect, hollow, pale yellow to brownish-white scape, 15–40 cm tall.

Flowers: Drooping, cream-colored with pinkish or purple spots.

Labellum: Concave, ovate-lanceolate, with a short, bulbous spur at the base.

Ecology and Habitat

The species was found growing in a shaded, high-moistured area with a thick layer of leaf litter and decaying wood. It was observed in a small colony of seven individuals. The timing of the bloom coincided with the first heavy rains of the monsoon, a characteristic trait of this ephemeral species.

Table 1: Features and observations of *E. roseum*

Features	Observation
Flowering Period	April – September
Altitude	~130m Mean Sea Level
Associated Flora	<i>Chukrasia tabularis</i> , <i>Mesua ferrea</i> , and various ferns
Abundance	Rare

While *E. roseum* is known from widespread regions of tropical Asia, including other parts of India, its documentation from Dulung underscores the rich yet underexplored orchid biodiversity of forests of Assam. The species has been recorded in tropical evergreen and moist forest habitats, where sufficient moisture and fungal

symbionts enable its myco-heterotrophic life cycle. The life cycle of *E. roseum* is closely tied to forest health; its myco-heterotrophic nature means it depends on soil mycorrhizae, reflecting intact forest floor conditions, the ephemeral nature of its above-ground appearance after rains suggests that seasonality and microclimate strongly influence detectability. Terrestrial orchids like *E. roseum* are often vulnerable to habitat disturbance, including logging, forest fragmentation, and alteration of soil fungal communities. The new record in Dulung Reserve Forest suggests the need for detailed orchid inventories across more seasons, conservation planning to maintain forest integrity and fungal networks, public and local community awareness about the uniqueness of such findings. The reserve forests of Assam already exhibit high orchid diversity, with rapid surveys in other protected areas (e.g., Kaziranga National Park) documenting dozens of orchid species.

Conclusion

The first record of *E. roseum* in Dulung Reserve Forest contributes to the floristic knowledge of orchid flora of Assam and highlights the ecological significance of the site for rare and specialized plant species. Continued botanical surveys and conservation measures are essential to capture the region's full biodiversity and protect these ecologically sensitive taxa. As a myco-heterotrophic species, its presence is a strong indicator of a healthy fungal network and undisturbed soil organic matter. Protection of this habitat is crucial, as the species is highly sensitive to changes in forest canopy cover and soil composition.

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