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Orchids of Telangana, India: An Annotated Checklist

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ABSTRACT: This present paper represented by an updated checklist of orchid species documented from the state of Telangana, India, based on a synthesis of herbarium collections, field observations and published literatures. A total of 35 orchid species belonging to 16 genera are enumerated in this communication, with detailed annotations including habit, phenology and occurrence. The checklist reveals a diverse orchid flora, comprising of 24 terrestrial (including 01 cultivated) and 11 epiphytic species. *Habenaria* Willd. is the most dominant genus with 10 species, followed by *Eulophia* R.Br. with 06 species. Several species, including *Aerides multiflora* Roxb., *Crepidium versicolor* (Lindl.) *Eulophia graminea* Lindl., *Habenaria panigrahiana* S. Misra, *Nervilia concolor* (Blume) Schltr., *Peristylus goodyeroides* (D.Don) Lindl. and *Zeuxine strateumatica* (L.) Schltr., are identified as rare within the state, while *Acampe praemorsa* (Roxb.) Blatt. & McCann and *Vanda tessellata* (Roxb.) Hook. ex G.Don are noted as common and distributed widely.

Keywords: Checklist, Conservation, Orchids, Telangana, Threats.

INTRODUCTION

Orchids (family Orchidaceae) represent one of the largest and most diverse families of flowering plants, known for their intricate floral morphology and ecological adaptations (Dressler, 1993). On World wide the family Orchidaceae is represented by approximately 28,484 species under 850 genera (Govaerts *et al.*, 2017), whereas, the India harbours around 1,256 species belonging to 155 genera, with 307 endemics (Singh *et al.*, 2019). They play a crucial role in ecosystem dynamics and are highly valued for their aesthetic appeal. Floristic studies, particularly those focused on regional checklists, are essential for understanding species distribution, diversity patterns, and conservation needs. Telangana, a state in southern India, possesses a diverse range of habitats that potentially support a rich orchid flora. However, comprehensive documentation of the orchid diversity in this region has been limited. This study aimed to provide an updated annotated checklist of orchids in Telangana, based on a thorough review of available data.

MATERIALS AND METHODS

A. Study Area

Telangana, situated in peninsular India between 15°50' and 19°55' N latitude and 77°14' and 80°00' E longitude, presents a diverse landscape and climate, influencing its rich biodiversity (Fig. 1). The state is characterized by an extensive plateau with an average elevation of 400 meters, segmented into three erosional surfaces, contributing to varied ecological niches. Drained by the Godavari and Krishna rivers, Telangana experiences a semi-arid climate, with hot summers reaching 45°C and a monsoon season delivering approximately 755 mm of rainfall. Geologically, Telangana showcases formations ranging from ancient Dharwar schists to recent alluvium, with the Archaean gneissic and granite complex dominating. The region is rich in mineral resources, including coal, limestone, and iron ores. Soil types are diverse, encompassing red, black, and laterite soils, each supporting distinct vegetation patterns (Pullaiah, 2015). The dominance of the Godavari and Krishna river systems, along with numerous waterfalls, contributes to the hydrological diversity of the state. Forests cover 24.69% of Telangana's geographical area, primarily reserved forests, with higher concentrations in northern and eastern districts (ISFR, 2023). The vegetation is classified into Tropical Moist Deciduous, Southern Dry Deciduous, Northern Mixed Dry Deciduous, Dry Savannah, and Tropical Scrub Forests, reflecting the varied climatic and edaphic conditions. This heterogeneity in topography, climate, geology, and vegetation provides a diverse habitat for a variety of flora and fauna, making Telangana a significant region for biodiversity studies (Reddy and Reddy 2016). The interplay of these environmental factors shapes the

distribution and composition of plant communities, including the orchid flora, which is the focus of this study.

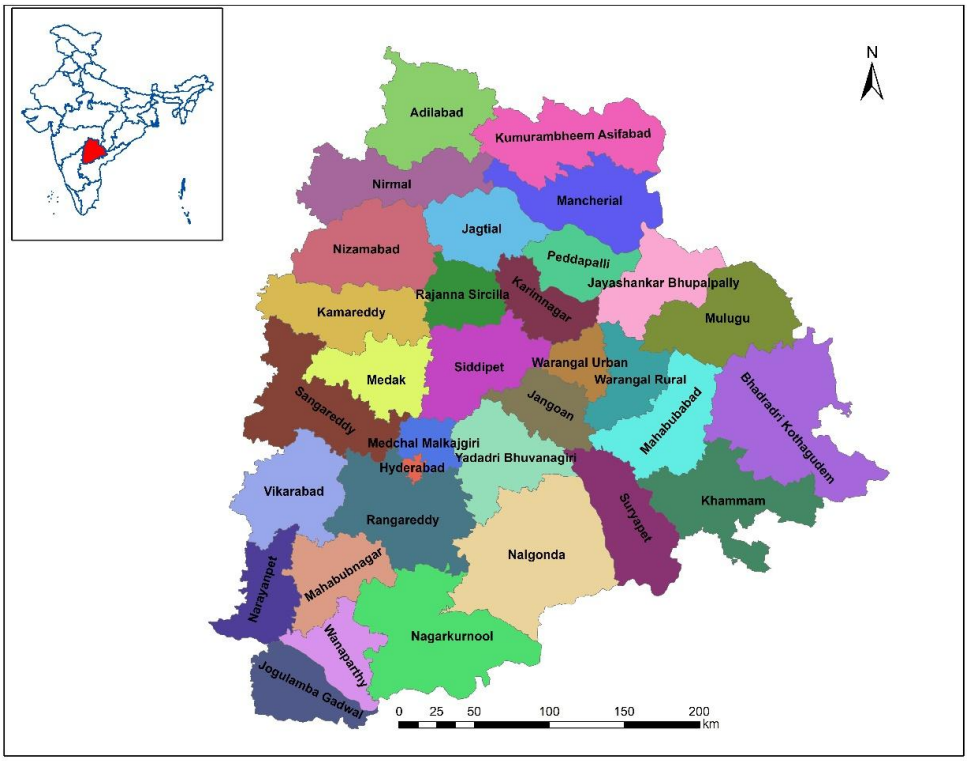


Fig. 1. Study area map- Telangana State.

B. Data Collection and Analysis

This checklist was compiled through a comprehensive review of existing data sources, including:

- Herbarium Collections: Specimens housed in regional and national herbaria were examined to verify species identification and distribution.
- Field Observations: Field surveys were conducted across various habitats in Telangana to document orchid occurrences and gather information on their phenology and habit.
- Research Publications: Published literatures, including floristic surveys, taxonomic revisions, and regional floras, was reviewed to compile a comprehensive list of orchid species reported from the state (Reddy *et al.*, 2006; Pullaiah, 2015; Reddy and Reddy 2016; Raju *et al.*, 2020; Asalla *et al.*, 2023).

Species identification was based on standard taxonomic literature and expert consultation (Mishra *et al.*, 2008; Singh *et al.*, 2019; Agarwala *et al.*, 2023). Nomenclature of the species is updated as per ICN algae, fungi, and plants (Shenzhen Code) (Turland *et al.*, 2018; POWO, 2024). The checklist includes information on the scientific name, habit (terrestrial or epiphytic), flowering and fruiting period and occurrence within Telangana.

RESULTS AND DISCUSSION

The present study documented 35 orchid species belonging to 16 genera in Telangana (Table 1). The orchid flora exhibited a mix of terrestrial (24 species including 01 cultivated) and epiphytic (11 species) habits (Fig. 2), reflecting the diverse habitats present in the State (Table 1 & Plate 1 & 2). *Habenaria* Willd. emerged as the most dominant genus, comprising 10 species, followed by *Eulophia* R.Br. with 06 species (Fig. 3). This dominance aligns with general trends observed in other tropical and subtropical regions of India, where these genera are frequently well-represented.

District-Wise Analysis

- Dominant Districts for Orchid Diversity:

— Khammam: This district appears to be a hotspot for orchid diversity, hosting a wide variety of species [*Acampe praemorsa* (Roxb.) Blatt. & McCann, *Aerides multiflora* Roxb., *Coelogyne pallida* (Lindl.) Rchb.f., *Crepidium versicolor* (Lindl.) Singh *et al.* (2019) *Cymbidium aloifolium* (L.) Sw., *Dendrobium herbaceum* Lindl., *Eulophia epidendraea* (J.Koenig ex Retz.) C.E.C. Fisch, *Nervilia concolor* (Blume) Schltr. and *Habenaria ramayyana* Ram.Chary & J.J. Wood etc.].

— Nagarkurnool: Also shows significant diversity, particularly for terrestrial *Habenaria* Willd. Species (*Habenaria hollandiana* Santapau, *Habenaria marginata* Colebr., *Habenaria panigrahiana* S. Misra, *Habenaria plantaginea* Lindl.). Other orchids are *Dendrobium macrostachyum* Lindl., *Eulophia picta* (R.Br.) Ormerod, *Eulophia recurva* (Roxb.) M.W.Chase, Kumar & Schuit., *Liparis deflexa* Hook.f. and *Peristylus goodyeroides* (D.Don) Lindl. etc.

— Adilabad: Supports a mix of epiphytic and terrestrial orchids [*Acampe praemorsa* (Roxb.) Blatt. & McCann,

Habenaria ramayyana Ram.Chary & J.J.Wood, *Habenaria roxburghii* Nicolson, *Vanda tessellata* (Roxb.) Hook. ex G.Don, *Vanda testacea* (Lindl.) Rchb.f. and *Zeuxine strateumatica* (L.) Schltr.].

• Restricted Distribution:

— Species with single-district occurrence: *Aerides multiflora* Roxb. in Khammam, *Dendrobium macrostachyum* Lindl. In Nagarkurnool, *Eulophia flava* (Lindl.) Hook.f. in Komurambheem Asifabad.

The presence of rare species such as *Aerides multiflora* Roxb., *Crepidium versicolor* (Lindl.) Singh *et al.* (2019) *Eulophia graminea* Lindl., *Habenaria panigrahiana* S. Misra, *Nervilia concolor* (Blume) Schltr., *Peristylus goodyeroides* (D.Don) Lindl. and *Zeuxine strateumatica* (L.) Schltr. in Telangana highlights the conservation significance of the region. These species, often restricted to specific habitats, are particularly vulnerable to habitat loss and fragmentation. In contrast, the widespread distribution of *Acampe praemorsa* (Roxb.) Blatt. & McCann and *Vanda tessellata* (Roxb.) Hook. ex G.Don suggests their adaptability and resilience to varying ecological conditions within the state.

The dominance of *Habenaria* Willd. in Telangana echoes findings from other peninsular Indian regions. For example, in studies conducted in the Eastern Ghats, *Habenaria* Willd. species frequently constitute a significant portion of the orchid flora. This suggests that the genus is well-adapted to the semi-arid and seasonally dry conditions prevalent in these regions.

The records of *Zeuxine longilabris* (Lindl.) Trimen and *Zeuxine strateumatica* (L.) Schltr. in Telangana add to the growing understanding of the distribution of these species in peninsular India. Studies on the genus *Zeuxine* Lindl. in other regions have highlighted their ecological preferences and potential taxonomic complexities, emphasizing the need for detailed morphological and molecular studies.

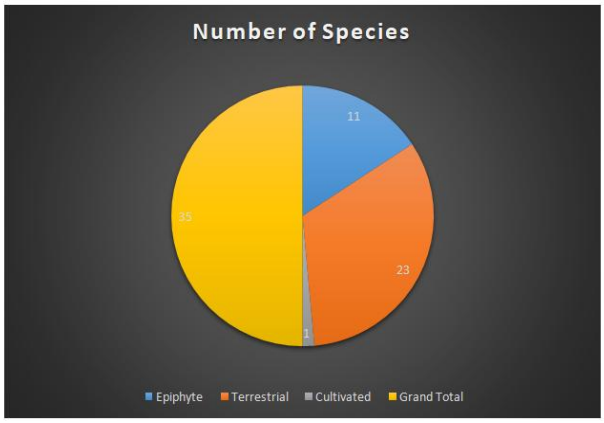


Fig. 2. Habit wise representation of orchid species.

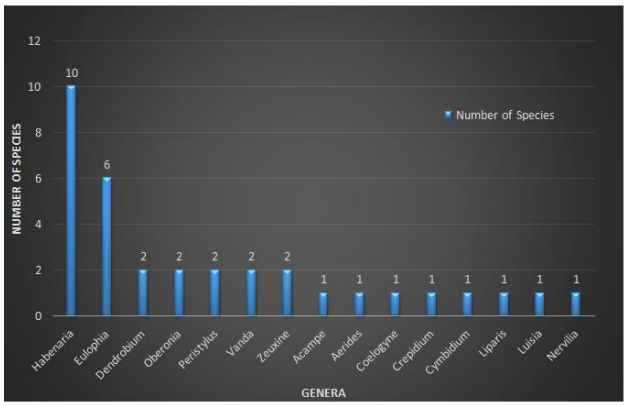


Fig. 3. Genus wise representation of orchid species (excluding 01 cultivated orchid).



Plate 1. A. *Acampe praemorsa* (Roxb.) Blatt. & McCann; **B**. *Cymbidium aloifolium* (L.) Sw.; **C**. *Aerides multiflora* Roxb.; **D**. *Habenaria marginata* Colebr.; **E**. *Habenaria plantaginea* Lindl.; **F**. *Habenaria ramayyana* Ram. Chary & J.J. Wood.



Plate 2. A. *Habenaria roxburghii* Nicolson; **B**. *Eulophia nuda* Lindl.; **C**. *Aerides multiflora* Roxb.; **D**. *Peristylus goodyeroides* (D.Don) Lindl.; **E**. *Vanda tessellata* (Roxb.) Hook. ex G.Don; **F**. *Vanda testacea* (Lindl.) Rchb.f.; **G.** *Zeuxine longilabris* (Lindl.) Trimen; **H**. *Zeuxine strateumatica* (L.) Schltr.

Table 1: List of Orchid species occurring in Telangana State.

Sr. No.	*Scientific Name*	Habit	Phenology (Flowering & Fruiting period)	District wise Distribution
1.	*Acampe praemorsa* (Roxb.) Blatt. & McCann	Epiphyte	May-August	Adilabad, Khammam, Warangal
2.	*Aerides multiflora* Roxb.	Epiphyte	February-March	Khammam
3.	*Coelogyne pallida* (Lindl.) Rchb.f. (= *Pholidota pallida* Lindl.)	Epiphyte	June-December	Khammam
4.	*Crepidium versicolor* (Lindl.) Singh *et al.* (2019) [= *Malaxis versicolor* (Lindl.) Abeyw.]	Terrestrial	September-October	Karimnagar, Khammam
5.	*Cymbidium aloifolium* (L.) Sw.	Epiphyte	Januray-November	Khammam
6.	*Dendrobium herbaceum* Lindl.	Epiphyte	August-December	Khammam
7.	*Dendrobium macrostachyum* Lindl.	Epiphyte	April-September	Nagarkurnool
8.	*Eulophia epidendraea* (J.Koenig ex Retz.) C.E.C.Fisch.	Terrestrial	February-August	Khammam
9.	*Eulophia flava* (Lindl.) Hook.f.	Terrestrial	June-August	KomurambheemAsifabad
10.	*Eulophia graminea* Lindl.	Terrestrial	March-May	Mahabubnagar
11.	*Eulophia nuda* Lindl. [= *E. spectabilis* (Dennst.) Suresh]	Terrestrial	February-June	Karimnagar
12.	*Eulophia picta* (R.Br.) Ormerod [=*Geodorum densiflorum* (Lam.) Schltr.]	Terrestrial	August-November	Karimnagar, Nagarkurnool
13.	*Eulophia recurva* (Roxb.) M.W.Chase, Kumar & Schuit. [*Geodorum recurvum* (Roxb.) Alston]	Terrestrial	May-September	Nagarkurnool
14.	*Habenaria commelinifolia* (Roxb.) Wall. ex Lindl.	Terrestrial	September-November	Mulugu
15.	*Habenaria furcifera* Lindl.	Terrestrial	August-November	Warangal
16.	*Habenaria hollandiana* Santapau	Terrestrial	September-November	Mahabubnagar, Nagarkurnool
17.	*Habenaria marginata* Colebr.	Terrestrial	September-November	Nagarkurnool
18.	*Habenaria multicaudata* Sedgw.	Terrestrial	August-November	Vikarabad
19.	*Habenaria panigrahiana* S.Misra	Terrestrial	July-September	Nagarkurnool
20.	*Habenaria plantaginea* Lindl.	Terrestrial	September-November	Mahabubnagar, Nagarkurnool
21.	*Habenaria ramayyana* Ram.Chary & J.J.Wood	Terrestrial	July-September	Adilabad, Khammam, Medak, Nizamabad,Vikarabad, Warangal
22.	*Habenaria roxburghii* Nicolson	Terrestrial	July-October	Adilabad
23.	*Habenaria thailandica* Seidenf. (=*Habenaria gibsonii* var. *foetida* Blatt. & McCann)	Terrestrial	July-September	Vikarabad
24.	*Liparis deflexa* Hook.f.	Terrestrial	July-August	Nagarkurnool
25.	*Luisia zeylanica* Lindl.	Epiphyte	August-November	Mahabubnagar
26.	*Nervilia concolor* (Blume) Schltr.	Terrestrial	June-December	Karimnagar, Khammam
27.	*Oberonia ensiformis* (Sm.) Lindl.	Epiphyte	March-July	Rare, in moist deciduous forests
28.	*Oberonia wightiana* Lindl.	Epiphyte	June-November	Rare, in moist deciduous forests
29.	*Peristylus goodyeroides* (D.Don) Lindl.	Terrestrial	August-November	Nagarkurnool
30.	*Peristylus lawii* Wight	Terrestrial	July-October	Mahabubabad
31.	*Vanda tessellata* (Roxb.) Hook. ex G.Don	Epiphyte	July-September	Adilabad, Mahabubabad, Warangal
32.	*Vanda testacea* (Lindl.) Rchb.f.	Epiphyte	April-June	Adilabad, Mahabubnagar
33.	*Zeuxine longilabris* (Lindl.) Trimen	Terrestrial	February-April	Bhadradri Kothagudem
34.	*Zeuxine strateumatica* (L.) Schltr.	Terrestrial	December-February	Adilabad
35.	*Spathoglottis plicata* Bleume	Terrestrial	Round the year	Cultivated

CONCLUSIONS

This annotated checklist enumerated 35 orchid species from 16 genera within the Telangana region, providing a baseline for understanding the state's orchid diversity. The identification of rare taxa, including *Oberonia ensiformis* (Sm.) Lindl. and *Oberonia wightiana* Lindl., alongside potentially endemic species such as *Habenaria ramayyana* Ram.Chary & J.J. Wood, *Habenaria hollandiana* Santapau and *Habenaria multicaudata* Sedgw., emphasizes the region's significance for orchid conservation. These findings underscore the necessity for targeted investigations into the ecological roles, population dynamics, and conservation status of these species. Future research should prioritize on: (1) detailed ecological assessments to elucidate habitat requirements and species interactions; (2) population genetic studies to determine genetic diversity and connectivity and (3) the

development and implementation of evidence-based conservation strategies to ensure the long-term persistence of Telangana's orchid flora. Furthermore, investigations into potential economic values, such as sustainable horticultural practices or medicinal applications, may provide additional incentives for conservation efforts.

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