



## Orchids of Madhya Pradesh: A comprehensive review

Deepika Patel\*, Satish Mohabe

Faculty of Science and IT, Madhyanchal Professional University, Bhopal, Madhya Pradesh, India

Corresponding Author: deepikapatel757575@gmail.com

### Abstract

Madhya Pradesh, located in central India, is renowned for its rich biodiversity, including a diverse range of orchid species. This review article explores the variety of orchids found in the state, highlighting notable species such as *Dendrobium macraei*, *Vanda tessellata*, *Aerides crispa*, and *Bulbophyllum leopardinum*. These orchids, which thrive in the region's diverse climatic conditions, play a crucial role in their ecosystems by supporting pollinator interactions and contributing to nutrient cycling. Despite their ecological importance, orchids in Madhya Pradesh face significant threats from habitat destruction, over-collection, and climate change. Conservation efforts, including the establishment of protected areas, ex-situ conservation initiatives, and community involvement, are essential to safeguard these species. This review underscores the need for sustainable practices and enhanced conservation strategies to ensure the survival of orchids in Madhya Pradesh, preserving their ecological and aesthetic value for future generations.

**Keywords:** Orchids, Madhya Pradesh, biodiversity, epiphytic plants, habitat destruction and sustainable practices

### Introduction

Madhya Pradesh, often referred to as the "Heart of India", is a land of diverse landscapes and rich biodiversity. It is home to vast forests, riverine systems, and unique ecosystems that support an array of flora and fauna. Among its botanical treasures, orchids hold a special place due to their intricate beauty, ecological significance and the fascination they have long held for botanists and horticulturists alike.

Orchids are one of the largest and most diverse families of flowering plants, with over 25,000 species worldwide. In India, they are predominantly found in the northeastern states and the Western Ghats. However, the central region, particularly Madhya Pradesh, also harbours a significant variety of orchid species. The state's diverse climatic conditions, ranging from tropical to subtropical, provide an ideal environment for these plants. Orchids in Madhya Pradesh are primarily epiphytic, meaning they grow on other plants, typically trees, deriving moisture and nutrients from the air and rain. However, some terrestrial species are also present, thriving on the forest floor. These orchids are not only a testament to the region's biodiversity but also play a crucial role in maintaining ecological balance. They contribute to the complexity of forest ecosystems, provide habitats for various microorganisms, and engage in intricate interactions with pollinators. Despite their importance, orchids in Madhya Pradesh face several threats. Habitat destruction due to deforestation, illegal logging, agricultural expansion, and urbanization poses significant risks to their survival. Additionally, over-collection for ornamental purposes and the impacts of climate change further exacerbate these challenges. Given these threats, concerted conservation efforts are essential to protect and preserve the orchid species of Madhya Pradesh.

This review aims to provide a comprehensive overview of the orchids found in Madhya Pradesh, detailing their diversity, ecological significance and the challenges they face. It also highlights the ongoing conservation efforts and suggests strategies for ensuring the survival of these remarkable plants. By understanding the importance of

orchids and the threats they encounter, we can work towards their preservation and the overall health of the ecosystems they inhabit.

### Diversity and distribution

Madhya Pradesh is home to a variety of orchid species, largely found in its forested regions and protected areas. These orchids are primarily epiphytic, meaning they grow on other plants, although some terrestrial species are also present. The state's diverse climatic conditions, ranging from tropical to subtropical, provide ideal habitats for these orchids. Madhya Pradesh, with its varied topography and climatic conditions, supports a rich diversity of orchid species. These orchids are found in different types of forests across the state, including moist deciduous, dry deciduous and semi-evergreen forests. The distribution of orchids in Madhya Pradesh is influenced by factors such as altitude, humidity, and forest type.

### Notable orchid species

Several notable orchid species are found in Madhya Pradesh, each with unique characteristics and ecological requirements. Some of these species include:

1. ***Dendrobium macraei***
  - **Habitat:** Moist deciduous forests.
  - **Characteristics:** This species is known for its striking yellow flowers with intricate purple veins. It typically grows on tree trunks and branches, thriving in high humidity and moderate light conditions.
2. ***Vanda tessellata***
  - **Habitat:** Dry deciduous forests.
  - **Characteristics:** Recognized by its greenish-yellow flowers with a tessellated (checkered) pattern, *Vanda tessellata* is an epiphytic orchid that prefers bright light and good air circulation.
3. ***Aerides crispa***
  - **Habitat:** Semi-evergreen forests.

- **Characteristics:** Notable for its fragrant white flowers with a faint pink blush, *Aerides crista* grows well in humid, shaded conditions. This orchid often forms large, pendulous clusters of flowers.

#### 4. *Bulbophyllum leopardinum*

- **Habitat:** Evergreen forests.
- **Characteristics:** This orchid is distinguished by its leopard-like spotted flowers. It thrives in shaded, humid conditions and is often found growing on tree trunks and branches.

#### Distribution patterns

The distribution of orchids in Madhya Pradesh is largely determined by the availability of suitable habitats. Moist and semi-evergreen forests, such as those found in the eastern and southern parts of the state, support a higher diversity of orchid species compared to the drier western regions. The protected areas in Madhya Pradesh, including national parks and wildlife sanctuaries, play a crucial role in preserving orchid habitats and ensuring the survival of these species.

#### Protected areas with significant orchid populations

- **Kanha National Park:** Known for its diverse flora, including several species of orchids, Kanha National Park provides a sanctuary for these plants within its moist deciduous and semi-evergreen forests.
- **Bandhavgarh National Park:** This park, with its rich biodiversity and varied habitats, supports a range of orchid species, particularly in its lush forested areas.
- **Pachmarhi Biosphere Reserve:** A biodiversity hotspot, this reserve encompasses various forest types and harbours a significant number of orchid species, benefiting from its diverse microhabitats.

#### Ecological niches

Orchids occupy various ecological niches in Madhya Pradesh's forests. Epiphytic orchids grow on trees, relying on the host plant for physical support while obtaining moisture and nutrients from the air and rain. Terrestrial orchids, on the other hand, grow on the forest floor, often in the leaf litter, and rely on symbiotic relationships with mycorrhizal fungi for nutrient uptake. The diversity of orchid species in Madhya Pradesh reflects the adaptability of these plants to different environmental conditions and their ability to form complex ecological interactions. The presence of orchids in various forest types and altitudinal ranges underscores their ecological importance and the need for targeted conservation efforts to protect their habitats.

The diversity and distribution of orchids in Madhya Pradesh highlight the ecological richness of the region. These plants, with their unique adaptations and ecological roles, are integral components of the state's biodiversity. However, the survival of orchids is threatened by habitat destruction, over-collection, and climate change. Therefore, preserving their habitats through protected areas and sustainable management practices is crucial for maintaining the ecological balance and ensuring the long-term survival of these fascinating plants.

#### Ecological significance

Orchids play a crucial role in their ecosystems. They are important for pollinator interactions, providing nectar to various insects and birds. Their presence is an indicator of a healthy and undisturbed ecosystem. Additionally, orchids contribute to the epiphytic layer in forests, which is vital for nutrient cycling and habitat complexity.

#### Conservation challenges

Despite their ecological importance, orchids in Madhya Pradesh face several threats:

#### Habitat destruction

Deforestation and land-use changes are significant threats to orchid habitats. Illegal logging, agricultural expansion, and urbanization result in the loss of forest cover, directly impacting orchid populations.

#### Over-collection

Orchids are highly prized for their ornamental value, leading to over-collection from the wild. This unsustainable practice has pushed several species towards the brink of extinction.

#### Climate change

Changes in temperature and precipitation patterns due to climate change affect the delicate balance of orchid habitats. Shifts in climate can lead to mismatches in flowering times and pollinator availability, disrupting the reproductive cycles of orchids.

#### Conservation efforts

##### Protected areas

Madhya Pradesh has several protected areas, such as the Kanha National Park and Bandhavgarh National Park, which serve as crucial refuges for orchids. These areas are managed to conserve the natural habitats and biodiversity of the region.

##### Ex-situ conservation

Botanical gardens and research institutions in Madhya Pradesh are actively involved in ex-situ conservation of orchids. These efforts include seed banking, tissue culture propagation, and cultivation of orchids in controlled environments to ensure their survival.

##### Community involvement

Engaging local communities in conservation efforts is vital. Sustainable practices and awareness programs help reduce the impact on orchid habitats. Eco-tourism initiatives also provide economic incentives for communities to protect their natural heritage.

#### Conclusion

Orchids of Madhya Pradesh are a testament to the region's rich biodiversity. However, they face numerous threats that require immediate attention. Conservation efforts, both in-situ and ex-situ, are essential to preserve these delicate and beautiful plants. By fostering a harmonious relationship between human activities and natural ecosystems, we can ensure that the orchids of Madhya Pradesh continue to thrive for generations to come.

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