

Seasonal Pollination Dynamics of *Cymbidium Aloifolium* by *Apis Cerana Indica* Honey Bees in the Western Ghats, Wayanad

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Abstract

Cymbidium aloifolium is a prominent epiphytic orchid species native to the Western Ghats, specifically found in the biodiversity-rich region of Wayanad. The pollination ecology of this orchid is intricately linked with local bee species, particularly **Apis cerana indica**, the Indian honey bee. This study explores the relationship between **Cymbidium aloifolium** and **Apis cerana indica**, highlighting the pollination mechanisms, frequency of bee visits, and the resultant fruit set.

Field observations were conducted during the peak blooming season, from April to June, when **Cymbidium aloifolium** exhibits its distinctive long-lasting flowers. **Apis cerana indica** was observed to be the primary pollinator, attracted by the orchid's vibrant flowers and enticing floral scent. The bees exhibit specific foraging behaviors, visiting multiple flowers during a single foraging trip, thereby enhancing cross-pollination rates. The pollination process is facilitated by the orchid's specialized floral structure, which allows effective transfer of pollen as the bees collect nectar.

The study recorded an average of 15 bee visits per flower per day, with a peak activity observed during the morning hours. Successful pollination events, indicated by the deposition of pollinia on the bee's body, were recorded in approximately 70% of the observed visits. The subsequent fruit set rate was observed to be 65%, highlighting a strong correlation between **Apis cerana indica** activity and reproductive success of **Cymbidium aloifolium**.

This pollination interaction not only underscores the ecological significance of **Apis cerana indica** in sustaining orchid populations but also emphasizes the critical role of maintaining healthy bee populations for the conservation of native orchid species in the Western Ghats. The findings suggest that habitat preservation and the protection of pollinator species are essential for the continued survival of **Cymbidium aloifolium**.

These insights contribute to a deeper understanding of plant-pollinator dynamics in tropical ecosystems and underscore the importance of integrated conservation strategies that encompass both flora and fauna. Future research could focus on the impacts of environmental changes on these interactions and the development of conservation practices that support both orchids and their pollinators.

Keywords: *Cymbidium aloifolium*, *Apis cerana indica*, pollination ecology, Western Ghats, Wayanad, orchid conservation, bee behavior, plant-pollinator interaction, fruit set, and Biodiversity.