

Conservation in Crisis: Terrestrial Orchids of the Mahanadi River Basin and the Fight Against Urbanization & Habitat Destruction

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The Mahanadi River Basin, located in the eastern part of India, is a biodiversity hotspot that supports a wide range of flora and fauna (Marndi et al., 2022; Devi, 2024; Patel et al., 2024). Terrestrial orchids are an integral component of this ecosystem, with many species found exclusively in this region. However, the rapid urbanization of the Mahanadi River Basin poses a significant threat to the conservation of these orchids. Urbanization is a major driver of habitat destruction and fragmentation, leading to population decline and isolation of plant species (Liu et al., 2016). Urbanization leads to the destruction of natural habitats, such as forests, grasslands, and wetlands, which are crucial for the survival of terrestrial orchids.



Figure 1: Habitat of *Zeuxine strateumatica* in wild

Urbanization also leads to soil pollution, altered hydrological cycles, and increased temperatures, which can have devastating effects on plant populations (Das et al., 2024). The increased use of fertilizers and pesticides in urban areas can contaminate soil and water, making it difficult for orchids to survive. On February 1, 2025, while conducting research on the Flora of Mahanadi River areas, I stumbled upon a remarkable find. In the Narsinghpur Range, West of Aathgarh Forest Division, Odisha, I observed *Zeuxine strateumatica* (L.) Schltr., a terrestrial orchid, thriving in its natural habitat (N 20° 32. 41'; E 85° 05. 62'; Elevation: 161 m; Figure 1).



Figure 2: *Zeuxine strateumatica* in urban areas with cements



Figure 3: Observation of *Zeuxine strateumatica* and captured with GPS coordinates in urban areas

However, what left me astonished was the subsequent observation of the same species in an urban area of CDA 13, Cuttack, merely 2-3 kilometres from the Mahanadi River (N 20° 29.22'; E 85° 48.39'; Elevation: 55 m; Figures 2-3). Amidst the concrete jungle, where natural soil was contaminated with cement waste, *Z. strateumatica* had adapted to survive. This unexpected find raises pressing following questions: How do native terrestrial orchids like *Z. strateumatica* cope with the stresses of urbanization? Who is responsible for their struggle to exist? Can humans truly survive without plants, or are we recklessly planning a future without them?

Implications for Conservation

The observation of *Z. strateumatica* in an urban area highlights the need for urgent conservation action. To protect terrestrial orchids and their habitats, it is essential to adopt a multi-faceted approach that involves:

- a) Habitat preservation and restoration
- b) Ex situ conservation and propagation
- c) Community engagement and education
- d) Policy reforms and legislation to regulate urbanization

By working together, we can mitigate the impacts of urbanization and ensure the long-term survival of terrestrial orchids in the Mahanadi River Basin.

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