

Orchid diversity in antropogenic-induced degraded tropical rainforest, an extrapolation towards conservation

ABSTRACT

The uncontrolled logging in Peninsular Malaysia and the resulting mudslides in the lowland areas have been perilous, not to just humans, but also to another biodiversity, including the wild orchids. Their survival in these highly depleted areas is being overlooked due to the inaccessible and harsh environment. This paper reports on the rescue of orchids at risk from the disturbed forests for ex-situ conservation, the identification of the diversity of orchids and the evaluation of the influence of micro-climatic changes induced by clear-cut logging towards the resilience of orchids in the flood-disturbed secondary forests and logged forests in Terengganu and Kelantan, located at the central region of Peninsular Malaysia, where the forest destruction by logging activities has been extensive. 109 orchid species belonging to 40 genera were collected from the disturbed areas. The diversity and data analyses show that the disturbed secondary forests had a higher orchid density (0.0133 plants/m²) than the logged sites (0.0040 plants/m²) as the habitat conditions were more dependable. Nevertheless, the logged forests harboured a higher diversity of orchids (H=4.50 and D=0.99) of which 97.9% were epiphytes. Eleven rare species were found along with six species endemic to Peninsular Malaysia, with two species new to science. The results highlighted the factors that allow the orchids to flourish or suffer in the disturbed forests. The logged forests had a higher ambient temperature and lower moisture level than the mud flood-disturbed and canopy-covered secondary forests. Apart from the extensive ground vegetation due to logs dragging extraction, low soil moisture and absence of leaf litter were believed to be the major attributes causing the low abundance of terrestrial orchids. The high abundance and diversity of epiphytic orchids and the large difference of their densities between the logged sites were influenced by the densities of fallen trees hosting orchid(s), disturbance-induced dryness stresses, durations of exposure to the antropogenic-induced disturbance, and less favourable soil conditions for the terrestrial orchids.

Keyword: Conservation; Diversity; Dryness stress; Ecology; Epiphyte; Logged forest; Mudslides; Orchidaceae