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CLIMATE, PHENOLOGY, AND BIOTIC INTERACTIONS: A STUDY OF TEN TREE SPECIES AT UNIVERSITY OF PERADENIYA, SRI LANKA

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Shifts in climatic factors over time influence phenology and associated biotic interactions in natural and man-made ecosystems. This study investigated the relationship of climatic factors, phenology and biotic interactions in ten selected plant species, namely *Peltophorum pterocarpum, Delonix regia, Mesua ferrea, Tabebuia rosea, Macaranga peltata, Spathodea campanulata, Filicium decipiens, Jacaranda mimosifolia, Samanea saman,* and *Muntingia calabura* at the Universtity of Peradeniya, Sri Lanka. Ten individuals were sampled from each of the ten selected plant species. The phenological events, including vegetative (flushing) and reproductive (flowering and fruiting) phenophases and biotic interactions (pollination and seed dispersal) associated with them were monitored from January to December 2024. Climatic factors (rainfall and temperature) during the study period were obtained from the Natural Resource Management Centre, Peradeniya. A positive correlation between high rainfall, and the flushing and flowering was recorded for *Peltophorum pterocarpum*, *Delonix regia, Mesua ferrea*, *and Tabebuia rosea*. In contrast, *Macaranga peltata* and *Filicium decipiens* recorded peak flowering during dry period (mean rainfall 0 mm and mean temperature 26.2 °C), avoiding floral damage due to excessive rainfall. All the tree species were pollinated by insects, except *Spathodea campanulata*, which was pollinated by birds. Seeds of *Macaranga peltata, Muntingia calabura, Samanea saman,* and *Filicium decieipiens* were dispersed by frugivores. Moreover, the fruiting period of *Mesua ferrea*, *Tabebuia rosea*, and *Delonix regia* overlapped with the wet period, ensuring favorable conditions for the seed germination after seed dispersal. High mean monthly rainfall during the wet season (101.8 – 131.5) mm reduced pollinator visits by two folds in *Peltophorum pterocarpum* and *Mesua ferrea* species, emphasising the effect of climate variables on plant-pollinator interactions. Climatic variability plays a pivotal role in shaping phenology and plant-animal interactions, with direct consequences for the reproductive ecology of tree species.

Keywords: Biotic interactions, Climate factors, Phenology, University of Peradeniya