

***Manilkara hexandra*: ECOLOGY OF THE SPECIES AND ITS DIEBACK IN BUNDALA NATIONAL PARK, SRI LANKA**

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Manilkara hexandra (Roxb.) Dubard, is a dominant canopy tree species in tropical dry forests of Sri Lanka. However, the species is dying out from many parts of the country. In Bundala National Park (BNP), the dieback of the species is so promiscuous that it would lead to rescind the whole ecosystem. Conservation of *M. hexandra* is thus vital for the perpetuity of the remaining dry forests and the conservation of biodiversity of the country. However, the lack of ecological information is reckoned to be a major drawback in prescribing necessary conservation and management guidelines. The main aims of this study were to identify the threats imposed on *M. hexandra*, gather autecological and synecological information related to the species and thereby to suggest conservation and management guidelines for the species and its natural habitats. The populations of *M. hexandra* in different land use types all over the country were assessed and the natural populations were enumerated in one hundred and twenty five 50×50 m² experimental plots. A detailed survey of *M. hexandra* was conducted in three 50 m wide belt transects in BNP, while the vegetation was enumerated in sixteen 20×20 m² plots established at randomly chosen points. Phenological events of 21 healthy, mature individuals of *M. hexandra* were examined in BNP over a period of 4 years from January, 2006 to December, 2009. The allelopathic effects and the competition exerted by *Prosopis juliflora* on growth performance of *M. hexandra* seedlings were detected by a glass house experiment conducted at the Department of Botany, University of Peradeniya.

Results revealed that the natural regeneration of *M. hexandra* was poor all over the dry zone of Sri Lanka, with a high fraction of over mature cohorts or unhealthy individuals. Tree cankers occurred in 65% of individuals in Sri Lanka. Tree dieback was severe in BNP and 47% of the individuals in this sub-population are dying back at present. These, together with the invasion by the alien exotic *P. juliflora* have altered the population structure and spatial distribution of *M. hexandra* in the tropical semi-deciduous (TSD) forests of BNP. Results of ordination analyses proved the gradual degradation of TSD forests in BNP, in which the invasion by *P. juliflora* plays a dominant role. Fast growing *P. juliflora* may efficiently draw ground water, resulting in a water scarcity during drought periods and this may subsequently lead to the dieback of *M. hexandra*. Moreover, specific invasive traits such as extended root system and allelopathic chemicals enable *P. juliflora* to outperform *M. hexandra* in drought prone environments. However, there is no abnormality in fruit production and, mass fruiting takes place every 3-4 years if the climatic conditions are favourable towards flowering and fruiting. These degraded tropical dry forests should be restored and *M. hexandra* needs to be conserved for the perpetuity of biodiversity in them. Assisting the natural regeneration, protection from illegal anthropogenic activities and cattle ranching, reducing the threats imposed by stress conditions especially by the canker disease, reducing pressure by large herbivores and by the alien exotic plant, *P. juliflora* and improving sanitation of forest stands are important measures in conserving *M. hexandra* in Sri Lanka. Existing policies should also be further strengthened in order to protect these invaluable dry forest ecosystems.