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Assessing Tree Species Richness and Diversity in the Kankaniyamulla Forest Reserve

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Abstract

Kankaniyamulla Forest Reserve (331.167 ha) is a secondary moist mixed evergreen forest located in the Northwestern Province (7.4051° N, 80.0283° E) with an average temperature of 24.07°C and an average annual rainfall of 1,689.4 mm. The estimated terrain elevation is 65 m above sea level. It harbours two tanks, and the buffer zone of the forest is subjected to high anthropogenic activities such as collecting plants for betel cultivation, firewood and for medicinal purposes. Hence, this forest is an important component of nearby villagers. However, the floristic composition of the forest is yet to be studied. Hence, this study aimed to identify the floral diversity of woody species in the Kankaniyamulla forest reserve. Data were collected from April to August 2024 on trees having more than 20 cm girth at breast height. GBH and spatial distribution of each tree were recorded along four random transects of 1,106 m, 1,315 m, 503 m, and 2,292 m, respectively with a width of 4 m. Shannon's diversity index and Simpson's index were used to determine species diversity. A total of 1,390 trees were recorded during the study and Shannon's diversity index values of four transects were 2.20, 2.49, 1.96, and 2.05, respectively, indicating moderate diversity with several species. Transect 2 represents the highest diversity of tree species, while the lowest was in transect 3. The most dominant species was *Swietenia macrophylla* (Meliaceae) followed by *Artocarpus nobilis* (Moraceae) and *Nothopegina beddomei* (Anacardiaceae) and the least abundant species was *Adenanthera pavonina* (Fabaceae). Species richness of four transects were 34, 27, 18 and 18, respectively; thus, transect 1 reflects the highest ecological health and complexity. In this study, 24 families were identified, and the most abundant families were Fabaceae, Moraceae and Anacardiaceae. According to the National Red List (2020), one endangered species; *Diospyros quaesita* (Ebenaceae) three Vulnerable species; *Pericopsis mooniana* (Fabaceae), *Canarium zeylanicum* (Burseraceae) and *Gyrinops walla* (Thymelaeaceae) and four Near Threatened species, *Vitex altissima*, *Donella lanceolate*, *Dipterocarpus zeylanicus* and *Albizia lebbeck* were recorded. The forest continues to demonstrate high ecological resilience while human activities have influenced the forest composition. The findings provide baseline information for future conservation and sustainable utilization strategies, emphasizing the need for biodiversity conservation, and focusing on the need for targeted management practices to maintain species diversity and support long-term forest regeneration.

Keywords: *Kankaniyamulla forest, Secondary forest, Species richness, Tree species diversity, Forest conservation*