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Effects of Conversion of Indigenous Forest to Plantation Forest on the Diversity of Macro-Fungi in Kereita Forest, Kikuyu Escarpment, Kenya

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Abstract : Tropical forests harbor a wide range of biodiversity and rich macro-fungi diversity compared to the temperate regions in the World. However, biodiversity is facing the threat of extinction following the rate of forest loss taking place before proper study and documentation of macrofungi is achieved. The present study was undertaken to determine the effect of converting indigenous habitat to plantation forest on macrofungi diversity. To achieve the objective of this study, an inventory focusing on macro-fungi diversity was conducted within Kereita block in Kikuyu Escarpment forest which is on the southern side of Aberdare mountain range. The macrofungi diversity was conducted in the indigenous forest and in more than 15 year old Patula plantation forest , during the wet (long rain season, December 2014) and dry (Short rain season, May, 2015). In each forest type, 15 permanent (20m x 20m) sampling plots distributed across three (3) forest blocks were used. Both field and laboratory methods involved recording abundance of fruiting bodies, taxonomic identity of species and analysis of diversity indices and measures in terms of species richness, density and diversity. R statistical program was used to analyze for species diversity and Canoco 4.5 software for species composition. A total number of 76 genera in 28 families and 224 species were encountered in both forest types. The most represented taxa belonged to the Agaricaceae (16%), Polyporaceae (12%), Marasmiaceae, Mycenaceae (7%) families respectively. Most of the recorded macro-fungi were saprophytic, mostly colonizing the litter 38% and wood 34% based substrates, which was followed by soil organic dwelling species (17%). Ecto-mycorrhiza fungi (5%) and parasitic fungi (2%) were the least encountered. The data established that indigenous forests (native ecosystems) hosts a wide range of macrofungi assemblage in terms of density (2.6 individual fruit bodies / m2), species richness (8.3 species / plot) and species diversity (1.49/ plot level) compared to the plantation forest. The Conversion of native forest to plantation forest also interfered with species composition though did not alter species diversity. Seasonality was also shown to significantly affect the diversity of macro-fungi and 61% of the total species being present during the wet season. Based on the present findings, forested ecosystems in Kenya hold diverse macro-fungi community which warrants conservation measures.

Keywords : diversity, Indigenous forest, macro-fungi, plantation forest, season
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