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Isolation and identification of litter decomposing fungi in Nagacholai Forest Reserve, Mullaitivu, Sri Lanka

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Nagacholai Forest Reserve, which was disturbed by local terrorism before 2009, is located in Mullaitivu District in the Northern Province of Sri Lanka. It is a tropical dry zone forest, administrated by the Department of Forest Conservation, Sri Lanka. Litter-fall and subsequent nutrient release from decomposing litter are crucial processes that regulate the nutrient availability and the nutrient cycling in soil, as well as the plant growth in forest ecosystems. Litter decomposition rates of forest ecosystems are governed by both biotic and abiotic factors. Therefore, the present study was conducted to study soil characteristics such as pH and electrical conductivity and to isolate and identify the litter decomposing fungi of the Nagacholai forest. Soil and litter were collected randomly by placing 0.5 m X 0.5 m size quadrats on the forest floor. The pH and electrical conductivity of each soil sample were determined by following standard methods. Litter decomposing fungi were isolated from leaf discs (1 mm X 1 mm) obtained from the collected litter following washing and plating method using sterilized distilled water. Pure cultures of isolated fungi were maintained at 28 °C in PDA and morphologically identified using identification keys. The low moisture content in the soil was reflected by brown colour, sandy-podzolic soil. The high proportion of less decomposed, dense litter layer reflected the low decomposition rate due to decelerated soil microbial activity and low water availability. Soil pH was within the range of 6.34 – 6.80 and electrical conductivity at 30 °C varied between 1.23 – 1.57 mS cm⁻¹. Five different fungal species were isolated in high frequencies (50%>) from leaf litter, while four of them were identified up to the genus level based on their vegetative and reproductive morphology (i.e. *Mucor* sp., *Aspergillus* sp., *Candida* sp. and *Pestalotiopsis* sp.). The remaining unidentified species produced white colour colonies and branched, hyaline, septate hyphae without showing any sexual reproductive structure. *Mucor*, *Aspergillus* and *Pestalotiopsis* are some of the common fungal decomposers found in most of the forests of different climatic zones. However, *Candida* is a filamentous yeast, which is not frequently reported as a decomposer in terrestrial ecosystems, but found to be a member of the normal soil microflora in forests as secondary sugar fungi. Therefore, *Mucor*, *Aspergillus* and *Pestalotiopsis* could be identified as the most prominent genera of litter decomposing fungi in the Nagacholai forest. Nevertheless, this preliminary study needs to be elaborated further to confirm their identity up to species level using molecular techniques.

Keywords: Decomposition, Fungi, Litter, Soil