

Pongsatorn Puangsombat 2010: Diversity of Soil Fungi in Different Land Use Types in Tha Kum-Huai Raeng Forest Reserves, Trat Province. Master of Science (Forest Biological Science), Major Field: Forest Biological Science, Department of Forest Biology. Thesis Adviser: Assistant Professor Uthaiwan Sangwanit, Ph.D. 221 pages.

Soils under different land use types in Tha Kum-Huai Raeng forest reserves including secondary dry-evergreen forest (DEF), Phayoong (*Dalbergia cochinchinensis*) plantation (PP), grassland (GL), rubber (*Heavia brasiliensis*) plantation (RP) and pineapple farm (PF) were systematically sampled from 9 spots in each land use. The leaf litter covered a 1 m×1 m area at each soil sample spot was also collected and weighed for a dry weight. The soils were isolated to obtain pure fungal cultures and isolation number of each fungal species by using a soil dilution plate method. After identification of soil fungi in each land use, the fungal diversity, Species Diversity Index, Important Value Index and Similarity Index were compared among the 5 land uses. The same sets of soil samples were also analyzed for physical properties (% sand, % silt and % clay) and chemical properties (pH, % organic matter, P, K, Ca and Mg). The relationships of soil fungi to leaf litter dry weights and soil physical and chemical properties were analyzed by ordination with Canonical Correspondence Analysis (CCA).

Results of the study revealed that there were altogether 71 species and 3,190 isolates of fungi in soils from 5 different land use types. The majority of them, 62 species were classified to the Class Deuteromyces, while the rest, 4 and 5 species were in the Class Zygomycetes and Class Ascomycetes, respectively. The numbers of fungal species and isolates in DEF, PP, GL, RP and PF were 33 and 895, 29 and 870, 38 and 756, 27 and 1,010 and 36 and 379, respectively. The Species Diversity Index was highest in PF (2.90), followed by DEF (2.19), PP (2.12), GL (1.65) and RP (1.56). The first five fungi of all land use types ranked by the Important Value Index were *Gongronella butleri*, *Penicillium* spp., *Talaromyces* sp., *Trichoderma* spp. and unidentified sp.1. The highest Similarity Index of soil fungi was found between DEF and PP (63.15%) followed by between PP and GL (55.01%) and the lowest was between DEF and PF (35.30%). Since there was no statistical difference in all mentioned environmental factors, the influence on soil fungal diversity and similarity may come from light radiated to the soil surface and soil temperature. Results of ordination with CCA showed that the soil fungi in these land uses had positive relationships with the amounts of P, Ca and Mg in the soils. The ranges of the amounts of P, Ca and Mg which supported the fungal appearance were 2.24-2.44, 185.02-326.15 and 34.93-80.07 mg/kg respectively.

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Thesis Advisor's signature