ABSTRACT

An attempt was made to elucidate the phytosociological heterogeneity and ecological differentiation of micro-fungi inhabiting the soils in the Forest Reserve at Kekanadura situated about 1 km north-east of Matara, in the southern lowland of Sri Lanka. Both the vertical and horizontal distribution and temporal variations in floristic-composition, species-richness and species-predominance were investigated with an attempted causal explanation in relation to the variations in more important of the edaphic, climatic and biotic factors.

Soil samples were taken from freshly-dug plots into sterile test-tubes, plated by the Warcup's soil-plate technique using the Martin's medium, and species were isolated, identified and subcultured. A total of sixty species was isolated which included two Ascomycetes, twelve Phycomycetes and forty-six Fungi Imperfecti; the commenest Genera were Aspergillus and Penicillium with ten and nine species respectively.

The distribution of fungi in soil profiles showed a decrease in the numbers and abundance of species with soil-depth; the majority of the species appeared to be

confined to the top 30-cm layers; this decrease was correlated with decrease in organic matter and aeration and excessive increase in soil moisture status.

The temporal variation in phytosociology was studied by taking monthly samples over a one year period. The number of species showed a bimodular variation in correlation with the bimodular rainfall distribution corresponding to the two monsoons, but was directly associated with the consequent changes in the soil moisture regime.

The horizontal phytosociological heterogeneity was investigated by collecting floristic and edaphic data from three transects each of sixteen 25x25 m contiguous plots located on three hill-sides selected to represent leeward, seaward and intermediate habitats. These three sites were the same as those used by Pemadasa (1986) for the investigation of the ecology of tree-species. The floristic data were statistically analysed by Reciprocal Averaging ordination and Indicator Species Analysis classification. These multivariate analyses demonstrated that the maximal microfungal differentiation and the differences in floristics between hill-sides were associated with the differential exposure of

soils to coastal winds and sea-spray. It was conjectured that soils on the seaward hill-sides are less favourable than those on the leeward hill-sides for the successful persistence of most species of microfungi, presumably because of the desiccating effects of winds, and salt and other particles carried by sea-spray; the two factors are expected to enhance evaporation so reducing soil moisture regime and modifying decomposition of organic debris, both of which are essential for the successful germination of fungal disseminules and their establishment, growth and sporulation.

The multivariate analyses indicated a remarkable parallelism between the phytosociology of tree species and microfungal flora, so indicating some control of the former on the ecological differentiation of the latter in the Kekanadura Forest Reserve.

The results are discussed with a major emphasis on the limitations of the methods employed for the isolation of fungi and estimation and determination of various edaphic and climatic parameters.

This is only a preliminary study which should be regarded as an end of a beginning, not a beginning of an end!