D-20: Species abundance and diversity of the arthropod fauna in the ground layer of the Makandawa-Kitulgala forest reserve

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Information on the species diversity of invertebrate fauna, in Sri Lanka forests is scanty compared to that on the vertebrate fauna. With the continued reduction of the natural forest cover, it would be useful to have documented the diversity of at least some invertebrate groups. The present study concerns, the largest group of animals, the Arthropods and the study was undertaken with the following objectives: To find species diversity and abundance of ground layer Arthropod fauna, to determine differences in species abundance and diversity in human impacted habitats, in comparison to undisturbed habitats; to determine differences in species abundance and diversity according to the environmental gradients.

Three sampling methods namely pit-fall trapping, Sweep netting and Intense Searching were employed to study arthropod fauna in the leaf litter; 10 pit-fall traps with & without baits were used and the trapping configuration was the Gradient directed line Transect (Gradsect). Three line transects were placed at 3 sites of the forest namely disturbed, mildly disturbed and undisturbed habitats. Transect positions were determined selectively to cover as much of the vegetation or habitat diversity available.

The study area Makandawa forest reserve is located in the south- west low land wet zone of Sri Lanka approximately latitudes 7-8° N and longitudes 80-81° E.

The exact location was decided at random. Altitudinal variation, and effect of rain were selected as the main environmental variables. The transect was placed with reference to the 1:63,630 series topographic map, which enabled the transect to be positioned at right angles to the contour, thus ensuring that the full range of altitudes and other aspects are covered by the 3 transects. A single transect had 4 plots of 10 x 5 m namely A,B,C, and D. The transect was traversed along a fixed bearing using a compass. Each plot was placed at regular intervals, along the transect. Within each plot 10 pit-fall traps were placed. Sampling was made on 3 days per week during the period March 1993 to June 1993 both months inclusive. Intensive searching was done between 0600 to 1800 h along 240 m length of the transect. The Arthropods within each plot were recorded by species inventory based on visual observations. Samples were removed to the laboratory for identification. Identification was done according to checklist and keys by Borror and Delong. (1963).

A total of 408 species were recorded within plots and transects in the forest and of this 191, 296 and 144 species were from transects 1, 2 and 3 respectively. The Shannon-Wiener index was used to measure diversity. Arthropod diversity in transects 1 and 2 were almost identical. However the diversity in transect 3 was quite difference from that of transects 1 and 2.

The 408 species of Arthropods recorded in the ground layer of Makandawa forest reserve consisted of 323 species of Insects, 68 species of Arachnids, 9 species of Miriapods and 2 species of land Crustaceans. Among the insects the highest diversity occurred in the order *Orthoptera* which was represented by 96 species.

Therefore insects were the major group of animals inhabiting the ground layer of the Makandawa forest.

In total 408 species were identified from all 3 transects in the forest and of this 191, 296, and 144 species were from transects 1,2 and 3 respectively. 79.17% of the total was accounted for by insects, which constituted the major group of animals inhabiting the ground layer of the Makandawa forest. This study showed

that the species diversity and abundance of Arthropods in the forest ground layer were high. The study indicates that with increasing disturbance by man the species diversity in the ground layers of the forest decreased. This may be attributed to the fact that there is an increase in light intensity on the ground layers, when disturbed.