

Arthropod diversity in four different ecosystems in the Mid Country Wet Zone of Sri Lanka

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Arthropods contribute significantly to biodiversity of natural environments. The present study was done to determine the diversity of arthropods in four ecosystems with different vegetation. Vegetation surrounding an aquatic environment (AQ), a broad-leaved wet, evergreen forest ecosystem (BL), a *Pinus caribaea* monoculture plantation (PN) and a *Pinus* plantation artificially enriched with indigenous broad-leaved tree species (PNEN) located close to each other in Peradeniya were selected. In each environment, arthropods were sampled in three randomly-selected sites (5m x 5m) using four sampling methods, namely, pit-fall traps, sticky traps, sweep net and beating tray. Collected arthropods were identified upto the highest possible taxa using standard identification keys, based on morphological characteristics. Simultaneously, a plant census was conducted. Arthropod- and vegetation diversities were computed separately for each site using Shannon-Wiener Index (H).

A total of 324 arthropod individuals were collected from all four sites. (AQ–71, BL–44, PN–20, and PNEN–189). They belonged to 68 species and 43 families. A total of 4416 plants were observed, from 84 species and 42 families. AQ had the greatest arthropod diversity ($H=2.642$), dominated by *Olios* spp. (Family Sparassidae) followed by BL ($H=2.444$), dominated by three arthropods, namely, a tettigoniid species, *Oxytate* spp. (Family Thomisidae), and *Psechrus* spp. (Family Psechridae). PN had the next highest arthropod diversity ($H=1.411$), dominated by *Dicaldispa* spp. (Family Chrysomelidae). The lowest arthropod diversity was found at PNEN ($H=1.3500$), dominated by a formicid species. In contrast when considering plant diversity, PNEN had the highest diversity ($H=2.614$) and PN the lowest ($H=0.879$). AQ ($H=1.810$) and BL ($H=1.871$) had intermediate values.

The arthropod diversity of AQ and BL was not significant from each other, while AQ was significant from the other two ($F=5.50$, $P=0.024$). PN and PNEN were not significant from each other. It was observed that in AQ, BL and PN the arthropod diversity was linearly dependent on plant diversity ($R^2=0.423$) whereas it was not so when PNEN was also included ($R^2=0.008$). This shows that higher plant diversity contributes to greater arthropod diversity in ecosystems where human intervention is minimum. But this pattern was not visible in PNEN, which is an artificially-created ecosystem.

Keywords: Shannon-Wiener Index, *Olios* spp., *Oxytate* spp., *Dicaldispa* spp., enriched *Pinus*