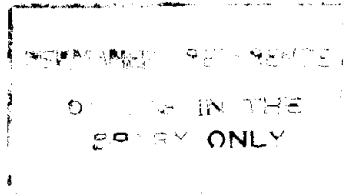


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**DIVERSITY AND RESOURCE PARTITIONING OF AVIFAUNA
IN FOREST AND AGRICULTURAL ECOSYSTEMS**



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DIVERSITY AND RESOURCE PARTITIONING OF AVIFAUNA IN FOREST AND AGRICULTURAL ECOSYSTEMS

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Abstract

The study was carried out to comparatively investigate the diversity of birds and their resource partitioning in Udawattakale Forest Sanctuary in Kandy (a forest ecosystem) and a rural agricultural area, comprising the villages Assadduma and Menikdiwela (also in Kandy district), with tea plantations, paddy fields, and Kandyan forest gardens (referred to here as wooded cultivation). A total of 86 species of birds were recorded within a period of four months out of which 60 occurred in the forest and 70 in the agricultural ecosystem. Forty three species were common to both ecosystems.

In terms of bird species diversity areas of wooded cultivation was found to be rich forest analogs, which along with tea plantations had the greatest avifaunal diversity among the different habitats within the agricultural ecosystem. Dominance (as measured by Berger-Parker dominance) was higher in the forest ecosystem. Within the agricultural ecosystem lowest diversity and highest dominance was observed in paddy fields where eastern cattle egret (*Bubulcus coromandus*) was recorded as the most abundant species. Most abundant species recorded in the forest and agricultural ecosystem were Tickell's blue flycatcher (*Cyornis tickelliae*) and yellow-billed babbler (*Turdoides affinis*), respectively.

Birds were assigned to ten feeding guilds based on literature and personal observations. Insectivores formed the great majority, both in terms of species richness and abundance, in

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both ecosystems. Distances among species in feeding guilds were determined by cluster analysis and it was found that no significant difference occurred in the community structure between the two ecosystems except for the clear differences seen in carnivore and omnivore guilds. In both ecosystems trees supported the greatest diversity of birdlife, represented by 7-10 feeding guilds. Omnivores, granivores, and nectarivores had significantly higher abundances in the agricultural ecosystem. Species that favor open areas were also more common there.

Cluster analysis based on presence/absence data of species was also used to determine the distances between different feeding substrates. In the forest ecosystem aerial feeders (aerial hawkers) were quite distinct from the other groups. In the agricultural ecosystem aerial feeders and trunk feeders (wood/bark probers) formed a distinct group. In both ecosystems the majority of species recorded were tree feeders, indicating that more food is available in trees than at lower levels. Also, this tendency may have implications in reducing parasitic infestations (see, for example, Dietsch [2008]).

Higher horizontal heterogeneity is viewed as the reason for higher species diversity and abundance recorded in the agricultural ecosystem. The study shows that heterogeneous agricultural ecosystems as those found in Sri Lanka are not as detrimental to birds as large areas of monoculture agro-ecosystems characteristic of industrialized countries. However, for such a mixed agro-ecosystem to sustain a 'healthy' avifauna, sufficient areas of tree cover, with sufficient dendrological diversity, must be available because trees play a key role in maintaining the avifaunal diversity of an area. Alpha, Margalef's, and Menhinick's indices of diversity indicate, however, that, even with comparatively low horizontal heterogeneity, the forest ecosystem still harbors a higher species richness, which is also indicated by the species discovery curves.