ABSTRACT

BIODIVERSITY OF ECOLOGICAL COMMUNITIES AND THE BIOGEOGRAPHY OF THEIR SPECIES IN THREE ISOLATED HILLS IN SRI LANKA

R. H. S. S. Fernando
Department of Botany
University of Peradeniya
Peradeniya
Sri Lanka

As the biota of isolated hills in Sri Lanka have been poorly studied, I investigated three isolated hills (Monaragala, Doluwakanda, Kokagala) of the island's intermediate zone, with respect to their (i) ecological plant communities, (ii) species richness and diversity of the vascular plants and selected fauna, within and among the ecological communities hill-wise and among hills, and (iii) the biogeographical affinities of their component plant and bird species.

In this study the gradsect method was used for field sampling; univariate/multivariate methods were used for data analyses and published information to identify the biogeographic affinities of species.

In the three hills collectively, 727 plant- and 357 animal species were recorded. They represented 17% of Sri Lanka's angiosperm-, 11 % of her fern- and 15% of her endemic flora. Hill-wise, species richness decreased in the order Monaragala, Kokagala and Doluwakanda, for plants (443, 372, 244, respectively) and also animals (272, 217, 210, respectively).

Among hills, plant species were similar in the lower elevation disturbed communities identified; that in the respective relatively undisturbed mid- and upper elevation forest communities were distinct and were dominated by Lauraceous species in Monaragala, by

Balanocarpus brevipetiolaris or *Calophyllum moonii* and *Humboldtia laurifolia* in Doluwakanda and by *Memecylon* spp., and *Cleistanthus pallidus* on ridges or *Vatica obscura* along lower slopes in Kokagala. The grassland/savanna communities, in Monaragala and Kokagala, had a very rich ephemeral herbaceous flora, imparting a more complex taxonomic structure to this community, compared to the tree/liana and understory floras in other communities. The plant community composition of the three hills also differed from that recorded for lowland forest communities surrounding these hills.

Three different bird communities were identified in Monaragala (low/mid-elevation, ridge/upper-elevation, grassland) and in Kokagala (dense forest, rock outcrop, savanna/grassland). The lattermost communities in both hills were distinct from each other. Doluwakanda had only a lower scrub-forest bird community and a tall-forest bird community. Bird species distribution in Monaragala and Doluwakanda varied significantly with altitude.

Biogeographically, of species inventoried in the three hills 33% are wet zone elements (most in Monaragala and Doluwakanda) and of them 33% are endemic. Kokagala had more dry and intermediate species. These hills are refugial outposts for some of Sri Lanka's endemic and threatened biota.

In this study among the flora, two new *Nervilia* species from Kokagala, new to Sri Lanka and possibly to science, *Didymoplexis seidenfadenii*, previously known only from India, *Liparis barbata, Hyalisma janthina* and *Stachyphrynium zeylanicum* found after a century, and among the fauna, *Nannophrys* species new to science, a Black Eagle's nest in Doluwakanda, the first for Sri Lanka, and a resident population of endemic Wood Pigeon in Monaragala were noteworthy discoveries.

Considering the above findings, conservation of these three hill forests, outside Sri Lanka's current protected area network, is of critical importance to protect the island's biodiversity.