

COMPARATIVE STUDY OF BUTTERFLY FAUNA IN THREE DIFFERENT HABITATS OF THE KNUCKLES REGION, SRI LANKA

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Introduction

Many ecosystems today are subjected to anthropogenic disturbances and habitat destruction. Therefore, methods are needed to monitor biotic responses to environmental changes (Kremen, 1992). Butterflies are more specialized with respect to host plants species and habitats than larger animals (Nelson and Anderson, 1994). The Knuckles forest has a distinctive biological setting because of its location and geography (Badenoch, 2008). The current study is designed to study and compare the butterfly fauna of three different habitats which cover both disturbed and undisturbed ecosystems of the knuckles region.

Materials and Methods

Observations were done mainly along Kalu Ganga River, starting from Pallegama village to forest core area. Three different habitats; Home gardens and agricultural lands (HG & AL), Forest margin (FM) and Natural forest (NF) were selected for the study. After a preliminary survey, five sampling sites (200 m X 400 m plots) were selected from each habitat. Field survey was carried out for six months from June 2007, in three field visits at two months interval. Field observations were done by walking the selected length of the habitat at a constant pace and recording all

butterfly species seen (Fleishman *et al.*, 2000). A sweep net and Binocular (Nikon 7X) were also used where necessary. Butterflies were identified to species level and recorded against the time. Butterfly larval host plants were identified and documented.

Results and Discussion

Two thousand two hundredes seventy four individuals of 102 species belonging to ten (10) families were recorded during the study. Four species are endemic to Sri Lanka. The highest number of species recorded was from the family Lycaenidae, which was 30.4 % of the total number of species recorded in the study. The lowest number of species (5.9 %) recorded was from the family Satyridae. Moreover, 7.8 %, 17.6 %, 13.7 %, 10.8 % and 9.8 % of species was recorded from family Danaidae, family Nymphalidae, family Pieridae, family Papilionidae and family Hesperidae, respectively.

In comparison to national status, highest number of species of butterflies was recorded from the family Papilionidae. It is 11 species of total no of 15 Papilionids recorded in the island. Lowest number of species was recorded from the family Hesperidae (20.8 %). Furthermore, 66.7 %, 50.0 %, 50.0 %, 37.5 % and

36.9 % were recorded from family Danaidae, family Nymphalidae, family Pieridae, family Satyridae and family Lycaenidae correspondingly. The family Acraeidae and the family Riodinidae have single members and the family Libytheidae composed of two members; all four species in above three families were recorded. Nineteen species of butterflies were recorded only once in the study (Figure 1) and were considered as the rarest species. Twenty two species occurred more than 20 times and were considered as the most common species. Eighty four common butterfly host plants were recorded, 29 of plant species in Natural Forest (NF), 47 in Forest Margin (FM) and 48 in Home Gardens and Agricultural Lands (HG and AL).

A total of 822 individuals were recorded from HG and AL that belongs to 64 species from ten families. Of them, thirteen species were restricted to HG and AL. Although the lowest number of individuals (409) of 61 species

from FM, only three species were restricted the habitat. Highest number of individuals (1043) and highest number of species (75) belonging to 9 families were recorded from NF and of them 23 species were restricted to the habitat.

NF and HG and AL are two extremes of habitats, which home higher number of species. Many uncommon butterflies are forest dwellers. All the species restricted to HG and AL are very common species in Sri Lanka except the Common Castor (*Ariadne ariadne minorata*) that is also considered common by Woodhouse (1950) and De' Abrera (1998).

The variation of butterfly abundance and diversity within a day (6.00 to 17.00 h) shows butterflies are active in mid day and the abundance peaks at 12.00 to 13.00 h. The diversity does not fluctuate remarkably but higher between 10.00 to 13.00 h. Slight increment of butterfly abundance with the diversity was observed in the

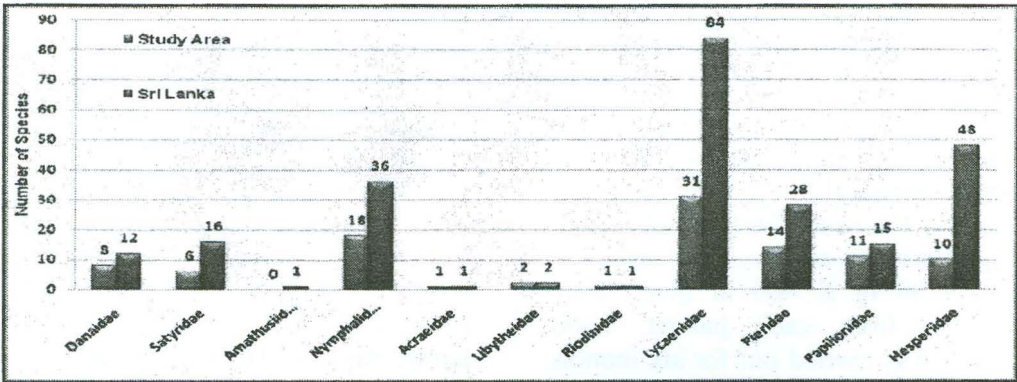


Figure 1. Species composition of butterflies of the study area in comparison with national status

belonging to 9 families was recorded

morning 7.00 to 8.00 h and in the

evening 15.00 to 16.00 h. This may be due to two reasons; White four-ring (*Yapthima ceylanica*) and Psyche (*Leptosia nina*) which has different niches in same habitat and poisonous species (*Euploea core asela*, *Parantica aglea*,) that have little threats remain visible over the day and abundant when other competitive species are absent. As some species specified to appear in less wedged times of dawn and dusk (such as evening browns) they may also appeared in this period.

Conclusions

Both NF and HG and AL serve more preferable habitats for butterflies than FM due to availability of different larval host plants and differences of habitat preferences by butterflies. Higher number of species of butterflies occurred in AL and HG since most of these habitats are unmanaged and many herbs and shrubs grow. Neither the diversity nor abundance directly indicates the degree of habitat degradation. But presence of some butterfly species can be used as a measure of habitat quality. In degraded habitats some butterfly species occur in higher numbers. Some species are restricted themselves to NF. The present study suggests that further investigations are needed on these

butterflies in to use them as a measure of habitat degradation.

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