

Diversity of Ground-Dwelling Insects in Ayer Hitam Forest Reserve

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INTRODUCTION

Insects are the most abundant animals on earth and two-thirds of these insects inhabit the tropical rain forests. In Peninsular Malaysia, majority of these insects occupy the lowland forests. These forests provide habitats for thousands insect species that are functionally important to the forest ecosystems. In recent years, however, the rates of deforestation in the lowland forests are rather alarming. The destruction of natural habitats and their conversion to other uses pose the single greatest threat to insect communities in the forests. In view of the changing ecosystem of Ayer Hitam Forest Reserve and its surrounding, a study on the diversity of ground-dwelling selected insect communities in the forest was conducted. Heretofore, very few information was available on insects of the forest except those of Maeto *et al.* 1995 and Sajap *et al.* 1997.

MATERIALS AND METHODS

The study was conducted at Ayer Hitam Forest Reserve, Puchong, Selangor, about 20 km south-east of Universiti Putra Malaysia, Serdang campus. Ground-dwelling insects were collected using pitfall traps. Each trap consisted of a plastic cup, 11.5 cm deep and 9.5 cm wide, containing water, few drops of detergent and a small amount of sorbic acid. Three plots, about 500 m apart from each plot, were established along a transect line into the forest. Within each plot, 24 pitfall traps were placed in a group of six within a subplot. The traps were installed twice a month for a period of three months and each trapping

period lasted for one week. Samples collected from each pitfall trap were sorted into orders.

RESULTS AND DISCUSSION

The ground-dwelling insects that were collected using pit fall traps are shown in Table 1. The total number of individuals were different between each plot with the middle plot had the highest number of individuals. As expected Hymenoptera dominated all other orders in all the plots. The diversity of the ground-dwelling insects apparently increased from the fringes towards the centre of the forest. This was indicated by the Shannon indices of 2.08, 2.14 and 2.40 at the fringe, middle and centre of the forest, respectively. This trend could be possibly due to the higher plant diversity in the centre than that of the forest fringes. In addition to the differences between plots, the community of ground-dwelling insects varied with the time of sampling (Table 2). The total number of individuals increased by three times, from 406 in August to 1472 in October. The diversity of the insects also increased correspondingly from 2.08 in August to 2.43 in October. The increase in abundance and diversity of insects in the month of October could be attributed to the onset of rainy seasons in the west-central part of Peninsular Malaysia.

In conclusion, Air Hitam Forest Reserve must be conserved. The forest currently acts as a refuge for many animals including insects that are adversely affected by losses of habitat area due to forest destruction and fragmentation.

TABLE 1
Insects collected in pitfall traps placed at three plots

Order	Plot 1	Plot 2	Plot 3	Total
Hymenoptera	404	627	335	1366
Isoptera	36	113	121	207
Collembola	34	103	84	221
Coleoptera	62	64	52	178
Diptera	27	48	47	122
Orthoptera	25	23	36	4*
Thysanura	4	9	11	24
Homoptera	5	5	5	15
Hemiptera	4	2	5	11
Lepidoptera	1	0	1	2
Neuroptera	1	0	0	1
Total	603	994	697	2294
Shannon Index	2.08	2.14	2.39	

TABLE 2
Insects collected in pitfall traps in three months

Order	Aug	Sep	Oct	Total
Hymenoptera	236	314	816	1366
Isoptera	74	40	156	270
Collembola	11	5	205	221
Coleoptera	67	22	89	178
Diptera	4	14	104	122
Orthoptera	6	12	66	84
Thysanura	3	4	17	24
Homoptera	3	2	10	15
Hemiptera	2	2	7	11
Lepidoptera	0	1	1	2
Neuroptera	0	0	1	1
Total	406	416	1472	2294
Shannon Index	2.08	2.11	2.42	

REFERENCES

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