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BUTTERFLIES OF GUNUNG PUEH-BERUMPUT RIDGE

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ABSTRACT

A total of 68 species and 158 individuals of butterflies from five families were sampled along the Gunung Pueh-Berumput Ridge during a 10-day preliminary survey of the fauna from 23 Oct.- 1 November 2001. Two-man-day samplings using telescopic aerial nets were conducted within a 1 km^2 area along the forest edge and existing trails. Nymphalidae with 36 species (66.7% of the total species) and 100 individuals represented the most diverse as well as abundant butterfly family at the Gunung Pueh-Berumput Ridge. The remaining families, namely Pieridae, Lycaenidae, Papilionidae and Hesperiidae were represented by 14, 11, four and three species, respectively. The most abundant butterfly species in the area was *Hypolimnas bolina philippensis* (Nymphalidae), represented by 12 individuals. This was followed by *Junonia orithya metion* (Nymphalidae) and *Neptis hylas sopatra* (Nymphalidae), which were represented by 10 and 6 individuals, respectively. The G. Pueh-Berumput ridge is also characterized by the occurrence of rare butterfly species such as *Lamproptera*

curius curius (Papilionidae), *E. simulatrix tecmesa* (Pieridae), *Neptis nata nata* and *Bassarona teuta bellata* (Nymphalidae).

ABSTRAK

Sejumlah 68 spesies dan 158 individu kupu-kupu mewakili lima famili telah disampel di sepanjang permatang Gunung Pueh-Berumput semasa tinjauan awal fauna rama-rama selama 10 hari dari 23 Okt.-1 Nov. 2001. Teknik pensampelan dua-orang per hari menggunakan jaring teleskopik dijalankan dalam kawasan 1 km^2 di sepanjang pinggiran hutan dan rintis sedia-ada. Nymphalidae merupakan famili yang paling tinggi kepelbagaian dan kelimpahannya dengan 36 spesies (66.7% daripada jumlah spesies keseluruhan) dan 100 individu. Famili selebihnya, iaitu Pieridae, Lycaenidae, Papilionidae dan Hesperiidae masing-masing diwakili oleh 14, 11, four and three species. Spesies kupu-kupu yang paling melimpah ialah *Hypolimnas bolina philippensis* (Nymphalidae) yang diwakili oleh 12 individu. Ini diikuti oleh *Junonia orithya metion* (Nymphalidae) dan *Neptis hylas sopatra* (Nymphalidae), masing-masing diwakili oleh 10 and 6 individu. Satu ciri fauna kupu-kupu kawasan G. Pueh-Berumput ialah kehadiran spesies langka seperti *Lamproptera curius curius* (Papilionidae), *E. simulatrix tecmesa* (Pieridae), *Neptis nata nata* dan *Bassarona teuta bellata* (Nymphalidae).

INTRODUCTION

The fauna of Pueh-Berumput Ridge, which straddles the Sarawak-Kalimantan border, has been little studied so information on the biodiversity of this area is very scarce.

The forest of Gunung Berumput, although secondary in nature due to repeated logging, is not part of the Pueh Forest Reserve. Unlike Gunung Pueh, Gunung Berumput is therefore not protected by law. Logging, shifting cultivation and hunting are threatening the ecosystem and wildlife.

These activities are carried out by the local communities from Sarawak as well as from across border. In view of this threat

there is an urgent need for a scientific study of the biological resources of the Pueh-Berumput Ridge.

The lack of knowledge on the fauna of Gunung Berumput and the increasing threat to its biological diversity has led us to carry out a survey on the insect fauna, in particular the butterflies with the aim of documenting its diversity and composition. Butterflies are among the best-known insects and they are perhaps the best group of insects for examining pattern of terrestrial biotic diversity and distribution, thus a good bioindicator group.

MATERIALS AND METHODS

A preliminary survey on butterflies was carried out from 21 October to 1 November 2001, at the Gunung Pueh-Berumput Ridge, Sarawak, Southwestern Borneo. A two-man-day sampling technique using aerial nets was employed in this study. Samplings were done along the existing man-made trails and forest edge within a 1 km^2 area. Species identification follows Aoki, Yamaguchi and Uemura (1982), Maruyama and Otsuka (1991), Otsuka (1988, 2001), Seki, Takanami and Otsuka (1991), Tsukada (1985, 1991), Tsukada and Nishiyama (1982), and Yata and Morishita (1985). The butterfly specimens are currently deposited at the Unimas Insect Reference Collection.

RESULTS AND DISCUSSION

A total of 68 species and 158 individuals from five butterfly families were collected along the Gunung Pueh-Berumput Ridge during the 10-day preliminary survey. Table 1 shows the number of species and individuals within the five families collected from the area. Nymphalidae with 36 species (66.7% of the total species) and 100 individuals represented the most diverse as well as abundant butterfly family from the study area. Their high occurrence in the Gunung Pueh-Berumput Ridge may be contributed by their predominantly fruit-feeding characteristic; most of the species from subfamilies Satyrinae, Morphinae, Nympalinae and Charaxinae feed on rotting-fruits (Corbet and Pendlebury, 1992) which are usually available on the forest floor.

Their distribution is also widespread as they are cosmopolitan butterflies that occupy most habitat types (Idris et al. 1999; Zaidi et al.1998).

Among the nymphalids, *Hypolimnas bolina philippensis* (Table 1) appeared to be the most abundant species in the area. This was followed by *Junonia orithya metion* and *Neptis hylas sopatra*, which were represented by 10 and 6 individuals, respectively. All three species are not uncommonly encountered in Borneo and are usually considered as lowland butterflies.

The other families, Pieridae, Lycaenidae, Papilionidae and Hesperiidae were represented by 14, 11, four and three species, respectively. Among the pierids, *Eurema blanda blanda*, also classified as a lowland butterfly by Otsuka (2001) was the commonest species encountered.

Among the other papilionids, the citrus butterfly, *Papilio demoleus* was collected at G. Pueh. However, none of *P. memnon* and *P. polytes* was encountered. Males of *P. memnon* were observed to be frequent in Gunung Mulu National Park particularly along the Melinau Trail (Holloway, 1984) and the Bau limestone area (Karim & Abang, 2004).

Lycaenidae, being the most diverse butterfly family in Borneo, however was not well represented in the samples. This is probably due to most species being canopy fliers (Holloway 1984; Corbet and Pendlebury 1992), and mostly confined to primary forest while some species are rather local in their distribution (Corbet and Pendlebury 1992). The common lycaenid collected from the G. Pueh-Berumput Ridge was *Ionolyce helicon merguiana* (Table 2) which is a widely-distributed lowland species in Borneo. In Peninsular Malaysia, *Ionolyce helicon merguiana* has also been recorded as commoner on the lowlands than in the hills (Corbet and Pendlebury 1992). In the present study, *I. helicon* was mostly collected at moist spots along the forest edge.

The least species represented in the study area was from the family Hesperiidae. This is not an unusual situation as many species of this family are usually recorded as very rare in collections since in some groups, the species are crepuscular. The species collected in this study are common species, namely

Erionata thrax thrax, Notocrypta quadrata and Pelopidas lubricans lubricans.

None of the species collected in this study are Bornean endemic species. However, out of the 68 species of butterflies sampled, about 48.5% (33 species) collected were singletons. Among these singletons, they notably include rarely encountered species in Sarawak such as *Neptis nata nata, E. simulatrix tecmesa* and *Lamproptera curius curius.* Another rare species is *Bassarona teuta bellata,* however, interestingly, both the male and female were sampled in this study. The rarity of these species are reflected in their rarity in existing collections in Sarawak. The existing voucher specimens of *N. nata nata* and *B. teuta bellata* in the Sarawak Museum dated back to collections made in Kuching in 1897 and 1898, respectively. Other existing specimens of *N. nata nata* were collected from Padawan in 1980 and the specimen from this study represented the latest record over a period of twenty years. *B. teuta bellata* used to be collected in Lambir National Park and Similajau in 2000 prior to the discovery of this species from G. Pueh-Berumput Ridge.

E. simulatrix tecmesa is a low montane butterfly and is categorized as a rarely encountered species, having been known only from a few voucher specimens in Sarawak

Existing voucher specimens in the Sarwak Museum indicated that the papilionid *Lamproptera curius curius* used to be collected in Limbang and Bau in 1895. A single male *Lamproptera curius curius*, was encountered at the peak of G. Berumput. This is a much rarer *Lamproptera* species compared to *L. meges meges*, which, however, was not encountered in this study.

The protected Rajah Brooke's birdwing, *Trogonoptera brookiana*, was surprisingly not commonly encountered in this area where only one male was collected throughout this study. However, this birdwing is not at all an uncommon species, and it normally flies in forested areas where its food plant, *Aristolochia tagala* is to be found.

CONCLUSIONS

Overall, a comparatively high number of butterfly species was recorded from the present study. This indicated that despite being degraded, the forests in the study area still sustains a high butterfly diversity. The G. Pueh-Berumput ridge is also characterized by the occurrence of rare butterfly species such as *Lamproptera curius curius, Neptis nata nata* and *Bassarona teuta bellata*. It is also characterized by a high number of nymphalid butterflies which is usually common in various Bornean lowland forests particularly at the understorey level.

This survey has provided some additional information on the occurrence and distribution of some butterfly species in Sarawak, in particular, the G. Pueh-Berumput Ridge. It is hoped that the butterfly checklist of G. Pueh-Berumput Ridge could serve as baseline data for further studies on butterfly diversity in Sarawak.

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Table 1 List of butterflies collected from Gunung Pueh-Berumput Ridge from 23 Oct–Nov 2001.

Family	Species/subspecies	M	F
PAPILIONIDAE	1. *Graphium antiphates itamputi* Butler 1885	2	1
	2. *Lamproptera curius curius* Fabricus 1787	1	-
	3. *Papilio demoleus* Linne 1758	-	1
	4. *Trogonoptera brookiana brookiana* Wallace 1855	1	-
	5. *Appias olferna olferna* Swinhoe 1890	-	3
PIERIDAE	6. *Cepora iudith hespera* Butler 1899	2	1
	7. *Dercas gobrias gobrias* Hewitson 1864	1	1
	8. *Eurema andersoni borneensis* Shirozu & Yata 1981	1	1
	9. *Eurema blanda blanda* Yata 1981	6	-
	10. *Eurema hecabe hecabe* Linnaeus 1758	3	-
	11. *Eurema simulatrix tecmesa* De Nice'ville 1895	1	-
	12. *Gandaca harina elis* Fruhstorfer 1910	1	-
	13. *Leptosia nina malayana* Fruhstorfer 1910	3	-
	14. *Pareronia valeria lutescens* Butler 1879	2	1
	15. *Saletara panda distanti* Butler 1898	3	-
NYAMPHALIDAE	16. *Bassarona dunya monara* Fruhstorfer 1913	2	-
Nyamphalinae	17. Bassarona teuta bellata Distant 1886	1	1
	18. Cethosia hypsea hypsea Doubleday 1847	1	2
	19. *Charaxes bernadus repititus* Butler 1869	2	-
	20. *Chersonesia peraka peraka* Distant 1884	-	1
	21. *Chersonesia rahria rahria* Moore 1857	1	-
	22. *Cirrochroa orissa orissa* Moore 1857	1	-
	23. *Euripus nyctelius borneensis* Distant 1887	1	-
	24. *Euthalia iapis ambalika* Moore 1858	1	-
	25. *Hypolimnas anomala anomala* Wallace 1869	2	1
	26. *Hypolimnas bolina philippensis* Butler 1874	8	4
	27. *Junonia atlites atlites* Linnaeus 1763	1	1
	28. *Junonia orithya metion* Fruhstorfer 1905	1	9
	29. *Neptis duryodana duryodana* Moore 1858	1	-
	30. *Neptis hylas sopatra* Fruhstorfer 1907	-	6
	31. *Neptis nata nata* Moore 1857	-	1
	32. *Tanaecia aruna aparasa* Vollenhoeven 1862	-	1
	33. *Tanaecia pelea djataca* Fruhstorfer 1913	-	1
	34. *Terinos clarissa praestigiosa* Fruhstorfer 1914	2	-
	35. *Vindula dejone dejone* Erichson 1834	1	-
	36. *Vindula erota montana* Fruhstorfer 1889	1	-
Satyrinae	37. *Melanitis leda leda* Linnaeus 1758	2	-
	38. *Melanitis zitennius rufinus* Fruhstorfer 1908	1	-
	39. *Mycalesis anapita fucentia* Fruhstorfer 1911	3	2
Danainae	40. *Mycalesis horsfieldi hermana* Fruhstorfer 1908	2	0
	41. *Mycalesis mineus macromalayana* Fruhstorfer 1911	0	2
	42. *Mycalesis orseis borneensis* Fruhstorfer 1906	2	2
	43. *Orsotriaena medus medus* Fabricius 1775	1	1
	44. *Ypthima pandocus sertorius* Fruhstorfer 1911	0	4
	45. *Euploea crameri crameri* (GP12) Lucas 1853	1	0

	46. *Euploea diocletianus lowii* Butler 1878	6	0
	47. *Euploea leucostictos syra* Fruhstorfer 1901	1	0
	48. *Euploea mulciber portia* Fruhstorfer 1904	5	0
	49. *Ideopsis vulgaris interposita* Fruhstorfer 1910	3	0
	50. *Parantica agleoides borneensis* Staudinger 1885	4	0
	51. *Parantica aspasia aspasia* (GP14) Fabricius 1787	1	2
LYCAENIDAE	52. *Anthene emolus goberus* (Fruhstorfer, 1916)	1	0
	53. *Anthene lycaenina miya* (Fruhstorfer, 1916)	1	0
	54**.** *Arhopala agrata brookei* Bethune-Baker, 1903	1	0
	55. *Arhopala horsfieldi basiviridis* de Niceville, 1891	0	1
	56. *Arhopala major major* (Staudinger, 1889)	1	0
	57. *Arhopala moorei moorei* Bethune- Baker, 1896	0	1
	58. *Cheritra freja pallida* (H.Druce, 1873)	1	0
	59. *Curetis santana malayica* (C. & R. Felder, [1865])	1	0
	60. *Eooxylides tharis tharisides* Fruhstorfer, [1912]	1	0
	61. *Hypolycaena erylus teatus* Fruhstorfer, [1912]	2	0
	62. *Ionolyce helicon merguiana* (Moore, 1884)	4	0
	63. *Jamides caeruleus caeruleus* H. Druce, 1873)	1	0
	64. *Jamides pura tenus* (Fruhstorfer, [1916])	2	0
	65. *Zieeria karsandra* Moore, 1884	0	1
HESPERIIDAE	66. *Erionata thrax thrax* (Linnaeus, 1767)	2	0
	67. *Notocrypta quadrata* Elwes & Edwards 1897	1	0
	68. *Pelopidas lubricans lubricans* (Herrich Schaffer, 1869)	1	0
TOTAL		**106**	**53**