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BUTTERFLIES (LEPIDOPTERA: RHOPALOCERA) OF TAMAN NEGARA JOHOR ENDAU ROMPIN, JOHOR

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ABSTRACT

Taman Negara Johor Endau Rompin (TNJER) is an old tropical rainforest of the world, where the rocks had been dated to be at least 248 million years old. It is located in the southern part of Peninsular Malaysia, in the state of Johor. Studies on diversity of butterflies (Lepidoptera: Rhopalocera) of TNJER had been reported since 1987 with the latest report being published in 2005. A pioneering scientific expedition to TNJER was conducted in 1985-1986 and a total of 179 butterfly species recorded and reported in 1987. The second expedition in 2002-2003 reported 206 species of butterfly, published in 2005. Thereafter, collections of butterfly were carried out opportunistically employing two methods: manual collection using aerial net and baited traps using over- ripe banana. A grant from Universiti Tun Hussein

Onn Malaysia enabled researchers to make several collection visits in 2013 (February, June and September). By the most recent study in 2013, 37 species had been added to the collection with 10 new records for TNJER. A more intensive collection is planned for 2014 to evaluate the actual butterfly diversity of an old tropical forest, using more quantitative method such as point counting. Perhaps when substantial reference collections had been gathered and checklist up-dated, the data of butterfly diversity could be compared between an old tropical forest (TNJER) and newer tropical forest of Borneo, particularly in Sabah and Sarawak to note differences if any occurred.

Keywords: Taman Negara Johor Endau Rompin, old tropical rainforest, butterfly biodiversity, reference collections

ABSTRAK

Taman Negara Johor Endau Rompin (TNJER) merupakan salah satu hutan hujan tropika tua di dunia, di mana batu-batunya berusia 248 juta tahun. Ia terletak di bahagian selatan Semenanjung Malaysia, di negeri Johor. Kajian ke atas kepelbagaian kupu-kupu (Lepidoptera: Rhopalocera) daripada TNJER dilaporkan sejak 1987 dengan laporan terbaru yang diterbitkan pada tahun 2005. Ekspedisi saintifik perintis untuk TNJER telah dijalankan pada tahun 1985-1986 dan sebanyak 179 spesies kupu-kupu yang dicatatkan dan dilaporkan pada tahun 1987. Ekspedisi kedua pada tahun 2002-2003 dilaporkan 206 spesies kupu-kupu, yang diterbitkan pada tahun 2005. Selepas itu, pengumpulan kupu-kupu dijalankan dengan menggunakan dua kaedah utama, iaitu mengaplikasikan koleksi manual menggunakan jaring udara dan perangkap berumpan yang menggunakan pisang busuk. Geran daripada Universiti Tun Hussein Onn Malaysia membolehkan penyelidik untuk melaksanakan pengumpulan spesimen kupu-kupu pada tahun 2013 (Februari, Jun dan September). Kajian terkini pada tahun 2013, telah ditambahkan 37 spesies dengan 10 rekod baru untuk TNJER. Beberapa pengumpulan lebih intensif dirancang pada 2014 untuk menilai kepelbagaian kupu-kupu yang sebenar bagi hutan hujan tropika lama, menggunakan kaedah lebih kuantitatif seperti titik pengiraan. Mungkin apabila koleksi rujukan yang besar telah berkumpul dan senarai semak dikemaskinikan, data kepelbagaian

kupu-kupu sesuai dibandingkan antara hutan tropika lama (TNJER) dan hutan tropika Borneo yang lebih baru, terutamanya di Sabah dan Sarawak untuk ambil perhatian perbezaan jika ada berlaku.

Kata kunci: Taman Negara Johor Endau Rompin, hutan hujan tropika lama, biodiversiti rama-rama, koleksi rujukan

INTRODUCTION

The Endau- Rompin area was gazetted as one of the prestigious national park in Malaysia straddling the Johore-Pahang border, with the area of 38,780 ha in Pahang (Kiew *et al.*, 1987) and 48,905 ha in Johore (Chew, 2007). Taman Negara Johor Endau Rompin (TNJER) is located in the southern part of Peninsular Malaysia, in the state of Johor and comprised of two gateways: Peta in Mersing and Selai in Segamat. It is an old tropical rainforest of the world, where the rocks had been dated to be at least 248 million years old. This national park was gazette in 1993 (Chew, 2007), with the objective is to conserve both flora and fauna.

Studies on diversity of butterflies (Lepidoptera: Rhopalocera) of TNJER had been reported since 1987 and the most recent report was published in 2005. A general collection of butterflies was carried out during the first scientific expedition to TNJER in 1985- 1986. A total of 179 butterfly species recorded from the expedition and reported in 1987 (Kirton, 1987). The second expedition in 2002-2003 reported 206 species
butterfly and the report was published in 2005 (Sofian-Azirun *et al.*, 2005).

MATERIAL AND METHODS

The sampling of butterfly were carried out opportunistically employing two methods, namely netting and trapping. Butterflies were collected using aerial net. For the baited traps, over- ripe bananas was used as baits. These traps were placed around Nature Education and Research Centre (NERC) area and along the trail of Sungai Semawak. The study was conducted over three visits on 2-4 February 2013, 23-25 June 2013 and 12-15 September 2013. Butterfly collected in the field were preserved temporarily in envelopes.

In the laboratory, each specimen was spread out, pinned and dried in the oven. All butterfly specimens were identified using keys in Corbet & Pendlebury (1992) and Otsuka (2001). Also, the specimens were brought to Centre for Insect Systematic, Universiti Kebangsaan Malaysia to be cross checked for identification. Identified specimens were deposited at Centre of Research for Sustainable Uses of Natural Resources, Faculty of Science, Technology and Human Development, Universiti Tun Hussein Onn Malaysia.

RESULTS AND DISCUSSION

A total of 37 species belonging to 27 genera and five families was collected during the study. When compared with previous reports of 1987 and 2005, 10 species are new records for TNJER. The species collected are listed in alphabetical order and arranged by family in Appendix 1. The most well represented family during the survey conducted in 2013 was Nymphalidae with a total of 28 species recorded. In fact, the use of baited traps was particularly successful for collecting a large number of fruit-feeding nymphalids. Most of the butterflies were collected in lowland forest and logging track. There are ten new species recorded in TNJER namely *Papilio demoleus malayanus* Wallace (Fig. 2), *Arhopala athada athada* (Staudinger), *Lambrix salsala salsala* (Moore), *Orsotriaena medus cinerea* (Butler), *Mycalesis horsfieldi hermana* Fruhstorfer, *Bassarona teuta goodrichi* (Distant), *Melanocyma faunula* (Westwood), *Bassarona teuta rayana* (Morishita) (Fig. 1), *Melanitis zitenius auletes* Fruhstorfer, *Agatasa calydonia calydonia* (Hewitson) and *Charaxes durnfordi durnfordi* Distant.

Fig. 1. Male of *Bassarona teuta rayana* (Morishita, 1968) with much wider whitish markings as compared to *ssp. goodrichi*. Five specimens were collected using trap baited with over-ripe banana, hung at a dipterocarp tree. The sampling site is along the Sungai Semawak trail at 93 m.

Fig. 2. *Papilio demoleus malayanus* Wallace, 1865. This species was caught when feeding nectar on flower of *Ixora* sp. at NERC during a bright sunny day.

Fig. 3. *Ideopsis vulgaris macrina* (Fruhstorfer, 1904). Five specimens were collected in the area of NERC. This species was found fluttering in the open space/logging track.

Based on Fig. 4, the cumulative graph of butterfly species collected from TNJER, the increasing curve shows the continuous addition of new butterflies species recorded in TNJER from 1987 to 2013. More species are expected to be discovered in the future.

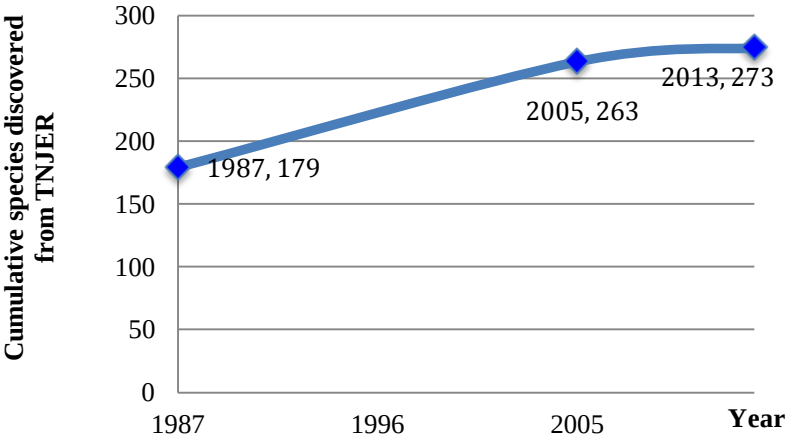

Fig. 4. The cumulative of butterfly species collected from TNJER.

CONCLUSION

This paper updates the latest information on the butterfly fauna of TNJER through studies conducted from 1987 to 2013. For this study covering a period of three months (February, June, September) and three or four collecting days, a total of 37 butterfly species were recorded and 10 new records for TNJER were added. Despite limited sampling period and unpredictable weather, the outcome of the study was substantial. Subsequently, a more intensive collection will be planned for 2014 to evaluate butterfly diversity of an old tropical forest with regard to species richness, composition and abundance. This can be achieved by 1) using more quantitative methods such as point counting to monitor the butterfly population in TNJER and 2) analyzing the diversity of butterfly by applying some species indices. When substantial reference collections have been gathered and checklist up-dated, the data of butterfly diversity will be compared between the old tropical forest (TNJER) and newer tropical forest of Borneo, particularly in Sabah and Sarawak, to gauge any pattern peculiar to forest age.

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Appendix 1

Family	Species	No. of Specimen	Sampling Location & Date	Notes
Papilionidae	1. *Papilio nephelus sunatus* Corbet, 1940	1	NERC (2/2/13)	
	2. *Papilio demoleus malayanus* Wallace, 1865	1	NERC (7/5/13)	New record
Nymphalidae	1. *Agatasa calydonia calydonia* (Hewitson, [1854])	1	NERC (15/9/13)	New record Protected under Wildlife Protected Species Act 2010 [Act 716]
	2. *Amathuxidia amythaon dilucida* (Honrath, 1884)	1	Trail NERC to Dam in Semawak River (15/9/13)	
	3. *Bassarona teuta goodrichi* (Distant, 1886)	1	NERC (2/2/13)	New record
	4. *Bassarona teuta rayana* (Morishita, 1968)	5	Trail NERC to Dam in Semawak River (13-15/9/13)	New record

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5. *Cethosia hypsea hypsina* C. & R. Felder, [1867]	1		
		NERC (2/2/13)	
6. *Charaxes durnfordi durnfordi* Distant, 1884	1	Trail NERC to Dam in Semawak River (15/9/13)	New record Protected under Wildlife Protected Species Act 2010 [Act 716]
7. *Danaus melanippus hegesippus* (Cramer, [1777])	1	NERC (24/6/13)	
8. *Doleschallia bisaltide pratipa* C.&R.Felder, 1860	1	NERC (2/2/13)	
9. *Euploea radamanthus radamanthus* (Fabricius, 1793)	1	NERC (24/6/13)	
10. *Idea stolli logani* (Moore, 1883)	1	Trail NERC to Dam in Semawak River (14/9/13)	* Protected under Wildlife Protected Species Act 2010 [Act 716]
11. *Ideopsis vulgaris macrina* (Fruhstorfer,1904)	1 2 2	NERC (3/2/13) NERC (24/6/13) NERC (14/9/13)	
12. *Lexias canescens pardalina* (Staudinger, 1886)	1	NERC (3/2/13)	

13. *Lexias dirtea merguia* (Tytler, 1926)	1	NERC, Semawak River (14/9/13)	
14. *Lexias pardalis dirteana* (Corbet, 1941)	2	Trail NERC to Dam in Semawak River (13/9/13)	
15. *Melanitis Ieda Ieda* (Linnaeus, 1758)	1	Trail NERC to Dam in Semawak River (14/9/13)	
16. *Melanitis zitenius auletes* Fruhstorfer, 1908	1	Trail NERC to Dam in Semawak River (14/9/13)	
17. *Melanocyma faunula* (Westwood, 1850)	1	Trail NERC to Dam in Semawak River (14/9/13)	New record
18. *Mycalesis horsfieldi hermana* Fruhstorfer, 1908	1	NERC (3/2/13)	

19. *Mycalesis maianeas maianeas* Hewitson, [1864]	1	NERC, Semawak River (13/9/13)	
20. *Mycalesis visala phamis* Talbot & Corbet, 1939	1	Trail NERC to Dam in Semawak River (14/9/13)	
21. *Orsotriaena medus cinerea* (Butler, 1867)	1	NERC (24/6/13)	New record
22. *Parantica aspasia aspasia* (Fabricius, 1787)	2	NERC (3/2/13)	
23. *Prothoe franck uniformis* Butler, 1885	1	Trail NERC to Dam in Semawak River (14/9/13)	Protected under Wildlife Protected Species Act 2010 [Act 716]
24. *Ypthima baldus newboldi* Distant, 1882	1	NERC (2/2/13)	
25. *Ypthima horsfieldii humei* Elwes & Edwards, 1893	2	NERC (2/2/13)	
26. *Zeuxidia amethystus amethystus* Butler, 1865	1	NERC, Semawak River (14/9/13)	

	27. *Zeuxidia aurelius aurelius* (Cramer, [1777])	1	Trail NERC to Dam in Semawak River (13/9/13)	Protected under Wildlife Protected Species Act 2010 [Act 716]
	28. *Zeuxidia doubledayi doubledayi* Westwood, [1851]	1	Trail NERC to Dam in Semawak River (15/9/13)	
Lycaenidae	1. *Arhopala athada athada* (Staudinger, 1889)	1	NERC (2/2/13)	New record
	2. *Jamides celeno aelianus* (Fabricius, 1793)	1	NERC (2/2/13)	
	3. *Zemeros emesoides emesoides* C.&R.Felder, 1860	1	Trail NERC to Dam in Semawak River (14/9/13)	
Pieridae	1. *Eurema hecabe contubernalis* (Moore,1886)	1	NERC (3/2/13)	
	2. *Eurema sari sodalis* (Moore, 1886)	1	NERC (2/2/13)	
Hesperiidae	1. *Ancistroides nigrita Maura* (Snellen,[1880])	1	NERC (3/2/13)	
	2. *Lambrix salsala salsala* (Moore,[1866])	4	NERC (3/2/13)	