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Short Notes

Odonata Fauna of Imbak Canyon Conservation Area, Sabah

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Abstract

Dragonflies and damselflies, collectively known as Odonata, are an important component of fresh water ecosystems. The Odonata fauna of the Imbak Canyon Conservation Area (ICCA) was surveyed during the Batu Timbang Research Station Scientific Expedition on 16-26 August 2017. A total of 62 Odonata species from 13 families were recorded. The family Libellulidae had the highest number of species (27), and this was followed by Coenagrionidae (nine species), Calopterygidae (five species), Platycnemididae (five species) and Platystictidae (four species). The other families (Devadattidae, Chlorocyphidae, Euphaeidae, Lestidae, Philosinidae, Aeshnidae, Corduliidae and Macromiidae) were only represented by 1-3 species. Of the species recorded, 30 are new records for ICCA. The number of species recorded was high, indicating the high diversity of Odonata fauna of ICCA. These records were combined with the existing records in literature to produce a checklist. At present, 68 species from 15 families are known from ICCA.

Keywords: Biodiversity, Borneo, Checklist, Imbak Canyon Conservation Area, Odonata, Sabah

Introduction

Dragonflies and damselflies collectively known as Odonata, are one of the oldest groups of insects in the world. They first appeared on the earth in the Carboniferous Period around 300 million years ago. Dragonfly fossils with an age of 130 million years old do not differ much in morphology compared to the present dragonflies. Close to 6,000 Odonata species are distributed throughout the world (Dijkstra et al., 2013). In Malaysia, more than 400 species have been recorded, with over 160 species known from the state of Sabah (Orr, 2003, 2005; Choong et al., 2017).

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Generally, Odonata have vibrant colours on their body and sometimes their wings. They are active during the day on hot sunny days. Odonata are always associated with fresh water such as rivers, streams, ponds, lakes, waterfalls, canals, swamps, marshes and paddy fields. Fresh water bodies are essential habitats for Odonata larvae. Therefore, Odonata forms an important biological component for fresh water ecosystems. Both the larvae and adults are good hunters. Odonata larvae prey on aquatic insects, tadpoles, small fish and shrimps and the adults mostly prey on other flying insects. Many Odonata species are good biological indicators for water quality.

The Imbak Canyon Conservation Area (ICCA), a main part of larger Imbak Canyon, is located immediately to the north of Maliau Basin Conservation Area in the central part of Sabah. With a size of 27,599 ha, ICCA consists of complex rainforest habitats ranging from lowland dipterocarp forests to montane heath forests (Yayasan Sabah, 2014). The published Odonata records for Imbak Canyon come from three publications – Choong (2011), Dow & Orr (2012) and Chung et al. (2013). Choong (2011) recorded 38 species from Mount Kuli Research Station (within ICCA) and Chung et al. (2013) recorded 24 species from Sungai Imbak Forest Reserve. It is noted that the part of Sungai Imbak Forest Reserve surveyed by Chung et al. (2013) falls outside ICCA. On the other hand, Dow & Orr (2012) reported the type series of *Telosticta janeus* from ICCA. It is always of immense interest to carry out additional surveys of Odonata in different parts of Imbak Canyon to document the species richness of ICCA. We carried out a short sampling in ICCA on 16-26 August 2017. Here we present the results of the field survey together with the available literature records to produce a checklist of Odonata known from ICCA.

Methodology

The Odonata of ICCA was surveyed during Batu Timbang Research Station Scientific Expedition on 16-26 August 2017. The survey was done at two sites – Imbak Canyon Studies Centre (5°5’28.9682”N; 117°2’11.2567”E) on 17-21 August 2017 and Batu Timbang Campsite/Research Station (5°0’13.1444”N; 117°4’46.2944”E) on 23-25 August 2017. The survey was done at all types of aquatic habitats (streams, rivers, swamps, ponds, puddles, waterfalls etc.) at both the sites. Adult insects were caught using aerial net. Specimens collected were treated with acetone and then dried in silica gel. The identification of specimens down to species was done based on references and comparison with specimens from other places. The specimens are kept in Centre for Insect Systematics (Universiti Kebangsaan Malaysia) and the Sabah Forestry Department.

Results and Discussion

A total of 62 Odonata species from 13 families were recorded during the Batu Timbang Research Station Scientific Expedition (Table 1). The family Libellulidae had the highest number of species (27), and this was followed by Coenagrionidae (nine species), Calopterygidae (five species), Platycnemididae (five species) and Platystictidae (four species). The other families (Devadattidae, Chlorocyphidae, Euphaeidae, Lestidae, Philosinidae, Aeshnidae, Corduliidae and Macromiidae) were only represented by 1-3 species. A total of 54 species were recorded at Imbak Canyon Studies Centre and 35 species at Batu Timbang Campsite (Table 1). This disparity of the species number does not necessarily reflect the species richness of a particular site. It is most likely the consequence of a lower sampling effort at one site – five sampling days in Imbak Canyon Studies Studies and three sampling days in Batu Timbang Campsite.

Table 1. Odonata species recorded during Batu Timbang Research Station Scientific Expedition 2017. Data from Imbak Canyon Studies Centre is in column A and Batu Timbang Campsite is in column B. Records from Choong (2011) are in column C. # indicates an observation without a voucher specimen. * indicates a new record for ICCA.

No.	Species	A	B	C
	Family Lestidae			
*1	*Lestes praevius* Lieftinck, 1940	/		
2	*Orolestes wallacei* (Kirby, 1889)	/		/
	Family Platystictidae			
3	*Drepanosticta actaeon* Laidlaw, 1934		/	/
4	*Drepanosticta versicolor* (Laidlaw, 1913)	/	/	/
*5	*Protosticta* cf *kinabaluensis* Laidlaw, 1915		/	
6	*Telosticta janeus* Dow & Orr, 2012		/	/
	Family Calopterygidae			
7	*Neurobasis longipes* Hagen, 1887	#	/	/
8	*Vestalis amaryllis* Lieftinck, 1965	/	/	/
*9	*Vestalis amoena* Hagen in Selys, 1853	/		
10	*Vestalis anacolosa* Lieftinck, 1965	/	/	/
11	*Vestalis beryllae* Laidlaw, 1915		/	/
	Family Chlorocyphidae			
12	*Rhinocypha aurofulgens* Laidlaw, 1931		/	/
13	*Rhinocypha humeralis* Selys, 1873	/	/	/
	Family Devadattidae			
14	*Devadatta tanduk* Dow, Hämäläinen & Stokvis 2015	/	#	/

	Family Euphaeidae			
15	*Euphaea subcostalis* (Selys, 1873)	/	#	/
	Family Philosinidae			
16	*Rhinagrion elopurae* (McLachlan in Selys, 1886)	/		/
	Family Platycnemididae			
17	*Coeliccia nigrohamata* Laidlaw, 1918	/	#	/
18	*Coeliccia* cf *nemoricola* Laidlaw, 1912	/	#	/
19	*Coeliccia arcuata* Lieftinck, 1940	/	/	/
20	*Copera vittata* (Selys, 1863)	/	#	/
21	*Prodasineura hyperythra* (Selys, 1886)			/
22	*Prodasineura dorsalis* (Selys, 1860)			/
23	*Prodasineura hosei* (Laidlaw, 1913)			/
*24	*Prodasineura verticalis* (Selys, 1860)	/		
	Family Coenagrionidae			
*25	*Agriocnemis femina* (Brauer, 1868)	/		
*26	*Argiocnemis rubescens rubeola* Selys, 1877	/		
27	*Argiocnemis* sp.	/		/
*28	*Ceriagrion bellona* Laidlaw, 1915	/		
*29	*Pseudagrion microcephalum* (Rambur, 1842)	/		
30	*Stenagrion dubium* (Laidlaw, 1912)	/	/	/
31	*Teinobasis laidlawi* Kimmins, 1936	/	#	/
*32	*Teinobasis rajah* Laidlaw, 1912	/		
*33	*Xiphiagrion cyanomelas* Selys, 1876	/		
	Family Aeshnidae			
*34	*Anax panybeus* Hagen, 1867	/		
35	*Indaeschna grubaueri* (Förster, 1904)	/	#	/
*36	*Tetracanthagyna degorsi/brunnea* (female)		/	
	Family Gomphidae			
37	*Microgomphus chelifer* (Selys, 1858)			/
	Family Macromiidae			
38	*Macromia corycia* Laidlaw, 1922		/	/
	Family Synthemistidae			
39	*Idionyx* sp. (female)			/
	Family Corduliidae			
*40	*Epophthalmia vittigera* (Rambur, 1842)	/		
	Family Libellulidae			

*41	*Agrionoptera insignis* (Rambur, 1842)	/		
*42	*Agrionoptera sexlineata* Selys, 1879	/		
*43	*Brachydiplax chalybea* Brauer, 1868	/		
*44	*Camacinia gigantea* (Brauer, 1867)	#		
*45	*Cratilla lineata* (Brauer, 1878)	/	#	
46	*Cratilla metallica* (Brauer, 1878)	/	#	/
*47	*Diplacodes trivialis* (Rambur, 1842)	/		
*48	*Hylaeothemis clementia* Ris, 1909	/		
49	*Lyriothemis biappendiculata* (Selys, 1878)	/	#	/
50	*Lyriothemis cleis* Brauer, 1868			/
*51	*Nesoxenia lineata* (Selys, 1868)	/		
*52	*Neurothemis fluctuans* (Fabricius, 1793)	/	/	
*53	*Neurothemis ramburii* (Brauer, 1866)	/	#	
*54	*Neurothemis terminata* Ris, 1911	/	#	
55	*Orthetrum chrysis* (Selys, 1891)	/	#	/
56	*Orthetrum glaucum* (Brauer, 1865)	/	#	/
57	*Orthetrum pruinosum* schneideri Förster, 1903	/	/	/
*58	*Orthetrum sabina* (Drury, 1773)	/		
*59	*Orthetrum testaceum* (Burmeister, 1839)	/	#	
*60	*Pantala flavescens* (Fabricius, 1798)	/	#	
*61	*Rhyothemis triangularis* Kirby, 1889	/		
62	*Tetrathemis irregularis hyalina* Kirby, 1889	/		/
*63	*Tramea transmarina euryale* Selys, 1878	/		
64	*Trithemis aurora* (Burmeister, 1839)	/		/
65	*Trithemis festiva* (Rambur, 1842)	/	/	/
66	*Tyriobapta torrida* Kirby, 1889	/	#	/
67	*Zygonyx iris errans* Lieftinck, 1953		#	/
*68	*Zyxomma petiolatum* Rambur, 1842	#		
	Total number of species	**54**	**35**	**38**

Among the species recorded, *Orthetrum glaucum*, *Orthetrum testaceum*, *Neurothemis ramburii* and *Neurothemis terminata* were found abundantly at the open areas in Imbak Canyon Studies Centre.

On the other hand, the camp sites and the logging road in Batu Timbang

Figure 1. Some of the Odonata species photographed at Imbak Canyon Conservation Area. A: *Teinobasis rajah*, B: *Lestes praevius*, C: *Neurobasis longipes*, D: *Teinobasis laidlawi*, E: *Cratilla metallica*, F: *Cratilla lineata*, G: *Orthetrum testaceum*, and H: *Lyriothemis biappendiculata*.

Campsite were frequently visited by *Cratilla lineata*, *Cratilla metallica* and *O. glaucum*. Particularly interesting species recorded during the expedition were *Lestes praevius*, *Vestalis beryllae*, *Telosticta janeus, Rhinagrion elopurae* and *Protosticta* cf *kinabaluensis*. *Lestes praevius*, a new record for Malaysia, was found at Imbak Canyon Studies Centre. Orr (2003) mentioned that *L. praevius* was only known from east Borneo (Kalimantan), but postulated the possibility of its wider distribution. *Telosticta janeus* is a unique species endemic to Sabah, and it is only known to Danum Valley and Imbak Canyon (Choong, 2011; Dow & Orr, 2012), and Maliau Basin (Dow, personal communication). *Vestalis beryllae, Rhinagrion elopurae* and *P.* cf *kinabaluensis* are uncommon species and endemic to Borneo (Orr, 2003). Some of the Odonata species recorded during the expedition were photographed and are shown in Figure 1.

Of these 62 species recorded, 30 species are new records for ICCA (Table 1; marked with *). The high number of new records may indicate that the Odonata fauna of ICCA is still very much unexplored. It is also noted that five species (*Heliocypha biseriata*, *Rhinocypha stygia*, *Euphaea impar*, *Rhyothemis phyllis* and *Rhyothemis regia regia*) recorded from Sungai Imbak Forest Reserve by Chung et al. (2013) have not yet been recorded in ICCA. Some parts of the Sungai Imbak Forest Reserve are within ICCA. Furthermore, these species are not rare, and therefore there is a high possibility of their presence in ICCA. The species recorded from the current field survey were combined with the existing records by Choong (2011) from Mount Kuli Research Station to produce a checklist (Table 1). At present, 68 species from 15 families are known from ICCA. This represents 42% of the species known from Sabah, indicating the high diversity of Odonata in ICCA.

Conclusion

In general, ICCA is rich in Odonata fauna. Undoubtedly, it is a refuge for many species endemic to Borneo. Batu Timbang Research Station and Mount Kuli Research Station are not far from each other, and they are located at the southern part of ICCA. This shows that only a small part of the ICCA has been surveyed for Odonata so far. Therefore, further surveys in other parts of the conservation area are needed to produce a more comprehensive checklist for ICCA.

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