

ODONATA (INSECTA) FAUNA OF TASEK BERA RAMSAR SITE, PAHANG, PENINSULAR MALAYSIA

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ABSTRACT

Records of Odonata collected at several sites in Tasek Bera Ramsar Site, Pahang on 13th– 19th August 2014 are presented. A total of 64 species from seven families were recorded of which 16 species are new records for Tasek Bera. These records are combined with the existing records from Tasek Bera in previous literature to produce an updated checklist of the Odonata known to Tasek Bera. At present it consists of 92 species from 12 families.

Keywords: Odonata, Dragonflies, Tasek Bera, Pahang, Peninsular Malaysia

*Received (17-August-15); Accepted (08-October-15); Available online
(25-March-16)*

Citation: Choong, C.Y., Izzat-Husna, M. & Amirrudin, B.A. (2016). Odonata (Insecta) fauna of Tasek Bera Ramsar Site, Pahang, Peninsular Malaysia. *Journal of Wildlife and Parks*, **31**: 39-48.

INTRODUCTION

With a total area of 6,150 hectares, Tasek Bera Ramsar Site is a wetland consisting of freshwater swamp lake, peat swamp forest and dipterocarp lowland forest, and surrounded by oil palm plantations (Cramphorn *et al.*, 1993). Semelai indigenous aborigines are the local inhabitants, mainly in Pos Iskandar settlement by the lake. Tasek Bera was conferred a Ramsar site in 1994 due to its biodiversity, ecological and social-economic importance. Its biodiversity richness has been well documented (Furtado & Mori, 1982).

The first published records of Odonata for Tasek Bera appeared in Furtado and Mori (1982). They recorded 32 species (note: 33 species were listed in the paper but *Brachygonia fluvialitis* is a mistake species, and thus it is removed from the record). Later on, Norma-Rashid *et al.* (2001) produced a comprehensive checklist of Odonata for Tasek Bera. They conducted samplings from 1997 to 2000 and recorded 59 species but *Prodasineura autumnalis* was removed from the record since the species does not occur in Peninsular Malaysia (Orr, 2005). By combining their sampling records with the records from Furtado and Mori (1982) and historical records from National Museum of Natural History, Leiden, they produce an Odonata checklist for Tasek Bera consisting of 76 species from 11 families.

In this study, we carried out a short sampling in Tasek Bera on 13th – 19th August 2014. Here we present the results of the field survey together with a summary of the available literature records to produce an updated checklist of Odonata known to Tasek Bera.

MATERIALS AND METHODS

Sampling was done on 13th – 19th August 2014 at various parts of Tasek Bera during the 2014 Inventory Programme conducted by the Department of Wildlife and National Parks (DWNP). The sampling was carried out around the lake (done on boat), swamp forest, open swamps and feeder streams to the lake. Adult Odonata were collected using handheld nets. Specimens were preserved with acetone treatment and drying in silica gel. Classification of Odonata follows Dijkstra *et al.* (2013a) except for the family Argiolestidae which follows Kalkman and Theischinger (2013) and Dijkstra *et al.* (2013b).

The samples collected is held either in the Centre for Insect Systematics at Universiti Kebangsaan Malaysia (UKM), Universiti Malaysia Terengganu (UMT) and the Institute of Biodiversity (IBD), DWNP, Bukit Rengit. Specimens were identified to species level with the aid of a microscope, by reference to the relevant literatures, and direct comparison with materials from other places.

RESULTS

The list of all species observed and collected in Tasek Bera in this study as well as records of the previous work by Norma-Rashid *et al.* (2001) are presented in Table 1. A total of 64 species from seven families were observed and collected

during this study. Out of these, 16 species are new records for Tasek Bera. *P. autumnalis* reported by Norma-Rashid *et al.* (2001) is treated here as *P. humeralis*. *P. humeralis* and *P. autumnalis* are very similar to each other, however, only *P. humeralis* occurs in Peninsular Malaysia (Orr, 2005). *B. fluvialitis*, an erroneous species in Furtado and Mori (1982) was also listed in Norma-Rashid *et al.* (2001) but was removed in this list. We observed *Anax* species in flight, but we did not manage to secure any specimen. *Anax guttatus* and *Anax panybeus* occur in Peninsular Malaysia (Choong *et al.*, 2008) and these two *Anax* species closely resemble one another, only close inspection confirms its identity. Therefore, we list this record here as *A. guttatus/panybeus*. A total of 27 species listed in Norma-Rashid *et al.* (2001) were not recorded in our field survey. *Orthetrum sabina*, *Rhyothemis obsolescens*, *Pseudagrion williamsoni* and *C. fluviatilis* were present in abundance during the field survey (Figure 1).

Table 1 Flies collected from Tasek Bera Ramsar Site, Pahang.

No.	Family <i>Species</i>	A	B	Location of specimen
Calopterygidae				
1.	<i>Neurobasis chinensis</i> (Linnaeus, 1758)		✓ -	
Chlorocyphidae				
2.	<i>Libellago aurantiaca</i> (Selys, 1859)		✓ -	
3.	<i>Libellago lineata</i> (Burmeister, 1839)		✓ -	
4.	<i>Libellago hyalina</i> (Selys, 1859)	✓	✓	UKM, UMT, IBD
Euphaeidae				
5.	<i>Dysphaea dimidiata</i> (Selys, 1853)		✓ -	
Argiolestidae				
6.	* <i>Podolestes orientalis</i> (Selys, 1862)	✓		UKM, IBD
Lestidae				
7.	<i>Platylestes heterostylus</i> (Lieftinck, 1932)		✓ -	
Platystictidae				
8.	<i>Drepanosticta sharpi</i> (Laidlaw, 1907)		✓ -	
Coenagrionidae				
9.	<i>Acigrion hisopa</i> (Selys, 1876)		✓ -	
10.	<i>Argiocnemis femina</i> (Brauer, 1868)	✓	✓	UKM, UMT, IBD
11.	* <i>Amphicnemis gracilis</i> (Kruger, 1898)	✓		UKM, IBD
12.	<i>Archibasis incisura</i> (Lieftinck, 1949)	✓	✓	UKM, UMT, IBD
13.	<i>Archibasis melanocyana</i> (Selys, 1877)		✓ -	
14.	* <i>Archibasis viola</i> (Lieftinck, 1949)	✓		UKM, IBD
15.	<i>Argiocnemis rubescens rubeola</i> (Selys, 1877)	✓	✓	UKM, UMT, IBD
16.	<i>Ceriagrion cerinorubellum</i> (Brauer, 1865)	✓	✓	UKM, UMT, IBD

17.	<i>Ischnura senegalensis</i> (Rambur, 1842)	✓	-
18.	<i>Mortonagrion aborense</i> (Laidlaw, 1914)	✓	✓ UKM, IBD
19.	<i>Pseudagrion australasiae</i> (Selys, 1876)	✓	✓ UKM, UMT, IBD
20.	<i>Pseudagrion microcephalum</i> (Rambur, 1842)	✓	✓ UKM, UMT, IBD
21.	* <i>Pseudagrion pruinsum</i> (Burmeister, 1839)	✓	UKM
22.	<i>Pseudagrion williamsoni</i> (Fraser, 1922)	✓	✓ UKM, UMT, IBD
23.	<i>Teinobais rajah</i> (Laidlaw, 1912)		✓ -
24.	* <i>Teinobasis ruficollis</i> (Selys, 1877)	✓	UKM
Platycnemididae			
25.	<i>Copera ciliata</i> (Selys, 1863)	✓	✓ UKM, UMT, IBD
26.	<i>Copera marginipes</i> (Rambur, 1842)	✓	✓ UKM, IBD
27.	* <i>Copera vittata</i> (Selys, 1863)	✓	UKM, IBD
28.	<i>Elatoneura analis</i> (Selys, 1860)		✓ -
29.	<i>Elatoneura aurantiaca</i> (Selys, 1886)	✓	✓ UKM, UMT, IBD
30.	<i>Onychargia atrocyana</i> (Selys, 1865)	✓	✓ UKM
31.	<i>Prodasineura collaris</i> (Selys, 1860)	✓	✓ UKM, IBD
32.	<i>Prodasineura humeralis</i> (Selys, 1860)	✓	✓ UKM, IBD
33.	<i>Prodasineura interrupta</i> (Selys, 1860)		✓ -
Aeshnidae			
34.	* <i>Anax guttatus/panybeus</i>	✓	-
35.	<i>Heliaeschna idea</i> (Brauer, 1865)	✓	✓ UKM, IBD
Gomphidae			
36.	<i>Ictinogomphus decoratus melaenops</i> (Selys, 1858)	✓	✓ UKM, UMT, IBD
37.	<i>Ictinogomphus acutus</i> (Laidlaw, 1914)	✓	✓ UKM, UMT, IBD
38.	<i>Macrogomphus decemlineatus</i> (Selys, 1878)		✓ -
39.	<i>Macrogomohus parallelogramma albardae</i> (Selys, 1878)		✓ -
40.	<i>Macrogomphus phalantus</i> (Liefinck, 1935)		✓ -
41.	* <i>Paragomphus capricornis</i> (Forster, 1914)	✓	UKM
Macromiidae			
42.	<i>Ephthalma vittigera</i> (Rambur, 1842)		✓ -
43.	<i>Macromia cincta</i> (Rambur, 1842)		✓ -
Libellulidae			
44.	<i>Acisoma panorpoides</i> (Rambur, 1842)	✓	✓ UKM, UMT, IBD
45.	<i>Brachydiplax chalybea</i> (Brauer, 1868)	✓	✓ UKM, UMT, IBD

46.	<i>Brachydiplax farinosa</i> (Kruger, 1902)	✓	✓	UKM,IBD
47.	<i>Brachydiplax sobrina</i> (Rambur, 1842)	✓	✓	UKM
48.	<i>Brachygonia oculata</i> (Brauer, 1878)	✓	✓	UKM
49.	* <i>Brachythemis contaminata</i> (Fabricius, 1793)	✓		UKM, UMT, IBD
50.	<i>Chalybeothemis fluviatilis</i> (Lieftinck, 1933)	✓	✓	UKM, UMT, IBD
51.	* <i>Cratilla lineata</i> (Brauer, 1878)	✓		UKM
52.	<i>Cratilla metallica</i> (Brauer, 1878)	✓	✓	UKM, UMT, IBD
53.	<i>Crocothemis servilia</i> (Drury, 1770)		✓	-
54.	<i>Diplacodes nebulosa</i> (Fabricius, 1793)		✓	-
55.	<i>Diplacodes trivialis</i> (Rambur, 1842)	✓	✓	UKM, IBD
56.	<i>Hydrobasileus croceus</i> (Brauer, 1867)	✓	✓	UKM, IBD
57.	<i>Lathrecista asiatica</i> (Fabricius, 1798)	✓	✓	UKM, UMT
58.	<i>Lyriothemis cleis</i> (Brauer, 1868)		✓	-
59.	<i>Nannophya pygmaea</i> (Rambur, 1842)	✓	✓	UKM, UMT, IBD
60.	<i>Nesoxenia lineata</i> (Selys, 1879)		✓	-
61.	<i>Neurothemis fluctuans</i> (Fabricius, 1879)	✓	✓	UKM, UMT, IBD
62.	* <i>Neurothemis fulvia</i> (Drury, 1773)	✓		UKM, UMT, IBD
63.	<i>Neurothemis terminata</i> (Ris, 1911)		✓	-
64.	<i>Orchithemis pruinans</i> (Selys, 1878)	✓	✓	UKM,UMT
65.	<i>Orchithemis pulcherrima</i> (Brauer, 1878)	✓	✓	UKM, UMT, IBD
66.	<i>Orthetrum chrysis</i> (Selys, 1891)	✓	✓	UKM, UMT, IBD
67.	<i>Orthetrum glaucum</i> (Brauer, 1865)	✓	✓	UKM, UMT
68.	<i>Orthetrum luzonicum</i> (Brauer, 1868)		✓	-
69.	<i>Orthetrum pruinatum schneideri</i> (Forster, 1903)		✓	-
70.	<i>Orthetrum sabina</i> (Drury, 1770)	✓	✓	UKM, UMT, IBD
71.	<i>Orthetrum testaceum</i> (Burmeister, 1839)	✓	✓	UKM, UMT, IBD
72.	<i>Pantala flavescens</i> (Fabricius, 1798)	✓	✓	UKM, UMT
73.	<i>Potamarcha congener</i> (Rambur, 1842)	✓	✓	UKM, UMT
74.	* <i>Pseudothemis jorina</i> (Forster, 1904)	✓		UKM, UMT
75.	<i>Rhodothemis rufa</i> (Rambur, 1842)	✓	✓	UKM, UMT, IBD
76.	* <i>Rhyothemis aterrima</i> (Selys, 1891)	✓		UKM, UMT, IBD
77.	<i>Rhyothemis obsolescens</i> (Kirby, 1889)	✓	✓	UKM, UMT, IBD
78.	<i>Rhyothemis phyllis</i> (Sulzer, 1776)	✓	✓	UKM, UMT, IBD
79.	* <i>Rhyothemis plutonia</i> (Selys, 1883)	✓		UKM, UMT
80.	<i>Rhyothemis triangularis</i> (Kirby, 1889)	✓	✓	UKM, IBD
81.	* <i>Tetrathemis irregularis hyalina</i> (Kirby, 1889)	✓		UKM, UMT, IBD
82.	<i>Tholymis tillarga</i> (Fabricius, 1798)	✓	✓	UKM, UMT
83.	<i>Tramea transmarina euryale</i> (Selys, 1878)	✓	✓	UKM
84.	<i>Trithemis aurora</i> (Burmeister, 1839)	✓	✓	UKM, IBD

85.	<i>Trithemis festiva</i> (Rambur, 1842)	✓	✓	UKM, IBD
86.	<i>Trithemis pallidinervis</i> (Kirby, 1889)		✓	-
87.	<i>Tyriobapta torrida</i> (Kirby, 1889)	✓	✓	UKM, IBD
88.	<i>Urothemis abbotti</i> (Laidlaw, 1927)		✓	-
89.	<i>Urothemis signata insignata</i> (Selys, 1872)	✓	✓	UKM, IBD
90.	<i>Zygonyx ida</i> (Selys, 1869)		✓	-
91.	<i>Zygonyx iris malayana</i> (Laidlaw, 1902)		✓	-
92.	* <i>Zyxomma petiolatum</i> (Rambur, 1842)	✓		UKM, IBD

Column A is record from the current study, column B is record from Norma-Rashid *et al.* (2001).
* indicates new record for Tasek Bera.



Figure 1 Some Odonata species of Tasek Bera; *Orthetrum sabina* (top left), a mating pair of *Rhyothemis obsolescens*, *Chalybeothemis fluviatilis* (bottom left), *Pseudagrion williamsoni* (bottom right).

DISCUSSION

The Pahang state is quite well studied for its Odonata fauna. The main published records of Odonata in Pahang are available for Krau Wildlife Reserve (Choong, 2014), Tasek Bera (Norma-Rashid *et al.*, 2001), Tasek Chini (Fadilawati *et al.*, 2008), Fraser's Hill (Ng & Choong, 2010), Cameron Highlands (Ng *et al.*, 2011), Sg Bebar (Dow *et al.*, 2012) and Kuala Tahan (Ng *et al.*, 2012). Undoubtedly, our study at Tasek Bera has added more Odonata information to the Pahang state.

At present, 92 species of Odonata are known to occur at Tasek Bera. Of these, 64 species were collected or observed during this study. This represents 37% of the 250 species of Odonata found in Peninsular Malaysia (Orr, 2005; Choong, 2015). In comparison, the Odonata diversity of Tasek Bera is slightly higher compared to Tasek Chini. The adjacent swamp lake of Tasek Chini has similar aquatic habitat as Tasek Bera, and the number of Odonata species recorded from Tasek Chini is 81 (Fadilawati *et al.*, 2008; Choong, 2015).

Although the period of field inventory was only seven days, the number of species recorded in this study was higher than that of Norma-Rashid *et al.* (2001), of which they recorded 58 species spanning four years (1997-2000). We noted that 27 species which were previously recorded at Tasek Bera (Norma-Rashid *et al.* 2001) were not observed or collected during this study. Some of these species are from old records which were collected before 1964 and kept in National Museum of Natural History, Leiden (Norma-Rashid *et al.*, 2001) such as *Drepanosticta sharpi*, *Platylestes heterostylus* and *Macrogomphus decemlineatus*. However, it must be noted that the weather during the sampling period in August 2014 was dry, as such the aquatic landscape of some parts of Tasek Bera might be different from the wet season. A few species from fast running clear forest stream recorded by Norma-Rashid *et al.* (2001), such as *Neurobasis chinensis*, *Libellago aurantiaca*, *Zygonyx ida* and *Zygonyx iris malayana*, were not observed by us as we did not visit aquatic habitat of fast running stream during the sampling period. Nevertheless, we have added 16 new records to the existing species list of Tasek Bera. Some of these new records are uncommon species such as *Teinobasis ruficollis*, *Rhyothemis aterrima* and *Rhyothemis plutonia*.

It is worth to note on the occurrence of *Brachydiplax sobrina* in Tasek Bera. *B. sobrina* was not included in Orr's (2005) Odonata checklist for Peninsular Malaysia and Singapore. Norma-Rashid *et al.* (2001) recorded this species from Tasek Bera, and this species was also recorded from Tasek Chini (Fadilawati *et al.*, 2008). We also recorded *B. sobrina* in Tasek Bera in this study. This species has so far only been recorded from two sites in Peninsular Malaysia – Tasek

Bera and Tasek Chini. However, it is reasonable to believe that *B. sobrina* might be under-recorded due to its resemblance to *Brachydiplax farinosa*. Another interesting species recorded by Norma-Rashid *et al.* (2001) was *Macrogomphus phalantus*. This species was also recorded in other parts of Pahang (Kemp & Kemp, 1989) and Negeri Sembilan (Norma-Rashid, 2009) but it is not listed in Orr's (2005) checklist for Peninsular Malaysia and Singapore.

During this study, we observed the abundance of *O. sabina*, *R. obsolescens*, *P. williamsoni* and *C. fluviatilis* in Tasek Bera. *O. sabina* was found in high number by the lake side, *R. obsolescens* was sighted in abundance at open swamps, while *P. williamsoni* and *C. fluviatilis* were found in plenty at the *Pandanus* vegetation (locally known as *Pandan*) around the lake in Tasek Bera.

Tasek Bera obtained its Ramsar site status in 1994, and it is certain that the Odonata fauna within the Ramsar site is safe guarded. However, encroachment of oil palm plantations surrounding the Ramsar site and pollution from the adjacent plantations may still post a threat to the health of freshwater ecosystem of Tasek Bera, and these need to be monitored closely.

CONCLUSION

At present the Tasek Bera has 92 Odonata species, indicating that Tasek Bera is rich in Odonata fauna. This checklist provides a basis for future reference and study of Odonata diversity of open freshwater swamp in Peninsular Malaysia.

ACKNOWLEDGEMENT

We are grateful to DWNP for inviting us to the Tasek Bera 2014 Inventory Programme.

REFERENCES

- Choong, C.Y. (2014). Odonata (Insecta) fauna of Krau Wildlife Reserve, Pahang, Peninsular Malaysia. *Journal of Wildlife and Parks*, **28**: 73-80.
- Choong, C.Y. (2015). [The Odonata of Peninsular Malaysia]. Unpublished raw data.

- Choong, C.Y., Orr, A.G. & Dow, R.A. (2008). Checklist of dragonflies of UKM campus, including Bangi Forest Reserve, Bangi, Selangor, Malaysia. *Echo*, **5**: 4-5.
- Cramphorn, J., Khan, M.S. & Lim, K.P. (1993). A Study of the Fish Fauna of Tasek Bera. Asian Wetland Bureau, Kuala Lumpur, Malaysia.
- Dow, R.A., Ng, Y.F. & Choong, C.Y. (2012). Odonata of Sungai Bebar, Pahang, Malaysia, with four species recorded for the first time from mainland Asia. *Journal of Threatened Taxa*, **4(3)**: 2417-2426.
- Dijkstra, K.-D.B., Bechly, G., Bybee, S.M., Dow, R.A., Dumont, H.J., Fleck, G., Garrison, R.W., Hämäläinen, M., Kalkman, V.J., Karube, H., May, M.L., Orr, A.G., Paulson, D.R., Rehn, A.C., Theischinger, G., Trueman, J.W.H., van Tol, J., von Ellenrieder, N. & Ware, J. (2013a). The classification and diversity of dragonflies and damselflies (Odonata). *Zootaxa*, **3703**: 36-45.
- Dijkstra, K.-D.B., Kalkman, V.J., Dow, R.A., Stokvis, F.R. & van Tol, J. (2013b). Redefining the damselfly families: the first comprehensive molecular phylogeny of Zygoptera (Odonata). *Systematic Entomology*, **39**: 68-96.
- Fadilawati, A., Choong, C.Y., Ng, Y.F. & Zainal Abidin, A.H. (2008). Kepelbagaian pematung (Odonata) di kawasan Tasik Chini Pahang, Malaysia. In *Proceedings of the 10th MSAB Symposium, Kuching 2008*. pp. 809-813.
- Furtado, J.I. & Mori, S. (eds.) (1982). Tasek Bera: the Ecology of a Freshwater Swamp. The Hague, Boston, London: W. Junk Publishers. pp. 413.
- Kalkman, V.J. & Theischinger, G. (2013). Generic revision of Argiolestidae (Odonata), with four new genera. *International Journal of Odonatology*, **16(1)**: 1-52.
- Kemp, R.G. & Kemp, G.S. (1989). Some dragonfly records from the states of Pahang and Perak, West Malaysia. *Notulae odonatologicae*, **3(3)**: 37-48.
- Ng, Y.F. & Choong, C.Y. (2010). Dragonflies (Odonata) of Fraser Hill, Pahang. In *Bio-Kejuruteraan Penilaian Ekosistem dan Spesies 2010 Bukit Fraser* (Adam, J.H., Gasim, M.B., Sakawi, Z., Choy, E.A., Rahman, Z.A., Tambi, N. & Juhari, M.A.A., eds.), pp. 45-50. Bukit Fraser Research Centre: Universiti Kebangsaan Malaysia.

Ng, Y.F., Choong, C.Y. & Dow, R.A. (2012). Odonata records from Kuala Tahan, Pahang, Peninsular Malaysia in December 2010. *Notulae odonatologicae*, **7(9)**: 77-88.

Ng, Y.F., Dow, R.A. & Choong, C.Y. (2011). New records of Odonata (Insecta) from the Cameron Highlands, with first records of two species for Malaysia. *Journal of Science and Technology in the Tropics*, **7**: 9-16.

Norma-Rashid, Y. (2009). Odonata diversity with one new record for Malaysia in the Kenoboi Forest Reserve, Negeri Sembilan, Malaysia. *Malaysian Journal of Science*, **28(4)**: 403-410.

Norma-Rashid, Y., Mohd-Sofian, A. & Zakaria-Ismail, M. (2001). Diversity and distribution of Odonata (dragonflies and damselflies) in the fresh water swamp lake Tasek Bera, Malaysia. *Hydrobiologia*, **459**: 135-146.

Orr, A.G. (2005). Dragonflies of Peninsular Malaysia and Singapore. Kota Kinabalu: Natural History Publications (Borneo).