Annotated checklist of odonates (Insecta: Odonata) in Sungai Bantang Recreational Forest, Bekok, Johor, Malaysia

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Abstract. A total of 34 species of odonates, including 17 species of dragonflies (Anisoptera) belonging to 2 families, and 15 species of damselflies (Zygoptera) belonging to 8 families were collected and recorded from Hutan Lipur Sungai Bantang in January, May and July 2017. From the suborder Anisoptera, Libellulidae is the most dominant family with 15 species and from the suborder Zygoptera, the richest family were Chlorocyphidae, Euphaeidae and Platycnemididae, each with three species respectively. A detailed list of odonates recorded from Hutan Lipur Sungai Bantang is presented. The result forms a baseline data of odonate fauna in this forest reserve useful in the monitoring of water quality of rivers found in the forest reserves in the future.

1. Introduction
Located at the western part of Johor, Sungai Bantang Recreational Forest is a forest reserve under the management of Johor Forestry Department. This forest reserve is located in district of Bekok, 64 km from Segamat town. Sungai Bantang Recreational Forest has well vegetated aquatic habitats, favourable habitats for odonates population to flourish.

Interest towards odonate is rising in Malaysia and the continuous research resulted with several new records for Peninsular Malaysia [1-2], with potential to discover new records and perhaps new species. Highest diversity of odonates is found in tropical region and this is due to optimum and favourable weather conditions [3-4] with various microhabitats and vegetation heterogeneity [5]. This included other environmental factors that have impact towards their growth [6]. Similarly [7] stated that environmental conditions have a direct impact towards odonates survivability. Sungai Bantang a recreational forest is well known for its rivers and waterfalls. The size of water bodies is one of the factors that influences species richness and diversity of odonates. This was found from study by [8] who stated that the larger the size of water bodies, the higher the species richness and diversity of odonates population.

Odonate faunistic studies have been conducted in various parts of Johor [2-9-10-11] but no such study has been conducted in Sungai Bantang. Thus, this study was conducted to produce an inventory of the odonates known from the site and add on to the baseline data for Johor, Malaysia. As odonates are indicators of fresh water quality, this baseline data could be used to assist in the management of protected areas supporting towards biodiversity conservation in Malaysia.
2. Materials and method
The odonate fauna of Sungai Bantang Recreational Forest, Bekok, Johor (N 02°20.725’ E 103°09.378’) were surveyed in three different months; with three consecutive visits of the study (Figure 1). Samplings were conducted in January, May and July 2017 with three consecutive days of sampling for each replicate.

Adult odonates were collected manually using aerial net. Data collection was conducted between 9:00 am to 2 pm during sunny weather in which insects are mostly active during this period due to the maximum amount of sunlight and low wind velocity. Forest trails along the river banks including small streams, ditches and temporary rain pools were sampled. A one kilometre line transect was set up. Twenty one sampling stations with intervals of 50 m between each station were established (Figure 2). Specific location for each sampling station was recorded using GPS.
Figure 2. Coverage areas for each sampling station along 1000-meter using point-count method

Specimens were placed individually in a glassine envelope to protect their wings in a good condition for identification. For every specimen that is captured or photographed, the date, name of collector and location are recorded. Specimens would be preserved by treatment with acetone followed by drying. All specimens were preserved for identification purpose. Species were identified to the species level according to [12]. The specimens were deposited at the UTHM Natural Gallery, Centre of Research of Sustainable Uses of Natural Resources (CoR-SUNR), Faculty of Applied Science and Technology, Universiti Tun Hussein Onn Malaysia for future reference.

3. Results

Thirty-four species of odonates from 22 genera and nine families were recorded from Sungai Bantang Recreational Forest (Table 1). Photographs of several specimens collected are shown in Figure 3 – Figure 30.

Annotated List of Species

Family Devadattidae

Devadatta argyoides Selys, 1859: Figure 3

D. argyoides (UTHM. IN.170712.01) was found moderately (uncommon) in Sungai Bantang throughout the three replicates of sampling. The number of individuals collected and recorded is much lower compared to the other species from this family (Euphaeidae). Found perched on stones and vegetation along the river banks in station 18 (N 02°21.113’ E 103°09.392’) with elevation 186 m. As stated in [1] this species commonly occurs in rivers with rocks and boulders. According to [12] this species is common in small streams of dense primary forest and a widespread species in Peninsular Malaysia, Sumatra and southern Thailand.

Family Calopterygidae

Vestalis amoena Selys, 1853: Figure 4
V. amoena (UTHM.IN.170104.02) was the most common species among Calopterygids, found abundantly along the forest streams in Sungai Bantang. V. amoena is commonly found perched on the vegetation located near the river banks. High number of this species was collected near the small streams in Station 6 (N 02°20.828’ E 103°09.411’) at elevation 140 m. V. amoena was found in high abundance in Station 6 and this is similar habitat where most of E. ochracea was observed. According to [1], Vestalis sp. and Euphaea ochracea were commonly found within same range of habitats. V. amoena is a common species in slow-running lowland montane streams [13]. V. amoena is a widespread species and common in primary forest of Peninsular Malaysia, Sumatra and southern Thailand [12].

Family Chlorocyphidae

Aristocypha fenestrella Rambur, 1842: Figure 5

A. fenestrella (UTHM. IN.170104.03) was found only during sampling in the first replicate in May 2017. It is found in abundant at Station 14 (N 02°21.024’ E 103°09.380’) with elevation 178 m. According to [12] A. fenestrella prefers clean and swift forest streams and categorized as widespread species in Peninsular Malaysia, Sumatra and southern Thailand.

Heliocypha biforata Selys, 1859: Figure 6

H. biforata (UTHM. IN.170104.04) is the most common species from genus Heliocypha and found in high abundance at Sungai Bantang. This species is known to be highly territorial [14] and this is supported by the high abundance of this species found in sampling Station 17 (N 02°21.086’ E 103°09.390’) with elevation 181 m. H. biforata is a common species inhabiting clear small streams and open rivers [12].

Heliocypha perforata Selys, 1879

H. perforata (UTHM. IN.170102.05) is another highly territorial species from genus Heliocypha that was found in abundant during the first replicate in January 2017. The habitat is similar to H. biforata but favours open areas of fast-flowing streams and widely distributed in tropical Asia [12]. H. perforata was observed perched on stone and log in Station 16 (N 02°21.074’ E 103°09.372’) with elevation 177 m.

Family Euphaeidae

Dysphaea dimidiata Selys, 1853: Figure 7

D. dimidiata (UTHM. IN.170104.06) was found in moderate abundance and common perching on stones and vegetation near the slow-flowing streams in Station 3 (N 02°20.768’ E 103°09.402’) with elevation 110 m. This species is a very conspicuous and fast-flying odonates that favours open areas with direct sunlight. D. dimidiata is a common lowland species that favours clean water and strong sunlight [12].

Euphaea impar Selys, 1859: Figure 8

E. impar (UTHM. IN.170514.07) was found abundantly and common species with high reliability of sightings in Sungai Bantang. Commonly perching near the vegetation along the river banks. This species favours shaded forest streams [14]. E. impar was commonly found at Station 8 (N 02°20.879’ E 103°09.411’), Station 9 (N 02°20.898’ E 103°09.412’) and Station 10 (N 02°20.937’ E 103°09.407’).
with elevation ranging from 140 to 150 m. According to [12], this species is common in dense, lowland forest streams and widespread in Sundaland.

**Euphaea ochracea** Selys, 1859: Figure 9

*E. ochracea* (UTHM. IN.170514.08) was the most abundant species from genus *Euphaea* collected and recorded throughout the survey. Commonly perch on twigs including marginal and overhanging vegetation along the slow-flowing forest streams. This species was found abundantly in almost all sampling stations with elevation ranging from 110 to 170 m. The highest abundance (N=18) was recorded in Station 6 (N 02°20.828’ E 103°09.411”) at elevation 140 m. This species can be easily recognized by the obvious golden tip on their wings (male). *E. ochracea* is common species in forest streams and widespread in tropical Asia [12].

Family Coenagrionidae

**Argiocnemis rubescens** Selys, 1877: Figure 10

*A. rubescens* (UTHM. IN.170712.09) was recorded during the third replicate in July 2017. This species was spotted about 10 m from the main streams perched on grass in grass field around Station 5 (N 02°20.809’ E 103°09.403”) with elevation 136 m. This species is common in swampy forests and widespread in Indo-Australian tropics [12].

Family Platycnemididae

**Coeliccia albicauda** Forster, 1907

A single individual of *C. albicauda* (UTHM. IN.170102.10) was captured perched near the edge of a small stream in Station 8 (N 02°20.898’ E 103°09.411”) at elevation of 140 m. According to [12], the habitat is similar to *C. didyma* which favours slow-flowing forest streams at elevation ranging from 100-1200 m. with widespread distribution in Peninsular Malaysia and Thailand.

**Coeliccia didyma** Selys, 1863

*C. didyma* (UTHM. IN.170712.11) was observed and collected in July 2017 near the edges of a small stream in Station 9 (N 02°20.898’ E 103°09.412”) with elevation at 145 m. This species is commonly found in slow-flowing streams in forest and widespread in mainland Tropical Asia [12].

**Coeliccia octogesima** Selys, 1863

*C. octogesima* (UTHM. IN.170712.12) was found in similar habitats as *C. didyma* but with some distance from the main river banks. It is in accord with [12] description of this species which is commonly found in deep lowland forest with some distance from water and a widespread species in Peninsular Malaysia and Sumatra.

**Indocnemis orang** Forster, 1907: Figure 11

A single specimen was collected (UTHM. IN.170103.13) during the survey during the first replicate. I. orang was found perched on overhanging vegetation near the stream in open areas of Station 14 (N 02°21.024’ E 103°09.380”) at elevation 178 m. This species is common in small and clear forest streams and favours sunny spots and widespread in mainland Tropical Asia [12].
Prodasineura laidlawii Forster, 1907: Figure 12

*P. laidlawii* (UTHM. IN.170711.14) is a moderately common species found in Sungai Bantang. This species has been recorded in every sampling occasion and mostly found perched near the lower vegetation located near the small streams in Station 6 (N 02°20.828’ E 103°09.411’) and Station 7 (N 02°20.855’ E 103°09.412’) with elevation around 140 m. According to [12], this species is common in forest streams with widespread distribution in Peninsular Malaysia and Thailand.

Family Platystictidae

*Drepanosticta quadratus* Selys, 1860: Figure 13

A single specimen of *D. quadratus* (UTHM. IN.170712.15) was collected and recorded in January 2017 and this species is quite uncommon in Sungai Bantang. A single individual was captured in Station 7 (N 02°20.855’ E 103°09.412’) perched on the vegetation near the river banks. *D. quadratus* is commonly found in small streams of primary forest [12].

*Protosticta foersteri* Laidlaw 1902: Figure 14

*P. foersteri* (UTHM. IN.170104.16) is categorized as an endemic and locally rare species and can be found in shady region of deep forest [12]. A single individual was captured in Station 7 (N 02°20.855’ E 103°09.412’) perched on the vegetation near the small streams at elevation 137 m a.s.l.

Family Aeshnidae

*Heliaeschna crassa* Kruger, 1899

A single individual of *H. crassa* (UTHM. IN.170712.17) was captured near the forest trails in Station 7 (N 02°20.855’ E 103°09.412’) at elevation 137 m with distance about 10 m from the main forest stream. This species is common in lowland swampy forest with widespread distribution in Sundaland [12].

*Indaeschna grubaueri* Forster, 1904: Figure 15

A voucher specimen of *I. grubaueri* (UTHM. IN.170712.18) was collected in July 2017 perching vertically on the hanging vegetation in forest trails near Station 7 (N 02°20.855’ E 103°09.412’). The habitat is similar with *H. crassa*, which was found some distance from main water bodies. *I. grubaueri* common in virgin lowland forest and actively foraging during afternoon to dusk [12]. It is a widespread species in Sundaland and the Philippines.

Family Libellulidae

*Agrionoptera insignis* Rambur, 1842: Figure 16

*A. insignis* (UTHM. IN.170711.19) was captured during first sampling in July 2017 perched on the vegetation at Station 1 (N 02°20.725’ E 103°09.378’) at elevation 110 m with a 10 m distant from water bodies. This species is common in lowland forest including disturbed habitats with widespread distribution in Tropical Asia and Australasia [12].

*Brachydiplex farinosa* Kruger, 1902: Figure 17
A single individual of *B. farinosa* (UTHM. IN.170711.20) was collected in July 2017 perched near the bushes in open areas with exposed sunlight at Station 2 (N 02°20.743′ E 103°09.389′) with elevation at 115 m. *B. farinosa* can be found in lowland swamp forest and uncommon (rare) in secondary habitats with widespread distribution in Sundaland and Tropical Asia [12].

*Cratilla metallica* Brauer, 1878: Figure 18

*C. metallica* (UTHM. IN.170514.21) was found in abundant during the survey in May and July 2017. *C. metallica* commonly found perched at vegetation with some distance from main water bodies, mostly recorded in Station 3 (N 02°20.768′ E 103°09.402′) and Station 4 (N 02°20.787′ E 103°09.415′) at elevation 110 m to 127 m. This is a common species that are usually found in closed forest and widely distributed in Tropical Asia [12].

*Lathrecista asiatica* Fabricius, 1798: Figure 19

A single voucher specimen of *L. asiatica* (UTHM. IN.170712.22) was collected in January 2017. This libellulids is quite uncommon in Sungai Bantang throughout the sampling locations. *L. asiatica* was found perched on vegetation near the forest edge in sunny spots at Station 2 (N 02°20.743′ E 103°09.389′) at elevation 115 m. As stated in [12], this species is commonly found near the forest margins and favours swamps and marshes and widely distributed in Tropical Asia and Australasia.

*Lyriothemis biappendiculata* Selys, 1878: Figure 20

A single individual of *L. biappendiculata* (UTHM. IN.170712.23) was spotted and collected in July 2017 perched on the forest margins in Station 1 (N 02°20.725′ E 103°09.378′) at elevation 110 m. *L. biappendiculata* is a locally common species in swampy forest found at elevation ranging from 0 to 600 m and widely distributed in Sundaland (except Java) and southern Thailand [12].

*Neurothemis fluctuans* Fabricius, 1793: Figure 21

*N. fluctuans* (UTHM. IN.170712.24) was found to be abundant in Sungai Bantang throughout the survey in Station 1 (N 02°20.725′ E 103°09.378′), Station 2 (N 02°20.743′ E 103°09.389′) and Station 6 (N 02°20.828′ E 103°09.411′) with elevation ranging from 110 m to 140 m. *N. fluctuans* is a very common and widespread species in Peninsular Malaysia. This species is common in lentic habitats including the disturbed habitats [12].

*Orchithemis pulcherrima* Brauer, 1878: Figure 22

A single individual of *O. pulcherrima* (UTHM. IN.170712.25) was collected in July 2017 perched on the vegetation in Station 1 (N 02°20.725′ E 103°09.378′) at elevation 110 m. This species is uncommon in Sungai Bantang. *O. pulcherrima* is common in lowland swamp forest [12].

*Orthetrum chrysis* Selys, 1891: Figure 23

*O. chrysis* (UTHM. IN.170515.26) is the most common species from genus *Orthetrum* [14] and was found abundantly during the survey perches in sunny spots at the vegetation near the water bodies including slow-flowing streams and puddles in station 4 (N 02°20.787′ E 103°09.415′) and 5 (N 02°20.809′ E 103°09.403′) with elevation range from 127 to 136 m. *O. chrysis* is common in open lentic habitats and widespread in Tropical Asia [12].
Orthetrum glaucum Brauer, 1865: Figure 24

*O. glaucum* (UTHM. IN.170515.27) is a common and abundant species observed in Sungai Bantang throughout the survey. This species commonly perched near the forest margins with some distance from main water bodies. The habitat is similar to *O. chrysis* [12].

Orthetrum sabina Drury, 1770: Figure 25

*O. sabina* (UTHM. IN.170103.28) was spotted during survey in January 2017 perched on the grass field with 10 m distance from river banks in Station 6 (N 02°20.828’ E 103°09.411’) at elevation 140 m. *O. sabina* is common in degraded habitats and often forages at forest margins [12].

Orthetrum testaceum Burmeister, 1839: Figure 26

*O. testaceum* (UTHM. IN.170514.29) was commonly spotted near the areas with puddles and slow-flowing streams in Sungai Bantang. The habitat is similar to *O. chrysis* and often observed to coexist within the same habitat range. This species usually found in open areas including disturbed habitats and widely distributed in Tropical Asia [12].

Potamarcha congener Rambur, 1842: Figure 27

A single individual of *P. congener* (UTHM. IN.170712.30) was collected in January 2017 perched on the twig near the forest trail with some distance from water bodies in station 3 (N 02°20.768’ E 103°09.402’) at elevation 110 m. According to [12] *P. congener* is common in disturbed habitats and widely distributed in Tropical Asia and Australasia.

Rhyothemis phyllis Sulzer, 1776

*R. phyllis* (UTHM. IN.170515.31) was spotted during the survey in May and July 2017, commonly flying high over the canopy and seldom perch in station 5 (N 02°20.809’ E 103°09.403’) at elevation 136 m. *R. phyllis* is one of the most frequently observed in tropics and common foraging on open secondary forest and widespread in Tropical Asia and Australasia [12].

Trithemis aurora Burmeister, 1839: Figure 28

*T. aurora* (UTHM. IN.170712.32) was recorded in January and May 2017 perches on the vegetative near the small puddles, temporary rain pools and slow-flowing stream in station 5 (N 02°20.809’ E 103°09.403’) at elevation 136 m. *T. aurora* is common in lentic habitats including sluggish streams and widely distributed in Tropical Asia [12].

Trithemis festiva Rambur, 1842: Figure 29

*T. festiva* (UTHM. IN.170711.33) was spotted along the streams perches on the stones exposed to sunlight mostly in station 4 (N 02°20.787’ E 103°09.415’) at elevation 127 m. As stated in [12], *T. festiva* is common in open areas of larger streams and widespread in tropical Asia.

Zygonyx iris Laidlaw, 1902: Figure 30

*Z. iris* (UTHM. IN.170513.34) was spotted to be abundant during the survey in July 2017 in which it has never been recorded previously in any of the sampling station in Sungai Bantang. *Z. iris* commonly spotted flying over the canopy and seldom perch. High abundance of this species recorded
in Station 5 (N 02°20.809’ E 103°09.403’) at elevation 136 m. This species prefers clear and open streams habitats and widely distributed in tropical Asia [12].

4. Discussion

Thirty-four species of odonates from 26 genera and eight families were collected in Sungai Bantang Recreational Forest throughout the survey in January, May and July 2017 for a total of nine sampling days. Species found in high abundance were *Vestalis amoena*, *Heliocypha biformata*, *Euphaea ochracea*, *Prodasineura laidlawii*, *Neurothemis fluctuans*, *Orthetrum chrysis*, *Orthetrum glaucum*, *Orthetrum testaceum* and *Trithemis festiva*. The most abundant species spotted throughout the survey in Sungai Bantang were *Euphaea ochracea* and *Vestalis amoena*. Sungai Bantang is a reserved forest with various microhabitats which consists of forest streams and *Euphaea ochracea* and *Vestalis* were known to be found commonly in the forest streams and indicator species of clear and undisturbed aquatic habitats [12]. *Euphaea ochracea* and *Vestalis* were commonly co-exist in the same niche [1] and this would explain the high abundance of these species occurrences’ in forest streams of Sungai Bantang.

The least abundant species were *Devadatta argyoides*, *Heliocypha perforata*, *Argiocnemis rubescens*, *Coeliccia albicauda*, *Coeliccia didyma*, *Coeliccia octogesima*, *Indocnemis orang*, *Drepanosticta quadratus*, *Protosticta foersteri*, *Heliaeschna crassa*, *Indaeschna grubaueri*, *Brachydiplex farinosa* and *Lyriothemis biappendiculata*. However, all these species were common species with widespread distribution except *Drepanosticta* and *Protosticta*. *Drepanosticta* is known to be secretive and sensitive species that required specific habitats or environmental conditions to thrive and survive [1].

Among the 34 species recorded from Sungai Bantang, only one species is categorized as an endemic species of Peninsular Malaysia. *Protosticta foersteri* is categorized as locally rare species and found in deep shaded forest [12]. This endemic species was also found in Endau-Rompin Johor National Park [9]. According to [12], *Drepanosticta quadratus* is known only from Singapore Island. However, the recent studies shown that *Drepanosticta quadratus* were recorded in several locations in Peninsular Malaysia including Endau-Rompin National Park [9]; Kenaboi Forest Reserve Negeri Sembilan [1]; Tasik Kenyir and Bukit Kesing Recreational Forest of Terengganu [15].

The species collected in Sungai Bantang is comparable with several studies on odonatofauna conducted in various locations of Johor including Endau-Rompin Johor National Park [9] recorded 104 species, Ayer Hitam Forest Reserve [2] recorded 45 species including one new record for Malaysia, Gunung Ledang National Park [16] listed 12 species and Soga Perdana Recreational Forest listed 22 species [11].

Sungai Bantang Recreational Forest is a reserve forest that is protected under the Johor Forestry Department. However, this area is still vulnerable towards threats due to the recreational activities by visitors that caused water pollution by littering within the recreational forest and this could lead towards serious problems such as Leptospirosis infections and water pollution that will affect the aquatic organisms including odonates population. Other threats such as oil palm plantations and ongoing agricultural activities in surrounding areas of reserve forests could cause declining abundance of odonates due to the use of insecticides and nitrogen fertilizers; and eventually lead to water pollution. Odonates are important organisms that serve as bio-indicator of aquatic habitats and predators of harmful insects such as mosquitoes including some agricultural pests. Conservation efforts that can be done to keep the population of odonates in Sungai Bantang are through prioritizing the conservation areas and control the amount of litter caused by visitors through awareness campaign and law enforcement.

5. Conclusion

Through this nine days of sampling at Sungai Bantang Recreational Forest, a total of 34 species of odonates were collected. Comparatively this number is low because as a forest reserve, this ecosystem would surely support many more species and of higher abundance. It is recommended that further
samplings be made for odonates at Sungai Bantang Recreational Forest covering longer period of time and wider areas.

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**Appendices**

**FIGURES**

![Figure 3](image3.png) ![Figure 4](image4.png)

![Figure 5](image5.png) ![Figure 6](image6.png)

![Figure 7](image7.png) ![Figure 8](image8.png)

![Figure 9](image9.png) ![Figure 10](image10.png)
Figures 3–10. Some odonate species found at Sungai Bantang Recreational Forest, Bekok, Johor. 3: *Devadatta argyoides*; 4: *Vestalis amoena*; 5: *Aristocypha fenestrella*; 6: *Heliocypha biforata*; 7: *Dysphaea dimidiata*; 8: *Euphaea impar*; 9: *Euphaea ochracea*; 10: *Argiocnemis rubescens*

Figures 11–18. Some odonate species found at Sungai Bantang Recreational Forest, Bekok, Johor. 11: *Indocnemis orang*; 12: *Prodasineura laidlawii*; 13: *Drepanosticta quadratus*; 14: *Protosticta*
foersteri; 15: Indaeschna grubaueri; 16: Agrionoptera insignis; 17: Brachydiplex farinosa; 18: Cratilla metallica

Figures 19–26. Some odonate species found at Sungai Bantang Recreational Forest, Bekok, Johor. 19: Lathrecista asiatica; 20: Lyriothemis biappendiculata; 21: Neurothemis fluctuans; 22: Orchithemis pulcherrima; 23: Orthetrum chrysis; 24: Orthetrum glaucum; 25: Orthetrum sabina; 26: Orthetrum testaceum
Figures 27–30. Some odonate species found at Sungai Bantang Recreational Forest, Bekok, Johor. 27: *Potamarcha congener*; 28: *Trithemis aurora*; 29: *Trithemis festiva*; 30: *Zygonyx iris*

**Table 1.** Odonates of Sungai Bantang Recreational Forest, Bekok, Johor.

| TAXA                        | JAN 2017 | MAY 2017 | JULY 2017 |
|-----------------------------|----------|----------|-----------|
| **Devadattidae (1 species)**|          |          |           |
| *Devadatta argyoides* Selys 1859 | X        | -        | X         |
| Calopterygidae (1 species)  |          |          |           |
| *Vestalis amoena* Selys 1853 | X        | X        | X         |
| Chlorocyphidae (3 species)  |          |          |           |
| *Aristocypha fenestrella* Rambur 1842 | X        | -        | X         |
| *Heliocypha biforata* Selys 1859 | X        | X        | X         |
| *Heliocypha perforata* Selys 1879 | X        | -        | -         |
| Euphaeidae (3 species)      |          |          |           |
| *Dysphaea dimidiata* Selys 1853 | X        | X        | -         |
| *Euphaea impar* Selys 1859   | X        | X        | X         |
| *Euphaea ochracea* Selys 1859 | X        | X        | X         |
| Coenagrionidae (1 species)  |          |          |           |
| *Argiocnemis rubescens* Selys 1877 | -        | -        | X         |
| Platycnemididae (5 species) |          |          |           |
| *Coeliccia albicauda* Forster 1907 | X        | -        | -         |
| *Coeliccia didyma* Selys 1863 | -        | -        | X         |
| Species                                            | X | -  | -  |
|----------------------------------------------------|---|----|----|
| *Coeliccia octogesima* Selys 1863                  | X | -  | -  |
| *Indocnemis orang* Forster 1907                    | X | -  | -  |
| *Prodasineura laidlawii* Forster 1907              | X | X  | X  |
| Platystictidae (2 species)                         |   |    |    |
| *Drepanosticta quadratus* Selys 1860               | X | -  | -  |
| *Protopistia foersteri* Laidlaw 1902               | X | -  | -  |
| Aeshnidae (2 species)                              |   |    |    |
| *Heliaeschna crassa* Kruger 1899                   | - | -  | X  |
| *Indaeschna grubaueri* Forster 1904                | - | -  | X  |
| Libellulidae (16 species)                          |   |    |    |
| *Agrionoptera insignis* Rambur 1842                | - | -  | X  |
| *Brachydiplax farinosa* Kruger 1902                | - | -  | X  |
| *Cratilla metallica* Brauer 1878                   | - | X  | X  |
| *Lathrecista asiatica* Fabricius 1798              | X | X  | -  |
| *Lyriothemis biappendiculata* Selys 1878           | - | -  | X  |
| *Neurothemis fluctuans* Fabricius 1793             | X | X  | X  |
| *Orchitethemis pulcherrima* Brauer 1878            | - | -  | X  |
| *Orthetrum chrysis* Selys 1891                     | X | X  | X  |
| *Orthetrum glaucum* Brauer 1865                    | X | X  | X  |
| *Orthetrum sabina* Drury 1770                      | X | -  | -  |
| *Orthetrum testaceum* Burmeister 1839              | X | X  | X  |
| *Potamarcha congener* Rambur 1842                  | X | -  | -  |
| *Rhynothemis phylis* Sulzer 1776                   | - | X  | X  |
| *Trithemis aurora* Burmeister 1839                 | X | -  | X  |
| *Trithemis festiva* Rambur 1842                    | X | X  | X  |
| *Zygonyx iris* Laidlaw 1902                       | - | X  | X  |
| Number of species (34)                             | 23| 15 | 24 |

X = Presence  
- = Absence