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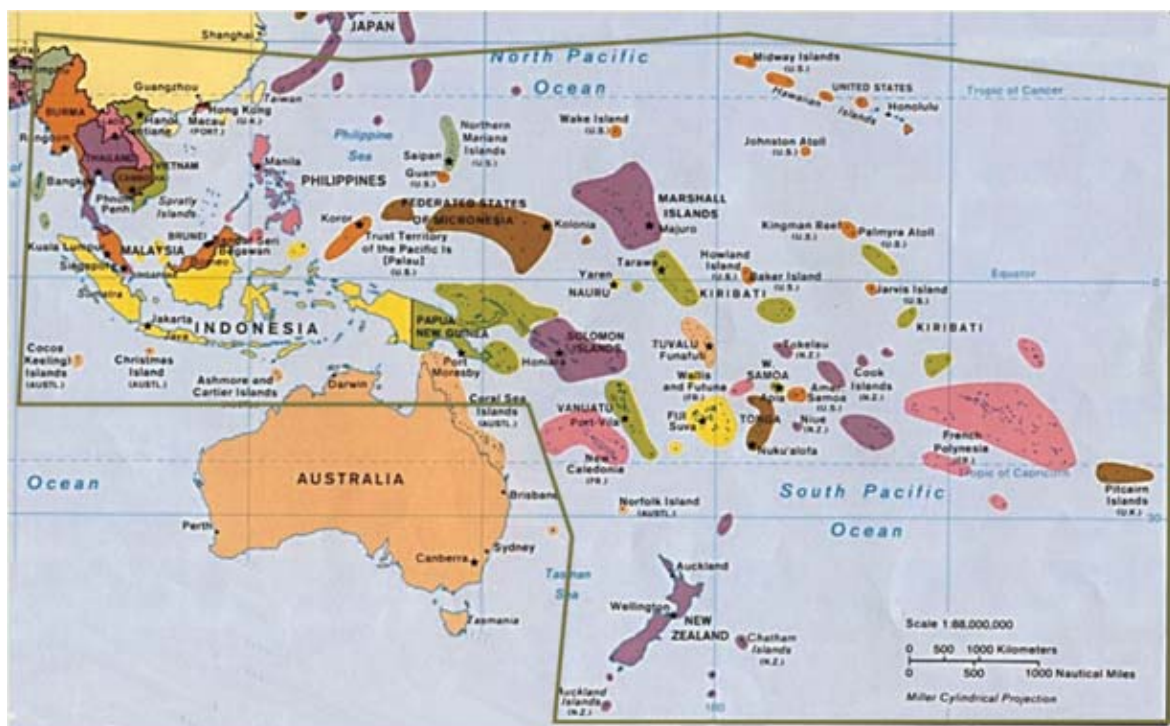
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## Odonata collected at the Samunsam Wildlife Sanctuary, Kuching Division, Sarawak, Malaysia in August 2015

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### Abstract

Results of a collecting trip to the Samunsam Wildlife Sanctuary in western Sarawak are presented. Several species are reported from Sarawak for the first time: *Elatoneura coomansi*, *Mortonagrion cf aborense*, *Macrogomphus phalantus* and *Pornothemis starrei*. Other notable records include *Coeliccia* species, *Prodasineura cf interrupta* and *Raphismia bispina*.

**Key words:** Malaysia, Borneo, Sarawak

### Introduction

Samunsam Wildlife Sanctuary (SWS) is a an area of lowland rain forest in the extreme west of Sarawak (Fig. 1), in Sematan district of Kuching division. It was declared a wildlife sanctuary in 1979; the original area covers 61 km<sup>2</sup>. The original area is located



**Figure 1. Location of the Samunsam Wildlife Sanctuary in Sarawak.**

around the Sungai Samunsam, and comprises areas of mangrove, alluvial, kerangas and mixed dipterocarp forest, with extensive stands of nipa palm around the Sungai Samunsam for some distance above the mangrove. The waters of the Sungai Samunsam and most of its tributaries are black and presumably have a low pH. Unfortunately the area was illegally logged in the past, so that the forest is in various states of disturbance, however the logging appears to have been done slowly without much heavy machinery and there is little or no sign of the network of logging tracks that are seen in most logged forest in Sarawak. A large extension, already selectively logged under timber licenses (e.g. legally) has been added south of the original area, some sampling in the upper part of Sungai Samunsam was presumably in the extension, since a main logging road is still clearly visible in this area.

At present SWS is reached by boat from the coastal town of Sematan. However an extension of the so-called Pan Borneo Highway will be built through the wildlife sanctuary, to connect to the communities at the south west tip of Sarawak; the exact route that the highway will take through the sanctuary is not yet known to me. Judging from satellite images there have been illegal encroachments and land clearing into the wildlife sanctuary along the Indonesian border (Fig. 2).



**Figure 2. Locations of sampling sites in the Samunsam Wildlife Sanctuary.**

I am not aware of any published records of Odonata from SWS before this, however many researchers have visited Samunsam over the years and so it seems likely that there are some specimens of Odonata from the wildlife sanctuary in collections. My visit was in August 2015, always a dry period, possibly exacerbated in 2015 due to

the strong El Nino event (a week after I left the smog from forest fires in Sumatra and Kalimantan began to pose serious problems in southwest Sarawak and much further east in border areas). My visit was arranged with assistance from the warden of Samunsam, Roy anak Francis, and I was assisted in the field by the extremely able Conservation Assistant, Kechandai anak Bakir.

The SWS headquarters takes water from a stream in the small hills nearby, but water levels were too low during my visit, so that the water supply was solely from rain fed water tanks and water had to be used very carefully to avoid running out. Smaller streams encountered mostly only had above ground flow near their mouths, or in only a few places. Most of my survey was conducted by using a small boat to access habitats along the Sungai Samunsam, with a much smaller amount of time spent at streams in the low hills near the SWS headquarters. The lower part of the Sungai Samunsam is deep and easily navigable, but above the nipa palm dominated part the submerged and partly submerged trunks of fallen trees pose an increasing problem, exacerbated by the fact that the river is still heavily tidily influenced, so that a tree trunk that is easily passed over or under going upstream becomes an obstacle by the time one goes back downstream. At the furthest point reached (see Fig. 2) it is possible to wade in the Sungai Samunsam for long stretches, but getting a boat close to that point is a considerable challenge.

### **Samunsam Wildlife Sanctuary Locations (Fig. 2)**

The positions of most of the locations, the headquarters (SWS HQ) and the furthest point reached on the Sungai Samunsam, are indicated in Fig. 2; note that three points on Sungai Assam (location 5) are marked. The Sungai Samunsam is still lined with nipa palm at the mouth of Sungai Samunsam Buta (location 4). Most locations sampled were 0–40m above sea level, location 8 covers ca 30-110m.

1. Sungai Samunsam above the nipa dominated part (coordinates at the mouth of location 5, Sungai Assam, can be taken as representative).
2. Sungai Samunsam in the nipa dominated part (representative coordinates 1.945N, 109.612E).
3. Channels from Sungai Samunsam running in Mangrove (e.g. 1.950N, 109.635E).
4. Sungai Samunsam Buta, a deep tributary of the Sungai Samunsam, and pools in forest nearby (1.954N, 109.607E).
5. The Sungai Assam, a long tributary of the Sungai Samunsam. Note that I am not completely sure that Sungai Assam is the correct name for this stream, it might refer to another stream (coordinates at mouth: 1.927N, 109.601E; representative coordinates upstream: 1.931N, 109.598E).
6. Smaller tributaries of Sungai Samunsam: (a) a tributary sampled first on 15.viii, and again on 20.viii by which time much of it had dried up (1.935N, 109.602E),

and another stream very nearby, also sampled on 20.viii; (b) a short tributary with tangled vegetation, sampled late on 16.viii (coordinates not taken); (c) a short muddy stream, sampled in the morning of 18.viii (1.920N, 109.597E); (d) a stream not seen by me except at its mouth, sampled by Kechandai on 19.viii (1.930N, 109.605E).

7. The trail from the headquarters to the stream providing water to the headquarters.

8. The water source stream, in some small hills (mixed dipterocarp forest) near the headquarters and other streams in the same hills (1.965N, 109.642E).

9. Around the headquarters (1.953N, 109.646E).

### Species collected

Collector's names are abbreviated as follows: KB – Kechandai anak Bakir, RD – the author. ♂+♀ denotes a pair in tandem.

### Zygoptera

#### LESTIDAE:

*Orolestes wallacei* (Kirby, 1889)

6a – ♂, 15.viii, RD.

#### PLATYSTICTIDAE:

*Drepanosticta rufostigma* (Selys, 1886)

8 – ♂, 14.viii, RD; 3 ♂♂, 20.viii, RD.

*Drepanosticta versicolor* (Laidlaw, 1913)

8 – ♂, ♀, 20.viii, RD.

*Telosticta bidayuh* Dow & Orr, 2012

8 – ♀, 20.viii, RD.

*Telosticta dupophila* (Lieftinck, 1933)

Males of *T. dupophila* were found in a small shallow low gradient stream in kerangas at the head waters of the Sungai Assam; small low gradient streams in lowland forest in south western Sarawak and north western Kalimantan seem to be the preferred habitat of this species, in contrast to most *Telosticta* which prefer higher gradient streams.

5 – 3 ♂♂, 19.viii, RD.

#### ARGIOLESTIDAE:

*Podolestes orientalis* Selys, 1862

4 – ♂, ♀ (teneral), 17.viii, KB; ♂, 17.viii, RD.

6a – 4 ♂♂, ♂+♀, 15.viii, RD; ♂, 20.viii, RD.

CALOPTERYGIDAE:

*Vestalis amaryllis* Lieftinck, 1965

5 – 2 ♂♂, 19.viii, RD.

7 – 2 ♂♂, 14.viii, RD.

8 – 4 ♂♂, 20.viii, RD.

*Vestalis amoena* Hagen in Selys, 1853

1 – ♂, 16.viii, RD.

5 – 2 ♂♂, 18.viii, RD.

CHLOROCYPHIDAE:

*Libellago aurantiaca* (Selys, 1859)

1 – ♂, 16.viii, RD.

5 – 2 ♂♂, 18.viii, RD; ♂, 19.viii, RD.

*Libellago hyalina* (Selys, 1859)

1 – ♂, 16.viii, RD.

6a – 2 ♂♂, 15.viii, RD.

*Sundacypha petiolata* (Selys, 1859)

5 – ♂, ♀, 18.viii, RD; 2 ♂♂, 19.viii, RD.

6d – 2 ♂♂, 19.viii, KB.

DEVADATTIDAE:

*Devadatta clavicauda* Dow, Hämäläinen & Stokvis, 2015

5 – ♂, 19.viii, RD.

8 – 2 ♂♂, 20.viii, RD.

EUPHAEIDAE:

*Dysphaea dimidiata* (Selys, 1853)

1 – 2 ♂♂, 16.viii, RD; ♂, 18.viii, RD.

5 – ♂, 18.viii, RD.

*Euphaea impar* Selys, 1859

1 – ♂, 16.viii, KB; ♂, 16.viii, RD.

5 – ♂, 18.viii, RD; ♂, 19.viii, RD.

6d – ♂, 19.viii, KB.

PHILOSINIDAE:

*Rhinagrion borneense* (Selys, 1886)

5 – ♂, 18.viii, RD; ♀, 19.viii, RD.

6a – ♂, 15.viii, RD; ♂, 20.viii, KB.

8 – ♂, 20.viii, RD.

## PLATYCNEMIDIDAE:

*Coeliccia flavostriata* Laidlaw, 1918

8 – 5 ♂♂, 20.viii, RD.

*Coeliccia* species

An as-yet-unnamed species, previously known from two other sites in south west Sarawak: a small area of remnant peat swamp forest near Kuching (see Dow & Reels 2011, 2013) and peat swamp forest on the Universiti Malaysia Sarawak campus in Samarahan division (see Dow & Reels 2013). As both of the other known sites are peat swamp forest it was a surprise to find it in different habitats at Samunsam. This species is currently being described, material will be listed with the description. Locations 6 and 8.

*Copera vittata* (Selys, 1863)

4 – 2 ♂♂, 17.viii, KB; ♂, ♂+♀, 17.viii, RD.

6a – 3 ♂♂, 15.viii, RD; ♂, ♀, 20.viii, RD.

*Elattoneura analis* (Selys, 1860)

5 – ♂, 18.viii, KB; 3 ♂♂, 18.viii, RD; 3 ♂♂, 19.viii, RD.

6d – ♂, 19.viii, KB.

*Elattoneura aurantiaca* (Selys, 1886)

This is a relatively scarce species, typically found on low pH streams. It was abundant at several locations at SWS.

1 – 2 ♂♂, ♂+♀, 16.viii, RD.

5 – ♂, 18.viii, KB; 3 ♂♂, ♂+♀, 18.viii, RD; ♂, ♂+♀, 19.viii, RD.

6a – 4 ♂♂, 15.viii, RD.

6c – ♂+♀, 18.viii, RD.

*Elattoneura coomansi* Lieftinck, 1937

A first record for Sarawak, *E. coomansi* was described from locations in Kalimantan Barat and on the Sumatran islands of Bangka and Belitung (Lieftinck 1937), and has subsequently been recorded from Kalimantan Tengah (Dow & Silvius 2014) and Pahang in Peninsular Malaysia (Dow, Ng & Choong 2012). Where the habitat has been recorded, *E. coomansi* has been associated with low pH waters.

1 – ♂, 3 ♀♀, 15.viii, RD.

4 – 3 ♂♂, ♀, 17.viii, RD.

5 – ♂, 18.viii, RD.

6d – 2 ♂♂, ♀, 19.viii, KB.

*Prodasineura dorsalis* (Selys, 1860)

5 – 2 ♂♂, ♂+♀, 19.viii, RD.

*Prodasineura haematosoma* Lieftinck, 1937

8 – 2 ♂♂, 20.viii, RD.

*Prodasineura notostigma* (Selys, 1860)

5 – 4 ♂♂, ♀, 18.viii, RD; ♀, 2(♂+♀), 19.viii, RD.



6a – ♂, 15.viii, RD.

6d – ♂, 19.viii, KB.

*Prodasineura verticalis* (Selys, 1860)

1 – 2 ♂♂, 15.viii, RD.

4 – 2 ♂♂, 17.viii, KB; ♂, 17.viii, RD.

5 – ♂, 18.viii, RD.

6c – ♀, 18.viii, KB.

6d – 2 ♂♂, 19.viii, KB.

*Prodasineura* species cf *interrupta* (Selys, 1860)

This is the same species that Lieftinck (1953a, 1953b) recorded from Borneo as *P. interrupta*; however it differs clearly from *P. interrupta*, described from a male from Singapore (Selys 1860) and also known from peninsular Malaysia and Sumatra (Lieftinck 1954, Orr 2005), in the structure of the male anal appendages and is a separate species. Material will be listed elsewhere (Dow & Ngiam in preparation). Locations 4, 5.

COENAGRIONIDAE:

*Archibasis tenella* Lieftinck, 1949

1 – ♂, 15.viii, RD.

5 – 3 ♂♂, 18.viii, RD.

*Archibasis viola* Lieftinck, 1948

1 – ♂, 15.viii, RD.

5 – ♂, 18.viii, RD.

*Ischnura senegalensis* (Rambur, 1842)

6a – ♀, 15.viii, RD.

*Mortonagrion* species cf *aborensis* (Laidlaw, 1914)

Together with a single male collected in peat swamp forest at Ulu Sebuyau National Park in Samarahan division in early 2015, this is the first record of this species from Sarawak. *M. aborensis* has been recorded from India, Thailand (e.g. Hämäläinen & Pinratana 1999), Laos (Sasamoto & Honda 2003), Vietnam (e.g. Von Ellenrieder et al. 2015), Cambodia (Kosterin 2010), peninsular Malaysia (e.g. Orr 2005), Sumatra and Borneo (e.g. Lieftinck 1954); it was described from north east India (Laidlaw 1914). At first I thought that the specimens from Sarawak were *M. aborensis*, but examination of the genital ligula produced a surprise: the genital ligula of *M. aborensis* is distinctive, and different from that of *Mortonagrion sensu stricto* in the sense of Dow & Choong (2015) as well as that of *Agriocnemis* and *Argiocnemis*, see Pinhey (1974) and the illustrations in Asahina (1982) and Dow (2011). The genital ligula of the Sarawak specimens turned out to be different from that of *M. aborensis*. A check of specimens from Kalimantan Tengah revealed the same form of genital ligula as in the Sarawak specimens but all specimens from mainland Asia checked so far (populations from peninsular Malaysia and northwest Thailand) agree with *M. aborensis*. Interestingly specimens from a few sites in fairly close proximity to one another in Riau province in Sumatra collected in 2014 are of both taxa, but

only one taxa was found at each site. Hämäläinen 1989 synonymised *M. binocellata* (Fraser, 1922), *M. gautama* (Fraser, 1922) and *M. simile* Ris, 1930 with *M. aborensis*. *Mortonagrion simile* was described from Sumatra and so it is possible that this is the correct name for the species also found in Borneo, but since both species occur in Sumatra, *M. simile* may have to remain as a junior synonym of *M. aborensis*. *Mortonagrion binocellata* and *M. gautama* were both described from locations in north eastern India (see the summary in Hämäläinen 1989) so it seems considerably less likely that these names apply to the species under consideration here. A resolution of these matters awaits examination of the types of all taxa concerned, where they are still available; Hämäläinen (1989) notes that the type of *M. aborensis* is apparently lost. The two species cannot be separated using the standard DNA barcoding marker COI (unpublished Naturalis data); this may suggest that one evolved from the other relatively recently.

1 – ♂, 16.viii, RD.

#### GOMPHIDAE:

*Gomphidia maclachlani* (Selys, 1873)

4 – 2 ♂♂, 17.viii, RD.

*Heliogomphus borneensis* Lieftinck, 1963

5 – ♂ (teneral, identification not certain), 19.viii, RD.

*Leptogomphus coomansi* Laidlaw, 1936

Material to be listed elsewhere. Location 5.



**Figure 3. *Macrogomphus phalantus* female; specimen collected at Samunsam Wildlife Sanctuary. Photograph by R.A. Dow.**

*Macrogomphus phalantus* Lieftinck, 1935

Another species that has not been recorded in Sarawak before, *M. phalantus* is very poorly known. It was described from two males and a female collected near Bakuan in Kalimantan Barat (Lieftinck 1935), and later recorded from south Sumatra (Lieftinck 1954). Records from peninsular Malaysia (Asahina 1986, Kemp & Kemp 1989, Norma-Rashid 2009, Norma-Rashid et al. 2001) require confirmation; that in Kemp & Kemp (1989) is listed with a question mark. A female was caught while flying over a boat at the edge of upstream Sungai Samunsam; the specimen is shown in Fig. 3.

1 – ♀, 18.viii, RD.

*Megalogomphus icterops* (Martin, 1902)

1 – ♂, 16.viii, KB.

*Microgomphus chelifera* (Selys, 1858)

5 – ♀ (teneral), 19.viii, RD.

6a – ♀, 15.viii, RD.

MACROMIIDAE:

*Macromia cincta* Rambur, 1842

Abundant on Sungai Samunsam.

1 – 2 ♂♂, 15.viii, RD; ♂, 18.viii, KB; 2 ♂♂, 20.viii, RD.

4 – ♀, 17.viii, RD.

LIBELLULIDAE:

*Agrionoptera insignis* (Rambur, 1842)

7 – ♂, 20.viii, RD.

9 – ♂, 14.viii, RD (on beach, at edge of forest).

*Brachygonia oculata* (Brauer, 1878)

4 – 4 ♂♂, 17.viii, KB; ♂, 17.viii, RD.

6d – ♂, 19.viii, KB.

*Cratilla metallica* (Brauer, 1878)

6d – ♀, 19.viii, KB.

*Lyriothemis biappendiculata* (Selys, 1878)

8 – ♂, 20.viii, RD.

*Neurothemis fluctuans* (Fabricius, 1793)

1 – ♂, 16.viii, RD (in backwater).

7 – ♂, 14.viii, RD.

*Orchithemis pruinans* (Selys, 1878)

6a – ♂, 15.viii, RD.

*Orchithemis pulcherrima* Brauer, 1878

5 – ♂, 18.viii, RD.

6a – 2 ♂♂, 15.viii, RD; ♂, 20.viii, KB; ♂, 20.viii, RD.

*Orthetrum chrysis* (Selys, 1891)

8 – ♂, 20.viii, RD.

*Orthetrum sabina* (Drury, 1773)

1 – ♂, 16.viii, RD.

*Pantala flavescens* (Fabricius, 1798)

9 – ♀, 17.viii, RD.

*Pornothemis serrata* Krüger, 1902

6a – 3 ♂♂, 15.viii, RD; 2 ♂♂, 20.viii, RD.

6c – 2 ♂♂, 18.viii, KB; ♂, 18.viii, RD.

*Pornothemis starrei* Lieftinck, 1948

This is the first time this species has been recorded in Sarawak, it was already known from southern Kalimantan (Lieftinck 1953b) and Brunei (Orr 2001, Dow & Choong unpublished) in Borneo, Sumatra (Lieftinck 1948) and Singapore (Tang et al. 2010). Two males were caught on the banks of the Sungai Samunsam in the nipa dominated part in the late afternoon; this is typical of the habitats where the species is found in Brunei (Dow & Choong unpublished), and agrees with the little that is written on the populations in Kalimantan and Sumatra. However the Singapore population is found in back mangrove. The Singapore population has much darker colouration mature colouration than other known populations, where mature males have colouration reminiscent of immature *P. serrata*. The two males collected at Samunsam had lighter colouration, but might be immature. Another, much darker, male was seen at the same location, but could not be caught; it is not known if this individual was a dark *P. starrei* or a *P. serrata* basking in the late afternoon sunshine.

2 – 2 ♂♂, 15.viii, RD.

*Raphismia bispina* (Hagen, 1867)

This is only the second record of *R. bispina* from Sarawak; it was previously recorded from Similajau National Park in Bintulu division (Dow & Reels 2010). Both females collected were in mangrove.

3 – 2 ♀♀, 17.viii, RD.

*Rhyothemis obsolescens* Kirby, 1889

1 – ♂, 16.viii, KB.

4 – ♂, 17.viii, KB.

5 – ♂, 18.viii, KB; ♂, 18.viii, RD

6a – ♂, 20.viii, RD.

6b – 2 ♂♂, 16.viii, RD.

6d – 2 ♂♂, 19.viii, KB.

*Risiopterygia dohrni* (Krüger, 1902)

6a – ♂, ♂+♀, 15.viii, RD.

*Tyriobapta kuekenthali* (Karsch, 1900)

5 – 4 ♂♂, 18.viii, RD.

*Tyriobapta torrida* Kirby, 1889

4 – ♂, 17.viii, KB; ♂, 17.viii, RD.

6a – 2 ♂♂, 15.viii, RD; ♂, 20.viii, RD.

*Zyxomma petiolatum* Rambur, 1842

7 – ♂, 20.viii, RD.

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