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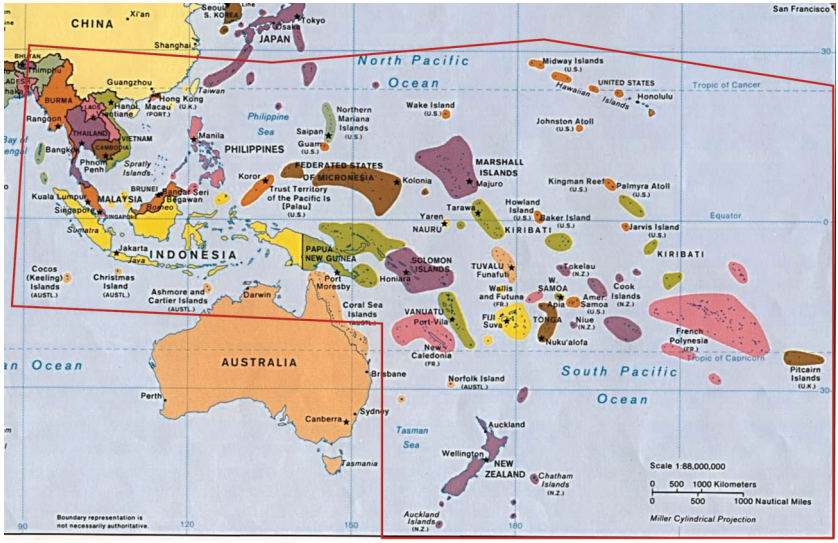

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New records of Odonata from the Crocker Range National Park, Sabah, Malaysia

Aqilah Afendy[1], Rory A. Dow[2,3] & Homathevi Rahman[1]

[1]Institute for Tropical Biology and Conservation, Universiti Malaysia Sabah, 88400 Kota Kinabalu, Sabah, Malaysia.
Email: homa.ums@gmail.com

[2]Naturalis Biodiversity Center, P.O. Box 9517, 2300 RA Leiden, The Netherlands.

[3]Sarawak Museum Campus Project, Jabatan Muzium Sarawak, Jalan Barrack, 9300 Kuching, Sarawak, Malaysia
Email: rory.dow230@yahoo.co.uk

Abstract

We report here the results from two field trips to collect Odonata in the Crocker Range National Park in western Sabah, Borneo, Malaysia. Thirty-six species were collected. *Telosticta fugispinosa* had not been described at the time of collection, nor had the two *Devadatta* species. There was no published record of *Protosticta* species cf *kinabaluensis* before the 2012 expedition, nor of *Drepanosticta* species cf *crenitis*.

Key words: Odonata checklist, Borneo, Sabah state, Crocker Range National Park, Malaysia, new records, *Telosticta fugispinosa*, *Devadatta aran*, *Devadatta tanduk*, *Protosticta* cf *kinabaluensis*, *Drepanosticta* species cf *crenitis*

Introduction

The Crocker Range National Park is situated in western Sabah in the northeast of Borneo, from 5°07'–5°56' N and 115°50'–116°28' E (Suleiman et al. 2007). The park is located in the southern part of the Crocker Mountain Range which includes a number of high peaks such as Gunung Alab (1964m), Gunung Tambuyukon (2579m), Gunung Trusmadi (2642m) and Gunung Kinabalu (4218m) (Isa et al. 2002). Of these peaks, only Gunung Alab is included in Crocker Range National Park which is managed by Sabah Parks Management. Little information on the Odonata found in the Crocker Range has been published; we are only aware of records identified to species in Kitagawa 1999, Karube & Yeh 2001, Garrison 2012, Dow, Hämäläinen & Stokvis 2015, Merckx et al. 2015 (Supplementary Table S2) and Dow, Afendy & Rahman 2016.

There are seven substations situated within Crocker Range National Park: Mahua, Gunung Alab, Ulu Kimanis, Ulu Membakut, Melalap, Buayan and Inobong, which are accountable in the management of ecosystem stability within the park. This paper includes results of surveys carried out at two of the substations: Inobong and Mahua; with a single record from Gunung Alab. These substations are all in

the northern part of the national park (see Fig. 1). The surveys were carried out by the first author at Mahua in 2010, and by the first and second authors at Inobong, Gunung Alab and Mahua during the Malaysian/Dutch expedition to Mount Kinabalu and the Crocker Range in 2012 (see Merckx et al. 2015).

Material collected by the first author is deposited in 'BORNEENSIS' at the Institute for Tropical Biology and Conservation (ITBC) at Universiti Malaysia Sabah unless otherwise noted. Material collected by the second author is currently either in coll. Dow or in the Naturalis Biodiversity Center in the Netherlands.

Odonata recorded in 2010 and 2012

Sampling locations

Locations where Odonata were collected are referred to by the codes introduced here in the list of species collected below.

M – Mahua (5.7963N, 116.4097E): M1 – main stream, relatively large, rocky; M2 – tributaries to M1; M3 – ponds, drains and open areas around the station. Situated in Interior Division.

A – Gunung Alab (5.8293N, 116.3417E), the highest station sampled (ca 1950m a.s.l.), but weather conditions were uniformly bad for sampling of adult Odonata during the periods when the authors were at the station during the 2012 expedition. A number of streams are accessible from the station. Situated in West Coast Division.

Figure 1. Locations of sampling stations in Sabah. Image derived from GoogleEarth

I – Inobong (5.8583N, 116.1386E), the lowest station sampled, a number of stream habitats were sampled: I1 – Kibambangan waterfall stream system; I2 – Batu Dinding stream system; I3 – trailside. Situated in West Coast Division.

Species collected

Tandem pairs are indicated by ♂+♀.

Zygoptera

PLATYSTICTIDAE

Drepanosticta rufostigma (Selys, 1886)

Material collected by RAD is listed in Dow (2017).

I1 – 6 ♂♂, 22.ix.2012, AA. Also location **I2**.

Drepanosticta cf crenitis Lieftinck, 1933

I1 – 2 ♀♀, 21.ix.2012, RAD.

M2 – ♂, 22.ix.2012, RAD.

Drepanosticta versicolor (Laidlaw, 1913)

I1 – 2 ♂♂, 22.ix.2012, AA.

Protosticta new species cf *kinabaluensis* Laidlaw, 1915

This is the same species, closely allied to *P. kinabaluensis*, listed by Dow & Ngiam (2014, as *Protosticta* species) from locations in the interior of Sarawak. It has also been found on Gunung Kinabalu, where it occurs at lower altitudes than *P. kinabaluensis*; see Dow, Afendy & Rahman (in preparation).

I1 – ♂, ♀, 21.ix.2012, RAD.

I2 – ♂, ♀, 20.ix.2012, RAD.

M2 – ♂, 22.ix.2012, RAD.

Telosticta fugispinosa Dow, Afendy & Rahman, 2016

Specimens collected are listed in Dow, Afendy & Rahman (2016). Locations **I1**, **I2**.

CALOPTERYGIDAE

Matronoides cyaneipennis Förster, 1897

M1 – ♂, 22.ix.2012, RAD.

Vestalis amnicola Lieftinck, 1965

M1,2 – ♂, 19.ix.2012, AA; 5 ♂♂, 22.ix.2012, RAD.

Vestalis beryllae Laidlaw, 1915

I3 – ♂, 19.ix.2012, RAD.

CHLOROCYPHIDAE

Rhinocypha spinifer Laidlaw, 1931

M1 – ♂, 19.ix.2012, AA.

M2 – ♂ (teneral), 22.ix.2012, RAD.

DEVADATTIDAE

Devadatta aran Dow, Hämäläinen & Stokvis, 2015

Specimens collected by RAD are listed in Dow, Hämäläinen & Stokvis (2015). Location **M**.

Devadatta tanduk Dow, Hämäläinen & Stokvis, 2015

Specimens collected by RAD are listed in Dow, Hämäläinen & Stokvis (2015). Location **I**.

I1 – ♂, 22.ix.2012, AA.

EUPHAEIIDAE

Euphaea basalis (Laidlaw, 1915)

Until relatively recently this species was only known from Mount Kinabalu, but it has now been recorded as far west as the Hose Mountains in Sarawak (e.g. Dow, Reels & Ngiam 2015).

M2 – 2 ♂♂, 22.ix.2012, RAD.

Euphaea subcostalis (Selys, 1873)

I1 – 5 ♂♂, 18.ix.2012, RAD; ♂, 19.ix.2012, RAD; ♂, 21.ix.2012, RAD; 7 ♂♂, 22.ix.2012, AA (one in RMNH).

I2 – 3 ♂♂, 20.ix.2012, RAD.

PLATYCNEMIDIDAE

Coeliccia borneensis (Selys, 1886)

M2 – ♂, 22.ix.2012, RAD.

Coeliccia ?nemoricola Laidlaw, 1912

I1 – ♂, 19.ix.2012, RAD; ♂, 21.ix.2012, RAD.

M2 – 4 ♂♂, 22.ix.2012, RAD.

COENAGRIONIDAE

Agriocnemis femina (Brauer, 1868)

M3 – ♂, 7.xii.2010, AA; 3 ♂♂, 8.xii.2010, AA; 2 ♂♂, 9.xii.2010, AA; ♂, 29.xii.2010, AA; ♂, ♀, 22.ix.2012, RAD.

Ceriagrion bellona Laidlaw, 1915

M2 – ♂, 30.xii.2010, AA.

Ischnura senegalensis (Rambur, 1842)

M3 – ♀, 22.ix.2012, RAD.

Stenagrion dubium (Laidlaw, 1912)

I1 – ♂, 19.ix.2012, RAD; 7 ♂♂, 21.ix.2012, RAD.

I2 – 2 ♂♂, 20.ix.2012, RAD.

M1 – ♂, 19.ix.2012, AA.

M2 – 3 ♂♂, 22.ix.2012, RAD.

Anisoptera

AESHNIDAE

Gynacantha species

Possibly two species are represented here.

M – ♂, 3.i.2011, AA; ♂, 4.i.2011, AA.

GOMPHIDAE

Leptogomphus species cf *coomansi* Laidlaw, 1936

See Dow, Stokvis & Ngiam (2017). Location I1.

Leptogomphus pendleburyi Laidlaw, 1934

See Dow, Stokvis & Ngiam (2017). Location I1.

MACROMIIDAE

Macromia species

A – Larva, 23.ix.2012, H. Smit.

SYNTHEMISTIDAE

Idionyx species

I2 – ♀, 20.ix.2012, RAD.

LIBELLULIDAE

Brachydiplax chalybea Brauer, 1868

M3 – ♂, 22.ix.2012, RAD.

Diplacodes trivialis (Rambur, 1842)

M3 – 2 ♂♂, 17.ix.2010, AA; 4 ♂♂ 30.x.2010, AA; ♂, 31.x.2010, AA; 2 ♂♂, 30.xi.2010, AA; ♂, 1.xii.2010, AA; 5 ♂♂, 7.xii.2010, AA; 2 ♂♂, 8.xii.2010, AA; ♂, 16.xii.2010, AA; ♂, 20.xii.2010, AA; ♂, 29.xii.2010, AA; ♂, 31.xii.2010, AA; 4 ♂♂, 2.i.2011, AA; 5 ♂♂, 3.i.2011, AA; ♂, 4.i.2011, AA; ♂, 19.ix.2012, AA.

Lyriothemis cleis Brauer, 1868

I2 – ♂+♀, 20.ix.2012, RAD.

Neurothemis ramburii (Brauer, 1866)

M3 – 3 ♂♂, 30.x.2010, AA; 2 ♂♂, 7.xii.2010, AA; ♂, 2.i.2011, AA; ♂, 22.ix.2012, RAD.

Neurothemis terminata Ris, 1911

M3 – ♂, 16.xii.2010, AA; ♂, 19.xii.2010, AA; 2 ♂♂, 29.xii.2010, AA; ♂, 31.xii.2010, AA.

Orthetrum chrysis (Selys, 1891)

M2 – ♂, 4.x.2010, AA; 3 ♂♂, 7.xii.2010, AA; 3 ♂♂, 8.xii.2010, AA; 2 ♂♂, 29.xii.2010, AA; 7 ♂♂, 31.xii.2010, AA.

Orthetrum glaucum (Brauer, 1865)

M3 – 3 ♂♂, 30.x.2010, AA; 2 ♂♂, 8.xii.2010, AA; 3 ♂♂, 15.xii.2010, AA; 3 ♂♂, 29.xii.2010, AA; 5 ♂♂, 30.xii.2010, AA; ♂, 1.i.2011, AA.

Orthetrum pruinosum schneideri Förster, 1903

M3 – 2 ♂♂, 30.x.2010, AA; 2 ♂♂, 17.xii.2010, AA; ♂, 19.xii.2010, AA; 2 ♂♂, 21.xii.2010, AA; ♂, 22.ix.2012, RAD.

Orthetrum sabina (Drury, 1773)

M2 – 2 ♂♂, 30.x.2010, AA; 2 ♂♂, 8.xii.2010, AA; ♂, 15.xii.2010, AA; ♂, 30.xii.2010, AA; ♂, 31.xii.2010, AA; 2 ♂♂, 1.i.2011, AA.

M3 – ♂, 19.ix.2012, AA.

Orthetrum testaceum (Burmeister, 1839)

M3 – ♂, 19.ix.2012, AA.

Pantala flavescens (Fabricius, 1798)

M3 – ♂, 31.x.2010, AA; ♂, 15.xii.2010, AA; 2 ♂♂, 18.xii.2010, AA; ♂, 30.xii.2010, AA; ♂, 31.xii.2010, AA; ♂, 1.i.2011, AA.

Trithemis festiva (Rambur, 1842)

M3 – 3 ♂♂, 31.x.2010, AA; 2 ♂♂, 30.xi.2010, AA; 4 ♂♂, 8.xii.2010, AA; 4 ♂♂, 16.xii.2010, AA.

Discussion

We have listed 36 species collected by us from the Crocker Range, we are aware of published records of only two additional species from the range: *Xiphiagrion cyanomelas* (Selys, 1876) (Garrison 2012) and *Linaeschna polli* Martin, 1909 (Kitagawa 1999, Karube & Yeh 2001), bringing the total to 38. Of the species collected, *Telosticta fugispinosa* had not been described at the time of collection, nor had the two *Devadatta* species. There was no published record of *Protosticta* species cf *kinabaluensis* before the 2012 expedition, nor of *Drepanosticta* species cf *crenitis*.

Thirty eight species is a low total and we may confidently expect that many more species occur in Crocker Range National Park. One of the great frustrations of the expedition in 2012 was the total lack of sunshine at the highest station visited, Gunung Alab. Good quality stream habitats at 1700–1800m a.s.l were easily accessible at Gunung Alab, and are likely to provide habitat for genuinely montane species; this is a priority area for future work. All of the locations that we sampled are in the north of the national park; sampling further south in the park is another priority.

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