IDF

International Dragonfly Fund - Report

Journal of the International Dragonfly Fund

1- 26

Chee Yen Choong, Rory A. Dow & Yong Foo Ng

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Published: 10.01.2020

144

ISSN 1435-3393

The International Dragonfly Fund (IDF) is a scientific society founded in 1996 for the improvement of odonatological knowledge and the protection of species.
Internet: http://www.dragonflyfund.org/

This series intends to publish studies promoted by IDF and to facilitate cost-efficient and rapid dissemination of odonatological data.

Editorial Work:	Rory A. Dow, Milen Marinov, Martin Schorr
Layout:	Martin Schorr
IDF-home page:	Holger Hunger
Printing:	Colour Connection GmbH, Frankfurt
Impressum:	Publisher: International Dragonfly Fund e.V., Schulstr. 7B, 54314 Zerf, Germany. E-mail: oestlap@online.de
Responsible editor:	Martin Schorr

Cover picture:	***Zygonyx iris***
Photographer:	C.Y. Choong

Published 14.01.2020

Additional records of Odonata from Kelantan and Terengganu, Malaysia

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Abstract

We report here the results from field trips to collect Odonata in the north-eastern parts of Kelantan state and the north of Terengganu state, Peninsular Malaysia. Eighty four species were collected, and four of these are new records for the state Kelantan and 10 are new records for the state of Terengganu. Notable records obtained from the field trips were *Euphaea masoni*, *Coeliccia sameerae*, *Pseudagrion ?lalakense*, *Leptogomphus tioman* and *Macromia cupricincta*. Checklists for Kelantan (140 species) and Terengganu (132 species) are given in an appendix.

Abstract in Malay

Hasil daripada kerja lapangan mengumpul Odonata di bahagian timur laut Kelantan dan bahagian utara Terengganu, Semenanjung Malaysia dilaporkan di sini. Sebanyak 84 spesies berjaya dikumpulkan, dan empat spesies merupakan rekod baharu bagi negeri Kelantan dan 10 spesies adalah rekod baharu bagi negeri Terengganu. Rekod yang menarik berjaya dikumpulkan daripada kerja lapangan ini adalah *Euphaea masoni*, *Coeliccia sameerae*, *Pseudagrion ?lalakense*, *Leptogomphus tioman* dan *Macromia cupricincta*. Senarai semak spesies untuk Kelantan (140 spesies) dan Terengganu (132 spesies) diberikan dalam lampiran.

Key words: new records, Odonata checklist, Peninsular Malaysia

Introduction

Kelantan and Terengganu are two large states located at the northeast of Peninsular Malaysia bordering with Pahang and Perak states in the west and south, and Thai Peninsula in the north. Parts of the states face the South China Sea. The south eastern part of Kelantan and the western part of Terengganu contain parts of Taman Negara National Park, the main conservation area in Peninsular Malaysia.

Checklists of the Odonata known from Kelantan and Terengganu were provided in Choong et al. (2017) and Choong et al. (2012) respectively. Later on, Choong (2020) added data, including new records for the state, from Ulu Sat Forest Reserve in Kelantan.

Amirrudin et al. (2011) published records from Jambu Bongkok Forest Reserve in Terengganu that were omitted in Choong et al. (2012) because they were not aware of the publication. Choong & Ng (2014) added more species for the state from Gunung Tebu. The latest published records for Terengganu came from Gua Bewah (within Taman Negara Terengganu) (Choong et al. 2018), again more species were added. All of these additions are considered in more detail in the Discussion below and updated checklists for both states are given in the Appendix.

We conducted a short field trip to north-eastern Kelantan and northern Terengganu to collect Odonata on 16–20 May, 2018. Collecting in Terengganu was conducted at and near to Hutan Lipur Jeram Linang (see Choong et al. (2017) for other results from this location). Additionally the second author conducted some limited sampling in the same part of northern Terengganu, on 29 November – 2 December 2016; however adverse weather conditions severely limited what could be accomplished. The results from these collecting trips are reported here; the general areas of the states where the sampling conducted are indicated in Fig. 1.

Figure 1. Map showing the sampling locations. See text for habitat details of each location.

Odonata recorded

Locations

Habitat photos from some of the locations are shown in Fig. 2.

Kelantan.

K1. Hutan Lipur Jeram Linang:

a. main stream and trailside [Coordinates just inside gate: 5.74209N, 102.37368E].

b. tributary entering below waterfall [upstream coordinates: 5.73992N, 102.3703E].

K2. Downstream of Hutan Lipur Jeram Linang as far as 5.75212N, 102.37433E.

K3. Pond near Jeram Linang [5.77042N, 102.37669E].

Figure 2. Habitat condition for some of the sampling locations.

Terengganu

T1. Hutan Lipur Lata Belatan.

a. main stream [representative coordinates: 5.63103N, 102.59612E].

b. tributaries.

c. pond.

T2. Main stream downstream of Hutan Lipur Lata Belatan [representative coordinates: 5.65574N, 102.58475E].

T3. Hutan Lipur Lata Tembakah.

a. main stream below first waterfall.

b. main stream further up [representative coordinates: 5.58983N, 102.44099E].

c. tributaries.

d. trailside.

T4. Unfinished road from Jerteh to Gua Musang:

a. small stream in logged forest just after end of road from Jerteh to Gua Musang [5.42852N, 102.52128E].

b. drains and pools near a.

T5. Unfinished road from Jerteh to Gua Musang:

a. low gradient stream before end unfinished road from Jerteh to Gua Musang [5.45192N, 102.51592E].

b. small pools near a.

T6. Unfinished road from Jerteh to Gua Musang:

a. Tributary to penultimate stream (Sg Mia?) on road from Jerteh to Gua Musang [representative coordinates 5.47094N, 102.52343E].

T7. Pond near unfinished road from Jerteh to Gua Musang [5.4574N, 102.5183E].

T8. On way to Lata Tembakah:

a. large pond [5.63014N, 102.48061E].

b. rice fields opposite a.

c. drains and marshy areas adjacent to b.

d. very slow stream and marshy areas near b.

T9. Muddy pools on track in rubber at end of small road running past Lata Tembakah [5.57203N, 102.47228E].

T10. Seasonal swamp and drains near road from Jerteh to coast [5.77873N, 102.56092E]. This location was extensively flooded in late 2016 but completely dry in May 2018.

T11. At lights at Lilly Budget Hotel, Jerteh [5.7372N, 102.50087E].

T12. Pond and adjacent rice field on kampung road not far from Jerteh [5.73132N, 102.56092E].

New records for Kelantan and Terengganu are indicated by a bold **K** or **T** respectively after the species authority.

Species collected

Zygoptera

Platystictidae

All taxa collected from this family are from the *Drepanosticta quadrata*-group. This species group is proving to be highly problematic but we are working towards a revision of it.

Drepanosticta sp. cf *fontinalis* Lieftinck, 1937 **K**, **T**

K1a – 2 ♂♂, 18.v.2018, YFN. **T4a** – 2 ♂♂, 19.v.2018, CYC; 2 ♂♂, 19.v.2018, RD; 4 ♂♂, 19.v.2018, YFN.

Drepanosticta sharpi (Laidlaw, 1907)

K1a – ♀, 18.v.2018, YFN.**T3d** – ♂, 17.v.2018, RD.

Drepanosticta sp. cf *sharpi* (Laidlaw, 1907) **K**, **T**

K1a – ♂, 18.v.2018, CYC. **T3d** – ♀, 17.v.2018, CYC; ♂, 17.v.2018, RD.

Figure 3. *Neurobasis chinensis* male at location K1a, photography by C.Y. Choong.

Calopterygidae

Echo modesta Laidlaw, 1902

T1a – ♂, 16.v.2018, CYC; ♂, 16.v.2018, RD.

Neurobasis chinensis (Linnaeus, 1758)

K1a – ♂, ♀, 18.v.2018, CYC; ♂, 18.v.2018, YFN. **K2** – ♂, 18.v.2018, RD. **T2** – ♀, 16.v.2018, CYC; ♂, ♀, 16.v.2018, RD; ♂, ♀, 16.v.2018, YFN. **T3a** – ♂, 17.v.2018, CYC; ♂, 17.v.2018, RD. **T5a** – ♂, 19.v.2018, CYC; 2 ♂♂, 19.v.2018, RD. **T6a** – ♂, 20.v.2018, CYC; ♂, 20.v.2018, RD.

Vestalis amethystina Lieftinck, 1965

T3c – 2 ♂♂, 17.v.2018, RD. **T4a** – ♂, 19.v.2018, CYC; 2 ♂♂, 19.v.2018, RD; ♂, 19.v.2018, YFN.

Vestalis amoena Hagen in Selys, 1853

K1a – 2 ♂♂, 18.v.2018, CYC; ♂, 18.v.2018, RD. **K2** – 3 ♂♂, 18.v.2018, RD. **T1a** – 2 ♂♂, 16.v.2018, CYC; 3 ♂♂, 16.v.2018, RD; ♂, 16.v.2018, YFN. **T3a** – ♂, 17.v.2018, CYC. **T5a** – ♂, 19.v.2018, CYC; 2 ♂♂, 19.v.2018, RD. **T6a** – ♂, 20.v.2018, CYC; 2 ♂♂, 20.v.2018, RD.

Chlorocyphidae

Aristocypha fenestrella (Rambur, 1842)

K1b – ♂, 18.v.2018, RD. **T6a** – ♂, 20.v.2018, RD.

Heliocypha biforata (Selys, 1859)

K1a – ♂, 18.v.2018, CYC. **K2** – ♂, 18.v.2018, RD. **T1a** – ♂, 16.v.2018, CYC; 3 ♂♂, 16.v.2018, RD; ♂, 16.v.2018, YFN. **T2** – ♂, 16.v.2018, RD. **T4a** – ♂, 19.v.2018, CYC;

Figure 4. *Libellago aurantiaca* male at location T6a, photograph by C.Y. Choong.

♂, 19.v.2018, YFN. **T5a** – ♂, 19.v.2018, CYC; ♂, 19.v.2018, RD. **T6a** – ♂, 20.v.2018, CYC; ♂, 20.v.2018, RD.

Heliocypha perforata (Percheron, 1835)

K2 – ♂, 18.v.2018, RD. **T3a** – ♂, 17.v.2018, CYC; ♂, 17.v.2018, YFN.

Libellago aurantiaca (Selys, 1859)

K1a – 2 ♂♂, 18.v.2018, CYC. **K2** – 2 ♂♂, 18.v.2018, RD. **T2** – 2 ♂♂, 16.v.2018, CYC; 4 ♂♂, 16.v.2018, RD. **T3a** – 2 ♂♂, ♀, 17.v.2018, CYC. **T6a** – ♂, 20.v.2018, CYC.

Libellago lineata (Burmeister, 1839)

K1a – ♂, 18.v.2018, CYC. **T2** – ♂, 16.v.2018, CYC; 3 ♂♂, 16.v.2018, RD. **T5a** – ♂, 19.v.2018, CYC; ♀, 19.v.2018, YFN.

Sundacypha petiolata (Selys, 1859)

T1a – ♂, 16.v.2018, CYC; ♂, 16.v.2018, YFN. **T1b** – ♂, 1.xii.2016, RD; ♂, 16.v.2018, RD. **T1c** – ♀, 16.v.2018, CYC. **T3c** – 3 ♂♂, 17.v.2018, RD.

Devadattidae

Devadatta argyoides (Selys, 1859)

K1a – ♂, ♀, 18.v.2018, CYC; ♀ (small drain running into stream), 18.v.2018, RD; ♂, 18.v.2018, YFN. **K1b** – 2 ♂♂, 18.v.2018, RD. **T1a** – ♂, 16.v.2018, YFN. **T1c** – ♂, 16.v.2018, CYC. **T3c** – ♂, 17.v.2018, CYC; 5 ♂♂, ♀, 17.v.2018, RD. **T4a** – ♂, 19.v.2018, CYC; ♂, 19.v.2018, RD; 2 ♂♂, 19.v.2018, YFN.

Figure 5. *Euphaea masoni* male at location T5a, photograph by C.Y. Choong.

Euphaeidae

Dysphaea dimidiata Selys, 1853

T1a – 2 ♂♂, 16.v.2018, CYC; ♂, 16.v.2018, RD. **T3c** – ♂, 17.v.2018, CYC. **T5a** – ♂, 19.v.2018, CYC; ♂, 19.v.2018, RD. **T6a** – ♂, 20.v.2018, CYC; ♂, 20.v.2018, RD.

Euphaea impar Selys, 1859

K2 – ♂, 18.v.2018, CYC; ♂, ♀, 18.v.2018, RD. **T1a** – ♂, 16.v.2018, CYC; ♂, 16.v.2018, RD; 2 ♂♂, 16.v.2018, YFN. **T3c** – ♂, 17.v.2018, RD. **T4a** – ♂, 19.v.2018, CYC; ♂, 19.v.2018, RD; ♂, 19.v.2018, YFN. **T6a** – ♂, 20.v.2018, RD.

Euphaea masoni Selys, 1879 **T**

T5a – 3 ♂♂, 19.v.2018, CYC; 6 ♂♂, 19.v.2018, RD; ♂, 19.v.2018, YFN. **T6a** – 4 ♂♂, 20.v.2018, CYC; 5 ♂♂, 20.v.2018, RD.

Euphaea ochracea Selys, 1859

K1a – ♂, 18.v.2018, RD. **K1b** – ♂, 18.v.2018, RD. **T1a** – ♂, 1.xii.2016, RD; ♂, 16.v.2018, RD; 2 ♂♂, 16.v.2018, YFN. **T3a** – 3 ♂♂, 17.v.2018, CYC; ♀, 17.v.2018, RD; ♂, 17.v.2018, YFN. **T4a** – ♂, 19.v.2018, CYC; 2 ♂♂, 19.v.2018, RD; ♂, 19.v.2018, YFN. **T5a** – ♂, 19.v.2018, RD. **T6a** – ♂, 20.v.2018, CYC; 3 ♂♂, 20.v.2018, RD.

Philosinidae

Rhinagrion macrocephalum (Selys, 1862)

K1a – ♀, 18.v.2018. YFN. **T1a** – ♂, 16.v.2018, YFN. **T3c** – ♀, 17.v.2018, RD.

Rhinagrion viridatum Fraser, 1938

K1a – 2 ♂♂, 18.v.2018. CYC. **K2** – ♂, 18.v.2018, RD. **T6a** – ♂, 20.v.2018, CYC; ♂, 20.v.2018, RD.

Platycnemididae

Coeliccia albicauda (Förster in Laidlaw, 1907)

K1a – ♂, 18.v.2018, CYC; 2 ♂♂, 18.v.2018, YFN. **K1b** – ♂, 18.v.2018, RD. **T1b** – ♂, 16.v.2018, CYC; 2 ♂♂, 16.v.2018, YFN. **T3c** – ♂, 17.v.2018, CYC; 3 ♂♂, 17.v.2018, RD. **T4a** – ♂, 19.v.2018, CYC; ♂, 19.v.2018, RD. **T6a** – ♂, 20.v.2018, CYC.

Coeliccia sameerae Dow, Choong & Ng, 2018

See Dow et al. (2018) for records from location K1 in 2016.

K1a – ♂, 18.v.2018, CYC; ♂, 18.v.2018, YFN. **K1b** – ♂, 18.v.2018, RD. **T3b** – ♂, ♀, 17.v.2018, RD.

Copera marginipes (Rambur, 1842)

K1a – ♂, 18.v.2018, CYC; ♂, 18.v.2018, YFN. **K2** – ♂, ♂+♀, 18.v.2018, RD. **T2** – ♂, 16.v.2018, CYC; ♂+♀, 16.v.2018, RD; ♀, 16.v.2018, YFN. **T3c** – ♂, 17.v.2018, YFN. **T4b** – ♂, 19.v.2018, CYC. **T6a** – ♂, 20.v.2018, CYC; 2 ♂♂, 20.v.2018, RD.

Copera vittata (Selys, 1863)

K1a – ♂, 18.v.2018, CYC. **T3a** – ♀, 17.v.2018, CYC. **T4b** – ♂, 19.v.2018, CYC.

Indocnemis orang (Förster in Laidlaw, 1907)

K1a – ♂, ♀, 18.v.2018, CYC; 2 ♂♂, ♀, 18.v.2018, YFN. **T3d** – 2 ♀♀, 17.v.2018, CYC; 2 ♀♀, 17.v.2018, RD; ♂, ♀, 17.v.2018, YFN.

Onychargia atrocyana Selys, 1865

T1c – ♀, 16.v.2018, YFN.

Prodasineura collaris (Selys, 1860)

T3c – 3 ♂♂, 17.v.2018, RD.

Prodasineura humeralis (Selys, 1860)

K1a – ♂, 18.v.2018, CYC; ♂, 18.v.2018, YFN. **K2** – 3 ♂♂, 18.v.2018, RD. **T2** – ♂, 16.v.2018, CYC; 3 ♂♂, 16.v.2018, RD; ♂, 16.v.2018, YFN. **T3a** – ♂, 17.v.2018, RD. **T5a** – 2 ♂♂, 19.v.2018, CYC; ♀, 19.v.2018, RD; ♂, 19.v.2018, YFN. **T6a** – ♂, 20.v.2018, CYC; 2 ♂♂, 20.v.2018, RD.

Prodasineura laidlawii (Förster in Laidlaw, 1907)

K1b – ♂+♀, 18.v.2018, RD. **T1a** – ♂, 1.xii.2016, RD; 2 ♂♂, 16.v.2018, CYC;.2 ♂♂, 16.v.2018, RD; 4 ♂♂, 16.v.2018, YFN. **T4a** – ♀, 19.v.2018, RD. **T5a** – ♂, 19.v.2018, CYC; ♂, 19.v.2018, RD; ♂, 19.v.2018, YFN. **T6a** – 2 ♂♂, ♀, 20.v.2018, RD.

Prodasineura notostigma (Selys, 1860)

T3c – ♂, ♂+♀, 17.v.2018, RD.

Pseudocopera ciliata (Selys, 1863)

K3 – ♂, 18.v.2018, RD. **T1c** – ♂, 16.v.2018, RD. **T7** – ♂, 20.v.2018, CYC; ♂, ♀, 20.v.2018, RD. **T8d** – ♂, 30.xi.2016, RD.

Figure 6. *Ceriagrion aurantiacum* male at location K3, photograph by C.Y. Choong.

Coenagrionidae

Agriocnemis femina (Brauer, 1868)

T8d – ♀, 30.xi.2016, RD.

Agriocnemis pygmaea (Rambur, 1842) **T**

K3 – 2 ♂♂, 2 ♀♀, 18.v.2018, CYC; 2 ♂♂, 18.v.2018, RD; 2 ♂♂, ♀, 18.v.2018, YFN. **T8c** – 3 ♂♂, 30.xi.2016, RD.

Argiocnemis rubescens rubeola Selys, 1877

T9 – ♂, 30.xi.2016, RD.

Argiocnemis sp.

K1a – ♀, 18.v.2018, CYC. **T3a** – ♂, 17.v.2018, CYC. **T3b** – 2 ♂♂ (rock pools by main stream), 17.v.2018, RD. **T5b** – ♂, 19.v.2018, RD.

Ceriagrion aurantiacum Fraser, 1922

K3 – 3 ♂♂, 18.v.2018, CYC; 3 ♂♂, 18.v.2018, RD; 2 ♂♂, 18.v.2018, YFN.

Ceriagrion cerinorubellum (Brauer, 1865)

T1c – ♂, 16.v.2018, CYC. **T8a** – ♂, 30.xi.2016, RD.

Ischnura senegalensis (Rambur, 1842)

K3 – ♂, 18.v.2018, RD. **T8a** – ♂, 30.xi.2016, RD. T12 – ♂, 2.xii.2016, RD.

Pseudagrion australasiae Selys, 1876

K3 – 2 ♂♂, 18.v.2018, RD. **T8a** – ♂, 30.xi.2016, RD.

Pseudagrion ?lalakense Orr & van Tol, 2001 **T**

This was a highly surprising find. *Pseudagrion lalakense* has been considered to be a species endemic to Borneo. A male *Pseudagrion* collected at a largely tree-lined

pond in the expectation that it would be *P. microcephalum* has anal appendages agreeing well with *P. lalakense* but differences in its markings. Further material and, ideally, molecular data are needed to be sure of the status of this taxon but if it does prove to be *P. lalakense* then that species is far more widely distributed than previously thought.

T7 – ♂, 20.v.2018, RD.

Pseudagrion microcephalum (Rambur, 1842)

T8a – 2 ♂♂, ♀, 30.xi.2016, RD. **T10** – 3 ♂♂, 2.xii.2016, RD.

Pseudagrion pruinosum (Burmeister, 1839)

T2 – ♂, 16.v.2018, CYC; ♂, 16.v.2018, RD; 2 ♂♂, 16.v.2018, YFN. **T5a** – ♂, 19.v.2018, CYC; ♂, 19.v.2018, RD; ♂, 19.v.2018, YFN. **T6a** – ♂, 20.v.2018, CYC; 2 ♂♂, 20.v.2018, RD.

Pseudagrion rubriceps Selys, 1876

T4b – 2 ♂♂, 19.v.2018, CYC.

Pseudagrion williamsoni Fraser, 1922

T1b – 3 ♂♂, 16.v.2018, RD; ♂, 16.v.2018, YFN. **T1c** – 2 ♂♂, 16.v.2018, CYC. **T8a** – 3 ♂♂, 30.xi.2016, RD.

Anisoptera

Gomphidae

Gomphidia abbotti Williamson, 1907 **T**

T3a – ♂, 17.v.2018, CYC. **T6a** – ♂, 20.v.2018, CYC; 3 ♂♂, 20.v.2018, RD.

Ictinogomphus decoratus melaenops (Selys, 1858)

T6a – ♂, 20.v.2018, CYC; ♂, 20.v.2018, RD. **T8a** – ♂, 30.xi.2016, RD. **T11** – ♀, 29.xi.2016, RD.

Figure 7. *Gomphidia abbotti* male at location T6a, photograph by C.Y. Choong.

Leptogomphus tioman Choong, 2016 **T**

T4a – ♀, 19.v.2018, RD; ♂, ♀, 19.v.2018, YFN.

Megalogomphus sumatranus (Krüger, 1899)

K2 – ♂, 18.v.2018, RD.

Microgomphus ?chelifer Selys, 1858

T6a – ♀ (teneral), 20.v.2018, RD.

Macromiidae

Macromia cupricincta Fraser, 1924 **T**

T6a – ♂, 20.v.2018, RD.

Synthemistidae

Idionyx sp.

K1b – ♀, 18.v.2018, RD.

Libellulidae

Acisoma panorpoides Rambur, 1842

K3 – ♂, 18.v.2018, CYC; 4 ♂♂, 18.v.2018, RD; ♂, 18.v.2018, YFN. **T7** – ♂, ♀, 20.v.2018, CYC.

Aethriamanta brevipennis (Rambur, 1842) **K**

K3 – ♀, 18.v.2018, RD. **T7** – ♂, 20.v.2018, CYC.

Aethriamanta gracilis (Brauer, 1878)

T1c – ♂, 16.v.2018, RD. **T7** – 2 ♂♂, 20.v.2018, CYC; 2 ♂♂, 20.v.2018, RD.

Agrionoptera insignis (Rambur, 1842)

T5b – ♂, 19.v.2018, RD.

Brachydiplax chalybea Brauer, 1868

K2 – ♀, 18.v.2018, RD. **K3** – 2 ♂♂, 18.v.2018, RD; ♂, 18.v.2018, YFN. **T1c** – ♂, 16.v.2018, RD. **T7** – ♂, 20.v.2018, CYC. **T10** – ♂, 2.xii.2016, RD.

Chalybeothemis chini Dow, Choong & Orr, 2007 **T**

T7 – 2 ♂♂, 20.v.2018, RD.

Cratilla lineata (Brauer, 1878)

T1a – ♂, 16.v.2018, RD. **T6a** – ♀, 20.v.2018, CYC; ♂, 20.v.2018, RD. **T9** – ♂, 30.xi.2016, RD.

Cratilla metallica (Brauer, 1878)

T6a – ♂, 20.v.2018, RD.

Crocothemis servillia (Drury, 1773)

T8a – ♂, 30.xi.2016, RD. **T8d** – ♂, 30.xi.2016, RD.

Diplacodes trivialis (Rambur, 1842)

T8a – 2 ♂♂, 30.xi.2016, RD. **T12** – ♂, 2.xii.2016, RD.

Lathrecista asiatica (Fabricius, 1798)

T3d – ♀, 17.v.2018, RD. **T9** – ♂, 30.xi.2016, RD.

Lyriothemis biappendiculata (Selys, 1878)

K1b – ♀, 18.v.2018, CYC; ♂, 18.v.2018, RD. **T1c** – ♂, 16.v.2018, CYC. **T3c** – ♂, 17.v.2018, CYC; 2 ♂♂, 17.v.2018, RD. **T4a** – ♂, 19.v.2018, CYC; ♂, 19.v.2018, YFN.

Nannophya pygmaea Rambur, 1842 **K**

K3 – ♂, 18.v.2018, CYC. **T1c** – 2 ♂♂, 16.v.2018, CYC; 2 ♂♂, 16.v.2018, RD.

Neurothemis fluctuans (Fabricius, 1793)

K1a – ♀, 18.v.2018, CYC. **T1a** – 3 ♂♂, 16.v.2018, CYC; ♂, ♀, 16.v.2018, RD; ♂, ♀, 16.v.2018, YFN. **T4b** – ♂, 19.v.2018, RD. **T6a** – ♀, 20.v.2018, CYC; ♂, 20.v.2018, RD. **T8a** – ♂, 30.xi.2016, RD. **T10** – ♂, 2.xii.2016, RD.

Onychothemis culminicola Förster, 1904

T5a – ♂, 19.v.2018, RD.

Onychothemis testacea Laidlaw, 1902

T2 – ♂, 16.v.2018, CYC; 2 ♂♂, 16.v.2018, RD.

Orchithemis pulcherrima Brauer, 1878

T6a – ♂, 20.v.2018, RD.

Orthetrum chrysis (Selys, 1891)

K2 – ♂, 18.v.2018, CYC; ♂, 18.v.2018, RD. **T1c** – ♀, 16.v.2018, YFN. **T3a** – ♂, 17.v.2018, CYC. **T5a** – ♂, 19.v.2018, RD.

Orthetrum glaucum (Brauer, 1865)

T5b – ♂, 19.v.2018, CYC. **T6a** – ♂, 20.v.2018, RD.

Orthetrum sabina (Drury, 1773)

K2 – ♂, 18.v.2018, CYC; ♂, 18.v.2018, RD. **T1c** – ♂, 16.v.2018, CYC. **T3b** – ♂, 17.v.2018, RD. **T8a** – ♂, 30.xi.2016, RD. **T12** – ♀, 2.xii.2016, RD.

Orthetrum testaceum (Burmeister, 1839)

T4b – ♂, 19.v.2018, RD. **T6a** – ♂, 20.v.2018, CYC. **T9** – ♂, 30.xi.2016, RD.

Potamarcha congener (Rambur, 1842)

T4b – ♂, 19.v.2018, RD. **T12** – ♂, 2.xii.2016, RD.

Rhyothemis obsolescens Kirby, 1889

T7 – ♂, 20.v.2018, CYC; 2 ♂♂, 20.v.2018, RD.

Rhyothemis phyllis (Sulzer, 1776)

K3 – ♀, 18.v.2018, CYC. **T8d** – ♂, 30.xi.2016, RD.

Rhyothemis plutonia Selys, 1883

K3 – ♂, 18.v.2018, RD. **T7** – 4 ♂♂, 20.v.2018, CYC; 6 ♂♂, 20.v.2018, RD.

Rhyothemis triangularis Kirby, 1889

T7 – ♂, 20.v.2018, CYC; 2 ♂♂, 20.v.2018, RD. **T8a** – ♀, 30.xi.2016, RD.

Tetrathemis hyalina Kirby, 1889

K2 – ♀, 18.v.2018, RD.

Tholymis tillarga (Fabricius, 1798) **T**

T11 – ♀, 29.xi.2016, RD.

Trithemis aurora (Burmeister, 1839)

T1a – ♂, 16.v.2018, RD. **T6a** – ♀, 20.v.2018, CYC. ♂, 20.v.2018, RD. **T7** – ♂, 20.v.2018, CYC.

Trithemis festiva (Rambur, 1842)

T5b – 2 ♂♂, 19.v.2018, CYC. **T6a** – ♂, 20.v.2018, CYC; ♂, 20.v.2018, RD.

Tyriobapta torrida Kirby, 1889

K1a – ♂, 18.v.2018, CYC. 2 ♂♂, 18.v.2018, YFN. **K2** – ♂, 18.v.2018, RD. **T1b** – ♂, 16.v.2018, CYC. ♂, 16.v.2018, RD. **T3a** – ♂, 17.v.2018, CYC. **T7** – ♂, 20.v.2018, CYC.

Urothemis signata (Rambur, 1842)

K3 – ♂, 18.v.2018, CYC. **T6a** – ♂, 20.v.2018, RD.

Zygonyx iris Selys, 1869

K2 – 2 ♂♂, 18.v.2018, RD. **T1a** – 3 ♂♂, 16.v.2018, CYC. 3 ♂♂, 16.v.2018, RD. **T3a** – ♂+♀, 17.v.2018, CYC. **T6a** – 2 ♂♂, 20.v.2018, CYC. 4 ♂♂, 20.v.2018, RD.

Figure 8. *Zygonyx iris* male at location T1a, photograph by C.Y. Choong.

Discussion

We spent nine sampling days (29 November – 2 December 2016; 16 – 20 May 2018) to collect Odonata in Kelantan and Terengganu. The sampling data for the trip in 2016 (for locations in Terengganu) was poor due to the bad weather condition. Therefore, most of the records presented in this study are from the sampling trip in 2018. It is noted that the 2018 trip consisted of five sampling days, and that four days were spent at locations in Terengganu and only one day was at locations in Kelantan. Therefore,

we do not have any intention to compare the species richness between the sampling in the two states.

The two sampling trips yielded a total of 84 species – Kelantan with 44 species and Terengganu with 80 species. Even though the sampling periods were short, we still managed to add four new records (*Drepanosticta* sp. cf *fontinalis*, *Drepanosticta* sp. cf *sharpi*, *Aethriamanta brevipennis* and *Nannophya pygmaea*) for the state of Kelantan and ten new records (*Drepanosticta* sp. cf *fontinalis*, *Drepanosticta* sp. cf *sharpi*, *Euphaea masoni*, *Agriocnemis pygmaea*, *Pseudagrion ?lalakensis*, Gomphidia abbotti, *Leptogomphus tioman*, *Macromia cupricincta*, *Chalybeothemis chini* and *Tholymis tillarga*) for the state of Terengganu.

Choong et al. (2017) produced a checklist for Kelantan with 131 species, and then Choong (2020) added five additional species (*Libellago aurantiaca*, *Rhinagrion macrocephalum*, *Pseudagrion australasiae*, *Hydrobasileus croceus* and *Rhyothemis triangularis*) from Ulu Sat Forest Reserve to the checklist. With the four new records from this study, the number of species known to the state of Kelantan now stands at 140 (see Appendix). *Coeliccia* cf *erici* in the checklist by Choong et al. (2017) was described as *Coeliccia sameerae* in 2018 (Dow et al. 2018).

On the other hand, the checklist for Terengganu produced by Choong et al. (2012) consisted of 107 species. *Coeliccia erici* in the checklist (Choong et al. 2012) is a misidentification of *C. sameerae*, this was clarified in Dow et al. (2018). *Neurothemis terminata*, a species no longer considered to occur in Peninsular Malaysia (see Seehausen & Dow 2016), was in the same checklist (Choong et al. 2012), this species had been recorded by Wahizatul–Afzan et al. (2006) from Sekayu Recreational Forest. We communicated with one of the authors of the paper (Amirrudin per. comm.), and we were informed that *Neurothemis fulva* was misidentified as *N. terminata*. Therefore, we remove *N. terminata* from the current checklist for Terengganu. We also found five records (*Ceriagrion olivaceum*, *Aethriamanta brevipennis*, *Chalybeothemis fluviatilis*, *Diplacodes nebulosa* and *Rhyothemis aterrima*) from Jambu Bongkok Forest Reserve (Amirrudin et al. 2011) which were not included in Choong et al. (2012). A further nine records (*Libellago hyalina*, *Sundacypha petiolata*, *Rhinagrion macrocephalum*, *Elattoneura analis*, *Prodasineura notostigma*, *Archibasis rebeccae*, *Archibasis viola*, *Macrogomphus thoracicus* and *Idionyx yolanda*) were added by Choong & Ng (2014). The latest published records from the state were in Choong et al. (2018), which added two additional species (*Rhinocypha pelops* and *Phyllothemis raymondi*) to the Odonata fauna of Terengganu. Our field trips in 2016 and 2018 yielded ten new records. All of these records bring the number of species currently known from Terengganu to 132 (see the Appendix).

It is worthwhile to mention a few notable records yielded from the sampling trips – *Euphaea masoni*, *Coeliccia sameerae*, *Pseudagrion ?lalakense*, *Leptogomphus tioman* and *Macromia cupricincta*. *Euphaea masoni* is recorded for the first time in Terengganu, and it now appears to be a rather common species in northern Peninsular Malaysia, making it all the more surprising that it was only recorded in Malaysia for the first time in 2015 (Dow et al. 2016). *Coeliccia sameerae* is a recently described species, and it has been so far found in three states (Kelantan, Terengganu and

Pahang) in Peninsular Malaysia (Dow et al. 2018). The discovery of what appears to be *Pseudagrion lalakense*, which had been considered to be endemic to Borneo, in the north of Peninsular Malaysia is remarkable, and serves to illustrate the fact that much remains to be learned about even pond species in this region. After its discovery in Tioman Island, *Leptogomphus tioman* was recorded in Kelantan in 2016 (Choong et al. 2017), and now it is known to be present in Terengganu, indicating a wider distribution range in Peninsular Malaysia than was imagined when it was described. *Macromia cupricincta* is a new record for Terengganu, and it is interesting to note that it is so far the only member of family Macromiidae known to Terengganu, although this might suggest that the family is poorly represented for the state, it is just as likely that it is simply the result of insufficient sampling and the difficulty of capture of most species in the family.

Acknowledgements

We are grateful to the Forestry Department Peninsular Malaysia for granting us a permit to collect Odonata from forest reserves in Peninsular Malaysia. The field work was financed by the Mohamed bin Zayed Species Conservation Fund. The second author's flights to and from England in 2016 (as part of a longer fieldwork period) and to and from Kuching in 2018 were covered by parts of grants from the International Dragonfly Fund.

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Appendix: Checklists of Odonata recorded from Kelantan and Terengganu

Kelantan Checklist (140 species)

Where the first record from Kelantan is not in this publication, a citation to the first record is made in square parenthesis after the species name.

Zygoptera

Lestidae

Lestes dorothea Fraser, 1924 [Choong 2013]

Lestes praemorsus decipiens Kirby, 1894 [Laidlaw 1902b]

Platystictidae

Drepanosticta fontinalis Lieftinck, 1937 [Lieftinck 1937]

Drepanosticta sp. cf *fontinalis* Lieftinck, 1937

Drepanosticta sp. cf pan Laidlaw, 1931 [Choong 2013 as D. pan]

Drepanosticta sharpi (Laidlaw in Laidlaw & Förster , 1907) [Laidlaw & Förster 1907 as *Platysticta quadrata* Selys, 1860]

Drepanosticta sp. cf *sharpi* (Laidlaw, 1970)

Protosticta curiosa Fraser, 1934 [Choong et al. 2017]

Argiolestidae

Podolestes orientalis Selys, 1862 [Choong et al. 2017]

Calopterygidae

Echo modesta Laidlaw, 1902 [Laidlaw 1902a]

Neurobasis chinensis (Linnaeus, 1758) [Laidlaw 1902a]

Neurobasis longipes Hagen, 1887 [Hämäläinen et al. 1996]

Vestalis amethystina Lieftinck, 1965 [Hämäläinen et al. 1996]

Vestalis amoena Hagen in Selys, 1853 [Hämäläinen et al. 1996]

Chlorocyphidae

Aristocypha fenestrella (Rambur, 1842) [Laidlaw 1902a]

Heliocypha biforata (Selys, 1859) [Laidlaw 1903]

Heliocypha perforata (Percheron, 1835) [Laidlaw 1903 as *Rhinocypha apicalis* Krüger, 1898]

Libellago aurantiaca (Selys, 1859) [Choong 2020]

Libellago lineata (Burmeister, 1839) [Choong 2007]

Libellago semiopaca (Selys, 1873) [Laidlaw 1902a as *Micromerus affinis* Laidlaw, 1902]

Libellago stigmatizans (Selys, 1869) [Lieftinck 1937]

Sundacypha petiolata (Selys, 1859) [Laidlaw 1902a as *Rhinocypha karschi* Krüger, 1898]

Devadattidae

Devadatta argyoides (Selys, 1859) [Hämäläinen et al. 1996]

Euphaeidae

Dysphaea dimidiata Selys, 1853 [Laidlaw 1902a as *Dysphaea limbata* Selys, 1859]

Euphaea impar Selys, 1859 [Laidlaw 1902a]

Euphaea masoni Selys, 1879 [Choong et al. 2017]

Euphaea ochracea Selys, 1859 [Laidlaw 1902a]

Philosinidae

Rhinagrion macrocephalum (Selys, 1862) [Choong 2020]

Rhinagrion viridatuma Fraser, 1938 [Laidlaw 1902b as *Amphilestes mima* Karsch, 1891]

Platycnemididae

Calicnemia chaseni (Laidlaw, 1928) [Choong 2013]

Coeliccia albicauda (Förster in Laidlaw, 1907) [Laidlaw 1902b as *Trichocnemis borneensis* (Selys, 1886)]

Coeliccia didyma (Selys, 1863) [Choong 2013]
Coeliccia sameerae Dow, Choong & Ng, 2018 [Choong 2013 as *C. erici*]
Copera marginipes (Rambur, 1842) [Laidlaw 1902b]
Copera vittata (Selys, 1863) [Laidlaw 1902b as *Copera atomaria* (Selys, 1886)]
Elattoneura analis (Selys, 1860) [Hämäläinen et al. 1996]
Indocnemis orang (Förster in Laidlaw, 1907) [Hämäläinen et al. 1996]
Onychargia atrocyana Selys, 1865 [Choong 2017]
Prodasineura collaris (Selys, 1860) [Laidlaw 1902b]
Prodasineura humeralis (Selys, 1860) [Laidlaw 1902b]
Prodasineura laidlawii (Förster in Laidlaw, 1907) [Hämäläinen et al. 1996]
Prodasineura notostigma (Selys, 1860) [Choong et al. 2017]
Pseudocopera ciliata (Selys, 1863) [Choong et al. 2017]

Coenagrionidae

Aciagrion borneense Ris, 1911 [Asahina 1966]
Agriocnemis femina (Brauer, 1868) [Laidlaw 1902b]
Agriocnemis minima Selys, 1877 [Asahina 1966 as *Agriocnemis d'abreui* Fraser, 1919]
Agriocnemis pygmaea (Rambur, 1842) [Asahina 1966]
Archibasis rebeccae Kemp, 1989 [Hämäläinen et al. 1996]
Argiocnemis rubescens rubeola Selys, 1877 Laidlaw 1902b]
Argiocnemis species [Choong 2013]
Ceriagrion auranticum Fraser, 1922 [Laidlaw 1902b as *Ceriagrion erubescens* Selys, 1891]
Ceriagrion cerinorubellum (Brauer, 1865) [Asahina 1966]
Ceriagrion fallax pendelburyi Laidlaw, 1931 [Hämäläinen et al. 1996]
Ischnura senegalensis (Rambur, 1842) [Asahina 1966]
Mortonagrion aborense (Laidlaw, 1914) [Choong et al. 2017]
Pseudagrion australasiae Selys, 1876 [Choong 2020]
Pseudagrion microcephalum (Rambur, 1842) [Norma-Rashid 2010]
Pseudagrion pruinosum (Burmeister, 1839) [Hämäläinen et al. 1996]
Pseudagrion rubriceps Selys, 1876 [Choong 2017]

Anisoptera

Aeshnidae

Amphiaeschna ampla basitincta Lieftinck, 1940 [Choong 2013]
Anax guttatus (Burmeister, 1839) [Laidlaw 1902a]
Gynacantha basiguttata Selys, 1882 [Laidlaw 1902a as *G. rosenbergei* Kaup in Brauer, 1867]

Gynacantha bayadera Selys, 1891 [Choong 2007]
Gynacantha limbalis Karsch, 1892 [Choong 2007]
Indaeschna grubaueri (Förster, 1904) [Choong 2013]
Periaeschna laidlawi (Förster, 1908) [Choong 2013]
Tetracanthagyna plagiata (Waterhouse, 1877) [Laidlaw 1902a]

Gomphidae

Burmagomphus divaricatus Lieftinck, 1964 [Lieftinck 1964]
Burmagomphus insularis Laidlaw, 1914 [Choong 2007]
Gomphidia abbotti Williamson, 1907 [Hämäläinen et al. 1996]
Gomphidictinus perakensis (Laidlaw, 1902) [Choong 2017]
Heliogomphus kelantanensis (Laidlaw, 1902) [Laidlaw 1902a as *Gomphus consobrinus]*
Ictinogomphus decoratus melaenops Selys, 1857 [Hämäläinen et al. 1996]
Leptogomphus tioman Choong, 2016 [Choong et al. 2017]
Macrogomphus parallelogramma albardae Selys, 1878 [Choong 2007]
Macrogomphus quadratus Selys, 1878 [Choong 2007]
Megalogomphus sumatranus (Krüger, 1899) [Hämäläinen et al. 1996]
Merogomphus parvus (Krüger, 1899) [Hämäläinen et al. 1996]
Microgomphus chelifer Selys, 1858 [Choong et al. 2017]
Nepogomphus walli (Fraser, 1924) [Norma-Rashid & van Tol 1995]
Onychogomphus castor Lieftinck, 1941 [Lieftinck 1941]
Onychogomphus thienemanni Schmidt, 1934 [Novelo-Gutierrez & Salmah 2013]
Paragomphus capricornis (Förster, 1914) [Choong 2007]
Phaenandrogomphus asthenes Lieftinck, 1964 [Choong et al. 2017]
Stylogomphus ?malayanus Sasamoto, 2001 [Choong et al. 2017]

Macromiidae

Macromia callisto Laidlaw, 1902 [Laidlaw 1902a as *Macromia gerstaeckeri* Krüger, 1899]
Macromia cydippe Laidlaw, 1922 [Hämäläinen et al. 1996]
Macromia gerstaeckeri Krüger, 1899 [Laidlaw 1902a]

Synthemistidae

Idionyx montana Karsch, 1891 [Choong 2013 as *Idionyx* sp.]
Idionyx yolanda Selys, 1871 [Laidlaw 1902a as *Idionyx* dohrni Krüger, 1899]
Macromidia genialis Laidlaw, 1923 [Choong et al. 2017]

Libellulidae

Acisoma panorpoides Rambur, 1842 [Laidlaw 1902a]

Aethriamanta gracilis (Brauer, 1878) [Choong et al. 2017]
Aethriamanta brevipennis (Rambur, 1842)
Brachydiplax chalybea Brauer, 1868 [Laidlaw 1902a as *Brachydiplax maria* Selys, 1878]
Brachydiplax farinosa Krüger, 1902 [Laidlaw 1902a as *Brachydiplax pruinosa* Laidlaw, 1902]
Brachythemis contaminata (Fabricius, 1793) [Laidlaw 1902a]
Camacinia gigantea (Brauer, 1867) [Laidlaw 1902a]
Chalybeothemis chini Dow, Choong & Orr, 2007 [Choong et al. 2017]
Cratilla lineata (Brauer, 1878) [Choong 2007]
Cratilla metallica (Brauer, 1878) [Laidlaw 1902a]
Crocothemis servilia (Drury, 1770) [Laidlaw 1902a]
Diplacodes nebulosa (Fabricius, 1793) [Laidlaw 1902a]
Diplacodes trivialis (Rambur, 1842) [Laidlaw 1902a]
Hydrobasileus croceus (Brauer, 1867) [Choong 2020]
Lathrecista asiatica (Fabricius, 1798) [Laidlaw 1902a as *Lathrecista terminalis* Kirby, 1889]
Lyriothemis biappendiculata (Selys, 1878) [Laidlaw 1902a]
Lyriothemis cleis Brauer, 1868 [Laidlaw 1902a as *Lyriothemis priapea* (Selys, 1878)]
Macrodiplax cora (Brauer, 1867) [Laidlaw 1902a as *Macrodiplax vittata* (Kirby, 1893)]
Nannophya pygmaea Rambur, 1842
Neurothemis fluctuans (Fabricius, 1793) [Laidlaw 1902a]
Neurothemis fulvia (Drury, 1773) [Choong 2013]
Neurothemis tullia (Drury, 1773) [Laidlaw 1902a]
Onychothemis coccinea Lieftinck, 1953 [Lieftinck 1953]
Onychothemis testacea Laidlaw, 1902 [Laidlaw 1902a]
Orchithemis pulcherrima Brauer, 1878 [Choong 2013]
Orthetrum chrysis (Selys, 1891) [Hämäläinen et al. 1996]
Orthetrum glaucum (Brauer, 1865) [Laidlaw 1902a as *Orthetrum nicevillei* Kirby, 1894]
Orthetrum luzonicum (Brauer, 1868) [Hämäläinen et al. 1996]
Orthetrum pruinosum schneideri Förster , 1903 [Laidlaw 1902a as *Orthetrum pruinosum* (Burmeister, 1839)]
Orthetrum sabina (Drury, 1770) [Asahina 1966]
Orthetrum testaceum (Burmeister, 1839) [Laidlaw 1902a]
Orthetrum triangulare malaccensis Förster , 1903 [Hämäläinen et al. 1996]
Pantala flavescens (Fabricius, 1798) [Asahina 1966]
Phyllothemis raymondi Lieftinck, 1950 [Choong 2017]
Potamarcha congener (Rambur, 1842) [Laidlaw 1902a as *Potamarcha obscura* (Rambur, 1842)]
Rhodothemis rufa (Rambur, 1842) [Norma-Rashid 2010]
Rhyothemis obsolescens Kirby, 1889 [Choong et al. 2017]

Rhyothemis phyllis (Sulzer, 1776) [Ris 1913]
Rhyothemis plutonia Selys, 1883 [Choong et al. 2017]
Rhyothemis triangularis Kirby, 1889 [Choong 2020]
Tetrathemis hyalina Kirby, 1889 [Hämäläinen et al. 1996]
Tetrathemis platyptera Selys, 1878 [Hämäläinen et al. 1996]
Tholymis tillarga (Fabricius, 1798) [Asahina 1966]
Tramea transmarina euryale Selys, 1878 [Choong 2017]
Trithemis aurora (Burmeister, 1839) [Laidlaw 1902a]
Trithemis festiva (Rambur, 1842) [Hämäläinen et al. 1996]
Tyriobapta torrida Kirby, 1889 [Laidlaw 1902a]
Zygonyx ida Hagen, 1867 [Ris 1912]
Zygonyx iris Selys, 1869 [Laidlaw 1902a as *Zygonidia malayana* Laidlaw, 1902]

Terengganu Checklist (132 species)

Where the first record from Terengganu is not in this publication, a citation to the first record is made in square parenthesis after the species name.

Zygoptera

Lestidae

Lestes praemorsus decipiens Kirby, 1894 [Choong et al. 2012]

Platystictidae

Drepanosticta fontinalis Lieftinck, 1937 [Choong et al. 2012]
Drepanosticta sp. cf *fontinalis* Lieftinck, 1937
Drepanosticta sp. cf *hamadryas* Laidlaw, 1931 [Choong et al. 2012 as *Drepanosticta* sp.]
Drepanosticta ?quadrata (Selys, 1860) [Choong et al. 2012]
Drepanosticta sharpi (Laidlaw in Laidlaw & Förster , 1907) [Choong et al. 2012]
Drepanosticta sp. cf *sharpi* (Laidlaw in Laidlaw & Förster, 1907)
Protosticta curiosa Fraser, 1934 [Choong et al. 2012]

Argiolestidae

Podolestes orientalis Selys, 1862 [Wahizatul-Afzan et al. 2006]

Calopterygidae

Echo modesta Laidlaw, 1902 [Choong et al. 2012]
Neurobasis chinensis (Linnaeus, 1758) [Wahizatul-Afzan et al. 2006]
Vestalis amethystina Lieftinck, 1965 [Wahizatul-Afzan et al. 2006]
Vestalis amoena Hagen in Selys, 1853 [Choong et al. 2012]
Vestalis gracilis (Rambur, 1842) [Choong et al. 2012]

Chlorocyphidae

Aristocypha fenestrella (Rambur, 1842) [Choong et al. 2012]
Heliocypha biforata (Selys, 1859) [Wahizatul-Afzan et al. 2006]
Heliocypha perforata (Percheron, 1835) [Wahizatul-Afzan et al. 2006 as *Rhinocypha* sp.]
Libellago aurantiaca (Selys, 1859) [Choong et al. 2012]
Libellago hyalina (Selys, 1859) [Choong & Ng 2014]
Libellago lineata (Burmeister, 1839) [Wahizatul-Afzan et al. 2006]
Libellago stigmatizans (Selys, 1869) [Wahizatul-Afzan et al. 2006]
Rhinocypha pelops Laidlaw, 1936 [Choong et al. 2018]
Sundacypha petiolata (Selys, 1859) [Choong & Ng 2014]

Devadattidae

Devadatta argyoides (Selys, 1859) [Choong et al. 2008]

Euphaeidae

Dysphaea dimidiata Selys, 1853 [Wahizatul-Afzan et al. 2006]
Euphaea impar Selys, 1859 [Choong et al. 2008]
Euphaea masoni Selys, 1879
Euphaea ochracea Selys, 1859 [Wahizatul-Afzan et al. 2006]

Philosinidae

Rhinagrion macrocephalum (Selys, 1862) [Choong & Ng 2014]
Rhinagrion viridatum Fraser, 1938 [Choong et al. 2012]

Platycnemididae

Calicnemia chaseni (Laidlaw, 1928) [Choong et al. 2012]
Coeliccia albicauda (Förster in Laidlaw, 1907) [Choong et al. 2008]
Coeliccia didyma (Selys, 1863) [Choong et al. 2012]
Coeliccia sameerae Dow, Choong & Ng, 2018 [Choong et al. 2012 as *Coeliccia erici*]
Copera marginipes (Rambur, 1842) [Wahizatul-Afzan et al. 2006]
Copera vittata (Selys, 1863) [Choong et al. 2008]
Elattoneura analis (Selys, 1860) [Choong & Ng 2014]
Indocnemis orang (Förster in Laidlaw, 1907) [Choong et al. 2012]
Onychargia atrocyana Selys, 1865 [Wahizatul-Afzan et al. 2006]
Prodasineura collaris (Selys, 1860) [Wahizatul-Afzan et al. 2006]
Prodasineura humeralis (Selys, 1860) [Choong et al. 2012]
Prodasineura laidlawii (Förster in Laidlaw, 1907) [Choong et al. 2008]

Prodasineura notostigma (Selys, 1860) [Choong & Ng 2014]
Pseudocopera ciliata (Selys, 1863) [Choong et al. 2012 as Copera ciliata]

Coenagrionidae

Aciagrion hisopa (Selys, 1876) [Choong et al. 2012]
Agriocnemis femina (Brauer, 1868) [Choong et al. 2012]
Agriocnemis nana (Laidlaw, 1914) [Choong et al. 2012]
Agriocnemis pygmaea (Rambur, 1842)
Amphicnemis gracilis Krüger, 1898 [Choong et al. 2008]
Archibasis melanocyana (Selys, 1877) [Wahizatul-Afzan et al. 2006]
Archibasis rebeccae Kemp, 1989 [Choong & Ng 2014]
Archibasis viola Lieftinck, 1948 [Choong & Ng 2014]
Argiocnemis rubescens rubeola Selys, 1877 [Choong et al. 2012]
Argiocnemis species [Choong et al. 2012]
Ceriagrion cerinorubellum (Brauer, 1865) [Choong et al. 2008]
Ceriagrion chaoi Schmidt, 1964 [Choong et al. 2012]
Ceriagrion olivaceum Laidlaw, 1914 [Amirrudin et al. 2011]
Ischnura senegalensis (Rambur, 1842) [Choong et al. 2008]
Mortonagrion aborense (Laidlaw, 1914] [Choong et al. 2012]
Pericnemis sp. [Choong et al. 2012]
Pseudagrion australasiae Selys, 1876 [Choong et al. 2012]
Pseudagrion ?lalakensis Orr & van Tol, 2001
Pseudagrion microcephalum (Rambur, 1842) [Laidlaw 1902b]
Pseudagrion pruinosum (Burmeister, 1839) [Choong et al. 2012]
Pseudagrion rubriceps Selys, 1876 [Choong et al. 2012]
Pseudagrion willaimsoni Fraser, 1922 [Choong et al. 2012]

Anisoptera

Aeshnidae

Gynacantha bayadera Selys, 1891 [Wahizatul-Afzan et al. 2006]
Gynacantha dohrni Krüger, 1889 [Wahizatul-Afzan et al. 2006]
Heliaeschna crassa Krüger, 1889 [Wahizatul-Afzan et al. 2006]
Indaeschna grubaueri (Förster, 1904) [Wahizatul-Afzan et al. 2006]

Gomphidae

Burmagomphus sp. [Wahizatul-Afzan et al. 2006]
Gomphidia abbotti Williamson, 1907
Ictinogomphus decoratus melaenops Selys, 1857 [Wahizatul-Afzan et al. 2006]

Leptogomphus tioman Choong, 2016
Macrogomphus thoracicus McLachlan, 1884 [Choong & Ng 2014]
Microgomphus chelifer Selys, 1858 [Wahizatul-Afzan et al. 2006]
Paragomphus capricornis (Förster, 1914) [Choong et al. 2012]

Macromiidae

Macromia cupricincta Fraser, 1924

Synthemistidae

Idionyx yolanda Selys, 1871 [Choong & Ng 2014]

Libellulidae

Acisoma panorpoides Rambur, 1842 [Choong et al. 2012]
Aethriamanta brevipennis (Rambur, 1842) [Amirrudin et al. 2011]
Aethriamanta gracilis (Brauer, 1878) [Choong et al. 2012]
Agrionoptera insignis (Brauer, 1878) [Choong et al. 2012]
Brachydiplax chalybea Brauer, 1868 [Choong et al. 2008]
Brachydiplax farinosa Krüger, 1902 [Choong et al. 2012]
Brachygonia oculata (Brauer, 1878) [Choong et al. 2008]
Brachythemis contaminata (Fabricius, 1793) [Laidlaw 1902a]
Chalybeothemis chini Dow, Choong & Orr, 2007
Chalybeothemis fluviatilis Lieftinck, 1933 [Amirrudin et al. 2011]
Cratilla lineata (Brauer, 1878) [Choong et al. 2012]
Cratilla metallica (Brauer, 1878) [Wahizatul-Afzan et al. 2006]
Crocothemis servilia (Drury, 1770) [Wahizatul-Afzan et al. 2006]
Diplacodes nebulosa (Fabricius, 1793) [Amirrudin et al. 2011]
Diplacodes trivialis (Rambur, 1842) [Choong et al. 2008]
Hydrobasileus croceus (Brauer, 1867) [Amirrudin et al. 2011]
Indothemis limbata (Selys, 1891) [Choong et al. 2012]
Lathrecista asiatica (Fabricius, 1798) [Amirrudin et al. 2011]
Lyriothemis biappendiculata (Selys, 1878) [Choong et al. 2012]
Lyriothemis cleis Brauer, 1868 [Choong et al. 2008]
Nannophya pygmaea Rambur, 1842 [Choong et al. 2012]
Nesoxenia lineata (Selys, 1879) [Choong et al. 2012]
Neurothemis fluctuans (Fabricius, 1793) [Wahizatul-Afzan et al. 2006]
Neurothemis fulvia (Drury, 1773) [Wahizatul-Afzan et al. 2006 as *Neurothemis terminata*]
Onychothemis culminicola Föster, 1904 [Wahizatul-Afzan et al. 2006]

Onychothemis testacea Laidlaw, 1902 [Choong et al. 2012]
Orchithemis pulcherrima Brauer, 1878 [Choong et al. 2008]
Orthetrum chrysis (Selys, 1891) [Wahizatul-Afzan et al. 2006]
Orthetrum glaucum (Brauer, 1865) [Wahizatul-Afzan et al. 2006]
Orthetrum luzonicum (Brauer, 1868) [Choong et al. 2012]
Orthetrum sabina (Drury, 1770) [Wahizatul-Afzan et al. 2006]
Orthetrum testaceum (Burmeister, 1839) [Wahizatul-Afzan et al. 2006]
Pantala flavescens (Fabricius, 1798) [Wahizatul-Afzan et al. 2006]
Phyllothemis raymondi Lieftinck, 1950 [Choong et al. 2018]
Potamarcha congener (Rambur, 1842) [Choong et al. 2012]
Pseudothemis jorina Förster, 1904 [Amirrudin et al. 2011]
Rhodothemis rufa (Rambur, 1842) [Amirrudin et al. 2011]
Rhyothemis aterrima Selys, 1891 [Amirrudin et al. 2011]
Rhyothemis obsolescens Kirby, 1889 [Choong et al. 2008]
Rhyothemis phyllis (Sulzer, 1776) [Laidlaw 1902a]
Rhyothemis plutonia Selys, 1883 [Choong et al. 2012]
Rhyothemis triangularis Kirby, 1889 [Wahizatul-Afzan et al. 2006]
Risiophlebia dohrni (Küger, 1902) [Choong et al. 2008]
Tetrathemis hyalina Kirby, 1889 [Wahizatul-Afzan et al. 2006]
Tetrathemis platyptera Selys, 1878 [Choong et al. 2012]
Tholymis tillarga (Fabricius, 1798)
Tramea transmarina euryale Selys, 1878 [Choong et al. 2012]
Trithemis aurora (Burmeister, 1839) [Wahizatul-Afzan et al. 2006]
Trithemis festiva (Rambur, 1842) [Wahizatul-Afzan et al. 2006]
Tyriobapta torrida Kirby, 1889 [Wahizatul-Afzan et al. 2006]
Urothemis signata insignata (Selys, 1872) [Choong et al. 2012]
Zygonyx iris Selys, 1869 [Wahizatul-Afzan et al. 2006]
Zyxomma petiolatum Rambur, 1842 [Wahizatul-Afzan et al. 2006]

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