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New records of Odonata from Selangor and Negeri Sembilan, Malaysia, with provisional checklists of species recorded from the states

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Abstract

Previously unpublished records of Odonata from the states of Negeri Sembilan and Selangor in Peninsular Malaysia are presented. One hundred and eight species are listed, of which 77 were collected in Negeri Sembilan and 87 in Selangor. Fifteen of the species recorded from Negeri Sembilan and seven of those recorded from Selangor appear to be first records for the respective state. Notable records include *Drepanosticta* sp. cf *hamadryas* Laidlaw, 1931, *Rhinocypha pelops* Laidlaw, 1936, *Acrogomphus ?malayanus* Laidlaw, 1925, *Heliogomphus kelantanensis* (Laidlaw, 1902); *Onychogomphus duaricus* Fraser, 1924, *Macromia cupricincta* Fraser, 1924, *Idionyx montana* Karsch, 1891, *Chalybeothemis chini* Dow, Choong & Orr, 2007 and *Hylaeothemis clementia* Ris, 1909 Ris, 1909. Provisional checklists of the Odonata known from Selangor plus the Federal Territory of Kuala Lumpur (171 species) and for Negeri Sembilan (116 species) are given in appendices.

Abstrak

Rekod lepas tidak diterbit bagi Odonata dari Negeri Sembilan dan Selangor, Semenanjung Malaysia diterbitkan buat pertama kali. Sebanyak seratus dan lapan spesies dilaporkan, 77 spesies dikutip dari Negeri Sembilan dan 87 spesies adalah dari Selangor. Lima belas spesies dari Negeri Sembilan dan tujuh spesies yang direkod dari Selangor adalah rekod pertama. Rekod penting termasuk *Drepanosticta* sp. cf *hamadryas* Laidlaw, 1931, *Rhinocypha pelops* Laidlaw, 1936, *Acrogomphus ?malayanus* Laidlaw, 1925, *Heliogomphus kelantanensis* (Laidlaw, 1902); *Onychogomphus duaricus* Fraser, 1924, *Macromia cupricincta* Fraser, 1924, *Idionyx montana* Karsch, 1891, *Chalybeothemis chini* Dow, Choong & Orr, 2007 and *Hylaeothemis clementia* Ris, 1909 Ris, 1909. Senarai semak provisional Odonata yang diketahui dari Selangor serta kawasan Wilayah Persekutuan Kuala Lumpur (171 spesies) dan untuk Negeri Sembilan (116 spesies) adalah seperti yang dibekalkan dalam lampiran.

Key words: new records, Odonata checklist, Peninsular Malaysia

Introduction

The state of Selangor is on the western side of Peninsular Malaysia and surrounds the

Federal Territory of Kuala Lumpur, the smaller state of Negeri Sembilan is to its south. Historically Selangor is one of the better studied states in Peninsular Malaysia for Odonata, Negeri Sembilan perhaps less so. We are aware of Odonata records from Negeri Sembilan in Choong 2010, Choong & Rahim 2014, Laidlaw 1931, Lieftinck 1965b, Norma-Rashid 2009, Orr 2008, Raja Zalinda et al. 2006, Ris 1909, Ris 1911, Seehausen & Dow 2016, Tsuda & Kitagawa 1987 and of records from Selangor and/or the Federal Territory of Kuala Lumpur in Asahina 1964, 1966, 1977, 1985, 1986, 1987, Brooks 1981, Butler 2011, Choong 2009, 2013, 2017, Choong, Hanisah & Ng 2012, Choong & Ng 2009, Choong & Orr 2010, Choong et al. 2008, 2018, Dijkstra et al. 2014, Dow 2011, Dow & Luke 2015, Dow et al. 2018, Fadilawati et al. 2008, Farizawati et al. 2014, Fraser 1942, 1944, Furtado 1969, 1970, 1972, 1974, 1975, Hämäläinen 2000, Hämäläinen et al. 2015, Inoue & Kuwahara 1974, Kalkman 2004, Kalkman & Villanueva 2011, Laidlaw 1902, 1931, 1934, Lempert 1999, Lieftinck 1931, 1954, 1964, 1965a, 1965b, 1971, 1984, Noorhidayah-Mamat et al. 2014, Norma-Rashid 1999, 2003, 2006, Norma-Rashid & van Tol 1995, Orr 2008, Raja Zalinda et al. 2006, Ris 1909, 1913a, 1913b, van Tol & Norma-Rashid 1995, Vick 1993, Yong & Hämäläinen 1994.

In this publication we present previously unpublished records from Selangor and Negeri Sembilan. The surveys reported here were largely funded by the International Dragonfly Fund and the Mohamed bin Zayed Species Conservation Fund.

In Appendix 1 and Appendix 2 we give provisional checklists for Selangor and the Federal Territory of Kuala Lumpur, and for Negeri Sembilan. It is likely that there are published records in the Malaysian (and possibly also the Japanese) literature that we are unaware of, but since no checklists are available for these two states it seems worthwhile to provide them here in the hope that they can be improved upon in the future. A number of published records are determined only to genus and we have only included these in the checklists if no other species from the genus is included. In Appendix 1 we have indicated whether the species in question has been recorded from Selangor or the Federal Territory of Kuala Lumpur or both but it should be noted that it in some cases it is extremely difficult to be sure which administrative entity a record actually comes from. For example the type locality of *Merogomphus femoralis* Laidlaw, 1931 is given as Kuala Lumpur so we have listed the species accordingly, but it is quite possible that the labels of the holotype merely given the nearest (in the year of collection, 1921) large town and the true type location is actually somewhere in Selangor.

Odonata recorded

Locations

Fig. 1 shows Negeri Sembilan and Selangor with some of the sampling locations indicated.

Selangor

All locations except one are to the east of Kuala Lumpur, the exception is S15 (Templar Park) which is to the north of Kuala Lumpur. Most of the sampling locations in Selangor are indicated in Fig. 2.

Figure 1. Overview of sampling locations in Negeri Sembilan and Selangor. Base image from Google Earth.

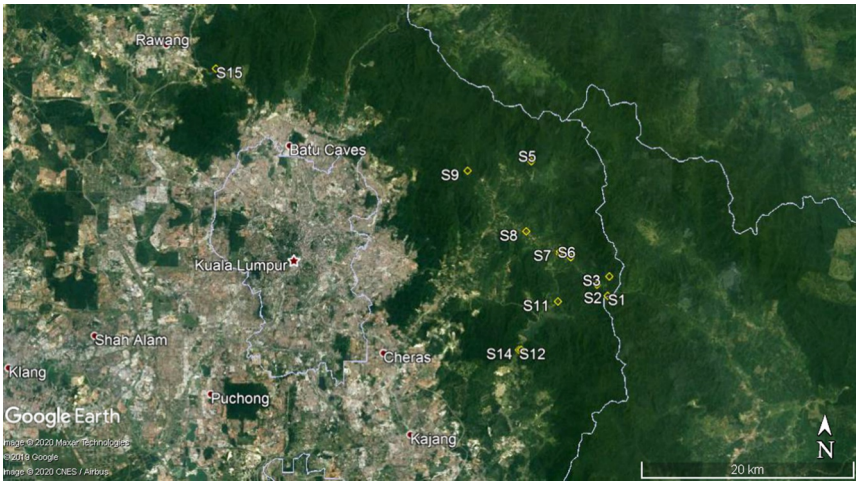

Figure 2. Sampling locations in Selangor. Base image from Google Earth.

S1. A small hill stream on the road from Selangor to Kuala Klawang in Negeri Sembilan [representative coordinates 3.11351N, 101.95218E], 460-565m a.s.l.

S2. Marshy areas on a hillside along the same road as S1 [3.12273N, 101.94295E], ca 412m a.s.l.

S3. A stream near the Orang Asli kampung Tanjung Rambi [representative coordinates 3.12987N, 101.95317E], 420-495m a.s.l.

S4. Marshy areas and trailside near S3.

S5. Streams at the foot of Gunung Nuang [representative coordinates 3.22576N, 101.88641E], 280-350m a.s.l.

S6. Sungai Lui upstream of bridge at the Orang Asli kampung Paya Lebar [representative coordinates 3.14544N, 101.9211E], 109-119m a.s.l.

S7. Ponds at Malay kampung near Paya Lebar [3.15022N, 101.91209E], 109m a.s.l.

S8. Pond at a kampung on a small road near Sungai Gabai [3.16684N, 101.8833E], 90m a.s.l.

S9. A tributary stream to Sungai Congkak [representative coordinates 3.21718N, 101.83289E], 190-280m a.s.l.

S10. Sungai Lui and tributaries downstream from Paya Lebar [representative coordinates 3.14842N, 101.91187E], ca 105m a.s.l. This location was only sampled after 2 PM.

S11. A large stream fed pond upstream of the reservoir of the Semenyih Dam [3.10804N, 101.9108E], 133m a.s.l.

S12. Sungai Lalang downstream of the Semenyih Dam [representative coordinates 3.0666N, 101.87852E], ca 74m a.s.l.

S13. Fish ponds near S12, ca 76m a.s.l.

S14. A large, non-fish, pond near S12 [3.06676N, 101.88039E], 84m a.s.l.

S15. Forest streams at Templar Park [3.30038N, 101.61906E], ca 100m a.s.l.

Negeri Sembilan

Most of the sampling locations in Negeri Sembilan are indicated in Fig. 3.

N1. Streams at Ulu Bendul Recreational Park [2.72642N, 102.07624E], 160-185m a.s.l.

N2. Ponds and at buildings at Ulu Bendul Recreational Park.

Figure 3. Sampling locations in Negeri Sembilan. Base image from Google Earth.

N3. Sungai Terachi [representative coordinates [2.73741N, 102.09908E], 120-130m a.s.l. Only sampled in poor weather conditions.

N4. (a) Tributary to Sungai Terachi accessed through rubber plantation [2.74234N, 102.10152E], 140-170m a.s.l.; (b) a small pool by road near mouth of (a).

N5. Ponds just outside gate to Ulu Bendul Recreational Park [2.73048N, 102.08234E], 145m a.s.l.

N6. Ponds past Rembau [2.56477N, 102.12684E], 45m a.s.l.

N7. Stream at Hutan Lipur Gunung Dato' [representative coordinates 2.5467N, 102.1731E], 100-210m a.s.l.

N8. Hutan Lipur Serting Ulu: (a) the main stream (a branch of Sungai Serting) in the area occupied by park facilities [coordinates at gate 2.91355N, 102.25733E], 150-200m a.s.l. Fig. 4 shows the main stream just inside the Hutan Lipur; (b) a tributary in the same part; (c) the main stream upstream of park facilities (entirely forest surrounded) [representative coordinates 2.91398N, 102.2504E], 200-250m a.s.l.; (d) a tributary in the same part; (e) forest pools near the stream in the same part.

Figure 4. Main stream at Hutan Lipur Serting Ulu, just inside the Hutan Lipur (location N8a).

N9. The same branch of Sungai Serting downstream of N8 [representative coordinates 2.91537N, 102.25977E], 120-140m a.s.l.

N10. A large pond near N9 [2.91502N, 102.26042E], 120m a.s.l.

N11. A smaller pond along the road leading to Hutan Lipur Serting Ulu [2.91772N, 102.26852E], 106m a.s.l.

Figure 5. Stream near old road from Pertang to Batu Kikir (location N14a).

N12. A pond in rubber near Simpang Pertang [2.92967N, 102.27926E], 95m a.s.l.

N13. Small steep hill streams in Serting Forest Reserve, accessed from the old road from Pertang to Batu Kikir [2.91137N, 102.22933E], 280-300m a.s.l.

N14. A stream near to an Orang Asli camp in Serting Forest Reserve by the old road from Pertang to Batu Kikir (a) main stream [entry point 2.89089N, 102.2205E], 230-250m a.s.l., Fig. 5 shows a section of this stream; (b) tributaries.

N15. A smaller stream in the same area as N14 [2.88473N, 102.21665E], 255-260m a.s.l.

N16. Along a logging track in the same area.

N17. A muddy pond surrounded by degraded forest near to N14, 236m a.s.l.

Species collected

First records (to our knowledge) from Selangor and the Federal Territory of Kuala Lumpur are indicated by a bold S, first records from Negeri Sembilan by a bold N, after the species authority. ♂+♀ indicates a pair in tandem.

Zygoptera

Lestidae

1. *Lestes praemorsus decipiens* Kirby, 1894 N

   N5 – 2 ♂♂, 7.ix.2016. **N11** – ♂, 18.viii.2019.

2. *Orolestes wallacei* (Kirby, 1889)

   S8 – ♂, 8.vi.2016.

Platystictidae

3. *Drepanosticta* sp. cf *hamadryas* Laidlaw, 1931 S, N

This is the same species as listed by Choong, Ng & Dow (2012) from Terengganu as *Drepanosticta* sp. and stated there to be a new species allied to *D. hamadryas*; only a single male was collected in Terengganu. The holotype of *D. hamadryas* (in the Natural History Museum, London (NHML), from Kuala Tahan in Pahang, stated to have been collected at 300 feet a.s.l.) is missing its anal appendages and the original description (Laidlaw 1931) is inadequate. However there is a second specimen in NHML (♂, Kuala Teku, Pahang, Peninsular Malaysia, 500-1500 feet a.s.l., 31.vii.1905, leg. H.C. Robinson), determined as *D. hamadryas* by D. Kimmins and indeed agreeing with what remains of the holotype in all except minor details of colouration and pattern. In contrast the specimen from Terengganu and those reported here differ significantly in colour and pattern, but are essentially identical in their anal appendages to the Kuala Teku specimen. There is a Kuala Teku in Taman Negara National Park, in the same general area as Kuala Tahan and it is likely that this specimen is from that area. More material and further study are required to determine if *D. hamadryas* is simply a variable species or if the taxon reported here is actually a distinct species. Whatever its true identity, this taxon was common at two of the locations covered here when they were visited.

S1 – 13 ♂♂, 3.vi.2016; ♂, 8.vi.2016; 6 ♂♂, 22.viii.2019. **S5** – 3 ♂♂, ♀, 4.vi.2016. **S9** – 7 ♂♂, ♀, 7.vi.2016. **N7** – ♂, 9.ix.2016.

4. *Drepanosticta fontinalis* Lieftinck, 1937

The specimens listed under this species have male anal appendages matching the illustrations provided in Lieftinck (1937) very well.

N7 – 10 ♂♂, ?♀, 9.ix.2016. **N13** – ♂, 20.viii.2019.

5. *Drepanosticta* cf *fontinalis* Lieftinck, 1937

The identity of this and the next species are the subject of ongoing enquiry.

S1 – 2 ♂♂, ?♀, 3.vi.2016; 4 ♂♂, 8.vi.2016; 8 ♂♂, 22.viii.2019. **S3** – 7 ♂♂, ♀, 6.vi.2016. **S5** – 9 ♂♂, ♀, 4.vi.2016. **S9** – 7 ♂♂, ♀, 7.vi.2016. **S15** – 9 ♂♂, ♂+♀, 21.xi.2007; ♂, 26.xi.2007. **N4a** – 2 ♂♂, 8.ix.2016.

6. *Drepanosticta* cf *sharpi* (Laidlaw, 1907) N

S1 – ♂, 3.vi.2016. **S5** – 2 ♂♂, 4.vi.2016. **S15** – ♂+♀, 21.xi.2007, **N4a** – ♂, 8.ix.2016. **N7** – 2 ♂♂, 9.ix.2016. **N8b** – ♂, 18.viii.2019. **N8d** – ♂, 19.viii.2019.

Calopterygidae

7. *Echo modesta* Laidlaw, 1902

S1 – 3 ♂♂, 3.vi.2016; 2 ♂♂, ♀, 8.vi.2016; 4 ♂♂, 22.viii.2019. **S3** – 3 ♂♂, 6.vi.2016. **S9** – 2 ♂♂, 7.vi.2016. **S15** – 2 ♂♂, 21.xi.2007. **N7** – ♂, 9.ix.2016. **N8b** – 2 ♂♂, 18.viii.2019. **N8c** – 4 ♂♂, 19.viii.2019.

8. N*eurobasis chinensis* (Linnaeus, 1758q)

The female from S10 was being consumed by *Onychothemis testeacea* when caught.

S6 – 2 ♂♂, 5.vi.2016. **S10** – 2 ♂♂, ♀, 23.viii.2019. **S12** – 2 ♂♂, 29.xi.2008. **N3** – ♂, 8.ix.2016. **N9** – 2 ♂♂, ♀, 18.viii.2019; ♂, 19.viii.2019.

9. *Vestalis amethystina* Lieftinck, 1965

S1 – ♂, 3.vi.2016. **S3** – 5 ♂♂, 6.vi.2016. **S5** – 2 ♂♂, 4.vi.2016. **S9** – ♂, 7.vi.2016. **S15** – 3 ♂♂, 21.xi.2007. **N1** – ♂, 6.ix.2016. **N4**a – ♂, 8.ix.2016. **N7** – 2 ♂♂, ♀, 9.ix.2016,. **N8b** – 2 ♂♂, 18.viii.2019. **N8c** – ♂, 19.viii.2019. **N15** – ♂, 20.viii.2019.

10. *Vestalis amoena* Hagen in Selys, 1853

S1 – ♂, 5.vi.2016. **S9** – ♂, 7.vi.2016. **S10** – ♂, 23.viii.2019. **S15** – 2 ♂♂, 21.xi.2007. **N9** – 2 ♂♂, 18.viii.2019. **N14a** – 4 ♂♂, 20.viii.2019; ♂, 21.viii.2019.

Chlorocyphidae

11. *Aristocypha fenestrella* (Rambur, 1842)

S1 – ♂, 3.vi.2016. **S3** – 2 ♂♂, 6.vi.2016. **S5** – 2 ♂♂, 4.vi.2016. **S9** – ♂, 7.vi.2016. **S15** – ♂, 21.xi.2007. **N7** – 2 ♂♂, 9.ix.2016. **N8a** – 3 ♂♂, 18.viii.2019. **N8c** – 3 ♂♂, 19.viii.2019. **N13** – ♂, 20.viii.2019. **N14** – ♂, 21.viii.2019.

12. *Heliocypha biforata* (Selys, 1859)

S6 – ♂, 5.vi.2016. **S15** – ♂, 21.xi.2007. **N1** – ♂, 6.ix.2016. **N8a** – ♂, 18.viii.2019. **N9** – ♂, 18.viii.2019; ♂, 19.viii.2019. **N14a** – ♂, 20.viii.2019; 2 ♂♂, 21.viii.2019.

13. *Heliocypha perforata* (Percheron, 1835)

S6 – 2 ♂♂, 5.vi.2016. **S10** – 6 ♂♂, 23.viii.2019.

14. *Libellago lineata* (Burmeister, 1839)

S6 – ♂, 5.vi.2016. **S10** – 3 ♂♂, ♂+♀, 23.viii.2019. **S11** – ♂, 22.viii.2019. **S12** – ♂, 29.ix.2008; ♂, 23.viii.2019.

15. *Libellago stigmatizans* (Selys, 1859) N

N14a – ♂, 20.viii.2019.

16. *Rhinocypha pelops* Laidlaw, 1936 S

This is apparently a scarce species in Peninsular Malaysia. A second female was seen at the same location as that collected, perched high and extremely wary, so its behaviour may play a role in its apparent scarcity.

S1 – ♀, 8.vi.2016.

Devadattidae

17. *Devadatta argyoides* (Selys, 1859)

S1 – 4 ♂♂, ♀, 3.vi.2016; 2 ♂♂, 8.vi.2016; 4 ♂♂, ♀, ♂+♀, 22.viii.2019. **S3** – 3 ♂♂, 6.vi.2016. **S5** – ♂, 4.vi.2016. **S9** – ♂, 7.vi.2016. **S15** – 6 ♂♂, 21.xi.2007; ♂, ♂+♀, 26.xi.2007. **N1** – ♂, 7.ix.2016. **N4**a – ♂, 8.ix.2016. **N7** – 7 ♂♂, 9.ix.2016. **N8a** – ♂, 18.viii.2019; ♂, 19.viii.2019. **N8b** – 4 ♂♂, 18.viii.2019. **N8c** – ♂, 19.viii.2019. **N9** – ♂, 18.viii.2019. **N13** – ♂+♀, 20.viii.2019. **N14a** – 2 ♂♂, 20.viii.2019; 2 ♂♂, 21.viii.2019.

Euphaeidae

18. *Dysphaea dimidiata* Selys, 1853

S6 – ♂+♀, 5.vi.2016. **S10** – ♂, 23.viii.2019.

19. *Euphaea impar* Selys, 1859

S15 – ♂, 26.xi.2007. **N1** – ♂, 6.ix.2016. **N8b** – 3 ♂♂, 18.viii.2019. **N8c** – 3 ♂♂, 19.viii.2019. **N14a** – 2 ♂♂, ♀, 20.viii.2019.

20. *Euphaea ochracea* Selys, 1859

S3 – 2 ♂♂, 6.vi.2016. **S5** – ♂, 4.vi.2016. **S9** – 2 ♂♂, 7.vi.2016. **S15** – ♂, 21.xi.2007. **N7** – 3 ♂♂, 9.ix.2016. **N8a** – 2 ♂♂, 18.viii.2019; ♂, 19.viii.2019. **N8c** – ♂, 19.viii.2019. **N9** – ♂, 18.viii.2019. **N14a** – 2 ♂♂, 20.viii.2019.

Philosinidae

21. *Rhinagrion viridatum* Fraser, 1938 N

N14a – ♂, 20.viii.2019.

Platycnemididae

22. *Calicnemia chaseni* (Laidlaw, 1928)

S1 – ♂, 3.vi.2016. **S3** – 4 ♂♂, 6.vi.2016. **S9** – 4 ♂♂, 7.vi.2016. **N8c** – ♂, 19.viii.2019.

23. *Coeliccia albicauda* (Förster in Laidlaw, 1907)

S1 – ♂, 3.vi.2016; 2 ♂♂, 8.vi.2016. **S9** – 2 ♂♂, 7.vi. **S15** – 2 ♂♂, 21.xi.2007; 4 ♂♂, 26.xi.2007. **N1** – ♀, 6.ix.2016. **N7** – 5 ♂♂, 9.ix.2016. **N8b** – 2 ♂♂, 18.viii.2019. **N8c** – 4 ♂♂, 19.viii.2019. **N9** – ♂, 18.viii.2019. **N14b** – 2 ♂♂, 20.viii.2019.

24. *Coeliccia erici* Laidlaw, 1917

Material collected at location S1 in 2016 listed in Dow et al, 2018. This is a very locally occurring species, typically found only at very low densities even where it occurs. N13 is a new location for the species.

S1 – 2 ♂♂, ♀, 22.viii.2019. **N13** – ♂, 20.viii.2019.

25. *Coeliccia octogesima* (Selys, 1863)

S15 – 2 ♂♂, 21.xi.2007.

26. *Copera marginipes* (Rambur, 1842)

S6 – 2 ♂♂, ♀, 5.vi.2016. **S10** – 2 ♂♂, ♂+♀, 23.viii.2019. **N9** – ♂, 18.viii.2019; ♂, 19.viii.2019.

27. *Copera vittata* (Selys, 1863)

N8e – ♂, 19.viii.2019.

28. *Indocnemis orang* (Förster in Laidlaw, 1907)

S3 – 2 ♂♂, 6.vi.2016. **S9** - ♂, 7.vi.2016. **S15** – ♂, 21.xi.2007; 2 ♂♂, 26.xi.2007. **N1** – ♂, 7.ix.2016. **N8a** – ♂, 18.viii.2019; 2 ♂♂, 19.viii.2019. **N8c** – 4 ♂♂, 19.viii.2019.

29. *Onychargia atrocyana* Selys, 1865

S14 – ♂+♀, 23.viii.2019.

30. *Prodasineura collaris* (Selys, 1860)

N1 – 5 ♂♂, 6.ix.2016. **N9** – ♂, 18.viii.2019.

31. *Prodasineura humeralis* (Selys, 1860)

S6 – 3 ♂♂, 5.vi.2016. **S10** – 4 ♂♂, ♂+♀, 23.viii.2019. **S11** – 2 ♂♂, 22.viii.2019. **S12** – 3 ♂♂,

2 ♀♀, 29.ix.2008; ♂, 23.viii.2019. **N1** – ♂, 6.ix.2016. **N3** – ♂, 8.ix.2016. **N9** – 3 ♂♂, ♂+♀, 18.viii.2019. **N14a** – ♂, 20.viii.2019.

32. *Prodasineura laidlawii* (Förster in Laidlaw, 1907)

S1 – ♂, 8.iv.2016. **S9** – ♂, ♀, ♂+♀, 7.vi.2016. **S15** – ♂, 21.xi.2007; ♂, 26.xi.2007. **N1** – 2 ♂♂, 6.ix.2016; ♂, 7.ix.2016. **N7** – 9 ♂♂, 9.ix.2016. **N8b** – ♂, 18.viii.2019. **N8c** – 8 ♂♂, 19.viii.2019. **N9** – 2 ♂♂, 18.viii.2019. **N14a** – ♂, 20.viii.2019; ♂, 21.viii.2019. **N15** – ♂, 20.viii.2019.

33. *Prodasineura notostigma* (Selys, 1860)

S15 – ♂, 21.xi.2007.

34. *Pseudocopera ciliata* (Selys, 1863)

S7 – ♀, 5.vi.2016. **S11** – ♂, 2 ♀♀, 22.viii.2019. **S13** – ♀, 29.ix.2008. **S14** – ♀, 23.viii.2019.

Coenagrionidae

35. *Agriocnemis femina* (Brauer, 1868)

S6 – ♂, 5.vi.2016. **S13** – ♂, ♀, 29.ix.2008.

36. *Agriocnemis rubescens rubeola* Selys, 1877

S8 – ♂, ♀, 8.vi.2016. **S11** – ♂, 22.viii.2019. **N5** – 2 ♂♂, 7.ix.2016.

37. *Agriocnemis* species

N1 – ♂, 6.ix.2016.

38. *Ceriagrion cerinorubellum* (Brauer, 1865)

S14 – ♂, 23.viii.2019.

39. *Ceriagrion chaoi* Schmidt, 1964 N

S8 – 2 ♂♂, 8.vi.2016. **N5** – 2 ♂♂, 7.ix.2016.

40. *Ischnura senegalensis* (Rambur, 1842)

S7 – ♂, 5.vi.2016. **S14** – ♂, 23.viii.2019. **N5** – ♂, 7.ix.2016.

41. *Pseudagrion australasiae* Selys, 1876

S7 – ♂, 5.vi.2016. **S13** – 2 ♂♂, 29.ix.2008. **S14** – 2 ♂♂, 23.viii.2019. **N5** – 2 ♂♂, 7.ix.2016. **N11** – ♂, 18.viii.2019. **N12** – ♂, 19.viii.2019.

42. *Pseudagrion microcephalum* (Rambur, 1842)

S6 – ♂, 5.vi.2016. **S11** – 2 ♂♂, 22.viii.2019. **S13** – 2 ♂♂, 29.ix.2008. **S14** – 2 ♂♂, 23.viii.2019.

43. *Pseudagrion pruinosum* (Burmeister, 1839)

S6 – 3 ♂♂, ♀, 5.vi.2016. **N3** – 2 ♂♂, 8.ix.2016. **N9** – ♂, 18.viii.2019; ♂, 19.viiii.2019.

44. *Pseudagrion rubriceps* Selys, 1876

S6 – ♂, 5.vi.2016. **S11** – 3 ♂♂, 22.viii.2019. **S12** – ♂, 29.ix.2008; ♂, 23.viii.2019. **S13** – ♂, 23.viii.2019. **N3** – ♂, 8.ix.2016.

Anisoptera

Aeshnidae

45. *Gynacantha subinterrupta* Rambur, 1842

S12 – ♂, 29.ix.2008.

46. *Indaeschna grubaueri* (Förster, 1904)

S15 – ♂, 26.xi.2007. **N17** – ♂, 20.viii.2019.

Gomphidae

47. *Acrogomphus ?malayanus* Laidlaw, 1925

*T*he female of *Acrogomphus malayanus* has not been described but the specimen listed here agrees well with the male in size and markings. Records of *Acrogomphus* larvae in Furtado (1969) are also likely to refer to this species.

S5 – ♀, 4.vi.2016.

48. *Burmagomphus divaricatus* Lieftinck, 1964

S6 – ♂, 5.vi.2016. **S9** – ♂, 7.vi.2016.

49. *Burmagomphus williamsoni* Förster, 1914 S

S6 – 4 ♂♂, 5.vi.2016. **S12** – ♀ (teneral), 29.ix.2008.

50. *Gomphidia abbotti* Williamson, 1907 N

S6 – 2 ♂♂, 5.vi.2016. **N9** – ♂, 19.viii.2019.

51. *Gomphidictinus perakensis* (Laidlaw, 1902)

S9 – 3 ♂♂, 7.vi.2016. **N14a** – ♂, 21.viii.2019.

52. *Heliogomphus kelantanensis* (Laidlaw, 1902)

N14a – ♂ (teneral), 20.viii.2019.

53. *Ictinogomphus decoratus melaenops* Selys, 1857

S6 – ♂, 5.vi.2016. **S11** – ♂, 22.viii.2019. **S12** – ♂, 29.ix.2008. **S13** – ♂, 23.viii.2019. **S14** – ♂, 23.viii.2019. **N5** – ♂, ♀, 7.ix.2016. **N9** – ♂, 18.viii.2019. **N12** – ♂, 19.viii.2019.

54. *Leptogomphus ?risi* Laidlaw, 1932

Furtado (1969) recorded exuviae of *Leptogomphus* from Selangor, maybe the single female recorded by us is the same species. The female collected in 2016 has similarities to *L. risi* but also differences and is not definitely that species.

S1 – ♀, 8.vi.2016.

55. *Megalogomphus sumatranus* (Krüger, 1899)

S6 – 3 ♂♂, 5.vi.2016. **N9** – 3 ♂♂, 19.viii.2019.

56. *Microgomphus chelifer* Selys, 1858 N

N14 – ♂ (teneral), 20.viii.2019.

57. *Nepogomphus fruhstorferi* (Lieftinck, 1934) N

*T*he female collected at location N14a was flying a short beat over a narrow and completely shaded section of the stream.

N9 – ♀, 19.viii.2019. **N14a** – ♀, 21.viii.2019.

58. *Onychogomphus duaricus* Fraser, 1924 S

S6 – 2 ♂♂, 5.vi.2016.

59. *Paragomphus capricornis* (Förster, 1914) N

S6 – 4 ♂♂, 5.vi.2016. **S10** – ♂, 23.viii.2019. **N3** – ♀, 8.ix.2016. **N9** – ♂, 18.viii.2019; 3 ♂♂, ♀, 19.viii.2019.

Macromiidae

60. *Epophthalmia vittigera* (Rambur, 1842

S7 – ♀, 5.vi.2016.

61. *Macromia callisto* Laidlaw, 1922 N

N9 – ♀, 18.viii.2019.

62. *Macromia cupricincta* Fraser, 1924 S

S6 – 2 ♂♂, 5.vi.2016.

Synthemistidae

63. *Idionyx montana* Karsch, 1891 N

N7 – ♂ (found dead in spider web), 9.ix.2016.

Libellulidae

64. *Acisoma panorpoides* Rambur, 1842

S6 – ♂, 6.vi.2016. **S7** – ♂, ♀, 6.vi.2016. **S11** – ♂, 22.viii.2019. **S13** – ♂, 29.ix.2008. **S14** – 2 ♂♂, 23.viii.2019. **N6** – ♂, 7.ix.2016. **N5** – ♂, 7.ix.2016. **N10** – ♂, 18.viii.2019. **N11** – ♂, ♀, 18.viii.2019.

65. *Aethriamanta brevipennis* (Rambur, 1842)

S7 – 2 ♂♂, 5.vi.2016. **S14** – 4 ♂♂, 23.viii.2019.

66. *Aethriamanta gracilis* (Brauer, 1878)

S7 – ♂, 5.vi.2016. **S11** – 3 ♂♂, ♀, ♂+♀, 22.viii.2019. **S13** – 2 ♂♂, 29.ix.2008. **S14** – 2 ♂♂, 23.viii.2019. **N6** – ♂, 7.ix.2016. **N11** – 2 ♂♂, 18.viii.2019.

67. *Agrionoptera insignis* (Rambur, 1842)

N5 – ♂, 7.ix.2016.

68. *Agrionoptera sexlineata* Selys, 1879

S15 – ♂, 21.xi.2007.

69. *Brachydiplax chalybea* Brauer, 1868

S7 – 2 ♂♂, 5.vi.2016. **S11** – 2 ♂♂, 22.viii.2019. **N5** – ♂, 7.ix.2016. **N4b** – ♂, 8.ix.2016. **N6** – 4 ♂♂, 7.ix.2016. **N11** – 2 ♂♂ 18.viii.2019. **N12** – ♂, 19.viii.2019.

70. *Brachydiplax farinosa* Krüger, 1902

This is *Brachydiplax farinosa* A as defined in Dow et al. (2016).

S8 – ♂, 8.vi.2016. **N5** – ♂, 7.ix.2016. **N17** – 4 ♂♂, 20.viii.2019.

71. *Brachythemis contaminata* (Fabricius, 1793)

S7 – ♂, 5.vi.2016. **S12** – ♂, 23.viii.2019. **S13** – ♂, 29.ix.2008; ♂, 23.viii.2019. **S14** – ♂, 23.viii.2019. **N6** - ♂, 7.ix.2016. **N12** – ♂, 19.viii.2019.

72. *Camacinia gigantea* (Brauer, 1867) N

N16 – ♂, 20.viii.2019. **N17** – 3 ♂♂, 20.viii.2019.

73. *Chalybeothemis chini* Dow, Choong & Orr, 2007 S

The number of locations known for this species is steadily increasing and it now appears far less specialised than was thought when it was first discovered.

S11 – 3 ♂♂, 22.viii.2019.

74. *Cratilla metallica* (Brauer, 1878)

S15 – ♂, 21.xi.2007. **N2** – ♂, 8.ix.2016. **N8a** – ♂ (at rock pool), 19.viii.2019.

75. *Crocothemis servilia* (Drury, 1770)

S7 – ♂, 5.vi.2016. **S14** – ♂, 23.viii.2019. **N11** – ♂, 18.viii.2019.

76. *Diplacodes nebulosa* (Fabricius, 1793)

S14 – 5 ♂♂, 23.viii.2019.

77. *Diplacodes trivialis* (Rambur, 1842)

N11 – ♂, 18.viii.2019. **N16** – ♂, 20.viii.2019; ♂, 21.viii.2019.

78. *Hydrobasileus croceus* (Brauer, 1867)

S14 – ♂, 23.viii.2019. **N5** – ♂, 7.ix.2016.

79. *Hylaeothemis clementia* Ris, 1909

Not often recorded in Peninsular Malaysia, but possibly this has more to do with habitat choice and wary behaviour than genuine rarity.

S1 – ♂, 8.vi.2016.

80. *Indothemis limbata* (Selys, 1891)

S14 – ♂, ♀, 23.viii.2019.

81. *Lathrecista asiatica* (Fabricius, 1798)

S8 – 2 ♂♂, 8.vi.2016.

82. *Lyriothemis biappendiculata* (Selys, 1878)

S1 – 2 ♂♂, 3.vi.2016; ♂, 22.viii.2019. **S9** – ♂, 7.vi.2016. **S15** – ♂, 21.xi.2007. **N1** – ♂, 6.ix.2016. **N8b** – 2 ♂♂, 18.viii.2019. **N14b** – ♂, 20.viii.2019. **N16** – ♀, 20.viii.2019.

83. *Neurothemis fluctuans* (Fabricius, 1793)

S6 – ♂, 5.vi.2016. **S7** – 2 ♂♂, 5.vi.2016. **S8** – ♂, 8.vi.2016. **S11** – ♂, 22.viii.2019. **S14** – ♂, 23.viii.2019. **N4**b – ♂, 8.ix.2016. **N5** – 2 ♂♂, 7.ix.2016. **N9** – ♂, 18.viii.2019. **N12** – 2 ♂♂, 19.viii.2019. **N17** – 3 ♂♂, 20.viii.2019.

84. *Onychothemis culminicola* Förster, 1904

S6 – ♀, 5.vi.2016.

85. *Onychothemis testacea* Laidlaw, 1902 N

S6 – 3 ♂♂, 5.vi.2016. **S10** – 2 ♂♂, 23.viii.2019. **S12** – 2 ♂♂, 29.ix.2008; 2 ♂♂, 23.viii.2019. **N3** – 3 ♂♂, 8.ix.2016. **N9** – ♂, 19.viii.2019.

86. *Orthetrum chrysis* (Selys, 1891)

S6 – ♂, 5.vi.2016. **N9** – ♂, 18.viii.2019. **N17** – ♂, 20.viii.2019.

87. *Orthetrum glaucum* (Brauer, 1865)

N9 – ♂, 18.viii.2019.

88. *Orthetrum luzonicum* (Brauer, 1868)

S6 – ♂, 5.vi.2016.

89. *Orthetrum pruinosum schneideri* Förster, 1903

N17 – 2 ♂♂, 20.viii.2019.

90. *Orthetrum sabina* (Drury, 1770)

S7 – ♂, 5.vi.2016. **S13** – ♂, 29.ix.2008. **S14** – ♀, 23.viii.2019. **N6** – ♂, 7.ix.2016. **N12** – ♂, 19.viii.2019.

91. *Orthetrum testaceum* (Burmeister, 1839)

S6 – ♂, 5.vi.2016. **N1** – ♂, 6.ix.2016. **N9** – ♂, 18.viii.2019.

92. *Orthetrum triangulare malaccensis* Förster, 1903

S2 – 2 ♂♂, 6.vi.2016. **S4** – ♂, 6.vi.2016.

93. *Pantala flavescens* (Fabricius, 1798)

N5 – ♂, 7.ix.2016. **N9** – ♂, 19.viii.2019.

94. *Potamarcha congener* (Rambur, 1842)

N12 – ♂, 19.viii.2019. **N17** – ♂, 20.viii.2019.

95. *Pseudothemis jorina* Förster, 1904

S7 – ♂, ♀, 5.vi.2016. **N5** – ♀, 7.ix.2016. **N10** – ♂, 18.viii.2019. **N12** – ♂, 19.viii.2019.

96. *Rhodothemis rufa* (Rambur, 1842)

S11 – ♂, 22.viii.2019. **S14** – ♂, 23.viii.2019. **N6** – 2 ♂♂, ♀, 7.ix.2016. **N10** – ♂, 18.viii.2019. **N12** – ♂, 19.viii.2019.

97. *Rhyothemis phyllis* (Sulzer, 1776)

S13 – ♂, 23.viii.2019. **S14** – ♂, 23.viii.2019. **N10** – ♀, 18.viii.2019.

98. *Rhyothemis plutonia* Selys, 1883 S

S14 – ♂, 23.viii.2019. **N5** – ♂, 7.ix.2016.

99. *Rhyothemis triangularis* Kirby, 1889

*S*13 – ♀, 29.ix.2008. **S14** – 3 ♂♂, 23.viii.2019. **N5** – ♂, 7.ix.2016. **N6** – ♂, ♀, 7.ix.2016. **N11** – ♂, 18.viii.2019.

100. *Tetrathemis hyalina* Kirby, 1889

N17 – ♂, 20.viii.2019.

101. *Tetrathemis platyptera* Selys, 1878

N8e – ♀, 19.viii.2019. **N17** – ♂, 20.viii.2019.

102. *Tholymis tillarga* (Fabricius, 1798)

S7 – ♂, 5.vi.2016.

103. *Tramea transmarina euryale* (Selys, 1878) N

S6 – 2 ♂♂, 5.vi.2016. **N5** – 2 ♂♂, 7.ix.2016. **N11** – ♂, 18.viii.2019.

104. *Trithemis aurora* (Burmeister, 1839)

S6 – ♂, 5.vi.2016. **S11** – ♂, 22.viii.2019. **S13** – ♂, 29.ix.2008; ♂, 23.viii.2019. **N9** – 2 ♂♂, 19.viii.2019.

105. *Trithemis festiva* (Rambur, 1842)

S6 – ♂, 5.vi.2016. **S15** – ♂, 21.xi.2007. **N9** – 2 ♂♂, 18.viii.2019; 2 ♂♂, 19.viii.2019.

106. *Tyriobapta torrida* Kirby, 1889

S8 – ♂, 8.vi.2016. **S15** – ♂, 26.xi.2007. **N8e** – ♂, 19.viii.2019. **N14a** – ♂, 21.viii.2019.

107. *Urothemis signata insignata* (Rambur, 1842)

S5 – ♂, 5.vi.2016. **S14** – ♂, 23.viii.2019. **N6** – ♂, 7.ix.2016. **N10** – ♂, 18.viii.2019.

108. *Zygonyx iris* Selys, 1869

S6 – ♂, 5.vi.2016. **S15** – 3 ♂♂, 21.xi.2007. **N9** – 2 ♂♂, 19.viii.2019.

Discussion

Of the 108 species listed above, 87 were collected in Selangor and 77 in Negeri Sembilan. Since Negeri Sembilan is relatively poorly studied for Odonata it is perhaps not surprising that the surveys reported here yielded 15 apparent first records for the state. However it is perhaps a little surprising that seven apparent new records for relatively well-studied Selangor are revealed.

Of the taxa collected during the surveys reported here, some are of particular interest: *Drepanosticta* sp. cf *hamadryas* and two *Drepanosticta* from the *D. quadrata*-group (D. cf *fontinalis* and *D.* cf *sharpi*) are likely to represent unnamed species, albeit known from elsewhere in Peninsular Malaysia as well as the locations reported here. *Rhinocypha pelops* is rarely recorded in Peninsular Malaysia. A number of the Gomphidae listed are also rarely recorded, for instance *Acrogomphus ?malayanus*, *Heliogomphus kelantanensis*; *Onychogomphus duaricus* is rarely recorded in Peninsular Malaysia but very widespread beyond Malaysia. Species such as *Macromia cupricincta*, *Idionyx montana*, *Chalybeothemis chini* and *Hylaeothemis clementia* have also not been recorded all that frequently in Malaysia but are likely to be much commoner than records suggest.

The provisional checklists given in the appendices list 116 and 171 species of Odonata from Negeri Sembilan and Selangor (including Kuala Lumpur) respectively. It is certain that the lists from both states will grow, probably significantly, with more work.

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Appendix I: Checklist of Odonata recorded from Selangor and the Federal Territory of Kuala Lumpur

Where the first record from either Selangor or the Federal Territory of Kuala Lumpur is not in this publication, a citation to the first record is made in square parenthesis after the species name, followed by a KL (for a record believed to be from the Federal Territory of Kuala Lumpur) or a S (for a record from Selangor). In cases where a species was recorded from either administrative entity for the first time in a particular year but the name appears in two publications in that year we have not attempted to determine which publication appeared first but have listed both publications.

Zygoptera

Lestidae

1. *Lestes praemorsus decipiens* Kirby, 1894 [Choong et al. 2008] S
2. *Orolestes wallacei* (Kirby, 1889) [Choong 2013] S

Platystictidae

3. *Drepanosticta fontinalis* Lieftinck, 1937 [Lieftinck 1965a] S
4. *Drepanosticta* cf *hamadryas* Laidlaw, 1931 S
5. *Drepanosticta* quadrata (Selys, 1860) [Choong, Hanisah & Ng 2012] S
6. *Drepanosticta sharpi* (Laidlaw, 1907) [Lieftinck 1965a] S

Argiolestidae

7. *Podolestes buwaldai* Lieftinck, 1940 [Hämäläinen 2000] S
8. *Podolestes orientalis* Selys, 1862 [Orr 2008; Choong et al. 2008] S

Calopterygidae

9. *Echo modesta* Laidlaw, 1902 [Laidlaw 1931] S
10. N*eurobasis chinensis* (Linnaeus, 1758) [Asahina 1966] KL, [Furtado 1969] S
11. *Vestalis amethystina* Lieftinck, 1965 [Lieftinck 1965b] S
12. *Vestalis amoena* Hagen in Selys, 1853 [Laidlaw 1931] KL, [Lieftinck 1965b] S
13. *Vestalis gracilis* (Rambur, 1842) [Furtado 1969] S

Chlorocyphidae

14. *Aristocypha fenestrella* (Rambur, 1842) [Laidlaw 1931] S
15. *Heliocypha biforata* (Selys, 1859) [Furtado 1969] S
16. *Heliocypha perforata* (Percheron, 1835) [Furtado 1969] S
17. *Libellago aurantiaca* (Selys, 1859) [Furtado 1969] S
18. *Libellago hyalina* (Selys, 1859) [Choong 2013] S
19. *Libellago lineata* (Burmeister, 1839) [Laidlaw 1931] KL, [Laidlaw 1931] S
20. *Libellago stigmatizans* (Selys, 1869) [Noorhidayah-Mamat et al. 2014] S
21. *Rhinocypha pelops* Laidlaw, 1936 S
22. *Sundacypha petiolata* (Selys, 1859) [Furtado 1969] S

Devadattidae

23. *Devadatta argyoides* (Selys, 1859) [Laidlaw 1931] S

Euphaeidae

24. *Dysphaea dimidiata* Selys, 1853 [Furtado 1969] S

25. *Euphaea impar* Selys, 1859 [Furtado 1969] S
26. *Euphaea ochracea* Selys, 1859 [Laidlaw 1931] S

Philosinidae

27. *Rhinagrion macrocephalum* (Selys, 1862) [Kalkman & Villaneuva 2011] S
28. *Rhinagrion viridatum* Fraser, 1938 [Kalkman & Villaneuva 2011] S

Platycnemididae

29. *Calicnemia chaseni* (Laidlaw, 1928) [Furtado 1969] S
30. *Coeliccia albicauda* (Förster in Laidlaw, 1907) [Brooks 1981] KL, [Furtado 1969] S
31. *Coeliccia erici* Laidlaw, 1917 [Dow et al. 2018] S
32. *Coeliccia octogesima* (Selys, 1863) [Choong et al. 2008; Orr 2008] S
33. *Copera marginipes* (Rambur, 1842) [Laidlaw 1931] KL, [Laidlaw 1931] S
34. *Copera vittata* (Selys, 1863) [Furtado 1969] S
35. *Elattoneura analis* (Selys, 1860) [Furtado 1969] S
36. *Elattoneura aurantiaca* (Selys, 1886) [Choong 2013] S
37. *Indocnemis orang* (Förster in Laidlaw, 1907) [Asahina 1964] S
38. *Onychargia atrocyana* Selys, 1865 [Laidlaw 1931] KL, [Brooks 1981] S
39. *Prodasineura collaris* (Selys, 1860) [Furtado 1975] S
40. *Prodasineura humeralis* (Selys, 1860) [Laidlaw 1931] KL, [Furtado 1969 as *P. verticalis*] S
41. *Prodasineura interrupta* (Selys, 1860) [Furtado 1969] S
42. *Prodasineura laidlawi* (Förster in Laidlaw, 1907) [Furtado 1969] S
43. *Prodasineura notostigma* (Selys, 1860) [Laidlaw 1931] S
44. *Pseudocopera ciliata* (Selys, 1863) [Brooks 1981 as *Copera annulata*] S

Coenagrionidae

45. *Aciagrion hisopa* (Selys, 1876) [Kalkman 2004] KL
46. *Agriocnemis femina* (Brauer, 1868) [Norma-Rashid 2006] S
47. *Agriocnemis minima* Selys, 1877 [Choong 2013] S
48. *Agriocnemis nana* (Laidlaw, 1914) [Choong et al. 2008; Orr 2008] S
49. *Agriocnemis pygmaea* (Rambur, 1842) [Inoue & Kuwahara 1974] KL, [Choong 2013] S
50. *Amphicnemis gracilis* Krüger, 1898 [Farizawati et al. 2014] S
51. *Archibasis incisura* Lieftinck, 1949 [Norma-Rashid & van Tol 1995] S
52. *Archibasis melanocyana* (Selys, 1877) [Choong 2013] S
53. *Archibasis rebeccae* Kemp, 1989 [Choong et al. 2008] S
54. *Archibasis viola* Lieftinck, 1949 [Laidlaw 1931] S
55. *Agriocnemis rubescens rubeola* Selys, 1877 [Laidlaw 1931] KL, [Brooks 1981] S
56. *Ceriagrion cerinorubellum* (Brauer, 1865) [Kalkman 2004] KL, [Furtado 1969] S

57. *Ceriagrion chaoi* Schmidt, 1964 [Yong & Hämäläinen 1994] KL
58. *Ischnura senegalensis* (Rambur, 1842) [Inoue & Kuwahara 1974] KL, [Furtado 1969] S
59. *Mortonagrion aborense* (Laidlaw, 1914) [Furtado 1969 as *M. simile*] S
60. *Mortonagrion arthuri* Fraser, 1942 [Dow 2011] S
61. *Pseudagrion australasiae* Selys, 1876 [Choong et al. 2008; Fadilawati et al. 2008] S
62. *Pseudagrion microcephalum* (Rambur, 1842) [Inoue & Kuwahara 1974] KL, [Furtado 1969] S
63. *Pseudagrion pruinosum* (Burmeister, 1839) [Furtado 1969 as *P. perfuscatum*] S
64. *Pseudagrion rubriceps* Selys, 1876 [Choong et al. 2008] S
65. *Pseudagrion williamsoni* Fraser, 1922 [Furtado 1969] S
66. *Teinobasis ruficollis* (Selys, 1877) [Choong 2013] S

Anisoptera

Aeshnidae

67. *Anax guttatus* (Burmeister, 1839) [Laidlaw 1931] S
68. *Anax panybeus* Hagen, 1867 [Choong et al. 2008; Orr 2008] S
69. *Gynacantha basiguttata* Selys, 1882 [Laidlaw 1931] KL, [Choong et al. 2008] S
70. *Gynacantha bayadera* Selys, 1891 [Laidlaw 1931] KL, [Choong et al. 2008] S
71. *Gynacantha corbeti* Lempert, 1999 [Lempert 1999] S
72. *Gynacantha dohrni* Krüger, 1899 [Choong et al. 2018] S
73. *Gynacantha subinterrupta* Rambur, 1842 [Laidlaw 1931] KL, [Norma-Rashid 2006] S
74. *Heliaeschna idae* (Brauer, 1865) [Laidlaw 1931] KL, [Laidlaw 1931] S
75. *Indaeschna grubaueri* (Förster, 1904) [Laidlaw 1931] S
76. Oligoaeschna foliacea Lieftinck, 1968 [Choong et al. 2018] S
77. *Tetracanthagyna brunnea* McLachlan, 1898 [Laidlaw 1931] S
78. *Tetracanthagyna plagiata* (Waterhouse, 1877) [Choong et al. 2018] S

Gomphidae

79. *Acrogomphus ?malayanus* Laidlaw, 1925 [Furtado 1969 listed *Acrogomphus* species on the basis of larvae, exuviae and one or more teneral specimens, it is likely that these are from A. *malayanus*] S
80. *Burmagomphus arthuri* Lieftinck, 1953 [Choong et al. 2018] S
81. *Burmagomphus divaricatus* Lieftinck, 1964 [Lieftinck 1964] S
82. *Burmagomphus williamsoni* Förster, 1914 S
83. *Gomphidia abbotti* Williamson, 1907 [Furtado 1969] S
84. *Gomphidictinus perakensis* (Laidlaw, 1902) [Furtado 1969] S
85. *Heliogomphus kelantanensis* (Laidlaw, 1902) [Furtado 1969] S
86. *Ictinogomphus decoratus melaenops* Selys, 1857 [Inoue & Kuwahara 1974] KL, [Laidlaw 1931] S

87. *Leptogomphus* species [Furtado 1969] S

88. *Macrogomphus quadratus* Selys, 1878 [Brooks 1981] S

89. *Megalogomphus sumatranus* (Krüger, 1899) [Furtado 1969] S

90. *Merogomphus femoralis* Laidlaw, 1931 [Laidlaw 1931] KL, [?Furtado 1969: larval records assigned to this species, but it is not clear to us whether these are even really *Merogomphus*] S

91. *Merogomphus parvus* (Krüger, 1899) [Lieftinck 1964] S

92. *Microgomphus chelifer* Selys, 1858 [Furtado 1969, intriguingly in the same publication a "*Microgomphus* sp. nov" is listed on the basis of larvae, exuviae and one or more teneral individuals] S

93. *Nepogomphus fruhstorferi* (Lieftinck, 1934) [Vick 1993 as *N. modestus*; earlier Furtado 1969 recorded Onychogomphus (?) fruhstorferi on the basis of larvae] S

94. *Nepogomphus walli* (Fraser, 1924) [Asahina 1986] S

95. *Onychogomphus duaricus* Fraser, 1924 S

96. Onychogomphus thienemanni Schmidt, 1934 [Norma-Rashid & van Tol 1995] S

97. *Orientogomphus minor* (Laidlaw, 1931) [Laidlaw 1931] KL

98. *Paragomphus capricornis* (Förster, 1914) [Laidlaw 1931] KL, [Laidlaw 1931] S

99. *Phaenandrogomphus asthenes* Lieftinck, 1964 [Lieftinck 1964] S

Chlorogomphidae

100. *Chlorogomphus* species [Furtado 1969 – larval record as C. dyak] S

Macromiidae

101. *Epophthalmia vittigera* (Rambur, 1842) [Laidlaw 1931; Lieftinck 1931] KL, [Furtado 1969] S

102. *Macromia callisto* Laidlaw, 1902 [Asahina 1987] KL, [Furtado 1969] S

103. *Macromia cincta* Rambur, 1842 [Furtado 1969] S

104. *Macromia cupricincta* Fraser, 1924 S

105. *Macromia gerstaeckeri* Krüger, 1899 [Furtado 1969] S

106. *Macromia* sp. or spp. [Furtado 1969 lists larval records of *M. arachnomima* and *M. (?) moorei fumata*, we are not sure if these identifications are correct but are convinced that they do represent at least one species distinct from the others listed here] S

Synthemistidae

107. *Idionyx yolanda* Selys, 1871 [Lieftinck 1971, but Furtado 1969 recorded *Idionyx* (?) *yolanda* on the basis of a larva] S

Corduliidae

108. *Hemicordulia tenera* Lieftinck, 1930 [Fraser 1944 as *Hemicordulia gracillima* Fraser, 1944] KL, [Asahina 1987] S

Libellulidae

109. *Acisoma panorpoides* Rambur, 1842 [Laidlaw 1931] KL, [Furtado 1969] S
110. *Aethriamanta brevipennis* (Rambur, 1842) [Choong et al. 2008] S
111. *Aethriamanta gracilis* (Brauer, 1878) [Laidlaw 1902 as *Brachydiplax melanops*] S
112. *Agrionoptera insignis* (Rambur, 1842) [Raja Zalinda et al. 2006] S
113. *Agrionoptera sexlineata* Selys, 1879 [Brooks 1981] S
114. *Brachydiplax chalybea* Brauer, 1868 [Brooks 1981] KL, [Laidlaw 1902 as *B. maria*] S
115. *Brachydiplax farinosa* Krüger, 1902 A [Brooks 1981] S
116. *Brachygonia oculata* (Brauer, 1878) [Laidlaw 1931] KL, [Choong 2013] S
117. *Brachythemis contaminata* (Fabricius, 1793) [Laidlaw 1931] KL, [Furtado 1969] S
118. *Camacinia gigantea* (Brauer, 1867) [Brooks 1981] KL
119. *Camacinia harterti* Karsch, 1890 [Ris 1913b] S
120. *Chalybeothemis chini* Dow, Choong & Orr, 2007 S
121. *Chalybeothemis fluviatilis* Lieftinck, 1933 [Furtado 1969] S
122. *Cratilla lineata* (Brauer, 1878) [Choong & Ng 2009] S
123. *Cratilla metallica* (Brauer, 1878) [Laidlaw 1931] KL, [Brooks 1981] S
124. *Crocothemis servilia* (Drury, 1770) [Inoue & Kuwahara 1974] KL, [Laidlaw 1931] S
125. *Diplacodes nebulosa* (Fabricius, 1793) [Laidlaw 1931] KL, [Furtado 1969] S
126. *Diplacodes trivialis* (Rambur, 1842) [Laidlaw 1931] KL, [Norma-Rashid 2006] S
127. *Hydrobasileus croceus* (Brauer, 1867) [Brooks 1981] KL, [Furtado 1969] S
128. *Hylaeothemis clementia* Ris, 1909 [Brooks 1981] S
129. *Indothemis limbata* (Selys, 1891) [Choong et al. 2008] S
130. *Lathrecista asiatica* (Fabricius, 1798) [Laidlaw 1931] KL, [Norma-Rashid 2006] S
131. *Lyriothemis biappendiculata* (Selys, 1878) [Laidlaw 1931] S
132. *Lyriothemis cleis* Brauer, 1868 [Kalkman 2004] KL, [Noorhidayah-Mamat et al. 2014] S
133. *Nannophya pygmaea* Rambur, 1842 [Laidlaw 1931] KL, [Laidlaw 1931] S
134. *Nesoxenia lineata* (Selys, 1868) [Brooks 1981] S
135. *Neurothemis fluctuans* (Fabricius, 1793) [Laidlaw 1931] S
136. *Neurothemis fulvia* (Drury, 1773) [Inoue & Kuwahara 1974] KL, [Laidlaw 1931] S
137. *Neurothemis tullia* (Drury, 1773) [Fadilawati et al. 2008] S
138. *Onychothemis coccinea* Lieftinck, 1953 [Furtado 1969] S
139. *Onychothemis culminicola* Förster, 1904 [Furtado 1969] S
140. *Onychothemis testacea* Laidlaw, 1902 [Furtado 1969] S
141. *Orchithemis pulcherrima* Brauer, 1878 [Laidlaw 1931] KL, [Laidlaw 1931] S
142. *Orthetrum chrysis* (Selys, 1891) [Furtado 1969] S
143. *Orthetrum glaucum* (Brauer, 1865) [Laidlaw 1931] KL, [Laidlaw 1931] S
144. *Orthetrum luzonicum* (Brauer, 1868) [Kalkman 2004] KL, [Laidlaw 1931] S
145. *Orthetrum pruinosum schneideri* Förster, 1903 [Norma-Rashid & van Tol 1995] S

146. *Orthetrum sabina* (Drury, 1770) [Laidlaw 1931] KL, [Laidlaw 1931] S
147. *Orthetrum testaceum* (Burmeister, 1839) [Laidlaw 1931] KL, [Laidlaw 1931] S
148. *Orthetrum triangulare malaccensis* Förster, 1903 [Ris 1909] S
149. *Pantala flavescens* (Fabricius, 1798) [Laidlaw 1931] KL, [Laidlaw 1931] S
150. *Phyllothemis raymondi* Lieftinck, 1950 [Choong 2017] S
151. *Potamarcha congener* (Rambur, 1842) [Laidlaw 1931 as *P. obscura*] S
152. *Pseudothemis jorina* Förster, 1904 [Laidlaw 1931] KL, [Choong et al. 2008] S
153. *Rhodothemis rufa* (Rambur, 1842) [Choong et al. 2008; Fadilawati et al. 2008a] S
154. *Rhyothemis aterrima* Selys, 1891 [Laidlaw 1931] S
155. *Rhyothemis obsolescens* Kirby, 1889 [Laidlaw 1931] KL, [Laidlaw 1931] S
156. *Rhyothemis phyllis* (Sulzer, 1776) [Brooks 1981] KL, [Laidlaw 1931] S
157. *Rhyothemis plutonia* Selys, 1883 S
158. *Rhyothemis triangularis* Kirby, 1889 [Kalkman 2004] KL, [Furtado 1969] S
159. *Tetrathemis hyalina* Kirby, 1889 [Choong et al. 2008] S
160. *Tholymis tillarga* (Fabricius, 1798) [Inoue & Kuwahara 1974] KL, [Brooks 1981] S
161. *Tramea transmarina euryale* (Selys, 1878) [Furtado 1969] S
162. *Trithemis aurora* (Burmeister, 1839) [Laidlaw 1931] KL, [Asahina 1966] S
163. *Trithemis festiva* (Rambur, 1842) [Asahina 1966] S
164. *Trithemis pallidinervis* (Kirby, 1889) [Laidlaw 1931] KL, [Furtado 1969] S
165. *Tyriobapta kuekenthali* (Karsch, 1903) [Hämäläinen 2000] S
166. *Tyriobapta torrida* Kirby, 1889 [Brooks 1981] KL, [Laidlaw 1931] S
167. *Urothemis signata insignata* (Rambur, 1842) [Kalkman 2004] KL, [Furtado 1969] S
168. *Zygonyx ida* Hagen, 1867 [Laidlaw 1931] S
169. *Zygonyx iris* Selys, 1869 [Laidlaw 1931] S
170. *Zyxomma obtusum* Albarda, 1881 [Choong & Ng 2009] S
171. *Zyxomma petiolatum* Rambur, 1842 [Choong et al. 2008] S

Appendix II: Checklist of Odonata recorded from Negeri Sembilan

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

Lestidae

1. *Lestes praemorsus decipiens* Kirby, 1894
2. *Orolestes wallacei* (Kirby, 1889) [Raja Zalinda et al. 2006]

Platystictidae

3. *Drepanosticta fontinalis* Lieftinck, 1937 [Orr 2008]
4. *Drepanosticta hamadryas* Laidlaw, 1931

5. *Drepanosticta* quadrata (Selys, 1860) [Norma-Rashid 2009]
6. *Drepanosticta* cf *sharpi* (Laidlaw, 1907)

Calopterygidae

7. *Echo modesta* Laidlaw, 1902 [Norma-Rashid 2009]
8. N*eurobasis chinensis* (Linnaeus, 1758) [Raja Zalinda et al. 2006]
9. *Vestalis amethystina* Lieftinck, 1965 [Norma-Rashid 2009]
10. *Vestalis amoena* Hagen in Selys, 1853 [Lieftinck 1965b]
11. *Vestalis gracilis* (Rambur, 1842) [Norma-Rashid 2009]

Chlorocyphidae

12. *Aristocypha fenestrella* (Rambur, 1842) [Raja Zalinda et al. 2006]
13. *Heliocypha biforata* (Selys, 1859) [Raja Zalinda et al. 2006]
14. *Heliocypha perforata* (Percheron, 1835) [Norma-Rashid 2009]
15. *Libellago hyalina* (Selys, 1859) [Raja Zalinda et al. 2006]
16. *Libellago stigmatizans* (Selys, 1859)
17. *Libellago lineata* (Burmeister, 1839) [Choong 2010]
18. *Sundacypha petiolata* (Selys, 1859) [Choong & Rahim 2014]

Devadattidae

19. *Devadatta argyoides* (Selys, 1859) [Raja Zalinda et al. 2006]

Euphaeidae

20. *Dysphaea dimidiata* Selys, 1853 [Norma-Rashid 2009]
21. *Euphaea impar* Selys, 1859 [Choong 2010b]
22. *Euphaea ochracea* Selys, 1859 [Raja Zalinda et al. 2006]

Philosinidae

23. *Rhinagrion viridatum* Fraser, 1938

Platycnemididae

24. *Calicnemia chaseni* (Laidlaw, 1928) [Norma-Rashid 2009]
25. *Coeliccia albicauda* (Förster in Laidlaw, 1907) [Norma-Rashid 2009]
26. *Coeliccia erici* Laidlaw, 1917 [Choong 2010 as C. kimurai Asahina]
27. *Copera marginipes*¬ (Rambur, 1842) [Norma-Rashid 2009]
28. *Copera vittata* (Selys, 1863) [Raja Zalinda et al. 2006]
29. *Indocnemis orang* (Förster in Laidlaw, 1907) [Norma-Rashid 2009]
30. *Prodasineura collaris* (Selys, 1860) [Choong 2010]
31. *Prodasineura humeralis* (Selys, 1860) [Norma-Rashid 2009]
32. *Prodasineura laidlawi* (Förster in Laidlaw, 1907) [Norma-Rashid 2009]
33. *Pseudocopera ciliata* (Selys, 1863) [Raja Zalinda et al. 2006]

Coenagrionidae

34. *Aciagrion hisopa* (Selys, 1876) [Norma-Rashid 2009]
35. *Agriocnemis minima* Selys, 1877 [Norma-Rashid 2009]
36. *Amphicnemis gracilis* Krüger, 1898 [Norma-Rashid 2009]
37. *Archibasis incisura* Lieftinck, 1949 [Raja Zalinda et al. 2006]
38. *Agriocnemis rubescens rubeola* Selys, 1877 [Norma-Rashid 2009]
39. *Agriocnemis* species [Choong 2010]
40. *Ceriagrion cerinorubellum* (Brauer, 1865) [Norma-Rashid 2009]
41. *Ceriagrion chaoi* Schmidt, 1964
42. *Ceriagrion fallax pendleburyi* Laidlaw, 1931 [Norma-Rashid 2009]
43. *Ischnura senegalensis* (Rambur, 1842) [Norma-Rashid 2009]
44. *Pseudagrion australasiae* Selys, 1876 [Choong 2010]
45. *Pseudagrion microcephalum* (Rambur, 1842) [Norma-Rashid 2009]
46. *Pseudagrion pruinosum* (Burmeister, 1839) [Choong 2010]
47. *Pseudagrion rubriceps* Selys, 1876 [Choong 2010]

Aeshnidae

48. *Anax guttatus* (Burmeister, 1839) [Norma-Rashid 2009]
49. *Gynacantha bayadera* Selys, 1891 [Norma-Rashid 2009]
50. *Gynacantha limbalis* Karsch, 1892 [Norma-Rashid 2009]
51. *Gynacantha* sp. [Norma-Rashid 2009 list *G. dravida* Lieftinck, 1960 from Negeri Sembilan; we have severe doubts over the occurrence of this Indian species in Malaysia but the record is likely to represent a *Gynacantha* species distinct from the others recorded from the state]
52. *Gynacantha subinterrupta* Rambur, 1842 [Raja Zalinda et al. 2006]
53. *Indaeschna grubaueri* (Förster, 1904) [Laidlaw 1931]
54. *Tetracanthagyna* species [Norma-Rashid 2009]

Gomphidae

55. *Gomphidia abbotti* Williamson, 1907
56. *Gomphidictinus perakensis* (Laidlaw, 1902) [Raja Zalinda et al. 2006]
57. *Heliogomphus kelantanensis* (Laidlaw, 1902) [Norma-Rashid 2009]
58. *Ictinogomphus decoratus melaenops* Selys, 1857 [Norma-Rashid 2009]
59. *Macrogomphus phalantus* Lieftinck, 1935 [Norma-Rashid 2009]
60. *Megalogomphus sumatranus* (Krüger, 1899) [Norma-Rashid 2009]
61. *Microgomphus chelifer* Selys, 1858
62. *Nepogomphus fruhstorferi* (Lieftinck, 1934)
63. *Nepogomphus walli* (Fraser, 1924) [Choong & Rahim 2014]
64. *Onychogomphus castor* Lieftinck, 1941 [Choong & Rahim 2014]

65. *Onychogomphus thienemanni* Schmidt, 1934 [Choong & Rahim 2014]
66. *Paragomphus capricornis* (Förster, 1914)

Macromiidae

67. *Macromia callisto* Laidlaw, 1922

Synthemistidae

68. *Idionyx montana* Karsch, 1891
69. Idionyx yolanda Selys, 1871 [Norma-Rashid 2009]

Libellulidae

70. *Acisoma panorpoides* Rambur, 1842 [Tsuda & Kitagawa 1987]
72. *Aethriamanta gracilis* (Brauer, 1878) [Norma-Rashid 2009]
73. *Agrionoptera insignis* (Rambur, 1842) [Raja Zalinda et al. 2006]
74. *Agrionoptera sexlineata* Selys, 1879 [Norma-Rashid 2009]
75. *Brachydiplax chalybea* Brauer, 1868 [Norma-Rashid 2009]
76. *Brachydiplax farinosa* Krüger, 1902 A [Norma-Rashid 2009]
77. *Brachythemis contaminata* (Fabricius, 1793) [Norma-Rashid 2009]
78. *Camacinia gigantea* (Brauer, 1867)
79. *Cratilla lineata* (Brauer, 1878) [Raja Zalinda et al. 2006]
80. *Cratilla metallica* (Brauer, 1878) [Raja Zalinda et al. 2006]
81. *Crocothemis servilia* (Drury, 1770) [Norma-Rashid 2009]
82. *Diplacodes trivialis* (Rambur, 1842) [Tsuda & Kitagawa 1987]
83. *Hydrobasileus croceus* (Brauer, 1867) [Norma-Rashid 2009]
84. *Lathrecista asiatica* (Fabricius, 1798) [Norma-Rashid 2009]
85. *Lyriothemis biappendiculata* (Selys, 1878) [Raja Zalinda et al. 2006]
86. *Lyriothemis cleis* Brauer, 1868 [Choong 2010]
87. *Nesoxenia lineata* (Selys, 1868) [Raja Zalinda et al. 2006]
88. *Neurothemis fluctuans* (Fabricius, 1793) [Ris 1911]
89. *Neurothemis fulvia* (Drury, 1773) [Tsuda & Kitagawa 1987]
90. *Onychothemis coccinea* Lieftinck, 1953 [Choong & Rahim 2014]
91. *Onychothemis culminicola* Förster, 1904 [Norma-Rashid 2009]
92. *Onychothemis testacea* Laidlaw, 1902
93. *Orchithemis pulcherrima* Brauer, 1878 [Norma-Rashid 2009]
94. *Orthetrum chrysis* (Selys, 1891) [Ris 1909]
95. *Orthetrum glaucum* (Brauer, 1865) [Raja Zalinda et al. 2006]
96. *Orthetrum luzonicum* (Brauer, 1868) [Raja Zalinda et al. 2006]
97. *Orthetrum pruinosum schneideri* Förster, 1903 [Ris 1909]

98. *Orthetrum sabina* (Drury, 1770) [Raja Zalinda et al. 2006]
99. *Orthetrum testaceum* (Burmeister, 1839) [Tsuda & Kitagawa 1987]
100. *Orthetrum triangulare malaccensis* Förster, 1903 [Norma-Rashid 2009]
101. *Pantala flavescens* (Fabricius, 1798) [Norma-Rashid 2009]
102. *Potamarcha congener* (Rambur, 1842) [Tsuda & Kitagawa 1987]
103. *Pseudothemis jorina* Förster, 1904 [Norma-Rashid 2009]
104. *Rhodothemis rufa* (Rambur, 1842) [Norma-Rashid 2009]
105. *Rhyothemis phyllis* (Sulzer, 1776) [Norma-Rashid 2009]
106. *Rhyothemis plutonia* Selys, 1883 [Norma-Rashid 2009]
107. *Rhyothemis triangularis* Kirby, 1889 [Norma-Rashid 2009]
108. *Tetrathemis hyalina* Kirby, 1889 [Raja Zalinda et al. 2006]
109. *Tetrathemis platyptera* Selys, 1878 [Norma-Rashid 2009]
110. *Tholymis tillarga* (Fabricius, 1798) [Laidlaw 1931]
111. *Tramea transmarina euryale* (Selys, 1878)
112. *Trithemis aurora* (Burmeister, 1839) [Raja Zalinda et al. 2006]
113. *Trithemis festiva* (Rambur, 1842) [Raja Zalinda et al. 2006]
114. *Tyriobapta torrida* Kirby, 1889 [Raja Zalinda et al. 2006]
115. *Urothemis signata insignata* (Rambur, 1842) [Norma-Rashid 2009]
116. *Zygonyx iris* Selys, 1869 [Norma-Rashid 2009]

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