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Photographic recording dragonflies and damselflies (Odonata) of Cambodia by public over a decade

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Abstract

Photographs of Odonata taken in Cambodia by public and posted to the 'Natural Cambodia' group in a social network for the decade 2012-2022 were followed and registered. After exclusion of already published ones, they comprised a bulk of 682 photographic observations of 91 species, with strong biases towards Anisoptera (74%) and the species with coloured wings (34%) and a strong deficiency of lotic Anisoptera such as Gomphidae and Macromiidae (just one observation of each). *Lestes concinnus* is for the first time reported for Phnom Kulen Plateau and *Lestes platystylus*, *Heliocyha biforata*, *Orolestes octomaculatus*, *Aciagrion occidentale*, *Ceriagrion calamineum*, *C. chaoi*, *Anax guttatus*, *Gynacantha subinterrupta*, *Agrionoptera insignis*, *Brachydiplax sobrina, Cratilla lineata calverti, Orthetrum luzonicum*, *Rhyothemis obsolescens*, *R. plutonia, R. triangulare, Tramea transmarina euryale,* and *Trithemis festiva* for the lowlands of Siem Reap Province. It is recommendable to post biodiversity photographs to internet platforms specially designed for this purpose, such as iNaturalist.org, rather than to common social networks which miss functions relevant to operation with scientific data. Important taxonomic notes are made on *Aciagrion occidentale*, *Ceriagrion* spp. and *Epophthalmia vittata/E. frontalis*.

Keywords: Odonata, dragonflies, damselflies, photographic observations, biodiversity, social networks, citizen science, Indochina, Cambodia, Siem Reap Province, Phnom Kulen Plateau, *Aciagrion occidentale, Aciagrion paludense, Ceriagrion olivaceum, Ceriagrion aurantiacum, Ceriagion auranticum, Epophthalmia vittata, Epophthalmia frontalis*.

Introduction

With the recent progress and spread of digital photography, registration of natural objects became easy and demanding just personal enthusiasm rather than special knowledge. This resulted in exploding growth of data which, in case of organism groups reliably identifiable by photos, like most Odonata, are potentially useful to science, especially if the photographs are geotagged and submitted to internet platforms specially designed as links between science and public, such as iNaturalist.org, observation.org. etc. (But note that the fewer such platforms exist the more comprehensive bulks of data they harbour). However, their use demands certain minimum skill and at least being informed of their existence. In the current situation when social networks oriented to broad public are universally spread and involve literally each human being, it is natural that so many natural lovers utilise them for sharing their findings in nature. However, these networks, unlike science, are designed for immediate use but not for accumulating and disseminating information for a long period of time. So they may appear useful for science only when permanently monitored by at least one expert is some group.

As a part of my investigation of the Odonata fauna of Cambodia, I took a labour of being such an expert who monitored records of Odonata in the 'Natural Cambodia' group, launched in 2012, in the Facebook social network owned by Meta Corporation. Both have been forbidden in Russia since 2022 and hence became unavailable, that provided me an opportunity to compile accumulated results of Odonata registry in Cambodia by public for the decade 2012-2021, plus the beginning of 2022 up to 1.03.2022. This work was complicated by intrinsic drawbacks of that internet platform, which were increasing difficulty of scrolling the posts backwards and absence of context search in comments, in which most identifications were made. Nevertheless, I believe that my compendium is complete or almost so.

Material and Methods

Most of dragonfly and damselfly registrations in 'Natural Cambodia' were made by foreigners living in the city of Siem Reap, of which Eddie Smith was most productive. A great part of his observations was made on the Phnom Kulen Plateau and have already been summarised (together with those from Phnom Kulen foothills up to Banteay Srei) in our joint paper devoted to its Odonata (Kosterin & Smith 2020). For this reason, his data on Phnom Kulen up to 28.04.2020, totally 262 observations, including 13 species not photographed by him elsewhere or later, or by others, were not included into this communication, while his observations made elsewhere or at later dates are included. I also did not include nine observations by Gerard Chartier made in Koh Kong Province (including one species not registered otherwise) and few observations by myself, since these data have also been published in regular scientific literature. I did not analyse a focused citizen science platform iNaturalist, where most of observations of Odonata from Cambodia appeared after the time period I consider.

Some taxonomic comments on certain species are provided along the annotated species list below.

Abbreviations

The authors (as they called themselves) of photographic observations were abbreviated (with periods) as follows: Alex – A., David Bailey – D.B., Vance Becljievski V.B., Paul Bertner – P.B., Anna Bella Bets – A.B.B., Phearun Birds – P.B., Jo Bold – J.B., Claudius Bredehoeft – C.B., Roberto Carlone – R.C., Blackdog To Chan – B.T.C., Phhat Chandara – P.C., Puthika Cheab – P.C., Bon Chem – B.C., Menno de Block – M.D.B., Bob Dromgoole – B.D., Claire Dousset – C.D., Joe Evans – J.E., Baard Ferdamar – B.F., Pierre Fitchat – P.F., Peter Gartner – P.G., Charles Gauci – C.H., Ea Rth Ran Ger – E.R.R.G., Stéphane De Greef – S.D.G., Tori Green – T.G., Christopher Guenole – C.G., Joe Hartmann – Jo.H., Timo Hartmann – T.H., Carsten Held – C.H., Francis Hemeter – F.H., Zoey Henley – Z.H., James Holden – Ja.H., Jeremy Holden – Je.H., David James – D.J., Mattew Jeanes – M.J., Gee Jey – G.J., Caleb Jones – C.J.; Eang Khut – E.K., Joeson Kim – J.K., Gil Koren – G.K., Nicole Kramer – N.K., Simon Krutch – S.K., Walter Kurtz – W.K., Ian Lawson – I.L., Bruno Lévi Truffert – B.L.T., Stephan Mahherhead – S.M., Ann McKenzie – A.M.K., Darren McNabb – D.M.N., Andrew Mills – A.M., Emmanuel Nabi – E.N., Pisith Nature-lover – P.N.L.; Sandy Nyerinck – S.N., Don A. Percival – D.A.P., Bernard Podevin – B.Po., Brigid Primrose – B.Pr., Dyna Sovan Ratanak – D.S.R., Kong San Ratanak – K.S.R., Vannroat Reaksmey – V.R., Monster

Rith – M.R., Jorge Rodriguez – J.R., Solomon Saint – S.Sai., Alex T. Sam – A.T.S., Sophoan Sanh – S.San., Netti Scholtz – N.S., Oktober Shoughers – O.S., Barbara Schwartz – B.S., Phann Sithan – P.S., Eddie Smith – E.S., Senglim Suy – S.Su., Sonia Taheri – S.T., Pedro Blanco Tattoer – P.B.T., Nicola Tinani – N.T., Philip Wakeman – P.W., Stephan Walgenbach – S.W., Jana Walter – J.W., Darren Webb – D.W., Eddie Yam – E.Y., Rob Zalinge – R.Z. Seven other observers of most common species did not provide any, even most general locality for their 1-2 photos and so were not included. In the list below, when a series of photographic observations was made by the same photographer, its abbreviated name is mentioned only once at the end of the series.

The provinces of Cambodia are abbreviated (without periods and boldfaced) as follows: **Ba** – Battambang; **Kam** – Kampot, **Kan** – Kandal, **KC** – Kampong Cham, **Ke** – Kep, **Kr** – Kratie, **KK** – Koh Kong, **KS** – Kampong Speu, **KTh** – Kampong Thom, **KTr** – Kampong Thrach, **MK** – Mondulkiri, **O**M – Oddar Meancheay, **PP** – Phnom Penh (beyond provinces), **PS** – Preah Sihanouk, **Pu** – Pursat, **PV** – Preah Vihear, **RK** – Ratanakiri, **SR** – Siem Reap, **SvR** – Svay Rieng, **ST** – Stung Treng, **Ta** – Takeo; **Unc** – province unclear.

Frequent locations were abbreviated (without periods, regular leters) as follows: AW – Angkor Wat, B – Bokor, BM – Ben Melaea, BSW – Buu Sraa Waterfall; KS – Kampong Speu; PA – Phnom Aoral, PK – Phnom Kulen, PP – Phnom Penh, PW – Pursat Waterfall, SR – Siem Reap, SRe – Siem Reap environs, TW – the Thmor Da Toch Waterfall, WB – West Barai.

Less repeated locations are indicated as provided by the authors of observations. To learn some of them it was necessary to address (always successfully) to a photographer to provide the place and date.

For multiple observations from the same place the latter is provided once at the beginning, followed by sexes photographed, dates and photographers.

The dates are provided in the dd/mm/yyyy format.

Annotated list of species registered

Lestidae

1. *Lestes concinnus* Hagen in Selys, 1862

   SR: PK: ♂, 23.11.2020 (E.S.).

   Remark. This is the first record of this species for the Phnom Kulen Plateau (Siem Reap Province).

2. *Lestes elatus* Hagen in Selys, 1862

   Kr: Kratie: ♀, 1.07.2021. **SR:** near BM: ♂, 23.08.2018 (E.S.).

3. *Lestes platystylus* Rambur, 1862

   SR: SR, Royal Garden, ♂, 10.2013; SR: ♂, 04.2016 (S.D.G.).

4. *Orolestes octomaculatus* Martin, 1902

   SR: BM: teneral ♂, 13.10.2013; near AW: ♂, 22.09.2014; ♂, 29.09.2014 (E.S.); Ta Prohm Temple: ♂, 16.08.2013 (S.D.G.).

Calopterygidae

5. *Mnais mneme* Ris, 1916

MK: Dak Dam waterfall: ♂, 11.2014 (E.S.).

6. *Neurobasis chinensis* (Linnaeus, 1758)

Kam: Teuk Chhou Rapids: ♂, 3.12.2017 (B.D.). **KS:** Kirirom Mts.: ♂, 8.12.2014 (M.R.); Phnom Aoral, Chreav Waterfall: ♂, ♀, 02.2021. M: BSW: ♂, ♀, 15.02.2022 (S.W.). **Pu:** TW: ♂, ♀, 20.11.2018 (E.S.); Veal Veng District, Thma Dar commune: ♂, 24.04.2014. **RK:** Virachey National Park: ♂, 30.12.2015 (P.S.).

7. *Vestalis gracilis* (Rambur, 1842)

Kam: B: ♂, ♀, 1.03.2022 (S.W.). **KS:** Kampong Speu: ♂, 11.2.2014 (S.Su.); PA, a small river: 02.2021; PA, near Chreav Waterfall: ♂, 6.02.22 (S.W.), **Pu:** PW: ♀, 21.11.2018. **RK:** Lake Yak Lom: ♂, 9.11.2014; ♂, 13.04.2015. **SR:** BM: ♂, 12.10.2013 (E.S.); Banteay Srei District, Tbeng Community Forest: ♀, 1.11.2014 (S.D.G.). **ST:** Sam Ang Commune: ♀, 01.2017 (C.J.).

Epallagidae

8. *Dysphaea gloriosa* Fraser, 1938

KK: Areng Valley: ♂, 6.05.2014 (K.S.R.). **ST:** Western Siem Pang Forest: ♂, 22.06.2015 (P.C.).

9. *Euphaea masoni* Selys, 1879

Kam: B: ♂, 1.03.2022 (S.W.).

10. *Euphaea inouei* Asahina, 1977

MK: BSW: ♂, 15.02.2022 (S.W.).

11. *Euphaea* sp.

SR: PK: ♂, copula (Fig. 1), 20.06.2013 (P.G.), ♂, no date (T.H.)

Remark. The *Euphaea* population of the Phnom Kulen Plateau is well known as corresponding to *E. masoni* in all respects but the diffuse rather than clearly limited wing dark pigmentation, bluesh-green and purple reflexes on both wing sides versus a purple reflex of the upperside only in *E. masoni*, and variably expressed paler areas at sides of the male labrum (labrum entirely black in *E. masoni*) (Kosterin & Smith 2020). In the more easterly situated Stung Treng Plateau both versions co-occur (Ibid.).

Chlorocyphidae

12. *Aristocypha fenestrella* (Rambur, 1842)

Kam: B: ♂, 29.04.2014 (B.D.) **KS:** Chreav Mts.: ♂, 22.01.2014 (K.S.R.); PA: ♂, 24.11.2014 (P.S.); PA, Chreav Waterfall: ♂, 1 ♀, 02.2021 (S.W.).

Figure 1. A male (above) and copula (below) of *Euphaea* sp. aff. *masoni*, Phnom Kulen Plateau, 20.06.2013. Photo by Peter Gartner.

13. *Aristocypha fulgipennis* (Guérin-Méneville, 1831)

MK: BSW: ♂, 12.04.2015 (E.S.); ♂, 22.06.2015: S.Su. **RK:** ♂, 2.01.2016 (P.S.).

14. *Heliocypha biforata* (Selys, 1859)

Kam: Teuk Chhou: ♂, 3.12.2017 (B.D.). **KS:** Phnom Chreav: ♂, 17.12.2014 (P.S.);

Kirirom: ♂, 6.07.2015 (S.Su.). **MK:** a small jungle creek: ♂, ♀, 16.02.2022 (S.W.). **SR:** PK: ♂, no date (T.H.); SRe: ♂, no date (E.S.).

15. *Heliocypha perforata limbata* (Selys, 1879)

KK: ♂, 27.12.2014, (P.S.). **KS:** Kirirom: ♂, 5.07.2015 (S.Su.). **MK:** BSW: ♂, 12.04.2015 (E.S.); ♂, ♀, 15.02.2022 (S.W.). **PS:** PW: ♂, 21.11.2018 (E.S.). **RK:** Virachey National Park: ♂, 2.01.2016 (P.S.).

16. *Libellago lineata* (Burmeister, 1839)

Kr: 30km SE of Kratie, Prek Te River: ♂, ♀, 16.02.2022 (S.W.). **KTh:** on the way to Preah Khan at Kampong Svay: ♂♂, 19.11.2014. **MK:** BSW: ♀, 12.04.2015. **PV:** west bank of the Mekong waterfalls: ♂, 8.06.2015 (E.S.). **RK:** 2 ♂♂, 3.01.2016 (P.S.). **SR:** SR: ♂, 14.11.2014; SRe: ♂, no date; ♀, 16.09.2018; ♂, ♀, 17.09.2018; Siem Reap River: ♀, 18.09.2018; Siem Reap River 10 km W of SR: ♂, 28.09.2018; near BM: ♀, 23.08.2018 (E.S.); ♂, ♀, PK, entrance to Kbal Spean Park, April-June 2013 (P.G.). **ST:** Western Siem Pang Forest: ♂, 22.06.2015 (P.C.).

Coenagrionidae

17. *Aciagrion approximans approximans* (Selys, 1876)

MK: at a small pond: ♂, 14.02.22 S.W.

18. *Aciagrion borneense* Ris, 1911

SR: SRe: ♂, ♀, 18.09.2018; ♀, 28.09.2018; WB: ♀, 14.01.2014; ♂, 9.02.2014 (E.S.).

19. *Aciagrion pallidum* Selys, 1891

KK: Tatai: ♀, 03.2015 (Jo.H.) **Pu:** PW: ♂, 21.11.2018 (E.S.). **SR:** SR, Royal Garden: ♂, 10.2013 (S.D.G.); 10 km NW of AW: ♀, 30.10.2013 (E.S.).

20. *Aciagrion occidentale* Laidlaw, 1919

SR: Ta Prohm Temple, ♂, 29.08.2013 (S.D.G.).

Remark. This single photographic observation by Stéphane De Greef being the only record of this species from Cambodia.

The direction of the triangular black dorsal mark on S8 in males was oppositely reported in the original description of *A. occidentale* (as a “race” of *A. hisopa* (Selys, 1876)) (Laidlaw 1919) and a subsequent paper by the same author (Laidlaw 1924), while actually damselflies with both versions occur, as pointed out by Joshi & Kunte (2014) and Hopkins (2024). According to the original description (Laidlaw 1919), in *A. occidentale* the mark apex is directed caudad, while the priority name *A. paludense* Fraser, 1922 is available for those damselflies in which it is directed basad (Joshi & Kunte 2014; Hopkins 2024). However, there still is a possibility that such damselflies, also reported from Cambodia (Hopkins 2024), are *A. borneense* with strongly reduced black maculation.

21. *Agriocnemis femina* (Brauer, 1868)

MK: at a small pond: ♂, ♀, 14.02.22 (S.W.).

22. *Agriocnemis minima* Selys, 1877

SR: SR: ♂, 2.01.2019; WB: ♀, 31.08.2018; a lake at Phnom Bok: ♂, ♀, 5.09.2018; ca 65 km W of SR off road no. 6: ♂, ♀♀, 28.10.2016 (E.S.).

23. *Agriocnemis nana* (Laidlaw, 1914)

PP: PP: ♀, 20.04.2014 (E.Y.). **PS:** Kbal Chhay Waterfall: ♂, 22.02.2022 (S.W.). **SR:** SRe: ♂, 3.01.2019; WB: ♀, 2.11.2018 (E.S.); WB: ♀, 3.12.2013 (I.L.); Tbeng Lech community forest: ♂, 28.11.2014 (S.SU.).

24. *Agriocnemis pygmaea* (Rambur, 1842)

MK: at a small pond: ♂, 14.02.22 (S.W.). **SR:** WB: ♂, 13.07.2016; ♂, 16.07.2016; east of SR: ♂, 11.10.2018; north of SR: ♀, 30.10.2021 (E.S.); Wat Atvea, rice fields: ♂, 20.10.2013 (S.D.G.).

25. *Ceriagrion aurantiacum* Fraser, 1923

SR: WB: ♂, 10.12.2013; 2 ♂♂, 11.2018; East Barai: ♂, 4.09.2018; SR: ♂, 2.01.2019; SR env.: ♂, 3.01.2019; north of SR, 30.10.2021: 3 ♂♂ (E.S.).

Remark. After the revision by Asahina (1967), the *Ceriagrion* species with males coloured from olive-grey to very dull orange (as in the observations referred) from Thailand and Indochina used to be traditionally identified as *C. olivaceum* Laidlaw, 1914. Yu et al. (2023) have shown that olive-brownish male specimens from China identifiable as *C. olivaceum* are identical to the azure blue males of *C. azureum* (Selys, 1891) from the same area with respect to morphology and that their sequences of the mitochondrial COI gene fragment and 16sRNA gene and the nuclear ITS region comprised the same clusters. These authors concluded that the former were just immature, not fully coloured males of *C. azureum*. On this base, they (Yu et al. 2023) have synonymised *C. olivaceum* with *C. azureum* (the valid name). Taking into account that both *C. azureum* and *C. olivaceum* were described by specimens from Myanmar, this solution is reasonable. However it makes no sense for the above mentioned specimens of "*C. olivaceum*" from Thailand and Indochina, which became dull orange rather than bright blue with maturity, especially provided that the bright-blue *C. azureum* does occur in these countries as well. Hence they represent some other, 'dull orange' species. For this, the name *Ceriagrion aurantiacum* Fraser 1924 is available. This species was described from Nilgiri Wynaad, the Wester Ghats of India (Fraser 1924) and was later treated as a 'race' (Fraser 1933) or subspecies (Asahina 1967) of *C. olivaceum*. Unfortunately, this name differs from that of the species below, described two years later by the same author, with just one letter "a" (*aurantiacum* versus *auranticum*), which no doubt will result in repeated confusions in future. Cambodian specimens of morphologically very similar, but differently coloured species (?) *C. aurantiacum, C. azureum, C. calamineum* and *C. malaisei* are under molecular analysis by Xin Yu, so their actual relationships will hopefully be resolved soon.

26. *Ceriagrion auranticum* Fraser, 1924

MK: at a small pond: ♂, 14.02.22 (S.W).

27. *Ceriagrion calamineum* Liefttinck, 1951

KK: Rainbow Lodge; ♂, 09.2015 (S.D.G.). **SR:** a lake at Phnom Bok: ♂, 7.09.2018 (E.S.).

28. *Ceriagrion cerinorubellum (*Brauer, 1865)

KS: Kirirom, 9.07.2015: ♂, (P.S.); Kampong Speu: ♀, 19.09.2021 (E.S.). **PS:** Kbal Chhay Waterfall: ♂, 22.02.2022 (S.W.); Koh Rong Sanloem Island: ♂, 27.05.2015 (G.K.). **SR:** WB: ♂, 12.12.2013; ♂, 15.12.2015; ♂, 21.09.2018; ♀, 2.11.2018 (E.S.).

29. *Ceriagrion chaoi* Schmidt, 1964

SR: 8 km north-west of AW: ♂, 13.05.2014 (E.S.).

Remark: Yu et al. (2023) claimed *Ceriagrion chaoi* to be a junior synonym of *C. bellona* Laidlaw, 1915, but this synonymy was rejected by Dow et al. (2024). According to the latter authors, a paper clarifying their status is expected.

30. *Ceriagrion indochinense* Asahina, 1967

SR: PK, entrance to Kbal Spean Park: ♂, 05.2013 (P.G.).

31. *Ceriagrion malaisei* Schmidt, 1964

SR: Phnom Bakeng: ♂, 11.05.2018 (C.G.).

32. *Ceriagrion praetermissum* Lieftinck, 1929

SR: SR: ♀, 10.08.2018; SRe: ♀, 28.09.2018; north of SR: 2 ♂♂, ♀, 24.10.2021; ♂, 30.10.2021; 10 km N of AW: ♂, 11.07.2015; WB: ♂, 21.09.2018: ♂, ♀, 30.09.2018: ♀♀, 2.11.2018; ♂, 26.07.2019: ♀, 8.10.2019; East Baray: ♀, 4.09.2018; a lake at Phnom Bok: ♂, 5.09.2018; “far point”: ♂, 3.11.2018, (E.S.); Phnom Bakeng: ♂, 8.04.2021 (C.G.); Beng Mealea: ♀, 6.10.2013 (S.D.G.).

33. *Ischnura senegalensis* (Rambur, 1842)

KTr: Trach Prek Tonhon Chas River near Vietnamese border: copula, 12.02.2022 (S.W.). **PP:** Lotus field near PP, ♂, copula, 19.04.2021 (S.W.). **PS:** Otres Beach: ♂, ♀, 18-19.11.2017 (P.W.). **SR:** WB: ♀, 10.07.2016; ♂, 19.07.2016 (E.S.).

34. *Pseudagrion australasiae* Selys, 1876

PS: Kbal Chhay Waterfall: ♂, 22.02.2022 (S.W.). **SR:** 8 km north-west of AW: ♂, 14.05.2014 (E.S.); PK, entrance to Kbal Spean Park: ♂, 05.2013 (P.G.).

35. *Pseudagrion microcephalum* (Rambur, 1842)

KS: 2 ♂♂, 1 ♀, PA: 02.2021 (S.W.). **SR:** WB: ♂, 4.10.2015 (E.S.). **Ta:** ♂, 14.06.2015 (R.Z.).

36. *Pseudagrion rubriceps* Selys, 1876

MK: BSW: ♀, 2.04.2015. **PV:** west bank of the Mekong waterfalls: copula, 8.06.2015. **SR:** SR: ♂, 7.12.2013; WB: ♀, 1.12.2013; ♂, 10.12.2013; 40 km south-west of Siem Reap: ♂, ♀, 20.03.2014 (E.S.).

37. *Pseudagrion willamsoni* Fraser, 1922

PS: Kbal Chhay Waterfall: ♂, 22.02.2022 (S.W.).

Platycnemididae

38. *Coeliccia yamasakii* Asahina, 1984

Kam: Bokor: ♂, ♀, 1.03.2022 (S.W.). **Pu:** ♂, 5.03.2016 (P.N.L.); Veal Veng District: ♂, 11.2015 (P.S.); PW: ♀, 21.11.2018 (E.S.).

39. *Copera marginipes* (Rambur, 1842)

MK: at a small pond: ♂, 14.02.22 (S.W.). **ST:** Sam Ang Commune: ♂, 01.2017 (C.J.).

40. *Onychargia atrocyana* Selys, 1865

KS: Kampong Speu: ♂, 12.09.2021; ♂ (immature), 19.09.2021; ♂, ♀, 27.09.2021; Kampong Speu env.: 2 ♂♂ (mature and immature), 11.10.2021 (E.S.); Kirirom: ♂, 8.07.2015 (S.Su.).

Onychargia sp.

SR: SR env.: ♂ immature, 10.09.2018; WB: ♂ immature, 18.09.2014, E.S.; ♂ immature, 31.08.2018; ♂ immature, 21.09.2018 (E.S.).

Remark. These photos most probably refer to *O. atrocyana*, but left unidentified since immature males of *O. atrocyana* can hardly be distinguished from *O. priydak* occurring in the same area (Kosterin & Smith 2020) without examination of the S10 morphology.

41. *Prodasineura autumnalis* (Fraser, 1922)

MK: BSW: ♂, copula, 12.04.2015. **Pu:** PW: ♂, 21.11.2018 (E.S.).

42. *Prodasineura coerulescens* (Fraser, 1932)

Pu: Pursat env.: ♂, ~15.09.2016, E.S.

43. *Prodasineura doisuthepensis* Hoess, 2007

MK: BSW: ♂, 12.04.2015 (E.S.).

44. *Prodasineura* sp. (aff. *verticalis* (Selys, 1860))

SR: Kbal Spean: ♂, 6.08.2014 (P.S.).

45. *Pseudocopera ciliata* (Selys, 1863)

MK: at a small pond: ♂, immature ♀, 14.02.22; ♂, immature ♀, 16.02.22 (S.W.). **SR:** AW: ♀, 03.2016 (S.D.G.); north of SR: ♂, 30.10.2021; 8 km north-west of AW: ♂, 14.05.2014; 10 km north of AW: ♂, 11.07.2015; West Gate of Angkor Thom: ♂, 17.06.2015; ca 65 km W of SR off road No. 6: ♂, 28.10.2016, (E.S.); Angkor Tom: ♀, 1.07.2015 (D.J.); Tbeng Lech community forest: ♂, 11.2014 (S.D.G.).

Aeshnidae

46. *Anax guttatus* (Burmeister, 1839)

Kam: Kampong Kreung: ♂, 21.11.2015 (S.N.). **PP:** PP: ♂, 3.02.2017 (S.Su.). **PS:** Otres Beach: ♂, 9.08.2016 (P.W.). **SR:** SR: ♀, 18.06.2020 (B.P.).

47. *Gynacantha subinterrupta* Rambur, 1842

SR: SR: ♂, 28.10.2013 (C.J.).

Gomphidae

48. *Ictinogophus decoratus melaenops* (Selys, 1868)

KC: east of Kampong Cham: ♂, 7.10.2016 (C.D.). **SR:** SR: ♂, 2.05.2014 (K.S.R.); AW: ♂, 9.03.2016, (Ja.H.); AW area: ♂, 14.09.2018 (C.G.); SR: ♂, 28.05.2014 (B.C.); ♂, 30.12.2013; SR env.: ♂, 21.05.2014, 8 km north-west of AW: ♂, 14.05.2014; 40 km south-west of SR: ♂, 20.03.2014; ♂, 18.03.2016 (E.S.); Banteay Srei: ♂, 01.2021 (S.W.); near BM: ♀, 23.08.2018 (E.S.).

Macromiidae

49. *Epophthalmia vittata vittata* Burmeister, 1829

SR: 300 m E of Pre Rup temple: ♀, date missing (E.S.).

Remark. Asahina (1961; 1981; 1987) identified Thai specimens of *Epophthalmia* with yellow marks on the labrum, frons and S8 (i.e. not *E. vittigera* Martin, 1909), as *E. frontalis frontalis* Selys, 1871, after which this name have been invariably being applied to such specimens from Thailand and Indochina by all authors. *E. frontalis* was described from “Malaisie?” (Selys 1871) (labelled as “Deyrolle, Malaisie?”) (Lieftinck 1931), which was an error and the type had originated from India (Lieftinck 1931), since *E. frontalis* is absent from Malaysia (Dow et al. 2024). *E. vittata*, described from Madras (India), differs from it in the yellow maculation of the frons, with a single cordate central spot in the cleft between the prominences in *E. vittata* versus two separate spots at the outer sides of the frontal prominences in *E. frontalis*, and the poorly developed mediolateral tooth on the cercus versus well developed in *E. frontalis* (Lieftinck 1931; Fraser 1936). Tiple & Parya (2020) pointed out the fact that the drawing of the head in Asahina (1987: fig. 1) depicts exactly the *vittata* condition, not the *frontalis* one. Up to my knowledge, all other specimens identified as *E. frontalis* from Thailand and Indochina have the same singular cordate spot in the frontal cleft instead of two separate spots at the prominences. Also the cerci are shown (Asahina 1987: figs 3-4) with poorly developed teeth, as should be in *E. vittata*. Although Tiple & Parya (2020) abstained from a radical solution, it is obvious and as follows: (i) Asahina (1987) made a blunder, perhaps mislead by the wrong type locality “Malaisie” indicated for *E. frontalis*; (ii) *E. frontalis* is a rare Indian endemic (Tiple & Parya 2020), while (iii) it is *E. vittata* which is widespread and common in Thailand and Indochina. All relevant checklists and faunal assessments should be amended accordingly.

Libellulidae

50. *Acisoma panorpoides* Ranbur, 1842

Kam: Teuk Chhou rapids: ♀, 3.12.2017 (B.D.). **KS:** Kampong Speu: ♀, 12.09.2021 (E.S.). **PP:** PP, BKK (not explained): ♂, 14.10.2014 (W.K.). **SR:** AW: ♂, 02.2021 (S.W.); WB: ♂, 30.09.2018; 8 km north-west of AW: ♀, 13.05.2014; Wat Athvea: ♂, 8.11.2013; 40 km south-west of SR: ♂, 20.03.2014; 40 km west of SR: ♂, 18.03.2016 (E.S.).

51. *Aethriamanta aethra* Ris, 1912

SR: SR: ♂, 14.03.2014; SR env.: ♂, 5.07.2018; ♂, 16.09.2018; WB: ♂, 3.07.2014; ♀, 31.08.2018; 12 km S of SR, Phnom Krom: 2 ♂♂ (1 immature), 5.10.2013; ♂, 8.05.2015; Wat Athvea: ♀, 8.11.2013 (E.S.).

52. *Aethriamanta brevipennis* (Rambur, 1842)

KS: Kampong Speu: ♀, 12.09.2021 (E.S.). **PP:** Baku near PP: ♀, 6.12.2013 (I.L.). **SR:** SR: ♂, 10.11.2015 (S.D.G.); SRe: ♂, 21.07.2016; 1 immature ♂, 17.09.2018; ♀, 28.09.2018: WB: ♂♂, 3.03.2014; ♂, 20.05.2014; ♂, 30.06.2014; ♂, 3.07.2014; ♂, 27.07.2014; ♂, 31.07.2014; ♀, 12.05.2014; ♀, 30.03.2015; ♀, 21.09.2018; ♂, 30.09.2018; ♀, 8.10.2019; East Baray: ♂, 21.07.2016; ♂♂, mature and immature, 4.09.2018; northern wall of East Baray, ♂, 30.07.2016; Phnom Krom: ♂, 5.10.2013; North of SR: ♀, 24.10.2021; ♂, 30.10.2021; 10 km NW of AW: ♀, 28.10.2013; old royal highway: ♀, 12.08.2018 (E.S.); Phnom Bakeng: ♀, 2.10.2014 (P.C.); Ta Prohm Temple: 1 immature ♂, 22.08.2013 (S.D.G.); Banteay Srei area: ♂, 23.10.2017 (R.C.); 1 immature ♂, near BM: 23.08.2018 (E.S.).

53. *Agrionoptera insignis* (Rambur, 1842)

SR: the temple area, 13.4089ºN, 103.9936ºE: ♂, 12.08.2018 (E.S.).

54. *Brachydiplax chalybaea* (Brauer, 1868)

KK: Chi Phat: ♂, 03.2015 (Jo.H.). **SR:** SR. env.: ♂, 18.03.2013; ♂, 21.05.2014; ♂, 25.07.2014; ♀, 8.10.2018; Phnom Krom: ♂, 10.2013; WB: ♂, 16.03.2014; ♂, 31.08.2018; ♀, 21.09.2018; ♂, 3.10.2018; ♀, 26.07.2019; West Gate of Angkor Thom: ♂, 17.06.2015, (E.S.); AW area: ♂, 14.09.2018 (C.G.); AW, near Tonle Snuol Temple: ♂, 01.2021 (S.W.); NE of Troave Kot Lake: ♀, 05.2016 (C.J.); Puok: ♀, 3.10.2018; near BM: ♂, 23.08.2018 (E.S.).

55. Brachydiplax farinosa Krüger, 1902

SR: 40 km SW of SR: ♂, 20.03.2014 (E.S.). PK, Kbal Spean: ♂, 21.09.2008 (T.H.).

56. *Brachydiplax sobrina* (Rambur, 1842)

SR: ♂, 24.08.2018; ♀, 28.08.2018; SRe.: immature ♂, 8.10.2018; ♂, 8.10.2018; east of SR: ♀, 11.10.2018 (E.S.); WB: ♂, 3.12.2013 (I.L.); near BM: ♂, 23.08.2018 (E.S.).

57. *Brachythemis contaminata* (Fabricius, 1793)

Kr: ♂, 31.05.2015 (P.C.). **PS:** Otres Beach: ♂, 18-19.11.2017 (P.W.); Kbal Chhay: ♂, 9-11.01.2021 (S.W.). **SR:** AW: ♂, 2012 (D.M.N.); ♂, 08.05.2014 (P.W.); 3 ♂♂, 1 ♀, 2021 (S.W.); WB: ♀, 4.10.2015 (E.S.); south-west of SR: ♂, 11.12.2014 (P.B.T.); 40 km south-west of SR: ♂, 20.03.2014; Kampong Khleang: ♂, 7.06.2014; near BM: ♂, ♀, 23.08.2018 (E.S.).

58. *Cratilla lineata calverti* Forster, 1903

KK: Chi Phat: ♂, 04.2015 (Jo.H.). **SR:** 30 km NNW of SR: ♂, 17.08.2013; ♀, 24.10.2013 (E.S.); Ta Prohm Temple: ♀, 22.08.2013 (S.D.G.).

59. *Crocothemis servilia* (Drury, 1773)

Kam: Kampot: ♂, 21.12.2013 (B.D.). **Kan**: ♂, Lvea Aem District, 11.07.2015 (P.C.). **KK:** Chi Phat, ♂, 9-11.01.2021 (S.W.). **OM**: monkey forest: ♂, 15.03.2014 (D.S.V.). **PP:** near PP: ♂, 9.11.2016 (S.Su.); Ly Young Pass Bridge, 10 km of PP: ♂, 7.06.2014 (A.); wetlands outside PP: 1 ♀, 02.2021 (S.W.). **SR:** SR: ♀, 5.10.2013; ♂, 30.05.2013 (E.S.); ♂, 4.05.2014 (A.M.); ♂, 19.11.2014 (B.F.); ♂, 17.11.2015; ♂, 10.2015 (S.D.G.); ♀, 9.05.2016 (B.S.); ♂, 11.08.2918 (E.S.); SRe: ♂, 21.05.2014; ♂, 17.06.2019 (E.S.); 2 m, AW: 2♂♂, 02.2021 (S.W.); WB: ♂, 21.05.2013; ♂, 30.03.2015; ♂, ♀, 22.12.2013 (E.S.); ♂, 05.2016 (C.J.); Wat Atvea: ♂, ♀, 20.10.2013 (S.D.G.); ♂, ♀, 8.11.2013; ♀, 8.05.2015 (E.S.); Prasat Bakong: ♀, 05.2016; 40 km south-west of SR: ♂, 20.03.2014; ♀, 18.03.2016 (E.S.); Phnom Krom env.: ♂, 10.12.2017 (R.C.).

60. *Diplacodes nebulosa* (Fabricius, 1793)

KS: ♀, 12.09.2021 (E.S.). **PP:** PP, LYP Bridge: ♀, 29.12.2013 (K.S.R.). **Pu:** O'Som village: ♂, 9-11.01.2021 (S.W.). **SR:** SR: ♀, 17.11.2014 (E.S.); SR center: ♂, 20.10.2016 (B.Po.); SR env.: ♀, 28.09.2018 (E.S.); Royal Garden: ♂, 31.08.2013 (S.D.G.); east of SR: ♂, 11.10.2018 (E.S.); AW: ♂, 30.01.2015 (B.T.C.); ♂, ♀, 02.2021 (S.W.); WB: ♀, 21.09.2018. (E.S.); Ta Prohm Temple; ♀, 31.08.2013; Tbeng Community Forest, Banteay Srei: ♂, 16.11.2014 (S.D.G.).

61. *Diplacodes trivialis* (Rambur, 1842)

Kam: Kampot: ♀, 21.12.2013 (B.D.). **Ke:** Koh Tonsay: ♂, 12.2015 (C.J.). **KK:** Tatai: ♀, 03.2014 (Jo.H.); ♀, Rainbow Lodge, 09.2015 (S.D.G.); Chi Phat: ♂, ♀, 04.2015 (Jo.H.) **PP:** Bateay district: ♂, ♀, 16.03.2014 (K.S.R.). **PS:** Otres Beach: ♂, 18-19.11.2017 (P.W.). **SR:** SR: ♂, ♀, 10.2015 (S.D.G.); SRe: ♂, 20.09.2018; ♂, 8.10.2018; north of SR**:** ♂, 30.10.2021 (E.S.); AW: ♀, 02.2021 (S.W.); Bayon: ♀, 10.03.2016 (Ja.H.); 10 km north-west of AW: ♂♂, 26 and 30.10.2013; 40 km west of SR: immature ♂, 18.03.2016 (E.S.); PK: ♂, no date (T.H.). **SvR:** Svay: ♀, 8.12.2018 (C.H.).

62. *Indothemis carnatica* (Fabricius, 1798)

SR: SR: ♂, 18.02.2014; WB: ♂, 26.02.2014 (E.S.).

63. *Indothemis limbata* (Selys, 1891)

KTh: on the way to Preah Khan at Kampong Svay: ♂, 19.11.2014 (E.S.). **SR:** Banteay Srei: ♂, 6.12.2016 (S.San.); ♂, 01.2021 (S.W.).

64. *Lathrecista asiatica* (Fabricius, 1798)

SR: SRe: ♂, 20.08.2015, ♂, 16.09.2018; north of SR: ♂, 4.10.2021; south wall of East Baray: ♂, 14.11.2021; ♂, 10 km north-west of AW: 30.10.2013 (E.S.); Ta Prohm Temple: ♂, 22.08.2013 (S.D.G.); on the road Battambang – SR: ♀, 17.10.2016, Siem Reap River 10 km west of SR: ♂, ♀, 24.09.2018; Phnom Krom, 12 km out of SR: ♂, 8.05.2015 (E.S.); Banteay Srei: ♀, 26.10.2013 (C.J.); Phnom Bakeng: ♂, 26.08.2021 (C.G.) PK: Kbal Spean: ♂, 21.09.2008 (T.H.). **OM:** ♂, 12.2015 (C.J.). **PP:** Phnom Tamao Mountain: ♂, 3.09.2014 (K.S.R.).

65. *Nannophia pygmaea* Ranbur, 1842

PV: Prey Long Forest: ♀, ?10.2015 (Je.H.).

66. *Neurothemis fluctuans* (Fabricius, 1793)

KK: Tatai: ♀, 03.2015 (Jo.H.). **KS:** PA: ♀, 22.02.2022 (S.M.). **PS:** Ream National Park: ♂, 24.03.2016 (J.B.). **Pu:** Pursat Waterfall: ♂, 21.11.2018 (E.S.). **SR:** SR: ♂, 17.02.2015; ♂, 9.10.2018; ♂, 10.10.2018; ♀ androchromatic, 24.08.2018; SRe: ♂, ♀, 21.05.2014; ♀ androchromatic, 07.2018; east of SR: ♂, 11.10.2018; AW: ♂, 6.11.2013; ♀ androchromatic, 12.11.2013; (E.S.); ♂, 5.10.2015 (A.B.B.); ♀ androchromatic, 6.10.2015 (A.M.K.); near AW: ♂, 18.03.2018 (R.C.); AW, near Tonle Snguol Temple: ♀, 01.2021 (S.W.); 8 km norrth-west of AW: ♂, 14.05.2014; 10 km north-west of AW: ♂, 26.10.2013; East Baray: ♀ androchromatic, 4.09.2018; 30 km north of SR: ♂, 4.11.2014; 35 km north-east of SR: ♂, 21.03.2014 (E.S.); Prasat Chaw: ♂, 05.2016; north-east of Troave Kot Lake, ♀, 05.2016 (C.J.); near BM: ♂, 23.08.2018 (E.S.).

67. *Neurothemis fulvia* (Drury,1773)

Kam: ♀, 07.09.2014 (J.K.). **KK:** Chi Phat, ♂, 05.2015(Jo.H.); 2 ♂♂, 9-11.01.2021 (S.W.); Tatai: ♂, 03.2015 (Jo.H.). **KS:** PA, a small river: 3 ♂♂, 02.2021 (S.W.). OM: ♂, 12.2015 (C.J.). **SR:** SR: ♀, 21.08.2013 (S.D.G.); ♂, 24.08.2018 (E.S.); ♂, 01.2021; copula, 13.02.2021 (S.W.); Angkor Butterfly Center: ♂, 17.02.2014 (E.S.); AW: ♀, 01.2012 (P.B.); ♀, 12.11.2013 (E.S.); ♂, 4.01.2014 (I.L.); ♀, 22.02.2014 (N.S.); ♂, 10.11.2015 (V.R.); Angkor Thom: ♀, 11.12.2014 (P.B.T.); WB: ♀, 13.01.2014; ♀, 31.07.2014; ♂, 4.10.2015 (E.S.); Ta Prohm Temple: ♀, 12.08.2013 (S.D.G.); Preah Khan: ♀, 9.22.2014 (V.R.); Korean Ring, few km north-west of Pheah Dak village: ♂, 16.01.2015 (S.D.G.); old royal highway: ♂, 12.08.2018; 8.5 km north-north-west of AW: ♀, 3.11.2013; 10 km north-west of AW: ♀, 26.10.2013; ♂, 6.11.2013; 30 km N of SR: ♀, 4.11.2014 (E.S.); PK: ♂, no date (T.H.); ♂, 6.10.2015 (S.D.G.); near BM: ♂, 23.08.2018 (E.S.). **ST:** Se-kong River: ♂, 28.04.2015 (P.C.). **Ta:** ♀, Kirivong District, 30.01.2020 (M.J.).

68. *Neurothemis intermedia atalanta* Ris, 1913

Kam: Teuk Chhou: ♀, 3.12.2017 (B.D.). **KK:** Tatai: ♀, 03.2015 (Jo.H.). **OM:** Sorng

Rokavorn, ♀, 30.10.2013 (C.J.). **SR:** SR: immature ♂, 16.12.2013 (T.G.); ♀, 19.02.2014; immature ♂, 11.08.2018; ♀, 28.08.2018; SRe: ♀, 16.09.2018; ♂, 8.10.2018; east of SR: ♀, 11.10.2018 (E.S.); AW: ♂, 01.2012 (P.B.); WB: ♀, 16.12.2013; ♀, 2.11.2018 (E.S.); Ta Prohm Temple: ♂, 7.08.2013 (S.D.G.).

69. *Neurothemis tullia* (Drury, 1773)

Ba: Battanmang: ♂, 14.10.2017 (O.S.). **KS:** Kampong Speu: ♂, ♀, 12.09.2021 (E.S.). **PP:** PP: ♀, 20.04.2021 (E.R.R.G.). **PS:** ♂, Sihanoukville, no date (D.B.). **Pu:** O'Som village: ♀, 9-11.01.2021 (S.W.). **SR:** SR: ♂, ♀, 28.05.2014 (B.C.); ♀, 11.2015 (S.D.G.); ♂, 25.01.2016 (J.R.); ♂, 11.08.2018; ♂, ♀, 9.10.2018 (B.Po.); ♂, 8.03.2019 (P.F.); SRe: ♂, ♀, 21.05.2014; ♀, 3.11.2018 (E.S.); AW: 3 immature ♂♂, 01.2021 (S.W.); WB: ♂, 16.12.2013; ♂, 14.01.2014; ♂, 26.02.2014; ♂, 27.07.2014; ♀, 28.01.2015; ♂, 12.05.2014; ♀, 3.10.2018; ♀, 8.10.2019; East Baray: ♂, 4.09.2018; a lake at Phnom Bok: ♀, 7.09.2018 (E.S.); Wat Atvea, rice fields: ♂, ♀, 20.10.2013 (S.D.G.); PK: ♂, no date (T.H.); PK: entrance to Kbal Spean Park: ♂, 04-06.2013 (P.G.). **Ta:** Kirivong District: ♂, 30.01.2020 (M.J.).

70. *Orthetrum chrysis* (Selys, 1891)

Kam: B: copula, 9.12.2017; ♀ teneral, 14.12.2017 (B.D.). **KK:** Chi Phat: ♂, copula, 9-11.01.2021 (S.W.). **PS:** Sihanoukville: ♂, 21.12.2015 (J.B.); Koh Rong Sanloem Island: copula, 13.12.2015 (G.K.). **Pu:** TW: ♂, ♀, 20.11. 2018 (E.S.). **SR:** Banteay Srei District, Tbeng Community Forest: ♂, 1.11.2014 (S.D.G.).

71. *Orthetrum glaucum* (Brauer, 1865)

Kam: B: ♂, 9.12.2017 (B.D.). **KS:** PA, Chreav Waterfall: ♂, 02.2021 (S.W.). **MK:** ♂, 10.01.2016 (V.R.). **PS:** Sihanoukville: ♂, ~25.10.2015 (J.B.); Prey Nob, 9-11.01.2021: ♀ (S.W.). **Pu:** TW: ♂, 20.11. 2018 (E.S.); O'Som village: ♂, 9-11.01.2021 (S.W.). **RK:** NE Cambodia: ♂♂, ♀♀, 11.2014.

72. *Orthetrum luzonicum* (Brauer, 1868)

PS: Sihanoukville: ♂, 06.2017 (D.A.P.). **SR:** ♂, SRe: 21.05.2014 (E.S.)

73. *Orthetrum neglectum* (Rambur, 1842)

KK: Chi Phat: ♂, 9-11.01.2021 (S.W.). **PS:** Sihanoukville: ♂, 21.12.2015 (J.B.). **RK:** NE Cambodia: ♂, 11.2014 (E.S.).

74. *Orthetrum sabina* (Drury, 1773)

Ba: Battambang: ♂, 12.08.2017 (Z.H.). **KTh:** on the way to Preah Khan at Kampong Svay: copula, 19.11.2014 (E.S.). **PP:** PP: ♂, 4.01.2016 (P.W.); ♀, 19.07.2021 (S.T.); PP, "BKK" (not explained): ♂, 14.10.2014 (W.K.). **SR:** SR: ♂, 17.12.2013; ♀, 9.05.2014; copula, 4.09.2014 (E.S.); ♂, SR: 23.09.2014 (C.G.): SRe: ♂, 21.05.2014; WB: ♂, 12.12.2013; ♂, 10.01.2014; ♂, 3.07.2014; ♂, 21.03.2015; ♂, 30.03.2015; copula, 30.12.2015 (E.S.); ♂, ♂, 05.2016 (C.J.); 31.08.2018; East Baray: ♀, 4.09.2018 (E.S.); Bayon Temple: ♂, ♀, 14.03.2014 (A.T.S.); Wat Atvea: ♂, 10.2013 (S.D.G.); Ta

Prohm Temple: ♂, 16.08.2013; between SR and Chaung Svet Vibol Pagoda: ♂, 21.11.2015 (B.Pr.); 8 km SE of SR, Wat Chedei: ♂, 4.03.2014; Korean Ring, few km north-west of Pheah Dak village: ♂, 16.01.2015 (S.D.G.); 8 km north-west of AW: ♂, 14.05.2014 (E.S.); 10 km north-west of AW: ♂, 26, 6.11.2013 (E.S.); ♂, Prasat Bakong: 05.2016 (C.J.). **RK:** NE Cambodia: ♂, 11.2014.

75. *Palpopleura sexmaculata* (Fabricius, 1787)

SR: Banteay Srei District, Tbeng Community Forest: ♂, 16.11.2014 (S.D.G.).

76. *Pantala flavescens* (Fabricius, 1798)

Ke: Koh Tonsay: ♀, 12.2015 (C.J.); Kep National Park: ♀, 15.12.2017 (S.K.). **KS:** Kampong Bay, front porch: ♀, 31.10.2016 (G.J.). **PP:** PP: ♀, 2.09.2014 (E.K.); Phnom Tamao Mountain: ♂, 5.09.2014 (K.S.R.). **SR:** SR: ♂, 12.08.2015 (S.D.G.); SRe: ♂, 16.09.2018, ♀, 2.07.2019; WB: ♂, 4.10.2015 (E.S.); near AW: ♂, 16.06.2016 (G.C.); Phnom Krom: ♂, 5.10.2013; on the road Battambang – SR: ♀, 17.10.2016 (E.S.). **Ta:** Kirivong District: ♀, 30.01.2020 (M.J.).

77. *Potamarcha congener* (Rambur, 1842)

Ke: Koh Tonsay: ♂, 12.2015 (C.J.). **KK:** ♂, Areng Valley, 9.05.2014 (K.S.R.); Phum Doung village: ♂, 09.2015 (S.D.G.). **KS:** Kampong Bay: ♀, 10.11.2015 (G.J.). **SR:** SR: ♀, 10.2015 (S.D.G.); ♀, 24.08.2018; ♀, 10.09.2018; ♀, 17.09.2018; ♂, 10.10.2018; SRe: ♀, 30.12.2013; ♂, 20.09.2018; north of SR: ♂, 24.10.2021 (E.S.); AW: ♂, 08.05.2016 (P.W.); WB: ♀, 12.12.2013; ♀, 29.12.2013; ♀, 11.01.2014; immature ♂, 3.10.2018; 8.6 km north-north-werst of AW: ♀, 11.12.2013; Ko Ker Temple: ♀, 4.07.2017; old royal highway: ♀, 12.08.2918 (E.S.); BM: ♂, 05.2016 (C.J.); near BM: immature ♂, 23.08.2018 (E.S.); PK: entrance to Kbal Spean Park: many, 04-06.2013 (P.G.). Province unclear: Phnom Reap: ♂, 24.08.2014 (K.S.R.).

78. *Pseudothemis jorina* Förster, 1904

SR: SRe: ♀, 21.07.2016; ♀, 16.09.2018 (E.S.); AW: ♂, 9.03.2016 (Ja.H.); AW, a small pond: ♂, 02.2021 (S.W.); Angkor Thom: ♂, 24.02-02.03.2014 (A.B.B.); West Gate of Angkor Thom: ♂, 17.06.2015 (E.S.); Angkor Butterfly Center: ♂, 11.02.2014 (E.S.).

79. *Rhodothemis rufa* (Rambur, 1842)

KK: Chi Phat: ♂, 9-11.01.2021 (S.W.). **SR:** WB: ♂, 13.01.2014; ♂, 18.03.2013; ♂, 9.07.2014; ♀, 31.08.2018; ♂, 30.09.2018; Puok: ♂♂, ♀, 3.10.2018 (E.S.); north-east of Troave Kot Lake: ♀, 05.2016 (C.J.).

80. *Rhyothemis obsolescens* Kirby, 1889

SR: Sre: ♂, ♀, 21.05.2014; 35 km north-east of SR: ♂, 21.03.2014 (E.S.).

81. *Rhyothemis phyllis* (Sulzer, 1776)

KC: Mekong River: ♂, 24.01.2015 (S.D.G.). **KK:** Chi Phat: 2 ♂♂, 9-11.01.2021; 15 km of Botum Sokor: ♂, 9-11.01.2021 (S.W.). **Kam:** Kampot: ♀, 12.08.2020 (N.T.);

♂, 12.02.2022 (D.W.); Bokor Plateau: ♀, 23.03.2014 (B.D.). **PP:** PP: ♀, 31.08.2014 (E.K.); PP suburbs: ♂, 2.05.2018 (V.B.); PP, Koh Ouk Gna Tei: ♂, 05.01.2014 (K.S.R.); wetlands outside PP: ♂, ♀, 02.2021 (S.W.). **SR:** SR: ♂, 13.03.2014 (E.S.); ♂, 21.09.2014 (I.L.); SRe: ♂, 21.05.2014; ♂, 8.09.2018; ♂, 16.09.2018 (E.S.); Ak Yum: ♂, 28.02.2018 (R.C.); Ta Prohm Temple: ♂, 22.08.2013 (S.D.G.); AW, near Tonle Snguol Temple: ♂, 01.2021 (S.W.); WB: ♂, 20.12.2013; ♂, 4.10.2015; East Baray: ♀, 4.09.2018; near BM: ♂, 23.08.2018 (E.S.); Phnom Bakeng: ♀, 16.08.2020 (C.G.).

82. *Rhyothemis plutonia* (Sulzer, 1776)

SR: SRe: ♂, 20.05.2014; ♀, 4.07.2019; 12 km south of SR: ♂, 8.05.2015; ♀, 15.06.2017; 8 km north-west of AW: ♂, 13.05.2014; ♂, 14.05.2014; ♂, 40 km SW of SR: 20.03.2014; Ko Ker Temple: ♂, 4.07.2017 (E.S.); Phnom Bakeng: ♂, 16.08.2020 (C.G.); near BM: ♂, 23.08.2018 (E.S.).

83. *Rhyothemis triangularis* Kirby, 1889

KS: Kirirom: ♂, 8.07.2015 (S.Su.). **SR:** SRe: ♂, 21.05.2014; on a road SR – PK: ♂, 8.05.2015 (E.S.).

84. *Rhyothemis variegata* (Linnaeus, 1763)

Kan: Kandal: ♀, 17.09.2009 (S.Sai). **Kr:** Kratie: ♀, 8.11.2018 (C.B.). **KS:** Kampong Speu: ♀, 12.09.2021 (E.S.). **PP:** PP centre: ♀, 12.08.2018 (M.D.B.). **PS:** Sihanoukville, Otres village: ♀, 19.11.2015 (J.E.). **SR:** SR: ♀, 10.2015 (S.D.G.); ♀, 20.12.2015 (E.S.); ♀, SR, Crane Cafe, 9.02.2017 (J.W.); SRe: ♀, 3.07.2019; Phnom Krom: ♀, 5.10.2013; ♀, 8.05.2015 (E.S.); 8 km south-east of SR, Wat Chedei: ♀, 4.03.2014 (S.D.G.); AW: ♀, 9.03.2016 (Ja.H.); AW, near Tonle Snguol Temple: ♀, 01.2021 (S.W.); WB: ♀, 3.12.2013 (I.L.); ♀, 20.12.2013; ♀, 3.03.2014; ♀, 21.09.2018; WB northern wall: ♀, 4.09.2018; East Baray: ♀, 4.09.2018; Puok: ♀, 3.10.2018; 10 km north-east of SR: ♀, , 6.07.2014 (E.S.); 23 km east of SR: ♀, 01.2021 (S.W.); 40 km wouth-west of SR: ♀, 20.03.2014 (E.S.).

85. *Tholymis tillarga (*Fabricius, 1798)

PS: Sihanoukville: ♀, 22.12.2014 (N.K.). **SR:** SR: ♀, 13.09.2018 (E.S.); ♀, 8.03.2019 (P.F.); SRe: ♀, 10.09.2018; ♂, 28.09.2018 (E.S.); AW, near Tonle Snguol Temple: ♀, 01.2021 (S.W.); East Baray: ♀, 22.07.2016; ♂, 30.07.2016; ♂, 4.09.2018; a lake at Phnom Bok: ♂, 5.09.2018; Puok: ♂♂, 3.10.2018 (E.S.); à Sokhsan Rd: ♀, 17.11.2021 (P.B.T.).

86. *Tramea transmarina eryale* Selys, 1878

SR: SR: ♂, 28.11.2013. (E.N.).

87. *Trithemis aurora* (Burmeister, 1839)

Kam: Toek Chhou area: ♂, 26.04.2015 (G.J.). **KK:** Areng Valley: ♂, 9.04.2014 (K.S.R.). **KS:** PA, Chreav Waterfall, 02.2021 (S.W.). **KTh:** on the way to Preah Khan at Kampong Svay:

♂, 19.11.2014 (E.S.). **Pu:** TW: ♂, ♀, 20.11.2018 (E.S.). **RK:** ♂, 11.2016 (F.H.); NE Cambodia: ♂, 11.2014. **RK**, **MK** or **Kr:** Lumphat Wildlife Sanctuary: ♂, 15.08.2015 (P.B.). **SR:** SR: 24.05.2016 (E.S.).

88. *Trithemis festiva* (Rambur, 1842)

SR: WB: ♂, 26.08.2014; the temple area, 13º24'32" N, 103º59'37" ♀, 12.08.2018. **Pu:** TW: ♂, ♀, 20.11.2018 (E.S.).

89. *Trithemis pallidinervis* (Kirby, 1889)

KK: Chi Phat: ♂, 03.2015 (Jo.H.). **PP:** PP: ♂, 29.12.2013; PP, 4.08.2014: ♂ (K.S.R.). **Pu:** O'Som village: ♂, 9-11.01.2021 (S.W.). **SR:** SR: 27-28.11.2013: ♀ (I.L.); ♂, 16.04.2014 (K.S.R.); ♀, 9.05.2014; SRe: ♂, 21.05.2014; ♂, 8.10.2018 (E.S.); AW: ♀, 4.01.2013 (I.L.); ♂, 02.2021 (S.W.); east wall of WB: ♂, 27.01.2015 (E.S.); Wat Atvea, rice fields: ♀, 20.10.2013; 8 km south-east of SE, Wat Chedei: ♂, 4.03.2014 (S.D.G.); 35 km north-east of SR: ♀, 21.03.2014 (E.S.).

90. *Urothemis signata insignata* Selys, 1872

KK: Chi Phat: ♂, 9-11.01.2021 (S.W.). **SR:** SRe: ♂, 21.05.2014; Phnom Krom: immature ♂, 26.09.2012 (E.S.); AW: 2 ♂♂, 02.2021 (S.W.); East Baray: ♂, 4.09.2018 (E.S.). **Ta:** ♀, 31.08.2014 (J.K.).

91. *Zygonyx iris malayana* Laidlaw, 1902

KS: PA, Chreav Waterfall: ♂, 02.2021 (S.W.). **Pu:** TW: ♂, ♀, 20.11.2018 (E.S.).

Discussion

As follows from the above list, the Cambodian naturalist community provided for the decade 682 photographic observations of 91 species of Odonata, not counting the excluded previously published data. (I also excluded some observations unidentifiable to species but, unfortunately, have not count them but those were fairly few.) Of them, only 176 (26%) observations were of Zygoptera while 506 (74%) were of Anisoptera, but the number of species registered in these suborders was equal, respectively 45 and 46. According to my current unpublished count, for the time being the known fauna of Odonata of Cambodia includes 204 species – 83 Zygoptera and 121 Anisoptera, of which three species are still unpublished and seven were not identified or not described, while the expected fauna according to my estimate would include 288 species. So, for the decade the narturalist community registered only 46% of the 197 known named species of Odonata of Cambodia. Expectedly, the numbers of both observations and species are strongly biased towards lentic species, but the extent of the bias is striking. Such large and predominantly lotic families as Gomphidae and Macromiidae are represented by just one lentic species each! This can be explained by the fact that lentic species are less confined to water and more readily disperse over terrain, and also by the fact that various ponds are frequent where people live and rest, while lotic species demand focused 'hunting' along the overgrown water courses. Another large shortage is of Aeshnidae, represented by just two species, which

are merely difficult to photograph. I would consider 22 of the species registered (24%) as having 'colored wings', that is with dark or colorful wing spots (not counting the frequent just basal spots), or with wings of entirely bright colour. These species comprise 230 observations (*N. fulvia* with 34 observations being the champion), which is 33.7% of the bulk data. Curiously, small size of the most Zygoptera resulted in their representation in only a quarter of observations, yet their species appeared not underrepresented at all (49% of species registered, versus 42% in the known named fauna).

So, the photographic activity of naturalist public appeared not too effective in revealing the fauna of even such spectacular insects as dragonflies and damselflies, as being too much affected by ecological preferences of people themselves.

Although no species new for the Cambodian fauna was registered, this bulk of data was not without quite interesting findings. *L. concinnus* is a new addition to the fauna of Phnom Kulen Mts, earlier summarised by Kosterin & Smith (2020). Kosterin (2020a,b) also summarised the fauna of the lowlands of Siem Reap Province revealed in his focused studies in 2017-2019 (separately for the plains and Lake Tonle Sap banks, and except for Banteay Srei area which was attributed to the Phnom Kulen foothills), which is now became updated with as many as the following 17 species: *L. platystylus, H. biforata, O. octomaculatus, A. occidentale, C. calamineum, C. chaoi, A. guttats, G. subinterrupta, A. insignis, B. sobrina, C. lineata calverti, O. luzonicum, R. obsolescens, R. plutonia, R. triangulare, T. transmarina euryale, T. festiva*. This is not surprising since the Siem Reap Province plains are the main distribution range of the Cambodian naturalists.

All in all, following such communities in common social networks in order to collect data on Odonata fauna seems no longer worth investing time, while efforts should be invested into popularisation of more science oriented but still joyful naturalistic platforms as iNaturalist.

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References

Asahina S. 1961. Odonata from Thailand. Nature & Life of Southern Asia 1: 209-223.

Asahina S. 1981. Records of little or unknown Odonata from Thailand. Tombo 23 (1/2): 3-16.

Asahina S. 1967. A revision of the Asiatic species of the damselflies of the genus *Ceriagrion* (Odonata: Agrionidae). Japanese Journal of Zoology 15: 255–334.

Asahina S. 1987. A list of the Odonata from Thailand. Part XVIII. Corduliidae 2. Kontyû 55 (4): 699–720.

Dow, R.A., Choong, C.Y., Grinang, J., Lupiyaningdyah, P., Ngiam, R.W.J., Kalkman, V.J. 2024. Checklist of the Odonata (Insecta) of Sundaland and Wallacea (Malaysia, Singapore, Brunei, Indonesia and Timor Leste). Zootaxa 5460: 1-122.

Fraser, F.C. 1924. A survey of the Odonate (dragonfly) fauna of Western India with special remarks on the genera *Macromia* and *Idionyx* and descriptions of thirty new species. Records of the Indian Museum 26: 423-522.

Fraser, F.C. 1933. The fauna of British India, including Ceylon and Burma. Odonata. Vol. I. Taylor and Francis, London, 423 pp.

Fraser, F.C. 1936. The fauna of British India, including Ceylon and Burma. Odonata. Vol. III. Taylor and Francis, London, 461 pp.

Hopkins, P. 2024. A first survey of the dragonflies (Odonata) of Siem Pang Wildlife Sanctuary, northeast Cambodia. Cambodian Journal of Natural History 2024 (1): 36-56.

Joshi, S. & Kunte, K. 2014. Dragonflies and damselflies (Insecta: Odonata) of Nagaland, with an addition to the Indian odonate fauna. Journal of Threatened Taxa 6: 6458–6472.

Kosterin, O.E. 2020a. Odonata of the great Lake Tonle Sap of Cambodia, as examined in 2017-2019. International Dragonfly Fund Report 154: 29-98.

Kosterin, O.E. 2020b. Miscellaneous faunal data on Odonata of Cambodia. International Dragonfly Fund Report 154: 185-224.

Kosterin, O.E. & Smith, E. 2020. Odonata of Phnom Kulen Mts, Cambodia: a preliminary checklist. International Dragonfly Fund Report 154. 99-184

Laidlaw, F.F. 1919. A list of the dragonflies recorded from the Indian Empire, with special reference to the collection of the Indian Museum. Part II (continued). The family Agrionidae. B. The legions *Argia* and *Agrion*. Records of the Indian Museum (a journal of Indian zoology) 16: 169–195.

Laidlaw, F.F. 1924. Notes on the Oriental dragonflies of the genus *Aciagrion*. Proceedings of the United States National Museum: 66 1–9.

Lieftinck, M.A. 1931. A revision of genus *Epophthalmia* Burm. (Odonata: Corduliinae). Treubia 13: 21–80.

Tiple, A.D. & Parya, A. 2020. First record of *Epophthalmia frontalis* from Central India (Insecta: Odonata: Macromiidae). Traveaux du Muséum National d'Histoire Naturelle "Grigore Antipa" 63 (2): 127–130.

Yu X., Chen C. & Zhang M. 2023. Integrative taxonomy of *Ceriagrion* species from China (Odonata: Coenagrionidae). Archive of Insect Biochemistry and Physiology 112(4): e22012.

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