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of Phu Quoc National Park, southern Vietnam

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## An updated checklist of dragonflies and damselflies (Insecta: Odonata) of Phu Quoc National Park, southern Vietnam

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### Abstract

A checklist of 93 dragonfly and damselfly species from Phu Quoc Island, southern Vietnam, is provided. It contains 7 species newly recorded to the Island and *Macromia cupricincta* Fraser, 1924 newly recorded for Vietnam. The taxonomic status and occurrences of some species in previous studies are discussed and re-assessed.

**Key words:** Odonata, *Macromia cupricincta*, *Coelliccia kazukoae*, *Amphicnemis valentini*, *Euphaea cyanopogon*, *Brachygonia oculata*, *Lyriothemis mortoni*, Phu Quoc, Vietnam

### Introduction

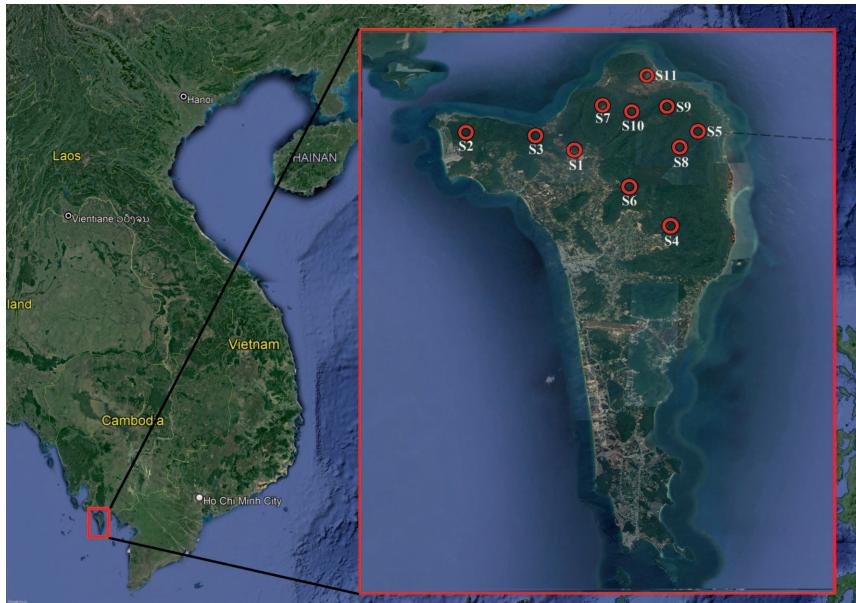
Phu Quoc is one of the largest islands in southern Vietnam with an area of 56,200 hectares. The island lies close to the Ream Peninsula of Cambodia and shares some odonate species that cannot be found in any other places in Vietnam, i.e. *Coelliccia kazukoae* Asahina, 1984, *Amphicnemis valentini* Kosterin & Kompier, 2018, *Euphaea cyanopogon* Hämäläinen, Kosterin & Kompier, 2019, *Brachygonia oculata* (Brauer, 1878) or *Lyriothemis mortoni* Ris, 1919 (Do et al. 2011; Kosterin & Kompier 2017, 2018; Hämäläinen et al. 2019). More than half of the island (31,422 hectares) were declared a National Park in 2001 (<https://thiennhieviet.org.vn/sourcebook/pdf/4%20Mekong%20Delta/Phu%20Quoc.pdf>), which is covered by various habitat types including lowland evergreen forest with the highest mountain (Mount Chua Mount) about 603 m high (Figure 5A, B) as well as coastal sand, off-shore, limestone forests, scrub and anthropogenic habitats. Bui (2008) first published a checklist of Odonata in Phu Quoc with more than 50 species (several of which are misidentified or undetermined). Subsequently, Do et al. (2011) reported 60 species and provided reconfirmation of the identification of some species in Bui (2008). However, the taxonomic status of some species recorded in Do et al. (2011) has been changed as follows:

- *Coelliccia* sp. and *Amphicnemis gracilis* Krüger, 1898 are *Coelliccia kazukoae* Asahina, 1984 and *Amphicnemis valentini* Kosterin & Kompier, 2018, respectively (Kosterin & Kompier 2017, 2018);
- *Euphaea ochracea* Selys, 1859 (or *Euphaea pahyapi* Hämäläinen, 1985 in Phan et al. 2018) was defined as a new species *Euphaea cyanopogon* Hämäläinen, Kosterin & Kompier, 2019 (Hämäläinen et al. 2019);
- Kompier (2022) pointed out that the species identified as *Rhinagrion mima* (Karsch, 1891) is truly *R. viridatum* Fraser, 1938;

- finally, *Prodasineura* sp. is identified as *Prodasineura verticalis* Selys, 1860 (Phan & Ngo 2020).

## Field surveys

In addition to the surveys recorded in Bui (2008), Do et al. (2011) and Kompier (2022) we conducted surveys in March 2018, February 2020, April and June 2022.



**Figure 1: Collecting sites map in Phu Quoc Island.**

### Collecting sites (Fig. 1)

- S1 (10.33446°N, 103.95101°E, 63 m altitude): This is a big swamp on the K7 road to Rach Tram village, located about 5 kilometers from the headquarter of the national park (Fig. 2A, B).
- S2 (10.35228°N, 103.87976°E, 97 m altitude): This site includes several small streams on the K7 road to Rach Tram village. The primary forest is interspersed with shallow watercourses over a compacted substrate (Fig. 2C, D).
- S3 (10.34408°N, 103.92234°E, 21 m altitude): A short canal and small swamp on the K7 road to Rach Tram village (Fig. 3A).
- S4 (10.25194°N, 104.03295°, 85 m altitude): Da Ban streams near Duong Dong Lake. The lower one is an open stream with large rocks, below Duong Dong lake (Fig. 3B). The upper one is another narrow shallow stream flowing within the primary forest (Fig. 3C).

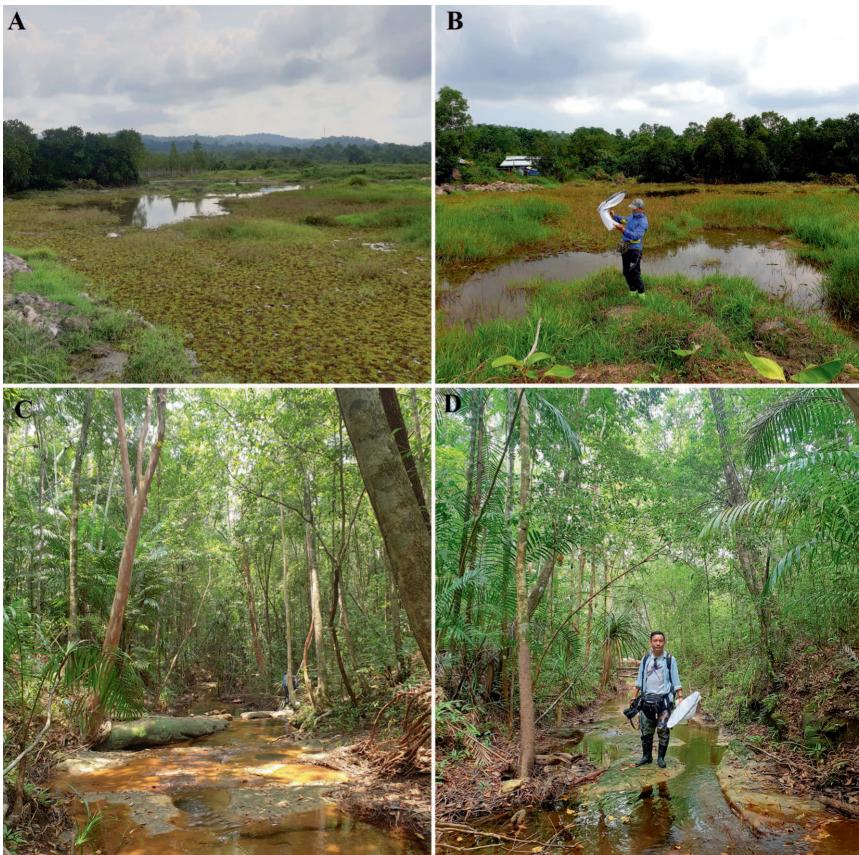


Figure 2: The authors' field work in S1 (A, B) & S2 (C, D).

- S5 (10.34330N, 104.04470E, 26 m altitude): An open stream near the Border Guard Station in the protected areas of the national park with sandy bottom, running along the primary forest (Fig. 3D).
- S6 (10.29310N, 103.98830E, 50 m altitude): Bom stream. This is a short stream that flows through fruit gardens of the local people. The borders of Bom stream were pourished with concrete and equipped with several small cabins to serve tourist parties. The bottom of Bom stream is covered with large stones.
- S7 (10.37640N, 103.98350E, 1 m altitude): Stream along the road to Ganh Dau village. This is a large stream close to the beach with large rocks on a sandy bottom (Figure 3E).
- S8 (10.34330N, 104.04470E, 26 m altitude): Streams near the national park headquarter: We surveyed several open (with large rocks) and small streams (small pebbles, sandy bottom) near the headquarter of the national park (Figure 3F).
- S9 (10.37970N, 104.00780E, 4 m altitude): K7 stream (stream near the K7 road) (Figure 4A).



**Figure 3:** Study sites: (A), S3; (B, C), S4; (D), S5; (E), S7; (F), S8.

- S10 (10.37200N, 103.99850E, 13 m altitude): A small stream under the 2nd bridge (about 1 kilometer from the headquarter of the national park) with sandy bottom (Figure 4B).
- S11: (10.42520N, 104.01290E, 11 m altitude): Several small swamps along the Rach Tram road (Figure 4C).

## Results

In this study, we present a checklist of in total 93 odonate species for Phu Quoc Island based on the list published by Do et al. (2011), the records by Kompiér (2022) of his visits in 2015 and 2016 and the results from four surveys of the authors (Tab. 1). During our surveys, we added seven taxa that had not been previously recorded for Phu Quoc Island including *Agiocnemis femina* (Brauer, 1868), *Argiocnemis rubescens* Selys, 1877, *Aciagrion pallidum* Selys, 1891, *Macromia cupricincta* Fraser, 1924, *Macromidia* sp., *Burmagomphus* sp. and *Orientogomphus circularis* (Selys, 1894). Besides, *Macromia cupricincta* is also a new record for the Vietnamese fauna. The taxonomic status of some species listed in previous publications are revised and removed from the species list of Phu Quoc:



Figure 4: Study sites: (A), S9; (B), S10; (C), S11.



Figure 5: Field survey in Phu Quoc Island. (A) Mr. Phu on the top of Chua Mount; (B) forest of Phu Quoc; (C, D) Dr. Phan at the headquarter of the national park and taking a photo on S7.

*Ceriagrion aurantiacum* and *Copera marginipes* in Do et al. (2011) are misidentifications and should be *Ceriagrion calamineum* Lieftinck, 1951 and *Copera vittata*, respectively (Kompier, 2022); the identification of *Pseudothemis zonata* in Bui (2008) and Do et al. (2011) is corrected as *P. jorina* which occurs everywhere on the island.

**Tab. 1: List of Odonata based on published, re-assessed and new records of the authors up to 2022 (Some of the species are figured in Appendix 1 and 2).**

|    | Species  | Examination sites with findings | References   |
|----|--|---------------------------------|--|
|    | <b>Zygoptera</b>   |                                 |  |
|    | <b>Argiolestidae</b>   |                                 |  |
| 1  | <i>Podolestes coomansi</i> Lieftinck, 1940                     |                                 | Kompier (2022)                                       |
|    | <b>Calopterygidae</b>  |                                 |  |
| 2  | <i>Neurobasis chinensis</i> (Linnaeus, 1758)                   |                                 | Do et al. (2011)                                     |
| 3  | <i>Vestalis gracilis</i> (Rambur, 1842)                        | S2, S3, S5, S6, S8, S9          | Do et al. (2011); Kompier (2022); this study         |
|    | <b>Chlorocyphidae</b>  |                                 |  |
| 4  | <i>Libellago hyalina</i> (Selys, 1859)                         | S3, S7, S9                      | Do et al. (2011); Kompier (2022); this study         |
| 5  | <i>Heliocypha biforata</i> (Selys, 1859)                       | S2, S4, S5, S7, S9              | Do et al. (2011); Kompier (2022); this study         |
|    | <b>Euphaeidae</b>  |                                 |  |
| 6  | <i>Euphaea cyanopogon</i> Hämäläinen, Kosterin & Kompier, 2019 | S2, S4, S6, S7, S9              | Hämäläinen et al. (2019); Kompier (2022); this study |
|    | <b>Coenagrionidae</b>  |                                 |  |
| 7  | <i>Aciagrion borneense</i> Ris, 1911                           |                                 | Do et al. (2011); Kompier (2022)                     |
| 8  | <i>Aciagrion pallidum</i> Selys, 1891                          | S4                              | This study   |
| 9  | <i>Agriocnemis minima</i> Selys, 1877                          | S4                              | Kompier (2022); this study                           |
| 10 | <i>Agriocnemis pygmaea</i> (Rambur, 1842)                      |                                 | Do et al. (2011); Kompier (2022)                     |
| 11 | <i>Agriocnemis femina</i> (Brauer, 1868)                       | S4                              | This study   |
| 12 | <i>Agriocnemis nana</i> (Laidlaw, 1914)                        |                                 | Kompier (2022)                                       |
| 13 | <i>Amphicnemis valentini</i> Kosterin & Kompier, 2017          |                                 | Kosterin & Kompier (2017); Kompier (2022);           |
| 14 | <i>Archibasis viola</i> Lieftinck, 1948                        | S4–6, S8, S9                    | Do et al. (2011); Kompier (2022); this study         |
| 15 | <i>Argiocnemis rubescens</i> Selys, 1877                       | S6                              | This study   |
| 16 | <i>Ceriagrion cerinorubellum</i> (Brauer, 1865)                | S1–8                            | Do et al. (2011); Kompier (2022); this study         |
| 17 | <i>Ceriagrion malaisei</i> Schmidt, 1964                       |                                 | Kompier (2022)                                       |
| 18 | <i>Ceriagrion calamineum</i> Lieftinck, 1951                   | S4                              | Kompier (2022); this study                           |
| 19 | <i>Ischnura senegalensis</i> (Rambur, 1842)                    | S4                              | Do et al. (2011); Kompier (2022); this study         |
| 20 | <i>Mortonagrion falcatum</i> Lieftinck, 1934                   |                                 | Kompier (2022)                                       |

|                          | Species  | Examination sites with findings | References                                    |
|--------------------------|--|---------------------------------|---|
| 21                       | <i>Paracercion calamorum</i> Ris, 1916           |                                 | Kompier (2022)                                |
| 22                       | <i>Pseudagrion australasiae</i> Selys, 1876      |                                 | Kompier (2022)                                |
| 23                       | <i>Pseudagrion microcephalum</i> (Rambur, 1842)  | S4, S5                          | Do et al. (2011); Kompier (2022); this study  |
| 24                       | <i>Pseudagrion pruinatum</i> (Burmeister, 1839)  |                                 | Do et al. (2011); Kompier (2022)              |
| 25                       | <i>Pseudagrion rubriceps</i> Selys, 1876         | S8                              | Do et al. (2011); Kompier (2022); this study  |
| 26                       | <i>Pseudagrion williamsoni</i> Fraser, 1922      | S5                              | Do et al. (2011); Kompier (2022); this study  |
| <b>Lestidae</b>          |  |                                 |   |
| 27                       | <i>Lestes elatus</i> Hagen in Selys, 1862        |                                 | Do et al. (2011)                              |
| 28                       | <i>Lestes praemorsus</i> Hagen in Selys, 1862    |                                 | Kompier (2022)                                |
| 29                       | <i>Platylestes platystylus</i> (Rambur, 1842)    |                                 | Kompier (2022)                                |
| <b>Megapodagrionidae</b> |  |                                 |   |
| 30                       | <i>Rhinagrion viridatum</i> Fraser, 1938         | S2, S4, S7, S9                  | Do et al. (2011); Kompier (2022); this study  |
| <b>Platycnemidae</b>     |  |                                 |   |
| 31                       | <i>Coeliccia kazukoae</i> Asahina, 1984          | S4                              | Kosterin & Kompier (2018); Kompier (2022)     |
| 32                       | <i>Coeliccia yamasakii</i> Asahina, 1984         | S4                              | Do et al. (2011); Kompier (2022); this study  |
| 33                       | <i>Copera vittata</i> (Selys, 1863)              | S6                              | Kompier (2022); this study                    |
| 34                       | <i>Onychargia atrocyana</i> Selys, 1865          |                                 | Do et al. (2011); Kompier (2022)              |
| 35                       | <i>Pseudocopera ciliata</i> (Selys, 1863)        |                                 | Kompier (2022)                                |
| 36                       | <i>Prodasineura verticalis</i> Selys, 1860       | S4, S7–9                        | Phan & Ngo (2020); Kompier (2022); this study |
| <b>Anisoptera</b>        |  |                                 |   |
| <b>Aeshnidae</b>         |  |                                 |   |
| 37                       | <i>Anax guttatus guttatus</i> (Burmeister, 1839) |                                 | Do et al. (2011); Kompier (2022)              |
| 38                       | <i>Gynacantha basiguttata</i> Selys, 1882        |                                 | Kompier (2022)                                |
| 39                       | <i>Gynacantha bayadera</i> Selys, 1891           |                                 | Kompier (2022)                                |
| 40                       | <i>Gynacantha subinterrupta</i> Rambur, 1842     |                                 | Kompier (2022)                                |
| 41                       | <i>Heliaeschna crassa</i> Krüger, 1899           |                                 | Kompier (2022)                                |
| <b>Corduliidae</b>       |  |                                 |   |
| 42                       | <i>Idionyx</i> sp.                               | S4, S6                          | Do et al. (2011); this study                  |
| 43                       | <i>Macromia cupricincta</i> Fraser, 1924         | S6                              | This study                                    |
| <b>Synthemistidae</b>    |  |                                 |   |
| 44                       | <i>Macromidia</i> sp.                            | S6                              | This study                                    |

|    | Species   | Examination sites with findings | References                                   |
|----|---|---------------------------------|--|
|    | <b>Gomphidae</b>                                    |                                 |  |
| 45 | <i>Burmagomphus</i> sp.                             | S10                             | Do et al. (2011); this study                 |
| 46 | <i>Ictinogomphus decoratus</i> (Selys, 1854)        | S6                              | Kompier (2022); this study                   |
| 47 | <i>Orientogomphus circularis</i> (Selys, 1894)      | S10                             | This study                                   |
| 48 | <i>Paragomphus capricornis</i> (Foerster, 1914)     | S4                              | Kompier (2022); this study                   |
|    | <b>Macromiidae</b>                                  |                                 |  |
| 49 | <i>Epophthalmia frontalis frontalis</i> Selys, 1871 | S6                              | Kompier (2022); this study                   |
| 50 | <i>Epophthalmia vittigera</i> (Rambur, 1842)        |                                 | Kompier (2022)                               |
|    | <b>Libellulidae</b>                                 |                                 |  |
| 51 | <i>Acisoma panorpoides</i> Rambur, 1842             | S1                              | Do et al. (2011); Kompier (2022); this study |
| 52 | <i>Agrionoptera insignis</i> (Rambur, 1842)         |                                 | Kompier (2022)                               |
| 53 | <i>Brachydiplax chalybea chalybea</i> Brauer, 1868  | S1                              | Kompier (2022); this study                   |
| 54 | <i>Brachydiplax sobrina</i> (Rambur, 1842)          | S1                              | Kompier (2022); this study                   |
| 55 | <i>Brachygonia oculata</i> (Brauer, 1878)           | S2                              | Do et al. (2011); Kompier (2022); this study |
| 56 | <i>Brachythemis contaminata</i> (Fabricius, 1793)   | S1                              | Do et al. (2011); Kompier (2022); this study |
| 57 | <i>Cratilla lineata</i> (Brauer, 1878)              |                                 | Do et al. (2011); Kompier (2022)             |
| 58 | <i>Crocothemis servilia</i> (Drury, 1773)           | S1                              | Do et al. (2011); Kompier (2022); this study |
| 59 | <i>Diplacodes nebulosa</i> (Fabricius, 1793)        | S1, S4, S11                     | Do et al. (2011); Kompier (2022); this study |
| 60 | <i>Diplacodes trivialis</i> (Rambur, 1842)          | S1                              | Do et al. (2011); Kompier (2022); this study |
| 61 | <i>Hydrobasileus croceus</i> (Brauer, 1867)         |                                 | Do et al. (2011); Kompier (2022)             |
| 62 | <i>Indothemis limbata</i> (Selys, 1891)             | S1                              | Kompier (2022); this study                   |
| 53 | <i>Lathrecista asiatica</i> (Fabricius, 1798)       | S1, S4                          | Do et al. (2011); Kompier (2022); this study |
| 64 | <i>Lyriothemis mortoni</i> Ris, 1919                |                                 | Do et al. (2011); Kompier (2022)             |
| 65 | <i>Nannophya pygmaea</i> Rambur, 1842               | S3                              | Do et al. (2011); Kompier (2022); this study |
| 66 | <i>Neurothemis fluctuans</i> (Fabricius, 1793)      | S1, S3                          | Do et al. (2011); Kompier (2022); this study |
| 67 | <i>Neurothemis fulvia</i> (Drury, 1773)             | S1, S2, S3, S5, S6–9            | Do et al. (2011); Kompier (2022); this study |
| 68 | <i>Neurothemis intermedia</i> (Rambur, 1842)        | S8                              | Kompier (2022); this study                   |
| 69 | <i>Neurothemis tullia</i> (Drury, 1773)             | S1, S4                          | Do et al. (2011); Kompier (2022); this study |

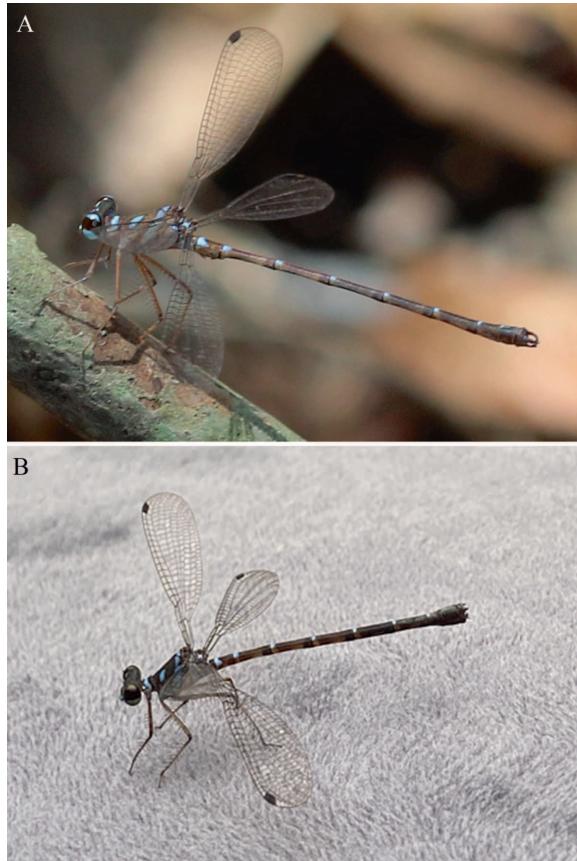
|    | Species  | Examination sites with findings | References                                   |
|----|--|---------------------------------|--|
| 70 | <i>Onychothemis testacea</i> Laidlaw, 1902         | S5                              | Do et al. (2011); this study                 |
| 71 | <i>Orchithemis pulcherrima</i> Brauer, 1878        | S4, S5, S7–9                    | Do et al. (2011); Kompier (2022); this study |
| 72 | <i>Orthetrum chrysostigma</i> (Selys, 1891)        | S1                              | Do et al. (2011); Kompier (2022); this study |
| 73 | <i>Orthetrum glaucum</i> (Brauer, 1865)            | S3, S4                          | Do et al. (2011); this study                 |
| 74 | <i>Orthetrum pruinosum</i> Burmeister, 1839        |                                 | Kompier (2022)                               |
| 75 | <i>Orthetrum sabina</i> (Drury, 1770)              | S1                              | Do et al. (2011); Kompier (2022); this study |
| 76 | <i>Pantala flavescens</i> (Fabricius, 1798)        | S1                              | Do et al. (2011); Kompier (2022); this study |
| 77 | <i>Potamarcha congener</i> (Rambur, 1842)          | S1, S10, S11                    | Do et al. (2011); Kompier (2022); this study |
| 78 | <i>Pseudothemis jorina</i> Förster, 1904           |                                 | Do et al. (2011); Kompier (2022); this study |
| 79 | <i>Rhodothemis rufa</i> Rambur, 1842               |                                 | Kompier (2022)                               |
| 80 | <i>Rhyothemis atterrima</i> Selys, 1891            |                                 | Kompier (2022)                               |
| 81 | <i>Rhyothemis obsoletescens</i> Kirby, 1889        | S3, S8, S9                      | Do et al. (2011); Kompier (2022); this study |
| 82 | <i>Rhyothemis phyllis</i> (Sulzer, 1776)           | S1, S5                          | Do et al. (2011); Kompier (2022); this study |
| 83 | <i>Rhyothemis triangularis</i> Kirby, 1889         | S1                              | Do et al. (2011); Kompier (2022); this study |
| 84 | <i>Rhyothemis variegata</i> (Linnaeus, 1763)       | S1                              | Do et al. (2011); Kompier (2022); this study |
| 85 | <i>Tetrathemis irregularis hyalina</i> Kirby, 1889 | S6                              | Do et al. (2011); Kompier (2022); this study |
| 86 | <i>Tholymis tillarga</i> (Fabricius, 1798)         | S2                              | Do et al. (2011); Kompier (2022); this study |
| 87 | <i>Tramea transmarina euryale</i> Brauer, 1867     | S6                              | Kompier (2022); This study                   |
| 88 | <i>Trithemis aurora</i> (Burmeister, 1839)         | S1–10                           | Do et al. (2011); Kompier (2022); this study |
| 89 | <i>Trithemis festiva</i> (Rambur, 1842)            | S1–3                            | Do et al. (2011); Kompier (2022); this study |
| 90 | <i>Trithemis pallidinervis</i> (Kirby, 1889)       |                                 | Do et al. (2011); Kompier (2022)             |
| 91 | <i>Urothemis signata</i> (Rambur, 1842)            |                                 | Do et al. (2011); Kompier (2022)             |
| 92 | <i>Zygonyx iris</i> Selys, 1869                    | S4                              | Do et al. (2011); Kompier (2022); this study |
| 93 | <i>Zyxomma petiolatum</i> Rambur, 1842             |                                 | Kompier (2022)                               |

### Additional notes on odonates of Phu Quoc National Park

*Podolestes coomansi* Lieftinck, 1940

(Figure 6A-B)

**Notes.** The record of this species in Phu Quoc was published by Kompier (2022) based on a photo of a male by Dutch naturalist Floris Brekelmans in April 2016 (Figure 6A). It should be noted here that a photo from U Minh Ha National Park (Ca Mau Province, South Vietnam), published on inaturalist.org (<https://www.inaturalist.org/observations/12646147-4?fbclid=IwAR2DDWlwjfJZdT SyExlla1hbHVjim2fYQprwF5qEulf97SWbol4HF5WPyTE>) is probably *P. coomansi* (Figure 6B) and should be confirmed in the future.



**Figure 5:** *Podolestes coomansi*, (A), male, courtesy of Floris Brekelmans (rearranged from Kompier 2022); (B), a female, courtesy of Tran Van Thoi in U Minh Ha National Park, Ca Mau Province on July 16, 2022 (rearranged from inaturalist.org).

*Argiocnemis rubescens* Selys, 1877

(Figure 7A-B)

**Notes.** This is a very common species that is distributed throughout Vietnam but was recorded on Phu Quoc for the first time.

*Agriocnemis femina* (Brauer, 1868)

(Figure 7C)

**Notes.** Although this species is widespread everywhere in Vietnam, it is certainly rare on the Island and was observed (in S4) in April 2020 for the first time.

*Aciagrion pallidum* Selys, 1891

(Figure 7D-E)

Specimen examined: 1 ♀, S4, 07.03.2018, To Van Quang leg.

**Notes.** New record to Phu Quoc. The female specimen on Phu Quoc is similar to other specimens in Vietnam known to us by having a yellowish body, a head with blue postocular spots and bluish stripes on the synthorax (Figure 7D). Appendages are yellowish, the cerci shorter than S10 and blunt apically (Figure 7E).



**Figure 7: Coenagrionidae species in Phu Quoc. (A, B), male and an immature female of *Argiocnemis rubescens*; (C), *Agriocnemis femina*, male; (D, E), head & thorax and abdominal tip of *Aciagrion pallidum*, female.**

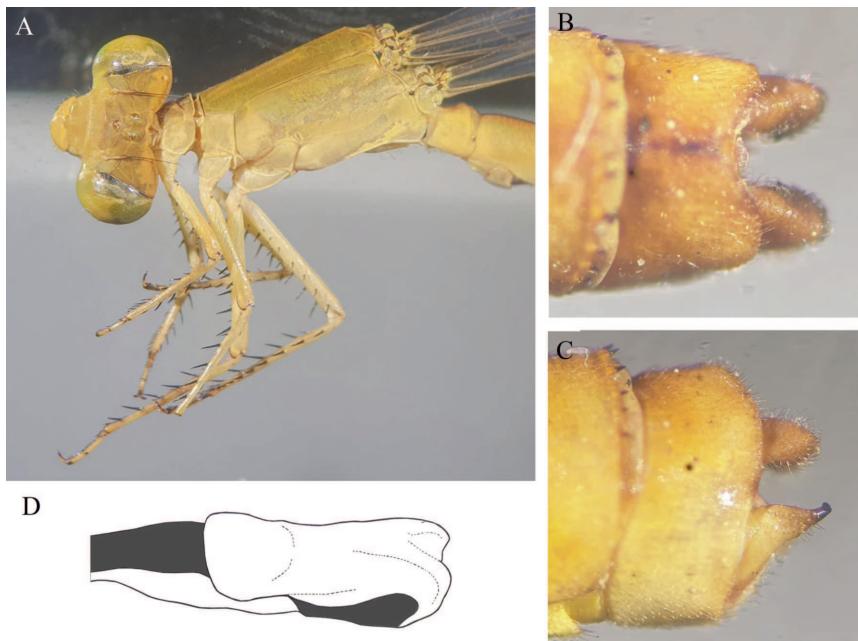
*Ceriagrion calamineum* Lieftinck, 1951

(Figure 8A-D)

Specimen examined: 1 ♂, S4, 07.03.2018, To Van Quang leg.

**Notes.** Bui (2008) and Do et al. (2011) recorded *Ceriagrion aurantiacum* on Phu Quoc but, as already pointed out by Kompier (2022), this is a misidentification and in reality *C. calamineum*, which is quite similar to *C. aurantiacum* in body coloration and structure of the appendages (Figure 8A-C). They can be separated based on the shape of the genital ligula: it is structurally simple in *C. calamineum* (Figure 8D), but complex with

three-lobes apically and two curved lateral flagella in *C. aurantiacum* (for instance, see Figure 6E-F in Phan & Dinh 2016). Therefore, the occurrence of *Ceriagrion aurantiacum* should be removed from the checklist of odonates of Phu Quoc Island.



**Figure 8:** Structure of *Ceriagrion calamineum*, male. (A), head and thorax, lateral view; (B, C), appendages in dorsal and lateral view; (D), genital ligula, ventral view.

#### *Copera vittata* (Selys, 1863)

(Figure 9)

**Notes.** Do et al. (2011) misidentified this species as *Copera marginipes* (Rambur, 1842). In fact it must be *Copera vittata*. We have never seen *Copera marginipes* in Phu Quoc although this species is very common throughout Vietnam. *Copera marginipes* should therefore be dropped from the list of odonates on Phu Quoc.

#### *Burmagomphus* sp.

(Figure 10A-C)

Specimen examined: 1 ♀, S10, 23.06.2022, Q.P. Ngo leg.

**Notes.** An additional species to Phu Quoc. Do et al. (2011) presumed the “*Microgomphus* sp.” in Bui (2008) is probably a *Burmagomphus* species. We confirmed the occurrence of a *Burmagomphus* species in Phu Quoc, but, unfortunately, we could not identify the species since we collected only one female.



Figure 9. A male of *Copera vittata* in nature.

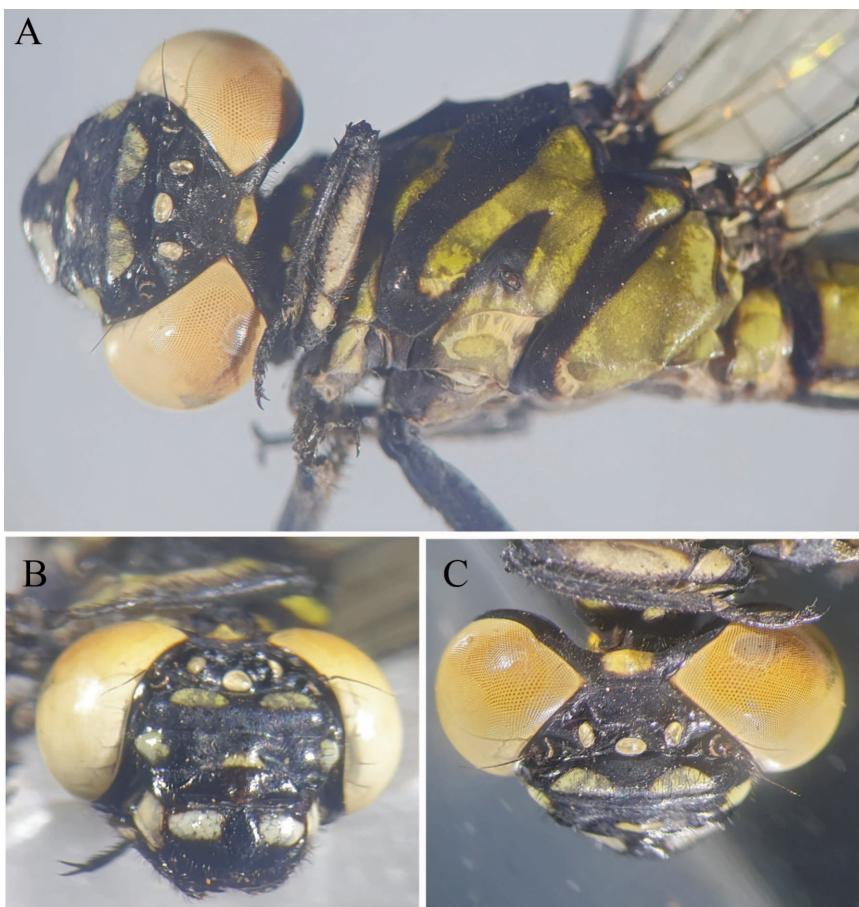


Figure 10. *Burmagomphus* sp., female. (A) Head and thorax, lateral view; (B, C), Head in frontal and dorsal view.

*Orientogomphus circularis* (Selys, 1894)

(Figure 11A-D)

Specimen examined: 2 ♂♂, S10, 23.6.2022, Q.P. Ngo leg.

**Notes.** An additional species to Phu Quoc. We primarily identified the specimens from Phu Quoc as *O. circularis* because their body coloration and structures (Figure 11A-D) well matched the illustrations of Thai species in Asahina (1986: Figures 67–73). *O. circularis* is widespread in Vietnam and elsewhere in SE Asia, occurring for instance also in Laos, Myanmar, and Thailand. We found no differences between specimens from the north and south of Vietnam, and consider these all *O. circularis*, although *O. naninus* (Förster, 1905) has been described from “Tonkin”, which is modern-day northern Vietnam. We consider it likely, pending further study, that *O. naninus* is a junior synonym of *O. circularis*.



Figure 11. *Orientogomphus circularis*, male. (A), Head and thorax, lateral view; (B, C), appendages in dorsal and lateral view; (D), Genitalia accessory, lateral view.

*Macromidia* sp.

(Figure 12A)

**Notes.** This is the first record of a *Macromidia* species on Phu Quoc. We saw only one female in S6 (Figure 12A) and were unable to collect it.

*Macromia cupricincta* Fraser, 1924

(Figure 12B-D)

Specimen examined: 4 ♂♂, 1 ♀, S6, 23.06.2022, Q.T. Phan &amp; Q.P. Ngo leg.

**Notes.** New record for the Vietnamese fauna. This species has also been recorded in Bac Kan, Gia Lai and Lam Dong Provinces by Tom Kompier (pers. comm.).



**Figure 12.** Macromiidae species. (A), *Macromidia* sp., a female in nature; (B-D), appendages and accessory genitalia of *Macromia cupricincta*, male.

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Appendix 1. Some damselflies (Zygoptera) in Phu Quoc.



**Appendix 2. Some dragonflies (Anisoptera) in Phu Quoc.**

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