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**Previously unpublished Odonata records from Sarawak, Borneo, part VI:
Miri Division including checklists for Niah, Lambir Hills,
Loagan Bunut and Pulong Tau National Parks**

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Abstract

Records of Odonata made from 2005 to 2020 in Miri Division in Sarawak are presented, including records from Lambir Hills, Loagan Bunut, Niah and Pulong Tau National Parks. Primary types of Odonata originating from Miri Division are listed. Surveys of more than one day duration in Miri Division and covered here are tabulated with the funding source where appropriate; four of the surveys covered here were funded by the International Dragonfly Fund. One hundred and eighty-eight species are listed based on surveys made by the authors, of which *Macromia jucunda* Lieftinck, 1955, had not been recorded from Borneo before, *Burmagomphus arthuri* Lieftinck, 1953 is a new record for Miri Division

and *Camacinia gigantea* (Brauer, 1867) has only been recorded from the Division recently with the only published record in a difficult to access publication (Choong (2020)). At least 48 more of the species listed were recorded from Miri Division for the first time in surveys covered in this report, although the records have been published (in most cases with no details beyond division and district in Dow (2021)) before. Two forms of *Xiphagrion cyanomelas* Selys, 1876 are recorded and the likelihood that they represent different species is discussed. A possibly new, large sized, species of *Macromia* allied to *M. westwoodii* Selys, 1874 is recorded and discussed. Other notable records not published with details before include *Rhinocypha stygia* Förster, 1897, *Rhinoneura caerulea* Kimmins, 1936, *Dysphaea lugens* (Selys, 1873), *Euphaea ameeke* van Tol & Norma-Rashid, 1995, *Euphaea basalis* (Laidlaw, 1915), *Amphicnemis* new sp. cf *mariae* Lieftinck, 1940 (previously recorded from Usun Apau National Park), *Anaciaeschna jaspidea* (Burmeister, 1839), *Heliaeschna uninervulata* Martin, 1909, *Borneogomphus* sp., *Heliogomphus borneensis* Lieftinck, 1964, *Ictinogomphus acutus* (Laidlaw, 1914), *Chlorogomphus* sp., *Macromia corycia* Laidlaw, 1922, *Idionyx montana* Karsch, 1891, *Hylaeothemis clementia* Ris, 1909, *Orchithemis xanthosoma* Laidlaw, 1911, *Rhyothemis fulgens* Kirby, 1889, *Rhyothemis regia* (Brauer, 1867), *Tetrathemis* sp. cf *platyptera* Selys, 1878, *Tramea phaeoneura* Lieftinck, 1953 and *Tramea* sp. cf *virginia* (Rambur, 1842). The habitat preferences of *Dysphaea lugens* are discussed. A male-male tandem of *Coeliccia nigrohamata* Laidlaw, 1918 is reported. The somewhat peculiar distribution of *Argiocnemis rubescens rubeola* Selys, 1877 and *Pseudothemis jorina* Förster, 1904 in Sarawak is discussed. Activity of the apparently normally crepuscular *Heliaeschna uninervulata* in the middle of the day is reported. An interesting morphological detail of some female *Chlorogomphus* from Sarawak is discussed. The likelihood that *Macromia corycia* is a junior synonym of *M. gerstaeckeri* Krüger, 1899 is discussed. The possibility that the range of *Rhyothemis regia* is expanding in Sarawak is remarked upon. The identity of *Tramea* sp. cf *virginia* is discussed. With the records presented here at least 222 species of Odonata are known from Miri Division and with the addition of *Macromia jucunda* to the known fauna, 309 species have now been recorded from Sarawak. More detailed specimen records are given in Appendix 1 and a revised checklist of Odonata from Lambir Hills National Park and the first checklists from Loagan Bunut, Niah and Pulong Tau National Parks are given in Appendix 2.

Key words: Malaysia, Borneo, Sarawak, Miri Division, Odonata, new records, checklists

Introduction

This paper is the sixth of a series of publications in which we hope to list all the Odonata records made by or involving the authors in Sarawak since 2005 and which have not previously been published and which are not scheduled to be published elsewhere. In this paper we present records from Miri Division of Sarawak, made up to 2020.

Miri Division, with an area of approximately 26,777km², is the second largest administrative division of Sarawak. The division is also historically one of the better studied areas for Odonata in Sarawak (this is reflected in the large number of primary types of odonate species that originate from the Division, see Table 1), thanks in part to a number

of expeditions organised by the Sarawak Museum in the early part of the last century. Records of Odonata from locations in Miri Division can be found in: Asahina (1966, 1986), Butler (2012), Butler & Orr (2013), Butler et al. (2016), Cowley 1937, Dow (2004, 2005, 2006, 2010a, 2010b, 2011, 2013, 2014a, 2014b, 2016, 2017, 2020, 2021a), Dow, Choong & Orr 2007, Dow, Hämäläinen & Stokvis (2015), Dow & Ngiam (2015), Dow & Orr (2012a, 2012b), Dow, Phan & Choong (2020), Dow & Morris (2021), Dow & Price (2020), Dow & Reels (2008, 2009, 2010, 2011), Dow, Reels & Butler (2013), Dow, Reels & Ngiam (2015), Dow, Stokvis & Ngiam (2017), Grinang & Nyanti (2007), Hämäläinen, Dow & Stokvis (2015), Hincks (1930), Kalkman & Villanueva (2011), Karsch (1900), Kimmins (1936), Laidlaw (1913, 1914, 1915, 1918, 1920, 1922, 1931, 1932), Lieftinck (1937, 1948, 1949, 1954, 1965, 1968), Matsuki & Kitagawa (1992, 1993), Orr & Dow (2016), Orr & Hämäläinen (2013), Reels & Dow (2006), Ris (1909, 1919), Schmidt (1934), Seehausen & Dow (2016), Steinhoff (2015), Steinhoff et al. (2016, 2019), van Tol & Norma-Rashid (1995). The primary types of 29 species of Odonata originate from Miri Division, these are listed in Table 1. It should be noted that throughout this publication, as in Dow et al. (2021) and for the same reasons, we have listed families of Odonata in an order now considered to be taxonomically incorrect; however we have listed *Bornargiolestes* Kim-

Table 1: Primary types of Odonata species collected in Miri Division.

Species	Notes
<i>Drepanosticta dentifera</i> Kimmins, 1936	Holotype
<i>Drepanosticta dulitensis</i> Kimmins, 1936	Holotype
<i>Drepanosticta forficula</i> Kimmins, 1936	Holotype
<i>Drepanosticta simuni</i> Dow & Orr, 2012	Holotype
<i>Protosticta joepani</i> Dow, Phan & Choong, 2020	Holotype
<i>Telosticta berawan</i> Dow & Orr, 2012	Holotype
<i>Telosticta dayak</i> Dow & Orr, 2012	Holotype
<i>Telosticta longigaster</i> Dow & Orr, 2012	Holotype
<i>Telosticta ulubaram</i> Dow & Orr, 2012	Holotype
<i>Vestalis atrophala</i> Lieftinck, 1965	Holotype
<i>Rhinocypha aurofulgens</i> Laidlaw, 1931	The type series is from Lio Mato in Miri Division, but no type was specified by Laidlaw (1931) and no lectotype has been designated, so that all are syntypes. The current whereabouts of the type series is unclear, possibly one or two of the four specimens are in the Natural History Museum in London.
<i>Rhinocypha cognata</i> Kimmins, 1936	Lectotype, currently considered a junior synonym of <i>R. stygia</i> Förster, 1897
<i>Rhinoneura caerulea</i> Kimmins, 1936	Holotype
<i>Devadatta aran</i> Dow, Hämäläinen & Stokvis, 2015	Holotype
<i>Dysphaea ulu</i> Hämäläinen, Dow & Stokvis, 2015	Holotype
<i>Bornargiolestes fuscus</i> Dow, 2014	Holotype
<i>Bornargiolestes nigra</i> Kimmins, 1936	Holotype
<i>Coeliccia campioni</i> Laidlaw, 1918	Holotype
<i>Coeliccia kenyah</i> Dow, 2010	Holotype
<i>Coeliccia macrostigma</i> Laidlaw, 1918	Holotype
<i>Coeliccia roberti</i> Dow, 2020	Holotype
<i>Prodasineura hosei</i> (Laidlaw, 1913)	Holotype
<i>Ictinogomphus acutus</i> (Laidlaw, 1914)	Holotype
<i>Leptogomphus sii</i> Dow, Stokvis & Ngiam, 2017	Holotype
<i>Onychogomphus marjanmatoki</i> Dow, 2014	Holotype
<i>Macromia corycia</i> Laidlaw, 1922	Holotype
<i>Macromia cydippe</i> Laidlaw, 1922	Holotype
<i>Chalybeothemis pruinosa</i> Dow, Choong & Orr, 2007	Holotype
<i>Orthetrum borneense</i> Kimmins, 1936	Holotype
<i>Tyriobapta kuekenthali</i> (Karsch, 1900)	Holotype

mins, 1936 under Rhipidolestidae (while retaining the same reservations over this mentioned in Dow et al. (2021)).

We have done a considerable amount of work in the division since 2005, which has fed into many taxonomic publications (see above and again reflected in the number of primary types originating from the division) but relatively few of the purely faunistic results have been published until now. Dow (2021a) lists 216 species, corrected to 218 in Dow

Table 2: Dates, locations and authors present for the main sampling periods included in this report, with funding source where appropriate. IDF – International Dragonfly Fund; MBZ – Mohamed bin Zayed Species Conservation Fund; WDA – Worldwide Dragonfly Association.

Location	Dates on which collecting carried out	Funding source where applicable	Author's present
Kelabit Highlands	28 th May-6 th April 2005		RD, GR
Niah NP	8 th -9 th May 2005		RD, GR
Lambir Hills NP	11 th -16 th May 2005		RD, GR
Kelabit Highlands	17 th -20 th May 2005		RD
Lambir Hills NP	31 st Jan-3 rd Feb 2006		RD, GR
Kelabit Highlands including Pulong Tau NP	14 th March-22 nd March 2006		RD
Loagan Bunut NP	2 nd -8 th April 2006		RD, GR
Upper Baram (various locations)	11 th -21 st Dec 2007	WDA	RD, GR
Gunung Kalulong and Lio Matu	6 th -13 th Oct 2009		RD
Gunung Kalulong area	14 th -21 st July 2010		RD
Lambir Hills NP	21 st -24 th April 2011		RD, SB
Marudi area	4 th -11 th Sept 2011		RD, RN
Niah NP	7 th -9 th Feb 2012		SB
Kelabit Highlands including Pulong Tau NP	6 th -18 th April 2012	MBZ	RD
Loagan Bunut NP	7 th -13 th Jan 2015	MBZ	RD
Sungai Lamah	7 th -11 th Feb 2015		RD
Long Terawan area	16 th -18 th June 2015		RD, JU
Pulong Tau NP	8 th -10 th Nov 2016	IDF	PS
Long Banga area	22 nd -31 st Aug 2016	Long Banga Scientific Expedition organized by Sarawak Forestry Department	CC
Tama Abu FR	15 th -24 th Aug 2017	Expedition organised by Sarawak Forest Department, RDs participation funded by the Sarawak Museum Campus Project	RD, JG, YN
Uma Bawang area	1 st -6 th June 2019	IDF	RD
Gerenai FMU and adjacent areas	17 th -29 th Feb 2020	MBZ	RD
Long Seridan area	4 th -9 th Oct 2020	IDF	RD
Uma Bawang area	13 th -18 th Oct 2020	IDF	RD

(2021b), from Miri Division (based on data up to early April 2019), the largest number of species recorded from any of Sarawak's administrative divisions (also see the discussion here). Many of the species (at least 48) now known from Miri Division were found there for the first time in the surveys reported on here and although almost all species recorded prior to April 2019 are listed from the division in Dow (2021a, 2021b) no details beyond district were given, so that details have only been available for material used in taxonomic publications until now. The large number of species occurring in the division is not only due to its size but also the fact that every type of habitat that supports Odonata in Sarawak is present in the division, from coastal formations and low land peat swamp forest to upper montane forest. Sampling trips in Miri Division that were more than day trips and with one or more of the authors present with records included here are listed in Table 2, along with the authors present, dates and (where applicable) the sources of all or part of the funding. It should be noted that the Odonatological results of the expeditions to the Long Banga area in 2016 and the Tama Abu Forest Reserve in 2017 listed below have also been published in Choong (2020) and Dow (2019) respectively, but these expedition proceedings appear to be difficult to get and the authors have not yet been provided with copies of the published versions of their papers.

The Baram River and its tributaries dominate Miri Division, the majority of the division is within the Baram drainage. Some parts of the division are often referred to in terms of the Baram, for instance the upper Baram and the mid Baram. However these terms are not very well defined and opinions appear to differ as to the exact extent of the area included under each. Some of the non-protected locations included here were only sampled during brief stops while travelling to some other location, others have been subjected to a much greater collecting effort. For instance Gunung Kalulong and its surrounds (location M18 below), first visited by some of us (RD and GR) for a few days in December 2007, was later visited for longer periods by RD in 2009 and 2010. On the other hand a pond by the highway between Bintulu and Miri (location M1 below) was only sampled briefly in 2005 by RD and GR while driving from Bintulu to Niah National Park. A few locations were not visited by any of the authors, specimens were collected by or under the direction of Luke Southwell (formerly our guide/field assistant for most of our work in Miri Division, now uncle-in-law of the first author) during other, non-odonatological activities.

Miri Division includes all or part of many protected areas, ranging from well-known and easily accessible National Parks such as Lambir Hills, Niah and Gunong Mulu to difficult to access areas such as Usun Apau National Park and the recently gazetted (or still in the process of being gazetted) Sungai Moh Wildlife Sanctuary. Results from some of these areas are included in this report and, for convenience, checklists for Niah, Lambir, Loagan Bunut and Pulong Tau National Parks are given in one of the appendices. To our knowledge these are the first checklists for three of these National Parks to be published, but Dow & Reels (2010) included a checklist from Lambir Hills National Park, however that list is out-of-date because of additional records and taxonomic changes. Grinang & Nyanti (2007) list species that they recorded within Pulong Tau National Park together with others found in the surrounding area, so that their list is not strictly speaking a checklist for the park. We have not done much work at Niah National Park and the first

author only visited this park for a few days in 2005, GPS readings for specific locations in the park have been lost. For these reasons we have not separated records from Niah into separate locations, in contrast to the other national parks covered here.

Note on the names of Orang Ulu and Penan settlements

The word “Long” refers to a river or stream mouth (not longhouse as is sometimes mistakenly assumed), most Orang Ulu (for instance the Berawan, Kayan, Kelabit and Kenyah peoples) and Penan longhouses (a relatively recent development, the Penan were mostly nomadic hunter gatherers until recent times, a few still maintain that lifestyle) are situated near to and take their names from the mouth of a stream and are therefore called Long [stream name]. Traditional wooden longhouses have a finite lifetime and when a new longhouse is built it is at a different location, traditionally the name of the longhouse changed to reflect this but in more recent times the old name is often retained to avoid confusion, however this does complicate matters when it comes to interpreting the name. Moreover the stream name after the “Long” may not be the stream immediately adjacent to the Longhouse but a tributary of it, or even a tributary of the stream which it flows into. For instance the Kelabit settlement Long Seridan is situated on the banks of Pa’Maguh but Pa’Seridan is a major tributary with its mouth on the opposite side of Pa’Maguh to the settlement. Some Kelabit settlements in the Kelabit Highlands (e.g. Pa’Lungan, Pa’Ukat) appear to take their names from a stream rather than its mouth, although RD is still not entirely clear on whether Pa’ means river or river mouth or both. These naming practices are different from those of the Iban (the largest Dayak group in Sarawak) who, over a large part of Sarawak (but not in all areas) typically name their longhouses after the current headman (the name literally translates as “House of so and so”), so that the name changes when the headman does. In the southwest the Bidayuh people employ



Fig. 1. Overview of locations in Miri Division covered in this report.

fixed names for their settlements, but the derivation of these names is not clear to us. Even among the Orang Ulu there are a few exceptions and a relevant example here is the Kayan settlement Uma Bawang, longhouse of RD's wife, Uma means house, Bawang means onion (so: "Onion House" or "House of Onions") and the name is fixed but its origin is unclear to us. The Kenyah settlement Lio Mato is another relevant example (RD was told that this name means "Thousand Islands"). It should be noted that any errors in this section are the result of RD's undoubtedly limited understanding of these issues, none of the other authors are to blame.



Fig. 2. More detail of locations in the northwest of Miri Division.

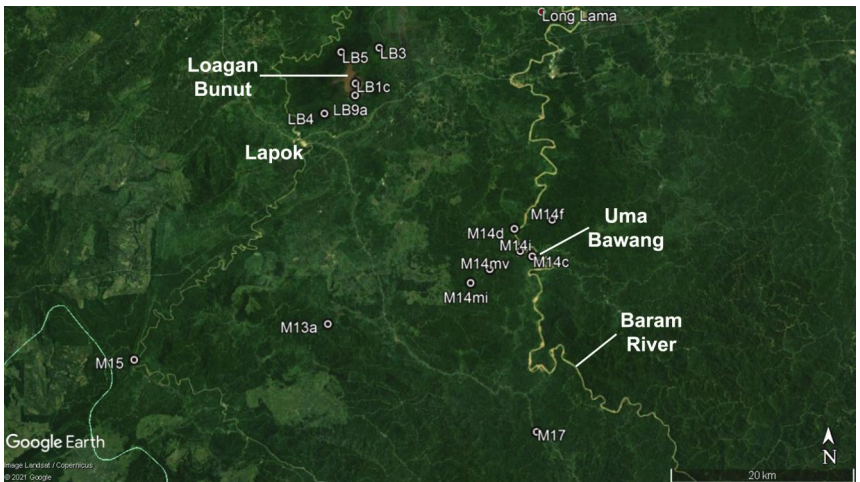


Fig. 3. More detail of locations in the mid Baram area of Miri Division.



Fig. 4. More detail of locations in the southeast of Miri Division.



Fig. 5. More detail of locations in the northeast of Miri Division.

Locations

Fig. 1 shows an overview of the locations covered in this report. More detail of many of the locations in the northwest is shown in Fig. 2 (including Lambir Hills National Park), those in the mid Baram area in Fig. 3 (including Loagan Bunut National Park), those in the southeast in Fig. 4 and those in the northeast in Fig. 5 (including Pulong Tau National Park).

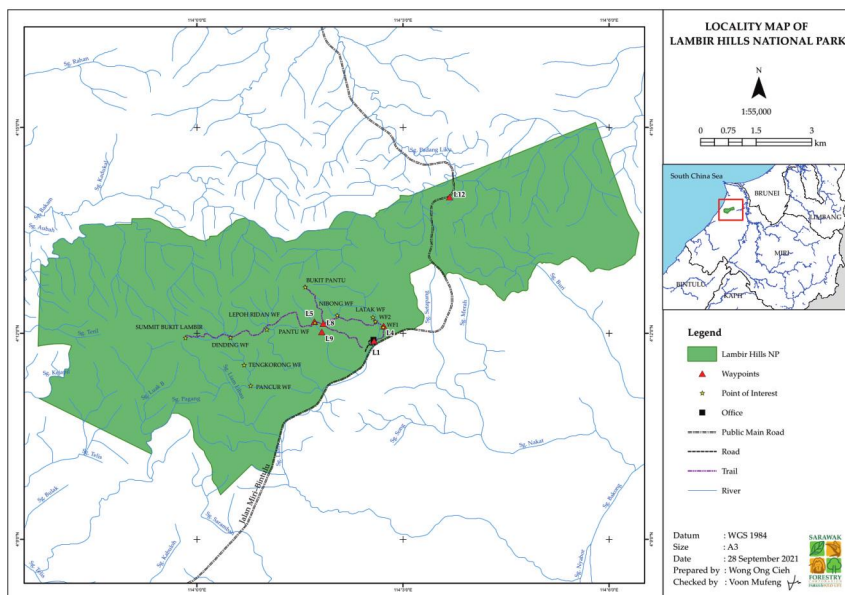


Fig. 6. Map of Lambir Hills National Park showing some of the sampling locations.

Lambir Hills National Park

Fig. 6 shows a map of Lambir Hills National Park with some of the locations marked.

L1: Two ponds adjacent to the Miri-Bintulu section of the Pan Borneo Highway, near the park HQ, one small, one large and forested at one end (coordinates at HQ: 4.1982N, 114.043E, ca. 45m a.s.l.):

- a: Open sections.
- b: Heavily shaded, swamp forest-like section next to the larger pond.

L2: Small pools in woods near location L1.

L3: Large pond near the staff accommodation.

L4: The stream in the Latak valley (coordinates at waterfall: 4.2018N, 114.0453E, sampled between ca. 45-85m a.s.l.):

- a: Swampy section near the park headquarters.
- b: Upstream from L4a, including the first waterfall.

L5: The stream at the Pantu waterfall, including its tributaries (4.2029N, 114.0285E, ca. 167m a.s.l.).

L6: The stream below the Nibong waterfall and trailside nearby.

L7: A stream crossing the summit trail, the first reached beyond the Pantu waterfall stream; Fig. 7 shows a section of this stream.



Fig. 7. Habitat at location L7 at Lambir Hills National Park. Photo by GR.

L8: A stream crossing Inoue trail and its tributaries, and trailside on Inoue trail (coordinates at top of Inoue Trail: 4.2024N, 114.0307E, ca. 198m a.s.l.).

L9: Oil Well Trail (coordinates at oil well: 4.2004N, 114.0303E, ca. 122-198m a.s.l.), a steep trail leading down to an almost flat area, the site of a small, old oil well:

a: Streams.

b: Trailside

L10: A trail leading to the Harvard University research plot.

L11: A large pond in forest, but open in the middle, on the way to the canopy walkway.

L12: In the extension to the National Park situated along the highway from Miri:

a: Small streams (4.2331N, 114.0613E, ca. 85-100m a.s.l.).

b: The Sungai Liku (nearby to L12a but sampled on the other side of the highway).

L13: Around the park buildings.

Loagan Bunut National Park

Fig. 8 shows a map of Loagan Bunut National Park with some of the locations marked.

LB1: Loagan Bunut (a large natural lake) itself (Fig. 9 shows a view over the lake):

a: Lake margin (coordinates for lake 3.7643N, 114.2402E, ca. 8m a.s.l.).

b: Adjacent flooded areas (sampled near head of Hydrology Trail: 3.7907N, 114.2395E).

c: Channel leading to Sungai Bunut (mouth of Sungai Bunut: 3.7645N, 114.246E).

LB2: Alluvial forest and rubber gardens adjacent to Sungai Bunut, and on Sungai Bunut (3.7993N, 114.2632E, ca. 20-25m a.s.l.).

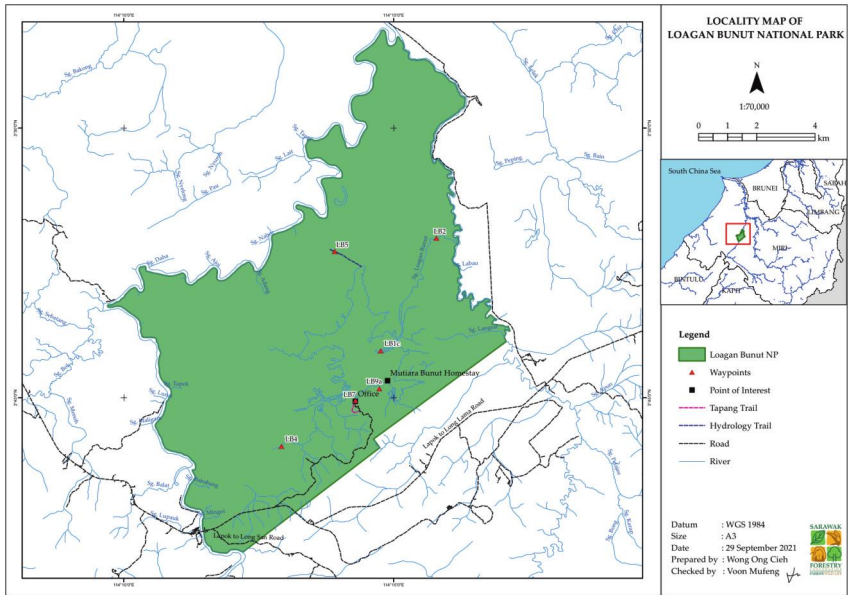


Fig. 8. Map of Loagan Bunut National Park showing some of the sampling locations.



Fig. 9. View over Loagan Bunut in the national park of the same name. Photo by GR.



Fig. 10. Habitat at location LB4 in Loagan Bunut National Park. Photo by RD.

LB3: Sungai Teru (3.7994N, 114.2692E, ca. 21m a.s.l.).

LB4: Sungai Bunan (connecting the lake to Sungai Tinjar) (3.735N, 114.2154E, ca. 14m a.s.l.). Fig. 10 shows a section of the channel.

LB5: Peat swamp forest on and around the Hydrology Trail (3.7952N, 114.2318E, ca. 20-30m a.s.l.).

LB6: Tiny streams and trailside in disturbed MDF on a hillside fairly close to the park buildings accessed from Tapang Trail, ca. 18-40m. a.s.l.

LB7: Around the park buildings, excluding species caught at lights (Park Headquarters: 3.7491N, 114.2382E, ca. 18m a.s.l.).

LB8: Lights at park buildings.

LB9: Ponds:

a: At a locally owned building, at edge of disturbed forest (3.7528N, 114.2456E, ca. 20m a.s.l.).

b: A completely open pond at a house belonging to a local headman (near to LB9a).

Pulong Tau National Park

Fig. 11 shows a map of Pulong Tau National Park with some of the locations marked.

P1: Above the waterfall at Bario, within Pulong Tau National Park (approximate coordinates 3.746N, 115.4334E, ca. 1250m a.s.l.). Fig. 12 shows a section of the stream here.

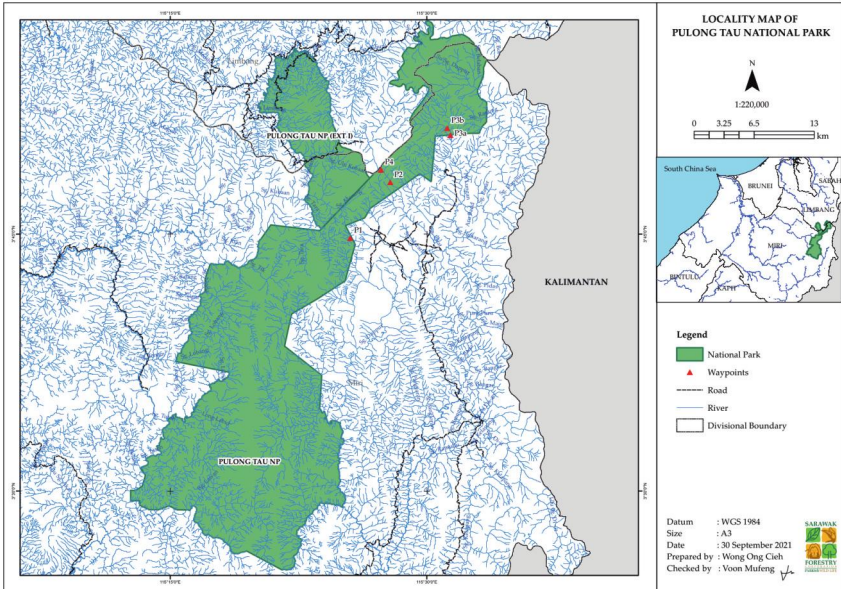


Fig. 11. Map of Pulong Tau National Park showing some of the sampling locations.

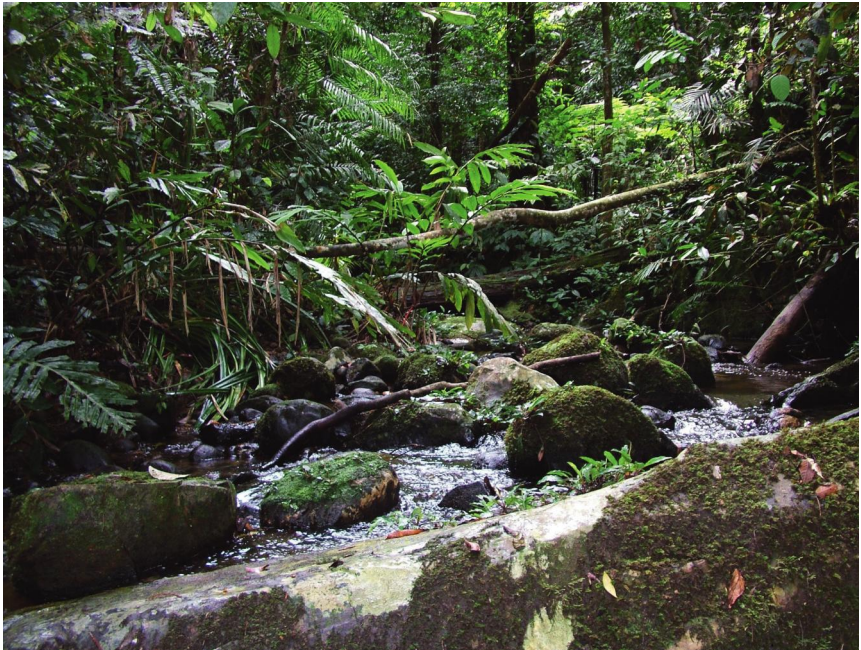


Fig. 12. Habitat at location P1 in Pulong Tau National Park. Photo by RD.

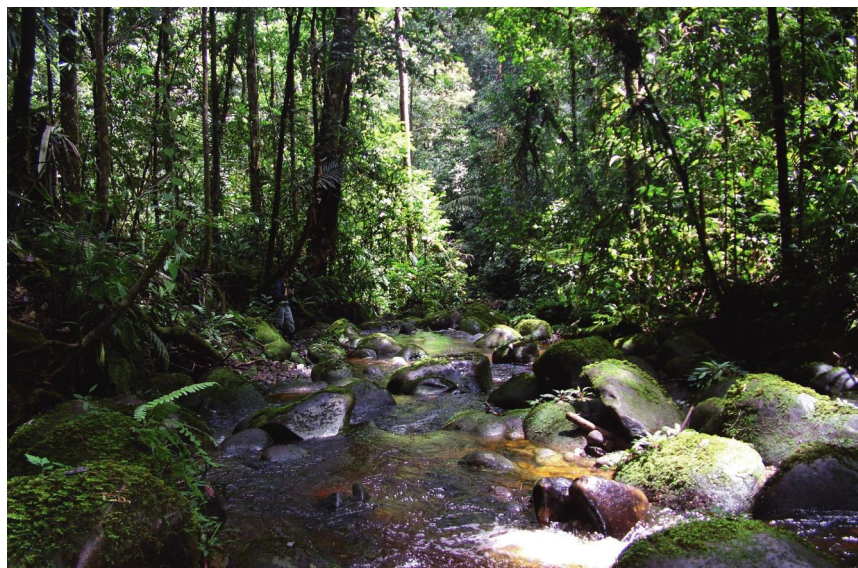


Fig. 13. Habitat at location P2a in Pulong Tau National Park. Photo by RD.

P2: Pa'Gelawat and tributaries and trailside within Pulong Tau National Park.

a: Pa'Gelawat, mainstream (shown in Fig. 13) and short steep seepage areas immediately adjacent to it (representative coordinates 3.8003N, 115.4642E, sampled between ca. 1,150-1,600m a.s.l.).

b: Tributaries.

c: Forest pools.

d: Trailside and in forest away from trail.

P3: Pa'Lungan area within Pulong Tau National Park.

a: Tributaries to Pa'Lungan (representative coordinates 3.8462N, 115.5229E, ca. 1,170m a.s.l.).

b: Sungai Temeling, a major tributary of Pa'Lungan, camp site in 2012 made beside this stream just above the confluence with Pa'Lungan (coordinates at camp 3.8529N, 115.5197E, ca. 1,210m a.s.l.).

c: Tributary system to Pa'Lungan reached by climbing over a ridge above Sungai Temeling Camp (3.8503N, 115.5142E, ca. 1,335-1,370m a.s.l.).

P4: A stream reached from Pa'Gelawat, but part of ulu Pa'Ukat (3.8126N, 115.4552E, sampled at ca. 1,660-1,730m a.s.l.).

Other Locations

M1: A pond by the Highway from Bintulu to Miri (3.7374N, 113.7749E, ca. 30m a.s.l.) Sampled briefly in overcast conditions in 2005.

- M2:** Niah National Park (3.799N, 113.7817E, sampled parts ca. 25-50m a.s.l.)
- M3:** A pond on the road to Niah National Park, just after the turning from the Bintulu-Miri highway (3.5199N, 113.6194E, ca. 20m a.s.l.) Sampled briefly in 2005.
- M4:** A farm on private land close to Lambir Hills National Park, and adjacent highly disturbed and second growth forest with a stream running through it (4.2362N, 113.9855E, ca. 50m a.s.l.)
- M5:** A farm at Beraya, belonging to an uncle-in-law of the first author (4.1779N, 113.8747E, ca. 15m a.s.l.) Sampled for a few hours on one day in 2015.
- M6:** Sungai Bakong and tributaries (representative coordinates 4.1932N, 114.131E, ca. 8-10m a.s.l.) Sampled on one day in 2005.
- M7:** At, in or around houses in Taman Tunku and Taman Jelita, adjacent suburbs of Miri (Taman Tunku: 4.319N, 113.9929E, ca. 20-25m a.s.l.)
- M8:** The Woodman plantation area, Kuala Baram (coordinates not known, none of the authors present, coordinates not taken).
- M9:** A stream in extremely disturbed forest between Miri and Marudi (4.2437N, 114.2063E, ca. 23m a.s.l.), only sampled during a brief stop on the journey from Marudi to Miri.
- M10:** Marudi (known as Claudetown in the colonial era) area:
- a: Sungai Dabai (4.1853N, 114.3928E, ca. 24-35m a.s.l.) and surrounds.
 - b: A trail through degraded peat swamp forest beside farmland (4.1796N, 114.3652E, ca. 25m a.s.l.) and kerangas nearby.
 - c: "Brunei trail" including stream and swamp (4.2122N, 114.3561E, ca. 14-30m a.s.l.), Fig. 14 shows a section of the trail.
 - d: "Brunei trail" where it starts to climb up a hill (tiny stream).
 - e: A peat swamp in old rubber (4.1358N, 114.3181E, ca. 25-30m a.s.l.), and kerangas area nearby. Fig. 15.
 - f: A trail running beside a stream in disturbed forest (4.1047N, 114.4197E, ca. 16m a.s.l.).
 - g: Peat swamp forest remnant behind school (4.1851N, 114.3434E, ca. 18m a.s.l.).
 - h: A trail through disturbed forest, with a stream, leading to a dry marsh, near a Chinese cemetery (4.1338N, 114.3527E, ca. 18m a.s.l.).
 - i: Very disturbed swamp forest on other side of the Baram from Marudi (4.1736N, 114.3085E, ca. 6m a.s.l.).
 - j: A swamp near an oxbow lake sampled by a field assistant without any of the authors present on 10/09/2011, coordinates not known, altitude assumed to be between 6-20m a.s.l.
 - k: A pond by the roadside.
 - l: In Marudi Town (4.1788N, 114.3223E, ca. 20m a.s.l.).
- M11:** Disturbed locations (forest edge ponds, ditches and freshwater swamp forest) outside of Gunung Mulu National Park (representative coordinates: 4.0329N, 114.7977E, ca. 40-50m a.s.l.).



Fig. 14. Part of the trail at location 10c. Photo by RN.



Fig. 15. Habitat at location 10e. Photo by RN.

M12: GT plantation in the Long Terawan area (ca. 25-60m a.s.l. in sampled parts):

a: Streams (representative coordinates 3.9393N, 114.6668E).

b: Ponds and swampy areas (representative coordinates 3.9346N, 114.6643E).

M13: Streams and ponds in a small oil palm plantation owned by one of RD's uncle-in-laws and in disturbed forest at Sungai Lamah:

a: Sungai Lamah and tributaries upstream of the plantation (representative coordinates 3.529N, 114.2194E, sampled between ca. 60-135m a.s.l.).

b: A tributary of Sungai Lamah on a hill above the plantation (3.539N, 114.237E, ca. 245m a.s.l.).

c: Ponds and other disturbed areas in and around the plantation (representative coordinates 3.5417N, 114.2295E, ca. 60m a.s.l.).

M14: Uma Bawang area:

a: Sungai Mabak and tributaries (3.6117N, 114.4105E, ca. 30-80m a.s.l.).

b: Sungai Marok and tributaries (coordinates near mouth 3.6048N, 114.4201E, sampled between ca. 35-85m a.s.l.).

c: Sungai Aton and tributaries (coordinates at entry point 3.5953N, 114.4199E, sampled between ca. 37-90m a.s.l.).

d: Sungai Bie and tributaries (representative coordinates 3.6222N, 114.4023E, sampled between ca. 27-75m a.s.l.).

e: Sungai Jelini Bakah and tributaries (coordinates near entry point 3.6211N, 114.4107E, ca. 45m a.s.l.).

f: Sungai Liyang and tributaries excluding M14g, M14h (representative coordinates 3.6311N, 114.4393E, sampled between ca. 27-65m a.s.l.).

g: Sungai Matan Tiong (a tributary to Sungai Liyang) and tributaries (representative coordinates 3.6337N, 114.4332E, ca. 69m a.s.l.).

h: Sungai Doh Hayak and tributaries (representative coordinates 3.6357N, 114.4288E, sampled between ca. 55-85m a.s.l.).

i: At Uma Bawang longhouse (3.6005N, 114.4081E, ca. 23m a.s.l.).

j: On the Baram River (coordinates on river at Uma Bawang 3.6016N, 114.4061E, ca. 19-20m a.s.l. in sampled part).

k: Sungai Kejin:

i: Upstream of road, disturbed and second growth forest (coordinates just upstream from road 3.5819N, 114.3748E, sampled between ca. 55-85m a.s.l.).

ii: Downstream of road (coordinates at confluence with Sungai Nyateng 3.5863N, 114.3763E, ca. 50m a.s.l.).

iii: Downstream of road and of confluence with Sungai Nyateng (representative coordinates 3.5924N, 114.3771E, ca. 49m a.s.l.).

l: Sungai Nyateng (coordinates at bridge 3.5855N, 114.382E, sampled between ca. 49-58m a.s.l.).

m: Ponds on road from main Samling road to the upper Baram to the Baram River, between Sungai Punei and the Baram River:

i: Large pond (formed by dammed stream), open on one bank, disturbed forest and oil palm around others, with smaller pond behind, joined by very small stream (3.5692N, 114.3593E, ca. 79m a.s.l.).

ii: Largely shaded pond (3.5717N, 114.3634E, ca. 109m a.s.l.).

iii. Large pond beside house (3.5753N, 114.3633E, ca. 108m a.s.l.).

iv: Open marshy area behind small Durian farm (3.5689N, 114.3629E, ca. 94m a.s.l.).

v: Large difficult to access pond near Sungai Kejin (3.5827N, 114.3781E, ca. 68m a.s.l.).

vi: Small forest edge pools beside road and along road (65-110m a.s.l.).

M15: In the north Tinjar area (sampled during a day trip made from Miri City).

a: Small high gradient stream in disturbed forest (3.4935N, 114.029E, ca. 60m a.s.l.).

b: Drains and small ponds beside plantation road near M15a.

M16: Sungai Dapoi (a) and Sungai Lobang (b), tributaries of the Tinjar River, south of the main Dulit range. Both sites were sampled in passing when none of the authors were present and coordinates are not available.

M17: The Sungai Suan and one of its tributaries on the main Samling road between Lapok and the Kilometre 10 camp, ca 65m a.s.l. (3.4235N, 114.4244E), Fig. 16 shows a section of the stream.



Fig. 16. Habitat at location M17. Photo by RD.

M18: Streams on Gunung Kalulong, Gunung Seludong and Batu Uro' (the last is probably technically the more north-western of the two horns of Kalulong, the mountain called Gunung Seludong here is shown with different names on some maps so we are not clear whether it is the true Gunung Seludong or not). This whole area is referred to as the Kalulong area below.



Fig. 17. Habitats at location M18a. Top image: a section of the stream affected by a land slide in the past. Bottom image: mouth of a small tributary, a teneral female *Bornargiolestes* was found on vegetation in the lower left corner. Photos by GR.

a: "Old camp" stream system on Gunung Kalulong, sampled ca. 760-990m a.s.l. (at camp: 3.2N, 114.6722E). Fig. 17 shows some of the habitat here.

b: "New Camp" stream system on Gunung Kalulong, sampled ca. 620-680m a.s.l. (at camp: 3.205N, 114.686E).

c: A stream at the foot of Kalulong, large boulders in narrow strip of original forest, Acacia plantation beyond, sampled ca 320-390m a.s.l. (3.1904N, 114.6968E).

d: Two streams close to each other on Gunung Kalulong on face adjacent to Gunung Seludong, sampled at ca 700-1,000m a.s.l. (3.218N, 114.6778E).

e: Forest streams at foot of Gunung Seludong, sampled at ca 300-400m a.s.l. (3.2622N, 114.7088E).

f: Streams on lower slopes Gunung Seludong sampled at ca 280-350m a.s.l. (3.2482N, 114.6812E).

g: Streams on Batu Uro', sampled ca 300-580m a.s.l. (3.2506N, 114.6259E).

h: Beside logging roads and trails, in forest, on these mountains.

i: Ponds and other open and disturbed areas not covered above: (a) open areas near M18a; (b) near M18b; (c) near M18f; (d) near M18d; (e) near M18e.

j: Small pond by logging road (3.195N, 114.6966E, ca. 420m a.s.l.).

k: Pond by Samling road leading to Gerenai Camp near foot of Gunung Kalulong, sampled briefly in afternoon (3.1571N, 114.6342E, ca. 320m a.s.l.).

M19: Two streams with an open canopy in highly disturbed and second growth forest, or in the open, in the Kalulong area, and tributaries to these streams, mostly in second growth forest, or highly disturbed forest:

a: Sungai Tamdoh and tributaries (3.2689N, 114.6287E, ca. 145m a.s.l.).

b: Sungai Pawan and tributaries (3.2779N, 114.5817E, ca. 150-200m a.s.l.).

M20: At the 'kilo 10' timber camp (3.2902N, 114.5638E, 480m a.s.l.).

M21: Two streams after the Long Banga Junction, crossed by the road to Pa'Dalih and Bario. These streams are distant from one another and are included together merely for convenience.



Fig. 18. Habitat at location M21a. Photo by RD.

a: Boulder stream in disturbed forest at ca. 770m a.s.l. (3.286N, 115.4861E) and tributaries. Fig. 18 shows a section of this stream.

b: Sungai Paley and surrounds (3.3493N, 115.5076E, ca. 900m a.s.l.).

M22: Lio Mato, streams in disturbed forest in Lio Mato water catchment and adjacent rubber, ca 200-390m a.s.l:

a: Camp stream system (3.1658N, 115.2276E).

b: Another stream system (3.1598N, 115.2337E).

c: Marshy semi open seepage area near M22a.

d: Trailside.

M23: Sungai Tudan near Lio Mato, sampled when none of the authors present, coordinates and altitude not known.

M24: Vicinity of Merawa Camp in the Upper Baram:

a: Streams in disturbed forest (3.2137N, 115.2772E, ca. 900-950m a.s.l.).

b: Ponds by logging roads and other open disturbed areas.

M25: Long Banga water catchment area (approximate coordinates 3.2219N, 115.43E, ca. 800-900m a.s.l.). This area was sampled on one day in 2007 by RD and GR (mainly the area above a large waterfall on the stream flowing through the water catchment) and again in 2016 by CC (mainly the area below the waterfall). Fig. 19 shows the waterfall, which was renamed as the Udau Waterfall for the 2016 expedition (in 2007 RD and GR were told that it was called the Aro Lano waterfall).

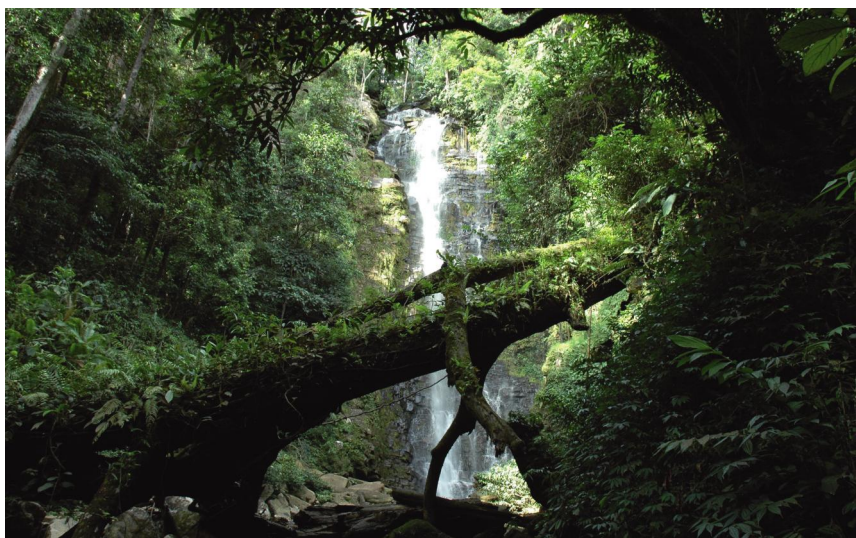


Fig. 19. Waterfall on stream running from the Long Banga water catchment area (location M25). Photo by GR.

M26: Pond by road near turning to Long Banga (approximate coordinates 3.2298N, 115.4069E, ca. 570m a.s.l.)

M27: Other locations in the Long Banga area, first two sampled when none of the authors were present, coordinates not available. The other three were sampled during the 2016 expedition:

- a: Streams and ponds at Batu Salip area, near Long Banga.
- b: Wet rice fields near Long Balong in Long Banga area.
- c: Long Banga campsite (3.2N, 115.3833E, ca. 440m a.s.l.).
- d: Sungai Sekuan, a stream with a small hydro-electric dam (3.1799N, 115.4782E, ca. 880m a.s.l.).
- e: Sungai Puak and its tributary Sungai Moa Kecil (3.1462N, 115.4776E, ca. 640m a.s.l.).

M28: Locations in the Tama Abu Forest Reserve sampled during the 2017 Tama Abu Expedition.

- a: Transect 4 stream system; a rocky and generally high gradient stream system and one of its tributaries (sampled to its head), in largely undisturbed forest (representative coordinates 3.3175N, 115.4735E, ca. 950-1,100m a.s.l.).
- b: Trailside at M28a.
- c: Streams on Transect 3, forest mostly disturbed by past logging activities (representative coordinates 3.3121N, 115.4807E, ca. 850-900m a.s.l.).
- d: A forest pool near to M28c (3.3133N, 115.4809N, ca. 880m a.s.l.).
- e: Transect 5/7 stream system, forest partly disturbed (representative coordinates 3.3062N, 115.4809E, ca. 800-900m a.s.l.).
- f: Trailside at M28e.
- g: A small high gradient stream near to the expedition camp site (representative coordinates 3.3093N, 115.4823E, ca. 700-740m a.s.l.).
- h: Sungai Baleh (not to be confused with the Baleh River in Kapit Division), a large torrential stream with many boulders, the camp site was situated beside this stream (coordinates at camp site 3.3093N, 115.4834E, ca. 700m a.s.l.).
- i: In the expedition camp site (ca. 700m a.s.l.).

M29: High altitude sites (1100-1450m a.s.l.) on logging road between Long Banga and Pa'Dalih and side roads. These sites were mostly very disturbed:

- a: Streams (3.4509N, 115.557E) (Fig. 20 shows the least disturbed of these).
- b: Pond by logging road at ca 1,300m a.s.l. (3.4564N, 115.5343E).

M30: Habitats in disturbed (some only moderately) and second growth forest and farmland around Bario up to boundary of Pulong Tau NP, and on way to Pa'Ukat and around Pa'Ukat, and on far side of Dappur River:

- a: Waterfall stream (upper part good quality old growth forest) upstream of agriculture:
 - i: Mainstream (representative coordinates 3.744N, 115.43942E, ca. 1,080-1,130m a.s.l.).



Fig. 20. Habitat at the least disturbed of the streams included under location M29a; few Odonata were found here. Photo by GR.

ii: Tributaries.

iii: Trailside.

b: Stream with failed small-scale hydroelectric project and tributaries, above dam:

i: Mainstream (approximate coordinates 3.757N, 115.44263E, sampled between ca. 1,070-1,150m a.s.l.) disturbed old growth forest.

ii: Tributaries.

iii: Trailside.

c: The "Gap" (so called because of a conspicuous gap in the canopy on a ridgetop at this location, visible from Bario) stream system and trailside above it, mixed second growth and disturbed old growth, becoming better quality upstream (approximate coordinates 3.7663N, 115.44817E, ca. 1,100-1,150m).

d: Stream with failed small-scale hydroelectric project, below dam including inside Bario, narrow corridor of forest in parts, open in others:

i: Stream itself (approximate coordinates 3.75006N, 115.45064E, ca. 1,030-1,070m a.s.l.).

ii: Marshy areas and pools away from stream.

iii: Trailside.

e: Rice fields, along paths, small streams, ditches, drains and pools in agricultural land and inside Bario (representative coordinates 3.75006N, 115.45064E, ca. 1,030m a.s.l.).

f: Small streams between Bario and Pa'Ukat and Bario and Pa'Umor (representative coordinates 3.7407N, 115.48486E, ca. 1,040m a.s.l.).

g: Muddy pools and drains in around disturbed and second growth forest near Jaman's lodge, and in Jaman's lodge (3.73519N, 115.50679E, ca. 1,030m a.s.l.).

h: Trail to Dappur River, including ditches and drains, highly disturbed swamp forest, in disturbed and second growth forest (representative coordinates 3.71096N, 115.47612E, ca. 1030m a.s.l.).

i: Far side of Dappur River (approximate coordinates 3.70288N, 115.48734E, ca. 1,130-1,060m a.s.l.):

i: Streams.

ii: Along trail.

j: Pa'Ukat (3.75998N, 115.48872E, ca. 1,040m a.s.l.):

i: Pa'Ukat stream

ii: Fallow rice fields etc.

M31: Habitats in disturbed (some only moderately) and second growth forest, and agricultural land between Pa'Ukat and Pa'Lungan or Pa'Gelawat:

a: Between Pa'Ukat and park boundary at Pa'Gelawat.

i: Pa'Gelawat below park boundary (approximate coordinates 3.77533N, 115.47515E, ca. 1,100m a.s.l.).

ii: Other.

b: Between Pa'Ukat and Pa'Lungan:

i: Marshes and swamps in old riverbeds (coordinates in one of the marshes 3.77796N, 115.52403E, ca. 1,100m a.s.l.).

ii: Small streams in disturbed old growth forest.

iii: Pools etc and trailside.

M32: Pa'Lungan (3.81126N, 115.52228E, ca. 1,080m a.s.l.) and surrounds.

a: Pa'Lungan stream below park boundary.

b: Rice fields, ponds etc. around Pa'Lungan.

M33: Dappur River.

a: River (coordinates downstream 3.6087N, 115.42175E, ca. 1,030m a.s.l.).

b: Tributaries.

M34: Sungai Lowing and its surrounds below the Usun Apau plateau.

a: Sungai Lowing, sampled near to bridge (representative coordinates 3.0102N, 114.7621E, 240-285m a.s.l.).

b: Stream system 1 (representative coordinates 2.9793N, 114.7492E, 610-686m a.s.l.).

c: Stream system 2 (representative coordinates 2.9749N, 114.7575E, 640-680m a.s.l.).

d: Pools on and beside skid paths and logging road, and perched beside old skid paths (610-680m a.s.l.).

e: Ponds near to the junction from the Samling Road to Long Anap (representative coordinates 3.03911N, 114.76162E, 466m a.s.l.).

M35: Sungai Paku, only one specimen collected by the first author's wife while fishing at the river (representative coordinates 2.943N, 114.86515N, 230m a.s.l.).

M36: In and around buildings at Gerenai Camp (2.93658N, 114.87763E, 301m a.s.l.).

M37: Long Silat area:

a: Stream in disturbed forest near Long Silat (coordinates not far upstream from mouth: 2.9724N, 114.9262E, 170m a.s.l.).

b: Ponds on road down to Long Silat (2.9655N, 114.9142E, 420m a.s.l.).

c: Various habitats (roadside, lights at longhouse etc.) in Long Silat area, all except those at the longhouse collected when authors not present and coordinates not recorded (coordinates at Long Silat 2.9683N, 114.9276E, 164m a.s.l.).

d: A mostly shaded pond (2.9036N, 114.8858E, 285m a.s.l.), not far from the junction to Long Silat on another road leading from the main Samling road to, for instance, Long Jekitan and Long Bee; all M39 locations below were accessed using this same road and its junctions.

M38: Sungai Moh drainage:

a: Streams accessed from an old logging road used in 2014 to reach the ulu Moh area, see Dow & Ngiam (2015) for results from that trip; the streams sampled in 2020 (representative coordinates 2.8998N, 115.0077E, 715-815m a.s.l.) and included in this report are near to the start of the road and were not sampled in 2014.

b: A pond formed where the main Samling road to Long Moh has dammed a small stream (2.9854N, 115.0619E, 315m a.s.l.).

c: The stream above M38b (coordinates up stream on left branch of this 2.9861N, 115.0610E, 330m a.s.l.).

d: Another pond formed where the main Samling road to Long Moh has dammed a small stream (2.9751N, 115.0495E, 331m a.s.l.).



Fig. 21. Section of Sungai Betua (location M39a) by road. Photo by RD.

M39: Upper Sungai Silat drainage area:

- a: Sungai Batau and a narrow, shaded, almost stagnant backwater (representative coordinates 2.87628N, 114.8548E, 250-290m a.s.l.). Fig. 21 shows a section of Sungai Batau near to the road.
- b: Stream system after junction to Long Bee (a small Penan settlement) representative coordinates 2.7952N, 114.8191E, 550-620m a.s.l.).
- c: Another stream system after the junction to Long Bee (representative coordinates 2.7894N, 114.8049E, 400-555m a.s.l.).
- d: The last accessible stream, high gradient, on a relatively high logging road (representative coordinates 2.76825N, 114.86764E, 745-810m a.s.l.).
- e: The penultimate accessible stream on the same logging road as MM39d (representative coordinates 2.7701N, 114.8659E, 730-850m a.s.l.).
- f: A stream system, high gradient near road then running almost flat for a considerable distance before rising to its sources (representative coordinates 2.7556N, 114.8114E, 640-695m a.s.l.), almost open in most of the low gradient section.
- g: A muddy mostly open pond in a grassy area beside M39f (2.75562N, 114.81142E).
- h: A pond at some huts beside Sungai Batau (2.87579N, 114.85593E, 246m a.s.l.).
- i: A pond on a ridge top (2.7866N, 114.7791E, 515m a.s.l.), largely open, muddy, difficult to access.
- j: Pools and at water flowing beside logging roads and flying over logging roads.

M40: Long Seridan area. All streams sampled in this area are within the drainage of the Pa'Maguh River, a tributary of the Tutoh which is in turn a tributary of the Baram River.

- a: Stream running past Long Selulung, a small Penan settlement. This stream may actually be Sungai Selulung (see the note on names of Orang Ulu and Penan settlements above). Sampled from upstream of road to Long Seridan where it runs in a rather flat bottomed, wide but very steep sided valley (representative coordinates 3.8223N, 115.0369E, ca. 300-360m a.s.l.) Initially rather open, with sediment and gravel substrates, the canopy gradually closes and the substrate becomes more rocky, the stream splits into two much narrower valleys (but still very steep sided). Only sampled in mostly overcast conditions.
- b: Pa'Pelap system, a stream entering Pa'Maguh close to Long Seridan:
 - i: Mainstream and its major branches (representative coordinates 3.9548N, 115.0688E, ca. 180-250m a.s.l.).
 - ii: A tributary close to the road to Long Seridan (coordinates at road 3.9511N, 115.067E, ca. 180m a.s.l.).
 - iii: Small tributaries further upstream.
 - iv: Pools and marshy area on path near road (coordinates at road 3.9511N, 115.067E, ca. 180m a.s.l.).
- c: A stream system crossed by a side road from the road leading to the Pa'Maguh bridge (representative coordinates 3.9288N, 115.0704E, ca. 220-280m a.s.l.).
- d: Small steep streams reached by cutting down from an old track leading from the

road to Pa'Maguh bridge at its highest point (representative coordinates 3.9447N, 115.0949E, ca. 470-510m a.s.l.) The forest immediately around these streams was hardly disturbed.

e: A large, turbid, pond formed where the road to Long Seridan dams a small stream (3.936N, 115.057E, ca. 210m a.s.l.).

f: Two narrowly separated turbid ponds formed by deliberate damming of a small stream, and some shaded marsh areas adjacent to these ponds (3.948N, 115.0593E, ca. 214m a.s.l.).

g: Two fairly large rain fed ponds with clear, dark water (i) and a small area of swampy second growth forest with many pools (ii) (3.9492N, 115.0601E, ca. 191m a.s.l.).

h: A muddy rain fed pond with extensive shady areas (3.9483N, 115.0666E, ca. 183m a.s.l.).

i: Small sunlit pond in scrub on highest part of road to Pa'Maguh bridge (3.9461N, 115.0964E, ca. 540m a.s.l.).

j: A muddy pond with extensive shady areas and tangled overhanging vegetation, formed by damming of a small stream by the road (3.9319N, 115.0682E, ca. 214m a.s.l.), near to M40c.

k: Pond/marshy area near the downstream of M40c (3.9349N, 115.0669E, ca. 218m a.s.l.).

l: Long shady pond in second growth near to Long Seridan, only sampled late in the day (coordinates not taken).

m: Flying over roads or beside roads.

n: At lights in building in Long Seridan (3.9754N, 115.0683E, ca. 198m a.s.l.) or outside buildings in Long Seridan.

List of species recorded

Where the first record (based on the date that the record was made on) definitely from Miri Division of a species was made during the fieldwork reported here (in many cases published previously) this is indicated by a * after the authority. Note that trinomial names are only given in cases where the subspecies recorded is not the nominate subspecies, in other cases it should be understood that the nominate subspecies is being referred to. Of course, especially with the authority given, it is implicit that the nominate subspecies is being referred to but following some recent discussions it appears worthwhile to emphasize this.

Zygoptera

Lestidae

1. *Lestes praemorsus decipiens* Kirby, 1894

L1a, M5, M12b, M40f, M40gi.

2. *Orolestes wallacei* (Kirby, 1889)

M2, M10a, M27d, M27e, M40j.

Platystictidae

3. *Drepanosticta actaeon* Laidlaw, 1934

Fig. 22 shows a male of the red-eyed form of this species that occurs in Miri Division.

M13a, M18a, M18b, M18d, M18e, M22b, M28a, M28g, M34b, M34c, M39d, M39e, M40a.

4. *Drepanosticta attala* Lieftinck, 1934*

Fig. 23 shows a female apparently ovipositing into the underside of the midrib of a broad leaf over Sungai Suan (M17). Also see *Protosticta* sp. in the Additional Records section in Appendix 1.

M17, M34a.



Fig. 22. Male of the red-eyed Miri Division form of *Drepanosticta actaeon*. Photo by GR.



Fig. 23. Female of *Drepanosticta attala* apparently ovipositing into the underside of the mid rib of a large leaf. Photo by GR.

5. *Drepanosticta* sp. cf *crenitis* Lieftinck, 1933*
M13a, M13b, M18a, M18d, M18e, M18g, M22a, M24a, M25, M28a, M28e, M28g, M39c, M39e.
6. *Drepanosticta* sp. cf *dentifera* Kimmins, 1936
 Specimens from this species complex from the Gunung Kalulong area (M18) and the Sungai Lowing area (M34) might be the true *D. dentifera* since these locations are relatively near to the type locality Mount Dulit.
L4b, L5, L8, L9b, M18f, M34b.
7. *Drepanosticta dulitensis* Kimmins, 1936
 Although described from Mount Dulit (Kimmins 1936) on the edge of Miri Division, this specie is rare in the division, which might be at the edge of its range.
M18a, M18d, M18g.
8. *Drepanosticta* sp. cf *forficula* Kimmins, 1936
 There are two or even three species in the *D. forficula* complex, all are very local in occurrence and normally occur at low densities, so that it is difficult to obtain sufficient material to deal adequately with these taxa, which are rather similar to each other and also exhibit some degree of variation in potentially diagnostic characters.
L9b.
9. *Drepanosticta rufostigma* (Selys, 1886)
L4b, L5, L6, L7, L9a, L12a, M13a, M14b, M17, M18a, M18d, M18e, M18f, M18g, M19a, M22a, M22b, M23, M25, M27c, M27d, M27e, M28a, M28c, M28g, M34b, M34c, M37a, M38a, M38c, M39b, M39c, M39d, M39e, M39f, M40a, M40biii, M40c.
10. *Drepanosticta versicolor* (Laidlaw, 1913)
L5, L12a, LB6, M13a, M14a, M14b, M14d, M14f, M14h, M17, M18a, M18g, M22a, M22b, M23, M24a, M27a, M28a, M28g, M28e, M34c, M38a, M39b, M39d, M40c, M40d.
11. *Protosticta joepani* Dow, Phan & Choong, 2020*
M18a, M28a, M28c, M30, M34c, P2d, P3c.
12. *Telosticta ?berawan* Dow & Orr, 2012
 Female specimens not definitely identifiable at present but not those of any of the other *Telosticta* species listed here. Specimens from location M22b were listed as *Telosticta* undetermined B in Dow & Orr (2012a). The male of *T. berawan* appears to exhibit cryptic behaviour and is very rarely found.
M22b, M28g, M39d.
13. *Telosticta dayak* Dow & Orr, 2012*
 A common species at Lambir Hills National Park.
L4b, L5, L7, L8, L9a, L12a.
14. *Telosticta longigaster* Dow & Orr, 2012*
M13a, M13b, M14a, M14b, M14c, M14d, M14h, M15a, M17, M18d, M18e, M18f, M18g, M34b, M34c, M40c, M40d.
15. *Telosticta ulubaram* Dow & Orr, 2012*
M24a, M25, M28a, M30aii, M30c, ?P3c.

16. *Telosticta* sp.*

See Dow & Orr (2012a: *Telosticta* undetermined A), teneral specimens that are possibly *T. belalongensis* Dow & Orr, 2012, known with certainty only from the Kuala Belalong Field Studies Centre in Brunei, but until mature males are collected this cannot be determined with any certainty.

M18e.

Argiolestidae17. *Podolestes harrissoni* Liefstinck, 1953

LB5, M10b, M10g.

18. *Podolestes orientalis* Selys, 1862

L4a, L12a, LB5, M2, M10b, M10c, M10e, M10f, M14a, M14b, M14e, M14ki, M14mi.

Calopterygidae19. *Matronoides cyaneipennis* Förster, 1897*

This is primarily a species of streams in montane forest but has occasionally been found as low as ca. 700m a.s.l. in the upper Baram.

M21a, M24a, M28a, M29a, M30ai, M30bi, M30c, M32a, P1, P2a, P3b.

20. *Neurobasis longipes* Hagen, 1887

M12a, M13a, M14f, M14ki, M14kii, M14kiii, M14l, M16a, M17, M18c, M19a, M19b, M22a, M27a, M27e, M28, M30ai, M30bi, M30di, M30e, M32a, M34a, M37a, M37c, M39a, M40bi, M40c.

21. *Vestalis amabilis* Liefstinck, 1965

This is the only *Vestalis* species that has been found at Lambir Hills National Park. Fig. 24 shows the supposed female.

L4a, L9a, L12b, M4, M12a.



Fig. 24. Female of *Vestalis amabilis* at Lambir Hills National Park. The identification is by supposition only but no other *Vestalis* species has been found at Lambir Hills. Photo by GR.

22. *Vestalis amaryllis* Lieftinck, 1965
M2, M13a, M14a, M14b, M14c, M14f, M14g, M14h, M18e, M18f, M25, M27d, M27e, M39b, M39f, M40bii, M40biii.
23. *Vestalis amnicola* Lieftinck, 1965
 A very common species in the upper Baram area and Kelabit Highlands.
M18a, M18c, M18d, M18e, M21a, M22a, M23, M24a, M25, M27a, M28a, M28e, M28g, M29a, M30ai, M30bi, M30bii, M30c, M31bii, M32a, M33b, M34a, M34c, M37a, M38a, M39a, M39b, M39c, M39e, M40a, M40c, P1, P2a, P3a, P3c.
24. *Vestalis amoena* Hagen in Selys, 1853
 In contrast to the last species, *V. amoena* is common in the lowlands but becomes increasingly scarce as one progresses into the mountainous interior.
M2, M13a, M14f, M14ki, M14kii, M14kiii, M14l, M16a, M16b, M18c, M19b.
25. *Vestalis atrophpha* Lieftinck, 1965
M13a, M14f, M14h, M14ki, M16a, M18c, M18e, M18f, M19a, M19b, M27a, M30h, M30ji, M40a, M40bi, M40c, P3a.
26. *Vestalis beryllae* Laidlaw, 1915
 Moderately common in the mountainous interior of Miri Division but never occurring at high densities.
M18g, M18h, M22d, M28a, M28b, M28f, M30bii, M31biii, M34b, M38c, M39e, M40c, M40d.

Chlorocyphidae

27. *Heliocypha biseriata* (Selys, 1859)
M2, M12a, M13a, M14a, M14b, M14f, M14ki, M14kii, M14kiii, M14l, M16a, M18c, M19a, M19b, M23, M25, M27a, M27d, M30di, M30e, M30ai, M30ji, M31ai, M31bii, M32a, M33, M37a, M39f, M40a, M40bi, M40bii, M40c.



Fig. 25. Immature male of *Libellago hyalina*. Photo by GR.

28. *Libellago aurantiaca* (Selys, 1859)
L4a, L12b, M4, M10a, M12a.
29. *Libellago hyalina* (Selys, 1859)
Fig. 25 shows an immature male.
L4a, LB1b, LB4, LB5, M2, M10c, M10f, M10e, M10h, M10j, M12a, M14f.
30. *Libellago semiopaca* (Selys, 1873)
This species is found at a variety of open aspect forest streams (for instance see records in Dow et al. (2021)) but also occurs on large turbid rivers. Along the mostly exposed banks of the Baram River in the vicinity of Uma Bawang (M14j) it was one of only two odonates encountered more than once and was moderately common. Although exposed there is disturbed forest around the Baram in this part and large quantities of dead wood in various states of submergence along the banks (used for oviposition by the female of *L. semiopaca*).
LB3, M2, M12a, M13a, M14f, M14j, M16a, M19a, M27a.
31. *Rhinocypha aurofulgens* Laidlaw, 1931
Not uncommon in the upper Baram area.
M13a, M16a, M18c, M21a, M27d, M27e, M28h, M29a, M33, M34a, M37a, M37c, M39a, M40a.
32. *Rhinocypha cucullata* Selys, 1873
M14f, M14h, M16b.
33. *Rhinocypha spinifer* Laidlaw, 1931
A common species in Pulong Tau National Park and on many of the stream systems below it in the Kelabit Highlands.
M21b, M24a, M24b, M25, M28a, M28e, M29a, M30ai, M30aii, M30bii, M30bii, M31bii, M32a, P1, P2a, P3a, P3b, P3c.
34. *Rhinocypha stygia* Förster, 1897
M14f, M16a, M16b, M40bi.
35. *Rhinocypha* sp.*
We have commented on this problematic form before, it is allied to *R. spinifer* but the male (only rarely collected) exhibits cryptic behaviour and is darker. Lest it be hypothesised that the male is a “sneaker” form of *R. spinifer*, we note that this form is normally found where *R. spinifer* is absent, making such a hypothesis unlikely.
M18a, M18d, M18e, M34d, M39d.
36. *Rhinoneura caerulea* Kimmins, 1936
Although a number of locations are now known for this species it remains elusive. Pulong Tau National Park contains much seemingly suitable habitat for it, but so far only a single individual has been collected there; Fig. 26 shows the specimen. Two individuals of what was almost certainly this species were seen at location M28a, a low altitude location by the standards of the species, but only in bright sunshine and they remained perched high, out of reach of RD’s net.
P2a.
37. *Sundacypha petiolata* (Selys, 1859)
M14a, M14b, M19a.



Fig. 26. Male specimen of *Rhinoneura caerulea*, the only example so far found within Pulong Tau NP. Photo by PS.

Devadattidae

In addition to the records listed below, there is a series of male *Devadatta* from locations M40c and M40d in the Long Seridan area (listed in the Additional Records section as *Devadatta* species). As noted in Dow et al. 2015 some of the Bornean *Devadatta* species appear to exhibit character displacement where their ranges overlap, rendering their identification easier in those areas, but outside of the intersection the characters relax, making identification without DNA problematic if it is not already known which species is present. The relevant example here is *D. aran* Dow, Hämäläinen & Stokvis, 2015 whose range overlaps with both *D. somoh* Dow, Hämäläinen & Stokvis, 2015 (in parts of Sarawak) and *D. tanduk* Dow, Hämäläinen & Stokvis, 2015 (in parts of Sabah) and where the ranges overlap both sexes of each species can be told apart without DNA. The specimens from the Long Seridan area have characters that seem intermediate between *D. aran* and *D. tanduk* Dow, Hämäläinen & Stokvis, 2015 but the Long Seridan area might also be just outside of the range of *D. somoh* so that the mystery specimens could be *D. aran*. Unfortunately, since they might have been more informative, no females were found. The only other *Devadatta* found in the Long Seridan area so far is *D. clavicauda*, in which the male has (compared to the other Bornean species) distinctive anal appendages and in which no character displacement has been observed. Further comments on this issue will be made the next part of this series of papers, focused on Limbang Division (Dow & Choong in preparation).

38. *Devadatta aran* Dow, Hämäläinen & Stokvis, 2015*

Rather common in the Tama Abu Range.

M18a, M18d, M21a, M24a, M25a, M28a, M28c, M28e, M29a, M30a_{ii}, M30a_{iii}, M30b_{ii}, M39d, M39e, P1, P2b, P2d.

39. *Devadatta clavicauda* Dow, Hämäläinen & Stokvis, 2015

Fig. 27 shows a male of this species; in general the Bornean *Devadatta* are very hard to identify from photographs but the inflated ends of the superior anal appendages, a defining character of *D. clavicauda*, are just visible in this photograph.

L4b, L5, L6, L9a, L12a, M14a, M14c, M14e, M14h, M18a, M18d, M18e, M18f, M18g, M22a, M22b, M23, M25, M27d, M28c, M28e, M28g, M36, M38a, M38c, M39b, M39e, M39f, M40c.



Fig. 27. Male of *Devadatta clavicauda*. Photo by GR.

40. *Devadatta somoh* Dow, Hämäläinen & Stokvis, 2015

This species, common in Kapit Division, is relatively scarce in Miri Division which might be the edge of its range in Sarawak.

M13a, M18g, M21b, M25, M34b, M39b, M39c.

Euphaeidae

41. *Dysphaea dimidiata* Selys, 1853

M12a, M13a, M14f, M14k_{iii}, M17.

42. *Dysphaea lugens* (Selys, 1873)

Commenting on the collection of this species on Sungai Bloh and Sungai Katibas at the Lanjak Entimau Wildlife Sanctuary, Dow et al. (2018) speculated that one of the reasons it had hardly been recorded in recent decades is a preference for larger streams with deep water and rapids that are difficult to sample. In October 2020 individuals of this species were collected along the banks of the Baram River, no other species of *Dysphaea* was collected at this location, and in fact the only other odonate found more than once along the banks of the Baram in the same area was *Libellago semi-*

opaca. Both these species were present even in the middle of the day when the temperature along the largely unshaded riverbanks was extreme. This observation tends to support the hypothesis that the species prefers larger streams and rivers, with deep water. However there are no rapids in the part of the Baram where *D. lugens* was collected (they begin further upriver), so that part of the hypothesis put forward in Dow et al. (2018) can be dismissed. The Baram River around Uma Bawang (and for a considerable distance upstream and all of the way downstream to its mouth) where the series of *D. lugens* was collected is very turbid except during droughts. The current state of the Baram has persisted since commercial logging commenced in the area (several decades) so this is not a new situation and it is clear that the species is tolerant of increased sediment loads in rivers and is therefore likely to be present on parts of most or all of the large streams and rivers in Sarawak.

M14j.

43. *Dysphaea ulu* Hämäläinen, Dow & Stokvis, 2015

M16b, M19b, M33a, M34a, M39a, M40bi.

44. *Euphaea ameeke* van Tol & Norma-Rashid, 1995

The range of this species (described from Brunei) extends into Sarawak as far as Lambir Hills and its surrounds, there is also an old specimen, previously misidentified as *E. impar*, from Trusan in Limbang Division in the Sarawak Museum (Dow & Morris 2021).

L4b, L5, L7, L9a, L12a, M4.

45. *Euphaea basalis* (Laidlaw, 1915)

Another elusive (at least in Sarawak) species of streams in montane forest.

P4.

46. *Euphaea impar* Selys, 1859

M2, M13a, M14a, M14b, M14c, M14d, M14f, M14g, M14h, M14ki, M14kii, M14l, M16b, M18a, M18d, M19a, M19b, M22a, M22b, M39f, M40bi, M40bii, M40biii.

47. *Euphaea subcostalis* Selys, 1873

Very common in the mid and upper Baram.

M13a, M14b, M14f, M14g, M14h, M14ki, M14kii, M14kiii, M14l, M16a, M16b, M18a, M18b, M18c, M18d, M18e, M18f, M19a, M19b, M22a, M22b, M25, M27e, M33b, M34a, M34c, M37a, M37c, M38a, M38c, M39c, M39f, M40a, M40bi, M40c.

- 48 *Euphaea subnodalis* (Laidlaw, 1915)

M18a, M18b, M21a, M21b, M23, M25, M27a, M27e, M28h, M29a, M32a, M34a, M39a, P3b.

49. *Euphaea tricolor* Selys, 1859

Although common where it occurs, there are relatively few records of this species from Miri Division compared with the southwest of Sarawak. It is notably absent from locations such as Sungai Liyang in the Uma Bawang area, many parts of which appear perfectly suited to it, but where only *E. subcostalis* has been found.

M16a, M19b, M33a, M33b, M34a, M39a.

Philosinidae

50. *Rhinagrion borneense* (Selys, 1886)

L4b, L5, L7, M13a, M14a, M14b, M14c, M14d, M14e, M14f, M14g, M14h, M14ki, M14l, M14mi, M16a, M16b, M18f, M19a, M19b, M22b, M25, M27a, M37a, M37c, M40bi, M40c.

Rhipidolestidae

51. *Bornargiolestes fuscus* Dow, 2014

This species remains known with certainty only from Gunong Mulu and Lambir Hills National Parks and the Kuala Belalong Field Studies Centre in Brunei. A teneral female from Gunung Kalulong (location M18a) was excluded from the type series by Dow (2014b) and is listed with a ? below, possibly it is some other species, either *B. nigra* Kimmins, 1936 (the female of which is unknown) or an unnamed species. The spot where the teneral female was found is shown in the lower image in Fig. 17.

L4b, L9b, M18a(?).

Platynemididae

52. *Coelliccia borneensis* (Selys, 1866)

Scarce or absent near to the coast, this species becomes locally common in the mountainous interior but is apparently and rather strangely absent from the parts of the Tama Abu Range in Miri Division that have been sampled (where much seemingly suitable habitat exists).

M14b, M14h, M16b, M18a, M18d, M18g, M18h, M19b, M34b, M34c, M34d, M40bi.

53. *Coelliccia campioni* Laidlaw, 1918

The comments on the last species apply equally well to this, except that it is even more local in occurrence.

M22a, M22b, M25, M27d, M34b, M34c, M37a, M38a.

54. *Coelliccia cyaneothorax* Kimmins, 1936

M38a, M40a, M40bi, M40c.

55. *Coelliccia kenyah* Dow, 2010

Fig. 28 shows a male of this species; it is not a very good photograph but is the best from a series that may be the only ones in existence.

LB6, M13a, M13b, M14c, M15a, M17, M18e, M18f, M18g, M40c.



Fig. 28. Male of *Coelliccia kenyah*. Photo by RD.

56. *Coeliccia macrostigma* Laidlaw, 1918
M10b.
57. *Coeliccia nemoricola* Laidlaw, 1912*
M21b, M28a, M28e, M30aiii, M30bi, M30bii, M30biii, M30c, M31bi, M30bii, P1, P2a, P2b, P2d, P3a, P3b, P3c.
58. *Coeliccia* sp. cf *nemoricola* Laidlaw, 1912
L6, L8, L12a, M18d, M18e, M18h, M25, M27a, M28c, M34b, M38a, M39b, M39f, M40c.
59. *Coeliccia nigrohamata* Laidlaw, 1918
A misplaced tandem between two males of *C. nigrohamata* was collected in Gunung Kalulung area on July 7, 2010; this behaviour is quite seldom observed..
L4b, L7, L12a, LB6, M4, M13a, M13b, M14a, M14b, M14d, M14e, M14f, M14h, M17, M18a, M18b, M18d, M18e, M18f, M18g, M18h, M19a, M19b, M21a, M22a, M22b, M24a, M25, M27a, M27d, M27e, M28c, M28e, M34b, M34c, M37c, M38a, M39b, M39c, M39d, M39e, M39f, M40a, M40bii, M40biii, M40d.
60. *Coeliccia roberti* Dow, 2020
See Dow (2020).
L4a, L5, L7, L8, L9a, L12a, M10d.
61. *Copera vittata* (Selys, 1863)
L1b, L4a, LB2, LB6, M2, M10a, M10c, M10e, M10f, M10g, M10i, M10j, M11, M13c, M14a, M14e, M14i, M14mi, M25, M27a, M27e, M30biii, M30diii, M31bi, M34e, M38b, M39a, M40a, M40l.
62. “*Elattoneura*” *analis* (Selys, 1860)
M10a, M14a, M14f, M16a, M16b, M25, M30ai, M30di, M30ai, M31bii, M32a.
63. *Onychargia atrocyana* Selys, 1865*
Additionally to the specimen based records below, Dow & Reels (2010) reported this species from Lambir Hills National Park based on a sight record.
M2, M6, M9, M10e, M10j.
64. *Prodasineura collaris* (Selys, 1860)
This widespread species is one of the most local and least common *Prodasineura* occurring in Sarawak.
L4a, M2, M10e, M10f.
65. *Prodasineura dorsalis* (Selys, 1860)
M10e, M10f, M10j, M14b, M14e, M18b, M25, M27e, M30f, M30ai, M31bii, M39f.
66. *Prodasineura hosei* (Laidlaw, 1913)
M14f, M14h, M22b, M39f, M40bi, M40bii.
67. *Prodasineura hyperythra* (Selys, 1886)
This species exhibits considerable variation in colour and pattern in parts of its range, Fig. 29 shows a typical male.
M2, M14a, M14b, M14c, M14d, M14e, M14f, M14h, M14mi, M25, M27e, M31bii, M37a, M39a, M39f.
68. *Prodasineura* sp. cf *peramoena* (Laidlaw, 1913)
L4a, L5, L7, L12a, M4.



**Fig. 29. Male of *Prodasineura hyperythra*.
Photo by RD.**

69. *Prodasineura verticalis* (Selys, 1860)

L4a, M2, M4, M10f, M13a, M14f, M14ki, M14kiii, M16a, M17, M19a, M19b, M27a, M30di, M33b, M34a, M37a, M37c, M39a, M40bi.

Coenagrionidae

70. *Aciagrion borneense* Ris, 1911*

L1a, M12b, M13c, M30biii, M30e, M30jii, M31aii, M31bi, M34e, M40gi.

71. *Agriocnemis femina* (Brauer, 1868)

L1a, L3, LB1a, LB9b, M7, M10a, M10e, M10h, M10i, M12a, M13c, M27b, M27e, M30biii, M30e, M30dii, M30g, M31aii, M31bii, M34e, M37d, M40h, M40k.

72. *Amphicnemis annae* Lieftinck, 1940

LB5.

73. *Amphicnemis* new sp. cf *mariae* Lieftinck, 1940*

Also known from Usun Apau National Park, this species is unusual in the genus in that it has only been found above 1,000m a.s.l. Although we have little doubt that this species is unnamed, the quality of the available material is not good and it is better to wait for better specimens before it is described.

M31bi.

74. *Amphicnemis martini*-group sp. or spp.

This species group is normally found in low pH swamp forest or in small swampy areas within other formations. A single female was found high on a bank above Sungai Betau in the upper Baram, a habitat certainly not meeting the above description, but perhaps there was typical habitat nearby.

LB5, M39a.

75. *Amphicnemis remiger* Laidlaw, 1912

M10b, M10c, M10e.

76. *Amphicnemis* sp. *wallacii*-group

Amphicnemis wallacii was described from southwest Sarawak, related forms differing

in details of the male anal appendages have been found in Bintulu and Miri Divisions, but it is not clear if these are distinct species or merely represent geographical variation in a single species.

L4b, LB2, LB6, M2, M10a, M10b, M10c, M10e, M10f, M10g, M11, M12a, M12b.

77. *Archibasis incisura* Lieftinck, 1949*

LB1a, LB2, LB5, LB6, LB8, LB9a, M6.

78. *Archibasis melanocyana* (Selys, 1877)*

LB1a, LB8.

79. *Archibasis tenella* Lieftinck, 1949

This forest stream species normally occurs at low densities and could easily be overlooked during short surveys. Even so, the number of records from Miri Division is surprisingly low.

L4a, M14f.

80. *Archibasis viola* Lieftinck, 1949

Fig. 30 shows a close up of a male of this species.

LB2, M2, M10c, M10e, M10j, M11, M30ai.



Fig. 30. Close up of male of *Archibasis viola*. Photo by GR.

81. *Argiocnemis rubescens rubeola* Selys, 1877

This widespread taxon is not common in Sarawak and all recent records come from Miri Division. The record from the Long Banga area here is the furthest into the interior of any reliable record that we know. It is likely that many older records from Sarawak actually refer to the next species so that the distribution of *A. rubescens rubeola* in Sarawak may not actually extend much further west than Miri Division. If correct this distribution, and also that of *Pseudothemis jorina*, is somewhat curious; both species are common in Peninsular Malaysia and occur in Sumatra but appear to be absent from the closest parts of Sarawak to these landmasses.

L1b, M4, M10e, M10i, M11, M27e.

82. *Argiocnemis* sp.
M10a, M14a, M14mvi, M27a, M29b, M30g, M31bi, M31bii, M31biii, M34e, M37d, M38b, M39g, M40gi, M40h, M40j, M40l.
83. *Ceriagrion bellona* Laidlaw, 1915
M18ic, M18ie, M24b, M27d, M30dii, M31bi, M31biii, M34d, M34e, M38d, M39f, M40j.
84. *Ceriagrion cerinorubellum* (Brauer, 1865)
L1a, L3, L4a, LB5, LB9a, M1, M4, M5, M7, M10a, M10c, M10g, M11, M12a, M14mi, M14mvi, M40f, M40gi, M40l.
85. *Ischnura senegalensis* (Rambur, 1842)*
L1a, L3, M3, M7, M13c, M30dii, M30e, M30g, M32b.
86. *Mortonagrion indraneil* Dow, 2011*
LB5, M10c, M10e, M10g.
87. *Pseudagrion lalakense* Orr & van Tol, 2001
Fig. 31 shows a male at Lambir Hills National Park.
L1a, L3, L11, LB1a, LB1b, LB2, LB7, LB8, LB9a, M1, M4, M11, M13c, M14mi, M14miii, M39h.



Fig. 31. Male of *Pseudagrion lalakense*. Photo by GR.

88. *Pseudagrion microcephalum* (Rambur, 1842)*
L1a, LB1a, LB2, LB4, LB9a, LB9b, M1, M2, M3, M5, M6, M9, M12a, M14mi, M14mvi, M34e.
89. *Pseudagrion perfuscatum* Lieftinck, 1937
M4, M13a, M14ki, M17, M18k, M19a, M27a, M27c, M27d, M30di, M30e, M37a, M39c, M39f.
90. *Pseudagrion pilidorsum* (Brauer, 1868)
M4.
91. *Stenagrion dubium* (Laidlaw, 1912)
L4b, L5, L9a, L12a, M13a, M14a, M14ki, M15a, M18a, M18d, M18e, M18g, M19b, M22a, M22b, M24a, M25, M27d, M28a, M28c, M28e, M28g, M30ai, M30aii, M30bii, M30c, M34b, M34c, M36, M38c, M39b, M39c, M39d, M39e, M39f, M40a, M40biii, M40c, M40d, P1, P2a, P2b, P3c.

92. *Teinobasis cryptica* Dow, 2010
LB5.
93. *Teinobasis laidlawi* Kimmins, 1936
M18d, M27a, M27e, M28d.
94. *Teinobasis rajah* Laidlaw, 1912*
L1b, LB5, M2, M6, M7, M10b, M10e.



Fig. 32. The two *Xiphiagrion* species. (A) Tandem pair of *Xiphiagrion cyanomelas* A (the typical lowland form). Photo by GR. (B) Male of *Xiphiagrion cyanomelas* B (the long-striped upland form). Photo by CC.

95. *Xiphiagrion cyanomelas* Selys, 1876 A
Xiphiagrion cyanomelas, as currently understood, is a common and widely distributed species. Two forms occur in Sarawak, the typical form with males with short antehumeral stripes, normally found at lower altitudes and a form normally found at higher altitudes with males with longer antehumeral stripes (there are a number of other differences). Although at one point we had considered it likely that these forms represent different species, by the time RD began work on Dow (2021a) this idea had been largely abandoned, after considering the variability reported in the species outside of Borneo (for instance see Lieftinck (1929, 1949)) and the fact that no support was given to it by DNA barcoding (unpublished Naturalis data). The possibility that the two forms represent separate species is not even mentioned in the notes in Dow (2021a) because of the aforementioned considerations and it had been expected

that intermediate forms would be found at intermediate altitudes in Sarawak. However both forms were found together on one small pond at ca 500m a.s.l. in the Sungai Lowing area in 2020 with no intermediates. In this population both forms were easily distinguishable with the naked eye by size, extent of blue markings and even shade of the blue markings, and no interaction was observed between the forms, despite the presence of females of at least the long-striped form and frequent interactions between males of the same form. A similar observation was made by CC in the Long Banga area in 2016. It is difficult to reconcile these observations with the notion that the two forms are merely variants of a single species and a thorough review of all records, including those from outside of Borneo, is needed. Unfortunately it appears that COI based DNA barcoding will be of no help in resolving the *Xiphiagrion* complex. Here we treat the two forms as distinct taxa. The typical lowland form is referred to as *X. cyanomelas* A here and the other form as *X. cyanomelas* B. The A form is closer to, and might well be, the true *X. cyanomelas*. Fig. 32 shows a male (of the typical lowland form) contact guarding a female whilst she oviposits.

L1a, LB9a, M3, M11, M14mvi, M18ei, M18j, M18k, M25, M27c, M27e, M34d, M34e, M37b, M38b, M39h, M40f, M40gi, M40j.

96. *Xiphiagrion cyanomelas* Selys, 1876 B
M21b, M25, M27e, M29b, M34d.

Anisoptera

Aeshnidae

97. *Anaciaeschna jaspidea* (Burmeister, 1839)*

A single female found dead in a spider web outside a shop in Bario represents the only record of this species from Sarawak of which we are aware. Possibly dusk sampling at the wet rice fields of Bario would yield more specimens.

M30e.

98. *Anax guttatus* (Burmeister, 1839)

Fig. 33 shows a male in hand.

M3, M7, M40m.

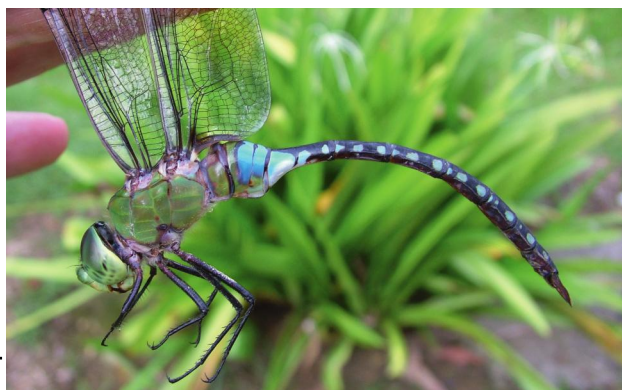


Fig. 33. Male *Anax guttatus* in hand. Photo by RD.

99. *Anax panybeus* Hagen, 1867

This species is often seen in the interior of Sarawak, where it is at least as common as *A. guttatus*, but it only rarely presents an opportunity to catch it. Frequently encountered flying over unsealed roads in good weather.

M18ei, M27a, M39a, M40m.

100. *Gynacantha basiguttata* Selys, 1882*

LB8, M14i, M36, M37c.

101. *Gynacantha dohrni* Krüger, 1899

L13, LB6, LB8, M7, M14i, M30e, P2c.

102. *Gynacantha* sp.

A single female specimen, not either of the species listed above.

LB5.

103. *Heliaeschna crassa* Krüger, 1899

The reader is referred to Note 52 in Dow (2021a) for comments on this and the next species.

LB8.

104. *Heliaeschna idae* (Brauer, 1865)

L13, M7.

105. *Heliaeschna simplicia* (Karsch, 1891)

Fig. 34 shows a male.

LB8, L13, M2.

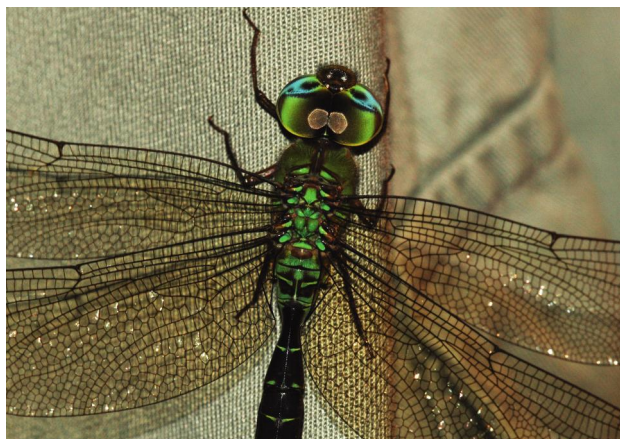


Fig. 34. Male of *Heliaeschna simplicia*. Photo by GR.

106. *Heliaeschna uninervulata* Martin, 1909*

A rarely encountered species in Sarawak. As with *Heliaeschna* in general this species is most often caught during crepuscular flight, however a male was caught apparently hawking over a shady backwater to the channel at location LB8 around midday in sunny conditions, it was seen some distance away and there was no sign that it had merely been disturbed from a resting place.

LB4, LB8, M2.

107. *Indaeschna grubaueri* (Förster, 1904)
M14i, M20, M27e, M28d, M30biii.
108. *Oligoaeschna foliacea* Lieftinck, 1968
LB8, M2, M6, M10c.
109. *Oligoaeschna* sp. or spp.
Female specimens not agreeing with *O. foliacea*. The record from M30biii is notable because of the altitude (around 1100m a.s.l.); most records of this genus from Borneo are from the lowlands.
LB8, M30biii.
110. *Tetracanthagyna degorsi* Martin, 1896
M30g, P1, P2a, P2b.

Gomphidae

111. *Acrogomphus* sp. cf *jubilaris* Lieftinck, 1964
Larval records not definitely identifiable to species.
L4b, P2b.
112. *Borneogomphus* sp.*
A female collected on Gunung Kalulong prior to the description of *Borneogomphus* (Karube & Sasamoto 2014). It differs in some details from the female of *B. teramotoi* Karube & Sasamoto, 2014 (the only named species in the genus) and might well represent a distinct species. Frustratingly the female was in tandem when seen but the tandem broke just before the net was swung and the male escaped.
M18a.
113. *Burmagomphus arthuri* Lieftinck, 1953*
This is the first record of this species from Miri Division to be published, a female collected in the Uma Bawang area in October 2020.
M14kiii.
114. *Heliogomphus borneensis* Lieftinck, 1964
This is usually a scarce species but over six days fieldwork in the Uma Bawang area in the mid Baram in early June 2019 it was encountered on five days, in seepages and tiny high gradient streams in disturbed forest, and more than one male was at least seen on several days.
M14b, M14c, M14d, M14g, M14h.
115. *Ictinogomphus acutus* (Laidlaw, 1914)
Normally found on low pH forest streams, a single male was found inside flooded (low pH water) forest at the margins of Loagan Bunut, perhaps there is more typical habitat somewhere in the vicinity.
LB5.
116. *Ictinogomphus decoratus melaenops* (Selys, 1858)
LB1a, LB4, LB9b, L1a, M2, M5, M6, M10c, M10f, M10k, M11, M13a, M14j, M14mi, M14miii, M19a, M19b, M27a, M27c, M34e, M39h, M40e.
117. *Leptogomphus coomansi* Laidlaw, 1936
L9a, L12a.

118. *Leptogomphus* sp. cf *coomansi* Laidlaw, 1936*
See Dow, Stokvis & Ngiam (2017) for comments on this taxon.
M13a, M14b, M14f, M14g, M16b, M22b.
119. *Leptogomphus* pasia van Tol, 1990*
P2a.
120. *Leptogomphus* pendleburyi Laidlaw, 1934
M14h, M18e, M39c, M40c, M40d.
121. *Leptogomphus* sii Dow, Stokvis & Ngiam, 2017
M18c.
122. *Leptogomphus* williamsoni Laidlaw, 1912*
M18d, M22b, M28c, M34b, M39e, M40d.
123. *Leptogomphus* sp.
See Dow, Stokvis & Ngiam (2017) for a discussion of this distinctive taxon, only known from a single female.
P3c.
124. *Macrogomphus* quadratus Selys, 1878*
L4a, M10f, M12a, M18g.
125. *Megalogomphus* sp.
A larval record that could be either of the two species known from Borneo
L4a.
126. *Microgomphus* chelifer Selys, 1858
M14f.
127. *Microgomphus* sp.
M10c.
128. *Sieboldius* japonicus (Selys, 1854)
This species, seemingly scarce in most parts of Sarawak, is quite common in the Kelabit Highlands.
M30aⁱⁱ, M30bⁱ, M31aⁱ, M32a, M33a.

Chlorogomphidae

129. *Chlorogomphus* sp. or spp.

A female collected at a small high gradient forest stream in the Long Seridan area in October 2020 is remarkable for the structure of its vertex, produced into a large rearward pointing horn. One of the female *Chlorogomphus* specimens in the Sarawak Museum reported by Dow & Morris (2021) has an identical or at least similar structure (it is partly obscured by dead fungus), although this was not mentioned in Dow & Morris (2021), three others might have such a structure but the vertex is so obscured by old fungus that it is not possible to be sure. The specimen in the Sarawak Museum that definitely has such a horn on the vertex, from "Baram", could possibly be one of the two females of *C. sp. cf splendidus* reported by Laidlaw (1914) although it does not agree in all details and Laidlaw made no mention of the horn. The other specimens that might have a vertex horn are labelled "Matang" or "Matang Road", locations in Kuching Division, one of these

is labelled "*O. [Orogomphus] splendidus*". The female from the Long Seridan area was collected after it flew up a mostly high gradient stream and began flying back and forth over a small, well vegetated gravel bar in a low gradient section at the confluence of two branches of the stream. The other record here is of a larva.

M40d, P2b.

Macromiidae

130. *Epophthalmia vittigera* (Rambur, 1842)*

Additionally to the specimen based records below, Dow & Reels (2010) reported this species from Lambir Hills National Park based on a sight record.

LB1a, LB4, M2, M13a, M14mi, M14miii, M32b, M34e.

131. *Macromia cincta* Rambur, 1842

Fig. 35 shows a closeup of a female in hand.

L4a, M10c.



Fig. 35. Close up of female of *Macromia cincta*. Photo by GR.

132. *Macromia corycia* Laidlaw, 1922

Also see below under *M. jucunda*.

M27d, M27e, M30ai, M30bi, M34a.

133. *Macromia cydippe* Laidlaw, 1922

M14l.

134. *Macromia jucunda* Lieftinck, 1955*

A single male *Macromia* was collected while it was rapidly flying a short beat, before 9 A.M., on Sungai Liyang (M14f) in the Uma Bawang area in October 2020, in the lower part of the stream which is heavily under the influence of the Baram River. When the Baram is high the lower section of Sungai Liyang is deep and turbid, when the Baram is at a more average level, after the first few hundred meters Sungai Liyang is shallow in its lower section, but with much sediment in the bed left by the Baram (further upstream this sediment is absent). The specimen from Sungai Liyang differs from all

species previously recorded from Borneo (and most species known from Sundaland) in many details, including the markings of the abdomen with S7 entirely black except for a small, very faint (hardly visible) basal dorsal yellow mark on S7 but a small basal dorsal yellow mark dorsally and slightly larger subbasal lateral yellow marks on S8, and details of the accessory genitalia and anal appendages. RD initially thought that the Sungai Liyang specimen was a new species but on checking the descriptions of all Southeast Asian species discovered that it is an excellent match to the very poorly known *M. jucunda* Lieftinck, 1955. *Macromia jucunda* was described from a single male collected in the Botanic Garden at Bogor in Java (Lieftinck 1955) and the only other record until now was of a single male from Bali in Kishi (1999). The Sungai Liyang specimen has accessory genitalia and anal appendages essentially identical to those of *M. jucunda* as illustrated in Lieftinck (1955: Figs 25-26) and only differs from the description of *M. jucunda* by lacking any small dorsal yellow spots on abdominal S4-S5 and in having the dorsal yellow marks on S7 and S8 smaller and in the case of S7, fainter. Even the size is very similar, Lieftinck gives abdomen plus anal appendages 41mm and Hw 32.8mm for *M. jucunda*, for the Sungai Liyang specimen the abdomen plus anal appendages 40.5mm, Hw 32mm. *Macromia jucunda* is in the *septima*-group of *Macromia*, as is the Sumatran *M. dione* Lieftinck, 1971. Dow et al. (2019) reported a larva from a location in Bintulu Division that is a close match with *M. dione* in the COI marker, and we do wonder if that larva was actually that of *M. jucunda*; it is entirely possible, even likely, that not all species in the *septima*-group are distinct from each other in COI, species boundaries between closely related taxa are quite often obscured in this marker. On the other hand there are also very likely to be synonyms within the *septima*-group and Dow & Ngiam (2015) already commented on the likelihood that *M. corycia* is a junior synonym of *M. gerstaeckeri* Krüger, 1899; in fact the male *Macromia* reported here from location M34a as *M. corycia* is a good illustration of this, it has accessory genitalia and anal appendages agreeing more (in as far as there are differences) with those of *M. gerstaeckeri* as illustrated by Lieftinck (1950) but abdominal markings agreeing better with those of *M. corycia* as illustrated by Lieftinck in the same paper. RD has only held off from synonymising *M. corycia* with *M. gerstaeckeri* because he has not yet had the opportunity to examine topotypical Javan *M. gerstaeckeri* specimens in detail.

M14f.

135. *Macromia westwoodii* Selys, 1874

M18a, M18f, M21a, M22b, M25, M28a, M30ai, M30c, M32a, M36, M39f, P2a, P2b.

136. *Macromia* sp. cf *westwoodii* (*?)

A single male caught while it was hawking along a shaded part of an old skid path near to M34b. Clearly closely allied to *M. westwoodii* but differing in details of the anal appendages and accessory genitalia. The single specimen is an exceptionally large individual (abdomen plus anal appendages 55mm, Hw 51mm), bigger than any of the *M. westwoodii* males whose measurements are given in Dow et al. (2019). The specimen appears to be outside of the variation occurring in *M. westwoodii* and is tentatively considered to be a new species, however further investigation and additional material is required before it can be named. We wonder if this is the same taxon as the *Macromia* sp. known from larvae (which were particularly large)

collected in Gunong Mulu National Park and close to *M. westwoodii* but appearing distinct to it in the COI marker (see the discussion and Fig. 24 in Dow et al. (2019)).

M34d.

Synthemistidae

137. *Idionyx montana* Karsch, 1891

The number of records of this species from Sarawak is growing steadily, it may actually be a fairly common species in the interior.

M27d, M27e, M281, M39b, M39f.

138. *Idionyx* sp. cf *yolanda* Selys, 1871

M40d

139. *Macromidia fulva* Laidlaw, 1915

L5, L12a, M18a, M18d, M19a, M30ai, M36, M40bii, P2a.

Corduliidae

140. *Hemicordulia tenera* Lieftinck, 1930*

M30f, M31bi.

Libellulidae

141. *Acisoma panorpoides* Rambur, 1842*

L1a, M3.

142. *Aethriamanta gracilis* (Brauer, 1878)

L1a, LB9a, M1, M3, M5, M11, M12b, M14mi, M14miii, M14mv, M18k, M34e, M37a, M40e, M40gi.

143. *Agrionoptera insignis* (Rambur, 1842)*

Sometimes abundant at forest edge ponds in the interior of Sarawak, for instance at location M14mii it was the most abundant species observed.

L1b, M2, M3, M11, M14mii, M14mvi, M27e, M40h, M40j.

144. *Agrionoptera sexlineata* Selys, 1879

M10e, M40gii.

145. *Brachydiplax chalybea* Brauer, 1868

L1a, L4a, LB1a, LB4, M1, M5, M6, M8, M10a, M10c, M10i, M10j, M11, M14mii, M27b, M27e, M32b, M40gi, M40k.

146. *Brachydiplax farinosa* Krüger, 1902 B

See the comments in Dow, Choong & Ng (2016); the species occurring in Sarawak is *Brachydiplax farinosa* B.

L1b, M11.

147. *Brachygonia oculata* (Brauer, 1878)

LB5, M2, M6, M10b, M10c, M10e, M10i, M10j.

148. *Camacinia gigantea* (Brauer, 1867)*

Recorded from Miri Division for the first time in 2016 and again in 2020, when it was



Fig. 36. Male of *Camacinia gigantea*. Photo by GR.

found at a number of locations. Abundant at some of the locations reported here, in particular M40gi. Fig. 36 shows a male.

M14mii, M27c, M37b, M37d, M40gi.

149. *Chalybeothemis pruinosa* Dow, Choong & Orr, 2007*

See Dow et al. (2007); this species remains known only from Loagan Bunut National Park, but has not been collected even there, despite deliberate searches in 2015, since it was discovered in 2006.

LB1c, LB8.

150. *Cratilla lineata* (Brauer, 1878)*

M13c, M14mvi, M18h, M27e, M30g, M31biii, M34d, M40biv, M40i.

151. *Cratilla metallica* (Brauer, 1878)

L4b, M2, M4, M13c, M14e, M14f, M14i, M14kiii, M18d, M18e, M19b, M25, M27a, M28d, M28i, M31aii, M34d, P2c.

152. *Diplacodes trivialis* (Rambur, 1842)

M7, M13c, M18j, M26, M27a, M27e, M30e, M30g, M40n.

153. *Hydrobasileus croceus* (Brauer, 1867)

Additionally to the specimen based records below, Dow & Reels (2010) reported this species from Lambir Hills National Park based on a sight record.

M2, M5, M11.

154. *Hylaeothemis clementia* Ris, 1909

M27e, P2b.

155. *Lathrecista asiatica* (Fabricius, 1798)*

A scarce species in Sarawak, where the only record apart from those reported here is in Kitagawa (1997) from a location in Kuching Division.

LB2, LB9a.

156. *Lyriothemis biappendiculata* (Selys, 1878)

Additionally to the specimen based records below, Dow & Reels (2010) reported this species from Lambir Hills National Park based on a sight record.

M13a, M13b, M14a, M14b, M14h, M18b, M18d, M18e, M24a, M28c, M40d.

157. *Lyriothemis cleis* Brauer, 1868
L8, M2, M19b, M27e, M37c.
158. *Nannophya pygmaea* Rambur, 1842
L1a, L3, LB9a, M1, M6, M10c, M10j, M11, M12b, M14mi, M14miv, M30e, M30j, M31biii, M37b, M40f, M40gi.
159. *Nesoxenia lineata* (Selys, 1879)*
LB2, LB5, M2, M10f, M12a, M30h, M40f.
160. *Neurothemis fluctuans* (Fabricius, 1793)
 This is by far the most common and least locally occurring of the three *Neurothemis* species known to occur in Sarawak, it is also extremely variable in size and extent of red markings on the wings, frequently overlapping with *N. ramburii* in these characters (however the two can always be told apart by the markings of the abdomen). All three *Neurothemis* species occurring in Sarawak are sometimes found in close proximity at the same site (for instance M14miii listed here).
L4a, L10, L12b, LB5, LB6, LB7, LB9a, M2, M4, M5, M6, M10a, M10c, M10f, M10g, M10j, M11, M12a, M12b, M13a, M13c, M14mi, M14mii, M14miii, M14miv, M14mvi, M15b, M18ic, M18ie, M18j, M19b, M22c, M23, M27b, M27d, M27e, M30e, M31aii, M31bi, M34d, M34e, M37d, M38b, M38d, M39g, M39h, M40e, M40f, M40gi, M40h, M40j, M40k, M40m.
161. *Neurothemis ramburii* (Brauer, 1866)
L1a, LB7, M2, M5, M14miii, M14mvi, M27d, M34e.
162. *Neurothemis terminata* Ris, 1911
L1a, LB9a, M2, M5, M13c, M14kii, M14miii, M15b, M27d, M27e, M39c, M40biv.
163. *Onychothemis coccinea* Lieftinck, 1953
 Additionally to the specimen based records below, Dow & Reels (2010) reported this species from Lambir Hills National Park based on a sight record.
M19a, M19b, M27a, M27e, M30di, M33a, M34a, M39a.
164. *Onychothemis culminicola* Förster, 1904
LB3, M4, M10c, M12a, M13a.



**Fig. 37. Male of *Orchithemis xanthosoma*.
 Photo by GR.**

165. *Orchithemis pulcherrima* Brauer, 1878
L2, L4a, L8, M2, M4, M10a, M10b, M10c, M10e, M10g, M10j, M12a, M31bi.
166. *Orchithemis xanthosoma* Laidlaw, 1911
Fig. 37 shows a male of this low pH specialist species.
M10b, M10c, M10e.
167. *Orthetrum chrysis* (Selys, 1891)
L4a, L11, L12b, LB5, LB6, LB7, M4, M8, M10f, M10i, M10j, M11, M13c, M14b, M14i, M14ki, M14l, M14mvi, M18ci, M18di, M18ei, M18k, M22c, M27a, M27b, M27d, M30jii, M34d, M38b, M38c, M40f, M40gi, M40j.
168. *Orthetrum glaucum* (Brauer, 1865)
L13, LB7, M4, M13a, M14i, M14mvi, M15b, M18d, M18g, M18ai, M18ci, M18ei, M18j, M21a, M23, M24b, M27a, M27d, M27e, M29b, M30dii, M31biii, M33a, M34d, M38a, M39a, M39f, M39j, M40m.
169. *Orthetrum pruinosum schneideri* Förster, 1903
M14l, M18e, M18ai, M22c, M24b, M27a, M27e, M30dii, M34d, M38a, M38b, M39a, M39f, M39j, M40a, M40i, M40m, P2a.
170. *Orthetrum sabina* (Drury, 1773)
L1a, LB6, LB7, M2, M5, M7, M8, M9, M10a, M10c, M10f, M10i, M12a, M12b, M13c, M15b, M26, M27a, M27b, M27e, M30e, M37b, M39h, M40e, M40gi, M40h.
171. *Orthetrum testaceum* (Burmeister, 1839)
L13, LB7, M2, M4, M5, M7, M10g, M12b, M13c, M14kii, M14l, M14miii, M14miv, M14mvi, M18ei, M18j, M18k, M19a, M19b, M26, M27a, M27b, M27e, M30e, M34d, M34e, M38b, M40e.
172. *Pantala flavescens* (Fabricius, 1798)*
Additionally to the specimen based records below, Dow & Reels (2010) reported this species from Lambir Hills National Park based on a sight record. Often seen flying over dirt roads in the interior.
M4, M18j, M27d, M30e, M40m.
173. *Pornothemis serrata* Krüger, 1902 complex
As noted in Dow et al. (2021) it appears that three species are currently being treated under the name *Pornothemis serrata* and the exact identity of the material reported here is best left open until a revision is completed.
LB2, M10a, M10e.
174. *Pseudothemis jorina* Förster, 1904
Males also seen at LB9a and LB9b on 13.i.2015 by RD. See also the comments under *Argiocnemis rubsecens rubeola*.
LB1c, LB2, M14mi.
175. *Rhodothemis rufa* (Rambur, 1842)*
L1a, L3, LB1a, LB9a, M3, M5, M6, M10i, M11, M40e.
176. *Rhyothemis aterrima* Selys, 1891*
L13, LB1a, LB1b, LB2, M6, M10c, M10h, M10j, M11, M12a.
177. *Rhyothemis fulgens* Kirby, 1889
M10e.

178. *Rhyothemis obsolescens* Kirby, 1889
L1b, L3, L8, M10c, M12b, M14mv, M31bi, M40gi.
179. *Rhyothemis phyllis* (Sulzer, 1776)
L13, LB1a, M1, M2, M3, M5, M6, M7, M10a, M10c, M10h, M10i, M31aii, M31biii.
180. *Rhyothemis regia* (Brauer, 1867)
This species, widely distributed to the south and east of Borneo and even recorded from satellite islands of Sumatra, is known to occur in Sabah (Chung et al. 2013) and was first recorded from Sarawak by Dow & Ngiam (2015) from a location in the upper Baram. The records presented here provide strong evidence that a breeding population is present in the northeast of Sarawak (and in addition to the locations listed below it was seen at location M37b). At most locations in the state only one or two individuals have been encountered but at location M40gi it was abundant. This is a conspicuous species and if it has been present in Sarawak since before records of Odonata were made in the state it is perhaps surprising that it has only been recorded in the last decade and only once before 2020; we wonder if its range is in the process of extending.
M14miii, M18k, M40e, M40gi.
181. *Rhyothemis triangularis* Kirby, 1889
L1a, LB9a, M3, M5, M11, M12b, M13c, M14f, M14mi, M14miii, M14mv, M27a, M27c, M34e, M37b, M37d, M38b, M38d, M40e, M40gi, M40k.
182. *Risiophlebia dohrni* (Krüger, 1902)*
LB5, M10e, M10g, M11.
183. *Tetrathemis hyalina* Kirby, 1889
Unusually abundant at location M14mi where it occurred on both the smaller and larger ponds everywhere there was any shade.
L1b, L4a, L11, LB1b, LB4, LB9a, M2, M4, M10a, M11, M14f, M14mi, M14mii, M27c, M38b, M40a, M40j.
184. *Tetrathemis* sp. cf. *platyptera* Selys, 1878*
The reader is referred to note 82 in Dow (2021a) for a discussion of this taxon.
M27a, M27e, M28d.
185. *Tholymis tillarga* (Fabricius, 1798)
Additionally to the specimen based records below, Dow & Reels (2010) reported this species from Lambir Hills National Park based on a sight record.
LB1a, LB8, M1, M8.
186. *Tramea phaeoneura* Lieftinck, 1953*
In the lowlands of Sarawak this species has only been found associated with low pH waters but it was found at an apparently non-low pH site (a well vegetated drain in agricultural land) above 1,000m a.s.l. near Bario. It occurs together with the next species at some locations, including the site reported here. Fig. 38 shows a specimen of this species, which rarely perches anywhere that it can be photographed in life. Although even males of the two species are difficult to separate without collection, specimens are easily told apart by the relatively shorter superior anal appendages of *T. phaeoneura* compared with those of *T. transmarina*.
M30h.



Fig. 38. Male specimen of *Tramea phaeoneura*. Photo by RD.

187. *Tramea transmarina euryale* Selys, 1878*

L1a, M5, M14miii, M26, M27c, M30h, M37b, M39i, M40f, M40gi.

188. *Tramea* sp. cf *virginia* (Rambur, 1842)

This is the same taxon reported by Dow & Ngiam (2015) from the upper Baram, and as that reported by Hincks (1930) from an unspecified location in Bintulu Division as *T. virginia*. We also have a recently collected female from Bintulu Division. As with *Rhyothemis regia*, the records here confirm the presence of a breeding population in Sarawak, although the true identity of the taxon remains something of a puzzle. It differs from *T. virginia* in a number of details and in fact bears a strong superficial similarity to *T. stenoloba* (Watson, 1962) but based on the presence of metallic colour on the frons belongs to a different species-group in the classification used by Watson (1967). It is also similar to *T. rosenbergi* Brauer, 1866 (based on known distributions perhaps a more plausible possibility than the last) but differs significantly in details of the male accessory genitalia and female vulvar scale.

M37b, M40gi.

189. *Trithemis aurora* (Burmeister, 1839)

M5, M12a, M13c, M14mi, M14mii, M14miii, M17, M18ai, M18bi, M18ei, M18k, M27e, M30e, M31aii, M34e, M38b, M38c, M39g, M40f.

190. *Trithemis festiva* (Rambur, 1842)
M13a, M14mvi, M15b, M18ai, M18ci, M18ei, M18k, M19a, M19b, M27a, M27e, M34a, M35, M39a, M39f, M39j, M40a, M40c.
191. *Tyriobapta kuekenthali* (Karsch, 1900)
 See Dow & Orr (2021) on this and the next species.
LB1b, LB5, M6, M10e, M10j.
192. *Tyriobapta laidlawi* Ris, 1919
L4a, L12a.
193. *Tyriobapta torrida* Kirby, 1889
L4a, L8, L12a, LB2, LB6, LB9a, M2, M4, M10c, M10e, M10j, M11, M12b, M14e, M14f, M14ki, M14mi, M27e, M30g, M30ai, M34e, M38b, M38d, M39f, M40h, M40j, M40l.
194. *Urothemis signata insignata* (Selys, 1872)*
L1a, LB9a, M3, M5, M11, M12b, M14mi, M14miii, M14mv, M40e, M40gi.
195. *Zygonyx ida errans* Lieftinck, 1953
M14f, M14ki, M27e, M281.
196. *Zyxomma obtusum* Albarda, 1881
M36.
197. *Zyxomma petiolatum* Rambur, 1842*
 Additionally to the specimen based records below, Dow & Reels (2010) reported this species from Lambir Hills National Park based on a sight record.
LB8, M10l, M14a, M14i, M32b, M36, M37c, M40n.

Discussion

It is evident from the large body of literature that refers to Odonata from Miri Division and the large number of species known from the division as well as the many locations covered in this report that the division has been relatively well sampled for the order. However new records for the division continue to be made and, for instance, the discovery of one possibly new *Macromia* species and the very poorly known *M. jucunda* in the division in 2020 serves to illustrate how much remains to be learnt. A glance at Fig. 1 here reveals a large area, mostly mountainous, in the eastern half of the division (with the "Miri Division" label in it) with no locations covered in this report. In fact even if all known locations from which Odonata have been collected are added this sampling void remains almost entirely unfilled and this area is a priority for further work. However, as the record of *Macromia jucunda* from the Uma Bawang area illustrates, significant discoveries can be made anywhere in the division and given the rapid rate of habitat alteration and conversion in the lowlands, additional effort also needs to be made in the lowland areas sooner rather than later.

Even in a diverse area such as Sarawak, odonate diversity is not evenly distributed. Lowland areas are typically more diverse in species than higher altitude ones and, at least where original habitat remains as well, the large degree of human alteration to habitat in accessible lowland areas boosts diversity by creating plentiful habitat suitable for species that would have been scarce or absent before such alteration. Although the hilly and moun-

tainous areas in the interior require more work to chart their diversity since the terrain is difficult to work in and less ground can be covered per day, they will not have equal species numbers to relatively flat lowland areas where forest remains. However the proportion of species endemic to Borneo typically increases the further into the interior one travels and with increasing steepness, this is well illustrated by the protected areas covered here: Niah, Loagan Bunut and Lambir Hills National Parks have approximately 5%, 16% and 24% of their known odonate fauna endemic to Borneo respectively (and of these only Lambir Hills has high gradient habitats for Odonata) but for Pulong Tau National Park in the deep interior this figure rises to approximately 45% (for the Zygoptera 76%). However diversity does not appear to be equal even between all areas in the mountainous deep interior and for example the area between (but not including) location M28 and (and including) the sampled parts of Pulong Tau National Park (a large part of the Tama Abu Range, with an altitudinal range of approximately 700-1700m a.s.l. sampled), although rich in endemic species, appears to have a relatively lower diversity overall, especially when only forest dependent species are considered (to exclude many of the effects of anthropogenic habitat alterations) compared with some other areas including a similar altitudinal range and terrain. The absence of any record of the *Coelliccia borneensis*-group, typically found relatively easily by an experienced worker, in the M28-Pulong Tau area is particularly puzzling since much seemingly suitable habitat for the group occurs there and the group occurs both to the southwest of the area and to its north on the other side of the Tama Abu Range in Limbang Division (Dow & Choong in preparation). Of areas in the interior covered here, that including Gunung Kalulong and adjacent mountains appears particularly rich and interesting. Finally on this subject it must be noted that although the odonate fauna found above 1500m a.s.l. in Sarawak is undoubtedly relatively small it is equally undoubtedly still far from well-known and its documentation is hampered not only by the difficulty of access to habitats at this altitude and the extremely local and low density occurrence of parts of the fauna but also by the simple fact that even when habitat at this altitude is accessed the weather is rarely cooperative.

Macromia jucunda raises the number of species of Odonata known from Sarawak to 309 (see Dow 2021a, 2021b). Although we have separated *Xiphiagrion cyanomelas* as two taxa above and provisionally considered *Macromia* sp. cf *westwoodii* as a separate species it is better to take a slightly more conservative approach when it comes to the Sarawak checklist, so we refrain from adding *Xiphiagrion cyanomelas* B and *Macromia* sp. cf *westwoodii* to that checklist for now, pending further investigation. Three species recorded here are additions to the fauna of Miri Division relative to the checklist of Dow (2021a, 2021b) with the same conservative approach as above: *Burmagomphus arthuri*, *Macromia jucunda* and *Camacinia gigantea*. Additionally RD only recently became aware of Grinang & Nyanti (2007), where *Burmagomphus insularis* Laidlaw, 1914 is recorded (with a photograph of a mature male) from Miri Division, with the other new records already mentioned this raises the number of species known from the division to at least 222.

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Appendix 1: Detailed specimen records

Material from some of the locations covered here that was already listed in previous taxonomic publications is listed here again in cases where insufficient detail was given in the original publication or where it might be difficult to relate the locations as given in the original publication to those given here or where the altitude given in the original publication is now believed to be inaccurate.

Zygoptera

Lestidae

Lestes praemorsus decipiens Kirby, 1894

L1a – ♂♂, 12.v.2005; ♂, 16.v.2005; ♂, 3.ii.2006; ♂♂, 21.iv.2011; ♂♂, ♀♀, 24.iv.2011.
M5 – ♂♂, ♀, 16.i.2015. **M12b** – ♂♂, 17.vi.2015. **M40f** – ♂, 5.x.2020. **M40gi** – ♂♂, 5.x.2020; ♂♂, 7.x.2020.

Orolestes wallacei (Kirby, 1889)

M2 – ♂♂, 8.v.2005. **M10a** – ♂, 5.ix.2011. **M27d** – ♂, 24.viii.2016. **M27e** – ♂, 27.viii.2016.
M40j – ♂♂, 8.x.2020.

Platystictidae

Drepanosticta actaeon Laidlaw, 1934

M13a – ♂, 9.ii.2015. **M18a** – ♂♂, 18.xii.2007; ♂♂, 19.xii.2007; ♂♂, ♀♀, 7.x.2009; ♂♂, 8.x.2009; ♂♂, 10.x.2009. **M18b** – ♀, 6.x.2009. **M18d** – ♂♂, 17.vii.2010. **M18e** – ♂♂, 20.vii.2010; ♀, 21.vii.2010. **M22b** – ♂, 13.x.2009. **M28a** – ♂♂, ♀, 15.viii.2017; ♂♂, 18.viii.2017; ♂, ♀, 22.viii.2017. **M28g** – ♂♂, 17.viii.2017. **M34b** – ♂♂, ♀♀, 27.ii.2020. **M34c** – ♂, ♀, 28.ii.2020. **M39d** – ♂, 24.ii.2020. **M39e** – ♂♂, 25.ii.2020. **M40a** – ♂, 4.x.2020.

Drepanosticta attala Lieftinck, 1934

M17 – ♂♂, 11.xii.2007; ♂, 11.xii.2007. **M34a** – ♂ (teneral), ♀, 26.ii.2020.

Drepanosticta sp. cf *crenitis* Lieftinck, 1933

M13a – ♀♀, 9.ii.2015. **M13b** – ♂, 8.ii.2015. **M18a** – ♀, 8.x.2009. **M18d** – ♂, 17.vii.2010; ♀, 18.vii.2010. **M18e** – ♀♀, 21.vii.2010. **M18g** – ♂♂, 16.vii.2010. **M22a** – ♀, 12.x.2009. **M24a** – ♂♂, 12.xii.2007. **M25** – ♂, 22.viii.2016. **M28a** – ♀, 18.viii.2017. **M28e** – ♂, 23.viii.2017. **M28g** – ♂♂, 17.viii.2017; ♂, 24.viii.2017. **M39c** – ♀, 19.ii.2020. **M39e** – ♀, 25.ii.2020.

Drepanosticta sp. cf *dentifera* Kimmins, 1936

L4b – ♂, 13.v.2005; ♂♂, 23.viii.2008. **L5** – ♂♂, 15.v.2005; ♂, 1.ii.2006; ♂♂, 21.iv.2011. **L8** – ♂♂, 22.xii.2007. **L9b** – ♂, 22.iv.2011. **M18f** – ♀, 14.vii.2010. **M34b** – ♀, 27.ii.2020.

Drepanosticta dulitensis Kimmins, 1936

M18a – ♂♂, 19.xii.2007; ♂♂, 8.x.2009, RD. **M18d** – ♂♂, ♀, 17.vii.2010. **M18g** – ♂♂, ♀, 16.vii.2010.

Drepanosticta sp. cf *forficula* Kimmins, 1936

L9b – ♂, ♀, 22.iv.2011.

Drepanosticta rufostigma (Selys, 1886)

L4b – ♂♂, 24.iv.2011. **L5** – ♂♂, ♀, 11.v.2005; ♂, 15.v.2005; ♂♂, ♀♀, 1.ii.2006. **L6** – ♂♂, 22.xii.2007. **L7** – ♂♂, 2.ii.2006. **L9a** – ♂♂, 22.iv.2011. **L12a** – ♂, 16.vii.2012. **M13a** – ♂♂, 9.ii.2015; ♂♂, ♀, 10.ii.2015. **M14b** – ♂, 1.vi.2019; ♂, 15.x.2020. **M17** – ♂, 11.xii.2007. **M18a** – ♂, 17.xii.2007; ♂♂, 18.xii.2007; ♂♂, 19.vii.2007; ♂♂, 7.x.2009; ♂♂, ♀, ♂+♀, 8.x.2009. **M18d** – ♂♂, ♀♀, 17.vii.2010; ♂, 18.vii.2010. **M18e** – ♂♂, 20.vii.2010; ♂♂, ♀, 21.vii.2010. **M18f** – ♂, 14.vii.2010. **M18g** – ♂♂, 16.vii.2010. **M19a** – ♂♂, 15.vii.2010. **M22a** – ♂♂, ♀, 12.x.2009. **M22b** – ♂, 13.x.2009, RD. **M23** – ♂, 7.vii.2012. **M25** – ♂♂, 16.xii.2007. **M27c** – ♂, 30.viii.2016. **M27d** – ♂♂, ♀, 26.viii.2016; ♂♂, ♀, 29.viii.2016. **M27e** – ♂, 27.viii.2016. **M28a** – ♂♂, 15.viii.2017. **M28c** – ♂, 16.viii.2017. **M28g** – ♂♂, 17.viii.2017. **M34b** – ♂♂, 27.ii.2020. **M34c** – ♂, 28.ii.2020. **M37a** – ♂♂, 9.vii.2014. **M38a** – ♂♂, 22.ii.2020. **M38c** – ♂, 20.ii.2020. **M39b** – ♂♂, 18.ii.2020. **M39c** – ♂♂, ♀, 19.ii.2020. **M39d** – ♂♂, 24.ii.2020. **M39e** – ♂♂, 25.ii.2020, RD. **M39f** – ♂, 23.ii.2020. **M40a** – ♂, 4.x.2020. **M40biii** – ♂♂, 6.x.2020; ♂, 7.x.2020. **M40c** – ♂♂, ♀, 8.x.2020, RD.

Drepanosticta versicolor (Laidlaw, 1913)

L5 – ♂, 15.v.2005. **L12a** – ♂, ♀, 16.vii.2012. **LB6** – ♂, ♀♀, 3.iv.2006. **M13a** – ♀, 10.ii.2015. **M14a** – ♂♂, 24.xii.2017. **M14b** – ♂♂, 1.vi.2019. **M14d** – ♀, 3.vi.2019. **M14f** – ♂ (in seepage), 5.vi.2019. **M14h** – ♀♀, 6.vi.2019, RD. **M17** – ♀, 11.xii.2007. **M18a** – ♂♂, 8.x.2009, RD. **M18g** – ♀, 16.vii.201. **M22a** – ♀♀, 12.x.2009. **M22b** – ♂♂, ♀, 13.x.2009. **M23** – ♂, 7.vii.2012. **M24a** – ♂♂, ♀, 12.xii.2007. **M27a** – ♂, 30.iii.2012. **M28a** – ♂♂, ♀♀, 18.viii.2017; ♀, 22.viii.2017. **M28e** – ♀, 23.viii.2017. **M28g** – ♂♂, ♀, 17.viii.2017. **M34c** – ♀, 28.ii.2020. **M38a** – ♀, 22.ii.2020. **M39b** – ♂, 18.ii.2020. **M39d** – ♀, 24.ii.2020. **M40c** – ♀, 8.x.2020. **M40d** – 2 ♀♀, 9.x.2020.

Protosticta joepani Dow, Phan & Choong, 2020

See Dow, Phan & Choong (2020) for records prior to 2020. **M18a**, **M28a**, **M28c**, **M30biii**, **P2d**, **P3c**.

M34c – ♂♂, ♀, 28.ii.2020.

Telosticta ?berawan Dow & Orr, 2012

M28g – ♀, 17.viii.2017. **M39d** – ♀♀, 24.ii.2020.

Telosticta dayak Dow & Orr, 2012

See Dow & Orr (2012) **L4b**, **L5**, **L7**, **L8**, **L9a**. Additional records:

L12a – ♂♂, 16.vii.2012.

Telosticta longigaster Dow & Orr, 2012

See Dow & Orr (2012a) for records prior to 2012 except for those from the Gunung Kalulong area which given again here: **M15a**, **M17**.

M13a – ♀, 21.xi.2013; ♂♂, 9.ii.2015; ♂♂, 10.ii.2015. **M13b** – ♀, 8.ii.2015. **M14a** – ♂♂, 24.xii.2017. **M14b** – ♂♂, 1.vi.2019; ♀, 15.x.2020. **M14c** – ♂♂, 2.vi.2019. **M14d** – ♂♂, ♀, 3.vi.2019. **M14h** – ♂♂, 6.vi.2019. **M18d** – ♂ (paratype), 17.vii.2010. **M18e** – ♂♂, ♀♀ (all paratypes), 21.vii.2010. **M18f** – ♂♂ (paratypes), 14.vii.2010. **M18g** – ♂ (paratype), 15.vii.2010; ♀ (paratype), 16.vii.2010. **M34b** – ♂♂, 27.ii.2020. **M34c** – ♂, 28.ii.2020. **M40c** – ♂♂, 8.x.2020. **M40d** – ♂♂, ♀, 9.x.2020.

Telosticta ulubaram Dow & Orr, 2012

See Dow & Orr (2012a). **M24a**, **M25**, **M30aii**, **M30c**.

M28a – ♂, 18.viii.2017; ♂♂, 22.viii.2017. **P3c** – ♀♀ (?), 9.iv.2012.

Telosticta sp.

See Dow & Orr (2012a: *Telosticta* undetermined A).

Argiolestidae

Podolestes harrissoni Liefstinck, 1953

LB5 – ♂♂, ♀, 4.iv.2006; ♂♂, ♀, 8.i.2015; ♂, 10.i.2015. **M10b** – ♂♂, 5.ix.2011. **M10g** – ♂, 8.ix.2011.

Podolestes orientalis Selys, 1862

L4a – ♂, 14.v.2005. **L12a** – ♂, 16.vii.2012. **LB5** – ♀, 10.i.2015. **M2** – ♂♂, 8.v.2005. **M10b** – ♂, 5.ix.2011. **M10c** – ♂, ♀, 6.ix.2011. **M10e** – ♂♂, ♀♀, 7.ix.2011; ♂♂, 8.ix.2011. **M10f** – ♀, 7.ix.2011. **M14a** – ♂, 24.xii.2017. **M14b** – ♂, 15.x.2020. **M14e** – ♂, 4.vi.2019. **M14ki** – ♀ (stagnant pool near to stream), 16.x.2020. **M14mi** – ♂, 17.x.2020.

Calopterygidae

Matronoides cyaneipennis Förster, 1897

M21a – ♂, 13.xii.2007. **M24a** – ♂♂, ♀♀, 12.xii.2007. **M28a** – ♂, ♀♀, 15.viii.2017. **M29a** – ♂♂, ♀, 15.xii.2007. **M30ai** – ♂♂, ♀, 3.iv.2005; ♂, ♀, 6.iv.2005; ♂♂, 19.v.2005. **M30bi** – ♂, 22.iii.2006. **M30c** – ♂, 20.v.2005. **M32a** – ♀, 1.iv.2005. **P1** – ♂♂, 17.iii.2006. **P2a** – ♂, 20.iii.2006; ♂, ♀, 21.iii.2006; ♂♂, 15.iv.2012; ♂♂, ♀♀, 16.iv.2012; ♀, 17.iv.2012; ♂♂, ♀♀, 7.xi.2016; ♂, ♀♀, 8.xi.2016; ♂♂, 10.xi.2016, LS. **P3b** – ♂, 11.iv.2012; ♂, 11.iv.2012.

Neurobasis longipes Hagen, 1887

M12a – ♂, 17.vi.2015. **M13a** – ♂, ♀, 5.ii.2010; ♂+♀, 12.iii.2010; ♂♂, ♀, 7.ii.2015; ♂♂, ♀, 10.ii.2015. **M14f** – ♂, 5.vi.2019; ♂♂, ♀, 13.x.2020; ♀, 14.x.2020. **M14ki** – ♂♂, 16.x.2020. **M14kii** – ♂♂, 17.x.2020. **M14kiii** – ♂♂, 18.x.2020. **M14l** – ♂, ♀, 18.x.2020. **M16a** – ♂, ♀, 4-5.v.2010. **M17** – ♀, 11.xii.2007. **M18c** – ♂, 9.x.2009. **M19a** – ♂♂, ♀, 15.vii.2010. **M19b** – ♂♂, ♀♀, 19.vii.2010. **M22a** – ♀, 12.x.2009. **M27a** – ♂♂, ♀♀, 29.iii.2012. **M28** – larval records without details. **M27e** – ♂, 22.viii.2016. **M30ai** – ♂, ♀, 2.iv.2005. **M30bi** – ♂, 22.iii.2006. **M30di** – ♂♂, 29.iii.2005. **M30e** – ♀, 1.iv.2005. **M32a** – ♂♂, ♀, 1.iv.2005; ♂, 8.iv.2012. **M34a** – ♂, 26.ii.2020. **M37a** – ♂♂, ♀, 9.vii.2014. **M37c** – ♂♂, 21.iii.2013. **M39a** – ♂♂, 21.ii.2020, RD. **M40bi** – 2 ♂♂, ♀, 6.x.2020, RD; ♂♂, 7.x.2020, GM. **M40c** – ♂♂, ♀, 8.x.2020, GL.

Vestalis amabilis Liefstinck, 1965

L4a – ♂♂, 13.v.2005; ♂, 14.v.2005; ♂, ♀, 31.i.2006; ♂, 23.viii.2008; ♂♂, ♀♀, 21.iv.2011; ♂♂, 24.iv.2011. **L9a** – ♂, 22.iv.2011, LS. **L12b** – ♂♂, 16.vii.2012. **M4** – ♂♂, 4.xi.2010; ♂♂, ♀♀ (?), 5.xi.2010. **M12a** – ♂♂, 17.vi.2015.

Vestalis amaryllis Liefstinck, 1965

M2 – ♂, 8.ii.2012. **M13a** – ♂♂, 9.ii.2015; ♂, 10.ii.2015. **M14a** – ♂♂, 24.xii.2017. **M14b** – ♂♂, 1.vi.2019, RD; ♂♂, 15.x.2020. **M14c** – ♂♂, 2.vi.2019. **M14f** – ♂, 14.x.2020. **M14g** – ♂, 5.vi.2019. **M14h** – ♂♂, 6.vi.2019. **M18e** – ♂♂, 20.vii.2010. **M18f** – ♂♂, 14.vii.2010. **M25** – ♂, 22.viii.2016. **M27d** – ♂, 29.viii.2016. **M27e** – ♂, 25.viii.2016. **M39b** – ♂♂,

18.ii.2020. **M39f** – ♂♂, 23.ii.2020. **M40bii** – ♂♂, 6.x.2020. **M40biii** – ♂♂, 7.x.2020.

Vestalis amnicola Lieftinck, 1965

M18a – ♂♂, 17.xii.2007; ♂♂, 18.xii.2007; ♂♂, 19.xii.2007; ♂, 7.x.2009; ♂♂, 8.x.2009; ♂♂, 10.x.2009. **M18c** – ♂♂, 9.x.2009. **M18d** – ♂, 17.vii.2010. **M18e** – ♂♂, 20.vii.2010. **M21a** – ♂♂, 13.xii.2007; ♂♂, 19.viii.2017. **M22a** – ♂♂, 12.x.2009. **M23** – ♂♂, 7.vii.2012. **M24a** – ♂♂, ?♀, 12.xii.2007. **M25** – ♂♂, 16.xii.2007. **M27a** – ♂♂, ?♀, 29.iii.2012; ♂♂, 30.iii.2012. **M28a** – ♂, 15.viii.2017; ♂, 18.viii.2017; ♂, 22.viii.2017. **M28e** – ♂, 23.viii.2017. **M28g** – ♂, 17.viii.2017. **M29a** – ♂♂, 15.xii.2007; ♂♂, 19.ii.2010. **M30ai** – ♂, 2.iv.2005; ♂♂, 3.iv.2005; ♂, 19.v.2005. **M30bi** – ♂, 6.iv.2005; ♂, 18.v.2005; ♂♂, 22.iii.2006. **M30bii** – ♂, 6.iv.2005; ♂♂, 17.v.2005; ♂, 18.v.2005; ♂♂, 15.iii.2006. **M30c** – ♂♂, 20.v.2005. **M31bii** – ♂, 31.iii.2005; ♂♂, 7.iv.2012. **M32a** – ♂♂, 1.iv.2005. **M33b** – ♂, 5.iv.2005. **M34a** – ♂♂, 26.ii.2020. **M34c** – ♂, 28.ii.2020. **M37a** – ♂♂, 9.vii.2014. **M38a** – ♂♂, ?♀, 22.ii.2020. **M39a** – ♂♂, 21.ii.2020. **M39b** – ♂, ?♀, 18.ii.2020. **M39c** – ♂♂, 19.ii.2020. **M39e** – ♂♂, 25.ii.2020. **M40a** – ♂♂, 4.x.2020. **M40c** – ♂♂, 8.x.2020, RD. **P1** – ♂♂, 17.iii.2006. **P2a** – ♂♂, 19.iii.2006; ♂♂, ♀, 20.iii.2006; ♂♂, 21.iii.2006; ♂♂, ♀♀, ♂+♀, 16.iv.2012; ♂, 17.iv.2012; ♂, 7.xi.2016. **P3a** – ♂, 8.iv.2012. **P3c** – ♂, 11.iv.2012.

Vestalis amoena Hagen in Selys, 1853

M2 – ♂, 8.v.2005; ♂, ♀, 9.v.2005; ♂♂, 7.ii.2012. **M13a** – ♂, 7.ii.2015. **M14f** – ♂♂, 13.x.2020. **M14ki** – ♂♂, ♀, 16.x.2020. **M14kii** – ♂♂, ♀, 17.x.2020. **M14kiii** – ♂♂, ♀, 18.x.2020. **M14l** – ♂♂, 18.x.2020. **M16a** – ♂♂, 4-5.v.2010. **M16b** – ♂♂, 4-7.v.2011. **M18c** – ♂, 9.x.2009. **M19b** – ♂♂, 19.vii.2010.

Vestalis atrophæa Lieftinck, 1965

M13a – 5.ii.2010; ♂, 21.xi.2013; ♂♂, 7.ii.2015, RD; ♂♂, 9.ii.2015, LS; ♂♂, 10.ii.2015. **M14f** – ♂♂, 5.vi.2019. **M14h** – ♂, 6.vi.2019. **M14ki** – ♂, 16.x.2020. **M16a** – ♂, 4-5.v.2010. **M18c** – ♂, 9.x.2009. **M18e** – ♂, 20.vii.2010. **M18f** – ♂♂, 14.vii.2010. **M19a** – ♂♂, ?♀, 15.vii.2010. **M19b** – ♂♂, 19.vii.2010. **M27a** – ♂, 29.iii.2012. **M30h** – ♂♂, 16.iii.2006. **M30ji** – ♂, 31.iii.2005. **M40a** – ♂♂, 4.x.2020. **M40bi** – ♂♂, 6.x.2020; ♂♂, 7.x.2020. **M40c** – ♂♂, 8.x.2020. **P3a** – ♂, 8.iv.2012.

Vestalis beryllæ Laidlaw, 1915

M18g – ♂♂, 15.vii.2010; ♂, 16.vii.2010. **M18h** – ♂♂ (near **M18g**), 16.vii.2010. **M22d** – ♂, 12.x.2009. **M28a** – ♂, 22.viii.2017. **M28b** – ♂, 15.viii.2017. **M28f** – ♂♂ (trailside above 1,000m a.s.l.), 20.viii.2017; ♂, 23.viii.2017. **M30bii** – ♂♂, 15.iii.2006. **M31biii** – ♂, 31.iii.2005. **M34b** – 2 ♂♂, ♀, 27.ii.2020. **M38c** – ♂, 20.ii.2020. **M39e** – ♂, 25.ii.2020. **M40c** – ♂♂, 8.x.2020. **M40d** – ♂, 9.x.2020.

Chlorocyphidae

Heliocypha biseriata (Selys, 1859)

M2 – ♂, 9.v.2005; ♂♂, ♀, 7.ii.2012. **M12a** – ♂♂, 17.vi.2016. **M13a** – ♂, 5.ii.2010; ♂, 7.ii.2015; ♂, 9.ii.2015; ♂, 10.ii.2015. **M14a** – ♂♂, 24.xii.2017. **M14b** – ♂, 1.vi.2019; ♂♂, 15.x.2020. **M14f** – ♂♂, 5.vi.2019; ♂♂, ♀, 13.x.2020; ♂♂, 14.x.2020. **M14ki** – ♂♂, 16.x.2020. **M14kii** – ♂♂, ♀, 17.x.2020. **M14kiii** – ♂♂, 18.x.2020. **M14l** – ♂, 18.x.2020. **M16a** – ♂♂, ♀♀, 4-5.v.2010. **M18c** – ♂, 9.x.2009. **M19a** – ♂♂, ♀♀, 15.vii.2010. **M19b** – ♂♂, ♀, 19.vii.2010. **M23** – ♂, ♀, 7.vii.2012. **M25** – ♂♂, 16.xii.2007; ♂, 22.viii.2016.

M27a – ♂♂, ♀, 29.iii.2012; ♂, 30.iii.2012. **M27d** – ♂, 29.viii.2016. **M30di** – ♂, 28.iii.2005; ♂♂, 29.iii.2005. **M30e** – ♂, ♀, 1.iv.2005; ♂, 3.iv.2005. **M30ai** – ♂, 16.iii.2006. **M30ji** – ♂, 31.iii.2005; ♂, 2.iv.2005. **M31ai** – ♂, 11.xi.2016. **M31bii** – ♂, 31.iii.2005; ♂♂, 7.iv.2012. **M32a** – ♂, 8.iv.2012. **M37a** – ♂♂, 9.vii.2014. **M39f** – ♂♂, 23.ii.2020. **M40a** – ♂♂, 4.x.2020. **M40bi** – ♂♂, 6.x.2020; ♂♂, 7.x.2020. **M40bii** – ♂, 6.x.2020. **M40c** – ♂♂, ♀♀, 8.x.2020.

Libellago aurantiaca (Selys, 1859)

L4a – ♂♂, 13.v.2005; ♂, 31.i.2006; ♀, 23.viii.2008; ♂♂, ♀, 21.iv.2011; ♂, 24.iv.2011. **L12b** – ♂♂, 16.vii.2012. **M4** – ♂, 4.xi.2010. **M10a** – ♂♂, ♀, 5.ix.2011. **M12a** – ♂, 17.vi.2015.

Libellago hyalina (Selys, 1859)

L4a – ♂, 31.i.2006. **LB1b** – ♂, 5.iv.2006. **LB4** – ♂, 11.i.2015. **LB5** – ♂, 10.i.2015. **M2** – ♂, 7.ii.2012. **M10c** – ♂♂, ♀♀, 6.ix.2011. **M10e** – ♂♂, 8.ix. 2011. **M10f** – ♂♂, 7.ix.2011. **M10h** – ♂, ♀, 9.ix.2011. **M10j** – ♂♂, 10.ix.2011. **M12a** – ♂, 17.vi.2015. **M14f** – ♂♂ (in lower, muddy part of stream), 14.x.2020.

Libellago semiopaca (Selys, 1873)

LB3 – ♂, 7.iv.2006. **M2** – ♂, 2 ♀♀, 8.ii.2012. **M12a** – ♂♂, ♀, 17.vi.2015. **M13a** – ♂♂, ♀, 7.ii.2015. **M14f** – ♂ (in lower, muddy part of stream), 14.x.2020. **M14j** – ♂♂, 14.x.2020; ♂, 15.x.2020. **M16a** – ♂, 4-5.v.2010. **M19a** – ♂♂, 15.vii.2010. **M27a** – ♂, 30.iii.2012.

Rhinocypha aurofulgens Laidlaw, 1931

M13a – ♂, 9.ii.2015. **M16a** – ♂♂, 4-5.v.2010. **M18c** – ♂♂, ♀♀, ♂+♀, 9.x.2009. **M21a** – ♂, 13.xii.2007. **M27d** – ♂, 29.viii.2016. **M27e** – ♂♂, 22.viii.2016. **M28h** – ♂, 24.viii.2017. **M29a** – ♂, 19.ii.2010. **M33a** – ♂♂, 4.iv.2005. **M34a** – ♂♂, ♀, 26.ii.2020. **M37a** – ♂♂, ♀, 9.vii.2014. **M37c** – ♂♂, ♀, 21.iii.2013. **M39a** – ♂♂, 21.ii.2020. **M40a** – ♂, 4.x.2020.

Rhinocypha cucullata Selys, 1873

M14f – ♂♂, 5.vi.2019; ♂♂, 13.x.2020; ♂♂, 14.x.2020. **M14h** – ♂, 6.vi.2019. **M16b** – ♂, 4-5.v.2010.

Rhinocypha spinifer Laidlaw, 1931

M21b – ♂, 31.viii.2016. **M24a** – ♂♂, 12.xii.2007. **M24b** – ♂♂ (stream pond where the stream crossed the logging road), 11.x.2009. **M25** – ♂♂, ♀, 16.xii.2007; ♂♂, 22.viii.2016. **M28a** – ♂, 15.viii.2017; ♂♂, ♀, 22.viii.2017. **M28e** – ♂, 23.viii.2017. **M29a** – ♂, 14.xii.2007; ♂♂, 15.xii.2007. **M30ai** – ♂♂, 2.iv.2005; ♂, 3.iv.2005; ♂♂, 19.v.2005. **M30aai** – ♂, 19.v.2005. **M30bi** – ♂♂, 22.iii.2006. **M30bii** – ♂, 6.iv.2005; ♂♂, 18.v.2005; ♂♂, 15.iii.2006. **M31bii** – ♂♂, 2.iv.2005. **M32a** – ♂♂, 1.iv.2005; ♂, 8.iv.2012. **P1** – ♂, 17.iii.2006. **P2a** – ♂♂, 19.iii.2006; ♂♂, 20.iii.2006; ♂♂, ♀, 21.iii.2006; ♂♂, 15.iv.2012; ♂♂, 16.iv.2012; ♂, 17.iv.2012; ♂♂, 7.xi.2016. **P3a** – 2 ♂♂, 8.iv.2012, RD. **P3b** – ♂♂, 11.iv.2012. **P3c** – ♂♂, ♀♀, 10.iv.2012; ♂, 11.iv.2012.

Rhinocypha stygia Förster, 1897

M14f – ♂♂, 5.ii.2019; ♂♂, 13.x.2020. **M16a** – ♂♂, 4-5.v.2010. **M16b** – ♂, 4-7.v.2011. **M40bi** – ♂♂, 7.x.2020.

Rhinocypha sp.

M18a – ♂, 17.xii.2007; ♀, 8.x.2009. **M18d** – ♀, 18.vii.2010. **M18e** – ♀, 21.vii.2010. **M34d** – ♂ (semi-teneral), 28.ii.2020. **M39d** – ♀, 24.ii.2020.

Rhinoneura caerulea Kimmins, 1936

P2a – ♂, 8.xi.2016.

Sundacypha petiolata (Selys, 1859)

M14a – ♂♂, 24.xii.2017. **M14b** – ♂♂, 1.vi.2019; 2 ♂♂, 2 ♀♀, 15.x.2020. **M19a** – ♂, 15.vii.2010.

Devadattidae

Devadatta aran Dow, Hämäläinen & Stokvis, 2015

See Dow, Hämäläinen & Stokvis (2015) for material collected up to 2015 (except that from the Gunung Kalulong area which is given again here): **M24a**, **M25**, **M29a**, **M30a****ii**, **M30a****iii**, **M30b****ii**, **P1**, **P2b**.

M18a – ♂♂, ♀ (all paratypes), 18.xii.2007; ♂♂ (paratypes), 19.xii.2007; ♂ (paratype), 7.x.2009; ♂♂, ♀♀ (paratypes), 8.x.2009. **M18d** – ♂♂ (paratype), 18.vii.2010. **M21a** – ♂, 19.viii.2017. **M28a** – ♂♂, 15.viii.2017; ♂♂, 18.viii.2017; ♂, 22.viii.2017. **M28c** – ♂♂, 16.viii.2017. **M28e** – ♀, 20.viii.2017. **M39d** – ♂♂, 24.ii.2020. **M39e** – ♂♂, 25.ii.2020, RD. **P2b** – ♂, 8.xi.2016; ♂, ♂+♀, 9.xi.2016; ♂, 10.xi.2016. **P2d** – ♂, ♀, 7.xi.2016.

Devadatta clavicauda Dow, Hämäläinen & Stokvis, 2015

See Dow, Hämäläinen & Stokvis (2015) for material collected up to 2015 (except that from the Gunung Kalulong area which is given again here): **L4b**, **L5**, **L6**, **L9a**, **L12a**, **M22a**, **M22b**, **M23**, **M25**.

M14a – ♂, 24.xii.2017. **M14c** – ♂, 2.vi.2019. **M14e** – ♂, 4.vi.2019. **M14h** – ♂, 6.vi.2019. **M18a** – ♂ (paratype), 17.xii.2007. **M18d** – ♂ (paratype), 17.vii.2010; ♂, 18.vii.2010. **M18e** – ♂ (paratype), 20.vii.2010; ♂ (paratype), 21.vii.2010. **M18f** – ♀ (paratype), 14.vii.2010. **M18g** – ♂ (paratype), 15.vii.2010; ♂ (paratype), 16.vii.2010. **M27d** – ♂♂, 24.viii.2016. **M28c** – ♂, 16.viii.2017. **M28e** – ♂, 23.viii.2017. **M28g** – ♂♂, ♀, 17.viii.2017. **M36** – ♀, 27.ii.2020. **M38a** – ♀, 22.ii.2020. **M38c** – ♂♂, 20.ii.2020. **M39b** – ♂, 18.ii.2020. **M39e** – ♂, 25.ii.2020. **M39f** – ♂♂, 23.ii.2020. **M40c** – ♂♂, 8.x.2020.

Devadatta somoh Dow, Hämäläinen & Stokvis, 2015

See Dow, Hämäläinen & Stokvis (2015) for material collected up to 2015 (except that from the Gunung Kalulong area which is given again here): **M13a**.

M18g – ♂ (paratype), 15.vii.2010; ♂♂, ♀ (all paratypes), 16.vii.2010. **M21b** – ♂, 31.viii.2016. **M25** – ♂♂, 22.viii.2016. **M34b** – ♂, 27.ii.2020. **M39b** – ♂, 18.ii.2020. **M39c** – ♂, 19.ii.2020.

Euphaeidae

Dysphaea dimidiata Selys, 1853

See Hämäläinen, Dow & Stokvis (2015) for records before June 2015. **M13a**, **M17**.

M12a – ♂, 17.vi.2015. **M14f** – ♂, 5.vi.2019; ♂♂, 13.x.2020. **M14k****iii** – ♂, 18.x.2020.

Dysphaea lugens (Selys, 1873)

M14j – ♂♂, 14.x.2020; ♂+♀, 15.x.2020.

Dysphaea ulu Hämäläinen, Dow & Stokvis, 2015

See Hämäläinen, Dow & Stokvis (2015) for records before 2015. **M16b**, **M19b**, **M33a**.

M34a – ♂♂, 26.ii.2020. **M39a** – ♂♂, 21.ii.2020. **M40bi** – ♂♂, 7.x.2020.

Euphaea ameeke van Tol & Norma-Rashid, 1995

L4b – ♂, 21.iv.2011; ♀, 24.iv.2011. **L5** – ♂♂, 11.v.2005; ♂, 15.v.2005; ♂♂, 1.ii.2006.

L7 – ♂♂, 2.ii.2006. **L9a** – ♂♂, 22.iv.2011. **L12a** – ♂, 16.vii.2012. **M4** – ♂♂, ♀, 4.xi.2010.

Euphaea basalis (Laidlaw, 1915)

P4 – ♂, 17.iv.2012.

Euphaea impar Selys, 1859

M2 – ♂♂, 8.ii.2012. **M13a** – ♂, 9.ii.2015. **M14a** – ♂♂, 24.xii.2017. **M14b** – ♂♂, 1.vi.2019; ♂♂, 15.x.2020. **M14c** – ♂, 2.vi.2019. **M14d** – ♂♂, 3.vi.2019. **M14f** – ♂, 5.vi.2019; ♂♂, 13.x.2020. **M14g** – ♂, 5.vi.2019. **M14h** – ♂, 6.vi.2019. **M14ki** – ♂♂, 16.x.2020. **M14kii** – ♂♂, 17.x.2020. **M14kiii** – ♂♂, 18.x.2020. **M14l** – ♂, 18.x.2020. **M16b** – ♂♂, 4-7.v.2011. **M18a** – ♂, 17.xii.2007. **M18d** – ♂, 18.vii.2010. **M19a** – ♂♂, ♀, 15.vii.2010. **M19b** – ♂♂, 19.vii.2010. **M22a** – ♂, 12.x.2009. **M22b** – ♂♂, 13.x.2009. **M39f** – ♂♂, ♀, 23.ii.2020. **M40bi** – ♂♂, 6.x.2020. **M40bii** – ♂, 6.x.2020. **M40biii** – ♂, 7.x.2020.

Euphaea subcostalis Selys, 1873

M13a – ♂♂, 5.ii.2010; ♂♂, 7.ii.2015; ♂♂, ♀, 9.ii.2015; ♂♂, ♀♀, 10.ii.2015. **M14b** – ♂, 1.vi.2019. **M14f** – ♂♂, 5.vi.2019; ♂♂, 13.x.2020, RD; ♂, 14.x.2020. **M14g** – ♂, 5.vi.2019. **M14h** – ♂, ♂+♀, 6.vi.2019. **M14ki** – ♂♂, 16.x.2020. **M14kii** – ♂♂, 17.x.2020. **M14kiii** – ♂♂, 18.x.2020. **M14l** – ♂, 18.x.2020. **M16a** – ♂♂, 4-5.v.2010. **M16b** – ♂, 4-7.v.2011. **M18a** – ♀, 8.x.2009. **M18b** – ♂, 6.x.2009. **M18c** – ♂♂, 9.x.2009, RD. **M18d** – ♂♂, 17.vii.2010. **M18e** – ♂♂, 20.vii.2010; ♂♂, 21.vii.2010. **M18f** – ♂♂♂, 14.vii.2010. **M19a** – ♂♂, ♀, 15.vii.2010. **M19b** – ♂♂, ♀, 19.vii.2010. **M22a** – ♂♂, 12.x.2009. **M22b** – ♂♂, 13.x.2009. **M25** – ♂♂, 16.xii.2007; ♂, 22.viii.2016. **M27e** – ♂♂, 22.viii.2016. **M30ai** – ♂, 16.iii.2006. **M33b** – ♂, 5.iv.2005. **M34a** – ♂♂, 26.ii.2020. **M34c** – ♂♂, 28.ii.2020. **M37a** – ♂♂, 9.vii.2014. **M37c** – ♂♂, 21.iii.2013. **M38a** – ♂, 22.ii.2020. **M38c** – ♂, 20.ii.2020. **M39c** – ♂♂, ♀, 19.ii.2020. **M39f** – ♂♂, 23.ii.2020. **M40a** – ♂, 4.x.2020. **M40bi** – ♂♂, 6.x.2020. ♂♂, 7.x.2020, RD. **M40c** – ♂♂, 8.x.2020, RD.

Euphaea subnodalis (Laidlaw, 1915)

M18a – ♂, 8.x.2009. **M18b** – ♂♂, 6.x.2009. **M21a** – ♂♂, 13.xii.2007; ♂♂, ♀, 19.viii.2017. **M21b** – ♂♂, 31.viii.2016. **M23** – ♂♂, 7.vii.2010. **M25** – ♂, 22.viii.2016. **M27a** – ♂♂, ♀♀, 29.iii.2012; ♂♂, 30.iii.2012. **M27e** – ♂, 22.viii.2016. **M28h** – ♂, 21.viii.2019. **M29a** – ♂, 19.ii.2010. **M32a** – ♂♂, 1.iv.2005. **M34a** – ♂, 26.ii.2020. **M39a** – ♂, 21.ii.2020. **P3b** – ♂♂, 11.iv.2012.

Euphaea tricolor Selys, 1859

M16a – ♂, 4-5.v.2010. **M19b** – ♂, 19.vii.2010. **M33a** – ♂♂, 4.iv.2005. **M33b** – ♂♂, ♂+♀, 5.iv.2005. **M34a** – ♂♂, 26.ii.2020. **M39a** – ♂♂ (one teneral), 21.iii.2020.

Philosinidae

Rhinagrion borneense (Selys, 1886)

L4b – ♂, 13.v.2005; ♂, 31.i.2006. **L5** – ♂, 1.ii.2006. **L7** – ♂, 2.ii.2006. **M13a** – ♂, 9.ii.2015; ♂, 10.ii.2015. **M14a** – ♂, 24.xii.2017. **M14b** – ♂♂, 1.vi.2019; ♂♂, 15.x.2020. **M14c** – ♂, 2.vi.2019. **M14d** – ♀, 3.vi.2019. **M14e** – ♀, 4.vi.2019. **M14f** – ♂♂, 5.vi.2019; ♂♂, 13.x.2020; ♂♂, 14.x.2020. **M14g** – ♂, 5.vi.2019. **M14h** – ♂, 6.vi.2019. **M14ki** – ♂,

♀, 16.x.2020. **M14l** – ♂, 18.x.2020. **M14mi** – ♂ (smaller pond), 17.x.2020. **M16a** – ♂♂, 4-5.v.2010. **M16b** – ♂, 4-7.v.2011. **M18f** – ♂, 14.vii.2010. **M19a** – ♂♂, 15.vii.2010. **M19b** – ♂, 19.vii.2010. **M22b** – ♂, 13.x.2009. **M25** – ♂♂, 16.xii.2007; ♂♂, 28.viii.2016. **M27a** – ♂♂, 29.iii.2012; ♂, 30.iii.2012, LS. **M37a** – ♂♂, 9.vii.2014. **M37c** – ♂, 21.iii.2013. **M40bi** – ♂♂, 6.x.2020; ♂♂, 7.x.2020. **M40c** – ♂♂, 8.x.2020.

Incertae sedis

Bornargiolestes fuscus Dow, 2014

See Dow (2014b): **L4b**, **L9b**, **M18a**(?).

Platycnemididae

Coeliccia borneensis (Selys, 1866)

Records from the Gunung Kalulong area, although previously published, are included below.

M14b – ♂, 15.x.2020 **M14h** – ♂, 6.vi.2019. **M16b** – ♂, 4-5.v.2010. **M18a** – ♂♂, 8.x.2009. **M18d** – ♂, 17.vii.2010. **M18g** – ♂♂, 15.vii.2010; ♂♂, 16.vii.2010. **M18h** – ♀ (near **M18a**), 7.x.2009; ♂ (near **M18d**), 18.vii.2010. **M19b** – ♂♂, 19.vii.2010. **M34b** – ♂, ♀, 27.ii.2020. **M34c** – ♂♂, 28.ii.2020. **M34d** – ♂, 28.ii.2020. **M40bi** – ♂, 7.x.2020.

Coeliccia campioni Laidlaw, 1918

M22a – ♂♂, 12.x.2009. **M22b** – ♂, 13.x.2009. **M25** – ♂, 22.viii.2016. **M27d** – ♂♂, 29.viii.2016. **M34b** – ♂, 27.ii.2020, RD. **M34c** – ♂♂, 28.ii.2020, RD. **M37a** – ♀, 9.vii.2014. **M38a** – ♂, 22.ii.2020.

Coeliccia cyaneothoraxi Kimmins, 1936

M38a – ♂, 22.ii.2020. **M40a** – ♂♂, 4.x.2020. **M40bi** – ♂♂, 7.x.2020. **M40c** – ♂, 8.x.2020.

Coeliccia kenyah Dow, 2010

Records from the Gunung Kalulong area, although previously published, are included below. See Dow (2010b) for **LB6**, **M15a**, **M17**.

M13a – ♂♂, 10.ii.2015. **M13b** – ♂♂, 8.ii.2015. **M14c** – ♂, 2.vi.2019. **M18e** – ♂♂, 21.vii.2010. **M18f** – ♂, ♀♀, 14.vii.2010. **M18g** – ♂, 16.vii.2010. **M40c** – ♂♂ (in tiny tributary).

Coeliccia macrostigma Laidlaw, 1918

See Dow (2016): **M10b**.

Coeliccia nemoricola Laidlaw, 1912

M21b – ♂, 31.viii.2016. **M28a** – ♂♂, ♀, 18.viii.2017, ♂, 22.viii.2017. **M28e** – ♂, 23.viii.2017. **M30aiii** – ♂, 3.iv.2005; ♂, ♀, 14.iii.2006. **M30bi** – ♂+♀, 6.iv.2005; ♂+♀, 22.iii.2006. **M30bii** – ♀, 6.iv.2005; ♂, 17.v.2005; ♂+♀, 18.v.2005; ♂♂, 15.iii.2006. **M30biii** – ♂, ♀, 6.iv.2005; ♂, 18.v.2005. **M30c** – ♂, 20.v.2005. **M31bi** – ♂♂, 31.iii.2005; ♂♂, 7.iv.2012. **M31bii** – ♂+♀, 7.iv.2012. **P1** – ♂, 17.iii.2006. **P2a** – ♂, 19.iii.2006; ♂♂, 21.iii.2006; ♂♂, ♀, 15.iv.2012. **P2b** – ♂♂, 15.iv.2012; ♂♂, 16.iv.2012; ♂♂, 8.xi.2016; ♂♂, 9.xi.2016; ♂♂, ♀, 10.xi.2016. **P2d** – ♀♀, 17.iv.2012. **P3a** – ♂, 8.iv.2012. **P3b** – ♂, 11.iv.2012. **P3c** – ♂♂, 9.iv.2012; ♂♂, 10.iv.2012; ♂♂, 11.iv.2012, KA.

Coeliccia sp. cf. *nemoricola* Laidlaw, 1912

L6 – ♀, 22.xii.2007. **L8** – ♂, 15.v.2005; ♂♂, 22.xii.2007. **L12a** – ♂♂, 16.vii.2012. **M18d** – ♂, 17.vii.2010. **M18e** – ♂, 21.vii.2010. **M18h** – ♂♂ (near **M18a**), 7.x.2009. **M25** – ♂♂, 22.viii.2016; ♂+♀, 28.viii.2016. **M27a** – ♂, 28.iii.2012. **M28c** – ♂♂, 16.viii.2017. **M34b** – ♂, 27.ii.2020. **M38a** – ♂♂, 22.ii.2020. **M39b** – ♂, 18.ii.2020. **M39f** – ♂, 23.ii.2020. **M40c** – ♂ (in tiny tributary), 8.x.2020.

Coeliccia nigrohamata Laidlaw, 1918

L4b – ♂, 31.i.2006; ♂♂, 21.iv.2011; ♂, 21.iv.2011. **L7** – ♀, 2.ii.2006. **L12a** – ♂♂, 22.iv.2011. **LB6** – ♂, 7.i.2015. **M4** – ♂♂, 4.xi.2010. **M13a** – ♂♂, 9.ii.2015. **M13b** – ♂♂, ♂+♀, 8.ii.2015. **M14a** – ♂♂, 24.xii.2017. **M14b** – ♂♂, 1.vi.2019; ♂♂, 15.x.2020. **M14d** – ♂, 3.vi.2019. **M14e** – ♂, 4.vi.2019. **M14f** – ♂, 5.vi.2019. **M14h** – ♂♂, 6.vi.2019. **M17** – ♂♂, 11.xii.2007. **M18a** – ♂, 18.xii.2007. **M18b** – ♂♂, 6.x.2009. **M18d** – ♂♂, ♀, 17.vii.2010. **M18e** – ♂, 20.vii.2010; ♂♂, 21.vii.2010. **M18f** – ♂♂, 14.vii.2010. **M18g** – ♂♂, 16.vii.2010. **M18h** – All near **M18a**: ♂♂, 7.x.2009; ♂+♀, 8.x.2009; ♂, 8.x.2009. **M19a** – ♂, 15.vii.2010. **M19b** – ♂, 19.vii.2010. **M21a** – ♀, 19.viii.2017. **M22a** – ♂♂, 12.x.2009. **M22b** – ♂, ♂+♀, 13.x.2009. **M24a** – ♂♂, ♂+♀, 12.xii.2007. **M25** – ♂♂, ♀, 16.xii.2007; ♂♂, 22.viii.2016. **M27a** – ♂, 30.iii.2012. **M27d** – ♂♂, 26.viii.2016. **M27e** – ♂, 22.viii.2016. **M28c** – ♂♂, ♀, 16.viii.2017. **M28e** – ♂♂, 23.viii.2017. **M34b** – ♂, 27.ii.2020. **M34c** – ♂, 28.ii.2020. **M37c** – ♂, 21.iii.2013. **M38a** – ♂♂, 22.ii.2020. **M39b** – ♂, 18.ii.2020. **M39c** – ♂♂, 19.ii.2020. **M39d** – ♂, 24.ii.2020. **M39e** – ♂+♀, 25.ii.2020. **M39f** – ♂, 23.ii.2020. **M40a** – ♂, ♂+♀, 4.x.2020. **M40bii** – ♂, 6.x.2020. **M40biii** – ♂, 6.x.2020. **M40d** – ♂, 9.x.2020.

Coeliccia roberti Dow, 2020

See Dow (2020): **L4a**, **L5**, **L7**, **L8**, **L9a**, **L12a**, **M10d**.

Copera vittata (Selys, 1863)

L1b – ♂, 12.v.2005; ♂, 24.iv.2011. **L4a** – ♂, 13.v.2005, ♂♂, 31.i.2006; ♂♂, 21.iv.2011. **LB2** – ♀♀, 9.i.2015. **LB6** – ♂, ♂+♀, 6.iv.2006. **M2** – ♂♂, 8.v.2005; ♀♀, 7.ii.2012. **M10a** – ♂♂, ♀, 5.ix.2011. **M10c** – ♂+♀, 6.ix.2011. **M10e** – ♂♂, 7.ix.2011; ♂♂, 8.ix.2011. **M10f** – ♂♂, 7.ix.2011. **M10g** – ♀♀, 8.ix.2011. **M10i** – ♂♂, 9.ix.2011; ♂♂, 10.ix.2011. **M10j** – ♂♂, 10.ix.2011. **M11** – ♂, 18.iv.2005. **M13c** – ♂, 9.ii.2015. **M14a** – ♂, 24.xii.2017. **M14e** – ♀, 4.vi.2019. **M14i** – ♂ (in yard behind longhouse), 17.x.2020. **M14mi** – ♂+♀ (smaller pond), 17.x.2020. **M25** – ♂♂, 22.viii.2016. **M27a** – ♂♂, ♀, 29.iii.2012; ♂, 30.iii.2012. **M27e** – ♂, 22.viii.2016. **M30biii** – ♂, 7.iv.2012. **M30diii** – ♂, 14.iii.2006. **M31bi** – ♂♂, 31.iii.2005. **M34e** – ♂, 26.ii.2020. **M38b** – ♂♂, 20.ii.2020. **M39a** – ♂, ♀, 21.ii.2020. **M40a** – ♂ (shady pool at side of stream), 4.x.2020. **M40i** – ♂, 9.x.2020.

“Elatoneura” analis (Selys, 1860)

M10a – ♂♂, 5.ix.2011. **M14a** – ♂, 24.xii.2017. **M14f** – ♂, 13.x.2020. **M16a** – ♂♂, 4-5.v.2010. **M16b** – ♂♂, 4-7.v.2011. **M25** – ♂♂, 16.xii.2007. **M30ai** – ♂, 3.iv.2005. **M30di** – ♂♂, 29.iii.2005. **M30ai** – ♂, 16.iii.2006. **M31bii** – ♂♂, 31.iii.2005. **M32a** – ♂, 1.iv.2005.

Onychargia atrocyana Selys, 1865

M2 – ♂, ♀, 7.ii.2012. **M6** – ♂♂, 8.iv.2005. **M9** – ♂, 11.ix.2011. **M10e** – ♂♂, 7.ix.2011; ♂, ♀, 8.ix.2011. **M10j** – ♂, ♀, 10.ix.2011.

Prodasineura collaris (Selys, 1860)

L4a – ♂, 14.v.2005; ♂+♀, 15.v.2005; ♂♂, 31.i.2006. **M2** – ♂, 9.ii.2012. **M10e** – ♂♂,

♀, ♂+♀, 8.ix.2011. **M10f** – ♀, 7.ix.2011.

Prodasineura dorsalis (Selys, 1860)

M10e – ♂♂, ♀, 8.ix.2011. **M10f** – ♂, ♂+♀, 8.ix.2011. **M10j** – ♂, 10.ix.2011. **M14b** – ♂, ♂+♀, 1.vi.2019. **M14e** – ♂, 3.vi.2019. **M18b** – ♂, 6.x.2009. **M25** – ♂+♀, 16.xii.2007. **M27e** – ♂, 27.viii.2016. **M30f** – ♂, 30.iii.2005. **M30ai** – ♂+♀, 16.iii.2006. **M31bii** – ♂, 31.iii.2005. **M39f** – ♂, 23.ii.2020.

Prodasineura hosei (Laidlaw, 1913)

M14f – ♂♂, 5.vi.2019; ♂♂, 13.x.2020. **M14h** – ♂, 6.vi.2019. **M22b** – ♂♂, 13.x.2009. **M39f** – ♂, 23.ii.2020. **M40bi** – ♂+♀, 6.x.2020; ♂, 7.x.2020. **M40bij** – ♂, 6.x.2020.

Prodasineura hyperythra (Selys, 1886)

M2 – ♂♂, ♀, 9.v.2005. **M14a** – ♂♂, ♀, ♂+♀, 24.xii.2017. **M14b** – ♂♂, ♂+♀, 1.vi.2019; 3 ♂♂, ♂+♀, 15.x.2020. **M14c** – ♂, 2.vi.2019. **M14d** – ♂, ♀, 3.vi.2019. **M14e** – ♂♂, 4.vi.2019, RD. **M14f** – ♂, 5.vi.2019. **M14h** – ♂, 6.vi.2019. **M14mi** – ♂, 17.x.2020. **M25** – ♂♂, 16.xii.2007; ♂♂, 22.viii.2016. **M27e** – ♂, 27.viii.2016. **M31bii** – ♂♂, ♂+♀, 31.iii.2005. **M37a** – ♂, 9.vii.2014. **M39a** – ♂, 21.ii.2020. **M39f** – ♂♂, 23.ii.2020.

Prodasineura sp. cf *peramoena* (Laidlaw, 1913)

L4a – ♂♂, ♂+♀, 13.v.2005; ♂+♀, 14.v.2005, RD; ♂♂, ♀, 31.i.2006; ♂, 23.viii.2008; ♂♂, 21.iv.2011; ♂♂, 24.iv.2011. **L5** – ♂♂, 11.v.2005; ♂♂, 1.ii.2006. **L7** – ♂♂, ♂+♀, 2.ii.2006. **L12a** – ♂♂, ♀♀, ♂+♀, 16.vii.2012. **M4** – ♂♂, 4.xi.2010.

Prodasineura verticalis (Selys, 1860)

L4a – ♂, 31.i.2006. **M2** – ♂♂, 9.v.2005; ♂♂, ♀, 7.ii.2012; ♂, 9.ii.2012. **M4** – ♂♂, 4.xi.2010. **M10f** – ♂, ♀, 7.ix.2011, RN. **M13a** – ♂, ♀, 5.ii.2010; ♂, 7.ii.2015; ♂, 10.ii.2015. **M14f** – ♂, 5.vi.2019; ♂, 13.x.2020; ♂, 14.x.2020. **M14ki** – ♂, ♂+♀, 16.x.2020. **M14kiii** – ♂♂, 18.x.2020. **M16a** – ♂♂, ♀, 4-5.v.2010. **M17** – ♂, 11.xii.2007. **M19a** – ♂, 15.vii.2010. **M19b** – ♂♂, 19.vii.2010. **M27a** – ♂, 29.iii.2012; ♂, 29.iii.2012. **M30di** – ♂, ♂+♀, 30.iii.2005; ♀, 16.iii.2006. **M33b** – ♂+♀, 5.iv.2005. **M34a** – ♂, 26.ii.2020. **M37a** – ♂, 9.vii.2014. **M37c** – ♂, 21.iii.2013. **M39a** – ♂, ♀, 21.ii.2020. **M40bi** – ♂, 6.x.2020.

Coenagrionidae

Aciagrion borneense Ris, 1911

L1a – ♂♂, 12.v.2005; ♂, 24.iv.2011. **M12b** – ♂♂, 17.vi.2015. **M13c** – ♀, 4.ii.2010; ♀, 5.ii.2010. **M30biii** – ♂♂, ♀♀, 7.iv.2012. **M30e** – ♂♂, 29.iii.2005; ♂, 16.iii.2006. **M30jii** – ♂, 30.iii.2005. **M31aii** – ♂, 21.iii.2006. **M31bi** – ♀, 31.iii.2005. **M34e** – ♂♂, 26.ii.2020. **M40gi** – ♂♂, 5.x.2020; ♀, 7.x.2020.

Agriocnemis femina (Brauer, 1868)

L1a – ♂, 12.v.2005; ♂♂, 24.iv.2011. **L3** – ♀, 15.v.2005. **LB1a** – ♂, 3.iv.2006; ♂♂, 10.i.2015. **LB9b** – ♂, 13.i.2015. **M7** – ♂♂, 12.i.2010. **M10a** – ♂, ♀, 5.ix.2011. **M10e** – ♂, 8.ix.2011. **M10h** – ♂, ♀, 9.ix.2011. **M10i** – ♂♂, 10.ix.2011. **M12a** – ♀, 17.vi.2015. **M13c** – ♂♂, ♀♀, 4.ii.2010; ♀, 5.ii.2010, LS; ♂♂, 10.ii.2015. **M27b** – ♂♂, ♀♀, 6.vii.2012. **M27e** – ♂♂, 22.viii.2016. **M30biii** – ♂♂, ♀, 7.iv.2012. **M30e** – ♂, ♀, 28.iii.2005; ♂♂, ♀♀, 29.iii.2005; ♀, 3.iv.2005. **M30dii** – ♂♂, 18.v.2005. **M30g** – ♂, ♀, 6.iv.2012. **M31aii** – ♀, 14.iv.2012. **M31bii** – ♂, 31.iii.2005. **M34e** – ♂, 26.ii.2020. **M37d** – ♂, 21.ii.2020. **M40h** – ♀, 6.x.2020. **M40k** – ♂, 9.x.2020.

Amphicnemis annae Lieftinck, 1940

LB5 – ♂♂, ♀♀, 4.iv.2006; ♂♂, ♀♀, 8.i.2015; ♀, 10.i.2015; ♀, 12.i.2015.

Amphicnemis new sp. cf *mariae* Lieftinck, 1940

M31bi – ♂♂, ♀♀, 7.iv.2012.

Amphicnemis sp. or spp. *martini*-group

LB5 – ♂♂, 4.iv.2006; ♂, 8.i.2015. **M39a** – ♀, 21.ii.2020.

Amphicnemis remiger Laidlaw, 1912

M10b – ♀, 5.ix.2011; ♂, 9.ix.2011. **M10c** – ♂, ♀, 6.ix.2011. **M10e** – ♂♂, ♀♀, 7.ix.2011; ♂, 8.ix.2011.

Amphicnemis sp. *wallacii*-group

L4b – ♀, 23.viii.2008; ♂, 21.iv.2011. **LB2** – ♀, 9.i.2015. **LB6** – ♂, 3.iv.2006. **M2** – ♀, 7.ii.2012; ♂♂, ♀♀, 8.ii.2012; ♂♂, ♀♀, 9.ii.2012. **M10a** – ♂, 5.ix.2011. **M10b** – ♂, 9.ix.2011. **M10c** – ♂♂, ♀♀, 6.ix.2011; ♂♂, ♀♀, 8.ix.2011. **M10e** – 6 ♂♂, ♀♀, 7.ix.2011. **M10f** – ♀, 7.ix.2011. **M10g** – ♀, 8.ix.2011. **M11** – ♂♂, ♀, 18.iv.2005. **M12a** – ♀, 17.vi.2015. **M12b** – ♂♂, ♀, 17.vi.2015.

Archibasis incisura Lieftinck, 1949

LB1a – ♂, 5.iv.2006. **LB2** – ♂♂, ♀♀, 7.iv.2006; ♂♂, ♀♀, 9.i.2015. **LB5** – ♂, ♀♀, 4.iv.2006. **LB6** – ♀, 6.iv.2006. **LB8** – ♂, 6.iv.2006; ♀, 7.i.2015. **LB9a** – ♀, 13.i.2015. **M6** – ♂, 8.iv.2005.

Archibasis melanocyana (Selys, 1877)

LB1a – ♂, ♀, 5.iv.2006. **LB8** – ♀, 4.iv.2006.

Archibasis tenella Lieftinck, 1949

L4a – ♂, 14.v.2005; ♂♂, 15.v.2005; ♂, 23.viii.2008. **M14f** – ♂, ♀, 13.x.2020.

Archibasis viola Lieftinck, 1949

LB2 – ♂♂, ♀, 7.iv.2006. **M2** – ♂, 8.v.2005. **M10c** – ♂♂, 6.ix.2011. **M10e** – ♂♂, 8.ix.2011. **M10j** – ♂, 10.ix.2011. **M11** – ♂+♀, 18.iv.2005. **M30ai** – ♂♂, 16.iii.2006.

Argiocnemis rubescens rubeola Selys, 1877

L1b – ♂♂, ♀, 12.v.2005; ♀, 24.iv.2011. **M4** – ♂, 4.xi.2010. **M10e** – ♂, 8.ix.2011. **M10i** – ♂, ♀♀, ♂+♀, 10.ix.2011. **M11** – ♂, 18.iv.2005. **M27c** – ♂, 30.viii.2016.

Argiocnemis sp.

M10a – ♂♂, ♀♀, 5.ix.2011. **M14a** – ♀, 24.xii.2017. **M14mvi** – ♂, 16.x.2020. **M27a** – ♂, ♀, 29.iii.2012. **M29b** – ♂, 19.ii.2010. **M30g** – ♂, 6.iv.2012. **M31bi** – ♂, 2.iv.2005. **M31bii** – ♂, ♀, 31.iii.2005. **M31biii** – ♂, 7.iv.2012. **M34e** – ♂♂, 26.ii.2020. **M37d** – ♂, 19.ii.2020; ♂, 21.ii.2020. **M38b** – ♂, 20.ii.2020. **M39g** – ♂♂, 23.ii.2020. **M40gi** – ♂, 5.x.2020. **M40h** – ♀, 6.x.2020. **M40j** – ♂♂, 8.x.2020. **M40l** – ♂, ♀, 9.x.2020.

Ceriagrion bellona Laidlaw, 1915

M18ci – ♂, ♀, ♂+♀, 14.vii.2010. **M18ei** – ♀, 20.vii.2010; ♀, 21.vii.2010. **M24b** – ♂, 12.xii.2007; ♂, 11.x.2009. **M27d** – ♂, ♂♂+♀♀, 24.viii.2016. **M30dii** – ♂, 22.iii.2006. **M31bi** – ♂, 2.iv.2005. **M31bii** – ♂♂, ♀♀, 7.iv.2012. **M34d** – ♂♂, ♀♀, 27.ii.2020; ♂, ♀, ♂♂+♀♀, 28.ii.2020. **M34e** – ♂, 26.ii.2020. **M38d** – ♂♂+♀♀, 20.ii.2020. **M39f** – ♂♂, ♀, 23.ii.2020. **M40j** – ♂+♀, 8.x.2020.

Ceriagrion cerinorubellum (Brauer, 1865)

L1a – ♂, 12.v.2005; ♂, 24.iv.2011. **L3** – ♂, 15.v.2005. **L4a** – ♂♂, ♀, 24.iv.2011. **LB5** – ♂,

4.iv.2006. **LB9a** – ♂, ♀, 13.i.2015. **M1** – ♂, 7.v.2005. **M4** – ♂, 5.xi.2010. **M5** – ♂♂, 16.i.2015. **M7** – ♀, 16.vi.2010. **M10a** – ♂, 5.ix.2011. **M10c** – ♂♂, 6.ix.2011. **M10g** – ♂, 8.ix.2011. **M11** – ♂, 18.iv.2005. **M12a** – ♀, 17.vi.2015. **M14mi** – ♂, 16.x.2020. **M14mvi** – ♀, 16.x.2020; ♂, 17.x.2020. **M40f** – ♂, 5.x.2020. **M40gi** – ♂, 5.x.2020. **M40l** – ♂, 9.x.2020.

Ischnura senegalensis (Rambur, 1842)

L1a – ♀, 12.v.2005; ♂, 16.v.2005. **L3** – ♀, 12.v.2005. **M3** – ♂, 7.v.2005. **M7** – ♂♂, 22.i.2010; ♂, 16.vi.2010; ♀, 22.iv.2013; ♂, ♀, 10.xii.2013; ♂, 28.v.2019. **M13c** – ♀, 4.ii.2010. **M30dii** – ♂, 18.v.2005. **M30e** – ♂♂, ♀♀, 29.iii.2005. **M30g** – ♂♂, 6.iv.2012. **M32b** – ♂, 8.iv.2012.

Mortonagrion indraneil Dow, 2011

See Dow (2011): **LB5**. Additional records:

LB5 – ♂♂, ♀, 8.i.2015. **M10c** – ♂♂, 6.ix.2011. **M10e** – ♂♂, ♀, 7.ix.2011; ♂♂, ♀, 8.ix.2011. **M10g** – ♀, 8.ix.2011.

Pseudagrion lalakense Orr & van Tol, 2001

L1a – ♂♂, 12.v.2005; ♂, 24.iv.2011. **L3** – ♂, 12.v.2005; ♂, 15.v.2005. **L11** – ♂, 3.ii.2006. **LB1a** – ♂, 3.iv.2006; ♂♂, 5.iv.2006. **LB1b** – ♂♂+♀♀, 7.iv.2006. **LB2** – ♂+♀, 9.i.2015. **LB7** – ♂ (apparently gleaning from canteen ceiling in morning), 4.iv.2006. **LB8** – ♂, 7.iv.2006. **LB9a** – ♂♂, 13.i.2015. **M1** – ♂, 7.v.2005. **M4** – ♂, 4.xi.2010. **M11** – ♂♂, ♀, ♂♂+♀♀, 18.iv.2005. **M13c** – ♂, 3.ii.2010; ♂, 12.iii.2010. **M14mi** – ♂♂, 17.x.2020. **M14miii** – ♂, 17.x.2020. **M39h** – ♂, 21.ii.2020.

Pseudagrion microcephalum (Rambur, 1842)

L1a – ♂, ♀, 12.v.2005; ♂, 16.v.2005; ♂♂, ♂♂+♀♀, 24.iv.2011. **LB1a** – ♂, 5.iv.2006. **LB2** – ♂+♀, 9.i.2015. **LB4** – ♂, 11.i.2015. **LB9a** – ♂♂, 13.i.2015. **LB9b** – ♂+♀, 13.i.2015. **M1** – ♂♂, 7.v.2005. **M2** – ♀♀, 8.ii.2012. **M3** – ♂+♀, 7.v.2005. **M5** – ♂♂, ♀, ♂♂+♀♀, 16.i.2015. **M6** – ♂, 8.v.2005. **M9** – ♂♂, 11.ix.2011. **M12a** – ♂, 17.vi.2015. **M14mi** – ♂♂, ♀, ♂+♀, 16.x.2020; ♂♂, 17.x.2020. **M14mvi** – ♂, ♀, 17.x.2020. **M34e** – ♂, 26.ii.2020.

Pseudagrion perfuscatum Lieftinck, 1937

M4 – ♂, 4.xi.2010. **M13a** – ♂♂, ♀, 4.ii.2010; ♂, 12.v.2010; ♂♂, ♀, 21.xi.2013; ♂♂, ♀, ♂+♀, 7.ii.2015; ♂, 9.ii.2015; ♂♂, ♀, 10.ii.2015. **M14ki** – ♂♂, 16.x.2020. **M17** – ♂, 11.xii.2007. **M18k** – ♂, on outflow channel to pond, 17.ii.2020. **M19a** – ♂, 15.vii.2010. **M27a** – ♂♂, 29.iii.2012. **M27c** – ♂♂, ♂+♀, 30.viii.2016. **M27d** – ♂, 24.viii.2016. **M30di** – ♂, 29.iii.2005. **M30e** – ♂, 3.iv.2005. **M37a** – ♂, 9.vii.2014. **M39c** – ♂♂, 19.ii.2020. **M39f** – ♂♂, 23.ii.2020.

Pseudagrion pilidorsum (Brauer, 1868)

M4 – ♂, 4.xi.2010.

Stenagrion dubium (Laidlaw, 1912)

L4b – ♂♂, ♂+♀, 13.v.2005; ♂, 23.viii.2008. **L5** – ♂♂, 11.v.2005; ♂♂, 1.ii.2006. **L9a** – ♂, 22.iv.2011. **L12a** – ♂♂, 16.vii.2012. **M13a** – ♂♂, 6.vii.2010; ♂♂, 9.ii.2015. **M14a** – ♂, 24.xii.2017. **M14ki** – ♂♂ (at shady wet cliff beside stream), 16.x.2020. **M15a** – ♂, 22.xii.2007. **M18a** – ♂♂, 18.xii.2007; ♂♂, 19.xii.2007; ♂♂, 7.x.2009; ♂♂, 8.x.2009; ♂, 10.x.2009. **M18d** – ♂♂, ♀♀, 17.vii.2010; ♂♂, 18.vii.2010. **M18e** – ♂♂, 20.vii.2010. **M18g** – ♂♂, 15.vii.2010. **M19b** – ♂, ♀, 19.vii.2010. **M22a** – ♂, ♀♀, 12.x.2009. **M22b** – ♂, 13.x.2009. **M24a** – ♂♂, 12.xii.2007. **M25** – ♂, 22.viii.2016. **M27d** – ♂, 26.viii.2016; ♂♂, 29.viii.2016. **M28a** – ♂, 15.viii.2017; ♂♂, ♀♀, 18.viii.2017; ♂♂, ♀, 22.viii.2017. **M28c** – ♂,

16.viii.2017. **M28e** – ♂♂, ♀, 23.viii.2017. **M28g** – ♂♂, ♀, ♂+♀, 17.viii.2017. **M30ai** – ♂♂, 3.iv.2005. **M30aii** – ♂+♀, 18.v.2005; ♂, 19.v.2005. **M30bii** – ♂♂, 15.iii.2006. **M30c** – ♀, 20.v.2005. **M34b** – ♂♂, 27.ii.2020. **M34c** – ♂, 28.ii.2020. **M36** – ♂, 25.ii.2020. **M38c** – ♂, 20.ii.2020. **M39b** – ♂♂, 18.ii.2020. **M39c** – ♂♂, 19.ii.2020. **M39d** – ♂♂, ♀, 24.ii.2020. **M39e** – ♂♂, 25.ii.2020. **M39f** – ♂, 23.ii.2020. **M40a** – ♂♂, 4.x.2020. **M40biii** – ♂♂, 6.x.2020. **M40c** – ♂♂, 8.x.2020. **M40d** – ♂♂, 9.x.2020. **P1** – ♂, 17.iii.2006. **P2a** – ♂♂, ♀, 16.iv.2012; ♂, 7.xi.2016. **P2b** – ♂, 8.xi.2016; ♂, ♀, 9.xi.2016. **P3c** – ♂♂, 9.iv.2012; ♂♂, 10.iv.2012; ♂, 11.iv.2012.

Teinobasis cryptica Dow, 2010

LB5 – ♀, 8.i.2015.

Teinobasis laidlawi Kimmins, 1936

M18d – ♂, 17.vii.2010 (presumably at a pond somewhere near the stream but no authors present). **M27a** – ♂♂, 29.iii.2012. **M27e** – ♂, 27.viii.2016. **M28d** – ♂♂, 16.viii.2017.

Teinobasis rajah Laidlaw, 1912

See Dow (2010a) for records prior to 2010. **M2**, **M6**.

L1b – ♂, 24.iv.2011, RD. **LB5** – 3 ♂♂, 8.i.2015, RD; ♂, 8.i.2015, LS; ♂+♀, 10.i.2015, RD. **M7** – ♂, 18.i.2010, LS; ♀, 5.iii.2013, LS. **M10b** – 2 ♂♂, 5.ix.2011, RD; 3 ♂♂, 5.ix.2011, RN; ♂, 5.ix.2011, LS; ♂, 9.ix.2011, RD; ♂, 9.ix.2011, N. **M10e** – 6 ♂♂, 7.ix.2011, RD; 2 ♂♂, 7.ix.2011, RN; ♂, 7.ix.2011, LS;

Xiphiagrion cyanomelas Selys, 1876 A

L1a – ♂♂, ♀, ♂♂+♀♀, 12.v.2005. **LB9a** – ♂, ♀, ♂+♀, 13.i.2015. **M3** – ♂, ♀, 7.v.2005. **M11** – ♂, 18.iv.2005. **M14mvi** – ♀, 17.x.2020. **M18ei** – ♀, 21.vii.2010. **M18j** – ♂, ♀♀, ♂+♀, 9.x.2009. **M18k** – ♂♂, 17.ii.2020. **M25** – ♂+♀, 28.viii.2016. **M27c** – ♂+♀, 30.viii.2016. **M27e** – ♂♂, ♂+♀, 25.viii.2016. **M34d** – ♂♂, 28.ii.2020. **M34e** – ♂+♀, 26.ii.2020. **M37b** – ♂♂, 29.ii.2020. **M38b** – ♂+♀, 20.ii.2020. **M39h** – ♂, 21.ii.2020. **M40f** – ♂, 5.x.2020. **M40gi** – ♂♂, 5.x.2020; ♀, 7.x.2020, RD; ♂ (teneral), 7.x.2020. **M40j** – ♂+♀, 8.x.2020.

Xiphiagrion cyanomelas Selys, 1876 B

M21b – ♂♂, 31.viii.2016. **M25** – ♂♂, 28.viii.2016. **M27e** – ♂, 25.viii.2016; ♂, ♂+♀, 27.viii.2016. **M29b** – ♂♂, 14.xii.2007. **M34d** – ♂+♀, 27.ii.2020; ♂♂, 28.ii.2020.

Anisoptera

Aeshnidae

Anaciaeschna jaspidea (Burmeister, 1839)

M30e – ♀, 21.iii.2006.

Anax guttatus (Burmeister, 1839)

M3 – ♂, 7.v.2005. **M7** – ♀, 1.xi.2009. **M40m** – ♂ (near **M40gi**), 5.x.2020.

Anax panybeus Hagen, 1867

M18ei – ♂, 21.vii.2010. **M27a** – ♂, 29.iii.2012. **M39a** – ♂, 21.ii.2020. **M40m** – ♂ (near **M40gi**), 5.x.2020; ♂ (near **M40gi**), 7.x.2020.

Gynacantha basiguttata Selys, 1882

LB8 – ♂, 7.i.2015; ♀, 8.i.2015; ♂♂, ♀, 9.i.2015, RD; ♂, ♀, 12.i.2015; ♂♂, 13.i.2015.
M14i – ♂ (flew into longhouse at ca 2:30PM), 15.x.2020. **M36** – ♀, 18.ii.2020; ♀, 28.ii.2020. **M37c** – ♂ (at lights in longhouse), 9.vii.2014.

Gynacantha dohrni Krüger, 1899

L13 – ♂, 23.iv.2011. **LB6** – ♀, 6.iv.2006. **LB8** – ♂, 3.iv.2006; ♂♂, 8.i.2015; ♂♂, ♀, 12.i.2015. **M7** – ♀, 21.iii.2011; ♂, 4.i.2015. **M14i** – ♂, 25.xii.2017; ♂, 17.x.2020. **M30e** – ♀, 3.iv.2005. **P2c** – ♂, 14.iv.2012.

Gynacantha sp.

LB5 – ♀, 4.iv.2006.

Heliaeschna crassa Krüger, 1899

LB8 – ♂, 7.iv.2006.

Heliaeschna idae (Brauer, 1865)

L13 – ♂, 2.ii.2006. **M7** – ♂, 10.xii.2013.

Heliaeschna simplicia (Karsch, 1891)

See Butler & Orr (2013). **M2**.

LB8 – ♂, 2.iv.2006; ♀, 3.iv.2006; ♂, 6.iv.2006; ♀, 9.i.2015. **L13** – ♂, 31.i.2006; ♂, 2.ii.2006.

Heliaeschna uninervulata Martin, 1909

LB4 – ♂ (hawking fast over a shady backwater around midday), 11.i.2015. **LB8** – ♂, 3.iv.2006. **M2** – ♂ (at lights in evening), 9.v.2005.

Indaeschna grubaueri (Förster, 1904)

M14i – ♀ (found dead on ground), 2.vi.2019. **M20** – ♀ (in canteen ca 1 pm), 11.xii.2007. **M27e** – ♀, 27.xiii.2016. **M28** – larval records. **M28d** – ♂, ♀, 16.viii.2017. **M30biii** – ♂, 18.v.2005.

Oligoaeschna foliacea Lieftinck, 1968

LB8 – ♀, 2.iv.2006; ♂, ♂+♀, 6.iv.2006; ♂, 7.iv.2006; ♂+♀, 9.i.2015. **M2** – ♂, 8.v.2005; ♂ (flying in clearing at ca 6.20 p.m.), 8.v.2005. **M6** – ♂, 8.iv.2005; ? ♀, 8.iv.2005. **M10c** – ♂, 6.ix.2011.

Oligoaeschna sp. or spp.

LB8 – ♀, 3.iv.2006; ♀, 8.iv.2006 in morning. **M30biii** – ♀, 6.iv.2005.

Tetracanthagyna degorsi Martin, 1896

M30g – ♂ (immature, found at lights in building in evening), 24.vi.2012. **P1** – ♀, 17.iii.2006. **P2a** – ♀, 21.iii.2006. **P2b** – ♀, 8.xi.2016.

Gomphidae

Acrogomphus sp. cf *jubilaris* Lieftinck, 1964

L4b – larva, iv.2011. **P2b** – larva, 8.xi.2016.

Borneogomphus sp.

M18a – ♀, 18.xii.2007.

Burmagomphus arthuri Lieftinck, 1953

M14kiii – ♀, 18.x.2020.

Heliogomphus borneensis Lieftinck, 1964

M14b – ♂♂, 1.vi.2019; ? ♀ (teneral), 15.x.2020. **M14c** – ♂♂, 2.vi.2019. **M14d** – ♂,

4.vi.2019. **M14g** – ♂, 5.vi.2019. **M14h** – ♂, 6.vi.2019.

Ictinogomphus acutus (Laidlaw, 1914)

LB5 – ♂, 4.iv.2006.

Ictinogomphus decoratus melaenops (Selys, 1858)

LB1a – ♂, ♀, 5.iv.2006. **LB4** – ♂, ♀, 9.i.2015. **LB9b** – ♂♂, 13.i.2015. **L1a** – ♂, 12.v.2005. **M2** – ♂, 9.ii.2012. **M5** – ♂, 16.i.2015. **M6** – ♂♂, 8.iv.2005. **M10c** – ♂♂, 6.ix.2011. **M10f** – ♂♂, 7.ix.2011. **M10k** – ♂, 8.ix.2011. **M11** – ♂♂, 18.iv.2005. **M13a** – ♂, 12.ii.2010. **M14j** – ♂, 5.vi.2019. **M14mi** – ♂, 17.x.2020. **M14miii** – ♂, 17.x.2020. **M19a** – ♂, 15.vii.2010. **M19b** – ♂♂, 19.vii.2010. **M27a** – ♂♂, 29.iii.2012. **M27c** – ♂, 30.viii.2016. **M34e** – ♂, 26.ii.2020. **M39h** – ♂, 21.ii.2020. **M40e** – ♂♂, ♀♀, 5.x.2020.

Leptogomphus coomansi Laidlaw, 1936

See Dow, Stokvis & Ngiam (2017). **L9a**, **L12a**.

Leptogomphus sp. cf *coomansi* Laidlaw, 1936

See Dow, Stokvis & Ngiam (2017) for material collected up to 2016. **M13a**, **M16b**, **M22b**. **M14b** – ♂, 1.vi.2019. **M14f** – ♀ (teneral), 13.x.2020. **M14g** – ♂, 5.vi.2019.

Leptogomphus pasia van Tol, 1990

See Dow, Stokvis & Ngiam (2017). **P2a**.

Leptogomphus pendleburyi Laidlaw, 1934

See Dow, Stokvis & Ngiam (2017) for material collected before 2016. **M18e**.

M14h – ♀, 6.vi.2019. **M39c** – ♂ (teneral), 19.ii.2020. **M40c** – ♀ (teneral), 8.x.2020. **M40d** – ♂, 9.x.2020.

Leptogomphus sii Dow, Stokvis & Ngiam, 2017

See Dow, Stokvis & Ngiam (2017). **M18c**.

Leptogomphus williamsoni Laidlaw, 1912

See Dow, Stokvis & Ngiam (2017) for material collected before 2016. **M18d**, **M22b**.

M28c – ♀, 16.viii.2017. **M34b** – ♀ (teneral), 28.ii.2020. **M39e** – ♂ (teneral), 25.ii.2020. **M40d** – ♂, 9.x.2020.

Leptogomphus sp.

See Dow, Stokvis & Ngiam (2017). **P3c**.

Macrogomphus quadratus Selys, 1878

L4a – ♂, 14.v.2005. **M10f** – ♂, 7.ix.2011. **M12a** – ♀, 17.vi.2015. **M18g** – ♂, 15.vii.2010.

Megalogomphus sp.

L4a – larva, iv.2011.

Microgomphus chelifera Selys, 1858

M14f – ♂, 5.vi.2019; ♀, 13.x.2020.

Microgomphus sp.

M10c – ♀, 6.ix.2011.

Sieboldius japonicus (Selys, 1854)

M30aii – ♀, 19.v.2005. **M30bi** – ♂, 18.v.2005; ♂, 22.iii.2006. **M31ai** – ♂, 11.xi.2016. **M32a** – ♂, 1.iv.2005; ♂, 8.iv.2012. **M33a** – ♂, 4.iv.2005.

Chlorogomphidae

Chlorogomphus sp. or spp.

M28 – Larval records. **M40d** – ♀, 9.x.2020. **P2b** – larvae, 8.xi.2016; larva, 9.xi.2016.

Macromiidae

Epophthalmia vittigera (Rambur, 1842)

LB1a – ♂, 5.iv.2006. **LB4** – ♂♂, 11.i.2015. **M2** – ♂, 8.v.2005. **M13a** – ♂, 22.xi.2013. **M14mi** – ♂, 17.x.2020. **M14miii** – ♂♂, 17.x.2020. **M32b** – ♂, 31.iii.2005. **M34e** – ♂♂, 26.ii.2020.

Macromia cincta Rambur, 1842

L4a – ♂, ♀, 14.v.2005. **M10c** – ♂♂, 6.ix.2011.

Macromia corycia Laidlaw, 1922

M27d – ♀, 29.viii.2016. **M27e** – ♂, ♀, 25.viii.2016. **M30ai** – ♀, 2.iv.2005. **M30bi** – ♀♀, 18.v.2005. **M34a** – ♂, 26.ii.2020.

Macromia cydippe Laidlaw, 1922

M14l – ♂, 18.x.2020.

Macromia jucunda Lieftinck, 1955

M14f – ♂ (lower, muddy part of stream), 13.x.2020.

Macromia westwoodii Selys, 1874

M18a – ♀, 17.xii.2007; ♂♂, 18.xii.2007. **M18f** – ♂, 14.vii.2010. **M21a** – ♂, 13.xii.2007. **M22b** – ♀, 13.x.2009. **M25** – ♂, 22.viii.2016. **M28a** – ♂, 18.viii.2017. **M30ai** – ♂, 3.iv.2005. **M30c** – ♂, 20.v.2005. **M32a** – ♂♂, ♀, 1.iv.2005. **M36** – ♀, 28.ii.2020. **M39f** – ♀, 23.ii.2020. **P2a** – ♂♂, ♀♀, 21.iii.2006. **P2b** – ♀, 10.xi.2016; ♀, 10.xi.2016.

Macromia sp. cf *westwoodii*

M34d – ♂, 27.ii.2020.

Synthemistidae

Idionyx montana Karsch, 1891

M27d – ♂, 29.viii.2016. **M27e** – ♀, 27.viii.2016. **M281** – ♀♀, 24.viii.2017. **M39b** – ♀, 18.ii.2020. **M39f** – ♂, 23.ii.2020.

Idionyx sp. cf *yolanda* Selys, 1871

M40d – ♀, 9.x.2020.

Macromidia fulva Laidlaw, 1915

L5 – ♀, 11.v.2005. **L12a** – ♂, 16.vii.2012. **M18a** – ♂♂, ♀♀, 18.xii.2007. **M18d** – ♂, 17.vii.2010. **M19a** – ♂, 15.vii.2010. **M30ai** – ♀, 3.iv.2005. **M36** – ♂, 27.ii.2020. **M40bii** – ♀, 6.x.2020. **P2a** – ♀, 21.iii.2006.

Corduliidae

Hemicordulia tenera Lieftinck, 1930

M30f – ♂, 30.iii.2005. **M31bi** – ♂, 31.iii.2005; ♂, 2.iv.2005; ♂, 7.iv.2012.

Libellulidae*Acisoma panorpoides* Rambur, 1842**L1a** – ♂, 12.v.2005; ♂, 16.v.2005. **M3** – ♂, 7.v.2005.*Aethriamanta gracilis* (Brauer, 1878)**L1a** – ♂, 12.v.2005; ♂, 23.iv.2011; ♂♂, 24.iv.2011. **LB9a** – ♂♂, 13.i.2015. **M1** – ♂, 7.v.2005. **M3** – ♂♂, 7.v.2005. **M5** – ♂♂, 16.i.2015. **M11** – ♂, 18.iv.2005. **M12b** – ♂♂, 17.vi.2015. **M14mi** – ♂♂, 17.x.2020. **M14miii** – ♂+♀, 17.x.2020. **M14mv** – ♂♂, 18.x.2020. **M18k** – ♂, 17.ii.2020. **M34e** – ♂♂, 26.ii.2020. **M37a** – ♂, 29.ii.2020. **M40e** – ♂, 5.x.2020. **M40gi** – ♂♂, 5.x.2020.*Agrionoptera insignis* (Rambur, 1842)**L1b** – ♂♂, 24.iv.2011. **M2** – ♀, 7.ii.2012. **M3** – ♂♂, ♀♀, 8.v.2005. **M11** – ♂♂, 18.iv.2005. **M14mii** – ♂♂, 17.x.2020. **M14mvi** – ♂♂, 16.x.2020. **M27e** – ♂, 27.viii.2016. **M40h** – ♂, 5.x.2020; ♂♂, 6.x.2020. **M40j** – ♂♂, 8.x.2020.*Agrionoptera sexlineata* Selys, 1879**M10e** – ♀, 9.ix.2011. **M40gii** – ♂♂, 7.x.2020.*Brachydiplax chalybea* Brauer, 1868**L1a** – ♂♂, 12.v.2005; ♂, 23.iv.2011. **L4a** – ♂, 24.iv.2011. **LB1a** – ♂♂, 5.iv.2006. **LB4** – ♂, 11.i.2015. **M1** – ♂♂, 7.v.2005. **M5** – ♂♂, ♀, 16.i.2015. **M6** – ♂♂, 8.v.2005. **M8** – ♂, 28.xii.2009. **M10a** – ♂, 5.ix.2011. **M10c** – ♂♂, 6.ix.2011. **M10i** – ♂♂, 9.ix.2011; ♂♂, 10.ix.2011. **M10j** – ♂, 10.ix.2011. **M11** – ♂, 18.iv.2005. **M14mii** – ♂, 17.x.2020. **M27b** – ♂♂, 6.vii.2012. **M27e** – ♂, ♀, 25.viii.2016. **M32b** – ♂, 2.iv.2005. **M40gi** – ♂, 5.x.2020. **M40k** – ♂, 9.x.2020.*Brachydiplax farinosa* Krüger, 1902**L1b** – ♂♂, 12.v.2005. **M11** – ♂♂, 18.iv.2005.*Brachygonia oculata* (Brauer, 1878)**LB5** – ♂, 4.iv.2006; ♂♂, ♀, 8.i.2015. **M2** – ♀♀, 9.v.2005; ♂♂, 7.ii.2012. **M6** – ♂♂, ♀, 8.iv.2005. **M10b** – ♂♂, ♀♀, 5.ix.2011. **M10c** – ♂♂, 6.ix.2011. **M10e** – ♂♂, 7.ix.2011; ♀♀, 8.ix.2011. **M10i** – ♂♂, ♀♀, 9.ix.2011. **M10j** – ♂, ♀, 10.ix.2011.*Camacinia gigantea* (Brauer, 1867)**M14mii** – ♂, 17.x.2020. **M27c** – ♂♂, 30.viii.2016. **M37b** – ♂♂, 29.ii.2020. **M37d** – ♂, 19.ii.2020; ♂, 21.ii.2020. **M40gi** – 3 ♂♂, ♀, 5.x.2020.*Chalybeothemis pruinosa* Dow, Choong & Orr, 2007**LB1c**, **LB8**.*Cratilla lineata* (Brauer, 1878)**M13c** – ♂, 8.ii.2015. **M14mvi** – ♂, 17.x.2020. **M18h** – ♂ (near **M18g**), 15.vii.2010. **M27e** – ♂, 27.viii.2016. **M30g** – ♂, 6.iv.2012. **M31biii** – ♂, 31.iii.2005; ♂, 2.iv.2005. **M34d** – ♂♂, 27.ii.2020; ♂, 28.ii.2020. **M40biv** – ♂, 6.x.2020. **M40i** – ♂♂, 9.x.2020.*Cratilla metallica* (Brauer, 1878)**L4b** – ♀, 21.iv.2011. **M2** – ♀, 8.ii.2012. **M4** – ♂, 4.xi.2010. **M13c** – ♂, 8.ii.2015. **M14e** – ♀ (apparently ovipositing onto blue linoleum floor inside dark abandoned hut), 4.vi.2019. **M14f** – ♂ (muddy pool in forest near stream), 13.x.2020. **M14i** – ♀, 5.vi.2019. **M14kiii** – ♂, 18.x.2020. **M18d** – ♂, 17.vii.2010. **M18e** – ♂, 21.vii.2010. **M19b** – ♂, 19.vii.2010. **M25** – ♂, 22.viii.2016. **M27a** – ♂, 28.iii.2012; ♂, 29.iii.2012. **M28d** – ♂, 16.viii.2017. **M281** –

♀, 19.viii.2017. **M31aii** – ♂, 21.iii.2006. **M34d** – ♂♂, 28.ii.2020. **P2c** – ♂, 15.iv.2012; ♀, 16.iv.2012.

Diplacodes trivialis (Rambur, 1842)

M7 – ♂, ♀, 18.i.2010; ♂♂, 22.i.2010. **M13c** – ♂♂, 3.ii.2010. **M18j** – ♂, 9.x.2009. **M26** – ♂, ♀, 16.xii.2007. **M27a** – ♂, ♀, 30.iii.2012. **M27e** – ♂, 25.viii.2016. **M30e** – ♀, 28.iii.2005; ♂, ♀, 29.iii.2005. **M30g** – ♂, 6.iv.2012. **M40n** – ♀ (perched on ground outside house), 6.x.2020.

Hydrobasileus croceus (Brauer, 1867)

M2 – ♂, 8.v.2005. **M5** – ♂, 16.i.2015. **M11** – ♂, 18.iv.2005.

Hylaeothemis clementia Ris, 1909

M27e – ♂, 27.viii.2016. **P2b** – ♂, 8.xi.2016.

Lathrecista asiatica (Fabricius, 1798)

LB2 – ♂, 7.iv.2006; ♂♂, 9.i.2015. **LB9a** – ♀, 13.i.2015.

Lyriothemis biappendiculata (Selys, 1878)

M13a – ♂, 9.ii.2015. **M13b** – ♂, 8.ii.2015. **M14a** – ♂, 24.xii.2017. **M14b** – ♂, 1.vi.2019; ♂, 15.x.2020. **M14h** – ♂, 6.vi.2019. **M18b** – ♂, 6.x.2009. **M18d** – ♂, 17.vii.2010. **M18e** – ♂, 21.vii.2010. **M24a** – ♂, 12.xii.2007. **M28c** – ♂♂, 16.viii.2017. **M40d** – ♂ (seepage at head of stream), 9.x.2020, RD.

Lyriothemis cleis Brauer, 1868

L8 – ♀, 22.xii.2007. **M2** – ♂, 8.ii.2012. **M19b** – ♂, 19.vii.2010. **M27e** – ♀, 27.viii.2016. **M37c** – ♂, 21.iii.2013.

Nannophya pygmaea Rambur, 1842

L1a – ♂, 24.iv.2011. **L3** – ♂♂, 15.v.2005. **LB9a** – ♂♂, ♀, 13.i.2015. **M1** – ♂, 7.v.2005. **M6** – ♂, 8.iv.2005. **M10c** – ♂♂, 6.ix.2011. **M10j** – ♂, ♀, 10.ix.2011. **M11** – ♂, 18.iv.2005. **M12b** – ♂, 17.vi.2015. **M14mi** – ♂♂, 17.x.2020. **M14miv** – ♂♂, 16.x.2020. **M30e** – ♂♂, ♀, 29.iii.2005; ♂♂, 30.iii.2005. **M30jii** – ♂, 30.iii.2005. **M31biii** – ♂, 7.iv.2012. **M37b** – ♂♂, 29.ii.2020. **M40f** – ♂♂, 5.x.2020. **M40gi** – ♂♂, 5.x.2020.

Nesoxenia lineata (Selys, 1879)

LB2 – ♂, 9.i.2015. **LB5** – ♂, 10.i.2015. **M2** – ♂♂, ♀, 8.v.2005. **M10f** – ♀♀, 7.ix.2011. **M12a** – ♂, ♀, 17.vi.2015. **M30h** – ♂, 16.iii.2006. **M40f** – ♂ (shady marsh area), 5.x.2020.

Neurothemis fluctuans (Fabricius, 1793)

L4a – ♂, 24.iv.2011. **L10** – ♂, 11.v.2005. **L12b** – ♂, 16.vii.2012. **LB5** – ♀, 12.i.2015. **LB6** – ♂, 7.i.2015. **LB7** – ♂, 3.iv.2006. **LB9a** – ♀♀, 13.i.2009. **M2** – ♂, ♀, 8.ii.2012. **M4** – ♂♂, ♀♀, 5.xi.2010. **M5** – ♂♂, ♀, 16.i.2015. **M6** – ♂, 8.iv.2005. **M10a** – ♂, 5.ix.2011. **M10c** – ♂♂, 6.ix.2011. **M10f** – ♀♀, 7.ix.2011. **M10g** – ♂, 8.ix.2011. **M10j** – ♂, 10.ix.2011. **M11** – ♂♂, 18.iv.2005. **M12a** – ♂, 17.vi.2015. **M12b** – ♂♂, ♀, 17.vi.2015. **M13a** – ♂, 7.ii.2015. **M13c** – ♂, 10.ii.2015. **M14mi** – ♂♂, 17.x.2020. **M14mii** – ♂, 17.x.2020. **M14miii** – ♂, 17.x.2020. **M14miv** – ♂, 16.x.2020. **M14mvi** – ♂, 18.x.2020. **M15b** – ♂, 21.xii.2007. **M18ci** – ♂, 14.vii.2010. **M18ei** – ♀, 20.vii.2010. **M18j** – ♂, 9.x.2009. **M19b** – ♂, 19.vii.2010. **M22c** – ♂, 12.x.2009. **M23** – ♂, 7.vii.2012. **M27b** – ♂, 6.vii.2012. **M27d** – ♂, 24.viii.2016. **M27e** – ♂, 27.viii.2016. **M30e** – ♂, 29.iii.2005. **M31aii** – ♂, 8.xi.2016. **M31bi** – ♂, 31.iii.2005. **M34d** – ♂♂, ♀♀, 28.ii.2020. **M34e** – ♂♂, 26.ii.2020. **M37d** – ♂♂, 19.ii.2020. **M38b** – ♂,

20.ii.2020. **M38d** – ♂, 20.ii.2020. **M39g** – ♂, 23.ii.2020. **M39h** – ♂, 21.ii.2020. **M40e** – ♂♂, ♀. **M40f** – ♂, 5.x.2020. **M40gi** – ♂♂, 5.x.2020. **M40h** – ♂♂, 6.x.2020. **M40j** – ♂♂, 8.x.2020. **M40k** – ♂, 9.x.2020. **M40m** – ♂, ♀♀ (all near **M40j**), 8.x.2020.

Neurothemis ramburii (Brauer, 1866)

L1a – ♂, 16.v.2005. **LB7** – ♂, 3.iv.2007. **M2** – ♂, 8.v.2005. **M5** – ♂♂, 16.i.2015. **M14miii** – ♂, 17.x.2020. **M14mvi** – ♂, 17.x.2020. **M27d** – ♂, 24.viii.2016. **M34e** – ♂, 26.ii.2020.

Neurothemis terminata Ris, 1911

L1a – ♂, 3.v.2006. **LB9a** – ♂♂, 13.i.2015. **M2** – ♂♂, ♀, 8.v.2005, GR; ♀, 8.ii.2012. **M5** – ♂, ♀, 16.i.2015. **M13c** – ♂, 11.ii.2015. **M14kii** – ♂♂, 17.x.2020. **M14miii** – ♂, 17.x.2020. **M15b** – ♂, 21.xii.2007. **M27d** – ♂♂, 24.viii.2016; ♀, 29.viii.2016. **M27e** – ♂♂, 27.viii.2016. **M39c** – ♂, 19.ii.2020. **M40biv** – ♂, 6.x.2020.

Onychothemis coccinea Lieftinck, 1953

M19a – ♂, 19.vii.2010. **M19b** – ♂, 15.vii.2010. **M27a** – ♂, 29.iii.2012. **M27e** – ♂, 22.viii.2016. **M30di** – ♂♂, ♀, 30.iii.2005. **M33a** – ♂, 4.iv.2005. **M34a** – ♂, 26.ii.2020. **M39a** – ♂, 21.ii.2020.

Onychothemis culminicola Förster, 1904

LB3 – ♂, 7.iv.2006. **M4** – ♂, 4.xi.2010. **M10c** – ♂, 6.ix.2011. **M12a** – ♂, 17.vi.2015. **M13a** – ♂♂, 9.ii.2015; ♂♂, 10.ii.2015.

Orchithemis pulcherrima Brauer, 1878

L2 – ♂, 12.v.2005. **L4a** – ♂♂, 14.v.2005; ♂, 31.i.2006. **L8** – ♂, 21.iv.2011; ♂, 22.iv.2011. **M2** – ♂, 8.v.2005; ♂♂, ♀, 7.ii.2012; ♀, 9.ii.2012. **M4** – ♂♂, ♀, 5.xi.2010. **M10a** – ♂, ♀, 5.ix.2011. **M10b** – ♂♂, ♀♀, 5.ix.2011. **M10c** – ♂♂, 6.ix.2011. **M10e** – ♂♂, 7.ix.2011; ♂♂, 8.ix.2011. **M10g** – ♂♂, 8.ix.2011. **M10j** – ♂♂, ♀, 10.ix.2011. **M12a** – ♂, 17.vi.2015. **M31bi** – ♂♂, 2.iv.2005; ♀, 7.iv.2012.

Orchithemis xanthosoma Laidlaw, 1911

M10b – ♂, 9.ix.2011. **M10c** – ♂♂, ♀, 6.ix.2011; ♀, 6.ix.2011. **M10e** – ♂, 7.ix.2011.

Orthetrum chrysis (Selys, 1891)

L4a – ♀, 13.v.2005; ♂, 14.v.2005; ♂♂, ♀, 21.iv.2011. **L11** – ♂, 3.ii.2006. **L12b** – ♂, 16.vii.2012. **LB5** – ♂, 4.iv.2006; ♀, 4.iv.2006. **LB6** – ♂, 7.i.2015. **LB7** – ♂, 3.iv.2006. **M4** – ♂, 4.xi.2010. **M8** – ♂, 22.xi.2009. **M10f** – ♂, 7.ix.2011. **M10i** – ♂, 9.ix.2011. **M10j** – ♂, 10.ix.2011. **M11** – ♂, 18.iv.2005. **M13c** – ♂, 10.ii.2015. **M14b** – ♂, 15.x.2020. **M14i** – ♀, 25.xii.2017; ♂, 17.x.2020. **M14ki** – ♂, 16.x.2020. **M14l** – ♂, 18.x.2020. **M14mvi** – ♂, 18.x.2020. **M18ci** – ♂♂, 14.vii.2010. **M18di** – ♂, 18.vii.2010. **M18ei** – ♂, 20.vii.2010. **M18k** – ♂, 17.ii.2020. **M22c** – 12.x.2009. **M27a** – ♂, 28.iii.2011; ♂♂, 29.iii.2011. **M27b** – ♂, 6.vii.2012. **M27d** – ♂, 24.viii.2016. **M30jii** – ♂, 30.iii.2005. **M34d** – ♂♂, 28.ii.2020. **M38b** – ♂, 20.ii.2020. **M38c** – ♂, 20.ii.2020. **M40f** – ♂, 5.x.2020. **M40gi** – ♂, 5.x.2020. **M40j** – ♂, 8.x.2020.

Orthetrum glaucum (Brauer, 1865)

L13 – ♂, 12.v.2005. **LB7** – ♂, 3.iv.2006. **M4** – ♂, 5.xi.2010. **M13a** – ♀, 9.ii.2015. **M14i** – ♀, 17.x.2020. **M14mvi** – ♂, 17.x.2020. **M15b** – ♂, ♀, 21.xii.2007. **M18d** – ♂, 17.vii.2010. **M18g** – ♂♂, 15.vii.2010; ♀, 16.vii.2010, MK. **M18ai** – ♂♂, 18.xii.2007. **M18ci** – ♂♂, ♀♀, 14.vii.2010. **M18ei** – ♂, ♀, 20.vii.2010; ♀, 21.vii.2010. **M18j** – ♂, 9.x.2009. **M21a** – ♂, 19.viii.2017. **M23** – ♂, 7.vii.2012. **M24b** – ♂♂, 12.xii.2007. **M27a** – ♂, ♀, 30.iii.2012. **M27d**

— ♂♂, 24.viii.2016. **M27e** — ♂, 22.viii.2016. **M29b** — ♂, 15.xii.2007; ♀, 19.ii.2010. **M30dii** — ♂, 6.iv.2005; ♂, 17.v.2005. **M31biii** — ♂, 2.iv.2005. **M33a** — ♂, 4.iv.2005. **M34d** — ♂♂, 27.ii.2020; ♀♀, 28.ii.2020. **M38a** — ♂♂, 22.ii.2020. **M39a** — ♀, 21.ii.2020. **M39f** — ♂, 23.ii.2020. **M39j** — ♂, ♂+♀, near **M39b**, 18.ii.2020; ♂, near **M39e**, 24.ii.2020; ♂♂, near **M39e**, 24.ii.2020; ♂♂, ♀♀, near **M39e**, 25.ii.2020. **M40m** — ♂♂, ♀♀, all immature (near **M40e**), 5.x.2020; ♂♂ (near **M40b**), 7.x.2020; ♀ (near **M40d**), 9.x.2020.

Orthetrum pruinoseum schneideri Förster, 1903

M14l — ♂, 18.x.2020. **M18e** — ♂, 21.vii.2010. **M18ia** — ♂♂, ♀, ♂+♀, 18.xii.2007; ♂, 8.x.2009. **M22c** — ♂♂, 12.x.2009. **M24b** — ♂♂, 12.xii.2007. **M27a** — ♂♂, 29.iii.2011. **M30dii** — ♂, 6.iv.2005. **M34d** — ♂♂, 27.ii.2020. **M27e** — ♂♂, 22.viii.2016. **M38a** — ♂♂, 22.ii.2020. **M38b** — ♂+♀, 20.ii.2020. **M39a** — ♂, 21.ii.2020. **M39f** — ♂, ♀, 23.ii.2020. **M39j** — ♂♂, near **M39b**, 18.ii.2020; ♂♂, near **M39e**, 24.ii.2020; ♂♂, near **M39e**, 25.ii.2020. **M40a** — ♂ (pool at side of stream), 4.x.2020. **M40i** — ♂, 9.x.2020. **M40m** — ♂ (near **M40e**), 5.x.2020. **P2a** — ♀, 21.iii.2006.

Orthetrum sabina (Drury, 1773)

L1a — ♂, 12.v.2005. **LB6** — ♂, 13.i.2015. **LB7** — ♂, 3.iv.2006. **M2** — ♀, 9.ii.2012. **M5** — ♂♂, 16.i.2015. **M7** — ♂♂, 12.i.2010. **M8** — ♂♂, 21.xi.2009; ♂, 30.xii.2009. **M9** — ♂♂, ♀, 11.ix.2011. **M10a** — ♂, 5.ix.2011. **M10c** — ♂, 6.ix.2011. **M10f** — ♂, 7.ix.2011. **M10i** — ♂♂, 9.ix.2011; ♂, ♀♀, 10.ix.2011. **M12a** — ♂, 17.vi.2015. **M12b** — ♀♀, 17.vi.2015. **M13c** — ♂♂, 3.ii.2010; ♂, 22.xi.2013. **M15b** — ♀♀, 21.xii.2007. **M26** — ♂, 16.xii.2007. **M27a** — ♂♂, 28.iii.2012; ♂♂, 30.iii.2012. **M27b** — ♂, 6.vii.2012. **M27e** — ♂, 22.viii.2016. **M30e** — ♀, 29.iii.2005. **M37b** — ♂, 29.ii.2020. **M39h** — ♂, 21.ii.2020. **M40e** — ♂♂, 5.x.2020. **M40gi** — ♂, 5.x.2020. **M40h** — ♀, 6.x.2020.

Orthetrum testaceum (Burmeister, 1839)

L13 — ♂, 12.v.2005. **LB7** — ♂, 3.iv.2006, GR. **M2** — ♂, 7.ii.2012; ♀, 8.ii.2012. **M4** — ♂♂, ♀, 5.xi.2010. **M5** — ♂, 16.i.2015. **M7** — ♂, 18.i.2010; ♀, 22.i.2010; ♂, ♀, 28.i.2010. **M10g** — ♂, 8.ix.2011. **M12b** — ♂, 17.vi.2015. **M13c** — ♂♂, 3.ii.2010; ♂, 5.ii.2010; ♀, 12.iii.2010; ♂, 7.ii.2015; ♂, 10.ii.2015. **M14kii** — ♂♂, 17.x.2020. **M14l** — ♂, 18.x.2020. **M14miii** — ♂, 17.x.2020. **M14miv** — ♂, 16.x.2020. **M14mvi** — ♂♂, 18.x.2020. **M18ei** — ♂, 20.vii.2010. **M18j** — ♂♂, 9.x.2009. **M18k** — ♂, 17.ii.2020. **M19a** — ♂♂, ♂+♀, 15.vii.2010. **M19b** — ♂, 19.vii.2010. **M26** — ♂, 16.xii.2007. **M27a** — ♂, ♀♀, 28.iii.2012; ♂♂, 29.iii.2012; ♂♂, 30.iii.2012. **M27b** — ♂♂, 6.vii.2012. **M27e** — ♂, 22.viii.2016. **M30e** — ♂♂, 30.iii.2005. **M34d** — ♂, 28.ii.2020. **M34e** — ♂♂, 26.ii.2020. **M38b** — ♂, 20.ii.2020. **M40e** — ♂, 5.x.2020.

Pantala flavescens (Fabricius, 1798)

M4 — ♂, ♀♀, 5.xi.2010. **M18j** — ♂, 9.x.2009. **M27d** — ♂, 24.viii.2016. **M30e** — ♂, 29.iii.2005. **M40m** — ♂♂ (near **M40d**), 9.x.2020.

Pornothemis serrata Krüger, 1902 complex

LB2 — ♀, 9.i.2015. **M10a** — ♂, 5.ix.2011. **M10e** — ♂♂, ♀, 8.ix.2011.

Pseudothemis jorina Förster, 1904

LB1c — ♂, 7.iv.2006. **LB2** — ♂♂, 9.i.2015. **M14mi** — ♂, 17.x.2020.

Rhodothemis rufa (Rambur, 1842)

L1a — ♂, 12.v.2005; ♂, 23.iv.2011. **L3** — ♂, 2.ii.2006. **LB1a** — ♂, 5.iv.2006. **LB9a** — ♂♂, 13.i.2015. **M3** — ♂♂, 7.v.2005. **M5** — ♂, 16.i.2015. **M6** — ♂, 8.iv.2005. **M10i** — ♀, 10.ix.2011. **M11** — ♂, 18.iv.2005. **M40e** — ♂, 5.x.2020.

Rhyothemis aterrima Selys, 1891

L13 – ♀, 12.v.2005. **LB1a** – ♂♂, 5.iv.2006. **LB1b** (at head of Hydrology Trail) – ♂, 4.iv.2006. **LB2** – ♂, 9.i.2015. **M6** – ♂♂, 8.iv.2005. **M10c** – ♂, 6.ix.2011. **M10h** – ♂, 9.ix.2011. **M10j** – ♂, 10.ix.2011. **M11** – ♂, 18.iv.2005. **M12a** – ♂, 17.vi.2015.

Rhyothemis fulgens Kirby, 1889

M10e – ♂, 8.ix.2011.

Rhyothemis obsolescens Kirby, 1889

L1b – ♂, 12.v.2005. **L3** – ♂, 12.v.2005. **L8** – ♂, 22.iv.2011. **M10c** – ♂♂, 6.ix.2011, RN. **M12b** – ♂, 17.vi.2015. **M14mv** – ♂, 18.x.2020. **M31bi** – ♂, 31.iii.2005; ♂, 7.iv.2012. **M40gi** – ♂♂, ♂+♀, 5.x.2020; ♂, 7.x.2020.

Rhyothemis phyllis (Sulzer, 1776)

L13 – ♀, 22.iv.2011. **LB1a** – ♂, 3.iv.2006. **M1** – ♂, 7.v.2005. **M2** – ♀, 9.ii.2012. **M3** – ♂, 7.v.2005. **M5** – ♀♀, 16.i.2015. **M6** – ♂, 8.iv.2005. **M7** – ♂, 28.i.2010. **M10a** – ♂, 5.ix.2011. **M10c** – ♀, 6.ix.2011. **M10h** – ♀, 9.ix.2011. **M10i** – ♂♂, 9.ix.2011. **M31aii** – ♂, 11.xi.2016. **M31biii** – ♂, 7.iv.2012.

Rhyothemis regia (Brauer, 1867)

M14miii – ♂♂, 17.x.2020. **M18k** – ♂, 17.ii.2020. **M40e** – ♂, 5.x.2020. **M40gi** – ♂♂, ♀, 5.x.2020; ♂, 7.x.2020.

Rhyothemis triangularis Kirby, 1889

L1a – ♂, 12.v.2005; ♂♂, 24.iv.2011. **LB9a** – ♂, ♀, 13.i.2015. **M3** – ♂, 7.v.2005. **M5** – ♂♂, ♀, 16.i.2015. **M11** – ♂, 18.iv.2005. **M12b** – ♂, 17.vi.2015. **M13c** – ♀, 3.ii.2010. **M14f** – ♀, 14.x.2020. **M14mi** – ♂, 17.x.2020. **M14miii** – ♂♂, 17.x.2020. **M14mv** – ♂, 18.x.2020. **M27a** – ♂, 29.iii.2012. **M27c** – ♂♂, 30.viii.2016. **M34e** – ♂♂, 26.ii.2020. **M37b** – ♂♂, 29.ii.2020. **M37d** – ♂, 19.ii.2020. **M38b** – ♂♂, 20.ii.2020. **M38d** – ♂♂, 20.ii.2020. **M40e** – ♂♂, 5.x.2020. **M40gi** – ♂♂, 5.x.2020. **M40k** – ♂, 9.x.2020.

Risiphlebia dohrni (Krüger, 1902)

LB5 – ♀, 10.i.2015. **M10e** – ♂, 8.ix.2011. **M10g** – ♀, 8.ix.2011. **M11** – ♂, 18.iv.2005.

Tetrathemis hyalina Kirby, 1889

L1b – ♂, 12.v.2005; ♂♂, 24.iv.2011. **L4a** – ♂, 23.viii.2008; ♂, 24.iv.2011. **L11** – ♂, 3.ii.2006. **LB1b** – ♂, 5.iv.2006. **LB4** – ♂♂, 11.i.2015. **LB9a** – ♂♂, 13.i.2015. **M2** – ♂, 7.ii.2012. **M4** – ♂, 5.xi.2010. **M10a** – ♂, 5.ix.2011. **M11** – ♂♂, 18.iv.2005. **M14f** – ♂ (lower, muddy part), 14.x.2020. **M14mi** – ♂♂, 17.x.2020. **M14mii** – ♂, ♀, 17.x.2020. **M27c** – ♂, 30.viii.2016. **M38b** – ♂, 20.ii.2020. **M40a** – ♂ (shady pool at side of stream), 4.x.2020. **M40j** – ♂, 8.x.2020.

Tetrathemis sp. cf. *platyptera* Selys, 1878

M27a – ♂♂, ♀, 28.iii.2012. **M27e** – ♂, 27.viii.2016. **M28d** – ♀, 16.viii.2017.

Tholymis tillarga (Fabricius, 1798)

LB1a – ♂, 3.iv.2006. **LB8** – ♂, 8.i.2015. **M1** – ♂, 7.v.2005. **M8** – ♀, 22.xi.2009; ♀, 30.xii.2009.

Tramea phaeoneura Lieftinck, 1953

M30h – ♂, 16.iii.2006.

Tramea transmarina euryale Selys, 1878

L1a – ♀, ♂+♀, 23.iv.2011. **M5** – ♂♂, 16.i.2015. **M14miii** – ♂, ♂+♀, 17.x.2020. **M26** – ♂, 16.xii.2007. **M27c** – ♂, 30.viii.2016. **M30h** – ♂, 16.iii.2006. **M37b** – ♂♂, 29.ii.2020. **M39i** – ♂, 23.ii.2020. **M40f** – ♂, 5.x.2020. **M40gi** – ♂, ♀, ♂♂+♀♀, 5.x.2020.

Tramea sp. cf. *virginia* (Rambur, 1842)

M37b – ♂, ♀, 29.ii.2020. **M40gi** – ♂+♀, 5.x.2020.

Trithemis aurora (Burmeister, 1839)

M5 – ♂, 16.i.2015. **M12a** – ♂, 17.vi.2015. **M13c** – ♂, 3.ii.2010. **M14mi** – ♂♂, 17.x.2020. **M14mii** – ♂, 17.x.2020. **M14miii** – ♂, 17.x.2020. **M17** – ♀, 11.xii.2007. **M18ai** – ♀, 18.xii.2007. **M18bi** – ♂, 6.x.2009. **M18ei** – ♂, 20.vii.2010; ♀, 21.vii.2010. **M18k** – ♂, 17.ii.2020. **M27e** – ♂, 22.viii.2016. **M30e** – ♂, 29.iii.2005. **M31aii** – ♂, 21.iii.2006. **M34e** – ♂♂, ♀, 26.ii.2020. **M38b** – ♂, 20.ii.2020. **M38c** – ♂♂, 20.i.2020. **M39g** – ♂, 23.ii.2020. **M40f** – ♂, 5.x.2020.

Trithemis festiva (Rambur, 1842)

M13a – ♂, 7.ii.2015; ♀, 9.ii.2015; ♂, 10.ii.2015. **M14mvi** – ♂, 17.x.2020. **M15b** – ♂, 21.xii.2007. **M18ai** – ♂♂, ♀♀, 18.xii.2007. **M18ci** – ♂, 14.vii.2010. **M18ei** – ♀, 20.vii.2010. **M18k** – ♂, 17.ii.2020. **M19a** – ♂♂, 15.vii.2010. **M19b** – ♂♂, 19.vii.2010, WK. **M27a** – ♂, 30.iii.2012. **M27e** – ♂, 22.viii.2016. **M34a** – ♂♂, 26.ii.2020. **M35** – ♂, 22.ii.2020. **M39a** – ♂, 21.ii.2020. **M39f** – ♂, 23.ii.2020. **M39j** – ♂♂, near **M39b**, 18.ii.2020; ♂, near **M39e**, 24.ii.2020. **M40a** – ♂, 4.x.2020. **M40c** – ♂, 8.x.2020.

Tyriobapta kuekenthali (Karsch, 1900)

LB1b – ♂, 5.iv.2006. **LB5** – ♂♂, 4.iv.2006; ♂♂, 8.i.2015; ♂, 10.i.2015. **M6** – ♂, 8.iv.2005. **M10e** – ♂♂, 7.ix.2011; ♂, 8.ix.2011; ♂, 9.ix.2011. **M10j** – ♂, 10.ix.2011.

Tyriobapta laidlawi Ris, 1919

L4a – ♂♂, 13.v.2005; ♂♂, ♀, 31.i.2006, RD; ♂, 21.iv.2011; ♂, 24.iv.2011. **L12a** – ♂, 16.vii.2012.

Tyriobapta torrida Kirby, 1889

L4a – ♂♂, 14.v.2005; ♂♂, 21.iv.2011; ♂♂, 24.iv.2011. **L8** – ♀, 22.iv.2011. **L12a** – ♂, 16.vii.2012. **LB2** – ♂, 7.iv.2006. **LB6** – ♀, 6.iv.2006. **LB9a** – ♂, 13.i.2015. **M2** – ♀, 9.v.2005. **M4** – ♂♂, 5.xi.2010. **M10c** – ♂♂, ♀, 6.ix.2011. **M10e** – ♂♂, ♀♀, 7.ix.2011. **M10j** – ♂♂, 10.ix.2011. **M11** – ♂, 18.iv.2005. **M12b** – ♀, 17.v.2015. **M14e** – ♂, ♀, 4.vi.2019. **M14f** – ♂, 5.vi.2019. **M14ki** – ♂ (stagnant pool near stream), 16.x.2020. **M14mi** – ♂, 17.x.2020. **M27e** – ♂, 25.viii.2016. **M30g** – ♂, 6.iv.2012. **M30ai** – ♂, 16.iii.2006. **M34e** – ♂, 26.ii.2020. **M38b** – ♂, 20.ii.2020. **M38d** – ♂♂, 20.ii.2020. **M39f** – ♂, 23.ii.2020. **M40h** – ♂, 6.x.2020. **M40j** – ♂, 8.x.2020. **M40l** – ♂, 9.x.2020.

Urothemis signata insignata (Selys, 1872)

L1a – ♂, 12.v.2005; ♂, 24.iv.2011. **LB9a** – ♂, 13.i.2015. **M3** – ♂, 7.v.2005. **M5** – ♂, 16.i.2015. **M11** – ♂, 18.iv.2005. **M12b** – ♂, 17.vi.2015. **M14mi** – ♂, 17.x.2020. **M14miii** – ♂♂, 17.x.2020. **M14mv** – ♂, 18.x.2020. **M40e** – ♂ (immature), 5.x.2020. **M40gi** – ♂♂, 5.x.2020.

Zygonyx ida errans Lieftinck, 1953

M14f – ♂, 5.vi.2019. **M14ki** – ♀, 16.x.2020. **M27e** – ♂♂, 22.viii.2016. **M281** – ♂, 22.viii.2017.

Zyxomma obtusum Albarda, 1881

M36 – ♀, 22.ii.2020.

Zyxomma petiolatum Rambur, 1842

LB8 – ♀, 4.iv.2006; ♂, 7.iv.2006; ♀, 9.i.2015; ♀, 12.i.2015. **M10I** – ♀ (at lights at café), 4.ix.2011. **M14a** – ♀, 25.xii.2017. **M14i** – ♀ (at lights), 6.vi.2019; ♀ (at lights), 18.x.2020. **M32b** – ♂, 31.iii.2005. **M36** – ♀, 21.ii.2020. **M37c** – ♂ (at lights in longhouse), 18.vii.2014. **M40n** – ♀ (at lights in house in evening), 7.x.2020.

Additional Records

Zygoptera

Platystictidae

Protosticta sp.

A single female collected at a small steep stream, apart from size and wing venation it closely resembles the female of *D. attala*. Although the wing venation could be a result of small size, the size itself, and the habitat in which it was found, argues against this merely being an unusually small individual of *D. attala*.

M15a – ♀, 22.xii.2007.

Chlorocyphidae

Larvae collected at M28 with a field identification as *Libellago* sp., however the larvae of *Rhinocypha spinifer*, which belongs to a distinct group, different from such species as *R. aurofulgens*, has not been described and possibly these records refer to that species.

Devadattidae

Devadatta sp.

M40c – ♂ ♂, 8.x.2020. **M40d** – ♂ ♂, 9.x.2020, RD.

Euphaeidae

Dysphaea sp.

M28 – Larval records.

Euphaea sp.

M28 – Larval records.

Anisoptera

Aeshnidae

Anax sp.

L1a – larva, iv.2011.

Gynacantha sp.

L8 – ♀, 22.iv.2011.

Heliaeschna sp. or spp.

Females of *H. crassa* and/or *H. idae*.

L13 – ♀, 1.ii.2006; ♀, 2.ii.2006. **LB8** – ♀, 4.iv.2006; ♀ ♀, 7.iv.2006. **M37c** – ♀ (at lights in longhouse), 21.iii.2013.

Oligoaeschna sp.

Possibly *O. folicea*.

M6 – ♀, 8.iv.2005.

Tetracanthagyna sp.

M2 – larvae, 6-10.ii.2012.

Gomphidae

Ictinogomphus sp.

M28 – larval records.

Heliogomphus sp.

L4a – larva, iv.2011. **M34c** – ♀ (teneral), 28.ii.2020.

Leptogomphus sp.

A female specimen originally identified by the first author as *L. pasia* but no longer in his possession so that the identification cannot be confirmed.

M30bii – ♀, 15.iii.2006.

Macrogomphus sp.

M2 – larvae, 6-10.ii.2012.

Microgomphus sp.

L4a – larva, iv.2011.

Macromiidae

Macromia sp.

M2 – larvae, 6-10.ii.2012. **M28** – larval records.

Synthemistidae

Idionyx sp.

L4a – larva, iv.2011. **M2** – larvae, 6-10.ii.2012. **M30bi** – ♀, 16.iii.2006.

Libellulidae

Neurothemis sp.

M28 – larval records.

Orthetrum sp.

M28 – larval records.

Appendix 2: Checklists

Lambir Hills National Park

A checklist from Lambir Hills National Park was included in Dow & Reels (2010) but a number of taxonomic changes have occurred since that list was published and additional sampling took place in 2011. Where the name in the list below differs from that used in Dow & Reels (2010) a note is given.

Zygoptera

Lestidae

1. *Lestes praemorsus decipiens* Kirby, 1894

Platystictidae

2. *Drepanosticta* sp. cf *dentifera* Kimmins, 1936
3. *Drepanosticta* sp. cf *forficula* Kimmins, 1936
4. *Drepanosticta rufostigma* (Selys, 1886)
5. *Drepanosticta versicolor* (Laidlaw, 1913)
6. *Telosticta dayak* Dow & Orr, 2012 [listed as *Protosticta* sp. cf *feronia* B Lieftinck, 1933 in Dow & Reels (2010).]

Argiolestidae

7. *Podolestes orientalis* Selys, 1862

Calopterygidae

8. *Vestalis amabilis* Lieftinck, 1965

Chlorocyphidae

9. *Libellago aurantiaca* (Selys, 1859)
10. *Libellago hyalina* (Selys, 1859)

Devadattidae

11. *Devadatta clavicauda* Dow, Hämäläinen & Stokvis 2015 [listed as *D. podolestoides* Laidlaw, 1934 in Dow & Reels (2010).]

Euphaeidae

12. *Euphaea ameeke* van Tol & Norma-Rashid, 1995

Philosinidae

13. *Rhinagrion borneense* (Selys, 1886)

Incertae sedis

14. *Bornargiolestes fuscus* Dow, 2014 [listed as *Bornargiolestes* species in Dow & Reels (2010).]

Platycnemididae

15. *Coelliccia* sp. cf *nemicola* Laidlaw, 1912
16. *Coelliccia nigrohamata* Laidlaw, 1918
17. *Coelliccia roberti* Dow, 2020 [listed as *Coelliccia* new species in Dow & Reels (2010).]
18. *Copera vittata* (Selys, 1863)

19. *Onychargia atrocyana* Selys, 1865
 20. *Prodasineura collaris* (Selys, 1860)
 21. *Prodasineura* sp. cf *peramoena* (Laidlaw, 1913)
 22. *Prodasineura verticalis* (Selys, 1860)
- Coenagrionidae
23. *Aciagrion borneense* Ris, 1911
 24. *Agriocnemis femina* (Brauer, 1868)
 25. *Amphicnemis* sp. cf *wallacii* Selys, 1863 [listed as *Amphicnemis* species in Dow & Reels (2010).]
 26. *Archibasis tenella* Lieftinck, 1949
 27. *Argiocnemis rubescens rubeola* Selys, 1877
 28. *Ceriagrion cerinorubellum* (Brauer, 1865)
 29. *Ischnura senegalensis* (Rambur, 1842)
 30. *Pseudagrion lalakense* Orr & van Tol, 2001
 31. *Pseudagrion microcephalum* (Rambur, 1842)
 32. *Stenagrion dubium* (Laidlaw, 1912)
 33. *Teinobasis rajah* Laidlaw, 1912
 34. *Xiphiagrion cyanomelas* Selys, 1876

Anisoptera

Aeshnidae

35. *Anax* species [A. *guttatus* was listed in Dow & Reels (2010) based on a sight record but this record could also refer to *A. panybeus*]
36. *Gynacantha dohrni* Krüger, 1899
37. *Gynacantha* sp.
38. *Heliaeschna idae* (Brauer, 1865)
39. *Heliaeschna simplicia* (Karsch, 1891)
40. *Oligoaeschna* sp. [a photographic record of a female made by RD in 2004]
41. *Tetracanthagyna plagiata* (Waterhouse, 1877) [A photographic record made by Hans Ehmann in May 2015]

Gomphidae

42. *Acrogomphus* species cf *jubilare* Lieftinck, 1964
43. *Heliogomphus* sp.
44. *Ictinogomphus decoratus melaenops* (Selys, 1858)
45. *Leptogomphus coomansi* Laidlaw, 1936
46. *Macrogomphus quadratus* Selys, 1878

47. *Megalogomphus* sp.

48. *Microgomphus* sp.

Macromiidae

49. *Epophthalmia vittigera* (Rambur, 1842)

50. *Macromia cincta* Rambur, 1842

Synthemistidae

51. *Idionyx* sp.

52. *Macromidia fulva* Laidlaw, 1915

Libellulidae

53. *Acisoma panorpoides* Rambur, 1842

54. *Aethriamanta gracilis* (Brauer, 1878)

55. *Agrionoptera insignis* (Rambur, 1842)

56. *Brachydiplax chalybea* Brauer, 1868

57. *Brachydiplax farinosa* Krüger, 1902 B

58. *Diplacodes trivialis*

59. *Cratilla metallica* (Brauer, 1878)

60. *Hydrobasileus croceus* (Brauer, 1867)

61. *Lyriothemis biappendiculata* (Selys, 1878)

62. *Lyriothemis cleis* Brauer, 1868

63. *Nannophya pygmaea* Rambur, 1842

64. *Neurothemis fluctuans* (Fabricius, 1793)

65. *Neurothemis ramburii* (Brauer, 1866)

66. *Neurothemis terminata* Ris, 1911

67. *Onychothemis coccinea* Lieftinck, 1953

68. *Orchithemis pulcherrima* Brauer, 1878

69. *Orthetrum chrysis* (Selys, 1891)

70. *Orthetrum glaucum* (Brauer, 1865)

71. *Orthetrum sabina* (Drury, 1773)

72. *Orthetrum testaceum* (Burmeister, 1839)

73. *Pantala flavescens* (Fabricius, 1798)

74. *Rhodothemis rufa* (Rambur, 1842)

75. *Rhyothemis aterrima* Selys, 1891

76. *Rhyothemis obsolescens* Kirby, 1889

77. *Rhyothemis phyllis* (Sulzer, 1776)

78. *Rhyothemis triangularis* Kirby, 1889
79. *Tetrathemis hyalina* Kirby, 1889
80. *Tholymis tillarga* (Fabricius, 1798)
81. *Tamea transmarina euryale* Selys, 1878
82. *Tyriobapta laidlawi* Ris, 1919 [listed as *Tyriobapta kuekenthali* (Karsch, 1900) in Dow & Reels (2010), see Dow & Orr (2021).]
83. *Tyriobapta torrida* Kirby, 1889
84. *Urothemis signata insignata* (Selys, 1872)
85. *Zyxomma petiolatum* Rambur, 1842

Loagan Bunut National Park

Zygoptera

Platystictidae

1. *Drepanosticta versicolor* (Laidlaw, 1913)

Argiolestidae

2. *Podolestes harrissoni* Lieftinck, 1953
3. *Podolestes orientalis* Selys, 1862

Chlorocyphidae

4. *Libellago hyalina* (Selys, 1859)
5. *Libellago semiopaca* (Selys, 1873)

Platycnemididae

6. *Coeliccia kenyah* Dow, 2010
7. *Coeliccia nigrohamata* Laidlaw, 1918
8. *Copera vittata* (Selys, 1863)

Coenagrionidae

9. *Agriocnemis femina* (Brauer, 1868)
10. *Amphicnemis annae* Lieftinck, 1940
11. *Amphicnemis* sp. *martini*-group
12. *Amphicnemis* sp. *wallacii*-group
13. *Archibasis incisura* Lieftinck, 1949
14. *Archibasis melanocyana* (Selys, 1877)
15. *Archibasis viola* Lieftinck, 1949
16. *Ceriagrion cerinorubellum* (Brauer, 1865)
17. *Mortonagrion indraneil* Dow, 2011
18. *Pseudagrion lalakense* Orr & van Tol, 2001

19. *Pseudagrion microcephalum* (Rambur, 1842)
20. *Teinobasis cryptica* Dow, 2010
21. *Teinobasis rajah* Laidlaw, 1912
22. *Xiphiagrion cyanomelas* Selys, 1876

Anisoptera

Aeshnidae

23. *Gynacantha basiguttata* Selys, 1882
24. *Gynacantha dohrni* Krüger, 1899
25. *Gynacantha* sp.
26. *Heliaeschna crassa* Krüger, 1899
27. *Heliaeschna simplicia* (Karsch, 1891)
28. *Heliaeschna uninervulata* Martin, 1909
29. *Oligoaeschna foliacea* Lieftinck, 1968
30. *Oligoaeschna* sp.

Gomphidae

31. *Ictinogomphus acutus* (Laidlaw, 1914)
32. *Ictinogomphus decoratus melaenops* (Selys, 1858)

Macromiidae

33. *Epopththalmia vittigera* (Rambur, 1842)

Libellulidae

34. *Aethriamanta gracilis* (Brauer, 1878)
35. *Brachydiplax chalybea* Brauer, 1868
36. *Brachygonia oculata* (Brauer, 1878)
37. *Chalybeothemis pruinosa* Dow, Choong & Orr, 2007
38. *Lathrecista asiatica* (Fabricius, 1798)
39. *Nannophya pygmaea* Rambur, 1842
40. *Nesoxenia lineata* (Selys, 1879)
41. *Neurothemis fluctuans* (Fabricius, 1793)
42. *Neurothemis ramburii* (Brauer, 1866)
43. *Neurothemis terminata* Ris, 1911
44. *Onychothemis culminicola* Förster, 1904
45. *Orthetrum chrysis* (Selys, 1891)
46. *Orthetrum glaucum* (Brauer, 1865)
47. *Orthetrum sabina* (Drury, 1773)

48. *Orthetrum testaceum* (Burmeister, 1839)
49. *Pornothemis serrata* Krüger, 1902 complex
50. *Pseudothemis jorina* Förster, 1904
51. *Rhodothemis rufa* (Rambur, 1842)
52. *Rhyothemis aterrima* Selys, 1891
53. *Rhyothemis phyllis* (Sulzer, 1776)
54. *Rhyothemis triangularis* Kirby, 1889
55. *Risioephlebia dohrni* (Krüger, 1902)
56. *Tetrathemis hyalina* Kirby, 1889
57. *Tholymis tillarga* (Fabricius, 1798)
58. *Tyriobapta kuekenthami* (Karsch, 1900)
59. *Tyriobapta torrida* Kirby, 1889
60. *Urothemis signata insignata* (Selys, 1872)
61. *Zyxomma petiolatum* Rambur, 1842

Niah National Park

Zygoptera

Lestidae

1. *Orolestes wallacei* (Kirby, 1889)

Argiolestidae

2. *Podolestes orientalis* Selys, 1862

Calopterygidae

3. *Vestalis amaryllis* Lieftinck, 1965
4. *Vestalis amoena* Hagen in Selys, 1853

Chlorocyphidae

5. *Heliocypha biseriata* (Selys, 1859)
6. *Libellago hyalina* (Selys, 1859)
7. *Libellago semiopaca* (Selys, 1873)

Euphaeidae

8. *Euphaea impar* Selys, 1859

Platycnemididae

9. *Copera vittata* (Selys, 1863)
10. *Onychargia atrocyana* Selys, 1865
11. *Prodasineura collaris* (Selys, 1860)
12. *Prodasineura hyperythra* (Selys, 1886)

13. *Prodasineura verticalis* (Selys, 1860)

Coenagrionidae

14. *Amphicnemis* sp. *wallacii*-group
15. *Archibasis viola* Lieftinck, 1949
16. *Pseudagrion microcephalum* (Rambur, 1842)
17. *Teinobasis rajah* Laidlaw, 1912

Anisoptera

Aeshnidae

18. *Heliaeschna simplicia* (Karsch, 1891)
19. *Heliaeschna uninervulata* Martin, 1909
20. *Oligoaeschna foliacea* Lieftinck, 1968
21. *Tetracanthagyna* sp.

Gomphidae

22. *Ictinogomphus decoratus melaenops* (Selys, 1858)
23. *Macrogomphus* sp.

Macromiidae

24. *Epophthalmia vittigera* (Rambur, 1842)
25. *Macromia* sp.

Synthemistidae

26. *Idionyx* sp.

Libellulidae

27. *Agrionoptera insignis* (Rambur, 1842)
28. *Brachygonia oculata* (Brauer, 1878)
29. *Cratilla metallica* (Brauer, 1878)
30. *Hydrobasileus croceus* (Brauer, 1867)
31. *Lyriothemis cleis* Brauer, 1868
32. *Nesoxenia lineata* (Selys, 1879)
33. *Neurothemis fluctuans* (Fabricius, 1793)
34. *Neurothemis ramburii* (Brauer, 1866)
35. *Neurothemis terminata* Ris, 1911
36. *Orchithemis pulcherrima* Brauer, 1878
37. *Orthetrum sabina* (Drury, 1773)
38. *Orthetrum testaceum* (Burmeister, 1839)
39. *Rhyothemis phyllis* (Sulzer, 1776)
40. *Tetrathemis hyalina* Kirby, 1889

41. *Tyriobapta torrida* Kirby, 1889

Pulong Tau National Park

The checklist below includes records from Grinang & Nyanti (2007), in some cases with some updates to the identifications. The sample reported in Grinang & Nyanti (2007), which also includes areas outside of the national park boundary, covers many more locations in the park than are reported here, including locations at a lower elevation.

Zygoptera

Platystictidae

1. *Protosticta joepani* Dow, Phan & Choong, 2020
2. *Telosticta ulubaram* Dow & Orr, 2012?

Calopterygidae

3. *Matronoides cyaneipennis* Förster, 1897
4. *Vestalis amnicola* Lieftinck, 1965
5. *Vestalis atrophia* Lieftinck, 1965

Chlorocyphidae

6. *Heliocypha biseriata* (Selys, 1859)
7. *Rhinocypha spinifer* Laidlaw, 1931
8. *Rhinoneura caerulea* Kimmins, 1936

Devadattidae

9. *Devadatta aran* Dow, Hämäläinen & Stokvis, 2015

Euphaeidae

10. *Dysphaea ulu* Hämäläinen, Dow & Stokvis, 2015
11. *Euphaea basalis* (Laidlaw, 1915)
12. *Euphaea impar* Selys, 1859
13. *Euphaea subnodalis* (Laidlaw, 1915)

Platycnemididae

14. *Coeliccia nemoricola* Laidlaw, 1912
15. *Prodasineura verticalis* (Selys, 1860)

Coenagrionidae

16. *Ceriagrion cerinorubellum* (Brauer, 1865)
17. *Stenagrion dubium* (Laidlaw, 1912)

Anisoptera

Aeshnidae

18. *Gynacantha dohrni* Krüger, 1899
19. *Tetracanthagyna degorsi* Martin, 1896

Gomphidae

- 20. *Acrogomphus* sp. cf. *jubilare* Lieftinck, 1964
- 21. *Burmagomphus insularis* Laidlaw, 1914
- 22. *Ictinogomphus decoratus melaenops* (Selys, 1858)
- 23. *Leptogomphus pasia* van Tol, 1990
- 24. *Leptogomphus* sp.
- 25. *Macrogomphus* sp.
- 26. *Sieboldius japonicus* (Selys, 1854)

Chlorogomphidae

- 27. *Chlorogomphus* sp.

Macromiidae

- 28. *Macromia westwoodii* Selys, 1874
- 29. *Macromia* sp.

Synthemistidae

- 30. *Macromidia fulva* Laidlaw, 1915

Libellulidae

- 31. *Cratilla metallica* (Brauer, 1878)
- 32. *Hylaeothemis clementia* Ris, 1909
- 33. *Orthetrum chrysis* (Selys, 1891)
- 34. *Orthetrum pruinosum schneideri* Förster, 1903
- 35. *Tyriobapta torrida* Kirby, 1889

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