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Previously unpublished Odonata records from Sarawak, Borneo, part IX: More Odonata from Limbang Division, including the first records from Gunung Buda National Park

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Abstract

Records of Odonata made in Limbang Division in Sarawak during three surveys in 2021-2022 made possible by funding from the International Dragonfly Fund are reported. All locations surveyed are within Limbang District and are grouped into two categories: locations surveyed on day trips from Limbang Town and locations in the Sungai Mendalam area further inland. All locations are in the lowlands of the division. The lowlands of Limbang Division had not been well studied for Odonata and the results presented here include 50 first records for Limbang Division, bring the total number of species known from the division to 173. In fact slightly more species were recorded during the 2021-2022 surveys than had been recorded from the division prior to 2021. Three of the new additions for Limbang are also first records for Sarawak (*Libellago phaethon*, *Rhinocypha humeralis* and *Oligoaeschna platyura*). The discovery of a large population of *Macrogomphus phalantus* not far from Limbang town is another significant result of the 2021-2022 surveys and is discussed in some detail. Other notable records include *Dysphaea lugens*, *Coelliccia kenyah*, the black form of *Copera vittata*, *Argiocnemis rubescens rubeola*, *Teinobasis cryptica*, *Macrogomphus* sp., *Chlorogomphus* sp., the true *Pornothemis serrata* and *Pornothemis starrei*. This report includes the first records of Odonata from Gunung Buda NP (a checklist is given in the appendix), where 76 species have been found so far.

Key words: Odonata, Sarawak, Limbang, new records, *Libellago phaethon*, *Rhinocypha humeralis*, *Oligoaeschna platyura*, *Macrogomphus phalantus*.

Introduction

Recently Dow & Choong (2021) reported on the Odonata of two upland and mountainous areas in Limbang Division, the most northern of Sarawak's administrative divisions. Following the publication of Dow & Choong (2021) additional funding was made available through the International Dragonfly Fund for further surveys in Limbang Division. Here the results of three surveys, made in November 2021, April 2022 and June/July 2022,

are presented. In contrast to Dow & Choong (2021) the recent surveys have concentrated on lowland areas, in the vicinity of Limbang Town and also in the Sungai Mendalam area including Gunung Buda National Park (NP); all of these locations are within Limbang District.

Limbang Town is situated on the banks of the Limbang River, approximately 6 km from the coast, in a relatively narrow strip of Sarawak sandwiched between the two sections of Brunei. Many of the locations reported on from this area here are very close to the border with Brunei (so much so that RD's phone frequently tried to switch to international roaming during the surveys). Sungai Mendalam is a substantial tributary of the Limbang River (but see below), situated further to the south and inland of Limbang town, but also close to the Brunei border. This area is also very close to the northern (least sampled) part of Gunung Mulu NP. Sungai Mendalam flows past the Melaban longhouse, an Iban community where RD stayed twice in 2022, and through Gunung Buda NP. Gunung Buda NP was gazetted in the year 2000 and covers 62.35 km² with an extension of 50.72 km² gazetted in 2011. A checklist of the Odonata known from Gunung Buda NP is provided in an appendix to this report.

Dow & Choong (2021) gave a brief summary of the odonatological knowledge of Limbang Division which there is little point in repeating here, except to remark that both Hincks (1930) and Cowley (1937) include material collected by H.W. Smith in the ulu Madalam area. Sungai Madalam (or Medalam) appears to be an alternative or slightly altered (older?) name for Sungai Mendalam, so that it is possible that Hincks' collecting sites were close to some of the locations reported on here, conceivably even within Gunung Buda NP. It is worth remarking here that Google Maps (accessed 10th August 2022) currently shows the location (and size) of Gunung Buda NP incorrectly. It is also worth remarking that the name that should be applied to the Limbang River in its upper parts is also a source of confusion. GoogleEarth labels the river that Sungai Mendalam flows into as Sungai Salidong upstream of the confluence and as Sungai Mendalam downstream of the confluence (even though Sungai Mendalam, as we understand it, is clearly a tributary of the larger river) and nowhere labels the larger river as Sungai Limbang or the Limbang River. However in the Limbang Town area the same river is called the Limbang River and in our opinion is that Sungai Mendalam ends at its confluence with the larger river, which is still the Limbang River at this point. Sungai Salidong begins further upstream and either refers to a major tributary of the Limbang River or the entire river in its upper part.

During the first survey all collecting was carried out by RD. During the second and third surveys RD's brother-in-law Mering Anyie acted as a field assistant and, in the Sungai Mendalam area, Ranggau anak Muntai, our host at the Melaban longhouse, also acted as a field assistant as well as providing boat and road transport and acting as a guide. Unfortunately during the June/July 2022 survey a nasty flu virus was plaguing the Melaban longhouse and RD promptly caught this virus and could only take part in fieldwork for the first three days. Despite the best efforts of Mering and Ranggau, RD's absence from the field undoubtedly reduced the effectiveness of the survey, this is particularly clear from the complete absence of some Zygopteran groups (for instance Platystictidae) in the results of the June/July survey, which was made entirely in the Sungai Mendalam area.

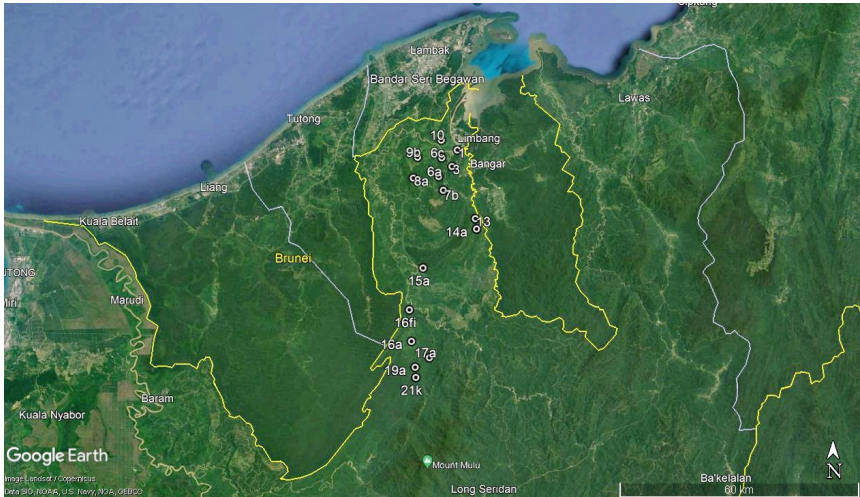


Figure 1: Overview of locations surveyed for Odonata in Limbang Division 2021-2022.

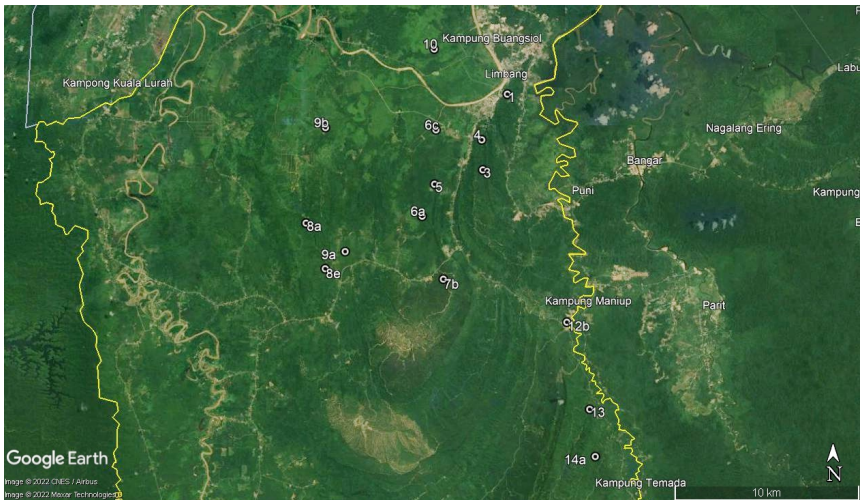


Figure 2: Locations surveyed on day trips from Limbang Town in November 2021 and April 2022.

Locations

Fig. 1 shows an overview of the locations in Limbang Division surveyed in 2021-2022.

Locations surveyed on day trips from Limbang Town

Some more details of these locations are shown in Fig. 2.

1. Bukit Sembeling Nature Reserve (all specimens from the stream running past the security post, representative coordinates 4.7453N, 115.0089E, ca. 40-180m a.s.l.).
 - a. Mostly high gradient section on a steep hillside.
 - b. Low gradient, sediment bottomed section just inside forest before confluence with Tasik Mas.
2. Tasik Mas, a large pond or small lake immediately below Bukit Sembeling Nature Reserve (4.7459N, 115.0071E, ca. 40m a.s.l.)
3. Bukit Hitam Nature Reserve (Fig. 3):
 - a. Sungai Poyan within the nature reserve, and its major, right (going upstream) branch, sampled from 4.7175N, 114.9963E to 4.7083N, 114.9969E, ca. 50-80m a.s.l.

Figure 3: A section of the upper part of Sungai Poyan in Bukit Hitam Nature Reserve (location 3a).



- b. Smaller tributaries to Sungai Poyan within the nature reserve.
 - c. In forest around path.
4. Outside Bukit Hitam Nature Reserve:
 - a. Sungai Poyan sampled from the boundary of the nature reserve downstream to 4.723N, 114.9964E, ca. 38-50m a.s.l.
 - b. Tributaries to Sungai Poyan.
 - c. A small swampy area at the head of a small tributary to Sungai Poyan.
 - d. A ditch by the road.
5. Rubbish dump area near Limbang Town:
 - a. Black water swamp forest (4.7014N, 114.9732E, ca. 17m a.s.l.) This site was visited several times, but always relatively late in the day just before rain started. It is actually a very promising looking site for low pH swamp forest specialist species and needs further work earlier in the day during good conditions (Fig. 4).
 - b. Drain between road and swamp (4.7019N, 114.9731E, ca. 17m a.s.l.)



Figure 4: Swamp forest at location 5a.

6. Sungai Berawan:

a. Sungai Berawan, a large tributary of the Limbang River, sampled from its mouth (4.7398N, 114.9785E, ca. 15m a.s.l.) to 4.6857N, 114.9671E, ca. 19m a.s.l. Near its mouth Sungai Berawan is wide and open, and only narrows slowly; over the entire part sampled the water appeared almost without flow on each of our visits.

b. Swamp forest accessed from Sungai Berawan at three points:

- i.** 4.7055N, 114.9607E, ca. 15m a.s.l.
- ii.** 4.7181N, 114.9609E, ca. 19m a.s.l.
- iii.** 4.7219N, 114.9639E, ca. 17m a.s.l.

c. Sungai Mengadap, a substantial tributary of Sungai Berawan, only sampled near the bridge at 4.728N, 114.9739E in November 2021 since it was not possible to take the boat upstream of the bridge. In April 2022 we were able to take the boat some way upstream of the bridge, but the channel rapidly became too narrow and obstacle filled for a boat of the size that we were using.

d. Sungai Bangkuati, another substantial tributary, only sampled briefly near its confluence with Sungai Berawan (4.6806N, 114.9713E, ca. 14m a.s.l.) since it was not possible to take the boat further without major work to clear the channel of obstacles.

7. Sungai Bakol area:

a. Sungai Bakol (only visited briefly in the afternoon on one day in November 2021 as rain began), 4.6534N, 114.9628E, ca. 24m a.s.l. This is a popular picnic spot for the local community, at the access point the stream runs over sheets of rock but upstream it flows through a deep, winding channel and looks difficult to sample affectively.

b. A stream system in logged kerangas forest near Sungai Bakol (upstream of the road), representative coordinates 4.6549N, 114.9775E, ca. 85-130m a.s.l.

8. Sites on the road running past Sungai Labuan:

a. Sungai Labuan, sampled from 4.6762N, 114.9126E to 4.6823N, 114.91E, ca. 34-45m

a.s.l. This stream runs through small farms and second growth forest of various ages, with some possibly old growth forest in small pockets and also further away from the stream on one side.

b. Large, relatively high gradient tributary with many boulders (representative coordinates 4.6803N, 114.9098E, ca 45-80m a.s.l.).

c. Small tributaries to Sungai Labuan.

d. Small ponds in second growth forest near to Sungai Labuan and a tiny muddy, semi-open seepage nearby.

e. Ponds in second growth forest beside road at 4.66N, 114.9194E, ca. 29m a.s.l.

f. Another pond, further from the road, in second growth forest and trailside near this, only sampled late in the day as weather conditions deteriorated, coordinates not recorded.

g. Open marsh beside wet rice fields near road (4.6547N, 114.9246E, ca. 16m a.s.l.)

h. Second growth alluvial forest, partly flooded at time of sampling, beside 8f.

i. Drains and small, semi-shaded trickles beside the road in the area of 8a.

9. Sungai Lubai, another large tributary of the Limbang River:

a. Mainstream, sampled from its confluence with the Limbang River (4.7488N, 114.9683E, ca. 11m a.s.l.) to 4.6684N, 114.9292E, ca. 16m a.s.l. The downstream part of this stream appears very similar to Sungai Berawan but upstream a strong current is obvious (Fig. 5).

b. Sungai Pundut, a slow flowing tributary, almost stagnant in its upper parts where the forest canopy is almost closed, sampled from its confluence with Sungai Lubai (4.7299N, 114.9379E, ca. 13m a.s.l.) to 4.7291N, 114.9195E, ca. 17m a.s.l. (note that the altitude upstream is from a GPS reading, Google Earth gives the altitude here as 5m a.s.l., which is obviously incorrect).

c. Swamp forest around Sungai Lubai, sampled at two points: (i) a very tangled and hard to access area upstream with many pools (4.6683N, 114.9303E, ca. 18m a.s.l.); (ii) an area with a small muddy stream and trails made by local people taking timber (4.6854N, 114.9274E, ca. 17-20m a.s.l.).

10. Sungai Buang Alang, a nipa palm lined stream with low pH swamp



Figure 5: Upper part of Sungai Lubai (location 9a).

forest upstream, sampled from its confluence with the Limbang River (4.7804N, 114.9925E, ca. 5m a.s.l.) to 4.7676N, 114.973E (GPS readings taken on the day and Google Earth both give a clearly incorrect 14-19m a.s.l. at this point).

11. Along the Limbang River between Sungai Buang Alang and Limbang Town (Fig. 6).



Figure 6: Sungai Buang Alang (location 11).

12. Kubong Log Pond:

- a.** A pond at Kubong log pond (4.6305N, 115.037E, ca. 19m a.s.l.).
- b.** A shady pond (4.6338N, 115.0383E, ca. 22m a.s.l.) with a smaller pond/pool to the side, behind houses at Kubong log pond, sampled during light rain in 2021, in sunny conditions but late in the day in 2022 (Fig. 7).
- c.** A more open but steep banked (difficult to access) pond behind 12a, connected to it by a short channel.

13. Sungai Reda Besai:

- a.** The mainstream, large, open and, at the time of sampling, rather turbid, crossed by the road after Kubong log pond, representative coordinates 4.5912N, 115.0495E, ca. 23-30m a.s.l. Only sampled during poor weather conditions.
- b.** Small grassy ponds beside a small trail at 9a, and on this trail.

14. Sungai Reda Mit:

- a.** Mainstream. Where this is crossed by the road it is barren and mud banked, but by following a small path at a farm and then cutting through second growth forest it can be accessed a little way upstream, where it is mainly shallow with a mixed sediment and gravel substrate (increasingly rocky further upstream). Sampl-

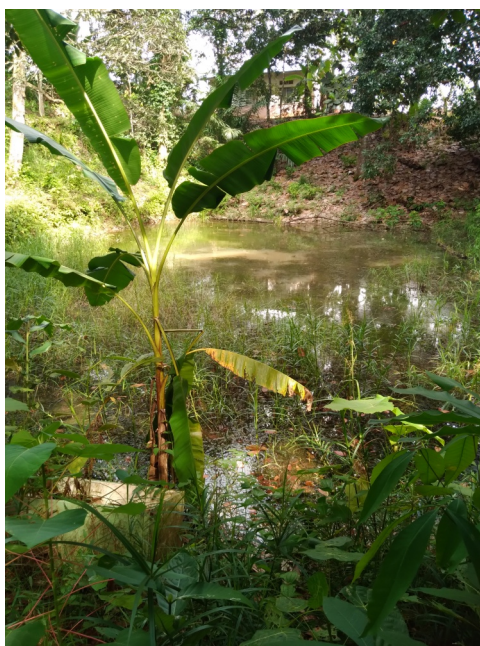


Figure 7: Shady pond behind houses at Kubong log pond (location 12b).

Figure 8: Sungai Reda Mit (location 14a) with Mering Anyie in view.

ed from the access point at approximately 4.5799N, 115.059E, ca. 23m a.s.l. to 4.5681N, 115.0522E, ca. 55m a.s.l. (Fig. 8).

b. Tributaries: (i) in heavily logged forest, completely open in some places, mostly low gradient, representative coordinates 4.5789N, 115.0548E, ca. 50-60m a.s.l.; (ii) steep tributary in logged forest, representative coordinates 4.5666N, 115.0541E, ca. 55-120m a.s.l.

c. Pools on old skid paths and in forest near to 14a.



15. A large, turbid stream crossed by an unsealed road continuing from a sealed road leading to Nanga Medamit. The main-stream here could not be sampled because it was too deep near the road and torrential further up. This location is rather remote from Limbang Town but is grouped with locations closer to the town for convenience.

This location is rather remote from Limbang Town but is grouped with locations closer to the town for convenience.

a. A small hillside tributary, representative coordinates 4.4805N, 114.9319E, ca. 65-125m a.s.l.

b. Trailside in forest and a swampy area around old pumping station.

c. An open area with small pools by the road.

Locations in the Sungai Mendalam area

Some more details of these locations are shown in Fig. 9.

16. Melaban longhouse area:

a. A sluggish, shaded stream at a small farm (coordinates at this farm 4.3159N, 114.9059E, ca. 40m a.s.l.)

b. Along a path beside an open marsh at the same farm, and in the marsh and at a tiny stream running into the marsh.

c. Fishponds belonging to the headman, on the opposite of the road to 16a,b.

d. A tiny, shaded, swampy stream running behind the above ponds.

e. At lights, or otherwise, in the longhouse (4.3185N, 114.8964E, ca. 30m a.s.l.).

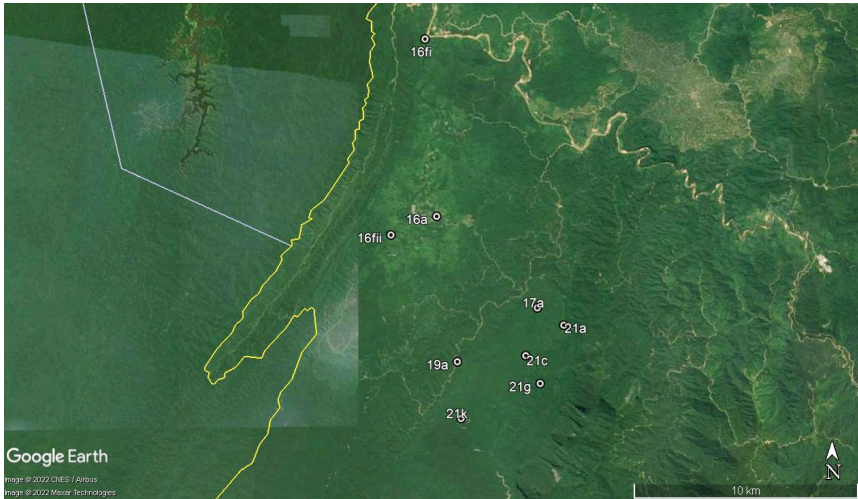


Figure 9: Locations surveyed in the Sungai Mendalam area in April and June/July 2022.

f. Sungai Mendalam (Fig. 10):

- i. Downstream of the longhouse as far as the confluence with the Limbang River.
- ii. Upstream of the longhouse, as far as 4.3084N, 114.8875E.



iii. A semi-open swamp/marsh area beside an area cleared for a road, accessed by walking from upstream Sungai Mendalam. Coordinates not taken since RD was not present.

h. Sungai Melaban (4.3252N, 114.8946E).

17. A branch of Sungai Assam outside (upstream) of Gunung Buda NP, running through logged old growth forest:

- a. Mainstream, sampled from 4.2917N, 114.9474E downstream to 4.2793N, 114.9463E, ca. 80-100m a.s.l. Alternating

Figure 10: Sungai Mendalam between the Melaban longhouse and the Limbang River (16f), with Utie anak Gira in the front of the boat.



Figure 11: Upstream of the logging road on a branch of Sungai Assam outside of Gunung Buda National Park (17b), photograph by Mering Anyie.

deep and shallow sections, open aspect in parts but with a closed canopy in others, this stream has a variety of substrates and appears to be rather rich in odonate species. Many fast flying Anisoptera were seen on the second visit to the site (June 2022) but could not be caught and it is likely that further work at this site (with 22 species already found) would yield a quite significant increase in the number of species recorded.

b. Same stream, upstream of bridge, coordinates not taken (Fig. 11).

c. Swampy pools along old skid paths near to 17a.

d. By logging road around access point to the stream.

18. Upstream Sungai Mentakung, this stream enters Sungai Mendalam downstream of the Melaban longhouse, near to another longhouse, but the upstream part sampled is in the lands of the Melaban longhouse. Coordinates not taken.

19. A small stream in heavily logged forest outside the park boundary, accessed from a spur from the old logging road that gives access to the tourist trail to Gunung Buda:

a. The stream (4.2578N, 114.9142E, ca. 100m a.s.l.)

b. In forest on slope above the stream.

20. Just outside Gunung Buda NP boundary, along or accessed from a logging road that runs to and then along the boundary for a distance. Logged old growth forest. This road was still in use by a timber company in April 2022 but by June 2022 their operations

in the area had finished and the condition of the road was already deteriorating:

- a. Muddy pools and marshy/ swampy areas on road and beside it opposite or before the park boundary.
- b. Small streams.

21. Gunung Buda NP:

- a. A logging road running along the park boundary (further along the same road as location 20): pools and drains just inside or exactly (judged from the boundary markers) at the boundary of the park and a small pond just inside the boundary. Coordinates at the pond 4.2724N, 114.9569E, ca. 98m a.s.l.
- b. Along an old, overgrown logging road within the park boundary.
- c. Sungai Assam branch running (i) downstream of old bridge (4.2576N, 114.9454E, ca. 90m a.s.l.), beside park boundary, to 4.2602N, 114.9417E, ca. 70m a.s.l.; (ii) upstream of old bridge, entirely within park boundary, sampled to the mouth of a tributary 4.2569N, 114.9474E, ca. 125m a.s.l., just downstream of a waterfall (Fig. 12).



Figure 12: A waterfall within Gunung Buda National Park (location 21cii).

Figure 13: Swamp forest within Gunung Buda National Park (location 21f).

d. Pools in forest near above, inside park boundary.

e. Tributary to 21cii mentioned above, sampled to 4.2551N, 114.9478E, ca. 150m a.s.l.

f. An area of swamp forest inside park in the 21ci area (Fig. 13).

g. An unnamed stream inside the park boundary, crossed by the old logging road of 21b, and in forest immediately adjacent to the stream. Sampled from 4.251N, 114.9418E upstream to 4.2492N, 114.9474E, ca. 90-165m a.s.l. (Fig. 14).

h. Tributaries to the 21g stream.

i. Other small streams just inside the park boundary.

j. Along the tourist route to Gunung Buda, from start on an old logging road (4.2404N, 114.9041E) until Sungai Mendalam at 4.2351N, 114.9157E. The water level in this part of Sungai Assam was too high to permit fording on the day this area was visited in April 2022 but in June/July 2022 the stream was fordable.



Figure 14: A section of the small, unnamed stream (location 21g) within Gunung Buda National Park.



Figure 15: Sungai Mendalam within Gunung Buda National Park (21ki) with one end of 21kii in view on the opposite bank from Ranggau anak Muntai.

k. Sungai Mendalam inside Gunung Buda NP:

i. Mainstream (representative coordinates 4.2351N, 114.9157E).

ii. A long loop off the mainstream, mostly dry when water levels low (Fig. 15).

iii. A small, red water, closed canopy stream, running into 21kii (representative coordinates 4.2317N, 114.9125E).

iv. In the mouth of small, dry (except for a few small pools) tributary to Sungai Mendalam.

List of species found during the 2021-2022 surveys

First records for Limbang Division are indicated by *, first records for Sarawak by **.

Zygoptera

Lestidae

1. *Lestes praemorsus decipiens* Kirby, 1894 *

16fiii – ♂, 5.vii.2022.

2. *Orolestes wallacei* (Kirby, 1889)

9ci – ♀, 13.iv.2022. **17c** – ♀, 8.iv.2022.

Platystictidae

3. *Drepanosticta* sp. cf. *dentifera* Kimmins, 1936 *

21h – ♀, 5.iv.2022.

4. *Drepanosticta rufostigma* (Selys, 1886)

3a – ♂, 6.xi.2021; ♂♂, 2.iv.2022. **3b** – ♂, 10.xi.2021; ♂♂, 2.iv.2022. **3c** – ♂♂, 10.xi.2021. **8b** – ♂♂, 1.iv.2022. **14bii** – ♂, 11.iv.2022. **21e** – ♂, 7.iv.2022. **21g** – ♂♂, ♀♀, 5.iv.2022.

5. *Drepanosticta versicolor* (Laidlaw, 1913)

1a – ♂, 5.xi.2021. **3b** – ♀, 2.iv.2022. **15b** – ♀, 11.xi.2021. **19b** – ♂, 6.iv.2022. **21h** – ♂, 5.iv.2022.

6. *Telosticta dayak* Dow & Orr, 2012

3a – ♂, 6.xi.2021. **3b** – ♂♂, ♀♀, 6.xi.2021; ♂♂, 2.iv.2022. **3c** – ♂, 8.xi.2021.

7. *Telosticta longigaster* Dow & Orr, 2012 *

15b – ♂♂, ♀, 11.xi.2021.

8. *Telosticta* sp.

Although teneral, the single female *Telosticta* found with Gunung Buda NP does not appear to be either of the two *Telosticta* species listed above.

21g – ♀ (teneral), 5.iv.2022.

Euphaeidae9. *Dysphaea dimidiata* Selys, 1853

14a – ♂, 3.iv.2022. **16fii** – ♂, 5.vii.2022. **17a** – ♂, 8.iv.2022; ♂♂, 28.vi.2022. **18** – ♂, ♀, 1.vii.2022. **21ci** – ♂, 7.iv.2022. **21ki** – ♂, 29.vi.2022; ♂, 2.vii.2022.

10. *Dysphaea lugens* Selys, 1873 *

Dow, Ahmad et al. (2021) reported this species, which had previously appeared to be scarce, from the Baram River in Miri Division and noted that it is “likely to be present on parts of most or all of the large streams and rivers in Sarawak”. During the Limbang surveys we found it to be moderately abundant on Sungai Mendalam downstream of the Melaban longhouse where the water is mostly relatively deep, and present but less common upstream of the longhouse where there are more shallow sections. Additionally one male was collected during overcast conditions on the Limbang River, not far downstream from Limbang Town, where the river is still tidally influenced. However we saw no sign of it on even the larger tributaries (Sungai Berawan and Sungai Lubai) of the Limbang River near to Limbang Town that we surveyed.

11 – ♂, 14.iv.2022. **16fi** – ♂♂, 27.vi.2022. **16fii** – ♂, 5.vii.2022.

11. *Euphaea impar* (Selys, 1859)

3a – ♂, 6.xi.2021; ♂, 2.iv.2022. **3b** – ♂, 2.iv.2022. **4a** – ♂♂, 8.xi.2021. **7b** – ♂♂, 13.xi.2021. **8a** – ♂, 10.xi.2021; ♂♂, 1.iv.2022. **8b** – ♂, 10.xi.2021. **8c** – ♂, 10.xi.2021. **14bii** – ♂, 3.iv.2022. **17a** – ♂, 8.iv.2022; ♂♂, 28.vi.2022. **17b** – ♂, 30.vi.2022. **21g** – ♂♂, ♀, 5.iv.2022. **21i** – ♂♂, 3.vii.2022.

12. *Euphaea subcostalis* Selys, 1873

14a – ♂, 11.iv.2022. **14bi** – ♂, 3.iv.2022. **17b** – ♂♂, 30.vi.2022. **18** – ♂♂, 1.vii.2022. **21ci** – ♂♂, ♀, 7.iv.2022. **21cii** – ♂, 7.iv.2022. **21g** – ♂♂, 5.iv.2022.

13. *Euphaea tricolor* Selys, 1859

This species appears to be more local in occurrence in Limbang Division than it does in the southwest of Sarawak, as was noted by Dow, Ahmad et al. (2021) for Miri Division.

14a – ♂, 11.iv.2022. **16fii** – ♂, 5.vii.2022. **17a** – ♂, 8.iv.2022; ♂, 28.vi.2022. **21j** – ♀, 2.vii.2022. **21ki** – ♂♂, 29.vi.2022. **21kii** – ♂, 29.vi.2022.

Devadattidae14. *Devadatta clavicauda* Dow, Hämäläinen & Stokvis, 2015

1a – ♂, 5.xi.2021. **3b** – ♂, 6.xi.2021; ♂♂, 2.iv.2022. **8b** – ♂♂, 1.iv.2022. **8c** – ♂,

10.xi.2021; ♂+♀, 1.iv.2022. **7b** – ♂♂, 13.xi.2021. **14bii** – ♂♂, 11.iv.2022. **21g** – ♂♂, 5.iv.2022. **21h** – ♂♂, 5.iv.2022.

Philosinidae

15. *Rhinagrion borneense* (Selys, 1886)

3a – ♂♂, 6.xi.2021; ♂♂, 2.iv.2022. **4a** – ♂, 8.xi.2021. **7b** – ♂, 13.xi.2021. **8a** – ♂, ♀, 10.xi.2021; ♂♂, 1.iv.2022. **8c** – ♂, 10.xi.2021. **14a** – ♂, 3.iv.2022. **17a** – ♂♂, ♀, 8.iv.2022; **17a** – ♂♂, 28.vi.2022. **17b** – ♂♂, 30.vi.2022. **18** – ♂♂, 1.vii.2022. **21cii** – ♂♂, 7.iv.2022. **21g** – ♂, 5.iv.2022. **21i** – ♂, 3.vii.2022. **21kii** – ♂, 29.vi.2022. **21kiii** – ♂, 29.vi.2022.

Argiolestidae

16. *Podolestes orientalis* Selys, 1862

5a – ♂, 2.iv.2022. **8e** – ♂, 10.xi.2021. **9cii** – ♀, 13.iv.2022. **17b** – ♂, 28.vi.2022. **21f** – ♂, ♂+♀, 7.iv.2022.

Calopterygidae

17. *Neurobasis longipes* Hagen, 1887

14a – ♂, 3.iv.2022. **16fi** – ♀, 27.vi.2022. **16fii** – ♂, ♀, 5.vii.2022. **16h** – ♂, 27.vi.2022. **17a** – ♂♂, ♀♀, 8.iv.2022; ♂♂, 28.vi.2022. **17b** – ♂♂, 30.vi.2022. **18** – ♂, 1.vii.2022. **21ci** – ♂♂, ♀, 7.iv.2022. **21cii** – ♂♂, 7.iv.2022. **21i** – ♂♂, 3.vii.2022. **21ki** – ♂, ♀, 29.vi.2022; ♂, 2.vii.2022. **21kii** – ♂, 29.vi.2022.

18. *Vestalis amabilis* Lieftinck, 1965

This species is common in the Limbang Town area, including at Bukit Hitam Nature Reserve. However two males (not listed below) from Bukit Hitam have atypical anal appendages and are difficult to assign to any described species; these individuals require further study.

3a – ♂♂, 6.xi.2021; ♂♂, 2.iv.2022. **4a** – ♂♂, 8.xi.2021. **8a** – ♂♂, 10.xi.2021; ♂♂, 1.iv.2022. **8b** – ♂, 10.xi.2021; ♂, 1.iv.2022. **8c** – ♂, 10.xi.2021. **14a** – ♂, 11.iv.2022. **21kiii** – ♂, 29.vi.2022.

19. *Vestalis amaryllis* Lieftinck, 1965

8b – ♂♂, 1.iv.2022. **8c** – ♂, 10.xi.2021. **21g** – ♂♂, 11.iv.2022.

20. *Vestalis amoena* Hagen in Selys, 1853

14a – ♂♂, 3.iv.2022. **16fi** – ♂, 27.vi.2022. **17a** – ♂♂, ♀, 8.iv.2022; ♂♂, 28.vi.2022. **17b** – ♂♂, ♀, 30.vi.2022. **18** – ♂♂, 1.vii.2022. **21ci** – ♂♂, ♀, 7.iv.2022. **21cii** – ♂, 7.iv.2022. **21g** – ♂♂, 5.iv.2022. **21i** – ♂♂, 3.vii.2022. **21ki** – ♂, 2.vii.2022. **21kii** – ♂, 29.vi.2022.

Chlorocyphidae

21. *Heliocypha biseriata* (Selys, 1859)

3a – ♂, 6.xi.2021; ♂♂, 2.iv.2022. **4a** – ♂, 8.xi.2021. **7b** – ♂, 13.xi.2021. **8a** – ♂, 10.xi.2021. **14a** – ♂♂, 3.iv.2022; ♂♂, 11.iv.2022. **14bi** – ♂, 3.iv.2022. **17a** – ♂♂, ♀, 8.iv.2022. **17b** – ♂♂, ♀♀, 30.vi.2022. **18** – ♂♂, ♀♀, 1.vii.2022. **20a** – ♂, 6.vii.2022. **20b** – ♂♂, 6.vii.2022. **21ci** – ♂, ♀, 7.iv.2022. **21i** – ♂♂, 3.vii.2022. **21kii** – ♂, 29.vi.2022.

22. *Libellago aurantiaca* (Selys, 1859)

17a – ♂, 8.iv.2022.

23. *Libellago hyalina* (Selys, 1859)

6bii – ♂, 9.xi.2021. **6c** – ♂♂, 9.xi.2021. **8h** – ♂, 10.xi.2021. **9b** – ♂♂, ♀, 12.iv.2022.

9cii – ♂♂, ♀, 13.iv.2022. **10** – ♀, 14.iv.2022. **16a** – ♂, 6.iv.2022. **21kiii** – ♂♂, 29.vi.2022.

24. *Libellago phaethon* (Laidlaw, 1931) **

This is a surprising addition to Sarawak's Odonate fauna. It was previously only known from the southeast of Sabah and the northeast of Kalimantan, so that records from Limbang Division represent a considerable increase to its known range. Only a single male was found at one location (4a) but it was almost abundant at Sungai Labuan (8a) in November 2021. However Sungai Labuan was revisited in April 2022 but the species was not found then, and it was not even seen at any other location in 2022.

4a – ♂, 8.xi.2021. **8a** – ♂♂, 10.xi.2021.

25. *Libellago semiopaca* (Selys, 1873) *

13a – ♂♂, 12.xi.2021. **14a** – ♂♂, 3.iv.2022; ♂, 11.iv.2022. **16fi** – ♂♂, 27.vi.2022.

16fii – ♂♂, ♀♀, 5.vii.2022.

26. *Libellago stictica* (Selys, 1859)

17a – ♂, 8.iv.2022; ♂, 28.vi.2022. **21ci** – ♂♂, 7.iv.2022. **21kii** – ♂, 29.vi.2022.

27. *Rhinocypha cucullata* Selys, 1873

16fii – ♀♀, 5.vii.2022. **17a** – ♂♂, 8.iv.2022; ♂♂, 28.vi.2022. **21ci** – ♂♂, ♀, 7.iv.2022. **21cii** – ♂♂, 7.iv.2022. **21j** – ♂, 6.iv.2022. **21kii** – ♂, 29.vi.2022.

28. *Rhinocypha humeralis* Selys, 1873 **

Another addition to Sarawak's Odonata, but since this species was already known from one location in Brunei (Orr 2001) this is less surprising than *Libellago phaethon*, indeed Dow & Choong (2021) predicted that it would be found in Limbang Division. What is perhaps surprising, given that only a single location has been reported for it in Brunei, is how common the species appears to be in the Limbang Town area (where we have found it at six separate locations so far) and further inland (three locations in the Sungai Mendalam area). It seems likely that this species will eventually also be found in the northernmost part of Gunong Mulu NP.

1a – ♂, 5.xi.2021. **3a** – ♂♂, 6.xi.2021; ♂♂, ♀♀, 2.iv.2022. **4a** – ♂♂, ♀, 8.xi.2021. **8a** – ♂♂, 10.xi.2021; ♂♂, ♀♀, 1.iv.2022. **8b** – ♂, ♀, 1.iv.2022. **8c** – ♂, 10.xi.2021. **14a** – ♂♂, ♀, 3.iv.2022; ♂♂, 11.iv.2022. **15a** – ♂♂, 11.xi.2021. **17a** – ♂♂, ♀, 8.iv.2022; ♂, 28.vi.2022. **17b** – ♂, 30.vi.2022. **18** – ♂♂, 1.vii.2022. **21i** – ♂, 3.vii.2022.

29. *Sundacypha petiolata* (Selys, 1859)

21e – ♂, 7.iv.2022. **21g** – ♂♂, 5.iv.2022.

Platycnemididae30. *Coeliccia borneensis* (Selys, 1886)

21j – ♀, 6.iv.2022; ♂, 2.vii.2022.

31. *Coelliccia kenyah* Dow, 2010 *

These records from Limbang Division are another extension to the known range of this species, originally described from a few sites in Miri Division but now known to extend into Bintulu and Kapit Divisions as well.

3b – ♂♂, 2.iv.2022. **15a** – ♂♂, 11.xi.2021. **21h** – ♂♂, 5.iv.2022.

32. *Coelliccia* sp. cf *nemoricola* Laidlaw, 1912

21h – ♂♂, ♂+♀, 5.iv.2022. **21j** (at a tiny trickle running beside the trail as it descends to the plain of Sungai Assam) – ♂, 6.iv.2022.

33. *Coelliccia nigrohamata* Laidlaw, 1918

3b – ♂♂, 6.xi.2021. **8c** – ♂♂, 10.xi.2021. **8d** (in the seepage) – ♂, 1.iv.2022. **8i** – ♂, 1.iv.2022. **14c** – ♂♂, 11.iv.2022. **15b** – ♂, 11.xi.2021. **16d** – ♂, 6.iv.2022. **21a** – ♂♂, ♂+♀, 5.iv.2022. **21ci** – ♂, 7.iv.2022. **21f** – ♂♂, 7.iv.2022. **21g** – ♂♂, 5.iv.2022. **21j** – ♂, 2.vii.2022.

34. *Coelliccia roberti* Dow, 2020

1a – ♂♂, 5.xi.2021. **7b** – ♂♂, 13.xi.2021. **21f** – ♂♂, 7.iv.2022.

35. *Copera vittata* (Selys, 1863)

Orr (2001) listed *Copera vittata* occur from Brunei (typical red-legged individuals) and also, as *Copera* sp., a form with black legs. Orr (2003) treated the black-legged form as local variant of *C. vittata*, noting that the two forms sometimes occur at the same locations. The black-legged form was found at six locations in the Limbang Town area (where it appears to be much more common than the red-legged form) during the surveys reported on here. Three other mature colour forms of *C. vittata* have been recorded in Sarawak (the red-legged form in the northeast, a yellow-legged form in the southwest and a black-and-yellow-legged form in parts of central Sarawak) but these are the first records of the black-legged form outside of Brunei. At one site (14a) both forms were found. In RD's opinion the black-legged form is the most distinctive from typical *C. vittata* in general appearance, and so far none of the other three colour forms has been recorded together at the same site so that the co-occurrence of the red-legged and black-legged forms in Brunei and Limbang stands out. However there is a lack of convincing morphological differences between the males of the different forms and here, pending further investigation, we follow Orr (2003) in treating the black-legged form as a local variant of *C. vittata*; however we list the two colour forms separately below.

Black-legged form:

1b – ♂♂, ♂+♀, 5.xi.2021. **4c** – ♂, 8.xi.2021. **4d** – ♂, 8.xi.2021. **8d** – ♂, 10.xi.2021; ♂+♀, 1.iv.2022. **8e** – ♂, 10.xi.2021. **8h** – ♂, ♀, 10.xi.2021. **8i** – ♂♂, 1.iv.2022. **9ci** – ♂, 13.iv.2022. **9cii** – ♂♂, 13.iv.2022. **12b** – ♂, 3.iv.2022. **14a** – ♂, 3.iv.2022.

Red legged form:

14a – ♂, 3.iv.2022; ♀, ♂+♀, 11.iv.2022. **16d** – ♂♂, ♂+♀, 6.iv.2022. **16e** – ♀, 27.vi.2022; ♂, 28.vi.2022. **17c** – ♂♂, ♀♀, 8.iv.2022; ♂♂, 28.vi.2022. **18** – ♂, 1.vii.2022. **20a** – ♂, 6.vii.2022. **21a** – ♂♂, ♀, 5.iv.2022. **21f** – ♂, 7.iv.2022. **21i** – ♂, 3.vii.2022. **21j** – ♂, 6.iv.2022; ♂♂, ♀, 2.vii.2022. **21kiii** – ♂♂, 29.vi.2022.

36. *Elattoneura analis* (Selys, 1860)

3a – ♂♂, 6.xi.2021. **4a** – ♂♂, 8.xi.2021. **8a** – ♂, 10.xi.2021; ♂, 1.iv.2022. **16a** – ♂♂, 6.iv.2022. **17a** – ♂♂, ♀, 8.iv.2022; ♂♂, 28.vi.2022. **21ci** – ♂♂, 7.iv.2022. **21cii** – ♂♂, 7.iv.2022.

37. *Onychargia atrocyana* Selys, 1865

In Sarawak this species is normally only found at low densities, but in the low pH swamp forest at location 5a it was abundant.

5a – ♂♂, 2.iv.2022.

38. *Prodasineura dorsalis* (Selys, 1860)

21kiii – ♂, ♀, 29.vi.2022.

39. *Prodasineura hosei* (Laidlaw, 1913)

A single male of this species was found perched low in a clearing on the old logging road inside Gunung Buda NP, an unusual place to find a male of this species in RD's experience.

21b – ♂, 5.iv.2022.

40. *Prodasineura hyperythra* (Selys, 1886)

1a – ♂, 5.xi.2021. **1b** – ♂♂, 5.xi.2021. **3a** – ♂♂, 6.xi.2021; ♂♂, 2.iv.2022. **3b** – ♂+♀, 6.xi.2021. **4a** – ♂, ♂+♀, 8.xi.2021. **8a** – ♂♂, 10.xi.2021. **8c** – ♂, ♀, 10.xi.2021. **9cii** – ♂, 13.iv.2022. **14a** – ♂, 11.iv.2022. **14bi** – ♂♂, ♀♀, 3.iv.2022. **14c** – ♂, 11.iv.2022. **16a** – ♂, 6.iv.2022. **19a** – ♂, 6.iv.2022. **21d** – ♂, 7.iv.2022. **21i** – ♂♂, ♀♀, 3.vii.2022.

41. *Prodasineura peramoena* (Laidlaw, 1913)

This is a problematic taxon. It was described from material collected at unspecified sites in Limbang and Lawas in August and September 1909 (Laidlaw 1913). Specimens collected later from Brunei and other parts of Sarawak and identified as *peramoena* are structurally identical but differ consistently in their markings, see note 34 in Dow (2021) for more details; here, for convenience we refer to such specimens as *peramoena*-like. In 2021 *peramoena*-like specimens were found at location 7b but a single male, much closer to the type series of *peramoena* in its markings, was found on the hill stream at Bukit Sembeling (1a, which could plausibly be one of the locations from which the type series came, since it is close to Limbang Town and would have been relatively easy to access even in the 1900s). The habitat is different at the two locations, that at 7b is clearly kerangas, which is the same type of habitat where most of the *peramoena*-like specimens from Sarawak and Brunei have been found. However in April 2022 *peramoena*-like specimens were found at Bukit Hitam, close to, and part of the same hill range as, Bukit Sembeling. It is still not clear whether this is a case of phenotypic plasticity (or just variation) or whether two (or more) distinct species are involved, although RD suspects the former.

1a – ♂, 5.xi.2021. **3a** – ♂♂, 2.iv.2022. **7b** – ♂♂, 13.xi.2021.

42. *Prodasineura tenebricosa* Lieftinck, 1937 *

A few males of this species were found hanging, mostly high, over deep water in Sungai Mendalam.

16fi – ♂♂, 27.vi.2022.

43. *Prodasineura verticalis* (Selys, 1860)

13a – ♂, 12.xi.2021. **14a** – ♂♂, 3.iv.2022; ♂♂, 11.iv.2022. **14bi** – ♂♂, 3.iv.2022.

16a – ♂, 6.iv.2022. **16fii** – ♂, 5.vii.2022. **17a** – ♂♂, 8.iv.2022; ♂♂, 28.vi.2022. **18** – ♂♂, 1.vii.2022. **21i** – ♂, 3.vii.2022. **21kii** – ♂, 29.vi.2022.

Coenagrionidae

44. *Aciagrion borneense* Ris, 1911 *

16b – ♂, 6.iv.2022. **21a** – ♂, 28.vi.2022.

45. *Agriocnemis femina* (Brauer, 1868)

2 – ♂, 5.xi.2021. **12b** – ♀, 3.iv.2022. **13b** – ♂+♀, 12.xi.2021. **16b** – ♂♂, 6.iv.2022.

46. *Amphicnemis wallacii*-group

6bi – ♂♂, ♀, 9.xi.2021. **6bii** – ♂♂, ♀, 9.xi.2021. **6biii** – ♂♂, ♀, 9.xi.2021. **8f** (on trail) – ♀, 10.xi.2021. **8h** – ♂, 10.xi.2021. **9ci** – ♂♂, ♀, 13.iv.2022. **9cii** – ♂♂, ♀, 13.iv.2022. **21f** – ♂, ♀, 7.iv.2022. **21g** – ♂♂, 5.iv.2022.

47. *Amphicnemis remiger* Laidlaw, 1912

The two female specimens reported here require further study. They seem closest to *A. remiger*, but the structure of the prothorax appears to be outside of the documented variation (discussed in Dow (2019)) in that species. The male from Gunung Buda NP is typical *A. remiger*.

16fiii – ♀ (?), 5.vii.2022. **21j** – ♀ (?), 6.iv.2022; ♂, 29.vi.2022.

48. *Archibasis incisura* Lieftinck, 1949 *

6c – ♂, 9.xi.2021. **6d** – ♂+♀, 14.iv.2022. **9a** – ♂, 13.iv.2022. **9b** – ♂♂, ♀, ♂+♀, 12.iv.2022. **9cii** – ♂, 13.iv.2022.

49. *Archibasis tenella* Lieftinck, 1949

3a – ♂, 6.xi.2021. **4a** – ♂♂, ♂+♀, 8.xi.2021. **7b** – ♂, 13.xi.2021. **14a** – ♂, 3.iv.2022. **17a** – ♀, 28.vi.2022. **21i** – ♂, 3.vii.2022.

50. *Archibasis viola* Lieftinck, 1949 *

6bii – ♂, 9.xi.2021. **8d** – ♂, 1.iv.2022. **9a** – ♂, 13.iv.2022. **9b** – ♂, 12.iv.2022. **9ci** – ♂♂, ♀, 13.iv.2022. **9cii** – ♂, 13.iv.2022.

51. *Argiocnemis rubescens rubeola* Selys, 1877 *

Quite common in the Limbang Town area, in contrast to the rest of Sarawak.

8e – ♂♂, ♀, 10.xi.2021. **8f** – ♂, 10.xi.2021. **9cii** – ♂, 13.iv.2022. **12b** – ♂♂, 12.xi.2021; ♂♂, ♀, 3.iv.2022.

52. *Argiocnemis* sp.

14a – ♂, 3.iv.2022. **14bi** – ♂, 3.iv.2022. **14c** – ♀, 11.iv.2022. **16d** – ♂♂, 6.iv.2022. **17c** – ♂♂, ♀♀, 8.iv.2022; ♂♂, 28.vi.2022. **20a** – ♂, 3.vii.2022; ♂, 6.vii.2022. **21a** – ♂♂, ♀♀, 5.iv.2022. **21b** – ♂, ♀♀, 5.iv.2022. **21f** – ♂♂, ♀♀, 7.iv.2022. **21g** – ♀, 5.iv.2022.

53. *Ceriagrion bellona* Laidlaw, 1915

17c – ♂, ♀, 8.iv.2022; ♂, ♀, ♂+♀, 28.vi.2022.

54. *Ceriagrion cerinorubellum* (Brauer, 1865)

8a – ♂, 10.xi.2021. **8e** – ♂, 10.xi.2021. **8f** – ♂, 10.xi.2021. **12b** – ♂♂, 3.iv.2022. **16d** – ♂, 6.iv.2022. **17c** – ♂, 28.vi.2022. **20a** – ♂, 3.vii.2022; ♂♂, 6.vii.2022. **21a** – ♂, 28.vi.2022.

55. *Pseudagrion lalakense* Orr & van Tol, 2001 *

12c – ♂, 3.iv.2022. **16fiii** – ♂, 5.vii.2022.

56. *Pseudagrion microcephalum* (Rambur, 1842) *

2 – ♂♂, 5.xi.2021. **8e** – ♂, 10.xi.2021. **9b** – ♂♂, ♀, ♂+♀, 12.iv.2022. **12a** – ♂+♀, 13.xi.2021. **12c** – ♂, 3.iv.2022.

57. *Pseudagrion pilidorsum* (Brauer, 1868) *

In Borneo this species has been reported from East Kalimantan and Sabah, and also a few locations in Miri Division in Sarawak, these are the first records from Limbang Division.

4a – ♂♂, 8.xi.2021. **8a** – ♂, 10.xi.2021. **14bi** – ♂♂, 3.iv.2022. **17b** – ♂, 30.vi.2022. **18** – ♂, 1.vii.2022. **20b** – ♂, 6.vii.2022.

58. *Stenagrion dubium* (Laidlaw, 1912)

3b – ♂, 6.xi.2021. **21h** – ♂♂, 5.iv.2022.

59. *Teinobasis cryptica* Dow, 2010 *

When describing this species Dow (2010: 213) noted that “At rest both sexes hang from the underside of leaves, this habit, together with their colouration, makes them very difficult to find; most specimens are teneral and were caught after being disturbed from low perches, their shiny wings and slow flight making them unusually conspicuous.” Subsequent observations of the species by RD have generally conformed to the above description but two females collected in Gunung Buda NP were found perched horizontally on roots emerging from the water in swamp forest, where their pale colouration contrasted strongly with their dark brown perches and the dark water below, rendering them very conspicuous.

21f – ♀♀, 7.iv.2022.

60. *Teinobasis laidlawi* Kimmins, 1936

17c – ♂♂, 28.vi.2022.

61. *Teinobasis rajah* Laidlaw, 1912

5a – ♂♂, 8.xi.2021; ♂♂, ♂+♀, 2.iv.2022. **6bii** – ♂, 9.xi.2021. **9ci** – ♂♂, ♂+♀, 13.iv.2022.

62. *Xiphiagrion cyanomelas* Selys, 1876

21a – ♂, 28.vi.2022.

Anisoptera

Aeshnidae

63. *Anax guttatus* (Burmeister, 1831) *

12a – ♂, 13.xi.2021.

64. *Heliaeschna simplicia* (Karsch, 1891) *

At Sungai Buang Alang (location 10) many members of the Aeshnidae were observed hanging under Nipa palm fronds hanging over the stream, but the need to constantly duck while the boat passed under the fronds made catching them extremely difficult. However two females were collected and proved to be *H. simplicia*.

9b – ♀, 12.iv.2022. **10** – ♀♀, 14.iv.2022.

65. *Indaeschna grubaueri* (Förster, 1904)

8d – ♂, 1.iv.2022.

66. *Oligoaeschna platyura* Lieftinck, 1940 **

This is the first record of this poorly known species from Sarawak. It had been known only from a few records from East Kalimantan made in the 1930s (Lieftinck 1968), an equally old record from the east of Sabah (Lieftinck 1968) and two records from Brunei made between 1990 and 2000 (Orr 2001). A single male was found perched just inside the mouth of a dry (at the time) tributary to Sungai Mendalam inside Gunung Buda NP in June 2022.

21kiv – ♂, 29.vi.2022.

Gomphidae

67. *Burmagomphus arthuri* Lieftinck, 1953 *

4a – ♂ (teneral), 8.xi.2021. **21ci** – ♂ (teneral), 7.iv.2022.

68. *Burmagomphus insularis* Laidlaw, 1914 *

21ki – ♂, 2.vii.2022.

69. *Gomphidia maclachlani* Selys, 1873

This species was abundant on the upper part (with obvious flow) of Sungai Lubai (9a), even in overcast conditions on the afternoon of 12.iv.2022. Males occupied conspicuous perches along the sides of the stream in a similar manner to *Ictinogomphus decoratus*, the latter species occurring together with them at a similar density. No individuals were seen in the lower part of the stream where the water appears flowless unless the Limbang River is low and only a single male was found on Sungai Berawan (6a) where there was little sign of flow in the surveyed parts on either visit made there.

3a – ♂, 6.xi.2021. **6a** – ♂, 14.iv.2022. **9a** – ♂♂, 12.iv.2022; ♂, 13.iv.2022. **14a** – ♂, 11.iv.2022. **18** – ♂, 1.vii.2022. **21kii** – ♂, 29.vi.2022.

70. *Heliogomphus borneensis* Lieftinck, 1964 *

16fii – ♀ (?) (teneral), 5.vii.2022. **21b** – ♂, 5.iv.2022. **21ci** – ♀, 7.iv.2022.

71. *Ictinogomphus decoratus melaenops* (Selys, 1858) *

2 – ♂, 5.xi.2021. **4a** – ♂, 8.xi.2021. **6a** – ♂, 9.xi.2021. **6c** – ♂, 9.xi.2021. **9a** – ♂, 12.iv.2022. **9b** – ♀, 12.iv.2022. **9cii** – ♂♂, ♀, 13.iv.2022. **14a** – ♂, 3.iv.2022. **16c** – ♂, 6.iv.2022. **20a** – ♂♂, 3.vii.2022.

72. *Leptogomphus coomansi* Laidlaw, 1936

21b – ♂, 5.iv.2022; ♂, 7.iv.2022. **21g** – ♀, 5.iv.2022. **21ki** – ♂, 2.vii.2022.

73. *Macrogomphus phalantus* Lieftinck, 1935 *

A female was collected in the same part of Sungai Lubai (9a) as *Gomphidia maclachlani* on 12.iv.2022 while it was hanging vertically in vegetation overhanging the stream's edge, slightly less than 2m above the surface of the water. A second female was seen perched in a similar manner a few meters upstream on the other side but could not be caught because of the dense tangle of branches where it was hanging; no males were seen on this day. On 13.iv.2022, in sunny conditions, numerous males (more than 40 were seen) were found in the same area, first noticed at around 9:30 AM but continuously present thereafter. Males flew constantly (none were observed perching), patrolling relatively short stretches

of the stream (clashing with or chasing each other on occasion) or hovering over particular spots. One of the males that was collected was caught by the simple method of holding the net behind it while it flew parallel to, but slightly slower than, the boat until it was completely inside the net. One female was collected flying over the stream. The water at this location is too deep to permit any collecting on the stream except from a boat, the stream is open canopy, approximately 6-10m wide in the part where the species was found and surrounded by disturbed swamp forest and alluvial (regularly flooded) forest.

Macrogomphus phalantus has seldom been recorded. It was described from Bakuan in West Kalimantan (Lieftinck 1935) and later recorded from Sumatra (Lieftinck 1954). Much later Dow (2016) recorded a single female from Sungai Samunsam in the Samunsam Wildlife Sanctuary in southwest Sarawak. The species has been recorded from Peninsular Malaysia but as noted by Dow (2016) these records require confirmation, see also Kosterin (2019) on the record in Asahina (1986). Kosterin (2019) described the subspecies *M. p. jayavarman* from Siem Reap Province in Cambodia. Kosterin's material was collected while hanging in trees close to a large lake (Lake Tonle) and he appears to believe that they breed in the lake. Lieftinck (1935) gives little information about the habitat where the type series of *M. p. phalantus* was collected (by L. Coomans de Ruiter) except that it was in "swampy forest", many other species were collected by Coomans de Ruiter at the same location and mentioned (or described) in publications by Lieftinck, where recorded the habitat is almost always given as "forest-marsh" or "swampy forest" but the species recorded from the area are a mixture of swamp forest species and stream species. The exception is that part of the type series of *Pseudagrion perfuscatum* Lieftinck, 1937 is from Bakuan and Lieftinck (Lieftinck 1937: 94) states (referring to all sites for the type series collectively) that it was "collected along small forest-brooks". It is likely that records from Bakuan are from several individual sites and although collecting may have been carried out in the forest it is entirely possible that there was a deep stream in the vicinity. However the above is speculation and it is not possible to determine the breeding habitat of *M. p. phalantus* from the information given by Lieftinck. The record in Dow (2016) was of a female caught while it was flying over a boat at the edge of the Samunsam River, with swamp forest and alluvial forest surrounding the river. The data from Sungai Lubai strongly suggest that *M. p. phalantus* breeds in lowland, open canopy streams with deep water, in Borneo such streams are typically surrounded by swamp forest and/or alluvial forest. One of the males from the type series was collected at dusk and RD had wondered if *M. p. phalantus* was mostly active at dusk but the records from Sungai Lubai argue against this.

Despite doubts over existing records of *M. phalantus* from Peninsular Malaysia, the species is likely to occur there. The general lack of records of the nominate subspecies is likely to be due in at least in part to a preference for streams with deep water where collection is only possible using a boat, similarly to *Dysphaea lugens*. However *M. phalantus* does appear to be a very locally occurring species, RD has sampled from a boat on deep water streams surrounded by swamp or alluvial forest in other parts of Sarawak (both near to the coast and further inland and including some at least superficially very similar to Sungai Lubai) and on larger streams and rivers in similar surrounds close to the coast in Brunei without seeing any sign of this species except at Sungai Lubai and Sungai Samunsam. More will be written about morphological details of the material from Sungai Lubai elsewhere,

but both sexes are generally in good agreement with the description given by Lieftinck (1935), the most obvious difference is that the short lateral stripe on the metepisternum of the holotype shown in Fig. 10 in Lieftinck (1935) is absent on all males collected from Sungai Lubai except one, where this stripe is faded and partly interrupted, however Lieftinck (1935: 202) notes that this stripe is "effaced" in the male paratype, so it is clearly a variable character. The measurements (mm) of the Sungai Lubai material are: males: Hw 32.5-34.5, abdomen plus appendages 42.5-43.5; females: Hw 36-37, abdomen plus appendages 42.5-44.5. Lieftinck gives the following for the type series of *M. p. phalantus*: male: Hw 33-34.5, abdomen plus appendages 40.5-41; female: Hw 35, abdomen 43.

9a – ♀, 12.iv.2022; ♂♂, ♀, 13.iv.2022.

74. *Macrogomphus* sp. *

This is the same taxon, seemingly distinct from *M. albardae* Selys, 1878, as that discussed briefly in Dow, Butler et al. (2021: 45-46). Two males were collected flying over shallow riffles on a stream in logged forest in generally overcast conditions in April, and a female was collected in flight over a different part of the same stream in June.

17a – ♂♂, 8.iv.2022; ♀, 28.vi.2022.

75. *Megalogomphus buddi* Dow & Price, 2020 *

16fii – ♂, 27.vi.2022. **21ki** – ♂, 2.vii.2022. **21kii** – ♂, 29.vi.2022.

76. *Microgomphus chelififer* Selys, 1858 *

8b – ♀, 1.iv.2022. **17a** – ♀, 28.vi.2022. **21i** – ♀, 3.vii.2022.

77. *Sieboldius japonicus* Selys, 1854

16fii – ♂, 27.vi.2022. **21ki** – ♂ (seen, not collected), 29.vi.2022.

Chlorogomphidae

78. *Chlorogomphus* sp. *

A single female was collected at a small stream in Gunung Buda NP and is so far unidentifiable to species.

21g – ♀, 5.iv.2022.

Macromiidae

79. *Epopthalmia vittigera* (Rambur, 1842) *

6a – ♂, 9.xi.2021. **9b** – ♂, 12.iv.2022. **16c** – ♂, 6.iv.2022.

80. *Macromia cincta* Rambur, 1842

6a – ♂♂, 9.xi.2021; ♂, 14.iv.2022. **9a** – ♂, 12.iv.2022; ♂♂, 13.iv.2022. **9b** – ♂, 12.iv.2022.

81. *Macromia cydippe* Laidlaw, 1922

One female was collected while flying low over a very shallow riffle in overcast conditions around midday in April 2022. A number of other *Macromia* individuals were seen in the same spot but frustratingly could not be caught, although a male *M. cydippe* was collected in June 2022 on a different part of the same stream where the female was caught.

17a – ♀, 8.iv.2022. **17b** – ♂, 30.vi.2022.

82. *Macromia* sp.

A single female, similar to that of *M. corycia* Laidlaw, 1922 but with some small but seemingly significant differences, was collected while it was flying over a shallow section at the bank of Sungai Mendalam. RD has similar females from locations in Kapit Division.

16fi – ♀, 27.vi.2022.

Synthemistidae83. *Macromidia fulva* Laidlaw, 1915 *

Almost abundant on a hill stream in logged kerangas in the Sungai Bakol area in November 2021, individuals were frequently disturbed from their hanging perches under overhanging branches and in vegetation at the side of the stream.

7b – ♂♂, 13.xi.2021.

84. *Macromidia genialis erratica* Lieftinck, 1948 *

Although seemingly more local in occurrence than *Macromidia fulva* the number of records of this species from Sarawak has been growing steadily and, given that it is generally more difficult to catch and less conspicuous than *M. fulva*, it is likely to be somewhat under-recorded.

21g – ♂, 5.iv.2022.

Libellulidae85. *Aethriamanta gracilis* (Brauer, 1878) *

12a – ♂, 13.xi.2021. **20a** – ♂, 3.vii.2022. **21a** – ♂, 28.vi.2022.

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

One male collected at location 8d in 2022 was hanging vertically under the stem of a plant emerging from the pond, atypical behaviour for this species, which normally perches horizontally.

8d – ♂♂, 10.xi.2021; ♂♂, 1.iv.2022. **16fiii** – ♀, 5.vii.2022. **17c** – ♂♂, 8.iv.2022; ♂, 28.vi.2022. **20a** – ♂, 3.vii.2022; ♂, 6.vii.2022. **21j** – ♀, 2.vii.2022.

87. *Brachydiplax chalybea* Brauer, 1868

5b – ♂, 8.xi.2021. **8d** – ♂, 10.xi.2021. **8e** – ♂, 10.xi.2021. **8f** – ♂, 10.xi.2021. **9b** – ♂, 12.iv.2022. **12a** – ♂, 13.xi.2021. **12b** – ♂♂, 3.iv.2022. **20a** – ♂, 3.vii.2022.

88. *Brachygonia oculata* (Brauer, 1878)

5a – ♂♂, 8.xi.2021; ♂♂, 2.iv.2022. **6bi** – ♂, 9.xi.2021. **6bii** – ♂, 9.xi.2021. **8e** – ♂, 10.xi.2021. **9a** – ♀, 12.iv.2022. **9cii** – ♂♂, ♀♀, 13.iv.2022.

89. *Cratilla lineata* (Brauer, 1878)

20a – ♂, 28.vi.2022. **21a** – ♂, 5.iv.2022.

90. *Cratilla metallica* (Brauer, 1878)

3c – ♂, 6.xi.2021. **4c** – ♂, 8.xi.2021. **8d** – ♂, 1.iv.2022. **8f** – ♀, 10.xi.2021. **12b** – ♂, 3.iv.2022. **17a** – ♂, 8.iv.2022. **21a** – ♂♂, 5.iv.2022.

91. *Lyriothemis biappendiculata* (Selys, 1878)

21g – ♂♂, 5.iv.2022.

92. *Lyriothemis cleis* Brauer, 1868

8b – ♀, 1.iv.2022. **14c** – ♂, 11.iv.2022. **21b** – ♂, 5.iv.2022. **21j** – ♀, 29.vi.2022.

93. *Nannophya pygmaea* Rambur, 1842

12a – ♂, 13.xi.2021. **14bi** – ♂, 3.iv.2022. **16fiii** – ♂♂, ♀, 5.vii.2022. **21a** – ♂♂, 28.vi.2022. **21b** – ♂, 5.iv.2022.

94. *Nesoxenia lineata* (Selys, 1879) *

4c – ♂♂, 8.xi.2021. **6bii** – ♂, 9.xi.2021. **9a** – ♀, 12.iv.2022; ♀, 13.iv.2022. **21cii** – ♂, 13.iv.2022. **21f** – ♀, 7.iv.2022.

95. *Neurothemis fluctuans* (Fabricius, 1793)

7a – ♂, 5.xi.2021. **8d** – ♂♂, ♀, 1.iv.2022. **8g** – ♂, 10.xi.2021. **9b** – ♂, 12.iv.2022. **12b** – ♀♀, 3.iv.2022. **13b** – ♂, 12.xi.2021. **14bi** – ♂, 3.iv.2022. **16b** – ♂, ♀♀, 6.iv.2022. **16d** – ♂, 6.iv.2022. **16fii** – ♀, 5.vii.2022. **16fiii** – ♀, 5.vii.2022. **17c** – ♂, 8.iv.2022; ♂♂, 28.vi.2022. **21a** – ♂, 5.iv.2022. **21b** – ♂♂, ♀♀, 5.iv.2022. **21ki** – ♀, 2.vii.2022. **21kii** – ♀, 29.vi.2022.

96. *Neurothemis ramburii* (Brauer, 1866) *

4a – ♀, 8.xi.2021. **8a** – ♂, 1.iv.2022. **8i** – ♂♂, 1.iv.2022.

97. *Neurothemis terminata* Ris, 1911

A male and female from Gunung Buda NP are somewhat atypical and require further study, but are listed under *N. terminata* here to avoid unnecessary inflation of the number of species recorded.

17c – ♀, 28.vi.2022. **21b** – ♂, ♀, 5.iv.2022.

98. *Onychothemis coccinea* Lieftinck, 1953 *

17a – ♂♂, 28.vi.2022. **17b** – ♂, 30.vi.2022. **21ki** – ♂, 29.vi.2022; ♂♂, 2.vii.2022.

99. *Onychothemis culminicola* Förster, 1904 *

9a – ♂♂, 13.iv.2022. **16fi** – ♂♂, 27.vi.2022. **16fii** – ♂♂, 5.vii.2022.

100. *Orchithemis pulcherrima* Brauer, 1878

6bi – ♀♀, 9.xi.2021. **6bii** – ♀, 9.xi.2021. **7b** – ♀, 13.xi.2021. **9b** – ♀, 12.iv.2022. **9cii** – ♂, 13.iv.2022. **16d** – ♂, 6.iv.2022. **17c** – ♂, 8.iv.2022; ♂, 28.vi.2022. **18** – ♂, 1.vii.2022. **20a** – ♂+♀, 3.vii.2022; ♂♂, 6.vii.2022. **21b** – ♀, 5.iv.2022. **21f** – ♂, 7.iv.2022.

101. *Orthetrum chrysis* (Selys, 1891)

4c – ♂, 8.xi.2021. **8d** – ♂, 10.xi.2021; ♂♂, 1.iv.2022. **14bi** – ♂, 3.iv.2022. **16fi** – ♂, 27.vi.2022. **16fiii** – ♂, 5.vii.2022. **17a** – ♂, 28.vi.2022. **21f** – ♂, 7.iv.2022. **21g** – ♂, 5.iv.2022. **21ki** – ♂, 2.vii.2022.

102. *Orthetrum glaucum* (Brauer, 1865)

14a – ♂, 11.iv.2022. **15c** – ♂, 11.xi.2021. **16b** – ♂♂, 6.iv.2022. **16fii** – ♂♂, 5.vii.2022. **17b** – ♀, 30.vi.2022. **18** – ♂, 1.vii.2022. **21b** – ♂, 5.iv.2022.

103. *Orthetrum pruinosum schneideri* Förster, 1903

14a – ♂, 13.iv.2022. **21g** – ♂, 5.iv.2022.

104. *Orthetrum sabina* (Drury, 1773)

12a – ♀, 13.xi.2021. **12b** (on path leading to) – ♂, 3.iv.2022. **13b** – ♀, 12.xi.2021.

14a – ♀, 3.iv.2022. **16b** – ♂♂, 6.iv.2022. **16fi** – ♀, 27.vi.2022. **16fiii** – ♂♂, ♀, 5.vii.2022. **20a** – ♂♂, 3.vii.2022.

105. *Orthetrum testaceum* (Burmeister, 1839)

9a – ♀, 12.iv.2022; ♀, 13.iv.2022. **13b** – ♂, 12.xi.2021. **14a** – ♂, 11.iv.2022. **14bi** – ♂, 3.iv.2022. **16b** – ♂♂, 6.iv.2022. **16fi** – ♀, 27.vi.2022. **16fiii** – ♀, 5.vii.2022. **17a** – ♂, 8.iv.2022. **17b** – ♀♀, 30.vi.2022. **18** – ♂♂, ♀, 1.vii.2022. **20a** – ♀, 3.vii.2022. **21b** – ♀♀, 5.iv.2022; ♀, 7.iv.2022. **21ki** – ♂♂, ♀♀, 2.vii.2022. **21kii** – ♂♂, ♀, 29.vi.2022.

106. *Pantala flavescens* (Fabricius, 1798)

17a – ♂, 28.vi.2022.

107. *Pornothemis serrata* Krüger, 1902 *

The fact that three almost cryptic species have been lumped together under *Pornothemis serrata* was most recently commented on by Dow, Ahmad et al. (2021). A revision of this complex is in preparation but here we can say that it has now become possible to determine which of the three is the true *serrata* and that two males from the Ulu Mendalam area are the true *P. serrata*.

16d – ♂, 6.iv.2022. **20a** – ♂, 6.vii.2022.

108. *Pornothemis* sp. cf *serrata* Krüger, 1902

One of the other two species in the *Pornothemis serrata* complex.

6a – ♂, ♀♀, 9.xi.2021. **9b** – ♂♂, ♀, 12.iv.2022.

109. *Pornothemis starrei* Lieftinck, 1948 *

This is a seldom recorded species, known from scattered published records from Borneo, Singapore and Sumatra. The species has been found in nipa palm dominated streams and rivers and in mangrove. In April 2022 it was found both on the nipa lined Sungai Buang Alang and along the banks of the Limbang River where it was not associated with nipa palm. This appears to be another species that is mostly found at deep water, apparently preferring tidally influenced streams and rivers. The record here is the second from Sarawak, where it had only been found at Sungai Samunsam before, however it is likely to be common in coastal areas and it can reasonably be expected to occur in Peninsular Malaysia as well.

10 – ♂♂, ♀♀, 14.iv.2022. **11** – ♂♂, ♀, 14.iv.2022.

110. *Rhodothemis rufa* (Rambur, 1842) *

6a – ♂, 9.xi.2021. **9b** – ♂, 12.iv.2022. **12b** – ♂, 12.xi.2021.

111. *Rhyothemis aterrima* Selys, 1891 *

6a – ♂, 14.iv.2022. **9b** – ♂♂, 12.iv.2022. **10** – ♂♂, ♀, 14.iv.2022.

112. *Rhyothemis obsolescens* Kirby, 1889

6a – ♂♂, ♂+♀, 9.xi.2021; ♂, ♀, 14.iv.2022. **9b** – ♂, 12.iv.2022. **20a** – ♂, 3.vii.2022; ♂, 6.vii.2022. **21a** – ♂, 28.vi.2022.

113. *Rhyothemis phyllis* (Sulzer, 1776) *

9b – ♂♂, 12.iv.2022.

114. *Rhyothemis triangularis* Kirby, 1889 *

12a – ♂, 13.xi.2021. **21a** – ♂, 28.vi.2022.

115. *Risiophlebia dohrni* (Krüger, 1902) *

21b – ♀ ♀, 5.iv.2022. **21f** – ♂, 7.iv.2022.

116. *Tetrathemis flavescens* Kirby, 1889 *

Another seldom recorded species. The female from Sungai Lubai (9a) was perched high over the stream in overcast conditions but the breeding habitat will surely be in the surrounding swamp forest.

9a – ♀, 12.iv.2022. **21f** – ♂, 7.iv.2022.

117. *Tetrathemis hyalina* Kirby, 1889

8d – ♂ ♂, 1.iv.2022. **8e** – ♂, 10.xi.2021. **9b** – ♂ ♂, 12.iv.2022. **12b** – ♂, 12.xi.2021.

16d – ♂ ♂, 6.iv.2022. **17c** – ♂, 28.vi.2022. **20a** – ♂ ♂, ♀, 3.vii.2022; ♂, ♀, 6.vii.2022.

118. *Trithemis aurora* (Burmeister, 1839)

13b – ♂, 12.xi.2021. **14a** – ♂ ♂, 11.iv.2022. **14bi** – ♂, 3.iv.2022. **16c** – ♀, 6.iv.2022.

20a – ♂, 3.vii.2022. **21a** – ♂, 28.vi.2022.

119. *Trithemis festiva* (Rambur, 1842)

8a – ♂, 10.xi.2021; ♂, 1.iv.2022. **14a** – ♂ ♂, 11.iv.2022. **14bi** – ♂ ♂, 3.iv.2022. **17a**

– ♂, 28.vi.2022. **17b** – ♂ ♂, 30.vi.2022. **17d** – ♂ ♂, 8.iv.2022. **18** – ♂ ♂, 1.vii.2022.

20b – ♂, 6.vii.2022. **21i** – ♂ ♂, 3.vii.2022. **21kii** – ♂, 29.vi.2022.

120. *Tyriobapta torrida* Kirby, 1889

8d – ♂, 1.iv.2022. **12b** – ♂ ♂, 3.iv.2022. **12c** – ♂, 3.iv.2022. **16d** – ♂, 6.iv.2022. **17c**

– ♂, ♀, 8.iv.2022; ♂, 28.vi.2022. **20a** – ♂, ♀, 6.vii.2022. **21a** – ♂, 28.vi.2022. **21f**

– ♂ ♂, 7.iv.2022. **21g** – ♂ ♂, 5.iv.2022. **21kiii** – ♂ ♂, ♀ ♀, 29.vi.2022.

121. *Urothemis signata insignata* (Selys, 1872) *

6a – ♂ ♂, 9.xi.2021; ♂, 14.iv.2022. **14a** – ♂, 3.iv.2022.

122. *Zygonyx ida errans* (Lieftinck, 1953)

17b – ♂ ♂, 30.vi.2022. **18** – ♂, 1.vii.2022. **21ki** – ♀, 29.vi.2022; ♂ ♂, 2.vii.2022.

123. *Zygomma obtusum* Albarda, 1881 *

This species appears to be very common around the Melaban longhouse, where individuals (most not collected) were found at lights almost every night during our stays there.

16e – ♂, 6.iv.2022; ♂, 8.iv.2022; ♀, 27.vi.2022; ♂, ♀ ♀, 28.vi.2022; ♀, 2.vii.2022.

124. *Zygomma petiolatum* Rambur, 1842 *

9b – ♂ (immature), 12.iv.2022. **16e** – ♀, 2.vii.2022.

Discussion

The last count of species recorded from Limbang Division was in Dow & Choong (2021): 123 species. In total 124 species were recorded during the three surveys made in 2021-2022, 50 of these were first records for the division, bringing the number of species of Odonata known from Limbang to 173. Three of the new additions for Limbang were also first records for Sarawak (*Libellago phaethon*, *Rhinocypha humeralis* and *Oligoaeschna platyura*). A large increase in records with even short surveys in the lowlands of Limbang is not surprising, nor (as already pointed out under the species heading above) was the discovery of *Rhinocypha humeralis* in the division. *Oligoaeschna platyura* could also have

been predicted to occur in Limbang Division based on its occurrence in Brunei and Dow & Choong (2021) only refrained from mentioning it in this context because the Bornean *Oligoaeschna* are so infrequently collected even by experts that it might have been many years before the species was actually found in Limbang. In contrast, the presence of *Libellago phaethon* in Limbang Division was a complete surprise (see under the species heading above). The discovery of a large population of *Macrogomphus phalantus* not far from Limbang town was another pleasant surprise. Less surprising but still notable records made during the surveys include *Dysphaea lugens*, *Coeliccia kenyah*, the black form of *Copera vitata*, *Argiocnemis rubescens rubeola* (not generally common in Sarawak), *Teinobasis cryptica*, *Macrogomphus* sp., *Chlorogomphus* sp., the true *Pornothemis serrata* and *Pornothemis starrei*. Dow & Choong (2021) pointed out that one further species that has not yet been recorded in Sarawak, *Mortonagrion alcyone* (Laidlaw, 1931), is likely to be present in Limbang. However despite the presence of similar habitats to those where the species has been recorded in East Kalimantan, Sabah and Brunei at sites surveyed in 2021-2022 we have yet to find *M. alcyone* in Limbang Division. All of the locations surveyed in 2021-2022 are in Limbang District; RD had originally planned on making some surveys in Lawas District (bordering Sabah) as well, but because of logistical complications these surveys were dropped from the schedule. Surveys in Lawas District are still highly desirable, hopefully it will be possible to make such surveys within the next few years.

This report includes the first records of Odonata from Gunung Buda NP (a checklist is given in the appendix), where 76 species have been found so far. Since even now relatively few days of sampling have been conducted within Gunung Buda NP, this total can be expected to rise considerably with further work. Gunung Buda NP is very close to the northernmost parts of Gunong Mulu NP, these parts of the latter national park have been less well studied than the area accessible from the park headquarters in Miri Division. Given the proximity of the two protected areas it is likely that most species such as *Rhinocypha humeralis* that are now known to occur within Gunung Buda NP but which have not yet found in Gunong Mulu NP will eventually be found in the northernmost part of Gunong Mulu NP.

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Appendix: Checklist of Odonata known from Gunung Buda National Park

Zygoptera

Platystictidae

1. *Drepanosticta* sp. cf. *dentifera* Kimmins, 1936
2. *Drepanosticta rufostigma* (Selys, 1886)
3. *Protosticta versicolor* Laidlaw, 1913
4. *Telosticta* sp.

Euphaeidae

5. *Dysphaea dimidiata* Selys, 1853
6. *Euphaea impar* (Selys, 1859)
7. *Euphaea subcostalis* Selys, 1873
8. *Euphaea tricolor* Selys, 1859

Devadattidae

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

Philosinidae

10. *Rhinagrion borneense* (Selys, 1886)

Argiolestidae

11. *Podolestes orientalis* Selys, 1862

Calopterygidae

12. *Neurobasis longipes* Hagen, 1887
13. *Vestalis amabilis* Lieftinck, 1965
14. *Vestalis amaryllis* Lieftinck, 1965
15. *Vestalis amoena* Hagen in Selys, 1853

Chlorocyphidae

16. *Heliocypha biseriata* (Selys, 1859)
17. *Libellago hyalina* (Selys, 1859)
18. *Libellago stictica* (Selys, 1859)
19. *Rhinocypha cucullata* Selys, 1873

20. *Rhinocypha humeralis* Selys, 1873

21. *Sundacypha petiolata* (Selys, 1859)

Platycnemididae

22. *Coeliccia borneensis* (Selys, 1886)

23. *Coeliccia kenyah* Dow, 2010

24. *Coeliccia* sp. cf *nemoricola* Laidlaw, 1912

25. *Coeliccia nigrohamata* Laidlaw, 1918

26. *Coeliccia roberti* Dow, 2020

27. *Copera vitatta* (Selys, 1863)

28. *Elattoneura analis* (Selys, 1860)

29. *Prodasineura dorsalis* (Selys, 1860)

30. *Prodasineura hosei* (Laidlaw, 1913)

31. *Prodasineura hyperythra* (Selys, 1886)

32. *Prodasineura verticalis* (Selys, 1860)

Coenagrionidae

33. *Aciagrion borneense* Ris, 1911

34. *Amphicnemis wallacii*-group

35. *Amphicnemis remiger* Laidlaw, 1912

36. *Archibasis tenella* Lieftinck, 1949

37. *Argiocnemis* sp.

38. *Ceriagrion cerinorubellum* (Brauer, 1865)

39. *Stenagrion dubium* (Laidlaw, 1912)

40. *Teinobasis cryptica* Dow, 2010

41. *Xiphiagrion cyanomelas* Selys, 1876

Anisoptera

Aeshnidae

42. *Oligoaeschna platyura* Lieftinck, 1940

Gomphidae

43. *Burmagomphus arthuri* Lieftinck, 1953

44. *Burmagomphus insularis* Laidlaw, 1914

45. *Gomphidia maclachlani* Selys, 1873

46. *Heliogomphus borneensis* Lieftinck, 1964

47. *Leptogomphus coomansi* Laidlaw, 1936

48. *Megalogomphus buddi* Dow & Price, 2020

49. *Microgomphus chelifer* Selys, 1858

50. *Sieboldius japponicus* Selys, 1854

Chlorogomphidae

51. *Chlorogomphus* sp.

Synthemistidae

52. *Macromidia genialis erratica* Lieftinck, 1948

Libellulidae

53. *Aethriamanta gracilis* (Brauer, 1878)
54. *Agrionoptera insignis* (Rambur, 1842)
55. *Cratilla lineata* (Brauer, 1878)
56. *Cratilla metallica* (Brauer, 1878)
57. *Lyriothemis biappendiculata* (Selys, 1878)
58. *Lyriothemis cleis* Brauer, 1868
59. *Nannophya pygmaea* Rambur, 1842
60. *Nesoxenia lineata* (Selys, 1879)
61. *Neurothemis fluctuans* (Fabricius, 1793)
62. *Neurothemis terminata* Ris, 1911
63. *Onychothemis coccinea* Lieftinck, 1953
64. *Orchithemis pulcherrima* Brauer, 1878
65. *Orthetrum chrysis* (Selys, 1891)
66. *Orthetrum glaucum* (Brauer, 1865)
67. *Orthetrum pruinatum schneideri* Förster, 1903
68. *Orthetrum testaceum* (Burmeister, 1839)
69. *Rhyothemis obsolescens* Kirby, 1889
70. *Rhyothemis triangularis* Kirby, 1889
71. *Risioephlebia dohrni* (Krüger, 1902)
72. *Tetrathemis flavescens* Kirby, 1889
73. *Trithemis aurora* (Burmeister, 1839)
74. *Trithemis festiva* (Rambur, 1842)
75. *Tyriobapta torrida* Kirby, 1889
76. *Zygonyx ida errans* Lieftinck, 1953

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