

Expedition to Mount Dulit, Sarawak, August-September 2008

- Odonata -

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Introduction

This is a report on a short expedition to Mount Dulit, Sarawak, conducted by Dr. Rory Dow and Mr. Graham Reels in late August, and early September, 2008. The

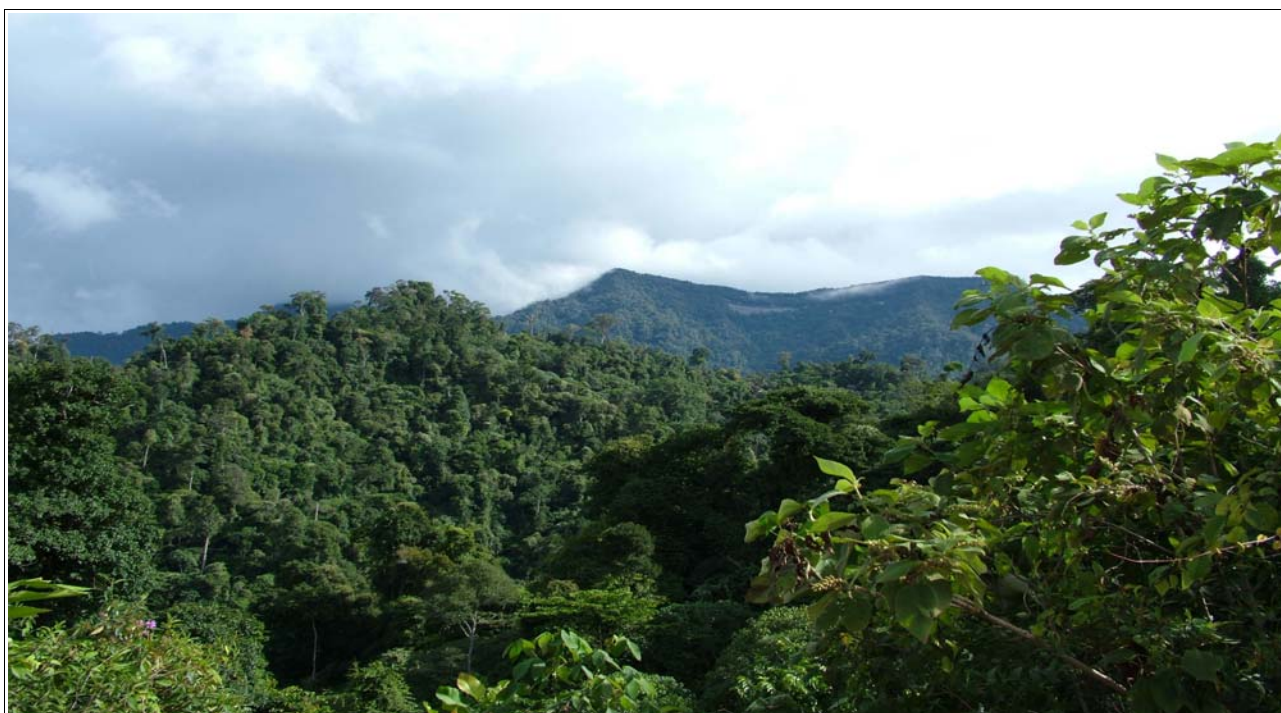


Fig. 1: The Dulit Range – Photography by R.A. Dow

objective of the expedition was to survey Odonata on the mountain, with particular attention to reconfirming the presence of a number of species (*Rhinoneura caerulea* [Chlorocyphidae], *Bornargiolestes nigra* [Megapodagrionidae], *Drepanosticta dulitensis*, *D. forficula*, & *D. dentifera* [Platystictidae] and *Orthetrum*



borneense [Libellulidae]) originally described from Mt. Dulit by Kimmins (1936), from material collected by members of an Oxford University Expedition to Sarawak in 1932 (Harrison 1933). The mountain was not re-visited by odonatologists until 2006.

Mount Dulit is in fact a 50km long ridge, reaching a maximum elevation of ca 1,400m, located along the southern bank of the Tinjar River in northeastern Sarawak. Along much of this ridge, on the Tinjar side, there is a sheer cliff at about 1,000m, rendering access to the upper elevations difficult. The ridge, at least at lower elevations, was logged in the post-war years, until the early 1990s. This effectively destroyed many land-marks used by the local villagers to navigate to the ridge top. An earlier, self-funded, expedition to Dulit by the authors, in April 2006, was unsuccessful in terms of reaching high altitude, owing to the local guides (from the longhouse settlement of Long Aton) being unable to find a route up beyond 500m.

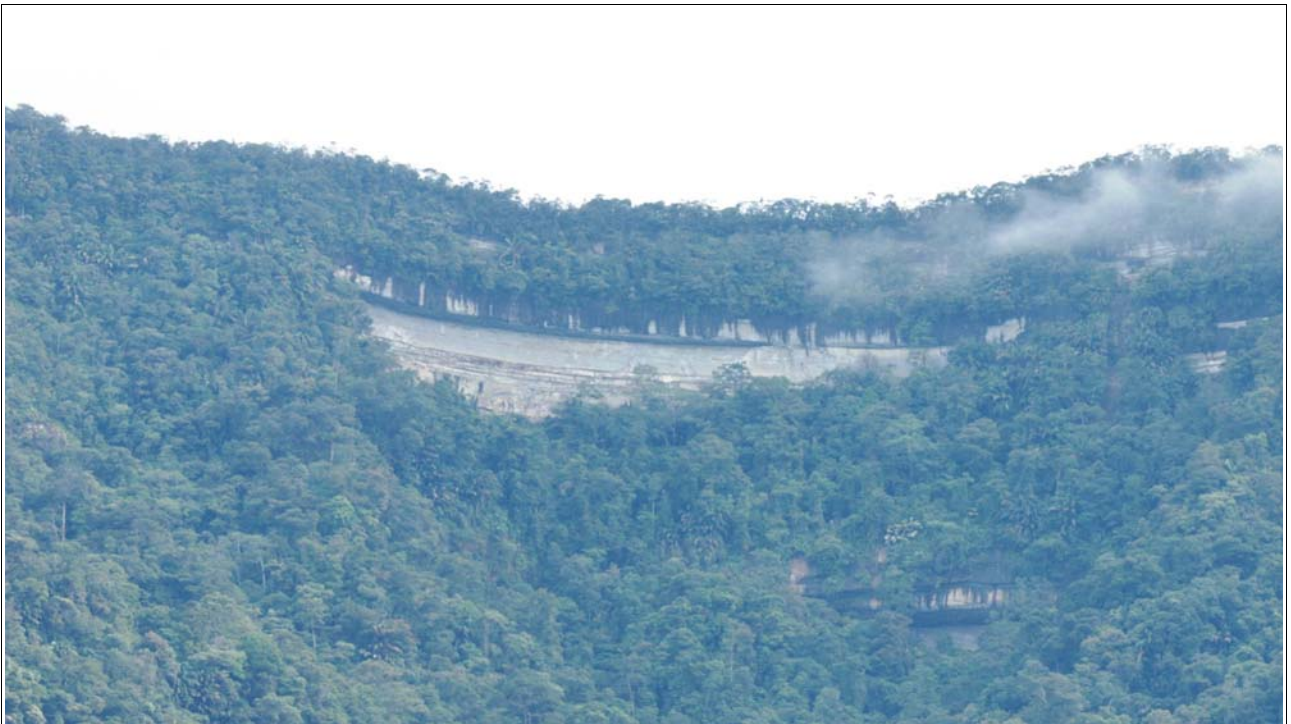


Fig. 2: The cliff below the summit of the Dulit Range – Photography by G.T. Reels

Following an hiatus of nearly two decades, selective logging activities, using helicopters, have resumed since 2006, giving greater urgency to the authors' objective of 'rediscovering' the montane *Rhinoneura caerulea* and various other odonate species not recorded, at least on Mt. Dulit, since their discovery in the 1930s.

The present expedition was generously sponsored by the International Dragonfly Fund. The following is an informal account of the 2008 expedition. An annotated list of odonate species recorded at Mount Dulit is provided in the Appendix.



The Mount Dulit Expedition, August 2008

The authors flew into Miri, in northeastern Sarawak, on the evening of 22nd August 2008. Our friends and expedition organizers John Barah and Luke Southwell were waiting for us at the airport. Luke drove us to our budget hotel in Miri. In the evening, Luke and John briefed us on the expedition details, indicating that our Long Aton guides had found a promising route, which might take us to the summit of the Dulit ridge. This news was actually rather disturbing, as our understanding up until this point had been that a route to the summit had already been found. Unfortunately the lines of communication between Long Aton and researchers living outside of Sarawak are somewhat tortuous, and information sometimes becomes distorted.

On 24th August we departed for Long Aton. Our transport was a 4WD, driven by John's nephew Simon, piled up with equipment and provisions for a 6 day camp, with 7 guides/porters, on the heights of Mt Dulit. Beside Simon and ourselves, Luke accompanied us as a translator, collector, cook, entertainer and general 'get things done' guy.



Fig. 3: Dulit expedition personnel: left to right: Mathias, Merang, Manan, Simon (driver), Binang, Rory, Galup, Graham, Richard, Simon – Photography by Luke Southwell

Our route took us through the small town of Lapok on the Tinjar. Lapok is sometimes described as a cowboy town, and does have a sort of frontier atmosphere.



It is the gateway to the network of logging roads that provide the only ground vehicle access to both the Upper Baram and Tinjar areas of Sarawak. Unfortunately part of the road to Lapok is very badly pot-holed; it is considered by many to be the worst state-maintained road in Malaysia. After Lapok we got onto the relatively good logging roads some time before 1400h. The sun was out and the views were occasionally spectacular, as we wound our way south along the west bank of the Tinjar valley.

We were making good progress and by 1530h we had reached Simon's wife's longhouse, where we had coffee and Simon picked up his shotgun and cartridge belt, hoping to shoot something on the road as he came back in the evening. We were now just an hour from Long Aton, and shortly after resuming our journey we caught our first glimpse of the northern end of the Dulit Range, with the exposed cliff outcropping a couple of hundred metres below the ridge. This was a view we hadn't had on our first trip to Long Aton, in 2006, when we arrived by a different route, on the opposite side of the Tinjar.

We eventually got to Long Aton at 1630h. The majority of the inhabitants of Long Aton are Kenyah, but a number of Penan live there as well; these Penan were nomadic hunter gatherers a generation or two ago. Simon went off to rustle up some porters, and returned shortly with Matthias (who had guided us in 2006, and had been nominated head porter and guide for this expedition), and half a dozen others.

We walked the short distance to Penghulu Joseph's house, where we were greeted warmly by Joseph (the paramount chief of the upper Tinjar longhouses) and his wife, and spent a couple of hours relaxing on Joseph's recently expanded verandah, from where there is a splendid view of the Dulit Range.

In the evening we were joined by the seven porters who were to take us up the mountain for a briefing, led by Luke and Joseph. We all sat on the floor of the verandah, passing round cigarettes and rum, for a couple of hours, while Luke explained what we needed, our reasons for being at Dulit, and gently defused an embryonic power struggle between Matthias (who is Penan) and a Kenyah chap, Merang, who clearly felt that he ought to be in charge. Things were resolved amicably (we hoped) and the meeting broke up about 2200h.

On the next morning, Luke busied himself with the canvas cover for our campsite, repairing holes, measuring, etc. He was going to stay around Joseph's house for the day, organizing the packing of the camp equipment into small parcels to be distributed among our seven porters.

In the mean time, we set out for an easy day's fieldwork exploring streams and ponds in the vicinity of Long Aton. It was a fiercely hot day and we took refuge in



the shade of small forest streams as much as possible. It was a good day for pond species, however, and we vouchered quite a few specimens, including a number of new records for the Dulit area. Later, on a rocky hillstream at about 100m on the lower slopes of Mt Dulit, we got some specimens of a long *Protosticta* species, still undescribed but quite common over a large part of Sarawak and originally discovered in Brunei.

On the 26th August, the guides/porters arrived early to pack their baskets for the expedition. Simon took them on ahead in his 4WD to the start of the trail, some 5km away. The authors and Luke had a light breakfast, then the three of us set off on foot along the Long Aton access road at about 0830h. Simon picked us up after we'd gone about 1km, and we linked up with the rest of the team after a rather frenetic drive. A group photo was taken, and then we plunged into the bush.



Fig. 4: *Lyriothemis cleis* – Photography by G.T. Reels

After about 20 minutes walking, we passed the site of our 2006 camp. In 2006, when the logging road here was unusable, it had taken a short boat trip and a 2-3 hour trek to reach this spot, so there were some benefits to the resumption of logging in the area. The porters were very heavily laden, and progress was slow, with frequent rest stops. At about 1300h, at an altitude of ca. 420m, Matthias said we should stop to make camp. The sleeping area was constructed at the edge of a clearing, while Luke and one of the Penan prepared a cooking/eating



site a little down the slope, in the forest and closer to the nearby stream. The authors took the opportunity to search for odonates in the vicinity. Graham photographed a female *Lyriothemis cleis* in another clearing 100 yards from our camp. Upon our return, Luke gave us a hot coffee, which was gratefully received. A bracing bath in the stream followed, during which Rory discovered a leech in his groin, the first of many.

The following day we rose at around 0600h. Our plan was to walk up, past the obstacle of a large waterfall, and make base camp as high up as possible. At 0915h we had broken camp and we set off up the mountain. The Penan led the way. After we had gone a short distance they stopped and the youngest, Galup, felled a tree sapling, then stripped the bark off in belt-width lengths. These were used to make new head straps for Matthias and Galup's baskets. The Kenyah did not use head straps on their wicker baskets.

We made good progress, reaching a stream with a waterfall at 600m by 1130h. A rope was hung over a steep rocky face at the side of the stream, which was scaled without mishap. Matthias had warned that there was a difficult bit involving climbing just above the waterfall. This was eventually reached after first negotiating some rickety wooden ladders built up the side of a cliff, with a 100ft drop below. There was a quite striking difference in the quality of the forest here compared with that lower down where timber had been removed using tractors. The forest we were in now had been logged using helicopters to remove the timber; the economics of this appear to favour the removal of fewer trees, and the whole process is less destructive to the forest as a whole.

After these obstacles, the going was relatively easy as we hit a ridge. We reached a point near a small stream, about 800m up the mountain, at 1300h. Matthias said we would camp here, so we spent most of the afternoon exploring the stream. The stream was typical of mountain streams in Sarawak in that it was steep and difficult to work in, with numerous obstacles that required us to take detours into the forest. We had *Vestalis beryllae*, a problematic *Drepanosticta* species (but certainly one not recorded on Dulit before) and several *Coelliccia* from the *borneensis* group of species; we saw no Anisoptera.

The next day (28th August) we got up about 0630h, had brekkie, did some laundry at the stream, and set off with Luke, Matthias, two of the Kenyah and two Penan, further up the ridge. Unfortunately, we didn't get very far, reaching an altitude of just ~920m before coming up against an impassably narrow and steep section. It was obvious we were on a spur off the main Dulit ridge, so we cut along the cliff face hoping to pick up a stream that we could follow higher up onto the main mountain. Again, we didn't get very far (and lost a lot of altitude) before things became rather too difficult, so Luke, Matthias and another of the Penan went on trying to find a route, while the authors explored a small stream for a few hours with Simon (not the same Simon as our driver), Merang and Ga-



lup. We got a few nice platystictids including *Drepanosticta forficula*, several *Coeliccia*, a *Pericnemis triangularis* on the ridge, and a *Tetracanthagyna* female.



Fig. 5: *Coeliccia* - male from the *borneensis* group - Photography by G.T. Reels

We got back to camp around 1520h. The camp had been improved considerably, with a dinner table and better specimen-processing table. Luke came back from the stream announcing that he'd just caught and eaten a crab. He has also eaten a leech in the past. The guides and porters had by now all realized that Luke is slightly mad.

On the 29th August, Luke, Matthias and the other Penan set off fairly early to try to find a route to higher ground than yesterday, for us to attempt on the 30th. We spent the day exploring small streams and depressions near the camp site. The three Kenyah stayed around the camp, apart from Simon, who set off to the stream from yesterday to collect dragonflies (he got more than we did). We did see a spectacular group of hornbills. Gibbons were calling on the previous day, but we didn't hear them on this day.

On the 30th, we rose rather late (about 0700h), had breakfast, and struck out with Simon, Richard and Manan (one of the Penan) for a stream that Luke, Matthias and Manan had got to the day before. The trail cut across the mountain-side and was very slippery and muddy. It also had a lot of leeches. There was a cliff face perhaps 30m high. Luke and Matthias had already fixed a rope up it, which was good because we couldn't have got up there without it. When we eventually reached the stream it was still only 1000h, and cloudy, so we sat and waited for the sun.



After an hour or so, things started happening, and we picked up several *Drepanosticta dulitensis* (the first reconfirmation that it is still on Dulit), *Idionyx* and a *Bornargiolestes* female. Not a bad haul. At an upstream waterfall, which we couldn't get up, Rory thought he glimpsed a *Rhinoneura*, which was very frustrating but also promising, if only we could get a bit higher.



Fig. 6: *Drepanosticta dulitensis*, rediscovered on its namesake mountain – Photography by G.T. Reels

Rory had lost a lot of skin off the sole of his left foot, and was weakened by diarrhoea, which potentially meant that he would be unable to go far on the next day. It was quite a subdued night and we turned in quite early.

On the morning of the 31st, it was decided that Graham would go back to yesterday's site with Simon, in order to try to find a way up past the waterfall, while Rory went to some streams a bit higher up, but easier to reach, which Luke and Matthias had found the day before.

The trail to the roped cliff was even more muddy and slippery by now, and climbing up was more difficult than yesterday. Shortly afterwards, Simon and Graham split off from the others, and after some more difficult scrambling reached yesterday's stream at about 1100h. Simon went to see if he could find a route above the waterfall – difficult, because the ravine was narrow and steep-sided, with lots of exposed cliff face. He returned at 1130h, saying he had found a



route, but was worried that it might be too difficult for Graham. “You have children already,” he said, “You must think of them.” This didn’t exactly inspire confidence, but Graham said let’s take a look anyway. Simon obligingly led him up a perilous slope, with drops of 10m to the stream below, and slippery mud. There were two hair-raising climbs. Graham managed to get up them with a little help from Simon, however, and presently was stood at the top of the waterfall.

Unfortunately, it soon became obvious that it was hopeless trying to get further up the stream because there was another waterfall ahead, and then yet another beyond that. Still below 1,000m, and giving up on the idea of gaining greater altitude in quest of *Rhinoneura*, Graham spent a couple of hours searching the accessible section of stream, but it was overcast and all he could get was a female *Drepanosticta dulitensis*, a female *Devadatta podolestoides*, a male *Coelellicia* and *Vestalis beryllae*.

Rory, meanwhile, had had a similar lack of success at the other streams, which, it transpired, disappeared very quickly from the point at which Luke and Mathias had spotted them. However some useful material was collected, including a few larvae.

By now we were both absolutely exhausted and not relishing the prospect of going back down the roped cliff. This descent proved to be nightmarish – easily losing one’s footing and having to cling madly to the rope in order to avoid plummeting to almost certain death. The sure-footed Simon came down last and had to roll up the rope as he descended.

We eventually got back to camp at 1630h, drank a much-needed cup of coffee, and painfully descended the muddy slope to the small stream pool that served as our bath.

The following morning, we all had breakfast and then the guys started dismantling the camp. It was time to descend from the mountain. At about 1000h we were ready to start our descent. Very soon, it seemed, we reached the steep cliff section that was followed by the two rickety wooden ladders, all over a deadly drop. A rope was tied from the top to where the ladders started and we struggled our way down. We continued our descent along the side of the fast-flowing boulder river, and negotiated the short section of roped rock face without incident. We went on down past the site of our lower camp and eventually into gently descending country, with a growing sense of relief that we had managed to get off the mountain without anyone sustaining any serious injuries. It was a very arduous walk, however, and by the time we reached the logging road again, at 1400h, we were both completely shattered. We waited around in the shelter of an abandoned logging hut, too tired to do much more than totter down to the river to wash the mud from our shoes, for an hour, until Simon (the



driver) showed up with his lovely air-conditioned 4WD. We all squeezed in happily and drove the 5km or so back to Long Aton.

We had a quiet dinner with Joseph and his wife, then the chaps all started arriving to receive their payment. We had decided to give everyone a bonus because we were so impressed with the hard work and diligence that all of them had shown. Luke made this announcement in Joseph's sitting room, where we had all gathered, and it was received with a round of applause. Then we took it in turns to make a speech thanking everyone. It all went down very well. Then it was time to go across to the longhouse for the evening's festivities.

We sat down with Simon, by now a valued friend, on the long verandah. Luke, Joseph and his wife had also come over, and after some 15 minutes or so there was a fairly sizeable number of families bringing food along for the communal dinner. Matthias and another chap had brought along their Sape'ks (traditional stringed instruments) and were playing some nice music, which was pleasant. The food was cleared away, and then a few warrior dances were performed. Then the long dance started, and we were cajoled into joining in. It was led by the second Sape'k player, followed by Merang, several women, and us. We shuffled along up and down the verandah, trying to stay in step with the others, for a very long time – maybe half an hour. Relieved when the dance finally ended, we sat down again with Simon, but were almost immediately called upon to perform a warrior dance. A succession of dances by women of the longhouse, brandishing handfuls of hornbill feathers, followed. Very beautiful. A welcoming speech came next, delivered by Simon's uncle (who warned us that we must stay there drinking and dancing until dawn), and we then stood up and Rory made a speech thanking the people of Long Aton for their warm welcome and hospitality. Graham made further suitable remarks, and Rory then presented Joseph with a cash gift for the longhouse fund.

At about quarter to two, the fatigue was really starting to hit us, and we finally dragged ourselves away. Our departure was not resisted and probably Simon, Merang and Richard were by now also feeling tired, in spite of having threatened to keep us there until the morning.

A few hours later, we did our packing, had breakfast with Joseph, and finally started moving the bags, with Simon and Matthias's help, up to the vehicle at about 1130h. Then we said goodbye to Long Aton for the time being, but we will have to return one day in the not-too-distant future. The expedition, although partially successful, failed to realize its ultimate aim of getting above 1,000m on the mountain and reconfirming the presence of all the Dulit endemics. However, much extremely useful material was collected; *Coelliccia* specimens from the *borneensis*-group have already proved invaluable in a revision of the group (Dow 2009).



Epilogue 1

After returning from Dulit to Miri, Rory made a trip to Gunung Mulu National Park. One of the objectives of this trip, which would not have been made without the IDF grant that took us to Mount Dulit, was to collect at above 1,000m on Gunung Mulu (which is over 2,000m). Rory had collected at 1,300-1,500m on this mountain in 2005, but in poor weather conditions; only one species (*Coeliccia* sp. cf. *nemoricola*) was found. On the September 2008 attempt two further species were recorded above 1,300m – the elusive *Procordulia fusiformis* and one of the species we had been looking for on Dulit, *Orthetrum borneense*. The preferred habitat of the latter was a small peaty forest pool, where males would descend from the canopy, and if undisturbed make a few passes around the pool, perch for a few minutes and then depart back into the canopy. There must be considerably more species of Odonata awaiting discovery at high altitudes on Gunung Mulu, but the most accessible stream habitats on the route to the summit are all on the face of the mountain that receives the least sun, which may be a factor in the lack of odonates found in these habitats to-date.

Epilogue 2

As the final draft of this report was being prepared, Luke returned from a short “recce” of a new route up Dulit. This was a successful trip, which took Luke and his companions to within approximately 100m of the highest peak on the southern end of the Dulit range. Luke reported streams and wet cliff faces right up to the highest point reached. In fact his companions reached the summit, but by a route that daunted even Luke, so not one that we will be attempting when we return.

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Fig. 7: Photography by Luke Southwell



Appendix

Family/Species	Pre-2006	2006	2008
Amphipterygidae			
<i>Devadatta podolestoides</i> Laidlaw, 1934	✓	✓	✓
Chlorocyphidae			
<i>Heliocypha biseriata</i> (Selys, 1859)	✓	✓	
<i>Libellago hyalina</i> (Selys, 1869)			✓
<i>Libellago semiopaca</i> (Selys, 1873)	✓		
<i>Rhinocypha aurofulgens</i> Laidlaw, 1931	✓	✓	
<i>Rhinocypha stygia</i> Förster, 1897	✓	✓	
<i>Rhinocypha spinifer</i> Laidlaw, 1931	✓		✓
<i>Rhinoneura caerulea</i> Kimmins, 1936	✓		
<i>Sundacypha petiolata</i> (Selys, 1859)	✓		
Euphaeidae			
<i>Dysphaea dimidiata</i> (Selys, 1853)	✓	✓	
<i>Euphaea impar</i> (Selys, 1859)	✓	✓	✓
<i>Euphaea subcostalis</i> (Selys, 1873)	✓	✓	✓
<i>Euphaea tricolor</i> (Selys, 1859)	✓		
Calopterygidae			
<i>Neurobasis longipes</i> Hagen, 1887		✓	
<i>Vestalis amabilis</i> Lieftinck, 1965	✓		
<i>Vestalis amaryllis</i> Lieftinck, 1965			✓
<i>Vestalis amnicola</i> Lieftinck, 1965	✓		
<i>Vestalis atropa</i> Lieftinck, 1965	✓	✓	✓
<i>Vestalis beryllae</i> Laidlaw, 1915	✓		✓
Lestidae			
<i>Lestes praemorsus decipiens</i> Kirby, 1894			✓
Megapodagrionidae			
<i>Bornargiolestes nigra</i> Kimmins, 1936 ¹	✓		
<i>Bornargiolestes species</i> ²			✓
<i>Podolestes orientalis</i> Selys, 1862	✓		
<i>Rhinagrion borneense</i> (Selys, 1886)	✓	✓	
Platystictidae			
<i>Drepanosticta ?actaeon</i> Laidlaw, 1934		✓	
<i>Drepanosticta</i> sp. cf. <i>crenitis</i> Lieftinck, 1933 ³	✓	✓	✓
<i>Drepanosticta dentifera</i> Kimmins, 1936	✓		
<i>Drepanosticta dulitensis</i> Kimmins, 1936	✓		✓
<i>Drepanosticta forficula</i> Kimmins, 1936	✓		✓
<i>Drepanosticta rufostigma</i> (Selys, 1886)	✓	✓	✓



Family/Species	Pre-2006	2006	2008
<i>Drepanosticta versicolor</i> Laidlaw, 1913	✓		
<i>Drepanosticta</i> ?new sp. ⁴			✓
<i>Protosticta</i> new species ⁵		✓	✓
Protoneuridae			
<i>Prodasineura dorsalis</i> (Selys, 1860) ⁶	✓		✓
<i>Prodasineura hosei</i> (Laidlaw, 1913)	✓		
<i>Prodasineura hyperythra</i> (Selys, 1886)	✓	✓	✓
<i>Prodasineura peramoena</i> (Laidlaw, 1913)	✓		
<i>Prodasineura verticalis</i> (Selys, 1860)	✓	✓	✓
Coenagrionidae			
<i>Aciagrion borneense</i> Ris, 1911			✓
<i>Argiocnemis femina</i> (Brauer, 1868)		✓	
<i>Amphicnemis</i> species ⁷	✓		
<i>Archibasis tenella</i> Lieftinck, 1949			✓
<i>Archibasis</i> ? <i>viola</i> Lieftinck, 1949 ⁸	✓		
<i>Argiocnemis rubescens rubeola</i> Selys, 1877	✓		
<i>Argiocnemis</i> species ⁹		✓	✓
<i>Ceriagrion b. bellona</i> Laidlaw, 1915			✓
<i>Ceriagrion cerinorubellum</i> (Brauer, 1865)		✓	
<i>Pericnemis triangularis</i> Laidlaw, 1931			✓
<i>Pericnemis</i> species ¹⁰	✓		
<i>Pseudagrion lalakense</i> Orr & van Tol, 2001		✓	✓
<i>Pseudagrion perfuscatum</i> Lieftinck, 1937		✓	✓
<i>Stenagrion dubium</i> (Laidlaw, 1912)		✓	✓
<i>Teinobasis laidlawi</i> Kimmins, 1936	✓	✓	✓
<i>Xiphiagrion cyanomelas</i> (Selys, 1876)			✓
Platycnemididae			
<i>Coeliccia borneensis</i> (Selys, 1886) ¹¹	✓		✓
<i>Coeliccia campioni</i> Laidlaw, 1918			✓
<i>Coeliccia cyaneothorax</i> Kimmins, 1936	✓		
<i>Coeliccia</i> species near <i>nemoricola</i> Laidlaw, 1912 ¹²	✓		✓
<i>Coeliccia nigrohamata</i> Laidlaw, 1918	✓	✓	✓
<i>Coeliccia</i> new species ¹³		✓	✓
<i>Copera vitatta</i> (Selys, 1863)	✓	✓	
Gomphidae			
<i>Ictinogomphus decoratus</i> (Selys, 1858)		✓	
<i>Leptogomphus pendleburyi</i> Laidlaw, 1934		✓	
<i>Leptogomphus</i> species		✓	
<i>Megalogomphus sumatranus</i> (Krüger, 1899)	✓		



Family/Species	Pre-2006	2006	2008
Aeshnidae			
<i>Indaeschna grubaueri</i> (Förster, 1904)		✓	
<i>Tetracanthagyna ?degorsi</i> Martin, 1896			✓
Corduliidae			
<i>Idionyx</i> sp. cf. <i>selysi</i> Fraser, 1926 ¹⁴			✓
<i>Idionyx yolanda</i> Selys, 1871			✓
<i>Macromia cincta</i> Rambur, 1842			✓
<i>Macromia corycia</i> Laidlaw, 1922	✓		
<i>Macromia euterpe</i> Laidlaw, 1915	✓		
<i>Macromia westwoodi</i> Selys, 1874		✓	✓
Libellulidae			
<i>Aethriamanta gracilis</i> (Brauer, 1878)		✓	
<i>Agrionoptera insignis</i> (Rambur, 1842)		✓	
<i>Brachydiplax farinosa</i> Krüger, 1902			✓
<i>Cratilla lineata</i> (Brauer, 1878)		✓	
<i>Cratilla metallica</i> (Brauer, 1878)	✓	✓	✓
<i>Diplacodes trivialis</i> (Rambur, 1842)		✓	
<i>Hydrobasileus croceus</i> (Brauer, 1867)		✓	
<i>Lyriothemis biappendiculata</i> (Selys, 1878)	✓		✓
<i>Lyriothemis cleis</i> Brauer, 1868		✓	✓
<i>Nannophya pygmaea</i> Rambur, 1842		✓	✓
<i>Neurothemis fluctuans</i> (Fabricius, 1793)	✓	✓	
<i>Neurothemis terminata</i> Ris, 1911		✓	
<i>Onychothemis culminicola</i> Förster, 1904		✓	
<i>Orchithemis pulcherrima</i> Brauer, 1878			✓
<i>Orthetrum borneense</i> Kimmins, 1936	✓		
<i>Orthetrum chrysis</i> (Selys, 1891)	✓	✓	
<i>Orthetrum glaucum</i> (Brauer, 1865)	✓	✓	
<i>Orthetrum pruinosum schneideri</i> Förster, 1903		✓	
<i>Orthetrum sabina sabina</i> (Drury, 1773)		✓	
<i>Orthetrum testaceum</i> (Burmeister, 1839)			✓
<i>Pornothemis serrata</i> Krüger, 1902	✓		
<i>Rhyothemis obsolescens</i> Kirby, 1889			✓
<i>Rhyothemis triangularis</i> Kirby, 1889		✓	✓
<i>Tramea transmarina euryale</i> Selys, 1878		✓	✓
<i>Tyriobapta torrida</i> Kirby, 1889	✓	✓	
<i>Urothemis signata insignata</i> (Selys, 1872)		✓	
<i>Zygonyx iris errans</i> Lieftinck, 1953	✓		



Notes

- ¹ What appears to be the true *B. nigra* has been collected on Gn. Mulu now, as well as *Bornargiolestes* sp.
- ² *Bornargiolestes* specimens collected at various locations in Sarawak and Brunei appear likely to be a distinct species to *nigra*, but closely allied.
- ³ This species group shows both *Drepanosticta* and *Protosticta* wing venation. Kimmins (1936) records a female *Protosticta* from the Kapah river; this female is from this group. Females with *Drepanosticta* venation, but belonging to at least two species were collected in 2006 and 2008; some of these might be the undescribed female of *D. dentifera* (which is in the same group), but at least one further species is present.
- ⁴ A problematic form, allied to *D. dupophila* and *P. feronia*, and to the next species; similar but slightly different forms have been found at other locations in NE Sarawak.
- ⁵ First discovered in Brunei by A. G. Orr, this species is widespread in Sarawak, and will be described by RAD and AGO during 2009.
- ⁶ Kimmins (1936) records a female of a *Protosticta* species from the junction of the Tinjar with its tributary the Lejok. RAD has examined this specimen - it is actually *Prodasineura dorsalis*.
- ⁷ *Amphicnemis lousiae* was listed by Kimmins (1936), this was corrected to *A. wallacei* by Lieftinck (1954) but in fact it was probably not this species, but an allied form common in NE Sarawak.
- ⁸ Listed by Kimmins (1936) as *A. melanocyana*, by Lieftinck (1954) as ?*viola*.
- ⁹ An unnamed *Argiocnemis*, common in Sarawak and peninsular Malaysia at least.
- ¹⁰ A single female collected by the 1932 expedition but not reported by Kimmins. It is in the pinned collection of the BMNH, and bears a note by Lieftinck that it is an unnamed species of either *Amphicnemis* or *Pericnemis*. RAD has examined the specimen, it appears more *Pericnemis* like than *Amphicnemis* like, although the distinction between the two genera is not entirely clear.
- ¹¹ A female, allied to *borneensis*, but possibly a distinct species, was collected at high altitude on Dulit in 1932, but omitted from Kimmins 1936 paper, is included with *borneensis* here for simplicity.
- ¹² The status of forms allied to *C. nemoricola* is currently under study by RAD.
- ¹³ A new species from the *borneensis* group of species, first discovered at Dulit and Loagan Bunut National Park in 2006. A description has been prepared by RAD as part of a revision of this species group (Dow 2009).
- ¹⁴ This species is either *selysi* or a closely allied species; it has been collected at four locations in Sarawak since 2006.

