Dragonflies of Mount Kinabalu
( the highest mountain in Borneo )

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Mount Kinabalu, towering 4101 m above the tropical rainforest, is a real dreamland for naturalists, especially for botanists. Within a day or two you are able to see a succession of biotopes from lush lowland rainforest to barren alpine landscape.

My hope to study Borneo's dragonflies came true last April, when I visited Sabah for 3 weeks. After arriving at Kota Kinabalu, I proceeded to the Kinabalu Park and stayed at the Headquarters on April 12-17 and then at Poring Hot Springs on April 17-21. Thereafter I went to Danum Valley in the eastern part of Sabah and stayed there on April 22-29 studying dragonflies of the lowland forest biotopes. By permission of responsible authorities I was allowed to collect samples of dragonflies during my visits. Besides collecting I was busy taping dragonflies with video camera. My main interest was taping the behaviour of damselflies belonging to the calopterygoid families.

Kinabalu Park

Mount Kinabalu Park covers a total 754 square kilometres. The lowest elevations (altitude range 450 - 900 m) are typical lowland and hill rainforests with dipterocarp trees. This zone can be easily surveyed around Poring Hot Springs in the SE corner of the park. From the springs (ca. 450-500 m) it is possible to walk within two hours up to the altitude 1000 m to the base of the Langanan Falls, which fall down nearly vertically some 150 m. The headquarters at the altitude 1500 m are within the lower montane zone, where the forest dominated by oaks and chestnuts is still tall in stature. At 1800 m the forest becomes increasingly mossy and changes gradually to dwarf forest before the tree-line is reached at 3300 m. Return trip to the top along the summit trail can be done in two days.
Literature on Kinabalu dragonflies

First published records on dragonflies from Mount Kinabalu date back to the 1890's. A major contribution to our knowledge was made by F.F. Laidlaw, who published two papers on the dragonfly fauna of this mountain. His paper in 1915 (Proc. zool. Soc. London 1915: 25-39) reported on the collections made by J.C. Moulton in 1913 and it listed 21 species, 7 of which were new to science. The other paper in 1934 (J. fed. Malay St. Mus. 17: 549-561) reported mainly on collections made by H.M. Pendlebury in 1929 and it listed a total of 26 species found in the "Lower Mountain Zone" (from 900 m upwards) of Mount Kinabalu. Two new species were described, the other, however, being found at a lower altitude on Kinabalu.


Dragonfly fauna of Mount Kinabalu is not rich in species. So far I am aware only less than 40 species to occur within the park boundaries. This is less than 15 % of all Bornean species. The Thai mountains Doi Inthanon and Doi Suthep-Pui are much more richer in species. The paucity of dragonfly species on Mount Kinabalu is due to small diversity of habitats, common pond species are missing. More species certainly occur at lower elevations on the mountain outside the park boundaries.

Mount Kinabalu is the type locality of 15 dragonfly species. Many of them have later been found also elsewhere in Borneo. Although half a dozen species are so far known only from Mount Kinabalu, it is uncertain whether any of them is "real Mount Kinabalu endemic", since the knowledge of the dragonfly fauna on other mountains in North Borneo is still very poor. So far there are apparently no dragonfly records made higher up than ca. 1700 m on Mount Kinabalu. The altitude range of most "montane" species is restricted to 900-1600 m.

Visit in April 1994

I can share R.G. Kemp's experience that dragonflies are rather few in numbers around the headquarters. I saw only 8 species, most of them on or around the small Silau-Silau stream near the headquarters. This shaded brook flows into the larger and more torrential Liwagu river.

April is the hottest month at the headquarters, with average temperature ca. 22 C. During my stay it was usually quite sunny between 10 AM and 2 PM, with spells of rain in the afternoon.

As expected the dragonfly fauna was much richer around Poring Hot Springs. However, if compared with Danum Valley the number of species and especially individuals was still quite small - a total of 22 species were observed at Poring, four of them present also at the headquarters. A tiny brooklet flowing through open terrain just below the hot springs abounded common libellulids. More interesting stream species could be seen on two small streams, which descend the forested mountain slopes and joins below the small Kipungit waterfall just a few hundred meters from the hot springs. A 3 km long trail leads from Kipungit waterfall to the magnificent Langanan Falls. Before the main waterfall the trail follows the stream from the altitude of ca. 850 m and passes two smaller waterfalls. I had no time to follow upstream the torrential Mamut river, which flows just between the park entrance and the hot springs. However, its open stony banks did not look as a good dragonfly habitat.

A variety of colourful butterflies abounded everywhere at Poring. Unfortunately no sign of *Rafflesia* was seen at the site it sometimes flowers.
Dragonfly species known from Mount Kinabalu

Amphipterygidae

*Devadatta p. podolestoides* Laidlaw, 1934, a quite widespread species in Borneo, was found on Mount Kinabalu already by J.C. Moulton. I encountered this cryptic species both at the headquarters (at one shaded spot along a trail bordering Silau-Silau stream) and at Poring (below the Kipungit waterfall and along the Langanan trail at 900 m).

Chlorocyphidae

At least three species are known from Mount Kinabalu, all originally described from there: *Rhinocypha stygia* Forster, 1897 and *R. moultoni* Laidlaw, 1915 and the peculiar *Rhinoneura villosipes* Laidlaw, 1915. *R. stygia* has later proven to be more widespread in northern Borneo. Laidlaw (1915) mentions also a teneral male of *Rhinocypha* sp. from Mount Kinabalu, stating that it is probably *R. biseriata* Selys, 1859. However, later the identity of this specimens has not been confirmed in the literature.

*Rhinoneura villosipes* was the dominant species along Silau-Silau stream at the headquarters. Males were commonly seen especially upstream near the mountain garden. Also a female specimen was netted. Female sex is still undescribed.

Unfortunately I found only a single female specimen of *Rhinocypha*. It was netted at Poring on a small tiny brooklet along the Langanan trail at ca. 900 m. It is apparently *R. moultoni*.

Euphaeidae

Three species of *Euphaea* are known from Mount Kinabalu, two of them -*Euphaea basalis* (Laidlaw, 1915) and *E. subnodalis* (Laidlaw, 1915) - originally described from there. *E. basalis* has apparently not yet been found elsewhere. The third species *Euphaea subcostalis* Selys, 1873 is widespread in Borneo and is known to occur from the sealevel to ca. 600 m.

I recorded all three species. *E. basalis* was found on Silau-Silau stream at the headquarters. Only a few males were seen and one collected. *E. basalis* seems to be confined to rather high altitudes and is known from 1000-1500 m. *E. subnodalis* and *E. subcostalis* were found occurring together at Poring along the stream above and below Kipungit waterfall at the altitude of some 450-500 m. I could not separate these quite similar species in the field. Later at home one third of the male specimens collected were proven to be *subnodalis* and the rest *subcostalis*. I also saw a glimpse of a male *Euphaea* on a tiny brook along the trail to Langanan waterfall at ca. 900 m (in the same spot where *Rhinocypha* female was collected). Since *E. subnodalis* has been recorded also at the altitude of ca. 920 m on Mount Kinabalu, this may have been either it or *E. basalis*.

Calopterygidae

Four calopterygid species have been recorded from the mountain. *Neurobasis cyaneipennis* Forster, 1897, certainly one of the most beautiful of all dragonfly species, is so far known only from Mount Kinabalu and from a stream between Mt. Selinguid and Mt. Batu Lawi in Sarawak. However, it probably occurs also in other higher mountains of northern Borneo between the altitudes of 900-1500 m.

A male of *N. cyaneipennis* with its shimmering blue wings was the first dragonfly seen when I first entered Silau-Silau stream soon after my arrival to the headquarters. However, the species proved to be rather few in numbers. Only solitary males and females were seen here and there along the stream between 10 AM and 2 PM, when the stream received rays of sun. A male was also observed along the larger and more torrential Liwagu river.
A small population of *N. cyaneipennis* was also found at Poring, but only above the altitude of ca. 850 m. The damsels preferred to stay around the pools formed just below the two small waterfall steps on way to the Langanan falls, the higher step just 100 m downstream from the main fall. The behaviour of the species seems to resemble more that of *Matrona* than the other *Neurobasis* species!

Out of the seven Bornean species of *Vestalis*, three are known from Mount Kinabalu: *V. beryllae* Laidlaw, 1915, *V. amnicola* Lieftinck, 1965 and *Vestalis anacolosa* Lieftinck, 1965, the holotypes of the latter two coming from Mount Kinabalu.

All of them were encountered at Poring. *V. amnicola* was the most abundant species. It appeared around Kipungit waterfall and along the Langanan trail up to the altitude of almost 1000 m. *V. anacolosa* was found only around Kipungit waterfall. *V. beryllae*, a species with strikingly long abdomen was the rarest species, only two males were found, one near Kipungit waterfall and the other along the trail at the altitude of ca. 700 m.

**Protostictididae**

Protostictids are very inconspicuous and cryptic damselflies. Two species have been originally described from Mount Kinabalu: *Protosticta kinabaluensis* Laidlaw, 1915 from the altitude of ca. 900 m and *Drepanosticta actaeon* Laidlaw, 1934 from 200 m. The latter species is known to be more widespread in Borneo - it occurs also in Danum Valley.

I found a single male and female of both species, *P. kinabaluensis* at the headquarters on the trail following Silau-Silau stream. They were found in a typical habitat, hanging on a nearly vertical, shadowy and moist slope. *D. actaeon* was encountered at Poring in a dark gorge in the joint of the two streams below Kipungit waterfall.

**Platycnemididae**

*Coeliccia* specimens of both sexes were encountered at Silau-Silau stream at the headquarters and at Poring near Kipungit waterfall and also higher up at ca. 850-900 m. *Coeliccia nemoricola* Laidlaw, 1912 is the only platycnemid recorded from Mount Kinabalu in literature (from ca. 900-1650 m). My series from Poring fits well with the descriptions of *C. nemoricola*, but all specimens from the headquarters differ consistently in some details. It remains to be studied, whether *nemoricola* is a very variable species, like some other *Coeliccias* or whether two different taxa exist in the mountains.

A teneral whitish specimen of *Copera*, most likely *C. marginipes* (Rambur, 1842) was seen at Poring along the small brook descending from the hot springs. Unfortunately it disappeared before it could be netted.

**Coenagrionidae**

Only two species have been listed from the mountain: *Stenagrion dubium* (Laidlaw, 1912) and *Ceriagrion bellona* Laidlaw, 1915. Apparently some other more common species thrive in the lower elevations of the mountain.

I found *S. dubium* to be quite common at Poring. Males of this interesting species were hanging on wet plants on a vertical cliff 50 m above Kipungit waterfall. A male was found at Langanan, hanging on the moist wall just a little aside the major water pour.

**Aeshnidae**

At least three widespread species are known from Mount Kinabalu. The original series of *Tetracanthagyna degorsi* Martin, 1895 includes a female from Mount Kinabalu. Kemp (1990) reports
to have found *Indaeschna grubaueiri* (Flrster, 1904) at Poring. The insect collections at the headquarters contain a male specimen of *Gynacantha basiguttata* Selys, 1882 labelled to be found at the headquarters site.

At Poring I saw a male *Gynacantha*, which looked like *basiguttata*, hanging on a twig in a dim rock cavity on the stream below Kipungit waterfall at 3 PM. Unfortunately it escaped before I managed to approach it. Every evening during my stay at Poring a few anisopterous dragonflies arrived to fly around the hostel building for a few minutes before the sunset. Unfortunately, I had no success in catching any of them, but I presume that they were *Gynacanthas* or *Oligoaeschnas*.

**Gomphidae**

At least two gomphid species have been recorded from the mountain. *Leptogomphus pendleburyi* Laidlaw, 1934 is known only from the type specimen collected in Kiau at the altitude of ca. 900 m. *Sieboldius japponicus* Selys, 1854, a widespread large species was found at Poring by R.G. Kemp.

**Cordulegastridae**

*Chlorogomphus dyak* (Laidlaw, 1911) has been recorded from Mount Kinabalu, at the altitude of 1000 m. Besides Borneo this species is also reported from the Philippines and Peninsular Malaysia.

**Corduliidae**

Three species have originally been described from Mount Kinabalu - *Macromidia fulva* Laidlaw, 1915, *Macromia euterpe* Laidlaw, 1915 and *Procordulia fusiformis* Lieftinck, 1977. The first is known to be a widespread lowland species in Borneo, but the others are apparently confined to the mountains habitats.

I found only *M. euterpe*. Several males and females were flying just in front of the Langanan fall and females were laying eggs on the torrential stream. A few specimens were seen also at lower elevations at Poring. *M. euterpe* is known to occur also at the headquarters site. I saw a female corduliid, most likely this species, laying eggs on the wooden wet balcony of the Old Fellowship Hostel after a heavy rainpour.

**Libellulidae**

Laidlaw (1915, 1934) listed 10 species of libellulids from Mount Kinabalu, all of them common and widespread species. However, he listed only those species found higher up than 900 m. More species certainly thrive at lower elevations. I can now add two further species *Cratilla metallica* (Brauer, 1878) and *Neurothemis r. ramburii* (Brauer, 1866) from Poring.

The only libellulid I saw at the headquarter site was a male of *Orthetrum pruinum schneideri* Forster, 1903 recorded on Silau-Silau stream. At Poring 6 common species abounded on the sunny brooklet just below the hot springs: *Orthetrum t. testaceum* (Burmeister, 1839), *Orthetrum glaucum* (Brauer, 1865), *Orthetrum pruinum schneideri*, *Neurothemis t. terminata* Ris, 1911, *Neurothemis r. ramburii* and *Trithemis festiva* (Rambur, 1842). *Orthetrum s. sabina* (Drury, 1770) was found on trail higher up at 700 m and a male of *Cratilla metallica* was seen near the hanging bridge over Mamut river.

Besides those species listed above at least *Cratilla l. lineata* (Brauer, 1878), *Trithemis aurora* (Burmeister, 1839), *Diplacodes trivialis* (Rambur, 1842) and *Zygonyx iris errans* Lieftinck, 1953 are known from Mount Kinabalu.