NOTES ON ODONATA COLLECTED IN KELANTAN (PENINSULAR MALAYSIA) IN APRIL 1995

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A list of 51 spp. collected or observed in SW Kelantan, in the area W of Gua Musang, in April 1995 is presented. Occurrence of Neurobasis longipes Hagen, recorded from the same area as new to mainland Asia in June 1994, was confirmed. Although this sp. seems to prefer different kind of streams than N. chinensis (L.), both spp. co-occur at Sg. Selieh. Other uncommon spp. recorded include Libellago stigmatizans (Sel.) and Archibasis rebecca Kemp.

INTRODUCTION

In May-June 1994 the third author and his field assistants carried out ichthyological studies in Kelantan, Pahang and Muar river drainages in Peninsular Malaysia. A fair number of dragonflies was also collected; the results were presented by NORMA-RASHID et al. (1996). The most striking record was the discovery of Neurobasis longipes Hagen, 1887 at two streams in the Kelantan river basin. Formerly this species was known only from Borneo.

April 9-14, 1995, we undertook a new trip to Kelantan. Our aim
was to get a better picture on the composition of the Kelantan dragonfly fauna, mainly to study the distribution and habits of *N. longipes* and to check its coexistence with *N. chinensis*.

We arrived in Kelantan, using the logging tracks leading from Cameron Highlands via Fort Brooke to Gua Musang. We were based at an abandoned logging camp, ca 10 km E of Fort Brooke, from where daily trips were made to the surrounding areas. Two days were spent at Sg. Lasau and Sg. Selieh (Loc. 4 and 5), while during the other days 10 other stream sites and two swampy ponds W of Gua Musang were visited. Altogether 51 dragonfly species were evidenced and a total of 467 specimens collected. The specimens are deposited in coll. Hämaläinen and in coll. Norma-Rashid.

**COLLECTING SITES**

Localities 1, 3-5, 10-11 and 14 are situated along the main logging track descending from Cameron Highlands towards Gua Musang, at an altitude range 700-300 m. Localities 6-9 and 13 are along a northbound sidetrack, which deviates from the main track 30 km NE from Fort Brooke. This track, passing Fort Ber, climbs towards higher elevations; our northernmost site (Loc. 13) is at an altitude of 890 m. Loc. 2 is 2 km S off the main logging track (10 km E of Fort Brooke) and loc. 12 is 15 km N of Fort Sigar.

**Streams:**

2. Sungai Mengrod, at the campsite; 4°39'25"N; 101°33'55"E. April 9, 1995. — 1 sp.
5. Sungai Selieh, alt. 365 m; 4°43'12"N; 101°39'22"E. On roadside, 31 km E of Fort Brooke. Surrounding vegetation: secondary forest, primarily bamboo. Canopy cover 90%. Bottom substrate: clay and silt. Water flow moderate. Width 1-3 m. Depth 0.3-0.4 m. Temperature 23.1°C; pH 7.5/7.0. April 10, 1995 (at 16-17) and April 13, 1995 (at 9.30-16). — 29 spp.
6. Sungai Tersuk; 4°44'00"N; 101°31'10"E. On road to Fort Ber near Tersuh village. Surrounding vegetation: mainly bamboo. Canopy cover 90%. Bottom

(7a) Sungai Ber and a small shadowy tributary coming from hill; 4°43'47"N; 101°32'40"E. April 11, 1995. — 5 spp.

(7b) Sungai Ber, at site where the road crosses the stream without bridge; 4°44'02"N; 101°31'45"E. April 11, 1995. — 3 spp.


(9) Small shadowy stream, N of Fort Ber, adjacent to loc. 13, alt. 885 m; 4°48'29"N; 101°26'06"E. April 11, 1995. — 5 spp.


(11) Sungai Chadoi, alt. 855 m; 4°37'57"N; 101°27'50"E. Surrounding vegetation: primary forest. Canopy cover 90%. Bottom substrate: rocky boulders and bedrocks. Water fast flowing. Width 2.5 m, depth 0.2 m. Water temperature 22.4°C; pH 7.5. April 12, 1995. — 9 spp.

(12) Sungai Hulu Berok; upper tributary of Sg. Berok; 4°40'36"N; 101°24'17"E. Surrounding vegetation: logged forest. Canopy cover 40%. Bottom substrate: bedrocks, boulders, cobbles, pebbles and sand. Water fast flowing. Width 4.6 m; depth 0.7 m. Water temperature 22.5°C; pH 7.0. April 12, 1995. — 6 spp.

Swampy ponds:


(14) Swampy area adjacent to loc. 11; 4°37'57"N; 101°24'17"E. April 12, 1995. — 3 spp.

LIST OF RECORDED SPECIES

AMPHIPTERYGIDAE

Devadatta a. argyoides (Selys, 1859)
Loc. 6: 3 ♂; — Loc. 10: 2 ♂; — Loc. 11: 1 ♀.

CALOPTERYGIDAE

Neurobasis c. chinensis (Linnaeus, 1758)
Loc. 5: 1 ♂; — Loc. 6: 8 ♂, 2 ♀; — Loc. 7a: 1 ♂, 1 ♀; — Loc. 7b: seen; — Loc. 8: 2 ♂; — Loc. 10: 8 ♂, 8 ♀; — Loc. 11: seen; — Loc. 12: 1 ♂, 1 ♀.

A single male was observed resting on the bank of Sg. Selieh (Loc.
5) just near the bridge, only two meters away from a female of *N. longipes* on April 10 at 5 p.m. Both specimens were collected. However, no *chinensis* were seen at the stream during the whole day of April 13.

*Neurobasis longipes* Hagen, 1887

Loc. 5: 4 ♂, 5 ♀.

A small series (2 ♂, 3 ♀) of this species was netted by Hj. Mokhtar Ibrahim from the same stream (as well as 1 ♀ at Sg. Lasau; Loc. 4) as a novelty for the Peninsular Malaysian fauna already on June 14, 1994 (see NORMA-RASHID et al., 1996).

*N. longipes* had earlier been considered as Bornean subspecies of *N. chinensis*, but HÄMÄLÄINEN (1993) ranked it as separate good species. Its occurrence in the same region along with *N. chinensis* confirms the correctness of this taxonomic decision.

Although a single male of *chinensis* was also found at Sg. Selieh, these two species seem to prefer different kinds of forest streams in the area; *longipes* is restricted to slow moving, clay and silt bottomed lowland streams, whereas *chinensis* has a broader scale of habitat requirements, preferring streams or stream sections with faster flow. The altitude of the known *longipes* sites in Kelantan is between 300-400 m. Also in Borneo the species is known only from lowlands, whereas, *chinensis* has been observed to occur also at much higher altitudes, even at 2300 m in India (FRASER, 1934).

It is interesting to note that *Euphaea impar, Libellago stigmatizans* and *Heliocypha biforata* were present in fair numbers at the same streams as *longipes*, and were missing at faster streams in the area. On the other hand, *Aristocyphafenestrella*, common at faster streams, did not occur at the *longipes* sites.

These two *Neurobasis* species are easy to separate (see HÄMÄLÄINEN 1993). Males: in *chinensis* the green colour in hind wing extends to the very base (except in the median space), but in *longipes* the whole basal 1/5th of the hind wing is clear. Females: in Malaysian *chinensis* whitish nodal spots are present in fore and hind wings and a distinct whitish pseudopterostigma in hind wings; *longipes* has no pseudopterostigma and no clear nodal spots (however, the nodal veins are partly whitish). In both sexes the legs, especially the anterior
femora, are proportionally distinctly longer in *longipes*; a fact pointed out already in the name of the species. There seem to be minor colour differences between the Bornean and continental specimens of *longipes*; these will be discussed at another occasion.

**Vestalis amethystina** Lieftinck, 1965

Loc. 5: 1 ♂; — Loc. 8: 1 ♂, 1 ♀; — Loc. 9: 1 ♂; — Loc. 10: 1 ♂; — Loc. 12: 1 ♂, 1 ♀.

**Vestalis amoena** Selys, 1853

Loc. 4: 12 ♂, 5 ♀; — Loc. 5: 6 ♂; — Loc. 6: 9 ♂, 3 ♀; — Loc. 7a: 1 ♂; — Loc. 8: 2 ♀; — Loc. 10: 1 ♂, 1 ♀.

These two *Vestalis* species coexist often, but not always, at the same streams. It would be interesting to study the differences in their reproductive behaviour.

**Euphaeidae**

**Dysphaea dimidiata** Selys, 1853

Loc. 4: 4 ♂; — Loc. 5: 5 ♂; — Loc. 10: 1 ♂.

**Euphaea impar** Selys, 1859

Loc. 4: 13 ♂, 1 ♀; — Loc. 5: 22 ♂, 3 ♀.

**Euphaea ochracea** Selys, 1859

Loc. 4: 7 ♂, 3 ♀; — Loc. 5: 5 ♂, 2 ♀; — Loc. 8: 2 ♂; — Loc. 10: 2 ♂, 1 ♀; — Loc. 11: 1 ♂, 1 ♀.

**Chlorocypididae**

**Aristocypha fenestrella** (Rambur, 1842)

Loc. 1: 1 ♂, 1 ♀; — Loc. 2: 1 ♂; — Loc. 6: 9 ♂, 9 ♀; — Loc. 7a: 2 ♂; — Loc. 7b: males seen; — Loc. 8: 3 ♂, 2 ♀; — Loc. 9: 1 ♂; — Loc. 10: 6 ♂, 2 ♀; — Loc. 11: 3 ♂, 2 ♀; — Loc. 12: 1 ♂, 1 ♀.

**Heliocypha biforata** (Selys, 1859)

Loc. 4: 9 ♂, 5 ♀; — Loc. 5: 4 ♂, 5 ♀.
**Heliocypha perforata limbata** (Selys, 1879)
Loc. 4: 3 ♂; — Loc. 10: 13 ♂, 5 ♀.

**Libellago stigmatizans** (Selys, 1859)
Loc. 4: 9 ♂, 1 ♀; — Loc. 5: 13 ♂.

In Peninsular Malaysia this species does not seem to be as rare as *L. semiopaca* (Selys, 1873), which is also known from Kelantan.

**MEGAPODAGRIONIDAE**

**Rhinagrion mima** (Karsch, 1891)
Loc. 4: 1 ♂, 3 ♀; — Loc. 5: 4 ♂.

**PLATYCNEMIDIDAE**

**Coeliccia albicauda** ( Förster, 1907)
Loc. 9: 2 ♂, 1 ♀; — Loc. 11: 1 ♂.

**Copera marginipes** (Rambur, 1842)
Loc. 4: 5 ♂, 2 ♀; — Loc. 5: 2 ♂, 1 ♀.

**Copera v. vittata** (Selys, 1863)
Loc. 5: 1 ♀; — Loc. 13: 1 ♂.

**Indocnemis orang** Förster, 1907
Loc. 7a: 1 ♂.

**PROTONEURIDAE**

**Elattoneura analis** (Selys, 1860)
Loc. 4: 1 ♂.

**Prodasineura autumnalis** (Fraser, 1922)
Loc. 4: 4 ♂; — Loc. 5: 4 ♂.

It appears fairly common in Peninsular Malaysia, although it was listed from there only recently (KEMP & KEMP, 1989).

**Prodasineura collaris** (Selys, 1860)
Loc. 10: 1 ♂; — Loc. 12: 1 ♂.
**Prodasineura laidlawii** (Förster, 1907)
Loc. 4: 9 ♂, 2 ♀; — Loc. 5: 5 ♂, 1 ♀.

COENAGRIONIDAE

**Archibasis rebecca** Kemp, 1989
Loc. 4: 3 ♂.
The type series comes from West Pahang and South Johor. Recently it has been recorded also from another site in Johor (VICK, 1993).

**Agriocnemis pygmaea** (Rambur, 1842)
Loc. 5: 1 ♂; — Loc. 10: 1 ♀.

**Argiocnemis rubescens rubeola** Selys, 1877
Loc. 4: 1 ♂, 1 ♀; — Loc. 5: 3 ♂; — Loc. 10: seen; — Loc. 13: 9 ♂, 5 ♀; — Loc. 14: 1 ♂.

**Ceriagrion fallax pendleburyi** Laidlaw, 1931
Loc. 13: 9 ♂, 6 ♀; — Loc. 14: 1 ♂.

**Pseudagrion pruinosum** (Burmeister, 1839)
Loc. 4: 7 ♂; — Loc. 5: 5 ♂; — Loc. 10: 2 ♂.

GOMPHIDAE

**Gomphidia a. abbotti** Williamson, 1907
Loc. 4: 1 ♂; — Loc. 7b: 1 ♂ seen.

**Ictinogomphus decoratus melaenops** (Selys, 1858)
Loc. 4: 1 ♂.
This common species is breeding in streams and in stagnant water.

**Megalogomphus sumatranus** (Krüger, 1899)
Loc. 4: 1 ♂ seen; — Loc. 5: 1 ♂.

**Merogomphus parvus** (Krüger, 1899)
Loc. 4: 1 ♂.
Nepogomphus walli (Fraser, 1924)
Loc. 6: 1 ♂.

Aeshnidae

Anax guttatus (Burmeister, 1839)
Loc. 13: 2 exuviae.

Corduliidae

Macromia cydippe Laidlaw, 1922
Loc. 5: 1 ♂.

Libellulidae

Acisoma p. panorpoides Rambur, 1842
Loc. 3: 1 ♀.

Diplacodes trivialis (Rambur, 1842)
Loc. 3: seen; — Loc. 7a: 1 ♀; — Loc. 8: 1 ♂.

Neurothemis fluctuans (Fabricius, 1793)
Loc. 3: seen; — Loc. 5: seen.

Orthetrum chrysis (Selys, 1891)
Loc. 4: 1 ♂, 1 ♀; — Loc. 5: males seen; — Loc. 6: males seen; — Loc. 10: males seen; — Loc. 11: males seen.

Orthetrum glaucum (Brauer, 1865)
Loc. 5: males seen; — Loc. 6: 2 ♂, 3 ♀; — Loc. 10: 1 ♂; — Loc. 11: 1 ♂, 2 ♀; — Loc. 13: 1 ♂.

Orthetrum luzonicum (Brauer, 1868)
Loc. 1: 1 ♂, 1 ♀; — Loc. 4: 1 ♂; — Loc. 10: 2 ♂, 1 ♀; — Loc. 11: 1 ♀; — Loc. 12: 3 ♂, 1 ♀.

Orthetrum pruinosum schneideri Förster, 1903
Loc. 5: males seen; — Loc. 10: 1 ♂, 1 ♀; — Loc. 13: 1 ♂.

The Peninsular Malaysian populations of pruinosum appear referable to this subspecies (see also NORMA-RASHID & VAN TOL, 1995).
In the peninsula, the southermost known record of the northern ssp. *neglectum* (Rambur, 1842) is from Prachuap Khri Khan in Thailand. So far neither *neglectum* nor *schneideri* have been recorded in southern Thailand.

*Orthetrum s. sabina* (Drury, 1770)
Loc. 8: seen.

*Orthetrum t. testaceum* (Burmeister, 1839)
Loc. 4: 1 ♂; — Loc. 5: 1 ♂; — Loc. 6: males seen; — Loc. 10: 1 ♂; — Loc. 13: 1 ♂.

*Orthetrum triangulare malaccense* Förster, 1903
Loc. 10: males seen; — Loc. 12: 2 ♂; — Loc. 13: 2 ♂.

*Pantala flavescens* (Fabricius, 1798)
Loc. 8: seen.

*Tetrathemis irregularis hyalina* Kirby, 1889
Loc. 4: 1 ♂; — Loc. 5: 1 ♂.

*Tetrathemis platyptera* Selys, 1878
Loc. 5: 1 ♂; — Loc. 10: 2 ♂; — Loc. 13: 6 ♂, 2 ♀; — Loc. 14: 1 ♂.

*Trithemis aurora* (Burmeister, 1839)
Loc. 4: 2 ♂, 1 ♀; — Loc. 5: 3 ♀; — Loc. 10: seen; — Loc. 13: seen.

*Trithemis festiva* (Rambur, 1842)
Loc. 4: 4 ♂; — Loc. 5: 2 ♂; — Loc. 6: males seen; — Loc. 10: 1 ♂.

*Tyriobapta torrida* Kirby, 1889
Loc. 5: a pair filmed in copula.

*Zygonyx ida* Selys, 1869
Loc. 11: 1 ♂.

*Zygonyx iris malayana* (Laidlaw, 1902)
Loc. 4: 2 ♂, 1 ♀; — Loc. 6: 1 ♂; — Loc. 11: 1 ♀.
DISCUSSION

At present about 220 dragonfly species are known from Peninsular Malaysia and Singapore. The species composition can be considered fairly well known, although novelties to the fauna are still found regularly, and even new species are expected. However, our knowledge of the distribution, habitat requirements and phenology of the different species is still rather inadequate. According to a "state checklist" (still at manuscript phase) of Peninsular Malaysian Odonata, the greatest numbers of species have so far been recorded from the states of Pahang, Selangor and Perak.

F.F. Laidlaw was the first to collect dragonflies in Kelantan. He gathered some 60 species at Kuala Aring and in Kota Bharu in 1899 (LAIDLAW, 1902a, 1902b). Thereafter only a few new records have been published on Kelantan dragonflies; e.g. the type specimens of Drepanosticta fontinalis Lieftinck, 1937, Onychogomphus castor Lieftinck, 1941, and Burmagomphus divaricatus Lieftinck, 1964 originate from Kelantan. Our present contributions (NORMA-RASHID et al., 1996) increase the number of species known from Kelantan to 90, a number which may represent at most 2/3 of the actual fauna of the state.

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