

CONTRIBUTION TO THE TAXONOMY OF THE PHILIPPINE  
DAMSELFLY *NEUROBASIS LUZONIENSIS* SELYS, WITH THE  
DESCRIPTION OF A NEW SUBSPECIES  
(ZYGOPTERA: CALOPTERYGIDAE)\*

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The lectotype of *N. luzoniensis* Selys, 1879 from Luzon is designated and the sp. is redescribed and figured. *N. l. subpicta* ssp. n. (holotype ♂: the Philippines, Negros Occidental prov., Mt Canlaon, Pula R., IX-1988; to be deposited in SMF, Frankfurt/Main) is described, figured and compared with the nominate ssp.

## INTRODUCTION

*Neurobasis luzoniensis* Selys, 1879, one of the most colourful of all dragonflies, has long been known from Luzon. Dr Carl Semper collected the first specimens in 1859-1861. His material was very briefly presented by SELYS LONGCHAMPS (1879) in a chapter on *Neurobasis chinensis* as follows: "Les exemplaires des Philippines (Luçon) pris par le professeur Semper, ont la stature de la *florida*, les ailes inférieures étant visiblement plus étroites et moins arrondies au bout que le type de Célèbes. On pourrait donner à cette race le nom de *Neurobasis Kaupi Luzoniensis*". It should be noted that Selys Longchamps considered *kaupi* Brauer, 1867, as a race of *N. chinensis* (Linnaeus, 1758).

In his last treatment on *Neurobasis*, SELYS LONGCHAMPS (1897) raised *luzoniensis* to a race of *chinensis* at the same taxonomic level as *kaupi*, and gave a very brief characterization of the male and female wings. Later LIEFTINCK (1949), following the unpublished view of Dr F. Ris considered *N. luzoniensis* as a distinct species.

\* Results of the Roland Müller Zoological Expeditions to the Philippines, No. 5.

NEEDHAM & GYGER (1939) described and figured the larvae of *N. luzoniensis*, but provided only very brief notes (including figures on male anal appendages) on the adults, which in fact have never been described in detail. NEEDHAM & GYGER (1939) claimed to have received specimens "at numerous times and from many collectors in Luzon and Mindanao". Needham's material is deposited at the Cornell University Insect Collection, but it does not include any specimens from Mindanao. Furthermore there are some Luzon specimens (but none from Mindanao) from Needham's collection in the Rijksmuseum van Natuurlijke Historie in Leiden, gathered by Dr M.A. Lieftinck for a world review of the genus *Neurobasis*, which unfortunately was never accomplished. Thus, the occurrence of this species in Mindanao is very much in doubt, and I presume that the inclusion of Mindanao into the range of the species was a lapse. Recently a very distinct new species, *N. anumariae* was described by HÄMÄLÄINEN (1989) from Mindanao and Leyte. In that paper also the wings of a Luzon specimen of *N. luzoniensis* were figured.

Roland A. Müller's large dragonfly material collected from various Philippine islands includes 70 specimens of *N. luzoniensis* from Nueva Vizcaya, Ifugao and Mountain provinces in Luzon and no less than 270 specimens from Mt Canlaon in Negros Occidental province. Furthermore, I have studied a few specimens from Negros Oriental province deposited in RMNH, Leiden. The Negros specimens differ markedly and consistently from the Luzon ones and represent a distinct new subspecies.

### *NEUROBASIS LUZONIENSIS LUZONIENSIS* SELYS, 1879

Figures 1-2

Type material. — *Neurobasis Kaupi Luzoniensis* SELYS LONGCHAMPS, 1879: 360. I have studied the type material preserved in coll. Selys Longchamps at the Institut Royal des Sciences Naturelles in Brussels. It includes 2 ♂ and 2 ♀ from Luzon. — **Lectotype** designated hereby: adult male specimen labelled "541" / "Chinensis L. kaupi Br. ? ♂" / *Neurobasis chinensis* race *luzoniensis* Selys ♂ Luçon". — **Paralectotypes**: a teneral male and two female specimens from Luzon.

Additional material studied. — Coll. Ris in SMF (Frankfurt/M): 2 ♂, Luzon, Mt Isaroy, 10/11-IV-1916, G. Böttcher; — 5 ♂, 4 ♀, Luzon, Los Banos, 21/28-II-1914, G. Böttcher; — 4 ♂, 3 ♀, Luzon, Los Banos, 21/25-VII-1914, G. Böttcher; — 1 ♂, Mindoro, Naujan, 1911, Rolle.

Coll. RMNH (Leiden): 1 ♂, 1 ♀, Luzon, 1898 (Ins. Phil., Staudinger); — 1 ♂, Luzon, Mts Florida blanca (low), 9/10-VI-1903; — 1 ♂, Luzon, Nigrito Iboates, Mts Batulitang, 20/28-VI-1903; — 1 ♂, Luzon, Los Banos, 8-I-1931, ex coll. Needham; — 1 ♂, Luzon, Los Banos, 11-I-1931, ex coll. Needham; — 1 ♂, Luzon, Mt Maquiling, V-1930, A.C. Duyang, ex coll. Needham; — 1 ♂, Luzon, Laguna, Los Banos (50 m), 17-VI-1930, ex coll. Needham; — 1 ♂, Luzon, Los Banos, 22-XI-1931, R. Gines, ex coll. Needham; — 1 ♀, Los Banos, College Laguna, 30-I-1930, ex coll. Needham; — 2 ♀, Luzon Bay, Laguna, 30-XII-1930, P.E. Alcalá, ex coll. Needham; — 1 ♂, 1 ♀, Luzon, Laguna, Los Banos, Molawin Creek, 1/4-IX-1930, F.C. Hadden, ex coll. Needham; — 2 ♂, 1 ♀, Luzon, Los Banos (200 m), Molawin Creek, 22/26-XI-1953, M.A. Lieftinck; — 2 ♂, 1 ♀, Luzon, Ifugao Province, Jacmal Bunkian, 24 km E Mayoaya, 800-1000 m, 16/18-VI-1967; — 1 ♂, locality as above, 22/24-VI-1967; — 1 ♂, locality as above, 25/27-IV-1967; — 1 ♀, locality as above, 1/3-V-1967; — 1 ♂, Luzon, Camarines Sur, Mt Iriga, 500-600 m, 14-IV-1962, H.M. Torre Villas.

Coll. R.A. Müller (St Gallen): 6 ♂, 3 ♀, Luzon, Nueva Vizcaya, Sta Fe, Dalton Pass, 800-900 m, 1/7-VI-1985, R.A. Müller; — 1 ♂, 6 ♀, Luzon, Nueva Vizcaya prov., Dalton Pass, 500-900 m, Sta Fe (Batching, Torner, Atbo, Perez Park, Zigsag), 9/16-II-1989, W. Catal; — 33 ♂, 19 ♀, Luzon, Nueva Vizcaya prov., Sta Fe, Dalton Pass, 800-1200 m, 25/30-VI-1989, A. Gorostiza; — 1 ♂, Luzon, Mountain prov., Mt Polis, 6000 ft, 6-V-1988, C. Treadaway; — 1 ♂, Luzon, Ifugao prov., NR Kinakin, 4500 ft, 24-III-1989, C. Treadaway.

**MALE.** — Head: Mentum and most of the median lobe of labium black; lateral lobes pale yellow, with hooks and the inner sides narrowly black. Labrum black with two yellow spots of variable size, usually covering most of the interior of the halves of the labrum. Base of mandibles black with a yellow dot of variable size. Anteclypeus black, yellowish in the middle. Postclypeus dark shining green. Genae black with yellow spots below the base of antennae. Antennae black; two basal joints pale. Frons and vertex metallic green, with small pale streaks on sides of the lateral ocelli.

**Prothorax:** Brilliant metallic green above, with black sutures. Proepisternum black, encircled with yellow. A tiny yellow streak on the lateral ridge connecting the anterior and median lobes of the pronotum.

**Pterothorax:** Brilliant metallic green, but tinged with brilliant metallic blue on dorsum, the blue colour forming a band around the mid-dorsal carina. Metepimeron broadly bordered with yellow, except at subalar ridge which is black; the yellow band interrupted with a narrow black bridge over the second lateral suture in the apical part of the metepimeron. The metallic green turns to mat black in the anterior corner of mesepimeron and metepimeron. Metepisternum yellowish anterior to the stigma. Metinfraepisternum yellow with large black spot below the stigma and with a black anteroventral streak.

**Wings:** Fore wings hyaline, with venation reflecting blue and green. Hind wings opaque; the metallic colouring reflects brilliant dark blue on the upper surface and green on the under surface. (In the specimen from Camarines Sur, Mt Iriga, RMNH, Leiden, the upper surface reflects also green at certain angles). The metallic colouring covers uniformly most of the wing area from base near to the apex (Fig. 1); the apical 1/6th being dark brown, with metallic blue colour restricted only around the main veins. By

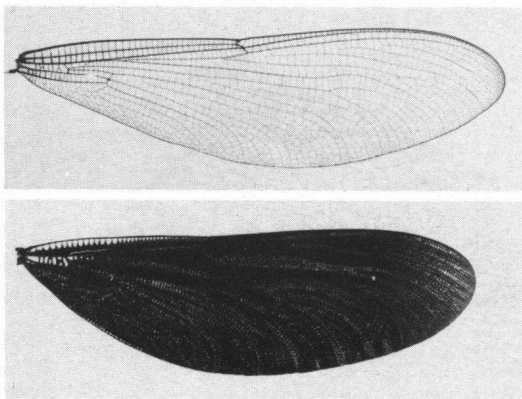


Fig. 1. *Neurobasis I. luzoniensis* Selys, ♂ (Luzon, Nueva Vizcaya prov., Sta Fe, Dalton Pass).

transmitted light the apical portion is clearly divided from the basal blue. In the apical portion the cell centres are subhyaline.

The metallic colour extends from the costa to the lower border of the wing, only the lowest row of minute sized cells are subhyaline without metallic reflections. In the costal field the upper half of the cell centres are hyaline in ca 20 basal antenodal cells. In the median space and in 2-3 cells apicad the arculus most of the cell centres are hyaline. Otherwise the metallic colouring is uniform without hyaline cells. In the hind wing the neuration is very much closer than in the fore wing.

**Abdomen:** Brilliant metallic blue and green. Dorsal surface of segments 2-7 reflects blue, that of segments 1 and 8-10 green. Sides of all segments reflect green. Anal appendages black.

**Measurements.** — Hind wing: 31-35 mm, abdomen 43-49 mm.

**FEMALE.** — Much lighter coloured insect than the male. Both wings hyaline.

**Head:** Labium yellowish, only the hooks of lateral lobes black; mentum and interior part of the median lobe darkened. Labrum yellow, basal and apical margins narrowly black, the basal black extending downwards in the median pit forming a small black triangle. Anterior surface of the scape and pedicel of antennae yellow. Base of mandibles yellow. The yellow spots in genae larger than in male, especially in teneral specimens. Head above as in male, but the green metallic colour slightly lighter.

**Pro- and pterothorax:** Thorax lighter metallic green, with the yellow colouring more expanded than in male. Distinct, narrow yellow stripe along the humeral suture, narrowing in the apical 3/4th. In old specimens this stripe seems to become narrower and may be interrupted by black colour in the middle. A similar narrow yellow stripe bordering the first lateral suture throughout, slightly broadening apicad near the wing base; this stripe being equally wide in teneral and in older specimens. The yellow stripes along sutures and the basal yellow colouring divide the metallic green on sides of pterothorax into three distinct parts (Fig. 2).

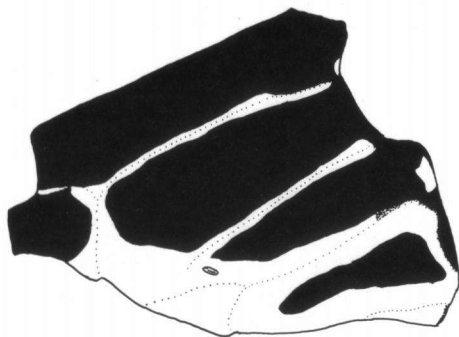


Fig. 2. *Neurobasis 1. luzoniensis* Selys, ♀: colour pattern of pterothorax (Luzon, Nueva Vizcaya prov., Sta Fe, Dalton Pass, Batching).

**Wings:** Hyaline with slight iridescence. Membrane of hind wing entirely more deeply tinged with brownish yellow than in fore wing. In fore wing only the costal-subcostal field up to nodus as deeply tinged as in hind wing. Costa metallic green; the venation otherwise brown, lighter brown in the hind wing. Pseudopterostigma

lacking.

**Abdomen:** Metallic green on dorsum, ventrolateral edge yellowish brown. The intensity of the metallic colouring decreases towards the apical segments. Dorsal carina very narrowly yellow on segments 2-7, broadening on 8-10, broadest on 9th. Anal appendages brown.

Measurements. Hind wing: 33-38 mm; abdomen 40-46 mm.

**DISTRIBUTION.** — Luzon, Mindoro.

### *NEUROBASIS LUZONIENSIS SUBPICTA* SSP. NOV.

Figure 3

**Material.** — **Holotype** ♂: Negros, Negros Occidental prov., Murcia, Mt Canla-on, Pula River, IX-1988, Alex Buonafe leg., deposited at present in coll. R.A. Müller (St Gallen, Switzerland) to be transferred to the Senckenberg Museum (Frankfurt/Main). — **Paratypes** from Müller's material; all collected by A. Buonafe: 1 ♂, Negros Occidental, Murcia, Mt Canla-on (ca 5500 ft), 22/28-IV-1987; — 3 ♂, 1 ♀, Negros Occidental, Murcia, Mt Canla-on, Pula River (5000 ft), 8-X-1987; — 29 ♂, 20 ♀, locality as above, 2/28-IV-1988; — 17 ♂, 21 ♀, locality as above, 1/9-VII-1988; — 53 ♂, 26 ♀, locality as above, IX-1988; — 14 ♂, 6 ♀, Negros Occidental, Murcia, Mt Canla-on, Red River (5600 ft), 12/13-II-1988; — 7 ♂, 7 ♀, Negros Occidental, Murcia, Mt Canla-on, Asia River (5400 ft), 16/18-II-1988; — 13 ♂, 8 ♀, locality as above, 2-IV/1-V-1988; — 2 ♂, locality as above, 30-VI-1988; — 19 ♂, 16 ♀, locality as above, IX-1988; — 2 ♂, 3 ♀, locality as above, XII-1988; — 1 ♂, locality as above, II-1989. — [2 ♂ and 2 ♀ of the above paratypes deposited in BMNH (London), RMNH (Leiden), SMF (Frankfurt/M) and in coll. B. Kiauta (Bilthoven) each; the rest in coll. R.A. Müller and coll. M. Hämäläinen]. — Other paratypes: 3 ♂, Negros Oriental prov., Palimpinon, Okay R. ravine, 28-VII-1958, H.E.M., ex Bishop Mus. (RMNH Leiden); — 1 ♀, Negros Oriental prov., Mt Macawili, 3600 ft, 28-IV-1953, Henri Townes (RMNH Leiden).

**MALE.** — Differs distinctly from the nominate subspecies by the smaller extent of metallic colouring in the hind wing (Fig. 3). Wing base considerably less coloured. A narrow metallic stripe along the subcostal field (covering also the lower third of the costal field before the nodus), continuing in the costal field apicad the nodus. Median space and ca 10 cells apicad the arculus hyaline. The field between  $R_1$  and  $R_2$  hyaline or subhyaline without metallic colouring, this field thus separating the above narrow metallic stripe from the main metallic patch throughout the wing. Cubital field with metallic colouring except in a few basal cells.

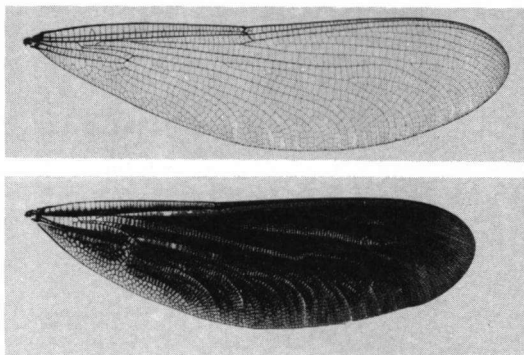


Fig. 3. *Neurobasis luzoniensis subpicta* ssp. n., ♂ (Negros Occidental prov., Mt Canla-on, Pula River).

The main metallic patch is bordered by  $R_2$  above, and below it is separated from the wing margin by 4-5 cell rows. In the wing apex the border between the metallic opaque portion and non-metallic subhyaline portion is by reflecting light more distinct than in the nominate subspecies, the apical portion lacking metallic blue reflections on the upper surface. In the main metallic patch there are several subhyaline cell centres, especially in the basal area and in the cell row just below MA.

Venation somewhat more open than in the nominate subspecies, especially in the anal area of the hind wing. There are usually only 4 cell rows between the lowest supplementary sector and the wing margin just below the curve of IA, whereas there are 6-7 cell rows in ssp. *luzoniensis*.

Abdomen relatively slightly longer than in the nominate subspecies.

Measurements. — Hind wing: 31-35 mm; abdomen 46-53.5 mm.

FEMALE. — Quite similar to that of the nominate subspecies. It can, however, be told apart by much narrower yellow stripes along the humeral and the first lateral sutures. Humeral suture very narrowly bordered with yellow along the basal 4/5th of the length of the suture. (In old females the band is interrupted in the middle). In most specimens, except in the teneral ones, the narrow yellow stripe along the first lateral suture is not continuous, but is interrupted in the middle by black colour for at least 1/3 of the length of the suture.

The difference in intensity of the brownish yellow tinge in fore and hind wings is less marked than in the nominate subspecies.

Measurements. — Hind wings 33-37 mm; abdomen 40-46 mm.

DISTRIBUTION. — Negros.

## DISCUSSION

The differences presented for the separation of the two subspecies seem to be very constant in the large material at hand. The single specimen available for study from Mindoro is an immature male. The hind wing colour pattern of this specimen does not seem to differ from that of the Luzon specimens.

In Luzon, *N. l. luzoniensis* seems to be a widely distributed insect, and it is known from both lowland streams and from streams at elevations as high as ca 1800 m. *N. luzoniensis subpicta* ssp. n. is so far known only from mountain streams in Negros.

Since many even of the largest islands of the Philippine archipelago are still very inadequately studied for dragonflies, discovery of such a striking insect as a *Neurobasis* is certainly possible in some other islands.

The recently described *Neurobasis anumariae* Hämäläinen, 1989, is known to occur in Mindanao and Leyte. This seems to be a more archaic species than *N. luzoniensis*, from which it differs markedly by considerably more open venation and by very reduced metallic colouration of the male hind wing.

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