

SHORT COMMUNICATIONS

**TWO NEW SPECIES OF CALOPTERA DAMSELFLIES  
FROM SOUTHERN VIETNAM  
(ZYGOPTERA: CHLOROCYPHIDAE, EUPHAEIDAE)**

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*Rhinocypha seducta* sp. n. (holotype ♂: southern Vietnam, Lam Dong prov., nr Di Linh, 26-IV-1998) and *Euphaea hirta* sp. n. (holotype ♂: southern Vietnam, Lam Dong prov., Bao Loc, 14-VI-1996) are described and illustrated, and their taxonomic status is discussed. The latter sp. co-occurs with *E. guerini* Ramb. and *E. masoni* Sel.

INTRODUCTION

The knowledge of the Vietnamese dragonfly fauna has increased considerably during the last 10 years, when many entomologists, especially from Japan, have visited the country. The Vietnamese Caloptera have been dealt with in two recent papers. VAN TOL & ROZENDAAL (1995) reported on collections made mainly in Nghe Tinh and Binh Tri Thien provinces in the poorly known central part of the country, but also in Tam Dao in northern Vietnam. The paper includes also descriptions of two new species, *Rhinocypha watsoni* and *Bayadera vietnamensis*. ASAHINA (1996) listed new material from various localities in northern Vietnam. In addition, DONNELLY's (1997) dragonfly collecting report from Tam Dao includes also calopterygoids.

The second author has made many collecting trips to different parts of Vietnam since 1993. From the damselfly material, all calopterygoids were identified first. Although we aim to publish a synopsis of the Vietnamese Caloptera at a later date, a new chlorocyphid and a new euphaeid species, found in the montane regions in Lam Dong province in southern Vietnam, are described separately here.

Discovery of a new *Euphaea*, co-occurring with two similar-looking congeners,

was very unexpected, though since ASAHINA (1969, 1975, 1977), no new Caloptera records from the southern part of Vietnam have been published.

*RHINOCYPHA SEDUCTA* SP. NOV.

Figures 1, 3-4

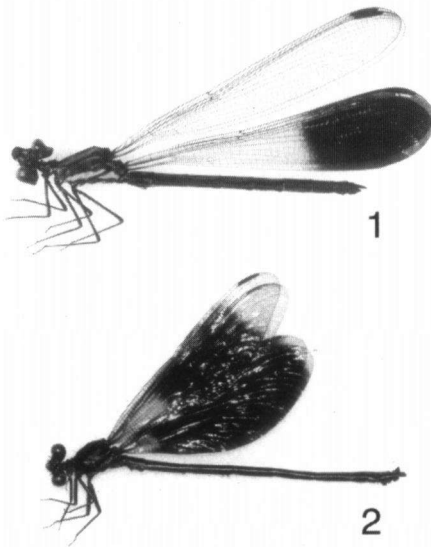
**Material.** — **Holotype** ♂: Vietnam, Lam Dong prov., nr Di Linh, alt. ca 1200 m, 26-IV-1998, H. Karube leg. — **Paratype** ♂: same site and date as the holotype. — Both specimens are deposited at Kanagawa Prefectural Museum of Natural History, Odawara, Japan.

**Etymology.** — *Seducta*, feminine gender of the word "seductus", which means "segregated" or "remote", indicating the secluded and remote locality of the new species.

**MALE.** — A dark species, characterized by brightly striped pterothorax, nearly unicolorous black abdomen and dark-tipped hindwings (Fig. 1). Both specimens appear to be semimature.

**Head.** — Labium black with yellow markings, those on median lobe largest. Large orange reddish spots at base of mandibles. Labrum and anterior side of rhinarium shining black. Dorsal side of rhinarium, frons and head above mat black, with conspicuous orange reddish markings as in Figure 3. Antennae black.

**Thorax.** — Prothorax (Fig. 4) black, with yellow markings: a longitudinal band in anterior lobe, two lateral spots on median lobe and a narrow median streak on posterior lobe. Posterior lobe furnished with long hairs. Pterothorax (Fig. 4)



Figs 1-2. General aspect: (1) *Rhinocypha seducta* sp. n., holotype ♂; — (2) *Euphaea hirta* sp. n., paratype ♂.

metallic black, with partly violet lustre on lower sides. Mesepisternum with a complete broad, orange-reddish humeral stripe, slightly narrowing at both ends. Mesepimeron with a narrow distal orange-reddish stripe just below the humeral suture. Metepisternum with a broad yellow, undulating stripe crossing the stigma, narrowing at distal end and not quite reaching the wing base. Above that a short, narrow distal stripe below the first lateral suture. Metepimeron with a triangle-shaped, yellow stripe near the wing base. Pterothorax below black, poststernum with a pair of small yellow spots at upper end. Legs black, with tiny, triangle-shaped, yellow spots on coxa. Inner surface

of hind femora obscurely paler basally.

**Wings.** — Forewings hyaline. Hindwings with the apical 2/5<sup>th</sup> opaque dark brownish (with strong iridescence). Hindwings slightly broader at apical part than forewings, more roundly shaped at apex. R3 starts 2 cells distad from subnodus. In forewings 12-14 antenodals (at first row) and 27-29 postnodals, in hindwings 11-12 and 23-25, respectively. Arculus at 3rd antenodal, or slightly distal to it (in one forewing at 4th antenodal). Sectors of arculus separated at base. Quadrangle with 3 crossveins in forewings and 4-5 in hindwings. Pterostigma brown, darker at basal third; covering 5-6 underlying cells in forewings and 7 cells in hindwings.

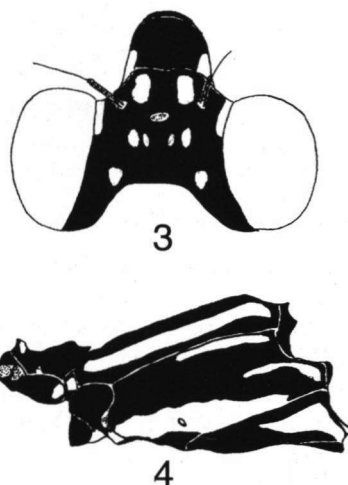
**A b d o m e n.** — Black, with bluish and violet shine. Furnished with small yellowish, lateral markings on S1 and S2, that on S2 triangle-shaped and at distal end. A tear-shaped, orange coloured middorsal spot on S2. Lateroventral acrotergites between segments distinctly yellow from S2-S3 to S9-S10. Appendages of typical shape for the genus, black.

**M e a s u r e m e n t s** (in mm). — Hindwing 26-27, abdomen (incl. app.) 20-21.

**FEMALE** unknown.

**HABITAT.** — Discovered at a tiny (some 60 cm wide), slow-moving mountain stream at an altitude of ca 1200 m. The collecting spot was in the border area between a remaining upper mountain rainforest and an ascending coffee tree cultivation.

**DIFFERENTIAL DIAGNOSIS.** — The combination of characters: pterothorax with reddish humeral stripe, nearly black abdomen and hindwings with dark apex, is unique among the known *Rhinocypha* species. From the known Vietnamese species, it shares the two latter characters with *R. watsoni* Van Tol & Rozendaal, 1995. However, *watsoni* differs strikingly by its nearly unicoloured pterothorax and proportionally broader hindwings. Males of the other regional species of the genus (s. str.), the south Chinese *R. drusilla* Needham, 1930 and *R. arguta* Hämäläinen & Divasiri, 1997 from NE Thailand are characterized by large reddish markings on the abdomen (HÄMÄLÄINEN & DIVASIRI, 1997). It may be worthwhile to make an addition to the description of *R. arguta* here; the lacking measurements for the male are: hindwing 24-25 mm, abdomen (incl. app.) 20-22 mm.



Figs 3-4. *Rhinocypha seducta* sp. n., holotype ♂: (3) head, dorsal view; — (4) thorax, lateral view. — [Not in scale].

*EUPHAEA HIRTA* SP. NOV.

Figures 2, 5-6, 7, 10

**Material.** — **Holotype** ♂: Vietnam, Lam Dong prov., Bao Loc, alt. ca 700 m, 14-VI-1996, H. Karube leg.; deposited at Kanagawa Prefectural Museum of Natural History, Odawara, Japan. — **Paratypes:** 9 ♂, all from Bao Loc, H. Karube leg., viz. 1 ♂, 14-VI-1996; 4 ♂, 15-VI-1996; 1 ♂, 5-V-1997; 3 ♂, 18-IV-1998. — 1 paratype at RMNH (Leiden), 2 in Coll. Hämäläinen and 6 at Kanagawa Prefectural Museum of Natural History.

**Etymology.** — *Hirta*, "hairy", denoting the excessive hairy appearance, when compared with its congeners.

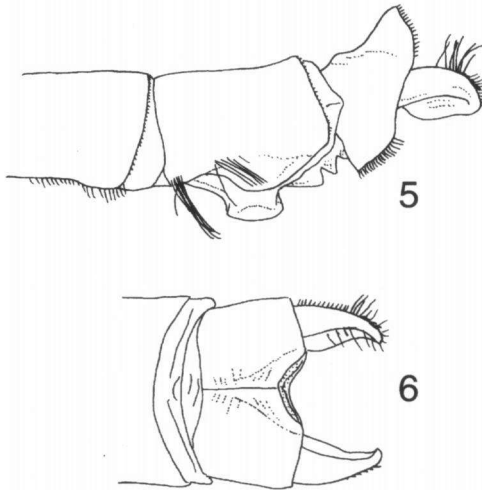
**MALE.** — In general appearance and wing colour pattern (Fig. 2) closely resembling *E. masoni*, but differing by clear structural details in appendages, 10th segment and in more profound hairiness.

**Head.** — Wholly black. Labium, labrum, clypeus, base of mandibles and genae shining black; head above mat black. Antennae black.

**Thorax.** — Prothorax and pterothorax black. In less mature males, pale brownish encircling bands on metepisternum and metepimeron partly visible. Legs wholly black. Tibiae, especially in forelegs, densely hairy on the inner surface.

**Wings.** — Broad opaque patches on wings as in Figure 2. Viewed horizontally, the wings show a mixture of iridescent bluish-green and coppery lustre. Forewing with 25-33 antenodals and 32-38 postnodals, in hindwing 23-27 and 28-33, respectively. Discoidal cell usually with 1 (seldom 2) crossveins in forewing and 1-2 (seldom 3) in hindwing; Cux with 2-3 crossveins in forewing and 2-4 in hindwing. Pterostigma long, covering 9-11 underlying cells. R3 originates slightly proximal to subnodus, more so in hindwing.

**Abdomen.** — Black, with an obscure paler spot on sides of S1 in less mature specimens. Vesicle ungrooved, smoothly oval shaped, without distinct lateral projections (Fig. 10). Auricles furnished with long, coarse hairs at tip. Ventral side of abdomen sparsely hairy throughout, but with denser and longer hair tufts at apical ends of S4 and S5 and at base of S9. Abdomen end and appendages as in Figures 5-6; sternal fold on S9 prominent,



Figs 5-6. *Euphaea hirta* sp. n., paratype ♂: end of abdomen (5) lateral view; — (6) dorsal view. — [Not in scale].

dorsal keel on S10 high and broad at dorsal and posterior views (Fig. 7). Superior appendages broad and furnished with long hairs on top. Inferior appendages fused to the sternite, strongly divergent and not visible at lateral view.

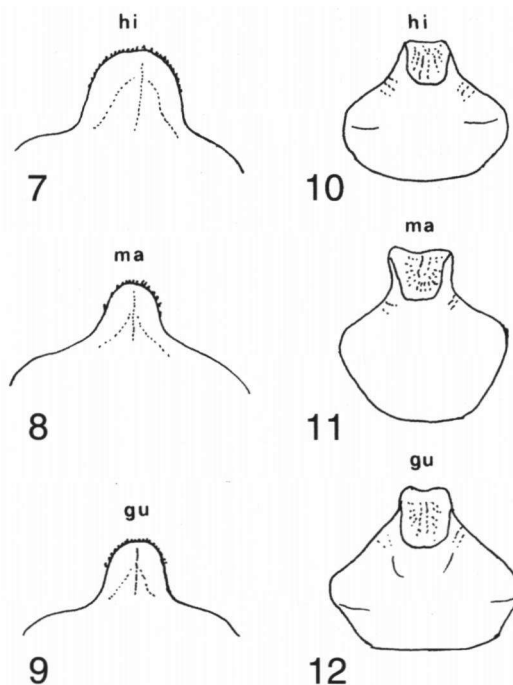
**Measurements** (in mm). — Hindwing 27-28, abdomen (incl. app.) 38-39.

**FEMALE** unknown.

**HABITAT.** — Found from two neighbouring (distance 2 km) streams near Bao Loc, at the edge of Da Lat Highlands descending to Ho-Chi-Minh plains. The streams, both 3-5 m wide and watery, flow in rain forest at an altitude of ca 700 m. In the better studied stream, *E. hirta* co-occurs with three other *Euphaea* species, *E. guerini*, *E. masoni* and *E. ochracea*. On the other one, at least *E. guerini* is also known to occur. Further evidence on their co-existence and on differences in reproductive behaviour would be of much interest.

**DIFFERENTIAL DIAGNOSIS.** — As already pointed out by VAN TOL & ROZENDAAL (1995), *Euphaea guerini* Rambur, 1842 and *E. masoni* Selys, 1879 are structurally distinct species, the latter is not a subspecies of *E. guerini*, as treated by ASAHINA (1977, 1985, 1996). Their co-occurrence in Bao Loc confirms this view. The subspecific taxon *inouei* Asahina, 1977 [type locality near Da Lat, S Vietnam] belongs to the species *masoni*. However, the obvious clinal variability of *masoni* throughout its range, extending from the southern tip of Thailand, through Burma to Nagaland and Yunnan in the North, and to Vietnam in the East, should be studied, to ascertain whether a subspecific splitting has a sound basis.

Both *guerini* and *masoni* are widely distributed in Vietnam and have been recorded from the southern, central and northern parts of the country. *E. guerini* occurs also in Laos. [Coll. Karube includes a male specimen from Lac Sao, near the Vietnamese border in central Laos, 30-IV-1995, S. Nakamura leg.].



Figs 7-12. Shape of dorsal keel on S10, posterior view (Figs 7-9); — and shape of vesicle, ventral view (Figs 10-12) in males of three sympatric *Euphaea* species: hi = *hirta* sp. n., — ma = *masoni*, — gu = *guerini*.

Table I  
 Characters to separate males of *Euphaea guerini*, *E. masoni* and *E. hirta* sp. n.

Character	<i>guerini</i>	<i>masoni</i>	<i>hirta</i>
hind wings wholly opaque	yes	no	no
lateral corners of vesicle with sharp edge	yes	no	no
ventral tufts of hairs on abd. S4 and S5	no	no	yes
ventral tuft of hairs on abd. S9	yes	no	yes
superior appendages with long hairs	no	no	yes
inferior appendages visible on lateral view	yes	yes	no

*E. guerini* can be easily separated from *masoni* and *hirta* already in the field and from a distance by its wholly opaque hindwings, showing brilliant green flashes (cf. DONNELLY, 1997). For clear and constant structural differences between *guerini* and *masoni* (incl. ssp. *inouei*), cf. ASAHINA (1977, figs 2, 30-42, 46-52), VAN TOL & ROZENDAAL (1995, figs 20-22) and Figures 7-12 in the present paper. Characters to separate males of these species and *E. hirta* are summarized in Table I.

The wing colour pattern and general appearance of *hirta* and *masoni* males are quite similar. However, the males of *hirta* (see Figs 2, 5-6) differ considerably from *masoni* in the following structural details (for *E. masoni*, see ASAHINA, 1977, figs 34-42, 46-48, 50 and ASAHINA, 1985, figs 22-24):

- no visible inferior appendages in lateral view;
- superior appendages broader in shape, and furnished with long hairs;
- the dorsal process on S10 more prominent, broader and upright;
- seen from lateral view, the bulbous ventral process on sternite of S9, basad to male valvules, is shorter and more prominent;
- ventral edge of tergites of S8 and S9 considerably more curled;
- on ventral side of abdomen, dense tufts of long hairs at apical end of S4 and S5;
- a ventral tuft of long, coarse hairs at base of S9 as in *guerini*;
- legs, especially fore tibiae, considerably more hairy;
- base of hindwing somewhat more broadly hyaline.

These characters are quite consistent in all 10 *hirta* males available for study. In one of these, the hairs on superior appendages are sparser and shorter.

Since VAN TOL & ROZENDAAL (1995) suggested that *guerini* and *masoni* "possibly hybridize to a small extent in the contact zone of their distribution", we also considered the possibility of *hirta* specimens being hybrids. However, this is ruled out by the fact that *hirta* structural features are not intermediate and there is no variation between the three types. We are tempted to believe that these three species do not hybridize anywhere.

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