

Vestalaria vinnula spec. nov. from southern Vietnam (Odonata: Calopterygidae)

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Vestalaria vinnula spec.nov. (holotype male, southern Vietnam, Lam Dong province, Blao, 1962) is described in both sexes and compared with other species of *Vestalaria* May, 1935 (= the *Vestalis smaragdina* - group), which is ranked as valid genus.

Introduction

In a treatment of the Caloptera damselflies from Fujian I revised the taxa related to the species *Vestalis smaragdina* Selys, 1879 (Hämäläinen, 2004). Ris's (1912) south Chinese 'ssp. *velata*' was upgraded to the species level and Asahina's (1977) 'hyaline winged form of *velata*' was described as a good species *V. venusta* spec.nov. After the paper was printed I received for study some old specimens of the *smaragdina* group collected in southern Vietnam. These represented a further new species, which is described below. Species of the *smaragdina*-group, including also *V. miao* Wilson & Reels, 2001 from Hainan, can be readily distinguished from each other by the structure of male anal appendages.

Dumont's et al.'s (2005) recent ground-breaking studies on the phylogenetic relationships on the extant calopterygids based on DNA analysis suggest that the *V. smaragdina*-group forms the sister group of all other *Vestalis* taxa. *V. smaragdina* was estimated to be a much older insect than the other *Vestalis* species studied, originating in the late Cretaceous, some 68 mya. Other *Vestalis* species studied appeared in the Eocene or later. On the basis of these results, which are also supported by clear structural differences, I conclude that the *V. smaragdina*-group deserves generic status (cf. Hämäläinen, 2004). The genus-group name *Vestalaria* May, 1935 (with *V. s. smaragdina* (Selys, 1879) as its type species) is available. However analyses on additional taxa, including on the aberrant *Vestalis beryllae* Laidlaw, 1915, are required before the infra-classification of the residual genus *Vestalis sensu stricto* can be evaluated (cf. Lieftinck, 1965).

Vestalaria vinnula spec. nov.
(figs 1-3)

Type material.— **Holotype**, ♂, "[southern] Vietnam, [Lam Dong province], Blao [= Bao Loc], [alt.] 600 m, 18.x.1962, Yoshimoto [leg.]". Deposited in RMNH (Leiden).— Paratypes (2 ♂, 5 ♀ from southern Vietnam, Lam Dong province, all. N.R. Spencer leg.): 1 ♂, 2 ♀, Fyan, [alt.] 1000 m, 2.viii.1961; 2 ♀, Fyan, [alt.] 1000 m, 6.viii.1961; 1 ♀ Dalat, 6 km S[outh], 1400 m [alt.], 18.vi.1961; 1 ♂ Dalat, 6 km S[outh], 1400 m [alt.], 20.vi.1961. Paratypes deposited in RMNH and in Coll. Hämäläinen. – Holotype and ♂ from Dalat are mature, but rather young specimens, ♂ from Fyan teneral, ♀ from Dalat mature and ♀ ♀ from Fyan mature or teneral.

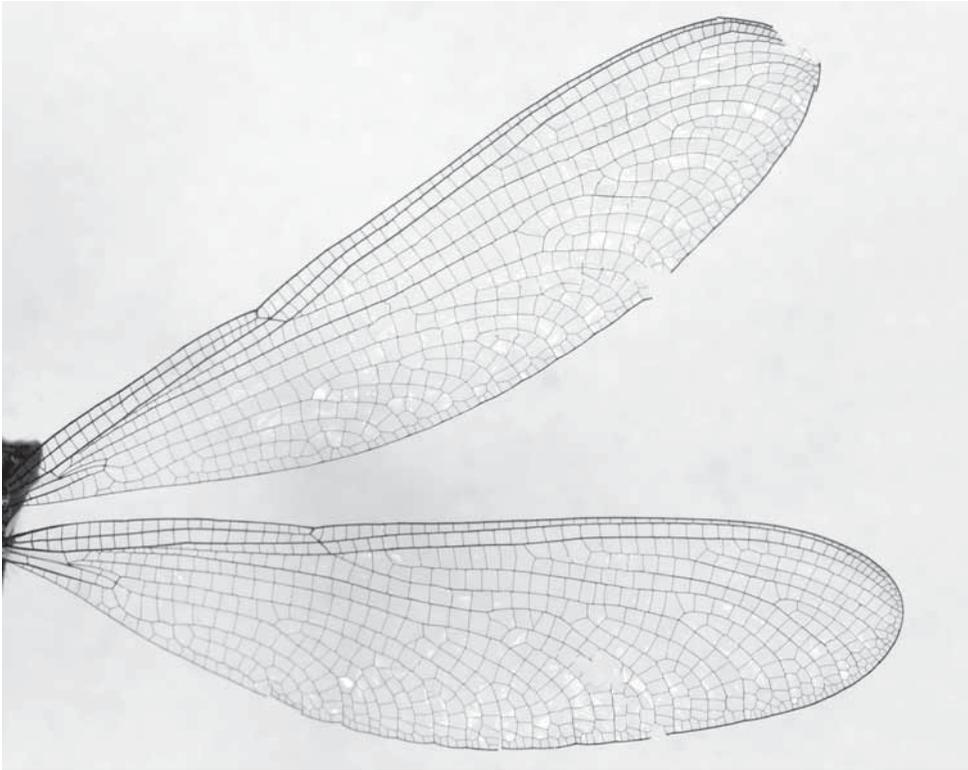


Fig. 1. Wings of the holotype male of *Vestalaria vinnula* spec.nov.

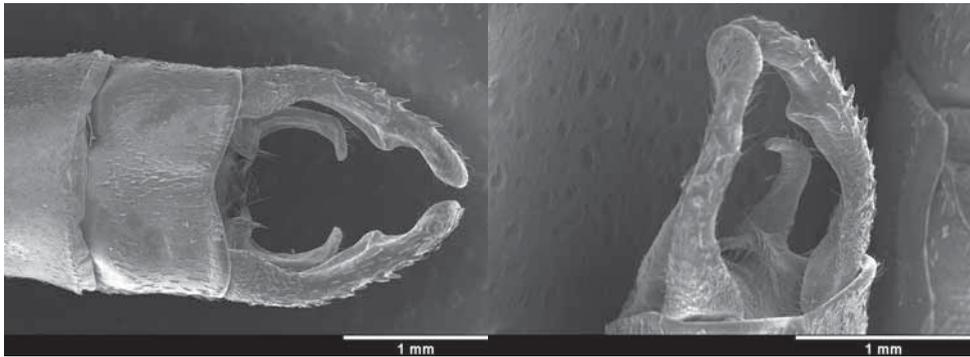
Male.

Head.— Labium black, genae black. Labrum, base of mandibles, clypeus, frons and vertex shining metallic green. Scape of antennae black, pedicel metallic green, flagellum black.

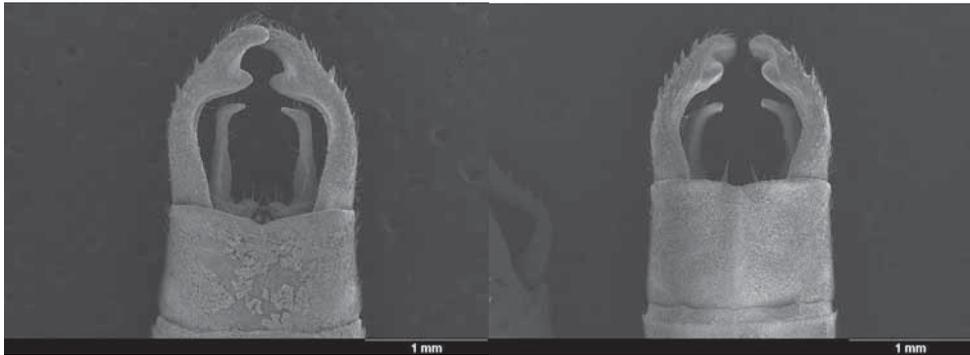
Thorax.— Prothorax shining metallic green. Synthorax shining metallic green above, yellow laterally and ventrally. The yellow area covers the entire metepimeron and metinfraepisternum, the anterior part of metepisternum to the level of the stigma and the adjoining antero-ventral corner of the mesepimeron. A yellow triangle covers nearly half of mesinfraepisternum. Coxa partly yellow, partly brownish, but wholly yellow in the teneral specimen. Legs otherwise black.

Wings (fig. 1).— Rather narrow. Hyaline, but pale brownish-tinted in the teneral specimen. Apices only very faintly darkened at the end of costal and subcostal fields. Venation rather open, typical to the species-group; black in mature specimens, brownish in teneral. Crossveins in the cubital space irregularly arranged, with 1 crossvein near the base and 2-4 crossveins in the apical third. Number of crossveins in quadrangle varies from 0 to 2.

Abdomen.— Segments 1-4 mainly shining metallic green, darker metallic in the apical segments. A trace of early pruinescence on S8 in the holotype specimen, suggesting that S8-10 may be pruinescent bluish white in older specimens, as in related species. S1 with anterolateral corner yellowish and only a trace of pale colour on the ventrolateral



Figs 2-3. Male anal appendages of *Vestalaria vinnula* spec. nov., dorsal and oblique lateral view.



Figs 4-5. Male anal appendages of (4) *Vestalaria smaragdina* (Selys, 1879) and (5) *Vestalaria venusta* (Hämäläinen, 2004), dorsal view.

edge of S2. S 8-9 only a trifle broader than the apex of S 7. Anal appendages shaped as in figs 2-3; inferiors narrow, half of the length of the superiors. Penile structure similar to that of *smaragdina*; cf. fig. 6.

Measurements (in mm).— Hind wing 32-36 (holotype 36), abdomen (inc. appendages) 44-48 (holotype 48).

Female.— Body colour resembles that of male. Wings slightly broader than in male. In mature specimens wings are hyaline or with a faint brownish tinge, without distinct apical darkening; venation dark. Teneral specimens with pale brownish venation and strong pale brownish tint. S8-9 moderately expanded on dorsal view, obscurely pale brownish ventrolaterally. Dorsum of S8-10 with whitish pruinescence in mature specimens. Ovipositor valves brown, the ventral margin furnished with a short row of minute denticles at the apical end.

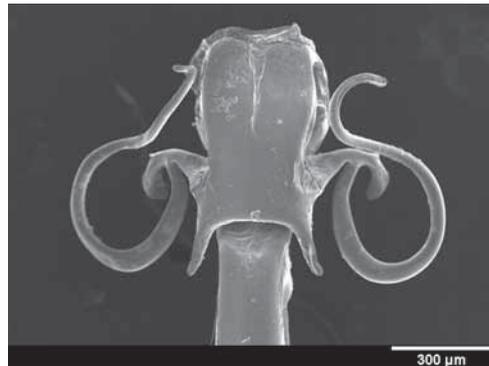


Fig. 6. Penis head of *Vestalaria smaragdina* (Selys, 1879).

Measurements (in mm).— hind wing 35-38, abdomen 41-45.

Comparative notes.— The genus *Vestalaria* is characterized by rather open venation, short quadrangle without or only with 1-2 crossveins, irregularly arranged crossveins in the cubital space (fig. 1), complex structure of the penis head (fig. 6) and by a similar colour pattern of the synthorax. At present five species are recognized.

Vestalaria velata (Ris, 1912) differs from other species by its uniformly brownish tinted wings in both sexes. Males of *V. miao* (Wilson & Reels, 2001) are also easily distinguished by their very short inferior appendages; cf. Wilson & Reels (2001, figs 3-4) and Wilson & Reels (2003, figs 2-3). Moreover, males of *V. vinnula* spec. nov., *V. smaragdina* (Selys, 1879) and *V. venusta* (Hämäläinen, 2004) can all be separated by the structure of the anal appendages; cf. figs 2, 4 and 5. In *V. vinnula* spec. nov. the apical portion of the superior appendages is longitudinally cleft and narrower than in the other species.

Female of *V. vinnula* spec. nov. can easily be separated from *V. smaragdina* (in Vietnam known so far only from Lao Cai province in the north) by fine structure of the ventral margin of the valves. Whereas *V. smaragdina* has a distinct row of sharp spines on the apical part (cf. Asahina 1985, fig. 16), *V. vinnula* spec. nov. has only a short row of minute blunt denticles, quite similar to *V. venusta*, and *V. miao* (cf. Wilson & Reels (2001, fig. 6).

Etymology.— *Vinnula*, the feminine form of the Latin adjective 'vinnulus', which means 'delightful'; cf. *venusta* (= 'charming').

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