A new genus of oriental lacewings (Neuroptera: Chrysopidae)

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Synopsis

Semachrysa, a new genus of green lacewings, is described. Fourteen species are recognized, of which seven are described as new, distributed throughout the Oriental region, Japan, N. Australia and New Hebrides. One new synonym is established and two lectotypes are designated. The tribe Ankylopterygini is redefined and its classification is discussed. *Nothancyla* Navás is removed from the tribe and provisionally placed in the Chrysopini. *Sencera* Navás is transferred to the Ankylopterygini. Keys are given to the world genera of the Ankylopterygini and to the species of *Semachrysa*.

Introduction

The green lacewings (Chrysopidae) are a cosmopolitan family of Neuroptera with over 1500 species currently recognized. They are of particular interest to applied entomologists because the predaceous larvae of some species have been used successfully in the biological control of certain homopterous pests (New, 1975). However, identification of green lacewings is often very difficult because many species are superficially very similar. Furthermore, descriptions of species by earlier authors were often inadequate, being based on unreliable external characters. For correct species determination it is éssential to examine the genitalia. However, this is a relatively new technique in the study of this group and so it is necessary to re-examine and redescribe much of the older material. Often only the male genitalia will show sufficient characters for specific determination, and many females can be identified only to generic level unless they show useful external characters.

The problem of identification has been compounded by the uncertainty of the higher classification of the family. Tribes and genera have often been described on the basis of wing venation characteristics which can vary even intraspecifically. Furthermore, many of the recently described genera are based solely on the presence of certain components of the male

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genitalia, but these may be reduced or lost in some species (Adams, 1975). Although these genera may form monophyletic groups, the inability to place unassociated females even into their correct genus is unsatisfactory.

The Chrysopidae has been divided into three subfamilies. The Nothochrysinae (Navás, 1910) and the Apochrysinae (Handlirsch, 1908), both of which have well-defined characteristics, have been revised by Adams (1967) and Kimmins (1952*b*) respectively. The remaining genera constitute the Chrysopinae (Esben-Petersen, 1918), but this group has not yet been clearly defined, and may not be monophyletic. Hölzel (1970) recognized three tribes within the Chrysopinae: the Chrysopini, Italochrysini and Ankylopterygini, and Adams (1978) also lists the Leucochrysini and Belonopterygini but none of these tribes has been adequately defined. The tribe Ankylopterygini, of which *Semachrysa* is a member, was first proposed by Navás (1910) to include *Ankylopteryx* and *Nothancyla*, but the group has never been revised.

The aim of this paper is to redefine the Ankylopterygini and demonstrate that it is monophyletic, to discuss the relationships of the constituent genera, and to assign species to the new genus *Semachrysa*.

Abbreviations

BMNH British Museum (Natural History), London, U.K.
EIHU Entomological Institute, Hokkaido University, Sapporo, Japan.
IP Institut für Pflanzenschutzforschung, Eberswalde, D.D.R.
MCZ Museum for Comparative Zoology, Harvard University, Cambridge, Massachusetts, U.S.A.
RNH Rijksmuseum van Natuurlijke Historie, Leiden, The Netherlands.
ZI Zoologiske Institut, Lund, Sweden.

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Methods

All drawings in this paper were made using a camera lucida attachment on a stereo-microscope. Male and female genitalia preparations were made in glycerine to avoid any distortion due to flattening. Terminology for genitalia and wing venation follows that of Tjeder (1966).

Measurements to express the ratio of the distance between *Sc* and *R*, and *R* and the posterior margin of the fore wing (p. 4), were made with a calibrated eye-piece graticule. Wing measurements given are taken from the apex to the base of the wing.

Tribe **ANKYLOPTERYGINI** Navás

Ancilopteriginos Navás, 1910: 59. Type-genus: *Ankylopteryx* Brauer.
Ancylopterygini Navás, 1913: 293.
Ankylopterygini Hölzel, 1970: 51.

Small to medium species, fore wing 7–17 mm, green or sometimes brown. Head short with eyes large and gena short. Temporal and postfrontal sutures distinct, producing raised central part of vertex. Antenna usually as long as or longer than fore wing. Scape slightly longer than broad, about three times length and three times breadth of pedicel; flagellar segments narrower than pedicel, about three times as long as broad. Setae on basal flagellar segments arranged in three concentric rings, on distal segments in four concentric rings. Mandibles long, slender, curved and symmetrical, lacking internal tooth (Fig. 7). Apical segments of labial and maxillary palps taper to slender, elongate apexes (Fig. 6). Galea with truncate apex and small apical papilla near outer angle; ligula rounded at tip; submentum slightly longer than broad (Fig. 5). Pronotum short. Legs short. Claws with or without basal dilation. Fore wing broad with broad basal costal area; hind wing narrow with narrow costal area. *Sc* and *R* close in all wings, diverging below

pterostigma. Fore wing with basal subcostal crossvein present. Cell *im* ovate or subtriangular. In fore wing cell m_2 longer than cell m_1; cell m_1 longer than cell *im*. Fore wing with *Rs* usually sinuate. Fore and hind wing with two series of gradate crossveins; *Psm* merges with outer gradate series. Setae on costal margin of fore wing generally long. Frenulum present at base of hind wing. ♂ with sternites 8+9 fused. Gonarcus arcuate. Arcessus or pseudopenis present. Entoprocessus present, either free or fused apically. Gonosaccus very long, simple or paired, with gonosetae. Hypandrium internum and comes present. Tignum and gonapsis lacking. ♀ with no praegenitale at tip of seventh sternite. Subgenital plate bilobed, at tip of membranous structure. Spermatheca rounded and flattened; duct simple or twisted; vela variable in size; ventral impression present or absent.

REMARKS. About 70 species of Ankylopterygini have been described, and there are several undescribed species in the BMNH. The biology is poorly known but the larvae are probably predaceous, like those of other Chrysopidae, feeding either on soft-bodied phytophagous insects such as Aphidae and Coccidae or on coccinellid larvae. The ecology is also little known but an association of many southern African species with 'dense, damp vegetation' has been recorded (Tjeder, 1966). Tjeder also observed that the wings are folded flat over the body when the insect is at rest, unlike the rest of the Chrysopidae in which the wings are folded downwards, roof-like. He concluded that the flat-folded wing behaviour of the Ankylopterygini is probably the result of the broad basal costal area of the fore wings which, if folded downwards, would prevent the short fore and middle legs from reaching the substrate.

Tjeder (1966) figures the ligula of *Ankylopteryx venusta* (Hagen) as emarginate, but this appears to be exceptional because this structure is rounded in all species examined.

Geographical distribution

The tribe is confined to the Old World and shows an almost continuous distribution from Africa (south of the Sahara), through Madagascar, Seychelles and Maldives, Sri Lanka, southern and eastern India, southern China, Japan, Philippines, Malaysia and Indonesia to northern Australia and the New Hebrides. It is restricted almost entirely to the tropics.

Classification of Ankylopterygini

Navás (1910; 1913; 1914) divided the Chrysopidae into several tribes which were based on relatively trivial venational characters and which have generally been ignored by subsequent authors in revisional studies of the family, e.g. Tjeder (1966), Aspöck *et al.* (1980) and New (1980).

The tribe Ankylopterygini (Navás, 1910) was characterized by the large basal costal area in the fore wing and a narrow hind wing, and included the genera *Ankylopteryx* and *Nothancyla*. Although the broad basal costal area of the fore wing is a distinctive feature of the tribe it may also be a ground-plan neuropterous character because it occurs in other unrelated groups within the Chrysopidae, such as the Apochrysinae (as well as in other families such as the Hemerobiidae, Psychopsidae and Rapismatidae), and so cannot be relied upon when defining the tribe.

Hölzel (1970) elaborated upon Navás's description and noted that the tribe also possessed symmetrical mandibles, simple male genitalia with a gonarcus and pseudopenis or arcessus, and that sternites 8+9 were fused in the male. Hölzel's description, however, is still not adequate for defining the tribe because these characters occur widely throughout the Chrysopidae. A number of adult characters are discussed below which show the Ankylopterygini to be a monophyletic group, and a comparative study has also been made with representatives of the other neuropterous families. It can now be shown that *Nothancyla* is unrelated to the Ankylopterygini, but that *Semachrysa* and *Sencera* should be included in the tribe. Because the other tribes of the Chrysopinae have not yet been clearly defined it has not been possible to show their relationships with the Ankylopterygini.

In species of Ankylopterygini the mandibles are long, slender, evenly curved and lack internal teeth. In the rest of the Chrysopidae and the remaining families the mandibles are short and broad, often with an internal tooth on one or both mandibles. Hölzel (1970) mentioned that the mandibles were symmetrical in the Ankylopterygini, but there are several other genera in the Chrysopinae which are not related to the Ankylopterygini, such as *Tumeochrysa* Needham and

Nineta Navás, in which the mandibles are symmetrical. In these two genera the mandibles are short and broad.

Another distinctive character of the Ankylopterygini is the elongation of the apical segments of the labial and maxillary palps. Although not found elsewhere in the Chrysopidae a similar condition occurs in some genera of the Hemerobiidae and Berothidae where it is presumed to have arisen independently. The basic neuropterous pattern is for the apical segment of the palps to be short and truncate.

Tjeder (1966) commented that the close proximity of veins *Sc* and *R* in both fore and hind wings is a feature of *Ankylopteryx*. It can now be shown that it is characteristic of the tribe. The relative distance between these veins is quantified as the ratio of the distance between *Sc* and *R* to the distance between *Sc* and the hind margin at the mid-point of the fore wing. In this way comparisons can be made between wings that are narrow and those that are broad. In the Ankylopterygini, and in some genera of the Apochrysinae, this ratio does not exceed 0·018:1, but in the rest of the Chrysopinae, the Nothochrysinae and the other neuropterous families it is usually more than 0·020:1.

The narrow hind wing is also a characteristic of the tribe, the ratio of hind wing length to breadth always being greater than 3·3:1. In other genera of the Chrysopidae, except some species of *Chrysoperla* Steinmann, the ratio is smaller. The Nemopteridae is also characterized by narrow hind wings but in this family they are highly modified, and broad hind wings appear to be the basic neuropterous pattern.

The male genitalic characters mentioned by Hölzel (1970) occur quite widely throughout the Chrysopidae; although the fusion of sternites 8+9 is probably a derived character, it too is commonly encountered in the family so that these characters cannot be used to define the tribe. However, the long gonosaccus in the male genitalia is characteristic of the tribe: in the rest of the Chrysopidae this structure is short.

The above characters define the Ankylopterygini and show that the tribe is a discrete monophyletic group within the Chrysopidae. Until the other tribes proposed by Navás are investigated in this way it will not be possible to say if they too form useful taxonomic groups.

Navás (1910) included *Nothancyla* in the Ankylopterygini because of the very broad costal field at the base of the fore wing and because the hind wing appeared to be narrow in comparison with the fore wing. Measurement of the hind wing, however, reveals that in fact it is quite broad, with a length to breadth ratio of 2·7:1, which is well outside the minimum of 3·3:1 for the Ankylopterygini. As noted previously the broad costal field of the fore wing is not a sufficiently reliable character to justify placing *Nothancyla* in the Ankylopterygini, and it does not possess any of the other characters used above to define the tribe. The apexes of the labial and maxillary palps are truncate, the mandibles are short and broad, and *Sc* and *R* are widely separated (0·037:1). In the male genitalia the gonosaccus is short and the entoprocessus absent. There is also a tignum (New, 1980) which is completely lacking in the rest of the Ankylopterygini, although it is found in certain other genera of the Chrysopinae. The wing venation appears to be less specialized than in other genera of the Ankylopterygini because there are several branched costal crossveins and the venation is generally more reticulated. However, the absence of a basal crossvein between *Sc* and *R* is unique among the Chrysopinae, though the same condition is found in the Apochrysinae. The flagellar segments are also much broader than those of the Ankylopterygini. It is clear, therefore, that *Nothancyla* should be removed from the Ankylopterygini but until the other tribes of the Chrysopinae have been more clearly defined the affinities of this genus will remain uncertain. On the basis of the arcuate gonarcus and the presence of a tignum I provisionally assign it to the Chrysopini. There are several other genera which Hölzel (1970) listed in the Chrysopini which share these two characters.

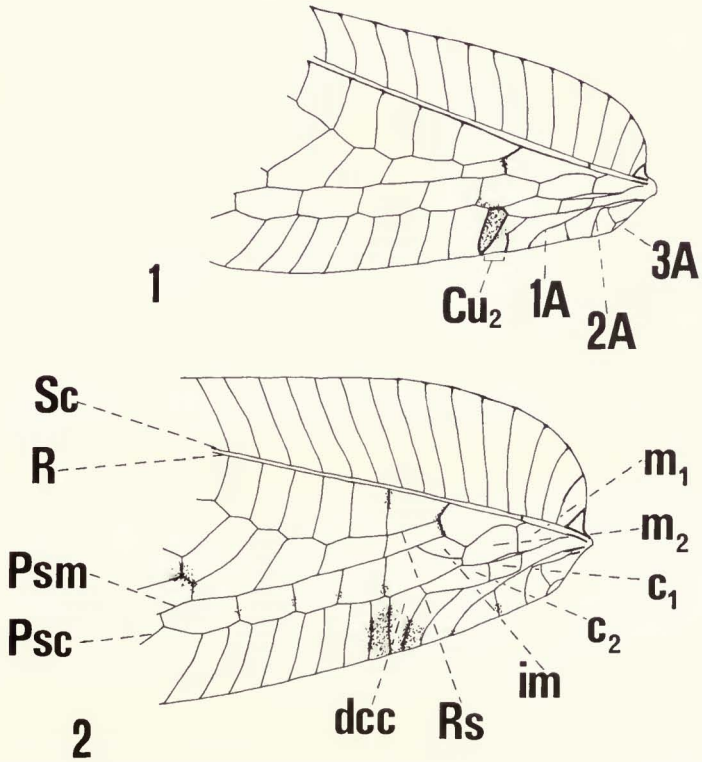
The status of the other genera in the tribe also needs reconsideration. At present *Parankylopteryx* is a subgenus of *Ankylopteryx* (Tjeder, 1966) and *Sencera* is a distinct genus. *Sencera*, however, is distinguishable from *Ankylopteryx* solely on the absence of the intramedian cell but this condition is approached in several of the Oriental species of *Ankylopteryx*, such as *A. doleschali* Brauer and *A. obliqua* Banks, and also in *A. decorsei* Navás from Africa, where cell *im* is much reduced in size. The generalized pattern of the male and female genitalia of *Sencera* is

also similar to that of *Ankylopteryx*. In contrast, the male genitalia of *Parankylopteryx* are very different from those of *Sencera* and *Ankylopteryx*. The entoprocessus are short in *Parankylopteryx* but long in *Ankylopteryx* and *Sencera*, and the arcessus is fused to the gonarcus in *Parankylopteryx*, but a separate pseudopenis is present in *Ankylopteryx* and *Sencera*. *Parankylopteryx* also possesses a paired gonosaccus, whereas this is simple in *Ankylopteryx* and *Sencera*. It seems likely, therefore, that *Sencera* is most closely related to *Ankylopteryx* and should have, at most, subgeneric status, and that *Parankylopteryx* is probably more distantly related and should be considered a genus.

These three genera appear to form a closely related group but *Semachrysa* seems to be more isolated and possesses four characters not found in the other genera of the tribe. The margin of the labrum is straight and not indented as in other genera of the Chrysopidae. The row of black spots on the frons and the spot on the postocular lobe, which occur in all species of *Semachrysa*, are not encountered in any other species in the Ankylopterygini and rarely occur in these positions in other chrysopid species. The possession of two pairs of long, lateral gonosetae (one pair in *S. cruciata*) also seems to be a specialized character of *Semachrysa* because the generalized chrysopid condition is for the gonosetae to be short and numerous. Another character which sets *Semachrysa* apart from the other genera in the tribe is the possession of three to four crossveins between *Sc* and *R* below a long pterostigma. In the other genera of the group the pterostigma is short and there are only one or two apical crossveins between *Sc* and *R*.

Key to the genera of Ankylopterygini

1 Margin of labrum straight. Three to four crossveins between *Sc* and *R* below pterostigma in fore wing. Head with dark spot on frons below each antenna (Figs 3, 4). Male gonosaccus with four (rarely two) long lateral gonosetae ..... ***SEMACHRYSA*** gen. n. (p. 6)



Figs 1, 2 1, *Sencera exquisita* Nakahara, base of fore wing. 2, *Ankylopteryx nonelli* Navás, base of fore wing. c_1 = cubital $cell_1$; c_2 = cubital $cell_2$; dcc = distal cubital cell; im = intramedian cell; m_1 = median $cell_1$; m_2 = median $cell_2$.

– Margin of labrum indented. One or two crossveins between *Sc* and *R* below pterostigma in fore wing. No spots on frons. Male gonosaccus with numerous short gonosetae 2

2 (1) Cell *im* absent in fore wing (Fig. 1) ..... ***SENCERA*** Navás
– Cell *im* present in fore wing (Fig. 2) 3

3 (2) Base of fore wing costa green. Tarsi dark brown. Male with entoprocessus long, usually fused apically; gonosaccus simple; pseudopenis present, arcessus absent.....
ANKYLOPTERYX Brauer

– Base of fore wing costa black. Tarsi green. Male with entoprocessus short, not fused apically; gonosaccus paired; pseudopenis absent, arcessus present .....
PARANKYLOPTERYX Tjeder

SEMACHRYSA gen. n.

Indochrysa Banks, 1938: 225. [Unavailable name: no type-species designated.]

Type-species: *Semachrysa minuta* sp. n.

Small lacewings; fore wing 7–13 mm. Head as in Figs 3, 4. Labrum small, margin straight, brown or black dorsally. Scape broad, three times length of pedicel; pedicel about same length as flagellar segments. Antenna green, same length as or longer than fore wing. Genae marked with dark brown; marking often continuous along lateral edge of clypeus and onto frons but always interrupted centrally. Single black spot present on frons below base of each antenna with black spot between in most species. Postocular lobe with black spot. Fifth segment of maxillary palp usually with brown band (Fig. 6). Ligula rounded at tip (Fig. 5). Pronotum unmarked, broader than long, not tapering anteriorly. Mesonotum usually marked with brown to varying degree. Legs short, unmarked. Claws with slight basal dilation (Fig. 10) or simple (Fig. 27). Base of fore wing and basal quarter of costa black; basal costal area slightly expanded. *Sc* and *R* close in all wings, diverging at pterostigma with three to four crossveins between. Cell *im* in fore wing ovate. *Rs* sinuate. Frenulum present in hind wing but not prominent. Setae on costal margin of fore wing quite short and inclined towards wing apex. Abdomen green, usually unmarked. ♂ genitalia with arcessus present, bifurcating basally and tapering apically. Gonosaccus simple, long, usually with two pairs of long lateral gonosetae and a short pair anterior to arcessus, projecting anteriorly. ♀ genitalia with spermatheca rounded; duct simple or twisted; vela distinct, often long; ventral impression present.

Remarks. Banks (1938) erected *Indochrysa* as a subgenus of *Chrysopa* Leach to accommodate *Chrysopa nigribasis* and *C. cruciata* which have 'broad basal costal spaces [in the fore wings], three dark spots in a transverse row below the antennae and ornate wings'. Banks (1937) had previously noted the affinities of *Chrysopa nigribasis* with *Ankylopteryx claggi* but did not formally group these species together. This relationship between *Ankylopteryx* and *Semachrysa* (as *Indochrysa*) is also suggested in his key to Malaysian Chrysopidae (Banks, 1938) where these two taxa separate at the same couplet. Kimmins (1952*a*) recognized a relationship between *Ankylopteryx picilabris* and 'the *claggi-nigribasis* group of species' but he too made no formal attempt to group them. More recently New (1980) noted that *picilabris* is 'distinct from other Australian taxa' [of *Ankylopteryx*] but did not comment further.

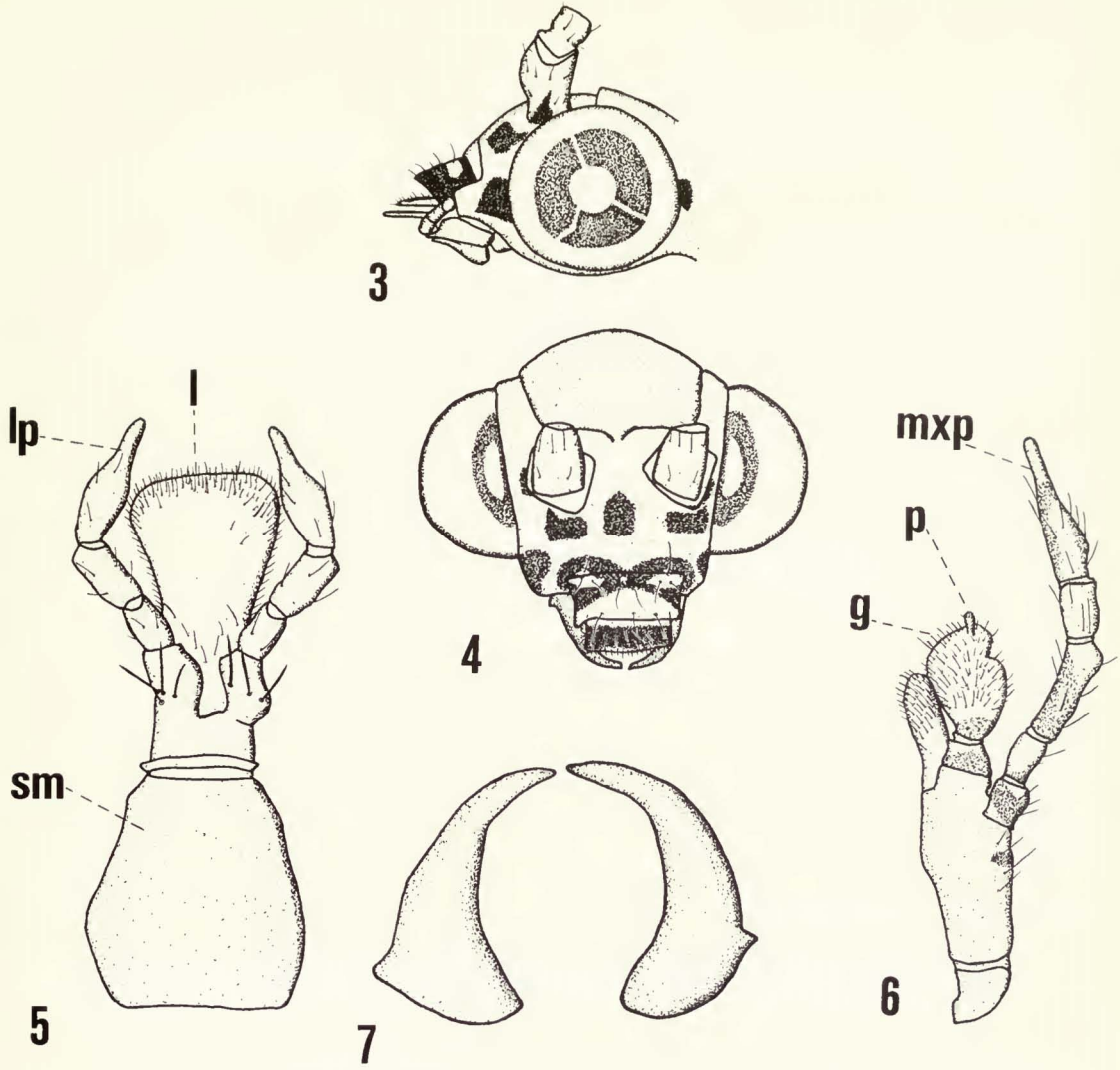
These species have been brought together in *Semachrysa* and their affinities with *Ankylopteryx* have been confirmed.

The species-groups of *Semachrysa*

The species of *Semachrysa* can be divided into three groups based on the male genitalia, particularly in the shape of the arcessus. No group characters have been found in the female genitalia, which show the generalized Chrysopinae pattern; of the five species known only from females four are omitted from the following list.

Group 1: *S. minuta, hyndi, papuensis, contorta, decorata.*
Group 2: *S. picilabris, sagitta, wallacei.*
Group 3: *S. matsumurae, cruciata.*

In group 1 the arcessus is narrow and tapers apically to a point with a wide basal bifurcation. In group 2 the arcessus also has a wide basal bifurcation but has a median expansion before tapering apically. As no males are known of *wallacei* its placing cannot be confirmed but it is tentatively



Figs 3–7 *Semachrysa minuta*. 3, head, lateral view; 4, head, frontal view; 5, labium, ventral view; 6, left maxilla, ventral view; 7, mandibles, ventral view. g = galea; 1 = ligula; 1p = labial palp; mxp = maxillary palp; p = papilla; sm = submentum.

included in this group on the basis of the markings of the head and mesothorax which closely resemble those of *picilabris* and *sagitta*. Moreover, in all group 2 species the crossvein between *Sc* and *R* is basal to the crossvein between cell m_1 and m_2. In all other species of the genus, except in a few specimens of *minuta*, this crossvein is apical to the m_1–m_2 crossvein. In group 3 the arcessus is broad, the basal bifurcation shallow and the dorsal surface grooved. It is difficult to suggest the phylogenetic relationships between these species or these groups but as more males are discovered they will probably become clearer.

Biology

The larvae and biology are known for only one species of *Semachrysa*. Kuwana (1922) described the larva of *matsumurae* as long and slender with the abdomen gradually tapering apically to a point. Length about 5·5 mm. Head small with long, curved, pointed mandibles, antenna with

fine hairs. Abdomen with a prominent lateral wart on each segment, each bearing a few long setae. Dorsum with fine setae usually carrying dead skins of coccids and aphids. Abdomen pale brownish yellow. Pupa pale green, curved ventrally into a ball. Cocoon white, spherical, 3·3 mm in diameter. Life-cycle bivoltine. The larvae fed on the coccid *Icerya purchasi* Maskell but sometimes also on larvae of the coccinellid *Rodolia cardinalis* (Mulsant), a species introduced to Japan to control *I. purchasi*. The larva of *Semachrysa matsumurae* has also been figured by Yoshida (1917).

Geographical distribution

The species of *Semachrysa* are distributed (Fig. 8) from Sri Lanka, the Khasia Hills (Assam), southern China, Japan, Malaysia, Philippines, Indonesia and northern Australia to the New Hebrides. They do not appear to be common but usually form a small percentage of the Neuroptera collected in any suitable habitat.

Checklist of species of *Semachrysa*

claggi (Banks) **comb. n.**
contorta **sp. n.**
cruciata (Esben-Petersen) **comb. n.**
dammermanni (Esben-Petersen) **comb. n.**
decorata (Esben-Petersen) **comb. n.**
rectoides (Banks) **syn. n.**
hyndi **sp. n.**
matsumurae (Okamoto) **comb. n.**
minuta **sp. n.**
nigribasis (Banks) **comb. n.**
papuensis **sp. n.**
picilabris (Kimmins) **comb. n.**
polysticta **sp. n.**
sagitta **sp. n.**
wallacei **sp. n.**

Key to species of *Semachrysa*

1		Wings unmarked except for indistinct small spot on *dcc* and black border on costa (Fig. 81). Mesonotum and metanotum without black or brown markings ***dammermanni*** (p. 22)
–		Wings with numerous brown spots. Mesonotum with at least one black or brown spot above wing base 2
2	(1)	Fore wing with strong dark brown spot at base of outer gradate series 3
–		Fore wing with no spots in this position (though very faint shading may be present) 4
3	(2)	Large dark brown spot present on fourth posterior marginal crossvein of fore wing. Small spot present on Cu_2 (Fig. 26). Male genitalia with arcessus narrow, not ridged (Fig. 29). Female genitalia with duct of spermatheca twisted and vela very long (Fig. 34) ..... ***contorta*** (p. 13)
–		Small spot present on fourth posterior marginal crossvein of fore wing but with large brown spot on *dcc* (Fig. 53). Male genitalia with arcessus broad and ridged. Female genitalia with duct of spermatheca and vela short (Figs 57, 61) ..... ***matsumurae*** (p. 17)
4	(2)	Single median spot on vertex behind antennae 5
–		No spot on vertex in this position 6
5	(4)	Hind wing with large brown spot on *dcc* and faint shading on posterior forked marginal crossveins ..... ***wallacei*** (p. 24)
–		Hind wing with only faint marks on *dcc* or forked marginal crossveins but brown spot present on fourth posterior marginal crossvein ..... ***picilabris*** (p. 16)
6	(4)	Prominent spot at base of inner gradate series of fore wing and on fourth posterior marginal crossvein. Male with abdominal setae dense and fine (Figs 20, 21) ***papuensis*** (p. 12)

Fig. 8 Distribution map of *Semachrysa*.

– Fore wing without this combination of markings though pale suffusion may be present in these positions 7

7 (6) Three spots on frons below antennae 8
– Two spots on frons below antennae ..... ***cruciata*** (p. 19)

8 (7) Brown band extending along inner edge of eye from postocular lobe to anterior edge of vertex ..... ***polysticta*** (p. 23)
– Brown band absent; isolated spot on postocular lobe 9

9 (8) Fore and hind wing lightly suffused, particularly along posterior margins (Fig. 9), distinct spots absent ..... ***minuta*** (p. 10)
– Fore and hind wing lightly suffused but distinct spots also present 10

10 (9) Darkest spot on fore wing on *dcc* 11
– Darkest spot on fore wing on fourth posterior marginal crossvein 12

11 (10) Spot on *dcc* in fore wing large, extending from anal veins to second cubital cell (c_2). Many crossveins with pale suffusion including *Rs* and inner gradates (Fig. 42)..... ***sagitta*** (p. 15)
– Spot on *dcc* in fore wing small, not extending to anal veins or c_2. All crossveins pale (Fig. 73) ..... ***nigribasis*** (p. 20)

12 (10) Small species; fore wing 7·5 mm, with four inner gradate and five outer gradate crossveins ..... ***hyndi*** (p. 11)
– Larger species; fore wing 9 mm or more with at least five outer gradate and six inner gradate crossveins 13

13 (12) Fore wing 9 mm with faint spot on *dcc* and extensive suffusion (Fig. 35). Female spermatheca with deep ventral impression (Fig. 41) ..... ***decorata*** (p. 14)
Fore wing 13 mm, no marks on *dcc* or suffusion (Fig. 77). Female spermatheca with shallow ventral impression ..... ***claggi*** (p. 21)

Semachrysa minuta sp. n.

(Figs 3–7, 9–15)

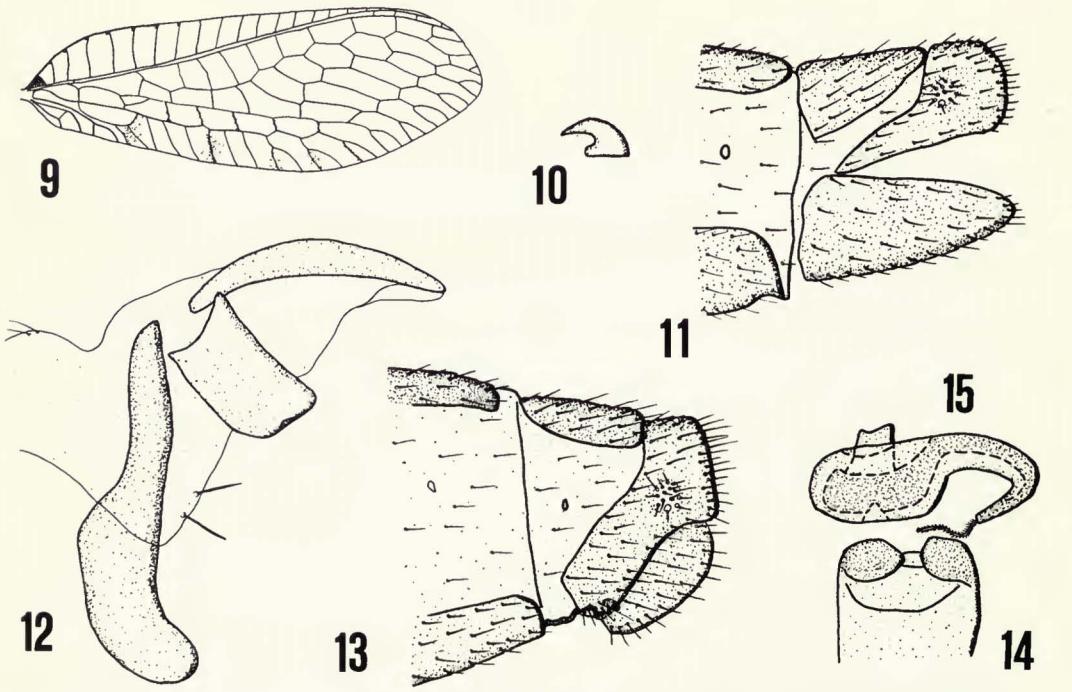
[*Chrysopa nigribasis* Banks; Banks, 1931: 414. Misidentification.]

♂. Head as in Figs 3–7. Markings as figured or with clypeus unmarked dorsally. Often with lateral brown stripe at base of scape. Apical segment of maxillary palp with brown band. Antenna longer than fore wing. Mesonotum with brown spot above wing base and on mesoprescutum. Metanotum often with brown spot above base of hind wing. Claw with slight basal dilation (Fig. 10). Fore wing (Fig. 9) 8 mm, narrow; costa black, sometimes as far as seventh crossvein; pale brown spots on *dcc*, fourth posterior marginal crossvein, forking marginal crossveins, *Psm* crossveins. Hind wing 7 mm; markings as in fore wing.
♀. Markings as in male.

GENITALIA ♂ (Figs 11, 12). Trichobothria 11–14. Arcessus curving ventrally, subacute apically with wide basal bifurcation. Entoprocessus long and curved inwardly.

GENITALIA ♀ (Figs 13–15). Trichobothria 14–16. Subgenital plate parallel-sided. Spermatheca narrow; vela short; ventral impression shallow.

REMARKS. *S. minuta* may be distinguished by the absence of any dark brown markings on the wings, though faint spots are numerous. *S. dammermanni,* which has only a faint spot on *dcc*, has no markings on the thorax, whereas in *minuta* there are dark markings on the mesothorax. *S. minuta* is also smaller than any other species of *Semachrysa* except *hyndi*. The latter may be distinguished by the prominent dark brown spot on the fourth posterior marginal crossvein which is lightly shaded in *minuta*.



Figs 9–15 *Semachrysa minuta*. 9, fore wing venation; 10, claw; 11, apex of ♂ abdomen, lateral view; 12, ♂ genitalia, lateral view; 13, apex of ♀ abdomen, lateral view; 14, ♀ subgenital plate, ventral view; 15, ♀ spermatheca, lateral view.

Several of the specimens examined from Borneo had been identified by Banks as *nigribasis* and are probably those to which he refers (Banks, 1931). However, *minuta* can be distinguished from *nigribasis* by the absence of a dark brown spot on *dcc*, fewer gradate crossveins and half as many trichobothria.

MATERIAL EXAMINED

Holotype ♂, **Borneo**: Samawang, nr Sandakan, 15.vii.1927 (*C. B. K. & Pendlebury*) (BMNH).

Paratypes. **Borneo**: 1 ♂, 5 ♀, data as holotype, 9–15.vii.1927 (BMNH). **West Malaysia**: 1 ♀, Kuala Lumpur, 30.vi.1935 (*Pendlebury*) (MCZ); 1 ♀, 28.i.1935, at light (*Pendlebury*) (BMNH); 1 ♂, Selangor, Ulu Langat, at light, 1.ix.1934 (BMNH). **Sumatra**: 1 ♂, Aur Kumanis, iii.1915 (*Jacobson*) (RNH).

Material excluded from the type-series. **Burma**: 1 ♀, Tenasserim Valley (*Doherty*) (BMNH).

Semachrysa hyndi sp. n.

(Figs 16–19)

♂. Head with dark brown marking extending dorsally and basally around clypeus. Dark brown stripe at base of scape extending on to head and continuous with spot on frons below each antenna; spot between antennae faint. Mesonotum with broad dark brown stripe across mesoscutum and mesoprescutum. Metanotum unmarked. Claws without basal dilation. Fore wing (Fig. 16) 7·5 mm; brown spot on fourth posterior marginal crossvein; faint shading on *dcc*, gradates, basal branch of 1*A* and *Psm* crossveins. Other veins green except base of *Rs*, radial crossveins below pterostigma, first costal crossvein and costa to first crossvein, brown; *im* short. Hind wing 6·5 mm; faint shading on alternate marginal crossveins and gradates.

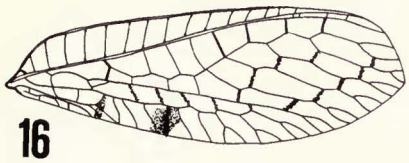
♀. Unknown.

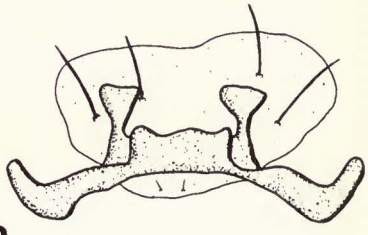
GENITALIA ♂ (Figs 17–19). Trichobothria 16. Gonarcus with submedian tooth. Arcessus narrow, similar to *minuta*.

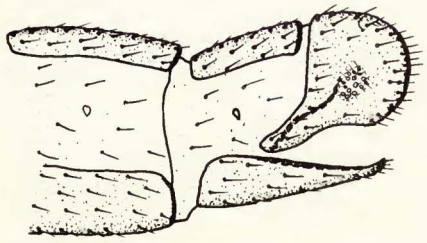
REMARKS. This species resembles *minuta* in wing venation, size and genitalia, but is distinguished by the presence of a dark brown spot on the fourth posterior marginal crossvein. The unique specimen was taken on vegetation in a jungle ravine.

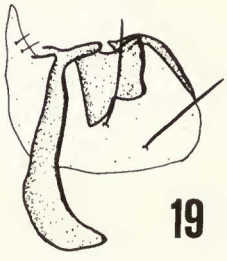
MATERIAL EXAMINED

Holotype ♂, **Sri Lanka**: Sabaragamuwa Province, Deerwood, Kuruwita, 9 km NNW. Ratnapura, 18.ii.1962 (*Brinck, Andersson & Cederholm*) (ZI).









Figs 16–19 *Semachrysa hyndi*. 16, fore wing venation; 17, apex of ♂ abdomen, lateral view; 18, ♂ genitalia, dorsal view; 19, ♂ genitalia, lateral view.

Semachrysa papuensis sp. n.

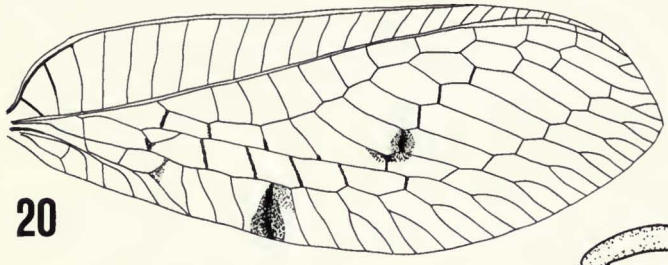
(Figs 20–25)

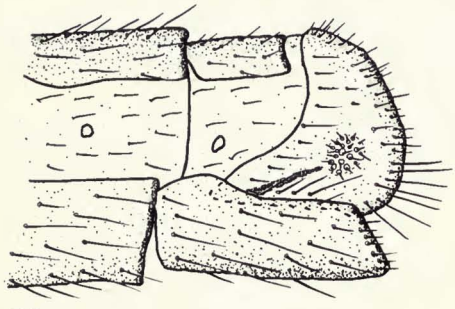
♂. Head with dark brown markings extending from gena to clypeus. White band across frons. Maxillary palp with apical segment exceptionally long and slender. Mesonotum with broad dark brown band across mesoscutum, becoming paler on mesoprescutum. Metanotum unmarked. Claws with slight basal dilation. Fore wing (Fig. 20) 12 mm, broad. Costa dark to third crossvein; large brown spot on fourth posterior marginal crossvein and on two basal inner gradates; pale shading on *dcc* and *Psm* crossveins; gradate crossveins brown, other crossveins green. Hind wing 11 mm. Crossveins green except outer gradate series, brown.

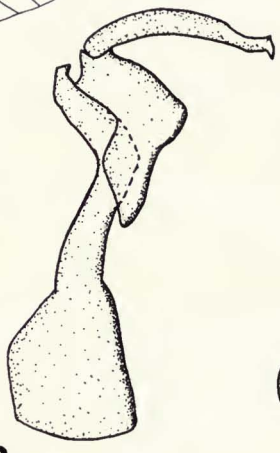
♀. Markings as in male, though brown facial markings may extend above clypeus.

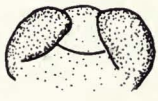
GENITALIA ♂ (Figs 21, 22). Trichobothria 20. Abdominal setae dense, long. Arcessus narrow with small dorso-apical spine.

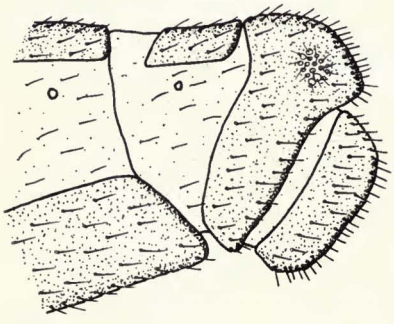
GENITALIA ♀ (Figs 23–25). Trichobothria 17. Subgenital plate broad. Spermatheca long, narrow. Vela long, curved. Ventral impression shallow.

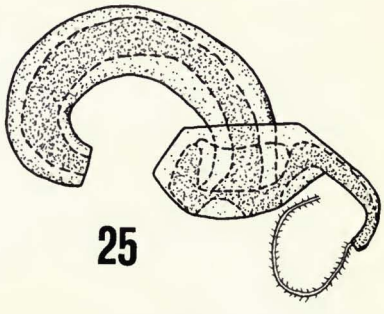












Figs 20–25 *Semachrysa papuensis*. 20, fore wing venation; 21, apex of ♂ abdomen, lateral view; 22, ♂ genitalia, lateral view; 23, apex of ♀ abdomen, lateral view; 24, ♀ subgenital plate, ventral view; 25, ♀ spermatheca, lateral view.

REMARKS. This large species is the only member of the genus with dark brown markings on both the fourth posterior marginal crossvein and the first two crossveins of the inner gradate series in the fore wing.

MATERIAL EXAMINED

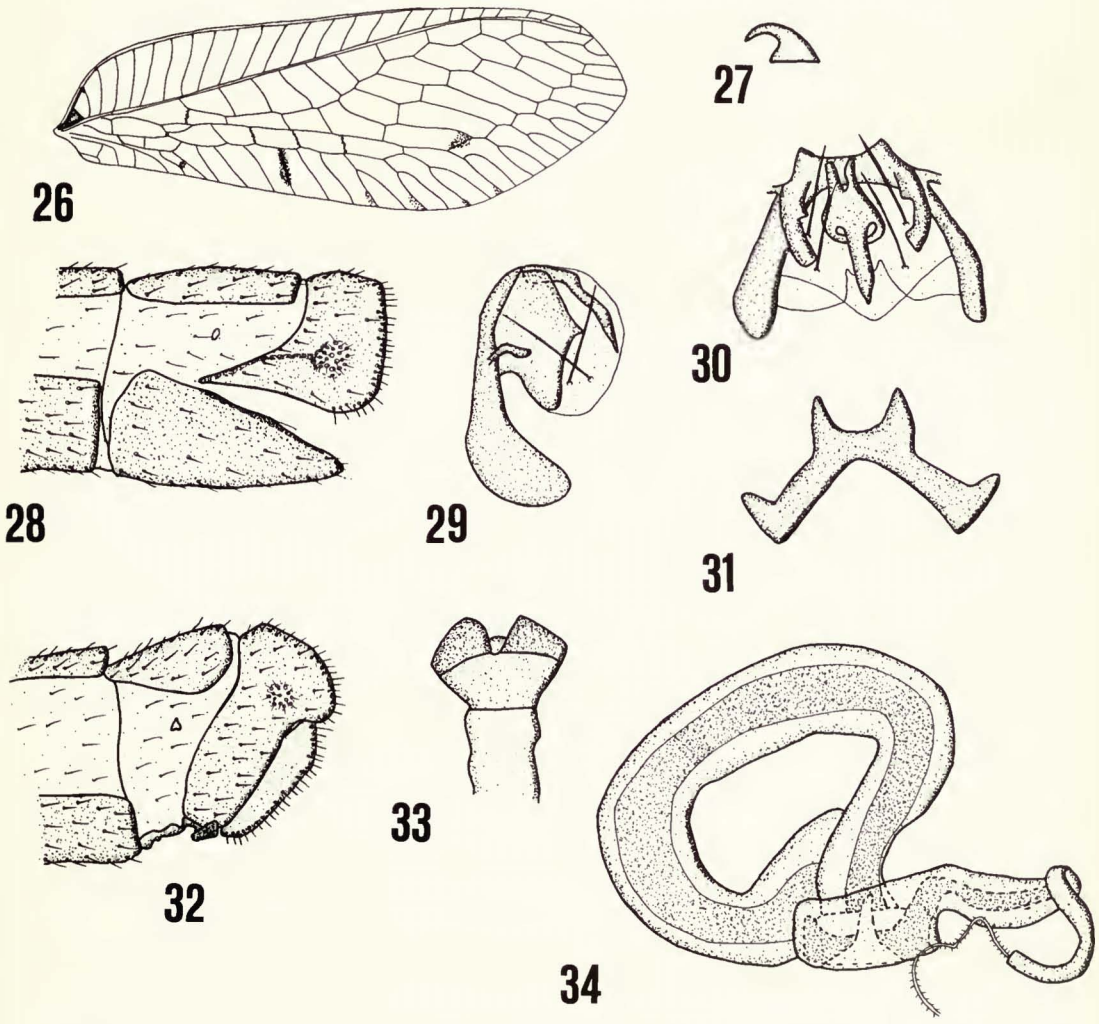
Holotype ♂, **New Guinea**: Lower Mist Camp, 1500 m, 29.i.1939 (*Toxopeus*) (RNH).

Paratypes. **New Guinea**: 1 ♂, Star Range, 1500 m, 3.vii.1959 (RNH); 1 ♀, Mafulu, 1500 m, xii.1933 (*Cheesman*) (BMNH).

Semachrysa contorta sp. n.

(Figs 26–34)

♂. Head with brown stripe on lateral and dorsal edge of clypeus. Spot on frons between antennae large and triangular. Frons often with white transverse band. Scape and pedicel with lateral brown stripe extending onto head. Brown spot on mesoscutum; mesoprescutum pale brown often marked with darker brown spots. Metanotum unmarked. Claws without basal dilation (Fig. 27). Fore wing (Fig. 26) 8–10 mm. Costa



Figs 26–34 *Semachrysa contorta*. 26, fore wing venation; 27, claw; 28, apex of ♂ abdomen, lateral view; 29, ♂ genitalia, lateral view; 30, ♂ genitalia, caudal view; 31, ♂ gonarcus, dorsal view; 32, apex of ♀ abdomen, lateral view; 33, ♀ subgenital plate, ventral view; 34, ♀ spermatheca, lateral view.

dark to second costal crossvein; wing marked with brown spots on basal and, sometimes, second outer gradate, fourth posterior marginal crossvein, with smaller spots on base of *Rs*, forking marginal crossveins and between branches of Cu_2. Hind wing 7·0–8·5 mm; unmarked.

♀. Markings as in male.

GENITALIA ♂ (Figs 28–31). Trichobothria 16–21. Arcessus narrow with wide basal bifurcation and lateral projections. Gonarcus with prominent submedian tooth.

GENITALIA ♀ (Figs 32–34). Trichobothria 15. Spermathecal duct coiled once; vela very long and curved; ventral impression very deep. Subgenital plate narrow, widening basally.

REMARKS. The wing markings separate this species from *matsumurae*, which it closely resembles. *S. contorta* has a small spot between the branches of Cu_2 and a large spot on the fourth posterior marginal crossvein. In *matsumurae* the spot between the branches of Cu_2 extends to *dcc* and the spot on the fourth posterior marginal crossvein is small.

MATERIAL EXAMINED

Holotype ♂, **India**: Assam, Khasia Hills (BMNH).

Paratypes. **India**: 5 ♂, 1 ♀, data as holotype (BMNH); 1 ♀, Assam, Khasia Hills 1907 (RNH).

Material excluded from the type-series. **India**: 2 ex., data as holotype (abdomens missing) (BMNH).

Semachrysa decorata (Esben-Petersen) **comb. n.**

(Figs 35–41)

Chrysopa decorata Esben-Petersen, 1913: 260. LECTOTYPE ♀, TAIWAN (IP), here designated [examined].

[*Chrysopa nigribasis* Banks; Banks 1939*a*: 138. Misidentification.]

Chrysopa (Indochrysa) nigribasis var. *rectoides* Banks, 1939*b*: 471. Holotype ♀, CHINA (MCZ) [examined]. **Syn. n.**

♂. Head with black marking on gena extending basally, laterally and dorsally around clypeus, leaving lateral pale spot on clypeus and median spot below, reminiscent of *S. minuta* (Fig. 4). Frons white, median spot on frons large, triangular; each lateral spot extending dorsally to outer lateral base of scape. Scape marked laterally with brown stripe. Antenna longer than fore wing. Maxillary palp with black dorsal marking at distal end of each segment; apical segments of maxillary and labial palps black. Mesoscutum with extensive brown markings; mesoprescutum marked pale brown with several darker brown spots. Claws with basal dilation. Fore wing (Fig. 35) 8·5 mm. Costa black to second crossvein. Large black-brown spot on fourth posterior marginal crossvein with smaller spots on *dcc*, base of *Rs, im*. Faint shading on *Psm* crossveins and posterior forking marginal veins. All other veins pale. Hind wing 8·0 mm, unmarked.

♀. Marked as in male with additional dark shading in fore wing on 1*A* and radial crossveins below pterostigma. Fore wing 9 mm. Hing wing 8·5 mm. Faint shading on marginal crossveins and gradates.

GENITALIA ♂ (Figs 36–38). Trichobothria 12. Gonarcus with submedian tooth and slender lateral extensions. Entoprocessus axe-shaped. Arcessus narrow and tapering apically with four dorsal setae.

GENITALIA ♀ (Figs 39–41). Trichobothria 18. Spermatheca broad; vela short, slightly curved; ventral impression very deep; spermathecal duct with one twist.

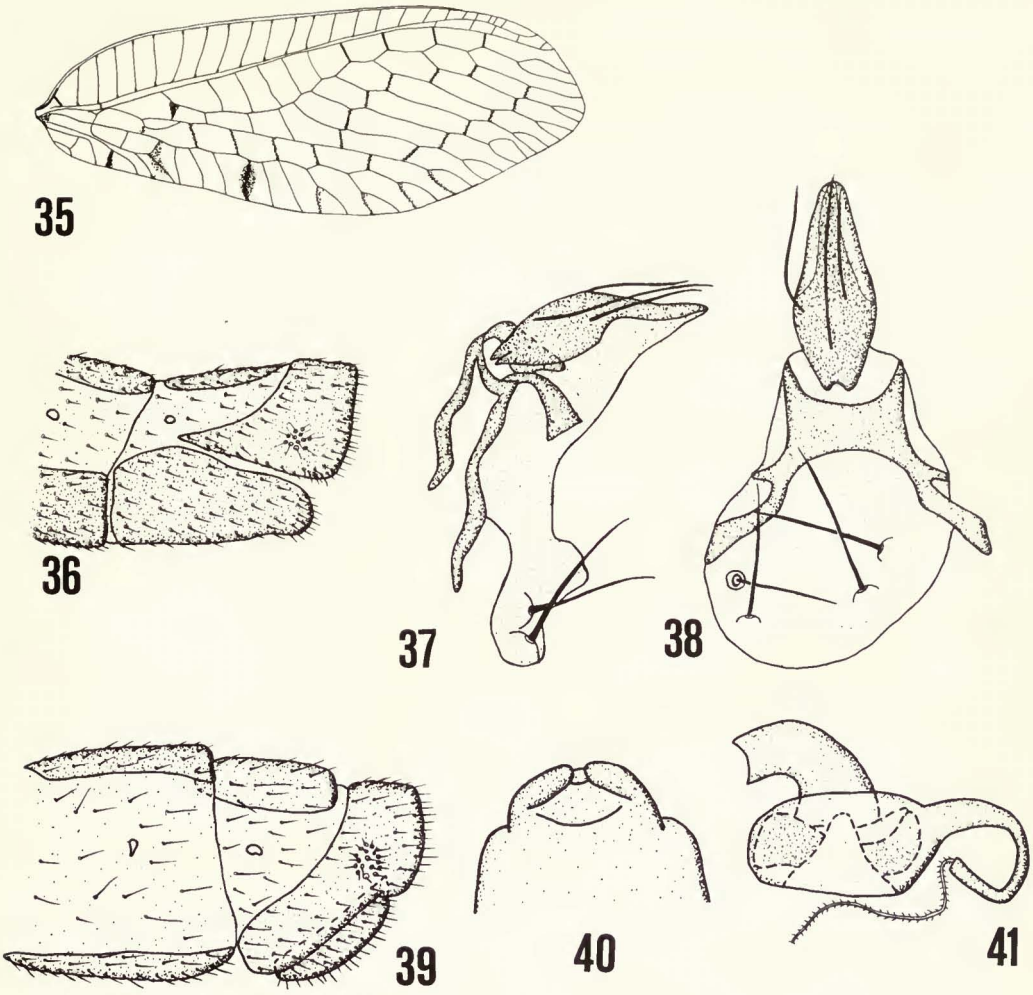
REMARKS. Banks (1939*b*) misidentified specimens of *matsumurae* (p. 17) as *decorata*, consequently he described true *decorata* as *nigribasis* var. *rectoides*.

Females of *decorata* may be distinguished by the very deep ventral impression and the relatively short vela and spermathecal duct which are not found together in any other species. The male may be distinguished by the presence of setae on the arcessus which are not found, in this position, in any other species of the genus. This species is also characterized by the dark spots on the mesoprescutum. Kuwayama (1962) states that in Japan it is on the wing during September.

DISTRIBUTION. China (Hainan Dao I.), Taiwan, Japan (Kuwayama, 1962), West Malaysia, Philippines (Banks, 1939*a*; 1939*b*).

MATERIAL EXAMINED

Chrysopa decorata Esben-Petersen, lectotype ♀, **Taiwan**: Kosempo, 1911 (*Sauter*) (IP). *Chrysopa*



Figs 35–41 *Semachrysa decorata*. 35, fore wing venation; 36, apex of ♂ abdomen, lateral view; 37, ♂ genitalia, lateral view; 38, ♂ genitalia, dorsal view; 39, apex of ♀ abdomen, lateral view; 40, ♀ subgenital plate, ventral view; 41, ♀ spermatheca, lateral view.

(Indochrysa) nigribasis var. *rectoides* Banks, holotype ♀, **China**: Hainan Dao I., Dwa Bi, 20.vii.1935 (*Gressitt*) (MCZ).

West Malaysia: 1 ♂, W. Pahang, Genting Tea Estate, 650 m, 11–29.xi.1981 (*Tuck*) (BMNH).

In the original description of *decorata*, Esben-Petersen (1913) lists two specimens. However, only one is present at IP; the other, apparently, is lost (The Director, IP, *in litt.*).

Semachrysa sagitta sp. n.

(Figs 42–45)

[*Chrysopa matsumurae* Okamoto; Kimmins, 1936: 87 (partim). Misidentification.]

♂. Head with brown markings extending from gena along dorsal edge of clypeus. Spot between antennae small, with those beneath each antenna larger. Scape unmarked. Mesonotum with brown spot above fore wing base and narrow stripe on mesoprescutum. Metanotum unmarked. Claws with slight basal dilation. Fore wing (Fig. 42) 10·5 mm. Costa dark to third crossvein; large brown spot on *dcc* with fainter shading on base of *Rs*, radial crossveins, fourth posterior marginal crossvein, gradates, *Psm* crossveins. Inner gradates

arched. Hind wing 9·0 mm, gradates brown with faint shading on fourth posterior marginal crossvein, forking marginal crossveins; other veins green.

♀. Unknown.

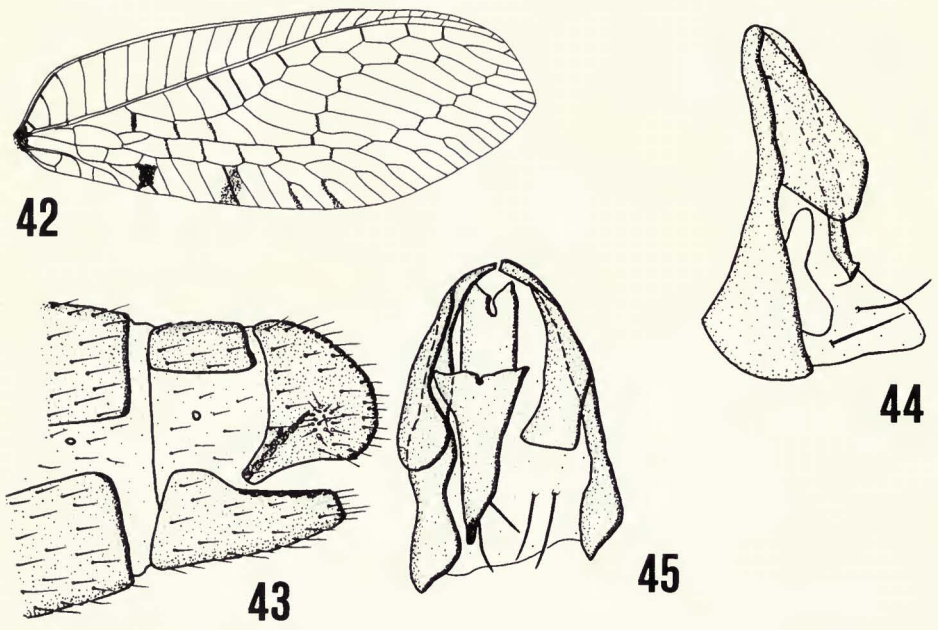
GENITALIA ♂ (Figs 43–45). Trichobothria 15. Arcessus with broad median expansion and small apical tooth.

REMARKS. The genitalia and markings of the fore wing are very similar to *picilabris* but *sagitta* may easily be distinguished from this species by the absence of a large spot on the hind wing and the absence of a median spot on the vertex immediately behind the antennae.

Kimmins (1936) misidentified three specimens from the New Hebrides as *Chrysopa matsumurae* Okamoto; of these, one is described here as *S. sagitta*, and the Erromanga specimen should be referred to *Chrysoperla* Steinmann. I have been unable to trace the Tangoa specimen.

MATERIAL EXAMINED

Holotype ♂, **New Hebrides**: Espiritu Santo I., Hog Harbour, 7.vii.1925 (*Buxton*) (BMNH).



Figs 42–45 *Semachrysa sagitta*. 42, fore wing venation; 43, apex of ♂ abdomen, lateral view; 44, ♂ genitalia, lateral view; 45, ♂ genitalia, caudal view.

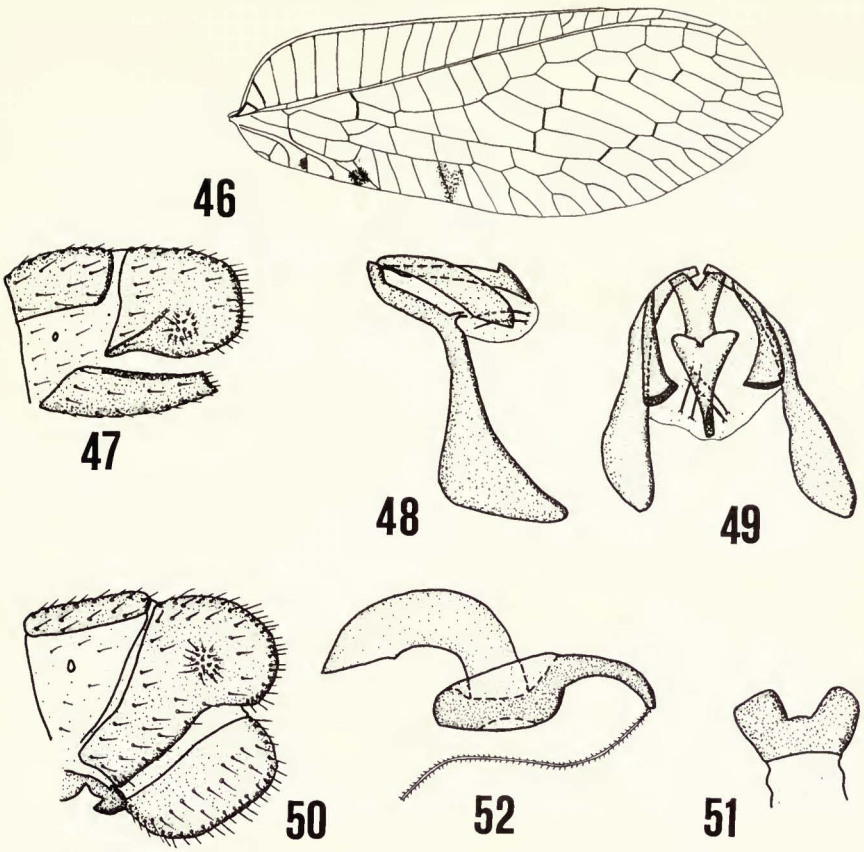
Semachrysa picilabris (Kimmins) **comb. n.**

(Figs 46–52)

Ankylopteryx picilabris Kimmins, 1952*a*: 77. Holotype ♀ [not ♂], AUSTRALIA (BMNH) [examined].

♂. Head narrow with brown mark around lateral edge of clypeus, not continuous with spot on gena. Brown median spot on vertex immediately behind antennae in addition to three on frons below antennae. Spot on frons between antennae faint. Scape unmarked. Mesonotum with brown spot above fore wing base, narrow stripe on mesoprescutum. Metanotum unmarked. Claws with slight basal dilation. Fore wing (Fig. 46) 9·5 mm. Costa dark to first crossvein; dark brown spot between branches of *Cu* extending to *dcc*; faint shading on fourth posterior marginal crossvein and branches of 1*A*. Other crossveins green except basal costals, base of *Rs*, inner gradates, radial crossveins below pterostigma, brown. Inner gradate series arched. Hind wing 8·5 mm, marked with small dark brown spot on fourth posterior marginal crossvein.

♀. Markings as in male.



Figs 46–52 *Semachrysa picilabris*. 46, fore wing venation; 47, apex of ♂ abdomen, lateral view; 48, ♂ genitalia, lateral view; 49, ♂ genitalia, caudal view; 50, apex of ♀ abdomen, lateral view; 51, ♀ subgenital plate, ventral view; 52, ♀ spermatheca, lateral view.

GENITALIA ♂ (Figs 47–49). Trichobothria 15. Arcessus downcurved with broad median expansion and apical spine. Gonarcus sinuous. Gonosetae short, curved, situated close to apex of arcessus, projecting anteriorly.

GENITALIA ♀ (Figs 50–52). Trichobothria 17. Subgenital plate with small median projection. Spermatheca narrow, duct short; vela large, curved; ventral impression shallow.

REMARKS. Externally this species is very similar to *wallacei* from which it differs by lacking a spot on *dcc* in the hind wing. The marking between the branches of Cu_2 is more extensive in *wallacei* than in *picilabris* and in the latter the apical crossvein of cell c_2 is green; in *wallacei* this vein is brown.

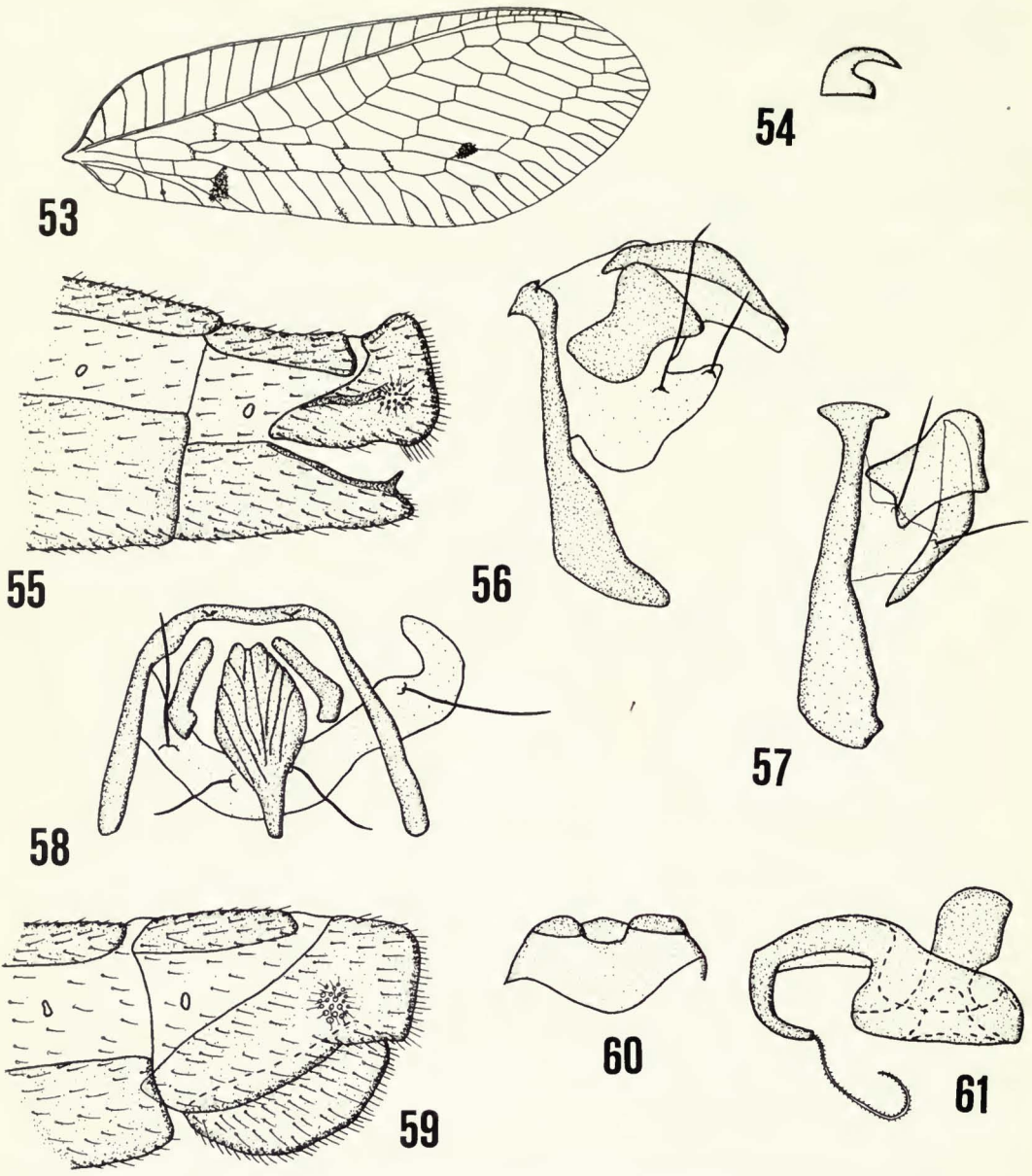
MATERIAL EXAMINED

Holotype ♀, **Australia**: north Queensland, Tully, 12.vi.1931 (*Franzen*) (BMNH).
Paratypes. 1 ♂, 1 ♀, same data as holotype (BMNH).

Semachrysa matsumurae (Okamoto) **comb. n.**

(Figs 53–64)

Chrysopa matsumurae Okamoto, 1914: 68. Lectotype ♀, JAPAN: Kyushu, Moji, 18.v.1906 (EIHU), designated by Kuwayama (1966: 136) [not examined].
[*Chrysopa decorata* Esben-Petersen; Banks, 1939*b*: 470. Misidentification.]



Figs 53–61 *Semachrysa matsumurae,* Japan. 53, fore wing venation; 54, claw; 55, apex of ♂ abdomen, lateral view; 56, 57, ♂ genitalia, lateral view; 58, ♂ genitalia, caudal view; 59, apex of ♀ abdomen, lateral view; 60, ♀ subgenital plate, ventral view; 61, ♀ spermatheca, lateral view.

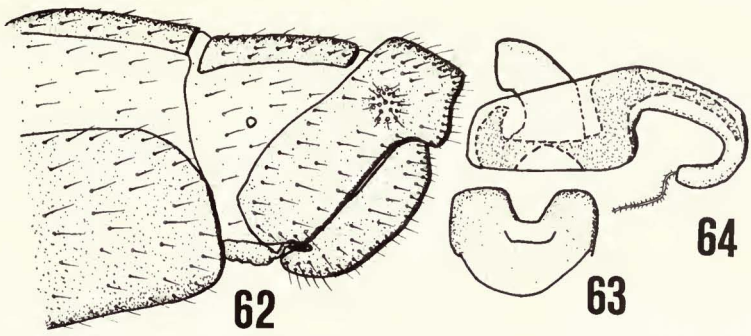
♂. Head with dark brown marking extending from gena along dorsal edge of clypeus; additional spot between antenna and eye. Scape and pedicel marked laterally with pale brown stripe. (In Khasia Hills specimens scape and pedicel unmarked in all but one specimen.) Antenna as long as or longer than fore wing. Apical segment of maxillary palp usually with brown stripe. Mesonotum with broad brown band extending across mesoscutum and mesoprescutum. Metanotum unmarked. Claws with basal dilation (Fig. 54). Fore wing (Fig. 53) 9·5–12·5 mm. Costa black to third crossvein; brown spot on basal outer gradate and at base of *dcc*, other veins green; additional faint shading on second and fourth posterior marginal crossveins, *Psm* crossveins, basal four radial crossveins, 1*A*, basal inner gradate vein. In one specimen

additional spot on second outer gradate vein. Hind wing 8–10 mm. Abdomen green dorsally, brown ventrally.

♀. Markings as in male.

GENITALIA ♂ (Figs 55–58). Trichobothria 16–21. Apodeme of sternite 8+9 forked. Gonarcus with small tooth in submedian area. Arcessus ovoid with dorsal grooves, basal bifurcation slight. Entoprocessus rectangular, narrowing medially.

GENITALIA ♀ (Figs 59–64). Trichobothria 18–23. Subgenital plate broad. Spermathecal duct short; ventral impression moderately deep; vela prominent and curved. (In specimens from Khasia Hills, Assam (Figs 62–64), ventral impression less pronounced and subgenital plate not as broad.)



Figs 62–64 *Semachrysa matsumurae,* Khasia Hills. 62, apex of ♀ abdomen, lateral view; 63, ♀ subgenital plate, ventral view; 64, ♀ spermatheca, lateral view.

REMARKS. I was unable to examine the lectotype of this species but received a detailed description and drawings from Mr S. Tsukaguchi. From this description it is obvious that the specimens I received from MCZ and which had been determined as *decorata* by Banks (1939*b*) are, in fact, *matsumurae*.

This species superficially resembles *contorta* but may be distinguished by the markings of the fore wing and differences in the genitalia. In *matsumurae* the spot on *dcc* is large, and extends to Cu_2, and that on the fourth posterior marginal crossvein is small. In *contorta* there is a small spot on Cu_2, whilst that on the fourth posterior marginal crossvein is large. In the male the arcessus is dorsally ridged in *matsumurae* but not in *contorta*. In the female the vela is short in *matsumurae* in contrast to the long vela of *contorta*.

MATERIAL EXAMINED

Taiwan: 1 ♂, Shinten, 3.iv.1932; 1 ex. (abdomen missing), Hassenzan, 24.vi.1934. **China**: 1 ex. (abdomen damaged), Hainan Dao I., Ta Han, 23.vi.1935; 1 ♂, E. Guandong, Yim Na San, 11.vi.1936; 1 ♂, 1 ♀, SW. Fujian, Gang-ken, 23.vii.1936. **Japan**: 1 ♂, 1 ♀, Ryukyu Is, Okinawa I., 31.viii.1934 (*Gressitt*) (MCZ). **India**: 3 ♂, 2 ♀, 3 ex. (abdomens missing), Assam, Khasia Hills (BMNH).

Semachrysa cruciata (Esben-Petersen) **comb. n.**

(Figs 65–72)

Chrysopa cruciata Esben-Petersen, 1928: 228. Holotype ♀, SUMATRA (RNH) [examined].
Chrysopa (Indochrysa) cruciata Esben-Petersen; Banks, 1938: 226.

♂. Head with brown markings extending around lateral and dorsal edge of clypeus. No spot on frons between antennae. Small lateral brown stripe at base of scape. Mesonotum with broad, brown, longitudinal band on mesoscutum. Claws without basal dilation. Fore wing (Fig. 65) 7 mm, narrow. Costa dark to first crossvein; large pale brown spots on base of *Rs, dcc* and between branches of Cu_2, fourth posterior marginal crossvein; pale shading on inner gradates, forking marginal crossveins and radial crossveins below pterostigma. Inner gradates arched. Hind wing 6·5 mm. Veins green, unmarked.

♀. Markings as in male with additional small brown spot on mesoscutum.

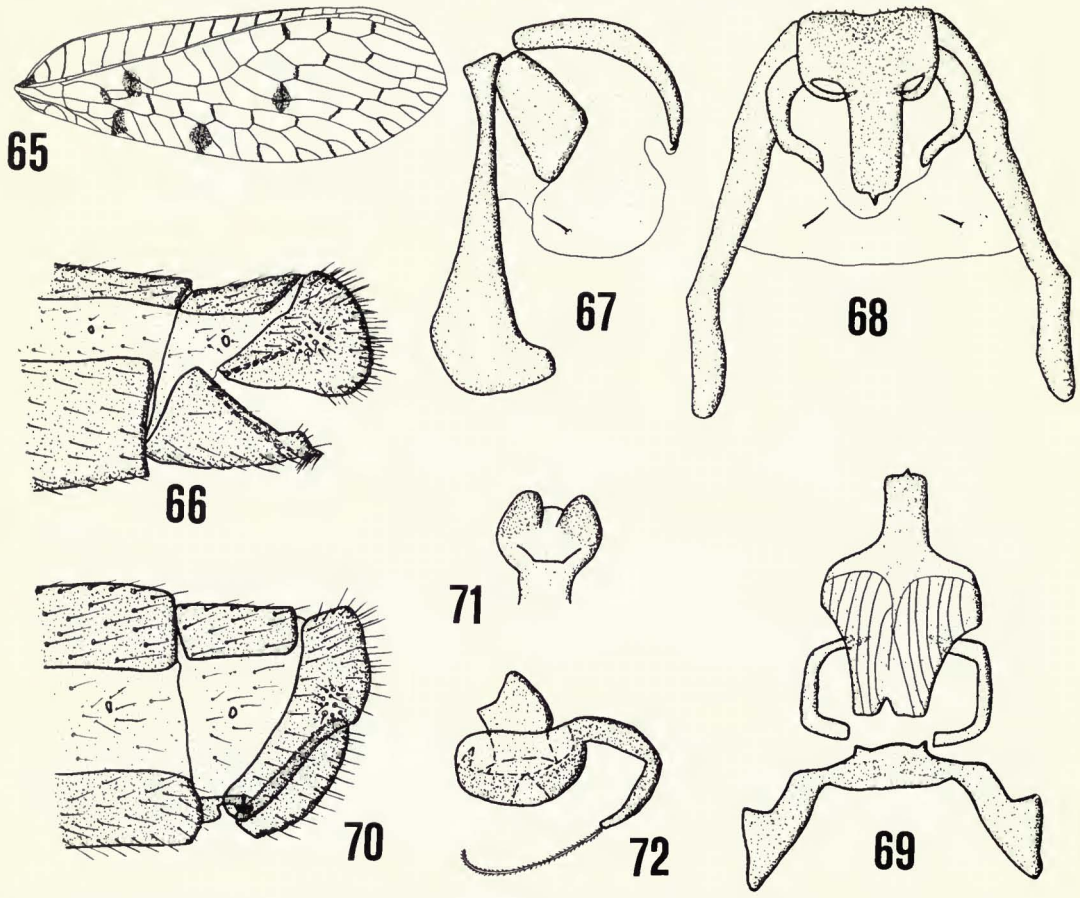
GENITALIA ♂ (Figs 66–69). Trichobothria 15. Tuft of setae at apex of sternite 8+9. Gonarcus with submedian tooth and median swelling. Arcessus broad, grooved dorsally. Only two, short gonosetae.

GENITALIA ♀ (Figs 70–72). Trichobothria 14. Spermatheca narrow; vela short; ventral impression deep.

REMARKS. *S. cruciata* can be distinguished by the large brown spot over *Rs* which is not found in any other species of the genus, except *polysticta*, from which it may be separated by the absence of a spot on the frons between the antennae. It is the only *Semachrysa* species in which the male has only one pair of lateral gonosetae.

MATERIAL EXAMINED

Holotype ♀, **Sumatra**: Lampung, Wai Lima Z., 9.xii.1921 (*Karny*) (RNH); 1 ♂, Engano I., ix–x.1890 (*Doherty*) (BMNH).



Figs 65–72 *Semachrysa cruciata*. 65, fore wing venation; 66, apex of ♂ abdomen, lateral view; 67, ♂ genitalia, lateral view; 68, ♂ genitalia, caudal view; 69, ♂ genitalia, dorsal view; 70, apex of ♀ abdomen, lateral view; 71, ♀ subgenital plate, ventral view; 72, ♀ spermatheca, lateral view.

Semachrysa nigribasis (Banks) comb. n.

(Figs 73–76)

Chrysopa nigribasis Banks, 1920: 337. Holotype ♀, WEST MALAYSIA (MCZ) [examined].
Chrysopa (Indochrysa) nigribasis Banks, 1938: 226.

♂. Unknown.

♀. Head with dark brown markings extending along dorsal edge of clypeus. Brown stripe on scape.

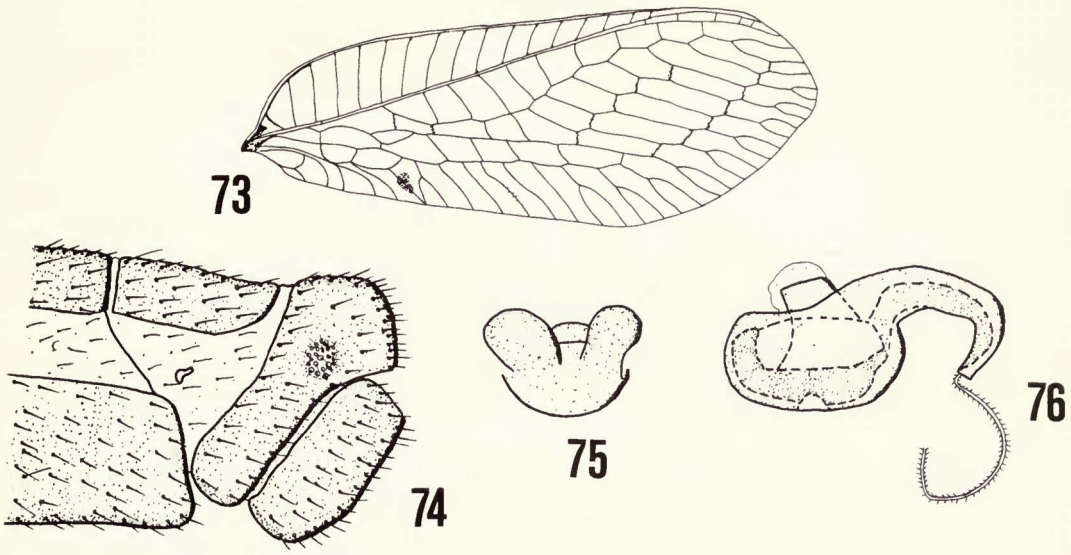
Mesonotum with narrow, transverse, brown stripe on mesoscutum and mesoprescutum. Metanotum unmarked. Claws with basal dilation. Fore wing (Fig. 73) 10 mm. Costa black to third costal crossvein; cell *im* long; gradates parallel; brown spot on *dcc*. Hind wing 9 mm, unmarked.

GENITALIA ♀ (Figs 74–76). Trichobothria 23. Subgenital plate outcurved. Spermatheca narrow; vela short; ventral impression shallow.

REMARKS. This species is distinguished by the absence of markings in the hind wing, while the fore wing has only a small spot on *dcc*.

MATERIAL EXAMINED

Holotype ♀, **West Malaysia**: Pinang I., Straits Settlements (*Baker*) (MCZ).



Figs 73–76 *Semachrysa nigribasis*. 73, fore wing venation; 74, apex of ♀ abdomen, lateral view; 75, ♀ subgenital plate, ventral view; 76, ♀ spermatheca, lateral view.

Semachrysa claggi (Banks) **comb. n.**

(Figs 77–80)

Ankylopteryx claggi Banks, 1937: 143. Holotype ♀, PHILIPPINES (MCZ) [examined].

♂. Unknown.

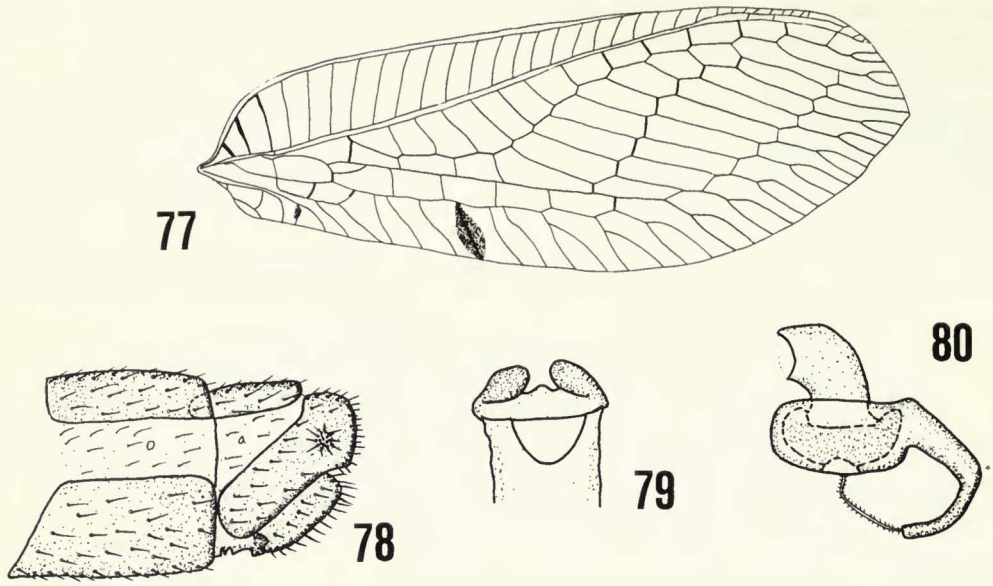
♀. Clypeus with small lateral brown spot continuous with brown mark on gena. Scape unmarked. Mesonotum with narrow, transverse, brown band across mesoscutum and mesoprescutum. Metanotum with pale brown spot above base of hind wing and two small spots on metaprescutum. Claws without basal dilation. Fore wing (Fig. 77) 13 mm, broad. Large brown spot on fourth posterior marginal crossvein, smaller spot on basal branch of 1*A*. Other veins green except inner gradates, radial crossveins below pterostigma, base of *Rs*, and basal costal crossveins, brown. Gradate series parallel. Costa dark to third crossvein. Hind wing 12 mm; small brown spot at base of *dcc* and fourth posterior marginal crossvein.

GENITALIA ♀ (Figs 78–80). Trichobothria 16. Subgenital plate broad, tapering apically. Spermatheca broad; vela short, slightly curved; ventral impression shallow.

REMARKS. This species has the largest wing span of the genus and may be distinguished by the large dark brown spot on the fourth posterior marginal crossvein and the smaller spot on the basal branch of 1*A*.

MATERIAL EXAMINED

Holotype ♀, **Philippines**: Mindanao, Davao, Mt. Mayo, 1500–1800 m, i. (*Clagg*) (MCZ).



Figs 77–80 *Semachrysa claggi.* 77, fore wing venation; 78, apex of ♀ abdomen, lateral view; 79, ♀ subgenital plate, ventral view; 80, ♀ spermatheca, lateral view.

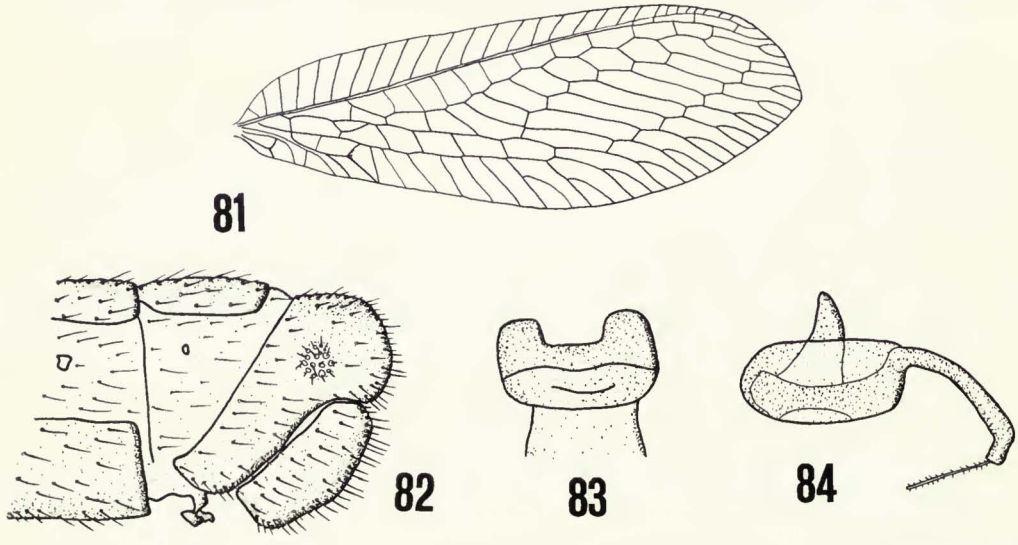
Semachrysa dammermanni (Esben-Petersen) **comb. n.**

(Figs 81–84)

Chrysopa dammermanni Esben-Petersen, 1929: 103. LECTOTYPE ♀, Buru I. (RNH), here designated [examined].

♂. Unknown.

♀. Dark brown spot on gena extending to lateral edge of clypeus. Spot on frons between antennae faint. Scape unmarked; antenna longer than fore wing. All palps unmarked. Mesonotum and metanotum unmarked. Claws with slight basal dilation. Fore wing (Fig. 81) 10 mm, unmarked except for indistinct



Figs 81–84 *Semachrysa dammermanni.* 81, fore wing venation; 82, apex of ♀ abdomen, lateral view; 83, ♀ subgenital plate, ventral view; 84, ♀ spermatheca, lateral view.

shading on *dcc* and costa black at base. Basal costal space only slightly enlarged. Hind wing 9 mm, unmarked. Veins green except gradates and radial crossveins below pterostigma, brown.

GENITALIA ♀ (Figs 82–84). Trichobothria 16. Subgenital plate broad. Spermatheca narrow, duct short; vela short; ventral impression shallow but broad.

REMARKS. This is the only speces in the genus in which the mesonotum and metanotum are unmarked.

MATERIAL EXAMINED

Lectotype ♀, **Buru I.**: Station 9, vii.1927 (*Toxopeus*) (RNH).
Paralectotype. 1 ex. (abdomen missing), same data as lectotype (RNH).

Semachrysa polysticta sp. n.

(Figs 85–88)

♂. Unknown.

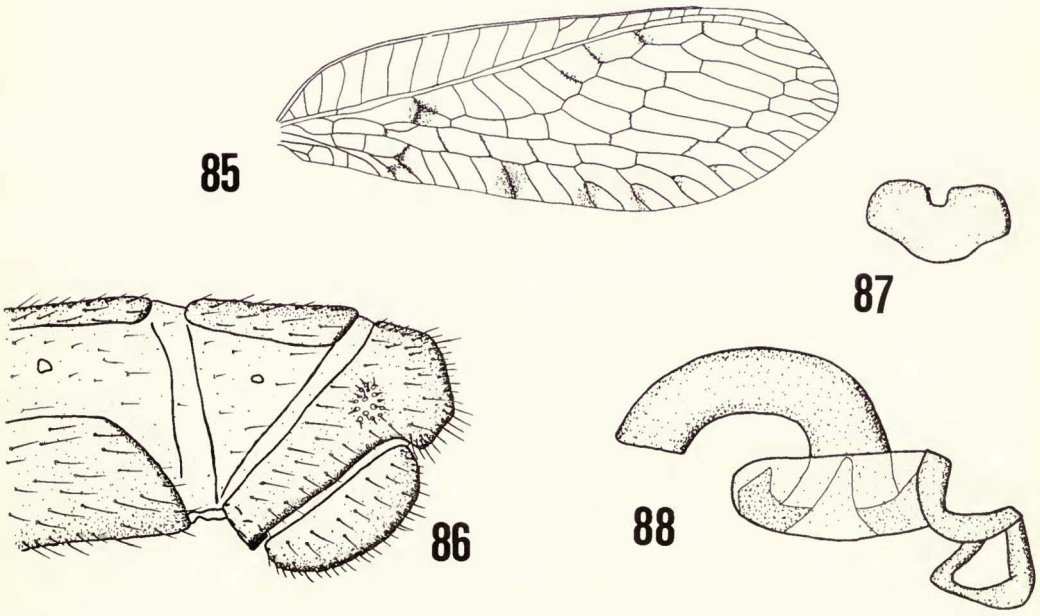
♀. Head with brown markings extending around lateral and dorsal edge of clypeus. Small lateral brown stripe on base of scape extending onto head. Brown mark on postocular lobe extending as band along edge of eye to anterior edge of vertex. Vertex with many small indentations. Apical segment of maxillary palp entirely brown. Mesonotum with two small isolated brown spots on mesoscutum and stripe on suture between mesoscutum and mesoprescutum. Fore wing (Fig. 85) 10 mm. Dark brown spots on base of *Rs*, *dcc* and fourth posterior marginal crossvein. Pale shading on radial crossveins below pterostigma, gradates and *Psm* crossveins. Hind wing 9 mm, unmarked except pale shading on alternate posterior marginal crossveins.

GENITALIA ♀ (Figs 86–88). Trichobothria 16. Spermatheca narrow, duct long, very twisted; vela long and curved; ventral impression very deep.

REMARKS. The fore wing is marked similarly to that of *cruciata*, but *polysticta* may be distinguished by the absence of a spot at the base of the inner gradate series. Other characteristics are the convoluted spermathecal duct and the deep ventral impression.

MATERIAL EXAMINED

Holotype ♀, **India**: Assam, Khasia Hills, no. 6, 1907 (RNH).



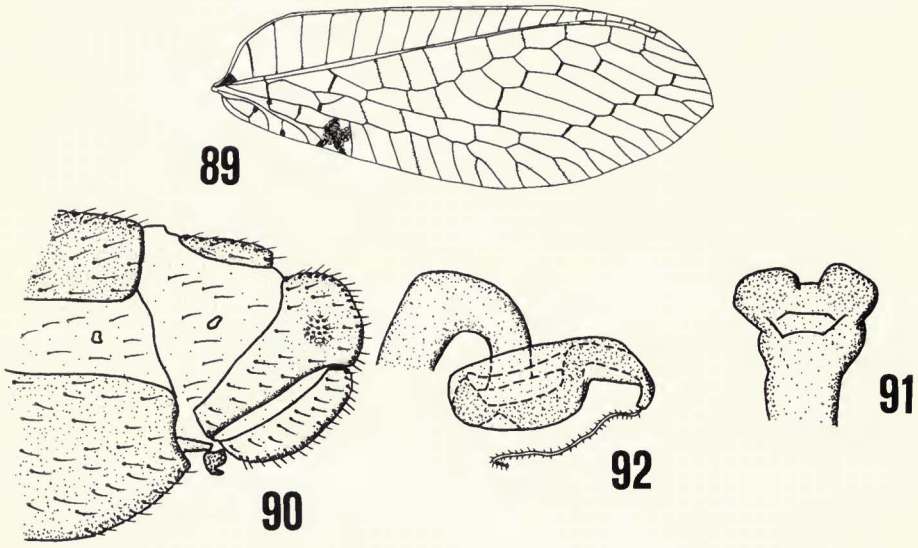
Figs 85–88 *Semachrysa polysticta*. 85, fore wing venation; 86, apex of ♀ abdomen, lateral view; 87, ♀ subgenital plate, ventral view; 88, ♀ spermatheca, lateral view.

Semachrysa wallacei sp. n.

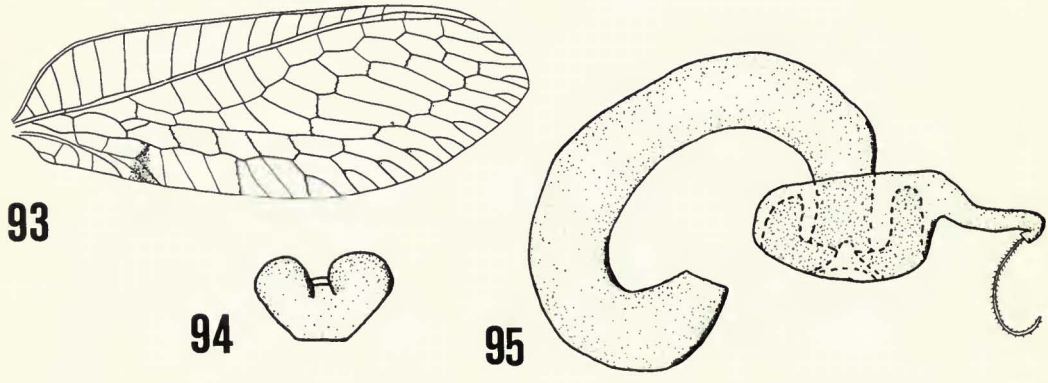
(Figs 89–95)

♂. Unknown.

♀. Head with clypeus almost entirely dark brown except for pale lateral spot. Additional median spot on vertex immediately behind antennae. Scape unmarked. Mesonotum with small brown mark on mesoscutum above base of fore wing and median spot adjacent to suture of mesoprescutum. Mesoprescutum with lateral, narrow, curving dark brown stripe and median pale brown spot on either side of dorsal suture. Metanotum unmarked. Claw with slight basal dilation. Fore wing (Figs 89, 93) 9 mm, narrow. Costa black to first costal crossvein. Other veins green except *Rs* crossveins, apical crossvein of cell c_2 and gradates, brown. Large dark brown spot on *dcc*, smaller brown spots on branches of 1*A* and basal branch of 2*A*, basal *Pcu* and *Psm* crossveins. Inner gradates arched. Hind wings broken and partly missing from type but large brown spot present on *dcc*. (New Guinea specimen with additional spots on alternate posterior marginal crossveins.) Hind wing 8·5 mm.



Figs 89–92 *Semachrysa wallacei,* Morotai I., 89, fore wing venation; 90, apex of ♀ abdomen, lateral view; 91, ♀ subgenital plate, ventral view; 92, ♀ spermatheca, lateral view.



Figs 93–95 *Semachrysa wallacei,* New Guinea. 93, fore wing venation; 94, ♀ subgenital plate, ventral view; 95, ♀ spermatheca, lateral view.

GENITALIA ♀ (Figs 90–92, 94, 95). Trichobothria 17. Subgenital plate broad and outcurved. Vela large, curved; ventral impression shallow. (New Guinea specimen with vela very long; ventral impression deep.)

REMARKS. This species is similar to *picilabris* but may be distinguished by the presence of the large spot on *dcc* in the hind wing.

The New Guinea specimen is very similar externally to the holotype of *wallacei*, but there are slight differences in the female genitalia, consequently it is excluded from the type-series.

MATERIAL EXAMINED

Holotype ♀, **Morotai I.** (*Wallace*) (BMNH).

Material excluded from the type-series. **New Guinea**: 1 ♀, Berhard Camp B, 100 m, 6.iv.1939 (*Toxopeus*) (RNH).

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Index

Synonyms are in *italics*; principal references are in **bold**. References to the check-list (p. 8) are not included.