Protophis but bearing fewer hairs. The long empodial hairs and the presence of 3 hairs on all first tarsal segments will distinguish Swistkophila from many other Aphididae.

Sceglewiczicella Holman 1974

The 4-segmented antennae with processes terminalis 3.5–5.4 times as long as the base of the last antennal segment and tergites 1–5 of the abdomen comprising a sclerotic shield are characteristic. In many ways resembling Sypatophticotheca of the Anuraphidina but distribution of the lateral abdominal tubercles and the long fine antennal hairs are characteristic aphidine.

Toxoptera Koch, 1856 (Figs. 40–49)

The presence of a stridulating mechanism distinguishes Toxoptera from all other Aphididae. Taco (1963) keyed the known fauna and Eastop (1956) gave a key to the three widely distributed species. Toxoptera was once used for all Aphid-like species with a once branched media in the forewing, including the greenbug, Schizaphis graminum (Rondani) of the tribe Rhopaliphagina.

Toxoptera Börner, 1940 (Fig. 36)

The large lateral abdominal tubercles, pointed cuads and long processus terminalis 4.5–5.0 times as long as the base of the sixth antennal segment distinguish the apline from other genera and the once branched media of the forewing distinguish the alate from most other Aphididae.

Xerobion Newsky, 1928

Included from the original description and subsequent redescription.

Xerophila Newsky, 1929

Many of the species originally described in Xerophila are similar to the type-species of Clypeophila Sellman, 1937, which has been regarded as a synonym of Clypeophila Newsky, 1928. However, the type-species X. saxatilis, while otherwise agreeing with Clypeophila, is described as having the arrangement of lateral abdominal tubercles characteristic of the Aphidina.

Zygaphila Knowlton, 1947

Z. staheli Knowlton, 1947, the type-species, has the median hairs of abdominal tergites 6–8 placed on spiral tubercles. It seems reasonable, however, to include the otherwise similar North American species of Aphila, even though they lack the spiral tubercles.

Acknowledgements

The key is based mostly on specimens in the British Museum (Natural History) including those provided by Dr R. C. Dickson, Dr Hille Ris Lamber, Peter Lecaldt, G. Remaudiere, A. G. Robinson and R. Takashishi, and also from loans from United States National Museum arranged by Miss L. M. Russell of the United States Department of Agriculture. Figures 40–50 originally appeared in The Entomologist.

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West African species of Macromia (Odonata: Corduliidae) belonging to the picta and sophia groups

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ABSTRACT. Macromia amicorum sp. n., a member of the picta species-group, is described from Nigeria and the Ivory Coast, and is compared with both sexes of the closely related species flaminita. A key is provided to members of the sophia species-group.

Introduction

The genus Macromia Rambur 1842 is made up of large to medium-sized insects, predominantly black and yellow in body colour, often with a metallic sheen, and with the eyes emerald green during life. They are powerful fliers, and the genus is world-wide in distribution, being known from N. America, S. Europe, Africa (especially the tropical regions), India, the Par East, S. E. Asia, and Australasia. About thirty African species are known, and a number of others have been described, but many of these have been, or probably will be, found to be synonyms as the various species-groups come to be revised.

The genus does not readily fall into clearly defined species-groups. Selys (1878) tried to split off a separate genus Phyllocrania, but this has not stood the test of time. As more species were discovered the character used to distinguish Phyllocrania were found to turn up individually in both groups. Authors have now reverted to the name Macromia for all of them, and each has his own ideas of what constitutes a species-group, the term being used loosely to signify little more than such-and-such a species and those most closely related.

In a previous communication (Gambles, 1971) an account was given of five species of Macromia inhabiting the Savannah zone of Nigeria (four of them belonging to the picta Unicryptaenae, M. N. Moylan Gambles, Wind- loup, Whitelchuch Hill, Reading RG8 7NU. 0307 6970 70/1900.389 £2.00 © 1979 Blackwell Scientific Publications 389.

Abbreviations for depositories

BMNH, British Museum (Natural History), London;
CUMZ, Cambridge University Museum of Zoology; DALDC, Professor D. A. L. Davies' collection; IARS, Institute for Agricultural Research, Samaru, Nigeria; IPNC, Institut des Parcs Nationaux du Congo, Bruxelles; IRSNB, Institut Royal des Sciences
Macromia picta Hagen in Selys 1871 is one of the commonest and most widespread African species of the genus. There are a number of other species superficially similar and usually indistinguishable on the wing, generally considered to be fairly close relatives. These are all medium sized Odonata with three lateral yellow stripes on the thorax, superior anal appendages a bright yellow, the abdomen conspicuously patterned with black and yellow for most of its length and measuring between 32 and 38 mm, with a hindwing of 30–35 mm. These are loosely referred to as the *picta* group. They can be divided into two sub-groups, the *picta* sub-group (*picta*, *americana* and *familiaris*), characterized by the presence of a 'horn' on the dorsal of the tenth segment, a conical projection surmounted by a tuft of stout setae, directed in an oblique posterior direction and *africana* sub-group, in which this subterminal horn is absent. Related to *africana* Selys 1871 are *pseudofamiliaris* Finley 1961 and *rigenerantia* Gambles 1971. But as further species with a general resemblance come to be added, the group becomes more and more difficult to define. Distinguishing features are not all of equal value, species or colour-forms tending towards melanism in damp forested areas, and the number of ends and cross-veins increasing with the size of the insect, so that species intermediate in size between the smaller and paler *picta* group of the savannah and the large dark *zophila* group of the forest regions become difficult to classify into distinct species groups, even though it is mostly simple to separate them into individual species.

The new species described below resembles *picta* and *pseudofamiliaris* in general appearance, somewhat similar to the latter in the shape of the hamules, and with a dorsal abdominal spine almost identical with that of the former.

Finley (1954), in the most comprehensive review of African *Macromia* published to date, found himself unable to define any clear-cut species-groups, owing to the uneven distribution of useful diagnostic characters among the various species. So he formulated a formula for each species by which the presence of twenty-three stated characters was indicated by a letter of the alphabet. This formula can be very useful, but it has definite limitations, both because some of the characters can be variable, and also because some of the species have been found to share the same formula with others described later. Thus *picta*, *familiaris* and *americana* share the formula ACQGJQSTUW. Finley's (1954) figure of the abdominal markings of *picta* shows, incidentally, hamules which can only belong to *americana* or *familiaris*, probably the former. In an earlier paper (1971) I suggested the possibility that this figure might have been based on a damaged specimen of *pseudofamiliaris*, repaired by the addition of the terminal segments of a *picta*. But the discovery of a further species, combining hamules like those of one species with the subterminal spine of the other species, shows that this criticism was wholly unjustified. In the same way Schmidt (1951) figures as *picta* a similar specimen in the Berlin Museum which by its hamules must have been either *americana* or *familiaris*, probably the latter (from Neu-Kamerun, leg. Teumann), so it seems possible that there may be a number of specimens labelled *picta* in various collections which are actually either *familiaris* or *americana*. Dr K. K. Günther of the Berlin Museum (personal communication) tells me that Teumann's specimen of *picta* cannot now be traced, so that it is not possible to decide for certain the specific identity of Schmidt's 1951 figure.

Macromia americana sp.n.

Holotype d. Head: labrum yellow, with brown line along borders of lateral lobes where they meet each other; labrum and anteclypeus ferruginous brown, yellow where they join; postclypeus mostly yellow; frons deep ferruginous turning to dark brown dorsally with blunt metallic sheen on dorsal of horns, yellow at sides and with transverse yellow band on dorsal posterior to horns; vertex black with slight metallic sheen, grooved in centre to form two small tubercules; occiput black, hind margin bilobed.

Pterothorax: dorsum dark brown, almost black, central carinae and antealar sinuses yellow; yellow antehumeral, mediasternal, and mesosternal stripes, separated by blackish-brown stripes of uniform colour; leg black, fore femora marked extensively with yellow on ventral (posterior) surface; hind (hine with bright yellow tufts ventrally; all coxae yellowish brown, trochanters of foreleg yellow, and of both other pairs black.

Abdomen: slender, slightly clubbed, black and yellow (details in Fig. 5), resembling *picta* and *pseudofamiliaris* in having gonop-reproductive organs on segments 3–5 with straight transverse posterior margin, instead of coming to a point mid-dorsally with slight lateral yellow posterior to jugal suture as in *africana* and *rigenerantia*; segment 2 with ocelli yellow; segment 8 with foliollas less pronounced than in *africana* and *rigenerantia*, shaped more like *picta* and *pseudofamiliaris*, and with slight notch like that of *picta* but rather more

marked (Figs. 10–12); segment 10 with raised dorsal cone bearing spine (clump of stout setae) of shape similar to that of *picus* (Fig. 14), dark-coloured with conspicuous yellow stripe posteriorly from base of spine to hind margin of segment; extensive yellow patches at posterior-lateral angles of this segment; posterior margin without spines; superior appendages yellow, commencing straight but bending downwards a little after half their length (much straighter in *flavimintelia*); inferior appendage roughly rectangular in shape, and coloured brown both dorsally and ventrally (Figs. 13–15).

Accessory genitalia: genital lobes yellow and elongated, as in *pseudaficanus* but to a much greater extent, projecting considerably beyond hook of hamule (by approximately same length as hook does beyond ventral projection); in ventral view extremities of lobes flattened and slightly expanded, forming structures similar to the apposed cupped palates of human hands, into which the hooks of the hamules fit (Fig. 17); hamules black, with angular projection on ventral border (Fig. 19), not so sharp as in *pseudaficanus*, and terminal hook wider and more curved.

Wings: hyaline, venation medium brown, with narrow yellow streak along grove of costa (wider and more obvious in some of the paratypes); modal formula

6 14 14 5
8 9 9 7
discooidal field starting with single row in all wings; four Cu2 in all wings; anal loop with six cells, anal triangle with two; excavation between membrane and tornus intermediate in depth between *picus* and *pseudaficanus* (Figs. 21–23); membrane pale brown, white at base; pterostigma brown, 2.4 x 0.65 mm in forewings, 3.3 x 0.65 mm in hindwings.

Length of abdomen (excluding appendages), 35.5 mm; hindwing 31 mm.

Paratype 9 (from type locality). Colour and pattern similar to those of holotype, except that the ferrugineous has not yet darkened to brown on discus of frontal horns, and vertex more blue-black than black; yellow annulus on anterior half of segment 2 divided into two yellow spots, as in most females of genus (Fig. 9); pattern of hind segments as in Fig. 25; hind margin of segment 10 with row of small spines; appendages yellow, 0.95 mm long, 0.35 mm wide at base, tapering to a point, lateral border straight, medial border convex.

Genitalia: hind end of eighth sternite trapezoidal, with valvar scale turned dorsal, posterior margin curved with notch in centre, dividing scale into two halves; heavier chitinization on either side of notch forming two roughly quadrilateral areas (Fig. 28); median processes separated at bases by distance approximately half length of process, processes widely divergent, free ends cylindrical for short distance before being rounded off; length of processes 0.35 mm, breadth 0.09 mm; length of free extremity 0.09 mm, breadth 0.06 mm.

Wings: modal formula

5 12 13 5
7 9 9 7
discooidal field starting with single row in all wings; four Cu2 in free wings, three in hindwings; seven cells in anal loop; pterostigma...
yellower brown than in holotype, 2.6 x 0.7 mm in forewings, 2.5 x 0.77 in hindwings.

Length of abdomen (excluding appendages) 35 mm; hindwing 31 mm.

Holotype d. IVORY COAST: River Ban- dama, near Korhogo, Jr. 1971 (R. P. Lindsay) (RMGC).

Paratypes. 10 d 8 9. IVORY COAST: Ban-

Macronia flavimitella Pinkey

Macronia flavimitella Pinkey, 1966a: 30–32.

[Macronia species near aquarius (Martin) of Pinkey, 1961: 109 and Plate 8, identification.]

d. As described by Pinkey (1966a), except in a few small particulars. In general closely resembles amicorum, but has some of the yellow markings slightly more prominent, and there are considerable differences in the accessory genitalia.

Genital lobes large, yellow, and flattened as in amicorum to form structures like the cupped palms of human hands (Pinkey likened them to hoods, covering the hooks of the hamules, from which the name is derived), but whereas in amicorum the palms are appressed, in flavimitella they are prominent (appearing supinate in ventral view). As a result of this, they appear very narrow in lateral view, and are also very much more flexible at the wrists, and so are easily distorted downwards and forwards; hook of hamule similar to that of amicorum, stouter and more curved than in pseudoflaminicola, but where these two species have a short and somewhat pointed projection on the ventral border, flavimitella has a large prominent rounded lobe, slightly lateral to origin of hook (Fig. 20).

Pinkey comments on the black and elongated anterior lamina, but the structure that he figures must be one of the anterior hamules (the main hamules are the posterior ones), which are rather large in this species. In flavimitella, as in most other Macronia species, the anterior lamina is a reduced and inconspicuous structure.

There is more yellow on segment 7, posterior to the jugal marks, than there is in the male of amicorum. The superior anal appendages are yellow, and straighter than those of the latter species (Figs. 14 and 15).

9. Head: labrum, sides of mandibles, labrum, clypeus, and frons yellow, anterior surface of frons suffused with deep reddish orange, lateral lobes of labrum brownish where they meet, and centre of labrum brownish; vertex dark metallic blue, grooved in centre to form two small tubercules; occipital triangle dark brown.

Prehensile dark brown; pterothorax brown with yellow ante-alar stripes, antennomeral, median lateral, and metasternal stripes; foreleg with coxae and trochanters yellow, femora black with ventral surface marked extensively with yellow, tibiae and tarsi black; mid- and hindlegs all black except for reddish brown coxae.

Abdomen black marked with yellow, segments 4–6 with sharp transverse division between yellow and post-jugal black (the other two females agree, unlike most males examined, which had 3–4 as in picus, pseudoflaminicola, and amicorum, with usual black diamond-shaped mark on yellow half (Fig. 41); 7–10 as in Fig. 27, with some yellow visible posterior to jugal marks in 7, unlike the female amicorum, which has no post-jugal yellow; anal appendages yellow, short, pointed, lateral border almost straight, medial border convex, length 1.1 mm, width at base 0.4 mm; hind margin of 10 with row of small black spines.

Genitalia: hind end of eighth sternite and fifth valva scale very similar to those of amicorum, differing chiefly in the amount and shape of the heavier chitinization; median processes stouter, stumpier, closer at their bases, and less divergent, 0.4 x 0.18 mm; free portion rounded off from commencement, 0.13–0.15 mm wide at base, 0.13 mm long. The appearance of the median processes provides a simpler and more direct way of separating the two species than do the vulvar scales themselves (Figs. 28 and 29).
Wings: nodal formula

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Joelioidea field starting with two rows of cells in all wings; fore Cu is in forewings, three in the hindwings; nine and ten cells in anal loop; pterostigma ochraceous brown; costa dark brown grooved with yellow; membrane greyish brown, whitish for basal third.

Length of abdomen (excluding appendages) 37 mm, hindwing 34 mm.

Material examined: (2 d, 3 P), CENTRAL AFRICAN EMPIRE. Ouistin and Nana Rivers, near Bouar, 13 d, 3 P (R. P. Lindley) (RFLC). Same locality, 1 d (R. P. Lindley) (RMGC). UGANDA, Aswa River, 1 d (V. G. L. von Samaer) (BMNH). (The d holotype, ZAIRE, Garamba National Park, is in IPNC, not examined.)

Comparison of the two species

These species differ chiefly in the accessory genitalia of both sexes, described in detail above (Figs. 17-20, 28-39). Colour and pattern are very similar, but amicorincus has the yellow band on segment 7 with less yellow projecting posteriorly to the jugal mark, a little in the male and none in the female. In flavinetitia the female has a small amount of yellow projecting above the jugal mark, the same as in the male amicorincus, and the male has considerably more (Figs. 24-27). The apical half of the superior appendage of the male is more curved in a ventral direction than the straighter flavinetitia. Also, amicorincus is generally slightly smaller, 6 hindwing 29.5-32 mm (mean 31, n = 10), and flavinetitia 29.5-33 mm (mean 32, n = 16). The male flavinetitia tends to have rather fewer antennal crossveins, in spite of its slightly larger size, 12 being the commonest number (over half of thirty-two wings noted, the rest having 11, 13 or 14), as against 13 in amicorincus (half of twenty wings, the rest with 12, 14 or 15). In the hindwing flavinetitia had 8 in over half of twenty-nine wings noted (range 8-10), as against 9 in amicorincus (well over half of twenty wings, range 8-10). The females are not compared, as only three of flavinetitia are known. Similarly flavinetitia males tend to have fewer cells in the anal loop, five cells in well over half of eighteen hindwings noted (range 5-8), while amicorincus had six in over half of twelve hindwings (range 6-8). In the females of either species there are more that in the males, usually nine or ten.

The sophia group

Macroemia sophia Selys, unlike picea, is neither common nor widespread, but it is a species that has been widely recorded in the literature. These records have more often than not referred to one or other of several species with which it has been confused. The species-group as I prefer to define it is restricted to sophia insigina, aureozona and novosorina, species apparently closely related, and characterized, especially by long, tapering, slightly bimodal superior appendages in the male, at least 3 mm in length, and an inferior appendage tapering to a very narrow apex; in the female, the lobes of the vulvar scale are very long, sometimes pressed close to the abdomen, but more often projecting conspicuously in a ventral direction. However, authors have used the species-group to cover a much wider assemblage of large, dark, forest-loving species, mostly with a long vertical 'horn' on the tenth segment of the male, but some without it, and some with a pair of horns. The abdomen, excluding the appendages, is from 46.5 to 61 mm long in the male, and the hindwing 40-51 mm; the length of the female hindwing can be as much as 56 mm.

These other species appear less closely related to sophia, and in some cases the affinities seem very tenuous indeed, e.g. nitescens. I have included nyssorina (formerly regina) which is not usually put in this group, because it appears to have distinct affinities with mélangés, and darker individuals bear a definite superficial resemblance and could be easily confused with it.

Macroemia sophia Selys

Macroemia sophia Selys, 1871: 550(d): 1878: 198(b).


[Macroemia aureozona (Nunney), 1883; Pinhey, 1960(d), misidentification.]

Selys (1871) described sophia from Cape Coast Castle, now in Ghana. This species differs from all other African Macroemia by its large size, the predominantly black colour of the body with very limited yellow on the abdomen, and a very long vertical dorsal horn on the tenth segment. The female was described (Selys, 1878) from an specimen from Inhamb in Cameroon. Since then, many authors have tended to call any large dark African species 'sophia'.

Schouteden (1934), referring to sophia, commented that Martin (1906) omitted to mention the bright yellow band encircling the thorax, and Fraser (1954) made this conspicuous band one of the chief characters for recognizing the species. Unfortunately, the true sophia lacks this band, and both these authors were referring to a quite different species, auronzona Pinhey (1966b).

Material examined: (3 d, 4 P), Holotype d, GHANA: Cape Coast Castle (BMNH). Originale 9, CAMEROON: Inhamb (BMNH). Other material: GUINEA: Yalanzou, Nimba (M. Lanore), 1 d (BMNH). IVORY COAST: Dabone, Mt Nimba (T. H. E. Jachson), 1 x. 07, 1 d (RMGC). NIGERIA: Ikum, labelled 'auronzona' by Fraser, 1 y (BMNH). CAMEROON: Bangui, Mba, 17.xiii.70 (E. A. Coreth), 1 y (BMGC), 1 y (RMGC).

Macroemia insigina (Kirby) Sp. nov.

Pseudosplinthus insigina Kirby, 1889, 299.

Kirby described insigina from Cameroon, as the type-species of a new monobasic genus Pseudosplinthus, which he considered related to Centelliae. Kurz (1893) placed insigina as a synonym of sophia, and this seems to have been generally accepted. However, the type specimens of both species have now been re-examined, and are clearly distinct. Meanwhile, any reference to sophia in the literature, unless it is to some extinct specimen whose identity can be checked, can equally well refer to other species.

Pinhey (1966b) regarded insigina as a colour form or possibly a sub-species of sophia, differing only in slightly larger size, and the greater amount of yellow on segment 3. Actually insigina is much closer to aureozona, and differs only in lacking the thoracic band and in having extensive yellow on segment 3.

Material examined: (4 d, 3 P), Holotype d, CAMEROON (BMNH). Other specimens: CENTRAL AFRICAN EMPIRE: Bouar, 1 d (R. P. Lindley) (RFLC). Etoumba, 1 y (BMNH, Gardner Collection, ex Pinhey). Kati, 1 d, 1 y, x. 63. (RMGC, ex Pinhey). GABON: Makokou, 1 y, 19.xi.73, 1 y, 5.xi.73 (J. Lepage) (RMGC).

Macroemia aureozona Pinhey

Macroemia aureozona Pinhey, 1966b, 296.

[Macroemia sophia Selys; Schouteden, 1934: 46; Fraser, 1954: 53; Pinhey, 1961: 116, all misidentifications.]

Until Pinhey's work (1965b), this species was mistakenly mixed up with sophia, and the misidentifications listed above are all referred to under that species. Fraser, who knew both species, considered that those which lacked the yellow band encircling the thorax had lost it through post-mortem decomposition, and not by any difference of species. He certainly knew the true sophia, and the specimen correctly determined by him in the BMNH. Whether he had ever seen a specimen of insigina is uncertain from the published literature. As there is no structural difference between aureozona and insigina and they are distinguished solely by geographical range and the distribution of the yellow markings (so that aureozona could arguably be considered a subspecies of insigina), its exodentled figure of the female gnattalia (1954) could equally well be either of these species, but certainly not sophia. Mainly, if not entirely, aureozona is a Zaire species, whereas insigina is from Cameroon, Central African Empire, and Gabon.

Material examined: (2 d, 3 P), ZAIRE: Bambes, Kisantu (BMNH, Fraser Be quest). (The holotype d, with 21 d, 8 paratypes, none of them examined, are in MAC, likewise 2 d, 1 y in NMB.)

West African species of Macroemia
Macromia anethorax Buske, 1873: 59 (S. Africa).
Phyllocidasia contumax (Selys, 1870: 103, (d) syn.n.

Macromia anethorax Buske, 1873: 59.

Phyllocidasia contumax (Selys, 1870: 103, (d) syn.n.

Selys described melania from a single female (from Nigeria, Old Calabar) lacking half the abdomen, so it remained imperfectly known for many years. The first male discovered was a particularly large specimen from Akole, and the connection was unrecognized. It was given the name contumax, but no further records have been published using this name. Two slightly smaller males (hindwing 42.5 and 43 mm, instead of 47) in the BMNH have been assigned
Macromia nyranzeza Grünberg

Macromia nyranzeza Grünberg, 1911: 104. 
Macromia reginae Le ROI, 1915: 348. 
Macromia halii Fraser, 1928: 137.

This species was long known as reginae, but Finck (1962) found this to be a synonym of nyranzeza. Longfield (1936) has already made halii a synonym of reginae. It is mainly an East African species, and is closely related to and replaced in West Africa by bifasciata (Martin, 1912), which is slightly smaller, has more yellow on the body, and is a savannah species. Both the females and bifasciata are characterized by their usually having the whole of the anterior half of segment 3 yellow in both sexes, with no black except sometimes a narrow longitudinal line mid-dorsally. In nyranzeza this black line may sometimes widen, and in very dark specimens may almost obliterate the yellow, which can lead to confusion with melanica. The species resembles melanica in a number of ways besides the colour-pattern. In the male, the whole shape of the dorsum of the tenth segment as well as the absence of the horn, the shape of the anal appendages, the hamules and genital lobes, are similar, and in the female the shape of the lobes of the vulvar scale is the same as in melanica. Although dark females of nyranzeza and pale ones of melanica can sometimes be very similar in the pattern of segment 3, they can never always be distinguished in segment 2, where melanica shows yellow laterally, and nyranzeza is dark from all aspects. Segment 7 has more yellow in nyranzeza than in melanica. The lobes of the vulvar scale of nyranzeza are rather more pointed, and carry long hairs at the tip, whereas melanica is hairless (Figs. 56 and 58).

Material examined. UGANDA: various localities, 16 d, 9 (BMNH, DALD, RMGC). RHODESIA: 17 (BMNH).

Macromia saydelii Fraser

Macromia saydelii Fraser, 1928: 55.

This species is recorded only from Zaire. It is a dark species with the yellow mediolateral girdle conspicuous, as in auriculata, but could not be mistaken for the latter, owing to its slightly smaller size, and much slimmer build.

Material examined (1 d, 1 f). Paratypes 1 d, 1 f, ZAIRED: Lomami (BMNH, Fraser Bequest). (Holotype d, paratype 9 in MAC, not examined).

Macromia unifasciata Fraser

Macromia unifasciata Fraser, 1954: 67.

This species also has the yellow thoracic band, and is extremely similar both in size and structure to saydelii. Morphological differences are very slight, but it is a much paler insect, with considerable yellow on the abdomen. It is known both from Zaire and Rhodesia.

Material examined (1 d, 1 f). ZAIRED: Gombe, 17; iv, 42, 16 (BMNH, Fraser Bequest). (Holotype d, and 5 f in MAC, not examined).

Macromia murell Schouteden

Macromia murell Schouteden, 1917: 105.

This species is recorded from Zaire only. The male is recognized by the short, blunted, dilated superior appendages, unlike those of any of the other species in the group. The females are characterized by the pale central mark on segment 5 (Figs. 45 and 50).

Material examined (2 d, 2 f). ZAIRED: Bumia, 1 d, Eka 1 d, 2 f (BMNH, Fraser Bequest). (Holotype d, paratype 9, ZAIRED: Insongo, 9 x, 13 (Dr. Meeuws) (MAC) not examined).

General discussion of the above species

A useful means of distinguishing males of aeruncata, sophia and insignis (together with the morphologically identical auriculata), is by the shape of the genital lobe, and the line of the genital fossa. The hamules are very similar in all three, so are of little help, although those of aeruncata are slightly more slender than those of the others. In aeruncata the genital lobe is more or less in a straight line with the edge of the fossa which viewed laterally, and projects only very slightly if at all in a ventral direction. In sophia and insignis the lobe is distinctly prominent ventrally, and there is an excavation in the margin of the fossa just anterior to the lobe, in sophia a narrow groove, and in insignis and auriculata a broad hollow. The anteromedial border of the genital lobe is flattened to form a shallow cup-like surface. In insignis and auriculata the cup is tilted laterally, so that the rim of the medial half projects much further anteriorly than that of the lateral half, and fills the gap between the lateral half and the hamule. In sophia the lobe is very much smaller, and comparatively little of the internal surface of the cup is visible laterally (Figs. 30-31).

In addition, there is a difference in the abdominal colour-pattern of these species (Figs. 1-3). The male sophia has small yellow jugal spots on segments 2 and 3, and a yellow patch on the basal part of 7 extending two-thirds of the distance to the jugal scale mid-dorsally and one-third laterally. There are no yellow stripes or other marks on the thorax.

The male insigne has considerable yellow on segment 3, and this represents an enlargement of the jugal yellow spots. There is no basal yellow anterior to the black mark on the prothorax of the segment. This species has no other yellow on either abdomen or thorax. The morphologically similar auriculata has no yellow at all on the abdomen, the only yellow being the very obvious medio-lateral stripe on the thorax, continuing dorsally to encircle the body, from which the species takes its name.

The male aeruncata has small yellow jugal spots on 2, and small basal and jugal spots on 3. There is also a basal yellow band on the anterior part of 7, reaching almost but not quite so far as the jugal scale. Unlike sophia, insignis and auriculata, it has the antero-alar sinus yellow. Lateral thoracic stripes are variable. It is usually possible to make out the mediolateral. This is just visible in the type. Fraser (1954) refers to this as metapleural, and says it is mentioned by Nunn and Nunn, however, only says 'a faint yellow line medially on each side' without stating which of the three possible stripes it is. The stripes are usually much clearer in E. leiffeltinck than in the nomenclatural type, but this is not an absolute distinction. A much better way of distinguishing the two colour-forms is by the labium. In aeruncata this is more or less unicellular pale brown. In E. leiffeltinck the ground-colour is orange-yellow with a dark brown E-shaped mark, with the back lying along the apical border of the lateral lobes, and the three branches running across the lobes and along...
the line separating them (Figs. 33 and 34), conspicuous in Fraser's type and paratype of *liefsteinii*, and clearly described by Pinhey under *cameronica*. Specimens from Sierra Leone, and the type (of whose origin there seems to have been some doubt, either Sierra Leone or Cameroon), have the pale lateral stripes on the thorax less distinctly visible and the labium concolorous, whereas all those I have seen from E. Nigeria, Cameroon or Fernando Po have been of the colour-form *liefsteinii* as defined above. However, Dr Pinhey has kindly provided me with particulars of the Nigerian specimens in the NMB, and these were all without stripes. The colour and pattern of the labium were not mentioned. As it is not possible to say whether the absence of stripes was lifelong, or due to age, or to post-mortem degradation, it is not possible to say whether the two colour-forms are a question of age and development, or of geographical distribution.

There are three distinct species of the *sophia* group proper known from West Africa, *sophia*, *ignatii* and *anechothorax*, based on the holotype males. Similarly three morphological types of females are known two corresponding in pattern and distribution with two of the males. Therefore it seems a reasonable probability that the remaining female is that of the only unsexted male, i.e. *sophia*, in spite of certain differences in the colour-pattern of segment 3, and the fact that no one has found both sexes from the same locality.

Stilts, at least, considered the female which they described from Cameroon to be that of *sophia*, although it was found about 1200 km from the male. Dr S. A. Corbet has taken two females similar in pattern and structure from Barombi Mbo, W. Cameroon, and there is another in the BMNH, misidentifed by Fraser as *anechothorax*, from Ikom, Nigeria. All these have an ovipositor (labe of the vulvar scale) exactly similar to that figured by Schreitf (1951) for *sophia* (a specimen from Barombi, in the Berlin Museum). It is this form of ovipositor that Pinhey (1966) — misled by Fraser — figured for *anechothorax*. The vulvar scale is produced in a ventral direction with the two lobes closely opposed to each other (Figs. 35 and 36), whereas in *insignis* and *anechothorax* (Figs. 37 and 38), the two lobes, although pointing in a similar direction, diverge strongly at the tips and are separated at their bases by a fold on their inner margins, the 'inner sub-basal triangular lobe' of Pinhey. Selby's female is badly crushed and the lobes are distorted, the left pointing normally, the right posteriorly. The terminal segments have become detached, and are presumed to a card on the same pin, so the lobes are difficult to see clearly. They were therefore washed off a temporarily reassembled in 70% alcohol and glycine to soften them, and make them visible from all angles. No trace can be found of the inner sub-basal triangular lobes, so before it was crushed it must have been similar to the females which I have assigned to *sophia*.

These all have considerably more yellow on the anterior half of the third segment than have the males. This has led Pinhey to the opinion that Selby's female is a *anechothorax* which he considered merely a colour-form of *sophia*. However, apart from the difference in the vulvar scale, which shows that Selby's female cannot be *sophia*, the arrangement of the yellow pattern is different. In *insignis* of both sexes, the yellow on 3 is formed from the jugal spots, posterior to the black marking on the anterior half of the segment, and there is no yellow basally. In the male *sophia* there may be a very slight basal yellow mark on 3 (not visible in the type, however), and slightly larger but still very small jugal spots, the black marking almost the whole of the anterior part of the segment. In the supposed females of this species, almost the whole of the anterior part of this segment is yellow, and the yellow is in the basal position, wholly anterior to the central black which extends back to the jugal suture (Figs. 41—44). While not proving that the supposed female is necessarily that of *sophia*, this at least confirms that it cannot possibly be *insignis*.

The female of *anechothorax* has a vulvar scale which is totally different, the lobes being long and narrow, crossing the median processes, pointing backwards close to the abdomen, and not projecting ventrally at all (Figs. 39—40). The female of *paula* has the lobes of the vulvar scale directed backwards (Fig. 55), wider than those of *anechothorax*, and similarly opposed to the ventral surface but not reaching beyond the median processes.

The female genitalia of *splendida* and *nyerere* have already been described above and compared. Those of *sedella* and *unijaculata*, almost identical with each other, have extremely short lobes to the vulvar scale (Figs. 61 and 62), and *moczi* has the vulvar scale bifid, prominent basally, but recurved (Figs. 39 and 60).

**Key to species**

The following key will help to separate the species of the *sophia* group proper, also the various other large dark species which have at times been, or which could be, confused with them. These are for the most part West African species, but also include a few others from Zaire, etc., which have not yet been and are probably unlikely to be found in the West.
The graphics and text are not clearly visible, but it seems to be an article discussing morphological features of a species, possibly from a scientific or entomological context. The text is in a natural reading format, and there are some diagrams or images that are not clearly visible due to the quality or resolution of the image.
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References