

A NEW SPECIES OF *Macromia* RAMBUR 1842 (ODONATA,  
CORDULIIDAE) FROM NIGERIA, AND THE HITHERTO  
UNDESCRIBED FEMALE OF *M. pseudafricana* PINHEY 1961

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Five species of *Macromia* have been found in the open Savannah region of Nigeria. Four of these are fairly widespread in West Africa, or beyond, but the fifth is distinct from any species yet described. All five are conspicuously patterned with black and yellow, and are very similar to each other. Only the common *M. bifasciata* (Martin 1912) can be distinguished on the wing, by its slightly larger size and the paleness of abdominal segment 3, the anterior half of which is wholly yellow. *M. picta* Hagen in Selys 1871, also a common species, and the other three from which it is indistinguishable on the wing, all have a dark diamond-shaped mark filling the dorsal part of this pale space. The male of *picta* is readily distinguished from the other three by having a spine on the dorsum of the 10th segment. The female is distinguished by the abdominal markings from all except *M. pseudafricana* Pinhey 1961, and from this it can be separated by the shape of the vulvar scale. At least three further species are found in the forest regions further South, but these have a very different appearance, with a more sombre pattern and the yellow elements much reduced.

Fraser (1954), revising the African species of this genus, introduced a useful (though not infallible) system of giving each a formula consisting of a number of letters indicating which of 23 listed characters were present. Three of the Nigerian Savannah species have the formula AGJMSTUW (except that the female of one of them is unknown, so that in this case the status of the 0 is unconfirmed, but it can be fairly safely deduced on the analogy of related forms). They therefore all run down to *M. africana* Selys 1871. One of these has been described by Pinhey (1961) as *M. pseudafricana* from a single male taken in Uganda. Its female is still undescribed. The remaining species, of which three males have been taken at Vom, Nigeria (Plateau Province, 4000 feet, 8° 47' E, 9° 13' N), is even closer to *africana* than is *pseudafricana*, and is here described as *M. nigeriensis*. The opportunity is taken to add a description of the female of *M. pseudafricana*.

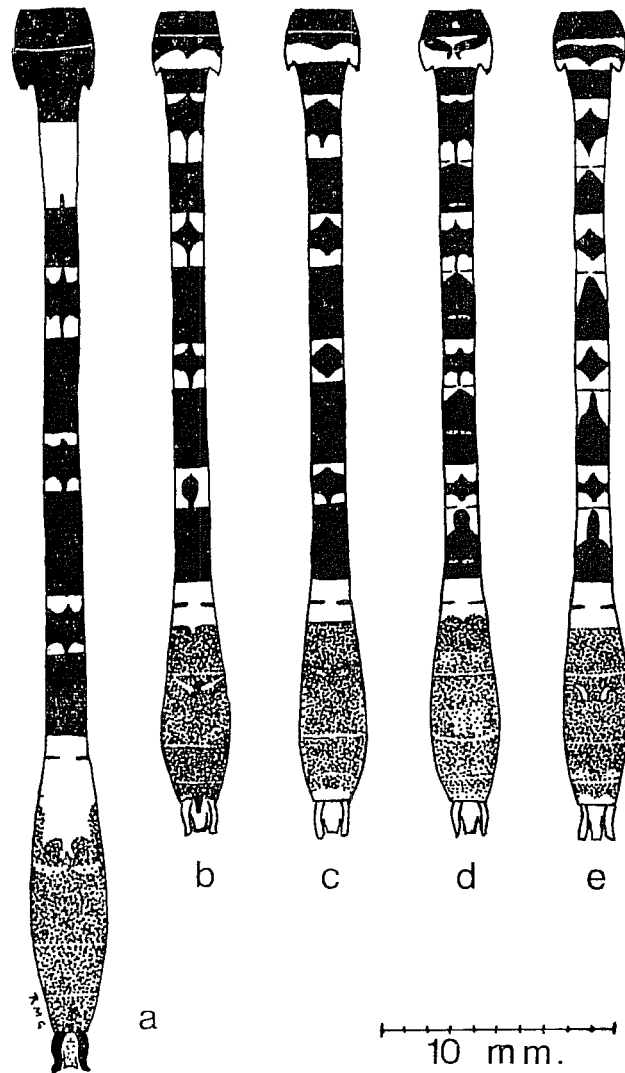


Fig. 1

Fig. 1. Abdominal patterns of *Macromia* spp. in dorsal view, (a) *M. bifasciata*; (b) *M. picta*; (c) *M. pseudaficana*; (d) *M. nigeriensis*; (e) *M. africana*

*Macromia nigeriensis* sp. nov.

Male (holotype)

Head: labium yellow with a narrow dark central line; labrum yellowish basally and laterally, pale reddish brown in centre and along apical margin; anteclypeus dull ochreous; postclypeus yellowish blotched with ochreous; frons deeply grooved dorsally, forming "horns", deep reddish brown on anterior face forming two triangular areas, yellow laterally, dorsal surface pale yellow but bottom of groove with dark brown triangular mark in front of median ocellus, encroaching on the yellow but not dividing it into two spots as in *africana* (fig. 2 a, b); vertex black with bluish metallic sheen, grooved in centre to form two small rounded horns; occiput black, posterior margin bilobed.

Pterothorax: dorsum dark reddish brown, central carina and ante-alar sinuses yellow; yellow antehumeral, mediolateral, and metepimeral stripes, separated by blackish brown stripes of uniform colour; metastigma yellow; legs dark brown to blackish, hind tibiae with bright yellow keels.

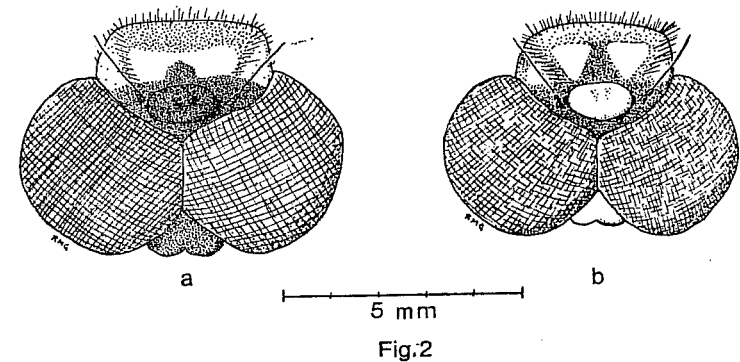


Fig. 2. Head patterns (dorsal) of (a) *M. nigeriensis*; (b) *M. africana*

Abdomen: comparatively slender, slightly clubbed at the last few segments, of the usual *Macromia* pattern with anterior half of segments 3-7 yellow with black markings and posterior half mainly black; detailed pattern as shown in fig. 1d; segment 1 with small yellow central spot; posterior half of segments 3-6 with small lateral yellow marks so that the black comes to a point in the mid-line instead of having a clearly defined transverse margin; tergite of segment 8 expanded to form triangular foliations which are directed ventrally; posterior margin of segment 10 without spines; superior appendages yellow with minute black denticles on ventral surface; whole appendage with a slight bisinuose curve when viewed dorsally (fig. 5a); apical half of appendages slightly dilated in a ventral direction, instead of being

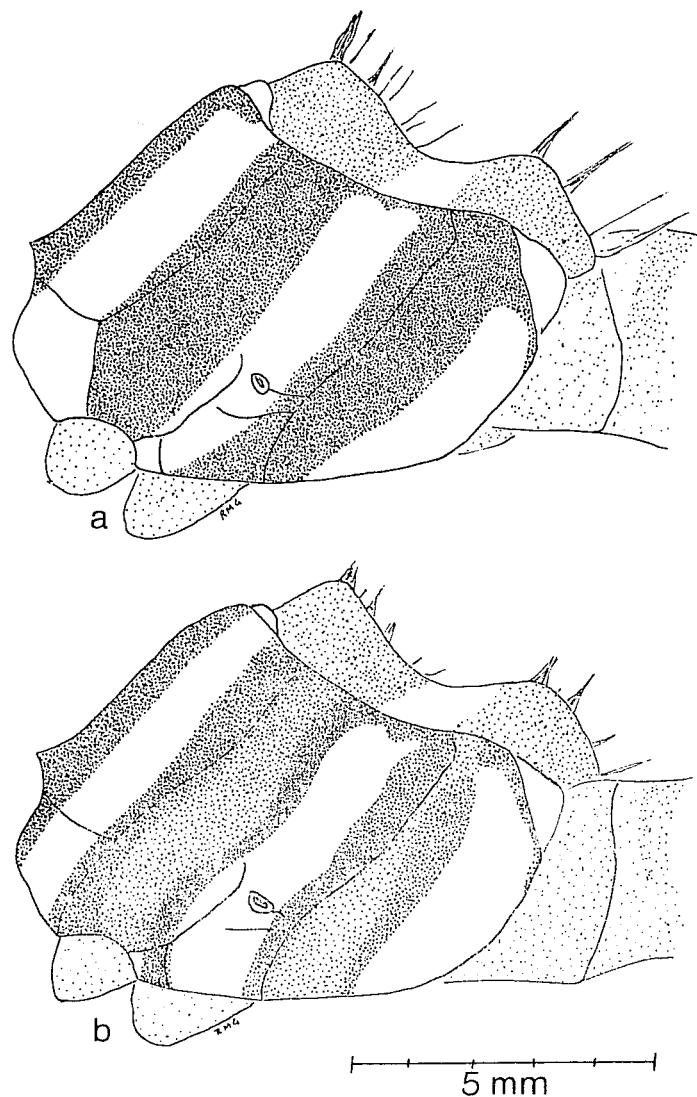


Fig. 3

Fig. 3. Lateral thoracic patterns of (a) *M. nigeriensis*; (b) *M. africana*

uniformly cylindrical as in *picta* (fig. 6 a, b); inferior appendage pale yellow dorsally and ventrally but with lateral margins dark.

Accessory genitalia: hamule black, ventral border in an elongated smooth curve; genital lobe yellow with a narrow dark stripe along the hamular border, unconnected with black marks encircling the segment as is the case in *picta* (fig. 6 a, c); oreillets yellow, without denticles.

Wings hyaline, venation medium brown, groove of costa yellow; nodal formula  $\frac{4 | 11 | 11 | 4}{7 | 7 | 8 | 6}$ ; discoidal field starting with 1 row

in all wings; additional bsq in all wings; 4 Cuq in forewings, 3 in hind; anal loops with 6 cells; anal triangles with 2; anal margin of hindwing with a shallow excavation between membranule and tornus (fig. 7b); membranule brown, whitish at base; pterostigma yellowish brown, 2.2 × 0.6 mm in forewings, 2.1 × 0.6 in hind.

Length of abdomen (excluding appendages) 34.25 mm; hindwing 30 mm. Vom, Nigeria, found hanging from a tree. 18.iii.1953.

Female unknown.

Two paratype males, Vom, 24.iii.1953 and 12.iv.1959, have

nodal formulae  $\frac{5 | 11 | 10 | 4}{6 | 8 | 8 | 7}$  and  $\frac{5 | 10 | 10 | 5}{7 | 7 | 8 | 7}$ ; 3 Cuq in fore-

wings as well as hind; otherwise practically identical with the holotype.

The new species and *africana* differ in their abdominal markings from *pseudafricana* and *picta*. In the two latter species the posterior half of segments 3 to 6 is wholly black in dorsal view, sharply demarcated transversely at the level of the jugal suture. In *nigeriensis* and *africana* the black area comes to a point mid-dorsally, leaving a small patch of yellow on each side posterior to the jugal suture (fig. 1 b-e). In *nigeriensis*, the demarcation is almost transverse on segment 3, although minute patches of yellow can just be seen, but from 4 to 6 the black shows a clear-cut point with obvious yellow on each side. In *africana* the black is clearly pointed on all segments from 3 to 6. As the pattern of the female *Macromia* is usually similar to that of the male, this should help in the recognition of the female when discovered, especially if the vulvar scale should happen to resemble that of one of the other species.

In spite of the general resemblance in body pattern, there are a number of characters which readily distinguish the males of *nigeriensis* and *africana*, and these may be tabulated as follows (the first three would probably serve to differentiate the females also):—

*M. nigeriensis*

1. Yellow band on dorsum of frons continuous (fig. 2a).
2. Vertex and occiput dark (fig. 2a).
3. Dark lateral thoracic stripes uniformly dark (fig. 3a).
4. Humule wholly dark and longer than that of *africana*; genital lobe with narrow dark stripe along hamular border, unconnected with other dark markings (fig. 4c).
5. No yellow spots anteriorly on dorsum of segment 8 (fig. 1d).
6. No row of spines along posterior margin of segment 10 (fig. 5a).
7. Male superior appendages with slight bisinuous curve (fig. 5a).

*M. africana*

- Yellow on dorsum of frons broken into two separate spots (fig. 2b).  
 Vertex and occiput yellow (fig. 2b).  
 Dark lateral thoracic stripes paler in the centre (fig. 3b).  
 Hamule dark at edge, pale yellowish in centre; shorter than that of *nigeriensis*; genital lobe bordered all round with blackish brown (fig. 4d).  
 Pair of yellow spots anteriorly on dorsum of segment 8 (fig. 1e).  
 Transverse row of small spines along posterior margin of segment 10 (fig. 5b).  
 Male superior appendages straighter (fig. 5b).

*M. pseudaficana* Pinhey 1961

As remarked above, the abdominal pattern of this species is extremely similar to that of *picta*, but the males can easily be told apart by the very characteristic shape of the hamule of *pseudaficana*, with a short blunt projection directed ventrally and a long narrow process pointing posteriorly ending in a small hook (fig. 4b); and also by the absence of the dorsal spine which shows clearly on the tenth segment of *picta* (fig. 6 a, b). Incidentally, small details in the figure of the body pattern of *picta* given by Fraser (*loc. cit.*) include the hamule of *pseudaficana* and the dorsal spine of *picta*. This must either be a slip in drawing—admittedly these details are not relevant to the portrayal of the pattern which is the purpose of the figure—or else an accurate drawing of a damaged specimen which has been repaired by the addition of part of the abdomen from another specimen—and species!

Another character of the male *pseudaficana*, not mentioned in the original description (but present in the holotype in the British Museum), which distinguishes it from the males of all the other species referred to in this paper, is the deep and narrow excavation in the anal margin of the hindwing, unlike the wide and shallow excavation in the others (fig. 7 a, b).

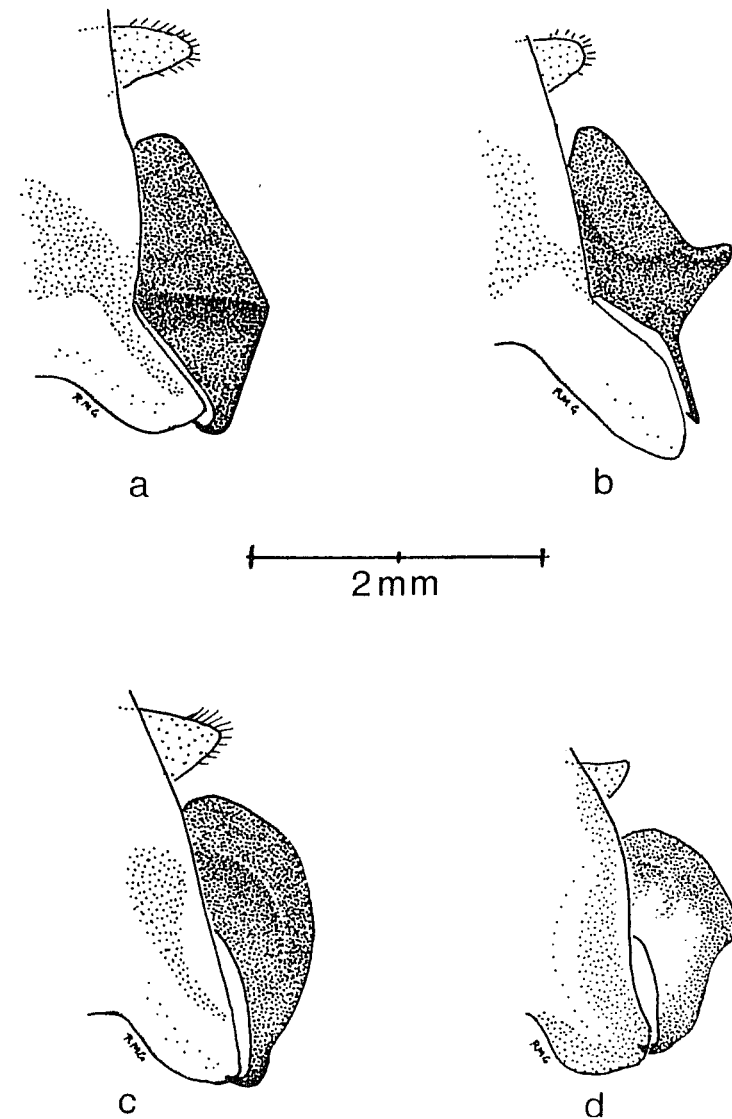


Fig. 4

Fig. 4. Hamule and genital lobe (from the right) of (a) *M. picta*; (b) *M. pseudaficana*; (c) *M. nigeriensis*; (d) *M. africana*

*Female* (allotype):

Head: labium yellowish, turning to brown in the mid-line; labrum yellow basally but quickly becoming reddish brown towards apex; ante-clypeus ochreous brown, postclypeus and frons

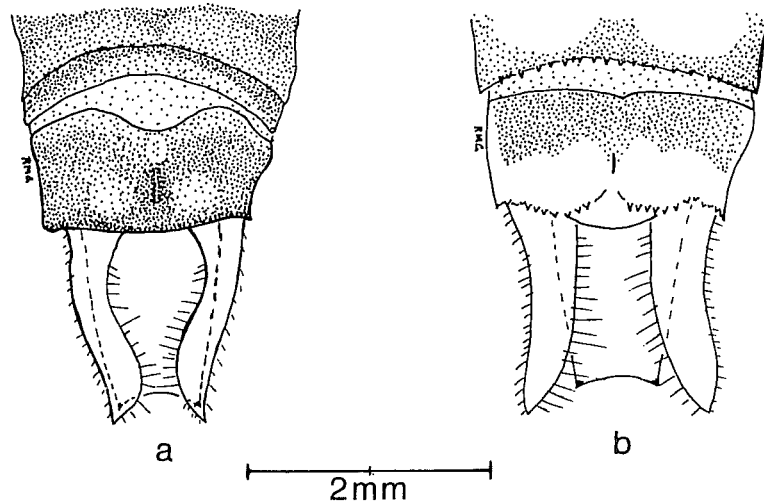


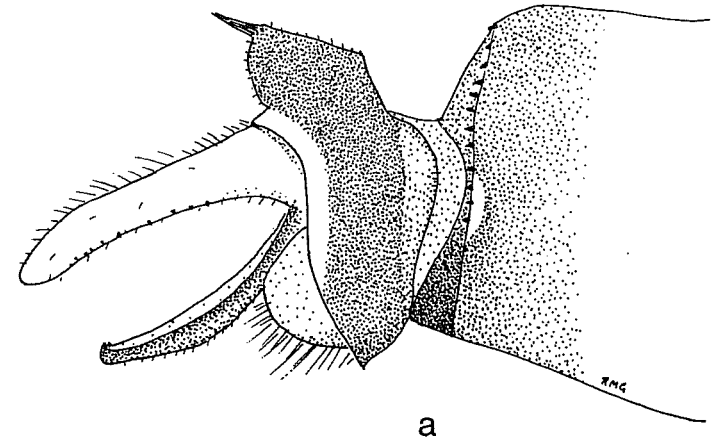
Fig.5

Fig. 5. Tenth segment and appendages (dorsal) of male (a) *M. nigriensis*  
(b) *M. africana*

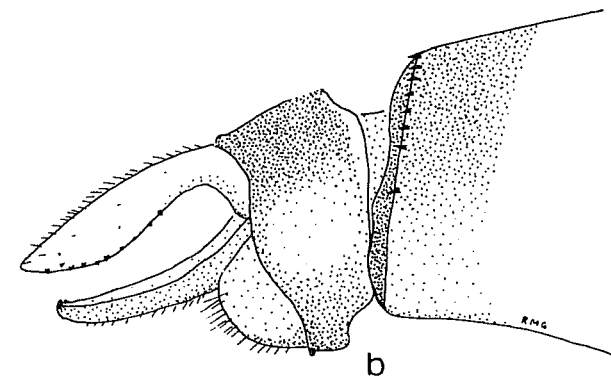
reddish brown in front, yellow at the sides; dorsum of frons with a complete yellow band, not divided into two yellow spots as in *africana* (fig. 2b), although encroached upon by a dark triangular spot in the groove anterior to the vertex; dark brown lateral to vertex; vertex lacks the two yellow spots posteriorly which (sometimes separate, sometimes joined) characterise both sexes of *picta*—unless lost by age or obscured by post-mortem discoloration; vertex and occiput metallic dark brown or black; eyes now brown, but were emerald green during life.

Thorax: pterothorax brown; central carina and ante-alar sinuses yellow; yellow antehumeral, mediolateral, and metepimeral stripes, separated by uniformly dark blackish-brown stripes of width approximately equal to that of the yellow; pterostigma yellow; legs black.

Abdomen: markings similar to those of male (see fig. 1c) except that the yellow transverse annulus on segment 2 is divided by a dark central bar into two yellow spots (this applies equally to six females in the writer's collection. Females of *picta* and



a



b

Fig. 6

Fig. 6. Tenth segment and appendages (from the right) of male (a) *M. picta*; (b) *M. nigriensis* (*africana* and *pseudofricana* are similar).

many other species differ in exactly the same way from their own males which also have the annulus complete); posterior half of segments 2-6 uniformly black, anterior border of this black terminating sharply and transversely at the jugal suture; in 7 a small amount of yellow centrally posterior to jugal suture; 8 wholly dark brown, and 9 similar but becoming paler apically; 10 yellow, as are the appendages (this applies to all the writer's females of this species, whereas all the female *picta* he has seen have had the appendages definitely dark, and the 10th segment apparently so, though in a few cases this may have been due to post-mortem discoloration).

Wings: hyaline, venation varying from dark brown to yellowish, with a yellow streak along the groove of the costa; nodal

formula  $\begin{array}{c} 6 \quad 2 \quad 13 \\ 7 \quad 9 \quad 17 \\ 8 \quad 8 \quad 6 \end{array} \quad 5$  (7th and 12th Ax in right forewing incom-

plete in this specimen, and 8th in left hindwing); discoidal field starting with two rows in all wings; bsq present in all wings; 4 Cuq in forewings, 3 in hind; anal loops with 11 and 10 cells; membranule uniform greyish brown; pterostigma brown, 2.0 × 0.6 mm.

Genitalia: the anterior border of the vulvar aperture has the form of a chitinous arch which probably represents the posterior margin of the vulvar scale. In *picta* (fig. 8a) and *africana* this scale ends with two prominent sharply triangular lobes by which the opening of the vulva is almost concealed. In *pseudaficana*

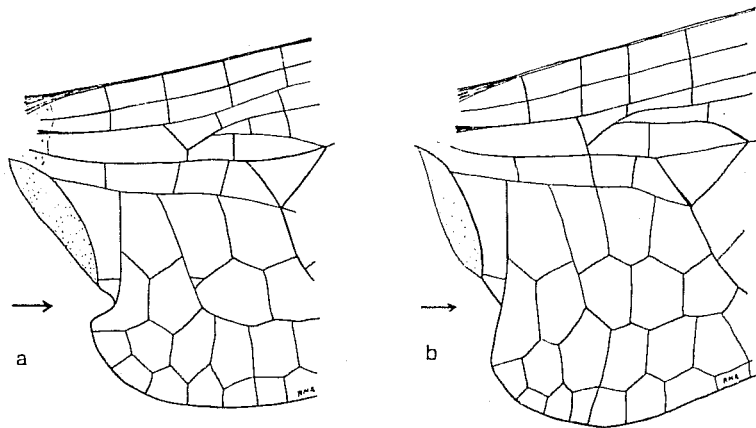


Fig. 7

Fig. 7. Anal margin of male hindwing of (a) *M. pseudaficana*; (b) *M. nigeriensis* (*picta*, *africana* and *bifasciata* are extremely similar). Arrow indicates excavation.

(fig 8b) these lobes are atrophied into two prominences attached to the surface of the 8th sternite like a bas-relief, forming two curved ridges, fused to the sternite entirely except for the two apices, which form the lateral extremities of the two curves. The posterior border of the aperture is formed by the anterior border of the 9th sternite. The median processes arise from this sternite considerably posterior to the aperture (about 1 mm behind), only the extremities being free, with their bases fused to the sternite. The two processes are separated from each other at their bases, and have no connection with the vulva. The space between vulva and processes is marked with transverse wrinkling, forming a very definite ridge just anterior to the latter. In *picta*, on the other hand, the median processes are fused to each other at their bases, forming a continuous ridge attached to the sternite, and this is connected to the vulva by a longitudinal ridge. Moreover, the processes are much closer to the vulva, approximately 0.5 mm behind it.

Length of abdomen (excluding appendages) 36 mm; hindwing 33 mm.

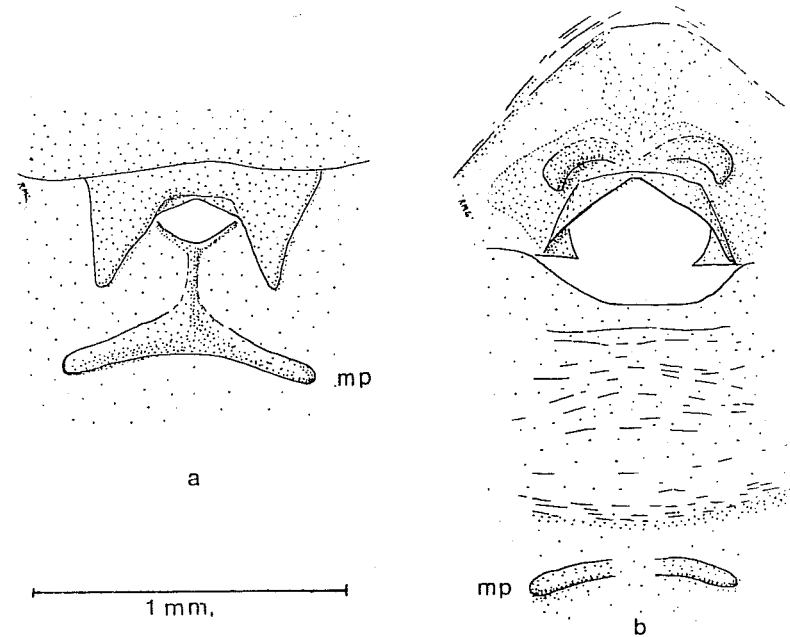


Fig. 8

Fig. 8. Vulvar apertures (ventral) of (a) *M. picta* (*africana* is rather similar); (b) *M. pseudaficana* (mp=median processes).

Specimen taken in Vom, on 13.xi.1962, by Robert Lindley and later presented by him to the British Museum. There are also six female paratypes in the writer's collection, all taken in or near Vom between 1951 and 1961, and agreeing closely with the above. None were taken with the males (of which the writer took four and Roger Lindley one), but the only female for which it could be mistaken is *picta*, a well-known species whose vulvar scale has been figured by Pinhey (1951). In addition to Pinhey's figure, further evidence that the specimen whose vulvar scale is shown in fig. 8a is correctly identified as *picta* is that this specimen was found with an undoubted male *picta* crawling across a road nose to tail, termite fashion. The writer supposes that a pair flying in tandem must have been struck down by a bird predator and still have been partially stunned by the impact. According to Fraser (*loc. cit.*) it is rare to see *Macromia* spp. in cop. or in tandem. The writer has only observed this once, in one of the forest species.

*Other records.* In addition to the holotype, the British Museum have an incomplete male *M. pseudafriicana* (Azare, Nigeria, vii.1924, Dr L. Lloyd). A female (Zungeru, Nigeria, 2.xi.1911, J. W. Scott Macfie), standing under *africana*, also belongs to this species. Roger Lindley (1968, 1970) has found the species in the Ivory Coast, a male from Korhogo, 9.iv.1968, and two females from the Bandama River near Ferkessedougou, 18.xii.1969. All these localities are in the Guinea Savannah zone except Azare, which is in the Sudan Savannah.

#### General data

A fully grown larva was found (Roger P. Lindley) in a shallow lake at Rayfield near Jos, Nigeria, and identified as *M. bifasciata* by the length of the legs, and by the close resemblance of the labium to that figured by Corbet (1957) in Uganda for the closely related *M. reginae*, which is replaced in West Africa by *M. bifasciata*. A damaged exuvia of the same species was found by a similar lake at Sabon Gida, between Jos and Vom. Both these lakes are artificial ones made for mining purposes by damming small streams. The breeding places of the other four species referred to here are unknown, but the adult habits of all five are very similar. They are fast and powerful fliers, sometimes patrolling up and down moderately short beats, sometimes flying in a direct line and rapidly disappearing. They are very cautious and quickly change their beat if approached. They are frequently seen flying along roads and paths flanked by trees, mostly between five and ten feet from the ground. They are seldom to be seen alighting. For this reason they are not usually well represented in collections, and less is known about the distribution of the species than might be expected from their relative abundance.

However, specimens may sometimes be found in the early morning hanging from bushes or twigs, where they have pre-

sumably been spending the night. They also tend to hang up about mid-day, and sometimes seem to favour a particular tree. In a year when *Macromias* are plentiful (as they were in Vom during March and April of 1953) it may be possible to obtain a fairly long series, including the rarer species, by visiting such a tree regularly and netting any specimens seen hanging within reach. During these two months, the writer was able to obtain 24 specimens mostly taken in this way (17 *picta*, 4 *pseudafriicana*, 2 *nigeriensis*, and 1 *africana*), out of a total of 49 in 14 years. The tree in question was a Flamboyant (*Poinciana regia*), whose leaves had scarcely started to sprout, and the *Macromias* used to hang from the extreme tips of the rather stout twigs. A certain number were also taken hanging from the slender and rather whippy branches of Eucalyptus saplings, but in this case instead of hanging from the tips they took up a position where the branches left the main stem. During the same two months five *Zygonyx torrida* (Kirby 1889) were found hanging similarly from the Eucalyptus and a sixth from the Flamboyant. This species though a Libellulid, has rather similar habits on the wing to those of *Macromia*, and the genus was once known as *Pseudomacromia*.

#### Acknowledgements

The writer would like to thank Mr D. E. Kimmins of the British Museum (Natural History) for facilities to examine specimens in the National Collection, and Messrs Roger and Robert Lindley for loan of their specimens for study and permission to quote their records.

The holotype of *M. nigeriensis* is in the writer's collection, and will be bequeathed to the British Museum. The allotype of *M. pseudafriicana* is already in the Museum Collection.

#### References

- CORBET, P. S. 1957. "Larvae of East African Odonata 9-11". *Entomologist*, **90**: 111-9. (Fig. 10c on p. 116). FRASER, F. C. 1954. "New species of *Macromia* from Tropical Africa". *Rev. Zool. Bot. Afr.*, **49**: 41-76 (esp. 42-45, and fig. 3, 1, on p. 54). LINDLEY, R. P. 1968, 1970. *Personal Communication*. PINHEY, E. C. G. 1951. "The Dragonflies of Southern Africa". *Transv. Mus. Mem.*, **5**: 1-335 (fig. 454 on p. 177). PINHEY, E. C. G. 1961. "A Survey of the Dragonflies (Order Odonata) of Eastern Africa". *Publication British Mus. (Nat. Hist.)*, 1-214 (p. 109 and pl. 8, fig. 5).