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## ON THE GENUS *UMMA* KIRBY (ODONATA)

by

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An attempt is made here to review all the known species of *Umma* Kirby, disregarding accepted synonymy which may be found in the author's Catalogue (Pinhey, 1962) as well as the deposition of types.

Kimmins (1933) showed the importance of the peneal or prophalline characters in estimating the species of this genus. The prophallus is certainly characteristic and it should be noted that throughout known males it bears lateral, sloping setae on the stem.

### GROUP SEPARATION

*Umma* Kirby, 1890, *Cat. Neur.-Odon.*: 100 (nom. nov. pro *Cleis* Selys, 1853)

Kimmins (1933) reviewed this genus on the basis of the penes and, with excellent figures, illustrated how on these grounds the species then known could be divided into three groups, depending on the shape of the upper ("ventral") terminal lobes. In 1950 Kimmins corrected the species *mesostigma* and *saphirina* which had been reversed in peneal characters, but the grouping remained the same:

- Group 1. *cincta*, *longistigma*
2. *declivium*, *mesostigma*, *saphirina*
3. *distincta*, *electa*

Taxa omitted from this list were the little known *splendida* Navás of Fernando Poo, which will be discussed in another paper; *femina* Longfield (1945), *puella* Sjöstedt (1917) and *purpurea* Pinhey (1961).

Another method of grouping the genus, in some ways perhaps more realistic, is to consider the dorsal markings, the colour of the venation and the development of the metasternum.

The metasternum in some species is almost or quite flat, in others it is distinctly raised posteriorly except at the periphery, and usually very hirsute, in both sexes. This peculiar feature may have some relation to sensitive recognition or guidance during mating and appears to be significant. However, if used as a basic character this would place the species *cincta* and *longistigma* in the same group as *declivium* and *purpurea* since all these have a flat metasternum. This sternal character should

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therefore be a subsidiary one since *declivium* and *purpurea* are clearly distinct from all the other species.

In reference here to the penaeal terminal lobes or branches the "upper" or "ventral" ones will be called *inner* branches, the "lower" ones external branches, since these seem less ambiguous terms. The inner branches are extensions of the central portion of the prophallus which, at rest, lie directly across the stem. During coition this portion is forced out posteriad so that then the "upper" or "ventral" features are reversed with the "lower" lobes.

Employing these characters for grouping the result may be tabulated as follows:

- A. Venation all bright metallic green, blue or violet. In these the metasternum may be partially but not clearly raised.

SPECIES GROUP 1. *distincta*, *electa*, *femina*

- B. Venation almost all or entirely black or dark red or violet black.

- a. Head and dorsum of thorax black or purplish-black in male.

SPECIES GROUP 2. *declivium*, *purpurea*

- b. Head and dorsum of thorax in both sexes bright metallic green, blue or purple, *not* black. Venation usually black or purplish-black but red-brown in *puella*. Abdomen in teneral state generally royal blue or purple, except in *puella*.

- (i) Metasternum with raised, hirsute central pad. Inner branches of prophallus moderately long.

SPECIES GROUP 3. *mesostigma* (= *splendida*), *puella*, *saphirina*

- (ii) Metasternum without strongly raised pad. Inner branches of prophallus very short.

SPECIES GROUP 4. *cincta*, *longistigma*

### KEY TO SPECIES

With the exception of *U. femina*, still only known in the female, this key is primarily designed for males. A preliminary key to females follows later.

*General key, mainly for males*

- |                                                                                                                                                                                            |                  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| 1. Venation all bright metallic (green, blue or violet) not black . . . . .                                                                                                                | 2                |
| — Venation dark red-brown to black, with or without metallic colours . . . . .                                                                                                             | 4                |
| 2. Pterostigma only 1 mm, yellow-brown between green veins. Basal segment of antenna metallic green . . . . .                                                                              | <i>femina</i>    |
| — Pterostigma 1-5 mm or more, metallic-hued. Basal segment of antenna blackish or yellow. . . . .                                                                                          | 3                |
| 3. Wings greenish-yellow. Pterostigma metallic green, blue-green or violet and green. Inner branch of prophallus broad at base, elongately triangular distally. Hindwing 26-33 mm. . . . . | <i>distincta</i> |
| — Wings mainly hyaline. Pterostigma metallic violet (lilac). Inner branch of prophallus narrower at base, more <i>truncate</i> distally. Hindwing 32-34 mm . . . . .                       | <i>electa</i>    |
| 4. Male with dorsum of head and thorax black or purplish-black . . . . .                                                                                                                   | 5                |
| — Male with head and/or thorax metallic green or purple. Venation black or purplish-black, but red-brown in <i>puella</i> . . . . .                                                        | 6                |
| 5. Wings without pterostigma. Head and dorsum of thorax in male matt black. Female wing apices not brown . . . . .                                                                         | <i>declivium</i> |
| — With long purplish black pterostigma <sub>2</sub> in male (brown in female). Head and                                                                                                    |                  |

~~X Key to reds~~

- dorsum of thorax in male purple-black. Female wing apices distinctly brown. . . . . *purpurea* 7
6. Metasternum distinctly raised posteriorly, more or less hirsute . . . . . 7  
 — Metasternum almost entirely flat . . . . . 9
7. Venation red-brown. Pterostigma yellowish-brown, the posterior proximal angle not acute, about 60°-70°. Male very large, abdomen 50 mm, hindwing 40 mm . . . . . *puella*
- Venation black or purplish-black. Pterostigma of male brown to black, the posterior angle very acute, about 30°. Smaller species, abdomen not more than 45 mm . . . . . 8
8. Most of the peripheral cells of the wings in the male completely filled with brown particularly those near the pterostigmata . . . . . *mesostigma*
- Few if any peripheral cells filled with brown, these usually only partially filled . . . . . *saphirina*
9. Pterostigma very short, 1 mm. Inferior appendage about two-thirds as long as superior; the superior with slight dorsal ridge at apex. . . . . *cincta*
- Pterostigma 2-3 mm. Inferior appendage nearly as long as superior; superior without dorsal ridge at apex. . . . . *longistigma*

The general key, with its bias towards the male, may sometimes assist with females. It is not possible without deeper research to make an adequate key to females but a very speculative one is suggested here. There is no difficulty with females of *distincta*, *femina*, *declivium*, *puella* and *cincta* (no female *electa* has been examined). In *mesostigma* the brown or amber at the apex is confined more or less to the marginal cells but the author has seen examples (mentioned in another paper) in which there is a broad apical brown fascia as in *purpurea*. The most difficult species to separate are *saphirina* and *longistigma*, in which the *pterostigma* is normally yellowish-brown in the female and not so characteristic as in the male.

The amount of yellow on the basal segment of the antenna is not apparently a useful female guide since the invasion of black is variable.

*Tentative key to females*

1. Venation metallic, not red-brown nor black . . . . . 2  
 — Venation mainly red-brown, dark brown or black . . . . . 4
2. Wings hyaline . . . . . *electa*  
 — Wings greenish or greenish-yellow. . . . . 3
3. Pterostigma only 1 mm long, the two cells below it large. . . . . *femina*  
 — Pterostigma at least 1.5 mm, the five or six cells below it small . . . . . *distincta*
4. Venation distinctly reddish-brown, not black. Lower posterior angle of pterostigma not strongly acute, about 60°. . . . . *puella*  
 — Venation not reddish, but brown to black, with or without metallic tints . . . . . 5
5. Pterostigma absent . . . . . *declivium*  
 — Pterostigma present . . . . . 6
6. Pterostigma only about 1 mm long, the three or four cells below it deeper than wide, the proximal angle of the pterostigma not strongly acute . . . . . *cincta*  
 — Pterostigma at least 1.5 mm, the cells below it not deep, the proximal angle strongly acute. . . . . 7
7. Apical margins of wings edged with brown or amber cells or wings with a brown fascia. Pterostigma usually dark at maturity. . . . . 8  
 — Apical margins of wings more or less hyaline, at most in old specimens with yellowish or traces of brown. Pterostigma usually yellowish-brown . . . . . 9

8. The brown at wing apices is normally only peripheral, rarely extensive.  
 Proximal side of pterostigma short (as in the figure) . . . . . *mesostigma*  
 — With brown apical fasciae, sometimes spreading in as far as pterostigma.  
 Proximal side of pterostigma long . . . . . *purpurea*
9. Pterostigma usually short, often broad, the proximal angle not very acute  
 and only three to four subpterostigmal cells. . . . . *saphirina*  
 — Pterostigma more often narrow, the proximal angle tending to be more acute;  
 usually at least six cells below it . . . . . *longistigma*

NOTES ON THE SPECIES

SPECIES GROUP 1

*U. distincta* Longfield, 1933, *Stylops* 2: 139 (Lake Tanganyika and Zambia)

- Fig. 1. *Antenna* Basal segment yellow.  
*Wings* Greenish. Venation green and violet. Pterostigma metallic green, sometimes tinged with blue or violet; 1.5-2.25 mm.  
*Anal appendages* Superior appendage with long inner keel from base to apex, somewhat hollowed out on either side of this ridge. Inferior only two-thirds as long, broadened apically.  
*Prophallus* The stem, as in all species, with slanting lateral setae. Inner branch large, elongately triangular; external branch

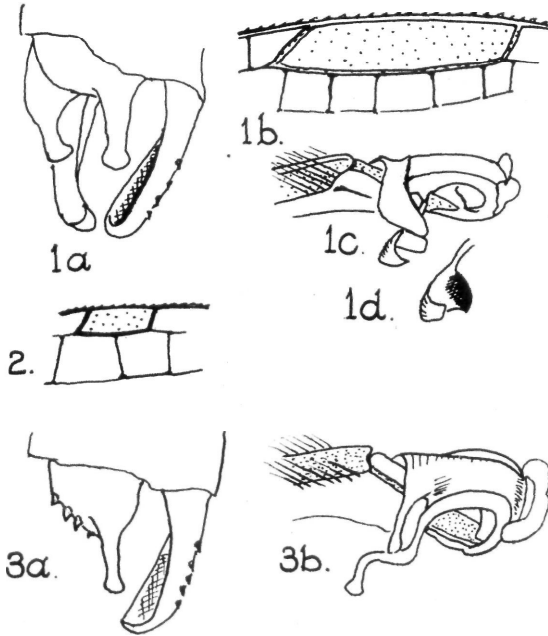


FIG. 1. *U. distincta* ♂  
 a. Anal appendages from left                      b. pterostigma of right forewing  
 c-d. prophallus from right and apex of external branch

FIG. 2. *U. femina* ♀  
 Pterostigma of right forewing

FIG. 3. *U. declivium* ♂  
 a. Anal appendages                      b. prophallus

- with slender stalk, the apex very broad, folded like a dead leaf.
- Size* Very variable. Abdomen 34-41 mm. hindwing 26-33 mm.
- Distribution* Southern Katanga, Northern Zambia, Eastern Angola (also, probably occurs in SW. Tanzania).
- U. electa* Longfield, 1933, *ibid.* 2: 139 (Kambove, Katanga)
- Antenna* Basal segment yellow.
- Wings* Hyaline. Pterostigma more lilac-blue than *distincta*; 2-2.5 mm.
- Anal appendages* mm.
- Prophallus* Similar. Inferior not inflated at apex. Inner branch narrower at base, more truncate apically than in *distincta*.
- Size* Abdomen 40-46 mm, hindwing 32-34 mm.
- Distribution* Only known so far from Katanga.
- U. femina* Longfield, 1945, *Archos Mus. Bocage* 16: 20 (Angola)
- Fig. 2. Still only known in the female, the type from Sangévé, Angola, and a female in the National Museum, Bulawayo, from Cuché (leg. Padre Eduardo, don. Dr. E. S. Ross).
- Antenna* Basal segment metallic green.
- Metasternum* Raised posteriorly, coated with brown hair.
- Wings* Yellowish-green. Pterostigma yellowish, subpterostigmal cells rather high; brown, between green veins; only 1 mm long.
- Size* Small; abdomen 27.5 mm, hindwing 26.5 mm.
- Distribution* Angola.
- SPECIES GROUP 2**
- U. declivium* Förster, 1906, *Jber. Ver. Naturk. Mannheim* 71.72: 51 (Usambara Mountains)
- Fig. 3. *Antenna* Basal segment black.
- Head and thorax* Head and face above, thorax dorsally black in male; metallic green in female, as in other species, with black sutural bands.
- Wings* Hyaline, with reddish-brown venation. Pterostigma absent (an easy distinguishing factor for both sexes).
- Anal appendages* Superior appendage like *distincta* with inner keel from base to apex. Inferior appendage longer, reaching three-quarters of the superior; slender in outer half, only slightly inflated apically. Slight dorso-apical ridge on superior.
- Prophallus* Inner branch slender, slightly thickened apically; external branch very long and sinuous.
- Size* Abdomen 39-44 mm, hindwing 32-5-35 mm.
- Distribution* Eastern Tanzania from Usambara Mountains to Uluguru Mountains.
- U. purpurea* Pinhey, 1961, *Entomologist's Mon. Mag.* 96: 264 (N. Cameroons)
- Fig. 4. *Antenna* Basal segment blackish.
- Head and thorax* As in *declivium* but purple-black instead of black. Female very like *declivium*.
- Wings* Hyaline with reddish venation; pterostigma purplish-black in both sexes, long, the posterior proximal angle so acute

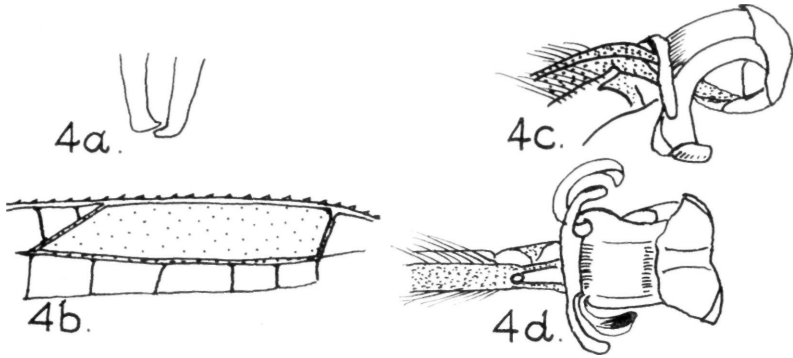


FIG. 4. *U. purpurea* ♂

a. apices of inferior appendages      b. pterostigma      c-d. prophallus

that two postnodal cross-veins are projected on to the posterior edge at least in the male. Pterostigma  $2 \cdot 5$  mm. Female wing apices distinctly brown.

*Abdomen*

Stouter than in *declivium*.

*Anal appendages*

Superior appendages like *declivium*; inferior not swollen on both sides at apex but the apical tooth is in-turned. No dorso-apical ridge on superior.

*Prophallus*

Inner branch slender, not widened apically. External branch sinuous, terminating in a scoop; in lateral view with broad base, widened distally.

*Size*

Abdomen  $38 \cdot 5$ - $40 \cdot 5$  mm, hindwing  $31$ - $38$ - $5$  mm.

*Distribution*

Cameroons—E. Nigeria border.

**SPECIES GROUP 3**

*U. puella* Sjöstedt, 1917, *Ark. Zool.* 2: 7 (Cameroons)

Fig. 5. A very large species which is distinct by its reddish venation but by anal appendages near Group 2 or Group 4.

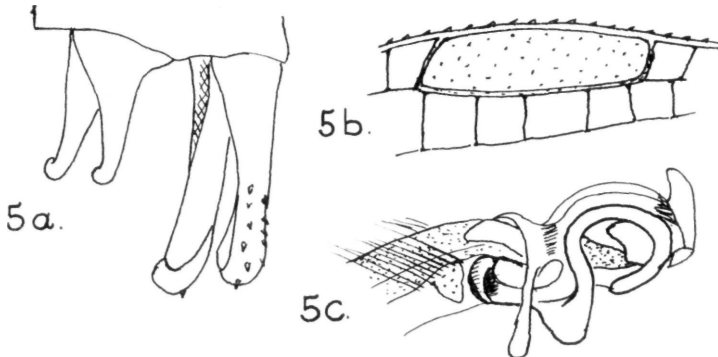


FIG. 5. *U. puella* ♂

a. anal appendages      b. pterostigma      c. prophallus

*Labrum orange yell with black med. line.*

- Antenna Basal segment yellow.  
 Thorax Metasternal inflation not very hirsute.  
 Wings Hyaline, but generally a little fumose, especially at the margins. Venation red-brown. Pterostigma distinctive, yellowish-brown between black veins and *not* acute at posterior proximal angle, the angle suspended being about 60° or more. Pterostigma 1.5 mm.  
 Anal appendages Superior appendage, as in *distincta* with keel from base to apex but not hollowed out. Inferior narrower at base than in the previous species; apex not widened, the tooth in-turned.  
 Prophallus Inner branch widened basally and apically. External branch with very broad lobe after a wide stalk, then curled up to a scoop.  
 Size ♂ Abdomen 50 mm, hindwing 40 mm.  
 ♀ Abdomen 40 mm, hindwing 36 mm.

In the next two species the keel on the superior appendage is short and there is a large tooth at the apex as well as a dorsal matted hair-tuft.

*U. mesostigma* (Selys), 1879, *Bull. Acad. r. Belg. Cl. Sci.* (2) 47: 358 (Cameroons)

- Fig. 6. Antenna Basal segment metallic blue at maturity.  
 Thorax Metasternal raised pad coated with brown hair.  
 Wings Hyaline, with black venation. Pterostigma blackish, with rather acute posterior proximal angle, usually with one postnodal cross-vein touching it; approximately 2 mm. Marginal cells in *male* mostly completely filled in with brown, at least below costa, in female only the apical fringe has darkened cells, but very occasionally there is a brown apical fascia.

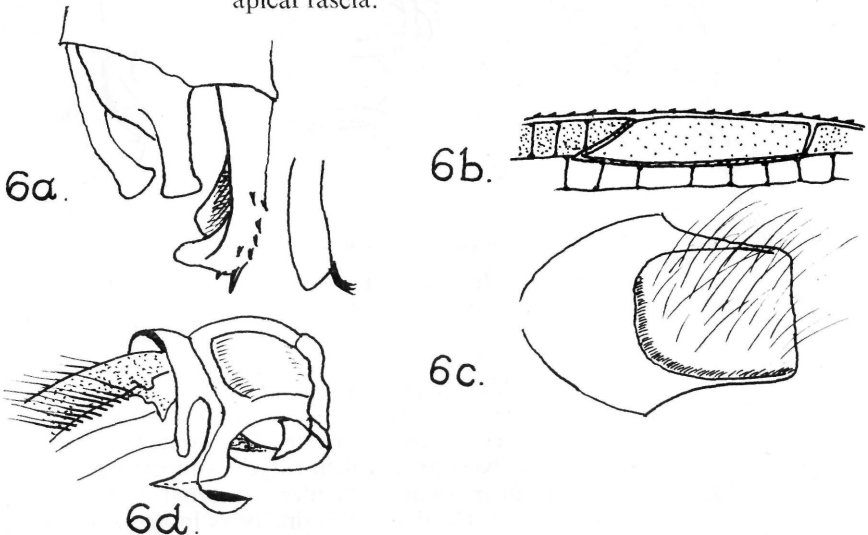


FIG. 6. *U. mesostigma* ♂

a. anal appendages and apex of superior more dorsally  
 c. metasternal plate

b. pterostigma  
 d. prophallus

*Anal appendages* Superior very robust, with short subapical keel and a large inner apical tooth, as well as a dorso-apical tuft of black matted hair. Inferior about two-thirds as long, stoutish, inflated apically.

*Prophallus* Inner branch slender. External branch complex, first widening like a shute, narrowing to an inner angle, then at a right angle posteriad to a scoop.

*Size* Cameroons, etc., abdomen 39.5-42 mm, hindwing 32.5-34 mm.

N. Congo (Kinshasa), abdomen 45.5 mm, hindwing 38.39 mm.

*Distribution* There are probably at least two if not three races: Examples from Cameroons to Dahomey; with a generally darker-winged form or race on Fernando Poo island; Northern Congo, a larger race. In another paper it will be inferred that *U. splendida* Navás is the Fernando Poo form.

*U. saphirina* Förster, 1916, *N. Beitr. Syst. Insektenk.* 1: 24 (Cameroons).

Fig. 7. This is very like *mesostigma* but the peripheral wing-cells have little or no brown in them.

*Antenna* Basal segment black or yellowish and black.

*Thorax* Metasternum well raised posteriorly and coated with long hair

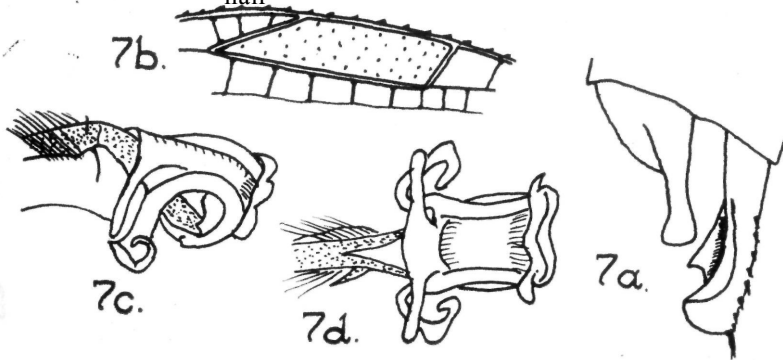


FIG. 7. *U. saphirina* ♂

a. anal appendages

b. pterostigma

c-d. prophallus

*Wings*

Hyaline. Pterostigma more acute at proximal angle (as in *purpurea*), blackish, in male, with two or three postnodal cross-veins projected on to it; in female far less acute. Peripheral costal cells scarcely tinted inside with brown. Pterostigma variable in size 1 • 5-2 • 5 mm.

*Anal appendages* Very like *mesostigma*. Apical tooth on superior not so prominent; inferior more slender in outer half, less swollen apically. No dorsal apical ridge on superior.

*Prophallus* With inner branch slender; external branch long and sinuous, not widened terminally as in *mesostigma*.

*Size* Abdomen 36-43 mm, hindwing 31-36 mm.

*Distribution* Uganda and Northern Congo (Kinshasa) to Central African Republic, Cameroons and Nigeria.



SPECIES GROUP 4

These have the inner branch of the prophallus *very* short.

*U. cincta* Hagen, 1853, in Selys, *Bull. Acad. r. Belg. Cl. Sci.* 20 (Suppl.): 23.

Fig. 8. *Antenna*

*Wines*

Basal segment metallic green.

Hyaline, with black venation. Pterostigma brown to black, very short, only about 1 mm long, not very acute at posterior proximal angle, the subpterostigmatal cells *high* (less so in female). The pterostigma may have some traces of green iridescence. Costal cells sometimes partly filled with brown.

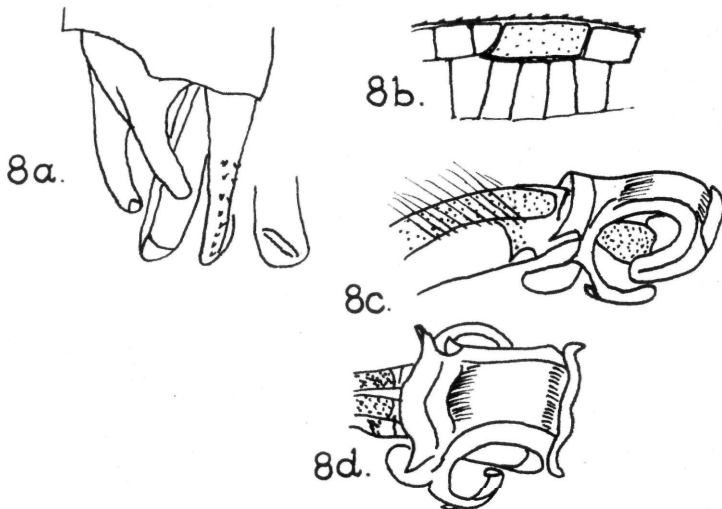


FIG. 8. *U. cincta* ♂

a. anal appendages and apex of superior

b. pterostigma

c-d. prophallus

*Anal appendages* Superior like *puella*, with keel from base to apex, not hollowed out; slight dorsal apical ridge. Inferior not much widened at base, slender apically, the apical tooth in-turned.

*Prophallus* Inner branch minute. External branch large and bifurcate, with broad anterior scoop, a strap posteriorly (with a minute scale on its outer margin).

*Size* Abdomen 41-45 mm, hindwing 34-36.5 mm.

*Distribution* Widespread from Congo (Kinshasa) to Nigeria and westwards to Guinea.

*V. longistigma* (Selys), 1869, *Bull. Acad. r. Belg. Cl. Sci.* (2) 27: 650 (East Nigeria)

Figs. 9, 10. This is one of the more puzzling species, since there appears to be considerable variation in the anal appendages and prophallus almost enough to separate more than one taxon.

*Antenna* Basal segment black or black and yellow.

*Thorax* Metasternum flat or slightly raised posteriorly but sparsely haired.

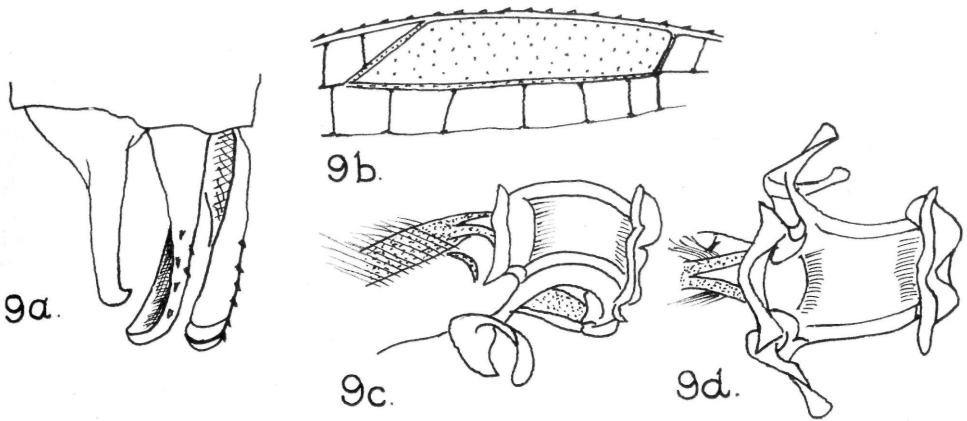


FIG. 9. *U. longistigma* ♂ (from Mekoum, Congo Brazzaville)

a. anal appendages

b. pterostigma

c-d. prophallus

*Wings*

Hyaline. Venation black or violet black. Pterostigma blackish brown, very acute in male at proximal angle, with one postnodal cross-vein projected on to it; pterostigma (Congo) 1-5 mm, (Cameroons-Nigeria) 2-3 mm. In the female the yellowish-brown pterostigma is variable.

*Anal appendages*

The superior may be slenderish, with continuous keel from base to apex, the apex slightly indented posteriorly; or it may be very robust, the keel not quite reaching the apex, the apex posteriorly with a deep hollow. Inferior long and slender, almost as long as superior; straight.

*Prophallus*

Inner branch very small. External branch long, bifid, rather like *cincta*, angled at the bifurcation, lobed, then a strap-like terminal portion.

*Size*

Abdomen 37-44 mm, hindwing 31 • 5-35 mm.

*Distribution*

N. Congo (Kinshasa) with short pterostigma (Ituri Forest); Congo (Brazzaville), Cameroons to S. Nigeria.

**TANDEM LINKAGE**

Fig. 11. The prothorax and adjacent regions of the mesothorax are illustrated for the female *saphirina*. Matt-black depressed areas which might be considered as possible contact points for the male's anal appendages are indicated by shading, these being chiefly around the median tubercles as well as the upper posterior angle of the mesinfraepisternum. Yet the significance of these areas is by no means obvious for two reasons. There seems little difference in the form of prothorax and in these depressed regions in females of different species, despite the obviously longer inferior appendages of male *longistigma*, in comparison to *mesostigma*, *saphirina* and others. Secondly, the male thorax shows similar blackened areas, although less depressed. The only assumption possible at present is that the inferiors are placed somewhere on the dorsum of the prothorax, the superiors probably below the hindlobe of the prothorax. It would certainly appear, however, that the

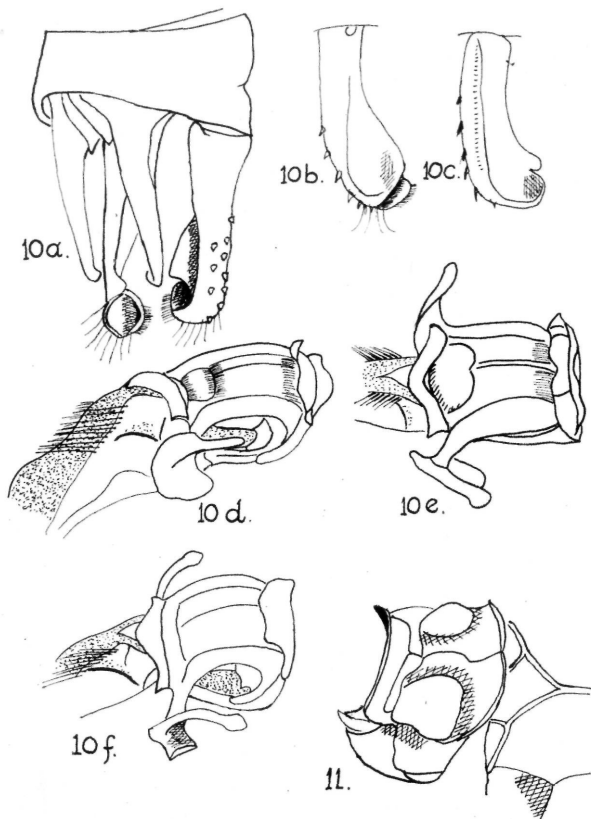


FIG. 10. *U. longistigma* ♂ (a-e, from Ikom, E. Nigeria; f, from Ituri Forest)  
 a. anal appendages      b-c. superior dorsally and ventrally      d-e. prophalli  
 f. prophallus of Ituri Forest example with short pterostigma

FIG. 11. Prothorax of *U. saphirina* ♀ and adjacent portions of mesothorax

complex apex of the superior in *mesostigma*, *saphirina* and *longistigma* must be designed to close on to ridges or depressions behind the prothorax.

#### SUMMARY

The species of the genus *Umma* Kirby are discussed. Group separation and a key are given. The most important papers are those by Kimmins.

#### References

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