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Chironomidae from Ethiopia. Part 1.

Tanypodinae (Insecta, Diptera)

By A. D. Harrison

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Females, some males, pupae and larvae of Tanypodinae, collected in the Ethiopian Highlands and Rift Valley lakes, are described. Of these, the known species are: *Clinotanypus claripennis* Kieffer, *Tanypus (Tanypus) guttatipennis* Goetghebuer, *Procladius (Holotanypus) brevipetiolatus* Goetghebuer, *Ablabesmyia (Ablabesmyia) dusoleili* Goetghebuer, *Ablabesmyia (Karelia) nilotica* Kieffer, *Conchapelopia trifascia* (Freeman) and *Nilotanypus comatus* (Freeman).

In addition, three new species are described: *Procladius (Psilotanypus) shibrui*, from a male only, *Ablabesmyia (Ablabesmyia) rimae*, from males, females, prepupae and larvae, and *Paramerina ababae*, from a male, a female, pupae and larvae.

Larsia africana Lehmann is reported for the first time from Ethiopia.

Dr. A. D. Harrison, Department of Biology, University of Waterloo, Waterloo, Ont. N2L, 3G1, Canada

Introduction

The Tanypodinae of Sub-Saharan Africa are listed by Freeman & Cranston (1980). Most of the males of these are described in Freeman's revision (1955 & 1956) and the others in Harrison (1978) and Lehmann (1979 & 1981); one species described by Fittkau (1962) from North Africa has also been found in the region (Tab. 1). Only Lehmann describes and pictures some females and pupae.

This paper describes females, pupae and larvae of both known and new species. The specimens were collected from 1981 to 1985 while the author was taking part in a joint limnological and fisheries programme organized by the biology departments of Addis Ababa University, Ethiopia, and the University of Waterloo, Ontario, Canada. The ecological background can be obtained from Harrison (1987), Harrison & Hynes (1988), Tilahun Kibret & Harrison (1989), Tudorancea, Baxter & Fernando (1989), and Tesfaye Berhe, Harrison & Hynes (1989).

Methods

Most adults of lake species were caught at lights on the lake shore by or sweeping bank vegetation in the morning. Running water species were bred out in aquaria in the laboratory at Addis Ababa. Larvae and pupae were collected during the survey programmes. Most specimens were mounted in Canada Balsam dissolved in cellosolve or in Euparal. Measurements were made with an eye-piece micrometer and all drawings with a drawing tube on the microscope.

Generic definitions and descriptions of adult males follow those of Roback (1971) and of females those of Saether (1977), pupal descriptions follow those of Fittkau & Murray (1986) and Langton (1984) and larval descriptions those of Fittkau & Roback (1983). In addition, Roback (1985) was used for the immatures of *Ablabesmyia* and Roback (1981) for the immatures of *Conchapelopia*. Morphological terminology is from Saether (1980).

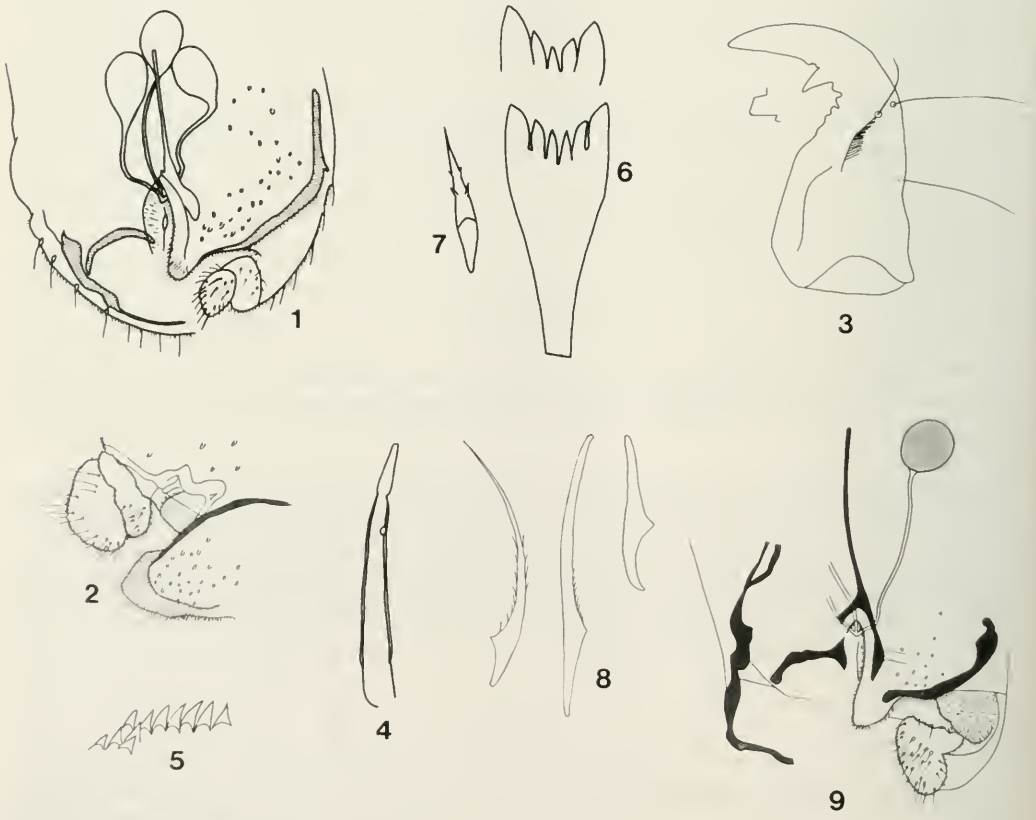
Station numbers given in text (ET) are those of Harrison & Hynes (1988) who give a description and the map reference.

Description of species

Clinotanypus claripennis Kieffer

Clinotanypus claripennis, Freeman 1955.

Larvae and adults were not directly associated but adults of *C. claripennis* were common at Lakes Zwai and Awasa where the larvae occurred. Adults of no other *Clinotanypus*-species were found during the three years when these lakes were studied.



Figs 1.–8. *Clinotanypus claripennis* Kieffer. Adult female, genitalia: 1. ventral; 2. lateral. Larvae: 3. mandible; 4. maxillary palp; 5. mental teeth; 6. ligula; 7. paraligula; 8. claws of posterior parapod.; 9. *Tanypus guttatipennis* Goetghebuer: female genitalia

Adult male

Colour: pattern and anatomical details fit well into the range given by Freeman (1955).

Adult female

Colour: pattern similar to that described by Freeman (1955), but small dark spots present near base of wings.

Genitalia (Figs. 1 & 2): gonopophysis VIII tongue-shaped, caudo-mesal angle rounded, gonocoxapodeme VIII well-developed continuing onto base of "tongue", rudiments of gonocoxite IX fairly" large, rounded and subtriangular in lateral view (Fig. 2): gonotergite IX well-developed, dark brown, no setae apparent; gonosternapodeme well-developed, curved, dark brown; cerci 85 μm long, 0.75 lenght of seminal capsules. Labia with no microtrichia. Seminal capsules pale and oval, slightly longer than half the length of the notum.

Pupa

None was found.

Larva (n = 10 for most measurements)

Body. Red in life but fading to cream-colour in preservative, head orange-brown.

Head capsule (from 10 unmounted specimens). Conical, length mean 1088 μm SD 39.5 μm, cephalic index mean 0.67.

Antennae. 667–777 μm, 0.67 length of head, 4.3 times length of mandible; AR 11.5–15.0, mean 12.9, SD 1.1; basal segment L/W mean 15.8, SD 0.8, ring organ 0.88–0.91 of length; segment 2 weakly curved L/W = 9; segments 3 & 4 (n = 3) very short, 0.16 of segment 2, and shorter than Lauterborn organs and 0.4 length of style; apical segment about 0.4 of segment 3; blade 1.5 length of flagellum; accessory blade about 0.54 length of blade, slightly longer than segment 2. Segment 2 and blade slightly recessed into segment 1.

Mandible (Fig. 3). Shows the hooked shape typical of the genus, apical tooth 2.5 × as long as basal width, two small teeth on proximal inner margin; basal tooth long and pointed but worn down in most specimens (Fig. 3 inset), point directed about 45° from the apical tooth, 4 small, rounded adjacent teeth proximal to basal tooth; sloping ridge on inner margin with about 12–15 points.

Maxilla (Fig. 4). Basal segment of palp 6.5 × as long as wide, on tall pedestal, length of apical segment 0.22 that of basal segment.

Mentum and M-appendage. Very similar to that of *C. nervosus* (Fittkau & Roback, 1983), 11 dorsomental teeth (Fig. 5).

Ligula. Most specimens with 6 teeth (Fig. 6) but one of the 10 examined had 5 (Fig. 6 inset), 2.2 as long as apical width, outer tooth 1.6 as long as inner tooth (range 1.3–2.0).

Paraligula (Fig. 7). With 4 accessory points 0.5 length of ligula.

Pecten hypopharynx. With about 30 teeth per side.

Abdomen. As for genus; procercus 2.8 times as long as wide, 14 claws of posterior parapod pale (Fig. 8), 5 very long drawn out to fine points with long, fine teeth on inner and outer margins, 5 slightly shorter with stouter curved points, some with fine teeth on inner margin as in Fig. 8, but others with fewer, smaller teeth in the same region, 4 shorter, simple, curved claws.

Material examined. Adults from Lakes Zwai and Awasa and larvae from Lakes Zwai, Awasa and Chamo collected during 1982 to 1985.

Comments. The male fits well into Roback's (1971) definition for the genus. Female: both gonopophysis VIII and the rudiment of gonocoxite IX are more rounded than those of *C. (C.) pinguis* (Loew) (Saether, 1977) and the coxosternapodeme is better developed, more curved and darker.

The larva resembles those of the species covered by Fittkau & Roback (1983) but differs in the orientation of the basal tooth of the mandible, the much narrower accessory blade of the flagellum, the pro-

portionately longer basal segment of the maxillary palp, the proportionately shorter outer tooth of the ligula and a few other small details.

Ecology. The larvae are found on lake bottoms where the mud is firm enough to support them. They have been found feeding on small oligochaetes.

Distribution. From Natal and the Orange Free State, South Africa, through most of tropical west, central and east Africa, Sudan, Ethiopia to Israel (Freeman, 1955).

Tanypus (Tanypus) guttatipennis Goetghebuer

Tanypus guttatipennis, Freeman 1955.

Adult male

Colour: Darker than that given by Freeman (1955); head, thorax, except scutellum, and abdomen mainly dark brown; scutellar tubercle very slightly raised, and conspicuously lighter in the centre; femur, proximal two-thirds dark below and light above, then a pale ring followed by a dark ring almost up to the pale knee; tibia mostly pale but with dark ring at apex; tarsi 1–3, mostly pale with dark ring at apex, tarsi 4 and 5 dark. Premandibular palp with 4 segments; wing as in Freeman (1955), spots all discrete.

Adult female

Colour: Similar to male, mostly dark brown.

Genitalia (Fig. 9). Gonocoxapodeme VIII well developed, dark, continuing onto base of tongue-shaped gonopophysis VIII; gonotergite IX well developed, dark, without setae, notum 2.3 × as long as ramus; coxosternapodeme well developed, slightly curved, dark; segment X without setae; seminal capsules, spherical, dark, no surface reticulation apparent.

Material examined. Most specimens were collected at lights in a house on the outskirts of Addis Ababa from October 1982 to November 1985, a few were netted on the shores of L. Awasa during February, 1984.

Comments. The four-segmented premandibular palp places this species into the sub-genus *Tanypus* (Roback, 1971). The various parts of the female genitalia are darker and more prominent that those pictured for *T. stellatus* (Coq.) by Saether (1977). They are more like those of *T. (T.) concavus* Roback (Roback, 1971). Freeman (1955), judging from the material available to him, felt that this species could be a pale form of *T. lacustris* Kieffer. These dark Ethiopian specimens show that this is not the case as they still keep the characteristic wing pattern of *guttatipennis*.

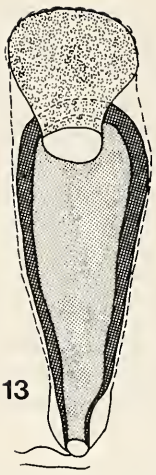
Ecology. No larvae were collected during the river and lake surveys so it must be assumed that they inhabit small ponds, marshy habitats and small, slow-flowing streams (cf. Fittkau & Roback, 1983).

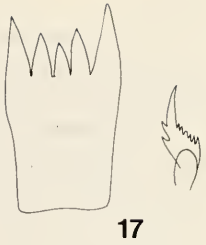
Distribution. From the Western Cape Province, through Central Africa to Ethiopia.

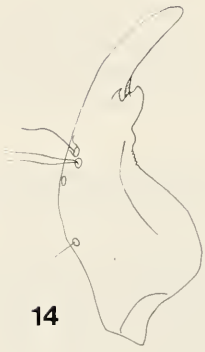
Procladius (Holotanypus) brevipetiolatus Goetghebuer

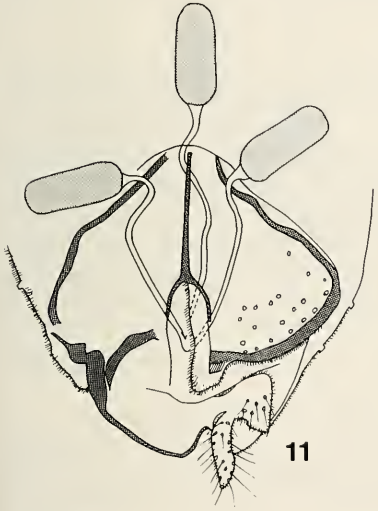
Procladius brevipetiolatus, Freeman 1955.

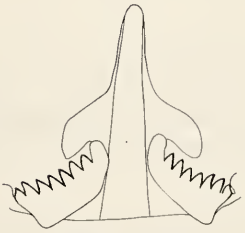
The African species of *Procladius* are in need of revision; as Freeman (1955) points out, the series in the collection of the British Museum (Natural History) contains specimens of varied sizes and colour intensities. Because of this the males in this Ethiopian collection are described in some detail.

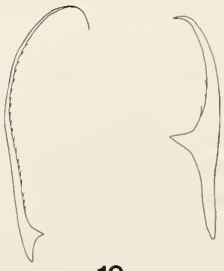


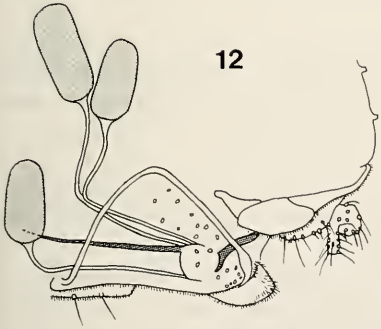


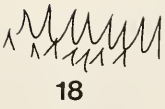












Figs 10.–19. *Procladius brevipetiolatus* Goetghebuer. Adult male; 10. hypopygium. Adult female, genitalia: 11. ventral; 12. lateral. Pupa: 13. cephalic horn. Larva: 14. mandible; 15. maxillary palp; 16. mentum & M–appendage; 17. ligula & paraligula; 18. teeth of pecten hypopharynx; 19. claws of posterior parapod.

Adult male

Colour (unmounted specimens). Frons and palps light brown, antennae brown, narrow cream-coloured region around the eyes, vertex brown to dark brown. Thorax: mainly dark brown, antepronotum dark brown, scutal stipes dark brown separated by thin light lines bearing the acrostical and dorso-central setae, shoulders light, scutellum light brown, postnotum dark brown with central light stripe, pleural region mostly cream-coloured, preepisternum dark brown. Legs: coxa dark, femur light brown, tibia cream-coloured with small dark band at tip, tarsomere 1 cream-coloured, tarsomeres 2–5 brown. Abdomen: all tergites dark brown with narrow cream-coloured region distally, sternites similar, hypopygium brown.

Head. AR 1.7.

Legs. LRI 0.72, LRII 0.67, LRIII 0.69.

Hypopygium (Fig. 10). Gonostylus with numerous setae, "heel" short with angle at about 45°, apodemes dark and clearly discernible, similar to those pictured for *P. denticulatus* Sublette by Saether 1980, but proportions are different; the superior volsella is relatively smaller but appears to be much the same size as those of some species illustrated by Roback (1971).

Adult female

Colour (unmounted specimens). Much the same as the male but abdominal sternites very light except sternite VIII which is brown, prominent, and rimmed by the dark brown gonocoxapodeme.

Genitalia (Figs. 11 & 12). Gonopophysis VIII somewhat tongue shaped but with caudomesal angle of about 40°, gonocoxapodeme large and dark brown, with wide ending on gonopophysis and following the edge of tergite VIII almost to join the one from the other side in the ventral midline; gonotergite IX well chitinized and dark brown, rudiments of gonocoxite IX small but obvious, coxosternapodeme slightly curved; segment X with 6 setae per side. Labia without microtrichia; seminal capsules watermelon-shaped in outline, more than 0.5 length of notum and longer than cerci; arrangement in body is better seen in lateral view (Fig. 12).

Pupa

No pupae were collected but the following data were obtained from prepupal larvae.

Cephalothorax. Horn (Fig. 13) 336 μm long and maximum width 106 μm, about 3 × as long as broad, external surface with small scales, no spines discernible, horn sac with thick walls, dark brown with granular appearance; plastron plate large, 70 μm high and 101 μm wide, connected to the horn sac by a broad neck.

Abdomen. Shagreen sparse, small spines (about 4 μm long and 2 μm wide at base) mostly singly, not in groups. Abdominal setation: lateral setae – anal lobe 2, segments VIII 5, VII 4, VI nil. Anal lobe fringed with about 40 spines, the proximal 20 about 25–28 μm long, the distal 20 progressively smaller to about 9 μm near terminal spine of about 23 μm.

Larva (n = 10 for most measurements)

Head capsule. Light cream in colour, 638–712 μm long, mean 675, cephalic index 0.74–0.82, mean 0.78, maximum height 450 μm (data from 10 unmounted specimens).

Antenna. Short, 138–189 μm, mean 171 μm, 0.91–1.0 length of mandible, AR 6.4–7.2, mean 6.8; length of basal segment 4.1–4.7 × width, ring organ 0.77–0.80 from base; segments 2 and 3 both twice as long as wide, segment 4 slightly more than half the length of segment 3; style ending about two-thirds length of segment 3, Lauterborn organs almost as long as segment 3; blade slightly longer than flagellum, accessory blade 0.75–0.85 length of blade.

Mandible (Fig. 14). Slender and curved, apical tooth almost black, 2.85–3.3 × as long as basal width, 0.27–0.30 × length of mandible, depending on wear; basal tooth large, point blunt and directed apically, smaller pointed tooth on ventral side; seta subdentalis arising at base of basal and apical teeth; ventro-lateral setae simple, 2 appears to have two branches.

Maxilla (Fig. 15). Palp 2.1–2.8 (mean 2.3) × as long as wide, ring organ in middle.

Mentum and M-appendage (Fig. 16). With 7 yellowish-brown dorso-mental teeth on each side, M appendages with labial vesicles sagittate; pseudoradula, as in Fig. 16, difficult to discern.

Ligula (Fig. 17). With 5 teeth in concave row, 1.45–1.8 × length of apical width; apex blackish brown, middle tooth 0.46–0.72 (mean 0.5) × length of outer tooth, depending on wear.

Paraligula (Fig. 17). 0.48–0.56 length of ligula, about 6 points on outer edge and 2–3 points on inner side.

Pecten hypopharynx (Fig. 18). Of about 15 large teeth, more or less the same size with a row of about 7 small teeth laterally.

Abdomen. Integument with minute, transverse rounded ridges, about 1 μm high and 3 μm from one crest to the next, with fringe of swim-setae; with 4 pointed anal tubercles, procercus 3.3–4.3 (mean 3.7) × as long as wide; posterior parapod (Fig. 19) with 16 claws, 5 long, 7 medium length, 3 short and one short and hooked; 4 shorter claws plain, medium with a few points and long claws with many points on inner edge; no small spines on parapod; anterior parapod with numerous short, medium and long claws which appear to have minute longitudinal ridges spiralling a few times towards the tip, the inner edges appear to have irregular, minute, blunt teeth.

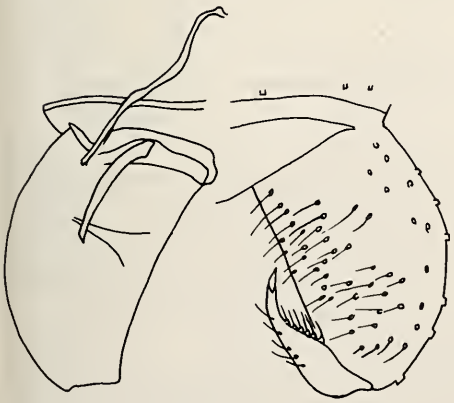
Material examined. Numerous adults were collected from Lakes Awasa and Zwai from April, 1981 to May, 1984, some at lights and some netted near the shore. Numerous larvae were collected from the same lakes from 1983 to 1985.

Comments. The male fits into the definition of the sub-genus *Holotanypus* Roback. Female: a prominent and well developed gonocoxapodeme is also pictured for *P. (P.) ruris* Roback (Roback 1971) and for *P. (P.) noctivagus* Kieffer (Chaudhuri & Debnath, 1983). Pupa: the thoracic horn is similar to that of *Procladius (H.)* sp. in Fittkau & Murray (1986). The larva falls mostly within the definition of Fittkau & Roback (1983).

Ecology. The larvae were found in the lakes on firm muddy bottom to a depth of about 8 m.

Distribution. Most of sub-Saharan Africa (Freeman, 1955).

***Procladius (Psilotanypus) shibrui*, spec. nov.**



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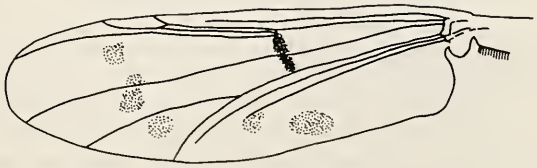

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Figs 20. & 21. *Procladius (Psilotantypus) shibrui*, spec. nov. Adult male: 20. wing; 21. hypopygium.

Adult male

Colour (unmounted specimen). A strikingly marked species. Head: frons and clypeus white, vertex (immediately post-ocular) white, posterior head brown; antennae basically brown, setae dark but conspicuously darker at the base of the last antennal segment, tip of antenna conspicuously dark. Thorax: antepronotum largely white, scutum background white, stripes dark brown, pleura mostly creamy white with dark spot below wing insertion; pre-episternum dark brown ventrally, creamy white laterally; scutellum white, postnotum dark brown. Wings (Fig. 20): very dark spot over rm, lighter spot over m-cu; the following somewhat diffuse spots – one large and one small in R 5, one spot in M, one in Cu (fork cell), one over anal vein and one posterior to this in anal cell. Halteres white. Legs: Mostly medium brown, tibia and first tarsomeres darkened at tips. Abdomen: basically dark brown but light bands anally on tergites I–VIII, hypopygium brown with very dark setae.

Head: AR 1.8, setae – clypeus 12, postorbitals about 13 in single row.

Thorax. Setae – antepronotals 2 (very small), humerals 1, dorsocentrals 7, acrostichals about 26 small and decumbant, prealars 5, supraalars 2. Wing 2.34 mm, no macrotrichia on membrane, not even a tip, row of setae on R and R_1; legs – LR I 1.5 & 1.4, LR II 1.7 & 1.7, LR III 1.5 & 1.5.

Hypopygium (Fig. 21). No setae on tergite XI, phallapodeme prominent, directed posteriorly; gonostylus with apical third bent inwards, an internal swelling with a row of contiguous setae on the edge and more ventrally, posterior margin rounded.

Adult female, pupa and larva. Unknown.

Material examined. The holotype male, slide-mounted in Canada Balsam, was collected in a parked car at the top of the mountain pass behind Addis Ababa (Gojjam Road), 1981. 4. 14. It is deposited in the Zoologische Staatssammlung, Munich, German Federal Republic.

Comments. This species differs from the only other sub-Saharan species of this subgenus, *P. (Ps.) reidi* Freeman, by the presence of spots in the wing cells; it appears also to differ from most other described species of *Psilotanypus* in this way; species of *Procladius* with marks on cells have been placed into the subgenus *Calotanypus* Roback, but this subgenus has macrotrichia on the cell membrane. The phallapodeme is rather like that illustrated for *P. (Ps.) bellus* (Loew) by Roback (1971).

Ecology. The one adult was collected in a region of small streams and swampy pools above 2500 m.

Distribution: Known only from the Ethiopian Highlands.

This species is named in honour of Dr. Shibru Tedla, Dean of the Faculty of Graduate Studies, Addis Ababa University, who instigated all my Ethiopian work.

Ablabesmyia (Ablabesmyia) dusoleili Goetghebuer

Pentaneura (Ablabesmyia) dusoleili, Freeman 1955

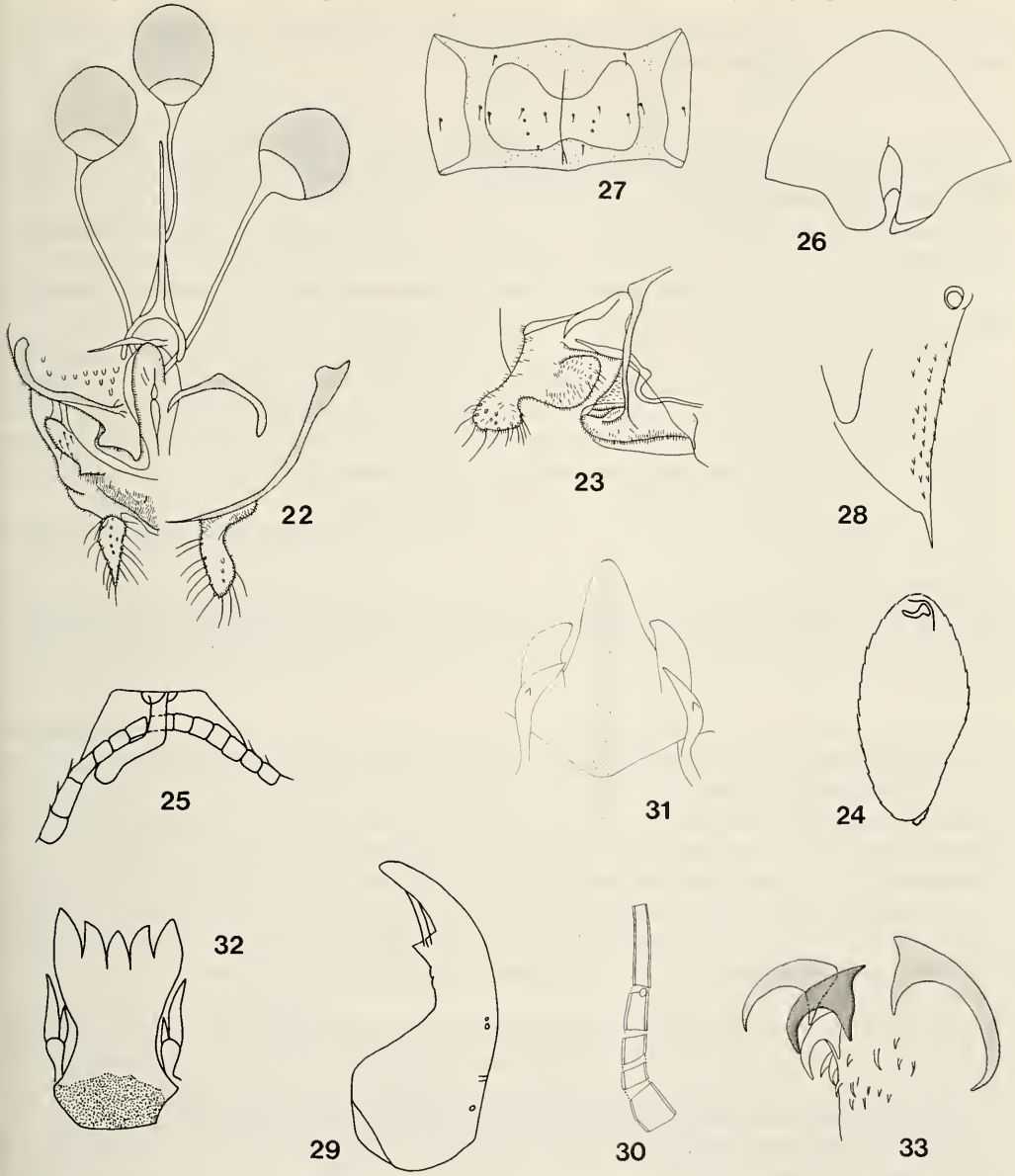
All the stages were related to one another by means of a pupa containing a pharate male with larval head capsule attached.

Adult male

These were identical to those described by Freeman (1955); the hypopygial blades, derived from the superior and inferior volsella (Saether 1980), were similar to those figured by Harrison (1978).

Wing length. 3 mm, AR 1.60–1.69, LR I 0.78, LR II 0.66–0.70, LR III 0.79.

Teeth of tibial spurs. TiI 1 + 8, TiII 1 + 6 & 1 + 6, TiIII 1 + 4 & 1 + 3 (very small); the accessory teeth are not all in the same plain as the main tooth but spiral away from it through half a turn to the end of the row. This also happens to a lesser extent in the short spurs.



Figs 22.–33. *Ablabesmyia (Ablabesmyia) dusoleili* Goetghebuer. Adult female, genitalia: 22. ventral; 23. lateral. Pupa: 24. cephalic horn; 25. aeropyle; 26. frontal apoteme; 27. tergite IV; 28. anal lobe. Larva: 29. mandible; 30. maxillary palp; 31. mentum & M–appendage; 32. ligula & paraligulas; 33. claws of posterior parapod.

Adult female

Tibial spurs. Similar to male, TiI 1 + 12, TiII 1 + 10 & 1 + 6, TiIII 1 + 5 & 1 + 3.

Genitalia (Figs 22 & 23). Gonocoxapodeme VIII fairly prominent continuing onto tongue-shaped gonapophysis VIII, notum 0.32 as long as ramus, gonotergite IX very narrow, gonocoxapodeme strongly curved, segment X constricted to each side of base of weak genital plate and with 6 macrotri-

chia per side; labia without microtrichia, seminal capsules almost spherical, mostly dark, greatest diameter almost 1.2 × length of cerci.

Pupa

Thorax. Horn (Figs 24 & 25) – 500 μm long, dark brown, ellipsoid, reticulation distinct, apical nipple small, aeropyle tube sinuate, blunt amoeboid area distally, rugose tubercle at base of horn, row of pointed tubercles near base.

Frontal apodeme (Fig. 26). Dome-shaped, lateral corners not produced into "nipples", caudal projections wide.

Wing pads. Venation rather faint, veins broad and pigmented reaching a distinct marginal band. No pigment spots or maculations.

Abdomen. Fig. 27 gives the colour pattern of abdominal tergite IV, distinctly darker areas centred on the dorsal mid-line, joined by narrow bands to lateral stripes. Mesal, segmentary brown marks, as defined by Roback (1985) are not apparent. The scar of tergite I is obvious but not darkly-pigmented. The shagreening consists of scale-like ridges (Fig. 28), seen most clearly on the distal halves of tergites I to VIII, no sharp points are discernible; smaller ridges are found also on the proximal parts of the tergites as well as on the pleura and sternites of all segments.

The setal pattern of tergite IV is shown in Fig. 27. The setae are very small. Tergite VII has 4 lateral setae and tergite VIII has five.

The anal lobe (Fig. 28) has a finely-pointed tip, the two lateral setae have adhesive sheaths, distal to these are small spines; there are no proximal spines but there are very small ridges of the shagreen arranged obliquely to the anterior-posterior direction. The genital sacs are apically rounded.

Larva

Colour. The body is yellowish and no dark spots were noted on the light-brown head capsule and the rest of the body; the procerci and their setae are darker than the rest of the body. For measurements n = 10 unless stated otherwise.

Head capsule. 1050–1087 μm, mean 1065 μm, SD 21, cephalic index 0.53–0.57, mean 0.55 (n = 5), no maculation, 2 of the 3 ventrolateral setae level with eye-spot, the third slightly posterior.

Antenna. 394–564 μm, mean 467 μm, SD 61.7, 0.44 as long as head, slightly more than 3 × the length of the mandible, AR 5.1 (mean), ring organ 0.5–0.6 of length of basal segment; Lauterborn organ very small, blade extends almost to the end of the flagellum, basal ring about 0.22 × length of blade and nearly 5 × as high as wide; style subequal to segments 3 & 4; segments 2–4 106 μm, blade 103 μm, accessory blade 94 μm (n = 1).

Mandible (Fig. 29). Basal width of apical tooth about 0.35–0.4 of length of tooth. Basal tooth large, in most of the 33 larvae examined it had a short point (45° angle), the rest were broken; ventral accessory tooth, blunt; ventrolateral setae and sensillum minusculum as in Fittkau & Roback (1983).

Maxilla (Fig. 30). Basal segment of palp divided into 4 segments, i.e. 5 segments in all.

Mentum and M-appendage (Fig. 31). As for genus but only one dorso-medial tooth on each side with an anteriorly directed point.

Ligula (Fig. 32). With five teeth, row clearly concave, apices of inner teeth outcurved.

Paraligula (Fig. 32). As in generic definition.

Pecten hypopharynx: with about 20–22 teeth per side, innermost and some other teeth unusually long.

Abdomen. Including anal tubercles, as in generic definition. No shagreen could be detected on the larval integument which appeared quite smooth. Posterior parapod with 16 claws (Fig. 33), 3 short, 3 intermediate and 10 long, one intermediate claw much darker than all the rest, but another intermediate and one moderately long claw sometimes slightly darker than the rest. Distal third of parapod bearing fine hooklets, becoming larger towards the base of the claws. A few very fine points on inner and outer margins of the long claws.

Specimens examined. Adults from Lake Zwai, 82.12.31 (at lights), Lake Langano, 83.3.14 and 83.12.11 (at lights), and the Abo-Kebena River, Addis Ababa, from September 1983–November 1985 (ET.2C and downstream), larvae and pupae from Abo-Kebena River 1984 and 1985.

Comments. This species fits well into the subgenus *Ablabesmyia* Roback.

Ecology. Although a few adults were collected at lights near lakes, no larvae were found in the lakes. Larvae and pupae were found in the torrential Abo-Kebena river, Addis Ababa, in sections where it was mildly polluted with organic waste, and where their food organisms, other chironomid larvae, were very abundant (Tesfaye Berhe, Harrison & Hynes, 1989). No larvae were found in numerous unpolluted torrential streams in the region (Harrison & Hynes, 1988).

Distribution. Widespread from the western Cape Province, South Africa, through Central Africa to Ethiopia and Egypt (Freeman, 1955).

Ablabesmyia (Ablabesmyia) rimae, spec. nov.

Ablabesmyia sp. A., Tilahun Kibret & Harrison, 1989.
Ablabesmyia sp. A., Tudorancea, Baxter & Fernando, 1989.

Larvae and adults were not directly associated but both were very abundant at Lakes Zwai and Awasa, where the material for these descriptions was collected. Adults of two other species were collected at these lakes, *A. nilotica*, a rare and larger species, and *A. dusoleili*, the immatures of which are described above.

Adult male

Colour. Head brown, palps very light; antepronotum light, mesonotum and mesosternum dark brown, mesopleura light, mesonotal stripes fused, scutellum light, postnotum dark brown; legs: femur I brown basally, lightening to tip but dark ring near tip, femurs II and III similar but lighter brown, all legs – tibia light with 3 dark rings, first close to knee, second central, third at tip, first tarsomere with two dark rings 2 to 4 with one dark ring at tip, 5 dark. Abdomen – all tergites brown but the first lighter centrally, 2–5 lighter distally, 6 & 7 conspicuously darker than the rest, hypopygium mostly dark brown but gonostyli light.

Head. AR 1.44–1.66, postorbital setae 25, in double row centrally but lateral half in single row, 36 setae on vertex, palps 4 jointed.

Thorax. Setae – antepronotals 3, dorso-centrals 19 or 20, acrostichals c. 70, humerals 9, prealars 10–11, supraalars 1.

Wings (Fig. 34). 1.6 mm long, dark patches over end of costa, over junction of R_1 and costa, over arculus through cell to costa, and over cross veins; light marbling over most of the wing as in Fig. 34.

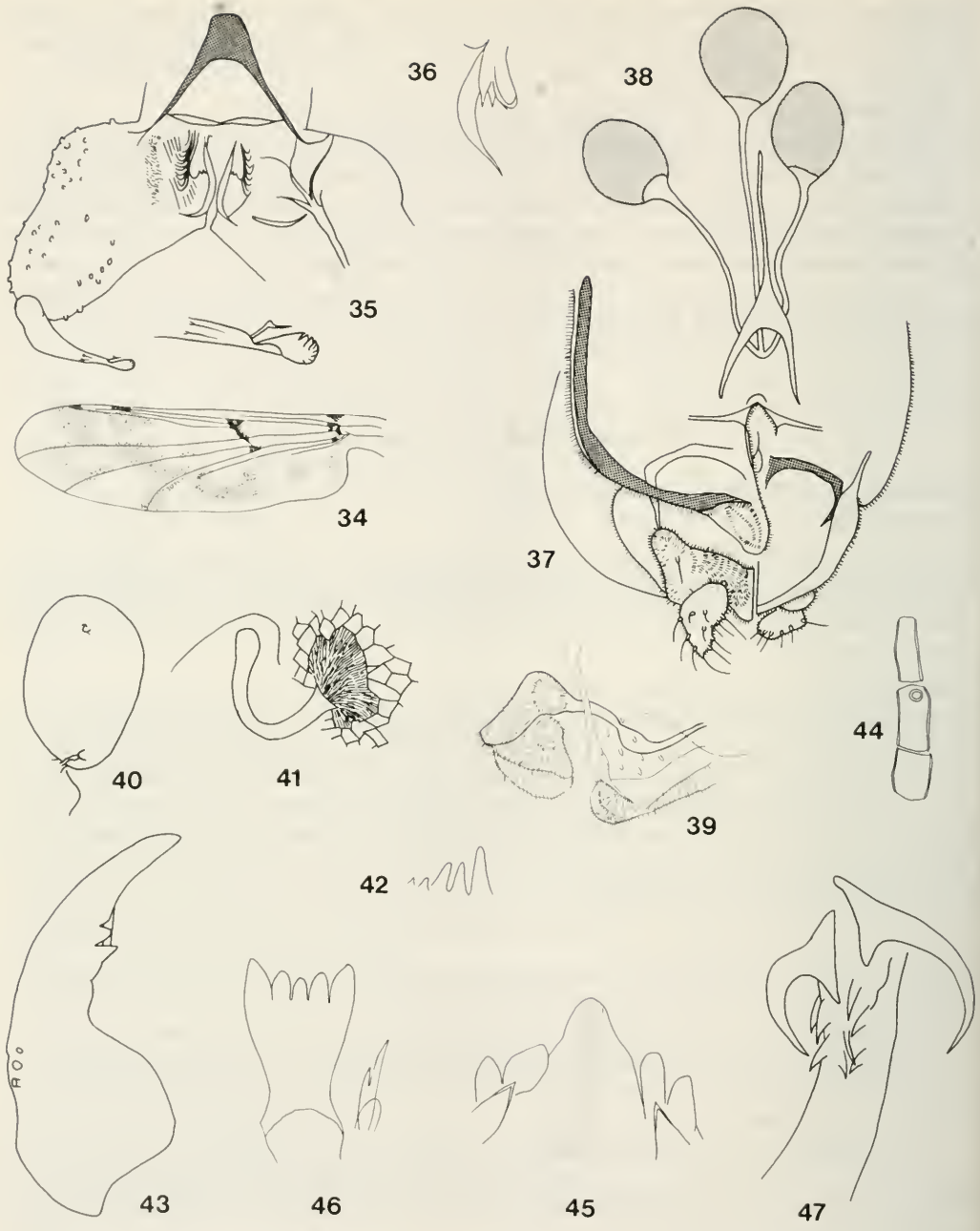
Legs. LR I 0.72–0.85, LR II 0.85, LR III 0.70; all tibia have only one spur with the following teeth: I 1 + 5, II 1 + 3, III 1 + 3.

Hypopygium (Fig. 35). Typical for the genus, blade of superior volsella (Fig. 36) long with fine point which is curved dorsally, dorsal lobe with two sharp points and one rounded point dorsally, no lateral lobe but numerous lateral filaments, those near the lobes strongly curved; preapical spur of gonostylus widened near tip.

Adult female

Colour. Generally lighter than male, head only dark in the post-ocular region, mesonotal stripes not fused, legs and wings similar to male; abdominal segments a fairly uniform light brown but the narrow tergite IX dark.

Head. Setae – postorbitals about 25, vertex 42.



Figs 34.–47. *Ablabesmyia (Ablabesmyia) rimae*, spec. nov. Adult male: 34. wing; 35. hypopygium; 36. blade. Adult female, genitalia: 37. ventral; 38. seminal capsules; 39. lateral. Pupa: 40. thoracic horn; 41. plastron tube; 42. comb teeth. Larva: 43. mandible; 44. maxillary palp; 45. mentum & M-appendage; 46. ligula and paraligula; 47. claws of posterior parapod.

Thorax. Setae – antepronotals 4, dorsocentrals 18, acrostichals about 92, humerals 13, prealars 19, supraalars 1.

Wings. 1.63 mm long, pattern as in male, tibial spurs as in male.

Genitalia (Figs 37, 38 & 39). Gonocoxapodeme VIII well developed and prominent, continuing onto base of tongue-shaped gonopophysis VIII, notum almost twice as long as ramus, gonotergite IX narrow but dark and prominent, coxosternapodeme strongly curved, segment X constricted to each side of weak postgenital plate. There is variation in the setation on segment X; of the 8 specimens examined one had one ventral seta on one side, one had one lateral seta on one side, one had one ventral socket on both sides and 5 had no setae. Labia without microtrichia; seminal capsules (Fig. 39) ovoid, most of capsule dark, greatest diameter 121–130 μm, much larger than cercus (74 μm). Fig. 39 shows the lateral view of gonopophysis VIII and segment X without setae.

Pupa

None was collected but some details of the pupa were obtained from prepupal larvae.

Thorax. Although thoracic horns (Figs 40 & 41) are rather crumpled they appear to be globular in shape, greatest diameter about 725 μm, with a distinct, fine reticulum and no rugose tubercles at the base. The basal lobe is small with spinules. The neck of the horn sac is very small, about 64 μm across (Fig. 41), and curved with no plastron plate. The comb consists of 9 or 10 long teeth and some short ones (Fig. 42) with rounded points.

Abdomen. Shagreen consists of very fine single spines, slightly curved and about 4–5 μm long, fairly densely and uniformly distributed, not in rows or groups. Lateral setae: VII 4, VIII 5, with one somewhat smaller seta, ventrally between 3 & 4 on VII.

Larva

Colour. Body and head capsule very light, basal margins of head capsule almost black and ventrobasal margin extending forwards in the shape of a short V. Procerci and setae dark, contrasting conspicuously with the rest of the body. N = 10 for measurements unless otherwise stated.

Head capsule. 563–637 μm, mean 604.26 μm, SD 31.2, cephalic index 0.44–0.56, mean 0.49, SD 0.04, two of the three ventrolateral setae usually level with eye-spot, although one may be slightly posterior, the third posterior.

Antenna. 246–269 μm, mean 256 μm SD 6.6, 0.42 as long as the head, about 3 × the length of the mandible. AR 4.1–4.5, mean 4.3, ring organ 0.7 of A1 length from the base. Lauterborn organs very small, blade extends almost to the end of the flagellum, basal ring 0.13 length of the blade and about 1.6 as high as wide, accessory blade about 0.6 from the base of ring, style subequal to antennal segments 3 + 4.

Mandible (Fig. 43). Basal width of apical tooth 0.35–0.36 length of tooth. Basal tooth large and pointed (about 30° angle), ventral accessory tooth pointed.

Maxilla (Fig. 44). Basal segment of palp divided into two segments, i.e. three segments in all.

Mentum and M-appendage (Fig. 45). As in Fittkau & Roback (1983), the two dorso-medial teeth point directly forward.

Ligula (Fig. 46). With five teeth, row clearly concave, apices of inner teeth only slightly outcurved; this is not apparent in some specimens.

Paraligula (Fig. 46). As for genus.

Pecten hypopharynx. With about 16 teeth per side, some teeth longer than others.

Abdomen. As for genus. All segments with fine shagreening, dorsally, laterally and ventrally, each shagreen unit appears as an almost straight line when viewed dorsally, but as a forward-curving spine when viewed laterally, but are elongated, forward-facing cusps, each 9 μm long. Posterior parapod with 25 claws, 9 long and 16 medium or short; no dark claws (Fig. 47). Distal one quarter of the parapod bearing a few flat hooklets in irregular, longitudinal rows, the length of the larger hooklets being about one half the width of the parapod at this point.

Specimens examined. Numerous adults from Lakes Zwai, Langano, Awasa and Abaya during the period April, 1981, to February, 1984. Holotype male slide-mounted in Canada Balsam from Lake Awasa, 1981.4.15, paratype males and females from Lakes Zwai and Awasa. Numerous larvae and prepupae were taken from Lakes Awasa and Zwai during limnological studies from 1983 to 1985. The holotype, paratypes, larval and prepupal material are deposited in the Zoologische Staatssammlung, Munich, German Federal Republic.

Comments. This species differs from all other known species by the presence of only one spur on all tibia of both sexes; apart from this, the structure of the adults conforms to that of the subgenus *Ablabesmyia* Roback. The pupal thoracic horn resembles that of *A. (Asayia) annulata* (Say) (Fittkau & Murray, 1986), specially in the structure of the subapical position and structure of the horn sac neck, but the thoracic comb tubercles and the simple shagreen spinules are unlike those of *annulata*. The larval structure fits into the range given for the genus by Fittkau & Roback (1983). There seems to be no good reason at present for erecting a new subgenus for this species which is now placed in the subgenus *Ablabesmyia*.

Ecology. This species is only known from the lakes of the Rift Valley, the larvae are found in the marginal vegetation zone and on the shallow, muddy bottom under or near this zone.

Distribution. Lakes of Ethiopian Rift Valley, hence the specific name from Latin *rima*, a rift.

Ablabesmyia (Karelia) nilotica Kieffer

Pentaneura (Ablabesmyia) nilotica, Freeman 1955.

This was a rare species and only a few adults were caught at lights near the Rift Valley lakes. No immatures were found which might belong to this species. The adults conform to the description of Freeman (1955). Additional features are:

Adult male

Head. AR 2.08 & 2.2;

Legs. LR1 tibia missing, LR2 0.74, LR3 0.83.

Hypopygium. The superior volsella is similar to Freeman's with a broad, flattened blade. Fig. 48 shows this in more detail with the small dorsal lobe not shown by Freeman.

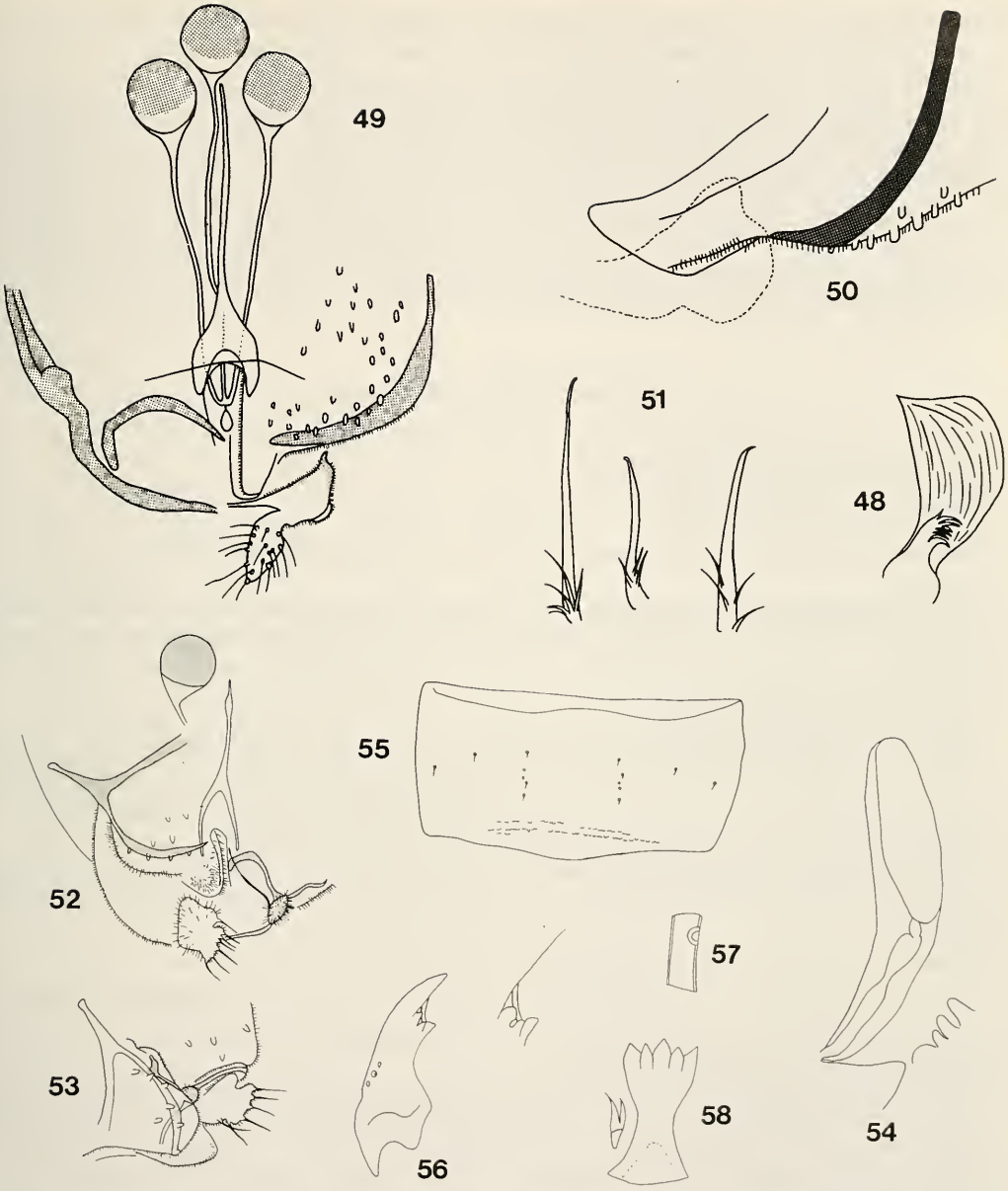
Adult female

Genitalia (Figs 49 & 50). Gonocoxapodeme well developed, continues onto base of gonopophysis VIII which is reduced and is hidden by segment X in lateral view (Fig. 50); gonotergite IX strongly chitinized but notum and ramus weakly chitinized, notum less than twice as long as ramus; coxosternapodeme strongly curved; segment X strongly chitinized, specially laterally, no setae; labia without macrotrichia, seminal capsules spherical, small, less than half as long as notum, about the same length as cerci, darker in oral two-thirds.

Specimens examined. Lake Awasa – 1 female, 81.4.15; Lake Langano, – 3 females, 83.3.14, – 1 male, 2 females, 1983.12.11. L. Abaya – 1 female, 84.2.26.

Ecology. Nothing definite is known but larvae were not found during extensive sampling of the Ethiopian Rift Valley lakes and rivers and streams. They must inhabit quiet bodies of water other than large lakes.

Distribution. Most of sub-Saharan, tropical Africa (Freeman, 1955).



Figs 48.–51. *Ablabesmyia (Karelia) nilotica* Kieffer. Adult male: 48. hypopygial blade, 51. tibial spurs. Adult female, genitalia: 49. ventral; 50. lateral; 52.–58. *Nilotanypus comatus* (Freeman). Adult female, genitalia; 52. ventral; 53. lateral. Pupa: 54. cephalic horn; 55. tergite IV. Larva: 56. mandible; 57. maxillary palp; 58. ligula & paraligula.

Comparison of the three species of *Ablabesmyia*

Adult males. *A. dusoleili* and *A. rimae* fit into Roback's (1971) subgenus *Ablabesmyia*, except that the latter has single spurs on all tarsi; this feature is not known from any other species. *A. nilotica* fits

well into Roback's (1971) subgenus *Karelia*. The males of all African *Ablabesmyia* described so far can be distinguished one from another by their wing patterns and aedeagal structure.

Adult females. Saether (1977) describes the genitalia of *A. basalis* and *A. annulata*. The structure of these three species is similar in the main features notably the strongly chitinized gonocoxapodeme VIII and the strongly curved coxosterapodeme. They resemble *A. basalis* in the reduction of gonopophysis VIII. The number of setae on segment X varies, *A. dusoleili* has about six per side, *A. rimae* none or one, and *A. nilotica* none, both *A. basalis* and *A. annulata* have setae. *A. nilotica*, which falls into Roback's subgenus *Karelia*, can be distinguished from the other two by its strongly chitinized segment X; *A. (Karelia) photophilus* (Kieffer) shows the same feature (Chaudhuri & Debnath, 1983) which suggests that this may be a useful subgeneric character.

Nilotanypus comatus (Freeman)

Pentaneura comata, Freeman 1953
Pentaneura (Pentaneura) comata, Freeman 1955
Nilotanypus comatus, Lehmann 1979.

Life stages were associated when one pharate male with a number of larvae were collected together in one spot.

Freeman's descriptions are supplemented below using a male and two females collected in Zimbabwe. The hypopygium of the pharate male from Ethiopia closely resembled that of the male from Zimbabwe.

Adult male (wing length 1.2 mm).

Thorax. A row of small tubercles on the mesonotum, just behind the head; thoracic setae – anteprontals 1, humerals 4, dorsocentrals 12, acrostichals 25, prealars in two groups, 3 + 4, supraalars 1; one tibial spur per leg (Fig. 51), spur on leg 2 smaller than others, spurs have no lateral teeth but a few small basal spines, not all in one plane; well-formed comb of 6 setae on tibia 3.

Hypopygium. 5 setae on tergite IX, long, straight setae on gonocoxite about 3.8 × length of gonocoxite; gonocoxite setae on pharate Ethiopian specimen nearly 4 × the gonocoxite length (in very long genital sac).

Adult female (small specimens, wing length 0.7–0.8 mm)

Thorax. A row of about 30 small tubercles on mesonotum behind the head; thoracic setae, antepronotals 1 or 2, humerals 5 or 6, dorsocentrals 11, acrostichals 22, prealars in two groups, 3 + 5, supraalars 1; tibial spurs and comb similar to male.

Genitalia (Fig. 52). Gonocoxapodeme VIII well developed, forming a roughly wishbone shaped structure, seen also in lateral view, Fig. 53; gonopophysis VIII well developed and tongue-shaped; gonotergite IX without setae, gonopophysis IX with notum less than twice as long as ramus; gonocoxapodeme curved; segment X with one seta per side; seminal capsules almost spherical and light brown, larger than small cerci.

An Ethiopian specimen is larger, wing length 1.4 mm; spurs, comb and genitalia are similar but there are more thoracic setae, humerals 10, dorsocentrals 17, prealars 10 + 8.

Pupa.

Very similar to the pupa described for this species by Lehmann, 1979.

Colour of exuviae yellowish, anal corners of abdominal segments II–VI not darker.

Thorax. Horn (Fig. 54) tubular but lateral view shows that the corona region is flattened or spoon-shaped, 138 μm long 29 μm wide; faint indication of surface scales in pre-corona region but no points; corona large, 83 μm, 0.6 length of horn; horn sac extends into corona region, probably with much the

same shape as corona but very flat and difficult to discern, except in lateral view. Thoracic comb of 13 tubercles with rounded points, the last 2 more pointed, the largest 2 × as high as broad.

Abdomen. Setation of tergites and spines (Fig. 55): II 4 D, no L, III 4D, 1L, IV 4D, 1L, V 4D, 2L, VI 4D, 2L, VII 4D, 1 small lateral near centre of lateral border; posterior L setae cannot be detected on tergites I–VII; tergite VIII with 5 lateral setae, nearly as long as the width of the segment; anal lobe with 2 lateral setae with mucus sheaths. Anal borders of tergites II–VII with two rows of mostly blunt spinules, some single but some in joined rows of 2 or 3; tergite VIII has a single, regular row of larger pointed, but not darker spines. Shagreen on all tergites scattered flattened, mostly blunt spinules, a miniature version of the lateral border spines on II–VII.

Genital lobes of male. Very long, 1.4 × length of main anal lobe; these accommodate the very long gonocoxite setae of adult.

Larva (n = 4)

Head capsule. Yellowish, 363–384 μm long, cephalic index about 2.0.

Antenna. 186–203 μm long, 0.53 as long as head, 4.2 × length of mandible; AR 2.4–2.7; basal segment 10.3 × as long as basal width with ring organ 0.65–0.70 from base; segment 2 6–7 × as long as basal width, tapering, distal width about two thirds proximal width; segment 3 about 0.14 as long as segment 2 and segment 4 about 0.6 as long as segment 3; style extends almost to the end of the flagellum; Lauterborn organs about 0.5 length of segment 3; blade and accessory blade about the same length and as long as flagellum.

Mandible (Fig. 56). Weakly curved, apical tooth 2.2–2.8 × as long as greatest width, basal tooth, large, point apically directed, small projection and large accessory tooth as in Fig. 56 (inset).

Maxilla. Basal segment of palp (Fig. 57) 1.8–2.7 × as long as wide.

Mentum and M-appendage. Very similar to that of *N. dubius* (Fittkau & Roback, 1983).

Ligula (Fig. 58). With 5 teeth, about 2.2 × as long as wide, middle tooth extending beyond other teeth, point of outer tooth extends outwards in some but this is not always apparent.

Paraligula (Fig. 58). About 0.4 length of ligula.

Pecten hypopharynx. With 5–6 approximately equal teeth.

Abdomen. The length of some long, curved setae equal to or greater than the width of segments 7 and 8, anal tubercles extremely long and slender, 2–3 times length of posterior parapods in preserved specimens, tip very difficult to discern; preanal setae slightly longer than parapods; procercus dark 3–3.8 × as long as broad; 16 claws of posterior parapods yellowish brown, 4 short and hooked, 5 medium length and slightly hooked, 6 long with fine points and one of medium length with a comb of points on inner margin.

Specimens examined. Pharate male and larvae from the Awash River at 750 m (ET. 39), November 1984, adult female from Weyb River (ET. 21) at 3000 m, January 1984, larvae from stream near Aposto (ET. 36) at 1680 m October 1984. Zimbabwe specimens: adult male, Inyangani Mountains, Eastern Districts, April 1962; adult females, Fishan's Kraal, lower Lundi River, April 1962.

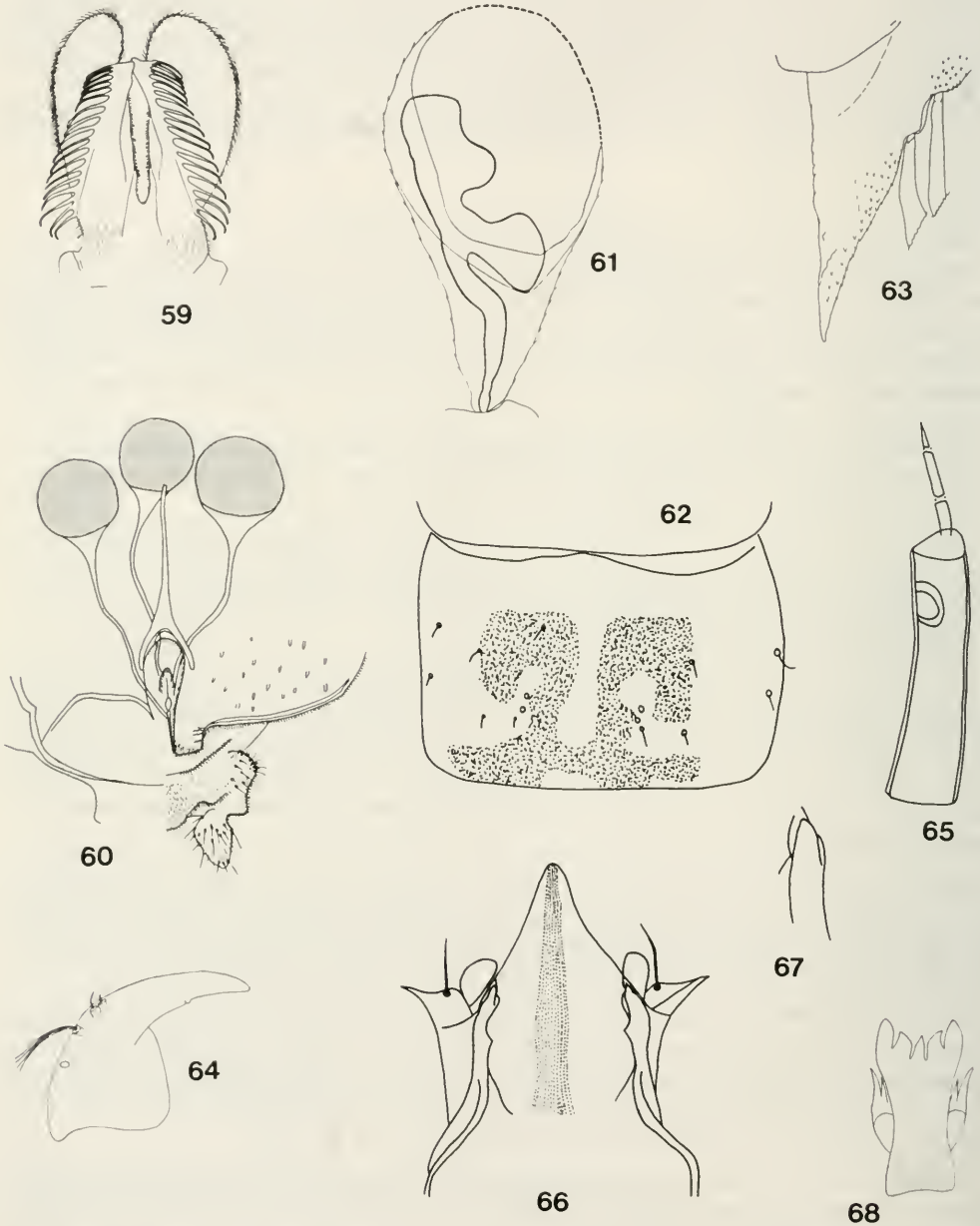
Comments. The larvae conform closely to those illustrated by Fittkau & Roback (1983) but the anal tubercles seem to be much longer. Almost identical larvae were collected in April, 1962, from the lower Lundi River, Zimbabwe, where adults were very common, including the females described above.

Lehmann's pupa differs in that the genital lobes are less than the length of the main anal lobe; his male also has a row of small tubercles on the mesonotum behind the head.

Ecology. The larvae inhabit stony torrents mainly in the lower zones or epipotamal of rivers but some adults have been found at high altitude such as the female reported here, the male from Zimbabwe and some by Freeman (1955).

Distribution. From the western Cape Province, central Africa, Nigeria, Ethiopia and Madagascar (Harrison, 1970).

All stages were correlated by finding a male pupa with clear adult wing pattern and anal lobes of the hypopygium, attached to its larval moult.



Figs 59.–68. *Conchapelopia trifascia* (Freeman). Adult male: 59. median volsella. Adult female: 60. genitalia. Pupa: 61. cephalic horn; 62. tergite IV; 63. anal lobe. Larva: 64. mandible; 65. maxillary palp; 66. mentum & M-appendage; 67. dorsomedial tooth; 68. ligula & paraligulas.

Adult male

As described by Freeman (1955). Additional details from the Ethiopian specimens: AR 1.5; wing length 3.3 mm; LR1 0.78, LR2 0.59, LR3 0.68. Spurs, Ti I 1 + 7, Ti II long 1 + 4, short 1 + 6, Ti III long 1 + 5, short 1 + 6. Abdominal colour: tergite 1 light, tergites 2–5 with dark pigment in broad, anterior bands, tergite 6, uniform, dark, tergites 7 and 8 uniform and darker than 6, hypopygium dark, median volsella as in Fig. 59.

The size of the wing, the wing pattern and abdominal colouration is similar to Freeman's type series.

Adult female

As described by Freeman (1955). In addition, the genitalia (Fig. 60) show: gonocoxapodeme VIII weak; gonopophysis VIII with end rather squared off; gonopophysis IX well developed, notum longer than ramus; gonotergite IX fairly well developed but weakly chitinized, no setae discernible: coxosternapodeme curved; segment X well developed with 11 setae per side; labia with apical microtrichia; seminal capsules more than half as long as notum, almost spherical in shape, light brown in colour, longer than cerci.

Pupa

Thorax. Horn (Fig. 61) with broad corona and small basal lobe. Thoracic comb a few, small, rounded tubercles. Thoracic integument finely tuberculate except posteriorly where knob-like tubercles form a finely rugose surface. In mature pupae the three dark stripes of the adult wing pattern can be clearly seen.

Abdomen. Lateral setae present on VII and VIII only; setation of tergite weak, setae are sometimes missing (Fig. 62). Shagreen of tergites I to VIII consists of multibranched spines with up to 20 points, these are confined to a discrete pattern (Fig. 62) and tend to collect debris. Outside the pattern, anteriorly and medianly, there are very few, scattered, small, rounded tubercles, except on I where they are fairly dense and some elongated. Posterior to the pattern on I–VIII there are fairly dense blunt tubercles which become more spine-like towards the posterior margin where they form a tight row of long, single-pointed spines. Sternites: the shagreen is of very small single-pointed spines, not arranged in a pattern. Anal lobe (Fig. 63): shagreen spines are mainly lateral.

Larva (for measurements n = 10)

Colour. Yellowish with no obvious markings, the procerci and their setae darker than the rest of the body.

Head capsule. Length 788–863 μm, mean 822 μm, SD 28, cephalic index 0.52–0.57, mean 0.54, SD 0.02, no maculations. General colour, yellowish, posterior margin medium brown, appearing dark brown in unmounted specimens.

Antenna. Length 354–384 μm, mean 364 μm, SD 11, 0.44 the length of the head and 2.5 the length of the mandible; ring organ 0.66–0.70 (mean 0.68, SD 0.02) from base of segment; blade 69–74 μm, segments 2–4 71–78 μm, length accessory blade/blade 0.88–1.0 (mean 0.93, SD 0.04), length blade/segments 2–4 0.91–0.99 (mean 0.96, SD 0.02).

Mandible (Fig. 64). Length 135–156 μm, mean 146 μm, SD 5. Seta subdentalis long but deeply recessed in a groove and often difficult to discern.

Maxilla (Fig. 65). First joint 52.6 μm, L/W 4.0–5.4, ring organ 0.76 (mean) from base, b-seta 3-segmented, longest seta about 48 μm.

Mentum an M-appendage (Figs 66 & 67). Labial vesicles rounded, not long, dorsomedial tooth as in Fig. 67.

Ligula (Fig. 68). Middle tooth/outer tooth 0.71–1.0.

Paraligula. As in Fig. 68.

Pecten hypopharynx. With about 20 teeth on either side.

Abdomen, including anal tubercles. As for genus. Some abdominal setae long, more than half the

width of the body segment. Procerci L/W 2.64–3.47 (mean 3.2, SD 0.31). Length of anal tubercles up to 218 μm with L/W 6.3 using basal width. Posterior parapods with small spines on distal fifth. Fifteen claws, 4 short, 5 long and thin and 6 intermediate; what appear to be small spines on outer and inner surface of claws are scale-like sculpturings of the surface.

Material examined. Adults from the Abo-Kebena River, March and November, 1985; pupae and larvae from all streams and rivers sampled in the Ethiopian Highlands (Harrison & Hynes, 1988).

Comments. This species is very similar to most other described species in all stages. It differs from *C. cygnus* Kieffer, the other sub-Saharan species with marked wings, as this has only one large band distal to the cross veins. The other two species known from sub-Saharan Africa, *C. longinervis* Freeman and *C. zairensis* Lehmann have plain wings. The pupa falls into the group with a corona in the thoracic horn.

Ecology. *C. trifascia* is a species of fast-running mountain streams and rivers and occurs mostly amongst stones in the current. Larger larvae appeared to be feeding mostly on small chironomid larvae.

Distribution. From the western Cape Province, South Africa, through tropical central Africa to the Ethiopian Highlands.

Paramerina ababae, spec. nov.

The adults and immatures were not associated directly but adults were bred out in the laboratory from larvae collected from the same station where the larvae described below were fairly common. Unfortunately the pupal exuviae were lost. Pupal information came from prepupal larvae.

Adult male

Head, antennae and palps. Light brown; AR 1.4, flagellomeres 6–9 swollen. Setae: postorbitals 14 in single row, 30 on clypeus.

Thorax. Pronotum brown, mentum brown, vittae darker, mesosternum brown, scutellum light brown, postnotum dark brown. Setae: antepronotals 7, humerals 10, prealars 14, dorso-centrals 27, acrostichals about 50, supraalars 2.

Legs. Light brown, not bearded, no pulvilli; LRI 0.95, LRII 0.84, LRIII 0.84, spurs (Fig. 69), teeth TiI 1+5, TiII 1+4, 1+3, TiIII 1+4, 1+3, comb on TiIII with 7 spines; claws slender and pointed. Ratio of length tarsomeres 4/5, I – 2.1, II – 1.9, III – 2.3. Large straight macrotrichia (tarsal spurs) terminal on tarsomeres 1 & 2 of leg II.

Wings (Fig. 70). Plain, all cells densely clothed with dark macrotrichia, length 2.9 mm, width 0.69 mm, costa not produced beyond R_{4+5}, apex of R_{4+5} between those of M and Cu_1, anal lobe obtuse.

Abdomen. Tergites 1–3 dark, most pigment granules in lateral and central longitudinal bands, 4–5 light, small amount of lateral pigment, 6–7 dark, as 1–3, 8 very dark.

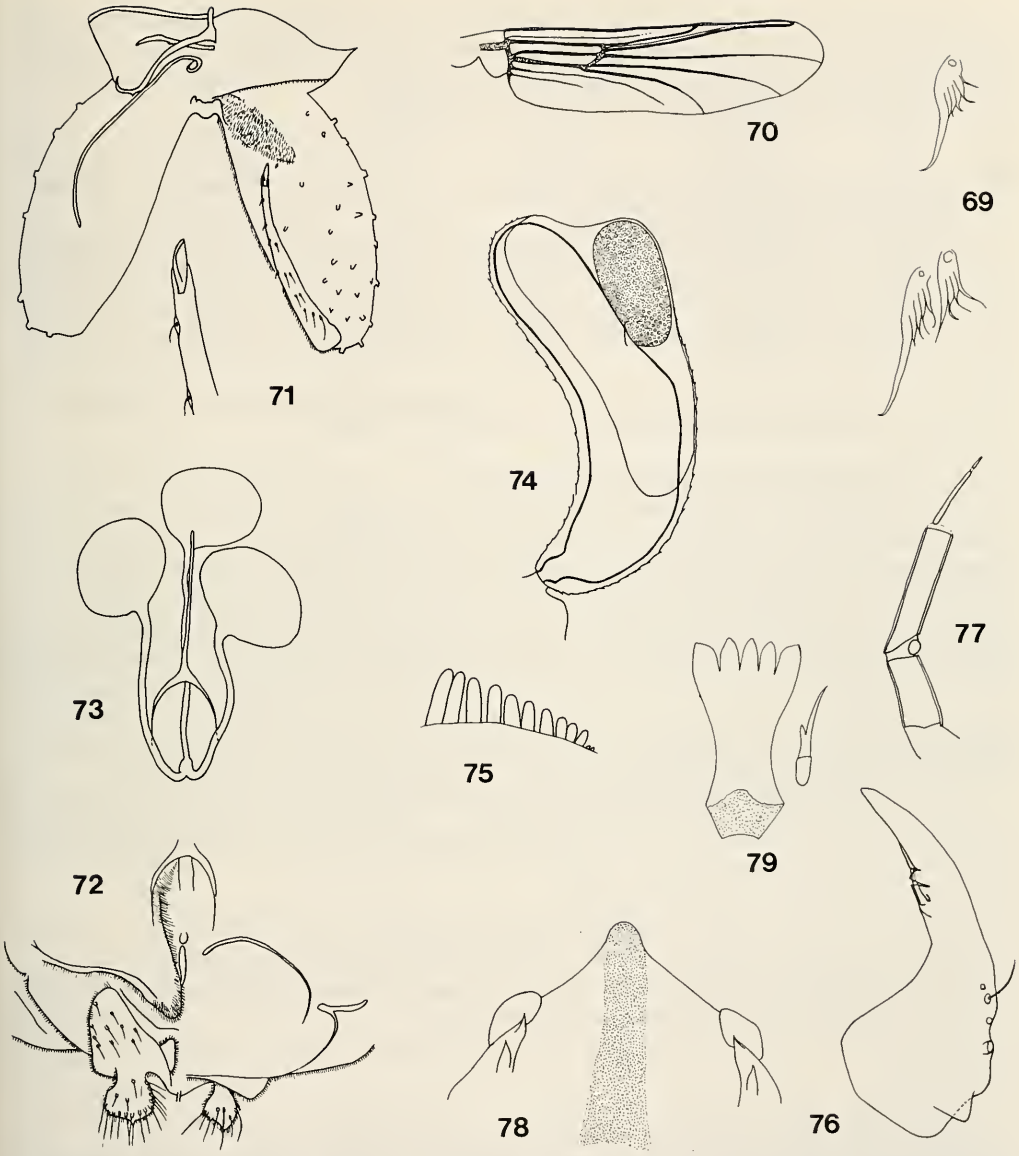
Hypopygium (Fig. 71). Light, 9T with no setae, gonocoxite 218 μm long, 94 μm broad, 2.3 × long as broad, gonostylus 163 μm long, 0.75 length of gonocoxite; distinct basi-dorsal lobe on gonocoxite; setae on gonostylus small, not longer than the basal width of the gonostylus.

Adult female

Colour obtained from unmounted specimen.

Head, antennae and palps. Light brown; 12 flagellomeres; Setae: 16 postorbitals, central 5 in single row, the rest in an irregular, double row; about 32 on clypeus.

Thorax. Pronotum and mesonotum brown, vittae darker, mesosternum brown, scutellum light brown, pronotum dark brown with thin, light medial stripe; setae: antepronotals 6, humerals 10, prealars 37, dorsocentrals 62, acrostichals about 58, supraalars 2.



Figs 69.–79. *Paramerina ababae*, spec. nov. Adult male: 69. tibial spurs of legs 1 & 2; 70. wing; 71. hypopygium. Adult female: 72. genitalia; 73. seminal capsules. Pupa: 74. cephalic horn; 75. comb. Larva: 76. mandible; 77. maxillary palp; 78. mentum & M-appendage; 79. ligula & paraligula.

Legs. Brown, spurs and comb as in the male, LRI 0.75, LRII 0.93, LRIII 0.71.

Wings. Similar to male but broader, length 2.88 mm, width 0.91 mm, costa not extending beyond R_{4+5}.

Abdomen. Tergite 1 centre bare of macrotrichia and with light, dark lateral patches with black "scars". Tergites 2 and 3 mostly dark, tergite 4 light, tergites 5 and 6 dark, tergite 7 slightly lighter than 5 and 6, tergite 8 light, genitalia light.

Genitalia (Figs 72 & 73). Similar to generic description; gonocoxapodeme VIII poorly developed, gonopophysis VIII tongue-shaped, gonopophysis IX weak, notum longer than ramus, gonotergite IX fairly well-developed, coxosternapodeme weak and curved, labia without microtrichia; seminal capsules (Fig. 73) 92 μm (maximum) (0.8× notum); cerci 34 μm long.

Pupa

No pupae were found but a few prepupal larvae were dissected for thoracic horns. Some abdominal features were visible through larval integument.

Cephalothorax. Horn (Fig. 74): 292 μm long, elongate but widened distally to accommodate large plastron plate with greatest diameter 101 μm, 0.42 corona length; external membrane covered with scales with no spines, corona large 241 μm long, 0.83 horn length; dorsal lobe rounded. Comb (Fig. 75) composed of tubercles with rounded tips, total number could not be discerned but was at least 12.

Abdomen. Shagreen on tergites of short sharp spines, arranged singly on anterior half of tergite but in rows of 2 or 3 on posterior half. Lateral setae – 4 on VII, 5 on VIII.

Larva (for measurements n = 7, unless otherwise stated)

Colour. The body is yellowish with no dark spots on head capsule or on the rest of the body; head capsule yellowish with postoccipital margin dark brown to blackish.

Head capsule. All specimens had been mounted before being identified, so only one width measurement was considered reliable. Length 787–912 μm, mean 855 μm, SD 46, cephalic index c. 0.5.

Antenna. 403–472 μm, mean 437, SD 22, 0.5 as long as the head, 3.3 length of mandible. AR 3.5 (mean); basal segment 14.3 as long as basal width with ring organ at 0.62 of length (mean), segment 2 15× as long as wide, segment 3 5.3× as long as wide, last segment 0.63 of segment 3. Style extending to about the middle of last segment, Lauterborn organs blunt apically extending to ⅔ of segment 3. Blade slightly shorter than segments 2–4, accessory blade shorter than blade by length of segments 3 and 4; basal ring of blade 2.8× as high as wide. (For flagellar measurements n = 1).

Mandible (Fig. 76). Basal width of apical tooth 0.31–0.5 length of tooth (mostly about 0.5); basal tooth small and acute, two-lobed with the smaller proximal lobe bearing the seta subdentalis; accessory tooth as large as basal tooth; inner margin of apical tooth overlying seta subdentalis. Seta 1 & 3 reduced, limited to pit, seta 2 longer and simple.

Maxilla (Fig. 77). Basal segment of palp 2-segmented, 4.9–5.5 as long as wide (mean 5.2), distinct ring organ between segments, b seta 2-segmented, about 0.44 length of basal segment.

Mentum and M-appendage (Fig. 78). As in generic description but overlapping points on strongly chitinized portion of base of M-appendage sharp not blunt.

Ligula (Fig. 79). As in generic description but teeth in straight or slightly convex line; all teeth uniformly dark.

Paraligula (Fig. 79). As in generic description.

Pecten hypopharynx. 13 or 14 teeth with larger towards the middle.

Abdomen. Anal tubercles long and tapering, about 0.5 as long as posterior parapods. Procercus dark, 2.9–3.3 as long as wide with 7 dark setae. 16 claws all yellowish, simple, surface covered with minute scales which give the impression of minute points on inner and outer margins; distal third of parapod bearing fine hooklets but on the ventral surface only.

Material examined. Adults – holotype male (March 1985) and paratype female (March 1985) bred from larvae from the Abo-Kebena River, Addis Ababa (ET. 2C and below) in the laboratory; numerous larvae and a few prepupae from the Abo-Kebena R. collected during 1985, and larvae from the Chancho Stream (ET. 5), October 1983.

Tab. 1. Colour of male abdominal tergites of plain-winged *Paramerina* spp. from sub-Saharan Africa.

Tergites	*P. vaillanti* Fittkau	*P. longipes* Freeman	*P. edwardsi* Freeman	*P. fittkaui* Lehmann	*P. ababae* sp. nov.
I	light brown	light	dark*	brownish	dark
II	half dark	dark	dark*	brownish	dark
III	half dark	dark	dark*	brownish	dark
IV	half dark	light	dark*	yellowish	light
V	half dark	dark	dark*	yellowish	light
VI	dark	dark	dark	brownish	dark
VII	dark	dark	dark	?	dark
VIII	dark	dark	dark	brownish	dark
IX	dark	light	light	yellowish	light

* paler colour spreading obscurely from incisures.

Comments: the male abdominal colour patterns of all the plain-winged species of *Paramerina* so far reported from sub-Saharan Africa are given in Tab. 1. *P. ababae* resembles *P. fittkaui* in the abdominal colour pattern but differs from it in the following features (*P. fittkaui* in brackets): AR 1.9 (1.4), coxa not produced (coxa produced), gonocoxite length 218 μm (144 μm), gonocoxite length/width 2. 3 (2.1), setae on gonostylus not longer than its basal width (these setae longer than this basal width), pupal horn expanded apically, horn sac apically blunt (horn not expanded apically, horn sac apically pointed), greatest diameter of plastron plate/length of horn 0.35 (0.22). (Measurements for *P. fittkaui* from figures in Lehmann, 1981).

Ecology. All larvae were found in stony torrents in stream above 2000 m altitude. They were more common in the slightly polluted but cool Abo tributary of the Kebena River where, with the other Tanypodinae, they must have benefited from the dense community of chironomid larvae.

Distribution. Known only from the Ethiopian Highlands.

Larsia africana Lehmann

One male was found with damaged wings; it appears to be close enough to *L. africana* to be included in this species.

Adult male

Basic colour yellowish.

Head. AR 1.33, postocular setae uniserial.

Thorax. Vitae light brown, legs yellowish, tarsi missing, spurs dark and lyrate, spur I with 7 lateral teeth, spurs II with 6 and 5 lateral teeth and spurs III with 6 and 5 lateral teeth; comb on Ti III not developed; no pulvilli. Wings damaged but no sign of markings, costa missing on both wings. Abdominal tergites: 1 light, 2–8 dark, 2–4 with dark anterior bands, others more uniform, pattern as for *L. africana*.

Hypopygium. Dark, 9T with no setae, gonocoxite simple 174 μm long, 2.5 times as long as broad, gonostylus basally enlarged, 133 μm long, apodemes very light, apical spine small.

Material examined. 1 adult male found drowned in the Kosso River, just beyond Debre Birhan, (ET. 17) 12 Jan. 1984.

Comments. This specimen is closer to *L. uniformis* (Goetghebuer) in its colouration, but differences in colouration, size and proportions between the two species are not great. I have placed it in *afri-*

cana because of the lack of setae in 9T, a feature so far unique to this species. Roback's (1971) definition of *Larsia* will have to be broadened slightly to include this species: "9T with 2–9 fine setae" has to be changed to: "9T with 0–9 setae."

Ecology. Lehmann's specimens came from a stream at 1800 m; this specimen from a torrential stream at 2900 m. A few *Larsia* larvae were found in other Ethiopian mountain streams but could not be associated with this adult.

Distribution. Kivu district, eastern Zaire (Lehmann, 1979) and the Ethiopian Highlands.

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