

The composition of *Dabulamanzia*, a new genus of Afrotropical Baetidae (Ephemeroptera), with descriptions of two new species

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SUMMARY

Dabulamanzia LUGO-ORTIZ and McCAFFERTY (Ephemeroptera : Baetidae), n. gen., is erected for certain new species and some of the species previously assigned to the *tarsale* group of *Afroptilum* GILLIES, including *D. babaora* (WUILLOT), n. comb., *D. indusii* (CRASS), n. comb. (designated as the type species), *D. media* (CRASS), n. comb., and *D. tarsale* (GILLIES), n. comb. *Dabulamanzia fica* LUGO-ORTIZ and McCAFFERTY, n. sp., and *D. helenae* LUGO-ORTIZ and McCAFFERTY, n. sp., are described based on larvae collected from northeastern South Africa. Larvae of *Dabulamanzia* are distinguished by a bulbous labial palp segment 3, a right mandible with incisors united for about two thirds of their length, and a small proximal arc of setae on the tibiae. Adults are distinguished by hindwings with a hooked costal process in the basal third and male genital forceps with a small, acute basomedial projection on segment 2 and with an elongate and ellipsoidal segment 3.

Keywords : Ephemeroptera, Baetidae, *Dabulamanzia*, new genus, new species, Africa.

RÉSUMÉ

La composition spécifique de *Dabulamanzia*, un genre nouveau de Baetidae (Afrotropical (Ephemeroptera), avec la description de deux espèces nouvelles

Dabulamanzia LUGO-ORTIZ et McCAFFERTY (Ephemeroptera : Baetidae), n. gen., est érigée pour deux espèces nouvelles et pour quelques espèces antérieurement assignées au groupe *tarsale* d'*Afroptilum* GILLIES, incluant *D. babaora* (WUILLOT), n. comb., *D. indusii* (CRASS), n. comb. (désignée comme espèce-type), *D. media* (CRASS), n. comb., et *D. tarsale* (GILLIES), n. comb. Les descriptions de *Dabulamanzia fica* LUGO-ORTIZ et McCAFFERTY, n. sp., et de *D. helenae* LUGO-ORTIZ et McCAFFERTY, n. sp., sont basées sur des larves récoltées en Afrique du Sud septentrionale et orientale. Les larves de *Dabulamanzia* se distinguent par : un segment 3 bulbeux sur le palpe labial, une mandibule droite avec des incisives fusionnées sur à peu près les deux tiers de leur longueur, et un petit arc proximal de soies sur les tibias. Les adultes sont caractérisés par des ailes postérieures portant sur le tiers basal un processus costal en forme de crochet, et, pour les mâles, par une petite protubérance aiguë, médiobasale sur le segment 2, ainsi qu'un segment 3 allongé et ellipsoïdal.

Mots clés : Ephemeroptera, Baetidae, *Dabulamanzia*, genre nouveau, espèces nouvelles, Afrique.

INTRODUCTION

GILLIES (1990) established the genus *Afroptilum* (Ephemeroptera : Baetidae) for all African species previously assigned to *Centroptilum* EATON (1869). GILLIES (1990) included two subgenera in *Afroptilum* : *Afroptilum* s.s. and *Afroptiloides* GILLIES. He considered *Afroptilum* s.s. to contain four groups : *dimorphicum*, *sudafricanum*, *sudanense*, and *tarsale*. The genus, as it was defined, however, is polyphyletic because it includes several different evolutionary lineages (McCAFFERTY and de MOOR 1995). Recent studies have begun to sort out and recognize those lineages [e. g., WUILLOT and GILLIES (1994), LUGO-ORTIZ and McCAFFERTY (1996b), BARBER-JAMES and McCAFFERTY (in manuscript)]. *Afroptiloides* was synony-

mized with *Acanthiops* WALTZ and McCAFFERTY (1987a) by McCAFFERTY and de MOOR (1995), and the rationale for that synonymy was elaborated by BARBER-JAMES and McCAFFERTY (in manuscript).

As part of our comprehensive systematic study of African baetids, we have found that certain new species from South Africa discovered by one of us (WPM) along with several species assigned to the *tarsale* group of *Afroptilum* s.s. by GILLIES (1990) and WUILLOT and GILLIES (1993) constitute a new genus distinct from *Afroptilum* s.s. and other groups previously placed therein. Herein we describe the new genus and new species and review previously described species. All materials studied are housed in the Purdue Entomological Research Collection, West Lafayette,

Indiana, except for some paratypes that we deposit in the Albany Museum, Grahamstown, South Africa.

RESULTS

1. *Dabulamanzia* LUGO-ORTIZ and McCAFFERTY, n. gen.

— Description

Larva

Head : Antennal scapes and pedicels bare. Frontal keel absent. Labrum (Figs. 1, 9) basally broad, with deep or shallow anteromedian emargination. Hypopharynx (Fig. 10) with distolaterally expanded superlinguae, lightly sclerotized basally. Left mandible (Figs. 2, 11) with incisors fused ; prostheca apically denticulate ; tuft of setae between prostheca and mola small or absent. Right mandible (Figs. 3, 12) with incisors united for nearly two-thirds of length ; prostheca single or bifid ; tuft of setae between prostheca and mola and at base of mola present. Maxillae (Fig. 13) with two-segmented palps, subequal to, or extending beyond, galealaciniae ; palp segment 1 shorter than segment 2. Labium (Fig. 14) with three-segmented palps ; palp segment 1 subequal in length to segments 2 and 3 combined ; palp segments 2 and 3 subequal ; palp segment 3 bulbous ; suture between palp segments 2 and 3 almost inconspicuous, giving appearance of being fused ; glossae subequal to paraglossae, basally broad, apically narrow ; paraglossae somewhat longer than glossae, basally broad, apically narrow.

Thorax : Legs (Fig. 15) without villopore ; dorsal and ventral margins of femora subparallel ; distal end of femora round ; small proximal arc of long, fine, simple setae present on tibiae ; tarsal claws (Figs. 4, 16) somewhat elongate, with variable denticulation. Hindwingpads present.

Abdomen : Terga (Figs. 5, 18) with scale bases over entire surface, and triangular spination on posterior margin. Gills (Figs. 6, 7, 19, 20) on abdominal segments 1-7, plate-like, held dorsolaterally, and anterodistally serrate. Paraprocts (Figs. 8, 21) with variable marginal spination. Three caudal filaments present ; terminal filament subequal to cerci.

Adult

Head : Male turbinate eyes ellipsoidal, well separated.

Thorax : Male forelegs with tibiae 1.5-1.75x length of femora. Forewings (CRASS 1947 : Fig. 22d ; GILLIES 1990 : Fig. 45 ; WUILLOT 1993 : Fig. 25) with single marginal intercalaries. Hindwings (CRASS 1947 : Figs. 22b, e ; GILLIES 1990 : Fig. 46 ; WUILLOT and GILLIES 1993 : Figs. 26, 27) somewhat elongate, usually with three longitudinal veins not reaching margin, and with hooked costal process in basal third.

Abdomen : Male genitalia (GILLIES 1990 : Fig. 47 ; WUILLOT and GILLIES 1993 : Fig. 29) with forceps segment 2 with small, acute basomedial projection ; segment 3 elongate and ellipsoidal.

— Etymology

Dabulamanzi literally means «the one who conquers the waters» in Zulu. It was the name of a legendary Zulu general. The name has been Latinized with a feminine ending.

— Type Species

Centroptilum indusii CRASS 1947 : 83.

— Included Species

Dabulamanzia babaora (WUILLOT), n. comb. ; *D. fica* LUGO-ORTIZ and McCAFFERTY, n. sp. ; *D. helenae* LUGO-ORTIZ and McCAFFERTY, n. sp. ; *D. indusii* (CRASS), n. comb. ; *D. media* (CRASS), n. comb. ; *D. tarsale* (GILLIES), n. comb.

— Distribution

Guinea ; South Africa : Kwazulu-Natal, Mpumalanga, Northern Province ; Tanzania.

— Diagnosis and discussion

Larvae of *Dabulamanzia* are distinguished by the incisors of the right mandible being united for nearly two-thirds of their length (Figs. 3, 12), the distinctive bulbous segment 3 of the labial palps (Fig. 14), and the small proximal arc of long, fine, simple setae on the tibiae (Fig. 15). Male adults are distinguished by the somewhat elongate hindwings that have a hooked costal process in the basal third (CRASS 1947 : Figs. 22b, e ; GILLIES 1990 : Fig. 46 ; WUILLOT and GILLIES 1993 : Figs. 26, 27) and by the genital forceps that have a small, acute basomedial projection on segment 2 and an elongate, ellipsoidal segment 3 (GILLIES 1990 : Fig. 47 ; WUILLOT and GILLIES 1993 : Fig. 29).

GILLIES (1990), in establishing the *tarsale* group, indicated that it differed from the other groups of *Afroptilum* in having relatively small hindwings with one costal process and variable labial palps. GILLIES (1990) did not provide a more detailed characterization of the group, and the wide range of morphological differences shown by the species included within this grouping (see also WUILLOT and GILLIES 1993), particularly in the larval stage, is indicative of its polyphyletic nature. LUGO-ORTIZ and McCAFFERTY (1996b), for example, recently showed that four of the species assigned to the *tarsale* group belonged to another new genus distinct from the type of *Afroptilum* as well as from the *tarsale* group of species, and indicated that it was possibly related to the pantropical genus *Cloeodes* TRAVER (1938).

Our primary criterion for establishing *Dabulamanzia* has been its distinctiveness with respect to *A. sudafricanum* (LESTAGE) (1924), the type of *Afroptilum* (GILLIES 1990). We consider the bulbous segment 3 of the labial palps (Fig. 14) and the small basomedial projection of segment 2 of the male genital forceps (GILLIES 1990 : Fig. 47 ; WUILLOT and GILLIES 1993 : Fig. 29) to be defining autapomorphies for *Dabulamanzia*. Other characteristics (see above), although of diagnostic value when considered in combination, are of doubtful phylogenetic significance because they are subject to considerable homoplasy within Baetidae.

Phylogenetic relationships of *Dabulamanzia* cannot be ascertained until more comparative data on Southern Hemisphere Baetidae are available. The bulbous segment 3 of the labial palps is somewhat similar to that of *Aturbina* LUGO-ORTIZ and McCAFFERTY (1996a : Fig. 6). However, *Aturbina* has other autapomorphies, including the loss of the turbinate portion of the eyes in male adults (LUGO-ORTIZ and McCAFFERTY 1996a : Fig. 12) and reduced genital for-

ceps (LUGO-ORTIZ and McCAFFERTY 1996a : Fig. 17), that clearly set it apart within Baetidae. The proximal arc of setae in the larval tibiae possibly indicates a relationship between *Dabulamanzia* and the *Cloeodes* complex (see WALTZ and McCAFFERTY 1987b) ; however, known adults of the *Cloeodes* complex differ from those of *Dabulamanzia* in having forewings with double marginal intercalaries in most interspaces.

2. *Dabulamanzia babaora* (WUILLOT), n. comb.

Afroptilum babaorum WUILLOT, in WUILLOT and GILLIES 1993 : 274.

— Discussion

Wuillot (WUILLOT and GILLIES 1993) described this species based on larvae and male and female adults from Guinea. The shape of segment 3 of the labial palps (WUILLOT and GILLIES 1993 : Fig. 33), the cleft incisors of the right mandible (WUILLOT and GILLIES 1993 : Fig. 31), the hooked costal process of the hindwings (WUILLOT and GILLIES 1993 : Figs. 26, 27), and the acute basomedial process of the male genital forceps (WUILLOT and GILLIES 1993 : Fig. 29) agree with the concept of *Dabulamanzia*.

Dabulamanzia babaora is similar to *D. helenae* and *D. media* (see below) in the larval stage, but it is clearly distinguished from those two species by its abdominal coloration (WUILLOT and GILLIES 1993 : Figs. 37, 38). Adults are distinguished from other known adults of *Dabulamanzia* by their abdominal coloration (WUILLOT and GILLIES 1993 : Fig. 28), and male adults by the relatively short segment 3 of the genital forceps (WUILLOT and GILLIES 1993 : Fig. 29).

3. *Dabulamanzia fica* LUGO-ORTIZ and McCAFFERTY, n. sp.

— Description

Larva

Body : Length 3.8-4.4 mm. General coloration medium brown.

Head : Coloration medium brown, with no distinct markings. Antennae nearly 2.5x length of head capsule. Labrum (Fig. 1) appearing round, not markedly narrowed apically, with submedial pair of long, simple setae and four to five long, simple setae submarginally. Hypopharynx similar to Fig 10. Left mandible (Fig. 2) incisors with eight denticles. Right mandible (Fig. 3) outer incisors with five denticles, medial incisors with three denticles ; prosthema large, bifid. Maxillae similar to Figure 13. Labium similar to Figure 14.

Thorax : Coloration medium brown. Legs (similar to Fig. 15) coloration cream ; femora with six to eight long, simple setae dorsally and scattered small, stout, simple setae ventrally ; tibiae bare dorsally and with eight to ten small, stout, simple setae ventrally ; tarsi with fine, simple setae ventrally and 12-14 small, stout, simple setae ventrally ; tarsal claws (Fig. 4) with eight to nine somewhat blunt denticles.

Abdomen : Coloration medium brown. Terga 1-7 and 9-10 medium brown ; tergum 8 cream to light brown. Terga (Fig. 5) with elongate, fine, simple marginal setae and spines nearly 1.5x longer than basal width. Gills (Figs. 6, 7) as long as one and one-half to two abdominal segments combined, well tracheated, lightly sclerotized anteriorly and posterior-

ly, with conspicuous marginal serration. Paraprocts (Fig. 8) with 11-12 sharp marginal spines, increasing in length distally, and scale bases and scattered fine, simple setae on surface. Caudal filaments coloration cream, medium brown every two or three intersegments ; length : 1.6-2.0 mm.

Adult

Unknown.

— Material examined

Holotype : Larva, South Africa, Northern Province, Kruger Natl. Park, Olifants R, 15 km from blacktop rd, Fig Tree Site, X-29-1990, W. P. and N. McCafferty. *Paratypes* : larva, same data as holotype ; larva, Mpumalanga Province, Sabie R at Lisbon Estates, X-27-1990, W. P. and N. McCafferty [mouthparts, forelegs, tergum 4, gills 4, and paraproct mounted on slide (medium : Euparal)] ; larva, Sabie R at Molondozi, X-23-1990, W. P. and N. McCafferty [mouthparts, forelegs, and paraproct mounted on slide (medium : Euparal)] ; two larvae, same locality (deposited in the Albany Museum, Grahamstown, South Africa). *Other material* : Three larvae, South Africa, Mpumalanga Province, Kruger Natl. Park, Sabie R at Molondozi, X-23-1990, W. P. and N. McCafferty.

— Etymology

This specific epithet is derived from the generic name of fig trees, *Ficus*. It is an allusion to the type locality, «Fig Tree Site.»

— Discussion

Larvae of *D. fica* are distinguished from other larvae of *Dabulamanzia* by the rounded labrum with elongate submarginal setae (Fig. 1), the small tuft of setae between the prosthema and mola of the left mandible (Fig. 2), the generally medium brown abdomen with no distinctive markings, the well tracheated and lightly marginally sclerotized gills (Fig. 6), and the paraprocts with scale bases over the entire surface and sharp marginal spination (Fig. 8).

4. *Dabulamanzia helenae* LUGO-ORTIZ and McCAFFERTY, n. sp.

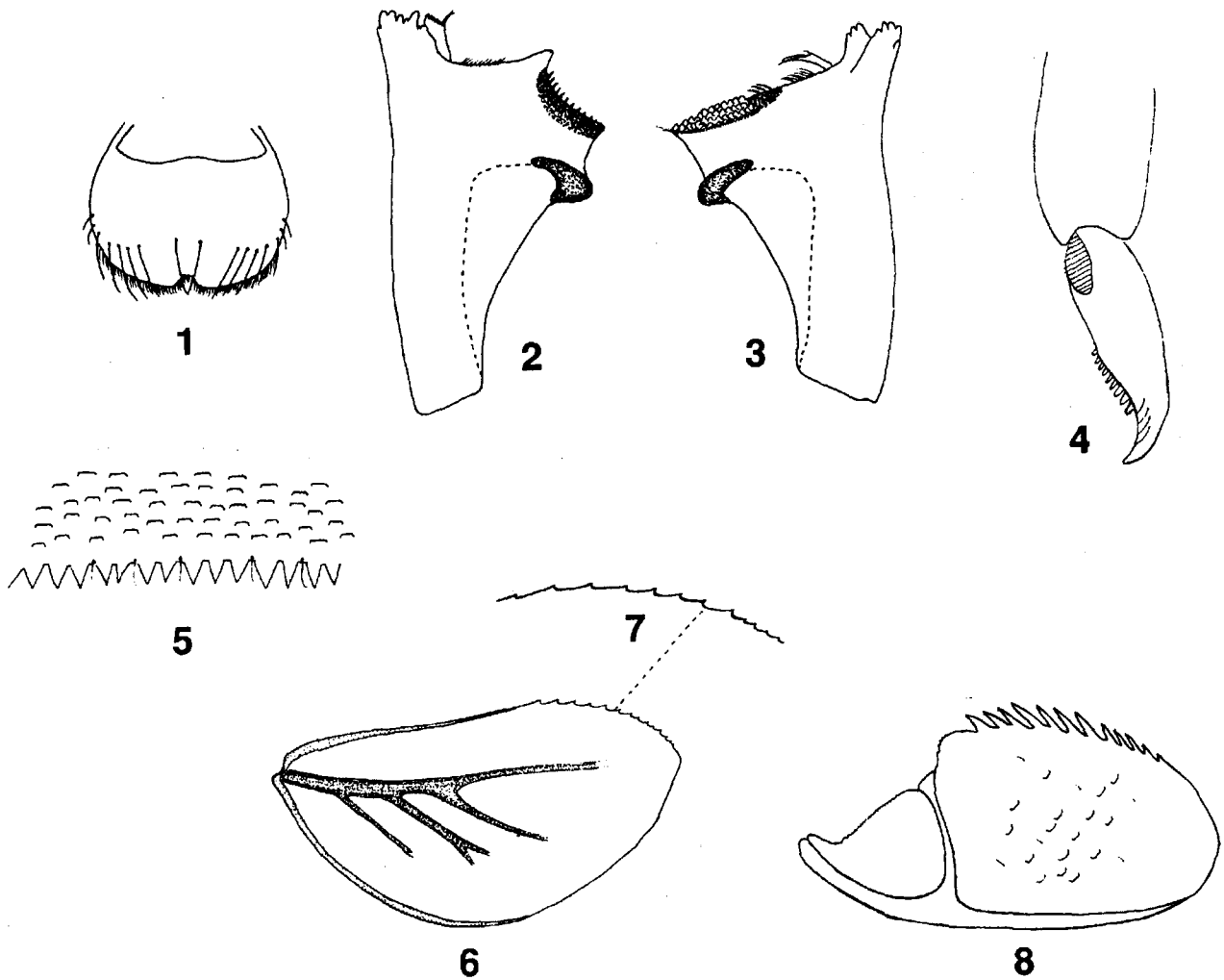
— Description

Larva

Body : Length 4.8-6.2 mm. General coloration medium brown and cream.

Head : Coloration medium brown, with no distinct markings. Antennae nearly 2.5x length of head capsule. Labrum (Fig. 9) somewhat narrow apically, with submedial pair of long, simple setae and three to four long, simple setae submarginally. Hypopharynx as in Fig 10. Left mandible (Fig. 11) incisors with seven denticles. Right mandible (Fig. 12) outer incisors with five denticles, medial incisors with three denticles ; prosthema small, single, apically setose. Maxillae (Fig. 13) with four sharp denticles on galealaciniae ; four short, simple setae on medial hump. Labium as in Figure 14.

Thorax : Coloration medium brown and cream. Legs (Fig. 15) coloration cream ; femora with six to eight long, simple setae dorsally and scattered small, stout, simple setae ventrally ; tibiae bare dorsally and with eight to ten small, stout, simple setae ventrally ; tarsi with fine, simple setae and 12-14 small, stout, simple setae ventrally ; tarsal claws (Fig. 16) with 13-14 sharp, slender denticles.



Figs. 1-8. *Dabulamanzia fica* LUGO-ORTIZ and McCafferty, n. sp.

Fig. 1 : Labrum (dorsal). Fig. 2 : Left mandible. Fig. 3 : Right mandible. Fig. 4 : Tarsal claw. Fig. 5 : Detail of tergal surface. Fig. 6 : Gill 4. Fig. 7 : Detail of gill margin. Fig. 8 : Paraproct.

Fig. 1 à 8. *Dabulamanzia fica* LUGO-ORTIZ et McCafferty, n. sp.

Fig. 1 : Labre (vue dorsale). Fig. 2 : Mandibule gauche. Fig. 3 : Mandibule droite. Fig. 4 : Griffes tarsales. Fig. 5 : Détail de la surface tergale. Fig. 6 : 4e branchie. Fig. 7 : Détail du bord branchial. Fig. 8 : Paraproct.

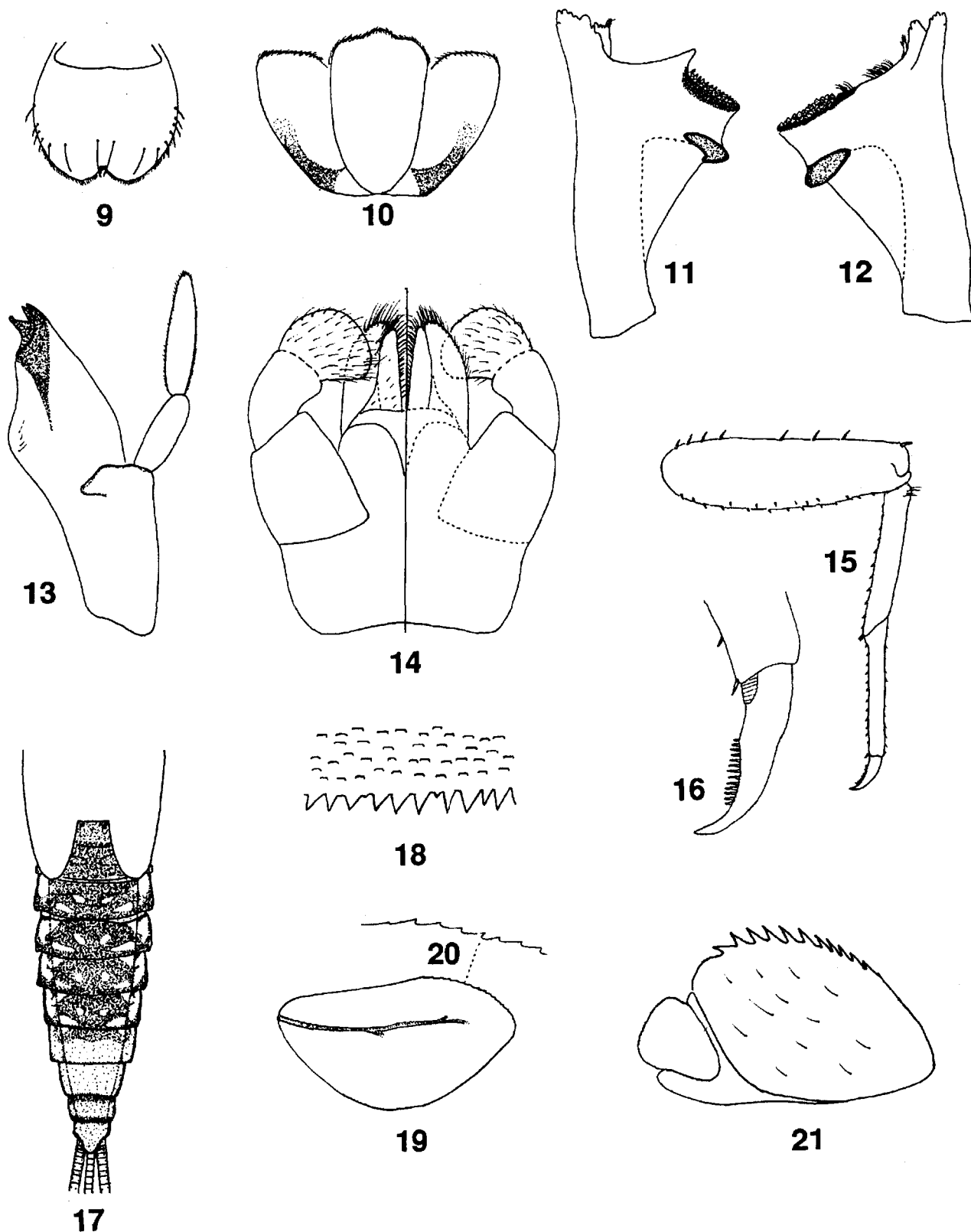
Abdomen (Fig. 17) : Coloration cream to medium brown. Tergum 1 cream to pale medium brown ; tergum 2 with faint submedial oblong markings in anterior half ; terga 3-6 with cream submedial round markings in anterior half and sublateral elongate markings in posterior half, anterolaterally with variable whitish to cream markings ; tergum 7 cream, medium brown along anterior margin ; tergum 8 cream ; tergum 9 medium brown anteriorly and posteriorly, cream in middle region ; tergum 10 cream, medium brown posteriorly. Terga (Fig. 18) with somewhat irregular spination. Gills (Figs. 19, 20) as long as one and one-half to two abdominal segments combined, weakly tracheated, with small marginal serrations. Paraprocts (Fig. 21) with 10-11 marginal spines, increasing in length distally, and with scattered fine, simple setae on surface. Caudal filaments coloration cream, medium brown every four intersegments ; length : 1.6-2.0 mm.

Adult

Unknown.

— Material examined

Holotype : Larva, South Africa, Mpumalanga Province, Sabie R at Lisbon Estates, X-27-1990, W. P. and N. McCafferty. *Paratypes* : Three larvae, same data as holotype ; two larvae, South Africa, Mpumalanga Province, Kruger Natl. Park, Sabie R at Sabie Gorge, Mozambique/South African border, X-22-1990, W. P. and N. McCafferty [mouthparts, forelegs, tergum 4, gills 4, and paraproct of one larva mounted on slide (medium : Euparal)] ; larva, South Africa, Mpumalanga Province, Kruger Natl. Park, Sabie R at Molondozi, X-23-1990, W. P. and N. McCafferty ; larva, Kruger Natl. Park, Sabie R at Molondozi, X-23-1990, W. P. and N. McCafferty. *Other material* : Ten larvae, same data as holotype ; larva, South Africa, Mpumalanga Province, Morite R nr Bushbuckridge, 580 m, X-19-1990, W. P. and N. McCafferty ; six larvae, South Africa, Mpumalanga Province, Sabie-Sand Game



Figs. 9-21. *Dabulamanzia helenae* LUGO-ORTIZ and McCafferty, n. sp.

Fig. 9 : Labrum (dorsal). Fig. 10 : Hypopharynx. Fig. 11 : Left mandible. Fig. 12 : Right mandible. Fig. 13 : Left maxilla. Fig. 14 : Labium (left : ventral ; right : dorsal). Fig. 15 : Left foreleg. Fig. 16 : Tarsal claw. Fig. 17 : Abdomen (dorsal). Fig. 18 : Detail of tergal surface. Fig. 19 : Gill 4. Fig. 20 : Detail of gill margin. Fig. 21 : Paraproct.

Fig. 9 à 21. *Dabulamanzia helenae* LUGO-ORTIZ et McCafferty, n. sp.

Fig. 9 : Labre (vue dorsale). Fig. 10 : Hypopharynx. Fig. 11 : Mandibule gauche. Fig. 12 : Mandibule droite. Fig. 13 : Maxille gauche. Fig. 14 : Labium (vue ventrale à gauche; vue dorsale à droite). Fig. 15 : Patte antérieure gauche. Fig. 16 : Griffes tarsales. Fig. 17 : Abdomen (vue dorsale). Fig. 18 : Détail de la surface tergale. Fig. 19 : 4e branchie. Fig. 20 : Détail du bord branchial. Fig. 21 : Paraprocte.

Reserve, Sabie R at Londolozi, X-20-1990, W. P. and N. McCafferty; three larvae, South Africa, Mpumalanga Province, Kruger Natl. Park, Sabie R at Sabie Gorge, Mozambique/South African border, X-22-1990, W. P. and N. McCafferty [mouthparts mounted on slide (medium: Euparal)]; ten larvae, South Africa, Mpumalanga Province, Kruger Natl. Park, Sabie R at Molondozi, X-23-1990, W. P. and N. McCafferty.

— Etymology

We name this species after Helen M. Barber-James, for her kind comradeship and assistance during field studies in Mpumalanga and the Northern Province in South Africa.

— Discussion

Larvae of *D. helenae* are most similar to those of *D. media* (see below). They differ from *D. media* in possessing a relatively apically narrowed labrum (Fig. 9), a single prosthema in the right mandible (Fig. 12), tarsal claws with more abundant and sharper denticles (Fig. 16), the more complex abdominal markings (Fig. 17), and the relatively poor gill tracheation (Fig. 19).

5. *Dabulamanzia indusii* (CRASS), n. comb.

Centroptilum indusii CRASS 1947 : 83.

Afroptilum indusii (CRASS) : GILLIES 1990 : 99.

— Material examined

Twenty-six larvae, South Africa, Mpumalanga Province, Buffelspruit at Shalom (Aalwan), 4 km W of Badplaas, paralleling Rt 38, off Avantune Rd, X-17-1990, W. P. and N. McCafferty.

— Discussion

CRASS (1947) described this species from larvae and male and female adults collected from Kwazulu-Natal. His figures of the male hindwing (CRASS 1947 : Fig. 22b) and genitalia (CRASS 1947 : Fig. 22c) and larval labium (CRASS 1947 : Fig. 24a) and right mandible (CRASS 1947 : Fig. 24c) clearly indicate that it is typical of *Dabulamanzia*. We therefore have designated this well-established species as the type of *Dabulamanzia*.

In the larval stage, the abdominal color pattern, particularly that of tergum 3 (CRASS 1947 : Fig. 24e), readily distinguishes *D. indusii*. Male adults are similar to those of *D. media* (see below); however, adults of *D. indusii* have a more acute costal process in the hindwings (CRASS 1947 : Fig. 22b) and segment 3 of the genital forceps is shorter (CRASS 1947 : Fig. 22c).

6. *Dabulamanzia media* (CRASS), n. comb.

Centroptilum medium CRASS 1947 : 81.

Afroptilum medium (CRASS) : GILLIES 1990 : 99.

— Discussion

CRASS (1947) described this species from larvae and male and female adults collected from Kwazulu-Natal. The male hindwings (CRASS 1947 : Fig. 22e) and genitalia (CRASS 1947 : Fig. 22f) and the larval labium (CRASS 1947 : Fig. 23b) and right mandible (CRASS 1947 : Fig. 22a) place the species in *Dabulamanzia*.

Dabulamanzia media is most similar to *D. helenae* in the larval stage. However, *D. media* differs from that species in possessing a rounder and apically broader labrum (CRASS

1947 : Fig. 23c), a bifid prosthema in the right mandible (CRASS 1947 : Fig. 23a), the fewer denticles in the tarsal claws (CRASS 1947 : Fig. 23f), the less complex abdominal markings (CRASS 1947 : Fig. 23g), and the well tracheated gills (CRASS 1947 : Fig. 23e). Male adults are similar to those of *D. indusii* but differ from them in possessing a less acute costal process in the hindwings (CRASS 1947 : Fig. 22e) and a longer segment 3 of the genital forceps (CRASS 1947 : Fig. 22f).

7. *Dabulamanzia tarsale* (GILLIES), n. comb.

Afroptilum tarsale GILLIES 1990 : 111.

— Discussion

GILLIES (1990) described this species from larvae and male and female adults from Tanzania. The morphology of its mandibles (GILLIES 1990 : Figs. 49-52), labium (GILLIES 1990 : Fig. 53), hindwings (GILLIES 1990 : Fig. 46), and male genitalia (GILLIES 1990 : Fig. 47) agree with our concept of *Dabulamanzia*, and on this basis we transfer the species to the new genus.

Dabulamanzia tarsale is unique within the genus because its labrum has a shallow rather than relatively deep antero-medial emargination (GILLIES 1990 : Fig. 54) and the tarsal claws have poorly defined basal denticles (GILLIES 1990 : Fig. 57). The denticulation of the left mandibular incisors (GILLIES 1990 : Fig. 51) also appears to be unique among *Dabulamanzia*; however, it is possible that GILLIES (1990) figure is based on a mature larva with worn denticles.

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