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NEW TAXA AND SYNONYMY IN THE FAMILY PYRGOTIDAE (DIPTERA, TEPHRITOIDEA). I. TRIBES PRODALMANNIINI AND TOXOPYRGOTINI

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New Taxa and Synonymy in the Family Pyrgotidae (Diptera, Tephritoidea). I. Tribes Prodalmaniini and Toxopyrgotini. Korneyev, V. A. — In addition to Toxurini and Pyrgotini, two monotypic tribes are described in the subfamily Pyrgotinae: Prodalmaniini, originally named and established by Aczél (1956) without detailed description or justification, and Toxopyrgotini trib. n. The type species of the type genera are redescribed and illustrated.

Key words: Diptera, Cyclorrhapha, Tephritoidea, Pyrgotidae, taxonomy, new tribe, *Toxopyrgota*, *Prodalmania*.

Introduction

While preparing a chapter for the Manual of Afrotropical Diptera (Korneyev, in press), I faced numerous problems of generic classification and nomenclature in the family Pyrgotidae. After a detailed study of the type specimens and vast additional material I came at a conclusion that some taxonomic improvements should be done.

Pyrgotidae are closely related to the family Tephritidae (Korneyev, 1999). Existing classification of the family was proposed by Aczél (1956), with further improvements proposed by McAlpine (1978, 1990). Detailed comparative morphological study of pyrgotid genera worldwide showed the need of further taxonomic improvements. Here, I focused on the advanced subfamily Pyrgotinae, which previously was divided into two subfamilies, worldwide distributed Pyrgotini and strictly Australasian Toxurini; the basal taxa of Pyrgotidae not included in Pyrgotinae, will be considered elsewhere (Korneyev, in preparation).

Material and methods

The specimens examined in this study are deposited in the following collections (curators in brackets): ANIC — Australian National Insect Collection, Canberra (D. Yeates, C. Manchester); DEI — Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany (F. Menzel); AMS — Australian Museum, Sydney; NHMW — Naturhistorisches Museum, Wien, Austria (R.-E. Contreras-Lichtenberg; P. Sehnal); NMKE — Nairobi National Museum, Kenya (R. Copeland); NMSA — KwaZulu-Natal Museum, Pietermaritzburg, South Africa (M. Mostovsky); SMNS — Staatliches Museum für Naturkunde, Stuttgart, Germany (H.-P. Tschorsnig).

In the labels of type specimens, the slash character (/) is used to indicate separated lines, the double reverse slash (\\) for the text on label rear side; the triple slash (///) is used for the scripts perpendicular to main text of label, and square brackets [] are for deciphered abbreviations in the literally quoted labels. The non-type material is arranged alphabetically by country names, then from the West to the East and from the North to the South within each country; and finally, by the year, month and day of collecting.

Tribe Prodalmanniini Aczél, 1956

Aczél, 1956: 3.

Type genus: *Prodalmannia* Bezzi, 1929.

Diagnosis. Ocelli present or absent; frontal setae lacking; antennae very short, pedicel with deep incision (P); face with short, partly fused antennal grooves; epistome very high, weakly sclerotized (P); wing with subcostal vein entire and reaching costal vein at acute angle (?A); costal vein with humeral and subcostal break (P); abdomen with sternites 1 and 2 fused (SA with other Pyrgotinae) with visible seam (P); male genitalia: phallic guide not developed (P); epandrium densely setose dorsally (P); inner surstylus with prensisetae (2–4 thickened setae) (P); female: oviscape on ventral side with a tongue-like comb of thickened setae (A); eversible membrane with one pair of taeniae (P); aculeus moderately large, twice as long as oviscape width at aperture (P), with setulose sternite 6 (P) and well developed anal slit (P); ventral receptacle scepter-like (SA with other Pyrgotinae).

This tribe is believed to be represented by a single species of its type genus, *Prodalmannia variabilis* Bezzi, 1929, which occurs only in Australia. Another undescribed new species of an undescribed new genus is known to me from Mt. Magnet, Western Australia, in the ANIC.

Taxonomic position. Prodalmanniini have fused sternites 1+2 (**synapomorphy** with the Toxurini and Pyrgotini) and thus belong in the subfamily Pyrgotinae, differing from the two latter tribes by having prensisetae on inner surstylus of males (setulose or microtrichose, without setae or prensisetae in the Toxurini and Pyrgotini) and aculeus with well-developed, setulose sternite 8 of females (“ventral lobes of the aculeus”) (almost entirely membranous, without setulae in the Toxopyrgotini trib. n., Toxurini and Pyrgotini) and well-developed anal slit on the dorsal side of cercal unit of female (no visible anal aperture in the Toxopyrgotini trib. n., Toxurini and Pyrgotini; rectum apparently opening within tergo sternite 8 forming a cloaca).

Prodalmanniini form the basalmost branch of the Pyrgotinae, opposite to the Toxopyrgotini trib. n. + Toxurini + Pyrgotini lineage.

Genus *Prodalmannia* Bezzi, 1929

Type species: *Prodalmannia variabilis* Bezzi, 1929 (by original designation).

Diagnosis. The genus can be distinguished from other pyrgotids by the combination of the tribal characters (see above) and the ocelli lacking (**apomorphy**, apparently lost independently from most other tribes of the Pyrgotinae); body densely and long setulose, subshining, not microtrichose (fig. 1–3); high, poorly sclerotized epistome, gena as high as eye, the subocular sclerite not developed, the proboscis elongate, geniculate; the femora not swollen, without femoral organ, long and densely setulose, without short spinulae; and wing with vein R_{4+5} bearing 4–5 setae basally on dorsal side and lacking pattern; aculeus wide, with narrow and pointed cercal unit.

Remarks. A monotypic genus known only from Australia. (Korneyev, in preparation).

Prodalmannia variabilis Bezzi, 1929 (fig. 1–29)

Bezzi, 1929: 19; Paramonov, 1958: 89, 93; Aczél, 1956: 2; Pitkin, 1989: 501.

Material. Type. Syntype ♂: **Australia**: “Sydney, Manly / Nov 1923” (33°47'55" S, 151°17'5" E), “Holotype”, “K.359109” (AMS); syntype ♀ [same labels as in syntype ♂] (AMS).

Non-type. Australia: New South Wales: Mosman, 25.09.1923, 1 ♂ (Mackerras) (ANIC); “Umgeb. Sydney”, [no date], 1 ♀, “Sydney”, [no date], 1 ♀ (Luddemann) (DEI) Capital Territory: Canberra, Black Mountain,

9.12.1957, 1 ♂ (I. F. B. Common) (captured at light and pinned together with *Phyllotocus macleayi*); idem, [data unavailable], 5 ♀ (I. F. B. Common) (ANIC).

Short description. Head matt brown, with black occiput and antenna; frons opaque reddish, deeply shagreened, narrowest part in male about 0.2, in female about 0.5 as wide as eye, vertex shagreened, subshining, setae and setulae black, one orbital seta at posterior one-third; ocellar triangle and orbital plates almost inconspicuous; frons and parafacial sparsely setulose. Antenna, including arista, black, all segments densely covered with scales, matt; scape with one row of setulae; pedicel with 1–2 rows of setulae and one long seta dorsally of pedicellar notch; flagellomere 1 rounded, as long as wide; arista 3-segmented, conspicuously microtrichose (fig. 11–12). Parafacial brownish-yellow, with subshining triangle; gena opaque reddish brown, soft, wider than vertical diameter of eye and 0.7–0.8 times as high as vertical diameter of eye. Face reddish, matt; antennal grooves widely fused, matt; epistome with black spot dorsally and two black lines along lateral margins. Palpus black, black setose; proboscis blackish, with black hairs. Thorax brownish yellow, shining, with paler postpronotal lobe

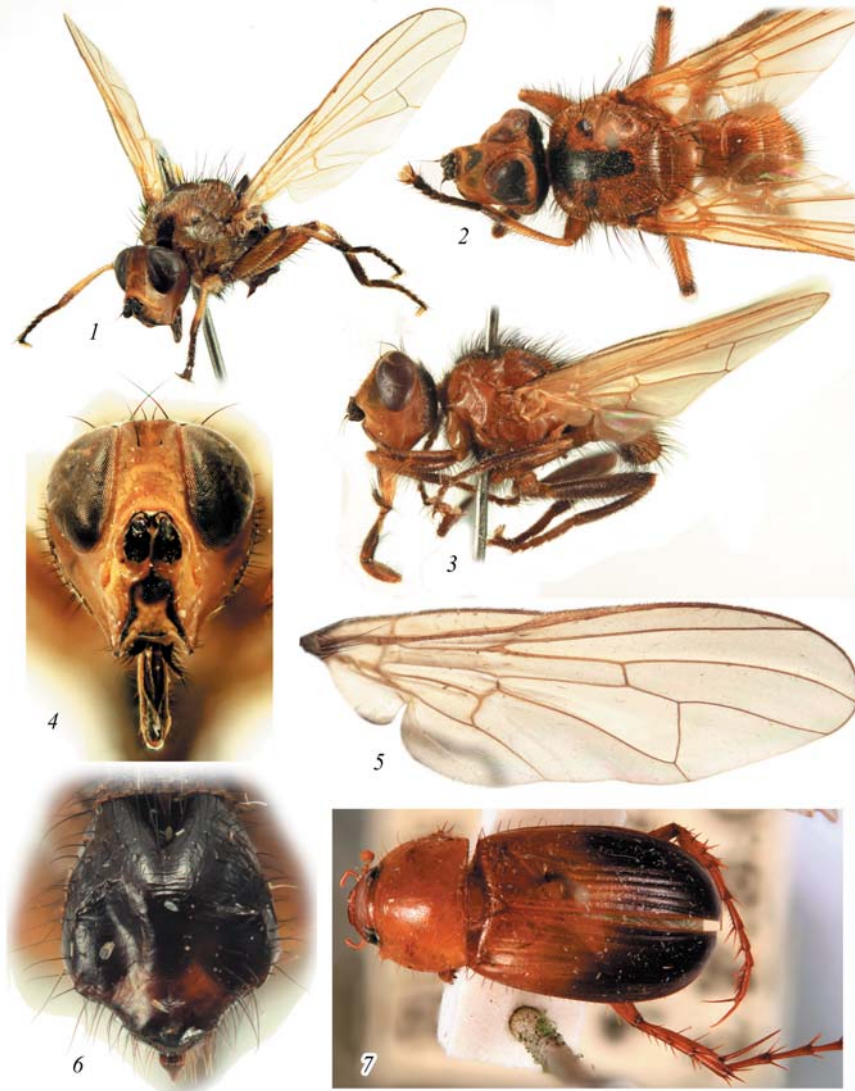


Fig. 1–7. *Prodalmanzia variabilis*: ♀ (1, 6), ♂ (2–5) and its possible host, *Phyllotocus macleayi* (7): 1 — habitus, antero-dorsal; 2, 7 — same, dorsal; 3 — same, lateral; 4 — head, anterior; 5 — wing; 6 — oviscapae.

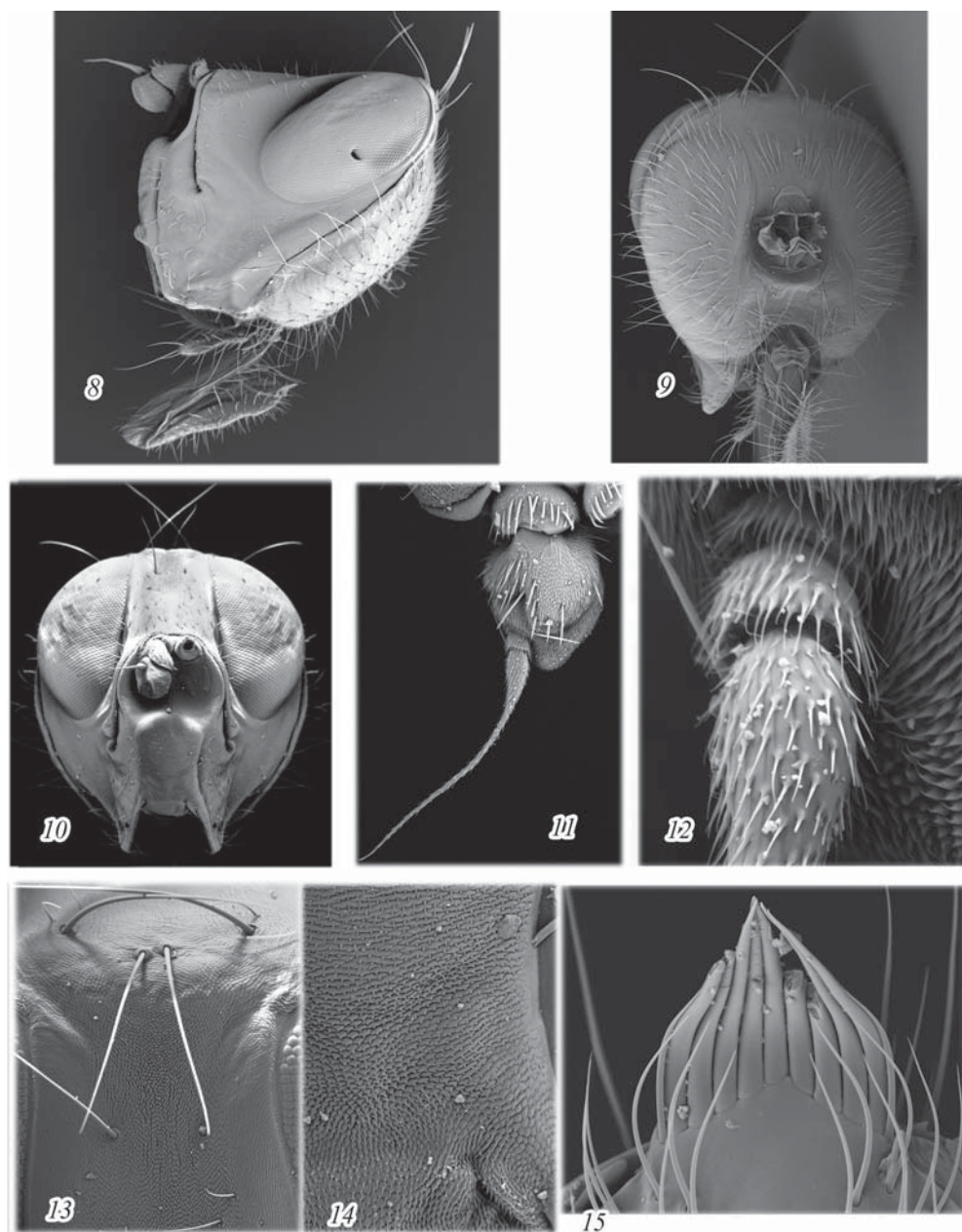


Fig. 8–15. *Prodalmania variabilis*, SEM photographs: 8–10 — head (8 — anterior, 9 — posterior, 10 — anterior view); 11 — antenna, dorsal; 12 — same, base of arista; 13 — vertex and frons; 14 — face vestiture; 15 — apico-ventral comb of oviscape.

and pleuron, long black setulose; mesonotum with black marking, short and narrow in female (fig. 1), sometimes entirely lacking, and wider and longer in male (fig. 2), with 1 postpronotal, 1 presutural supra-alar, 2 dorsocentral and 1 presutural acrostichal seta present; scutellum entirely subshining brownish yellow, with 3–4 pairs of long marginal setae and additional setulae, but mostly bare on disk; katapisternum and meron usually with black marks; mediotergite shining black. Wings hyaline, greyish microtrichose; yellowish at bases and on costa, veins yellowish, darkened on distal half of wing. Halteres pale yellowish. Legs brownish yellow, black setose and setulose,

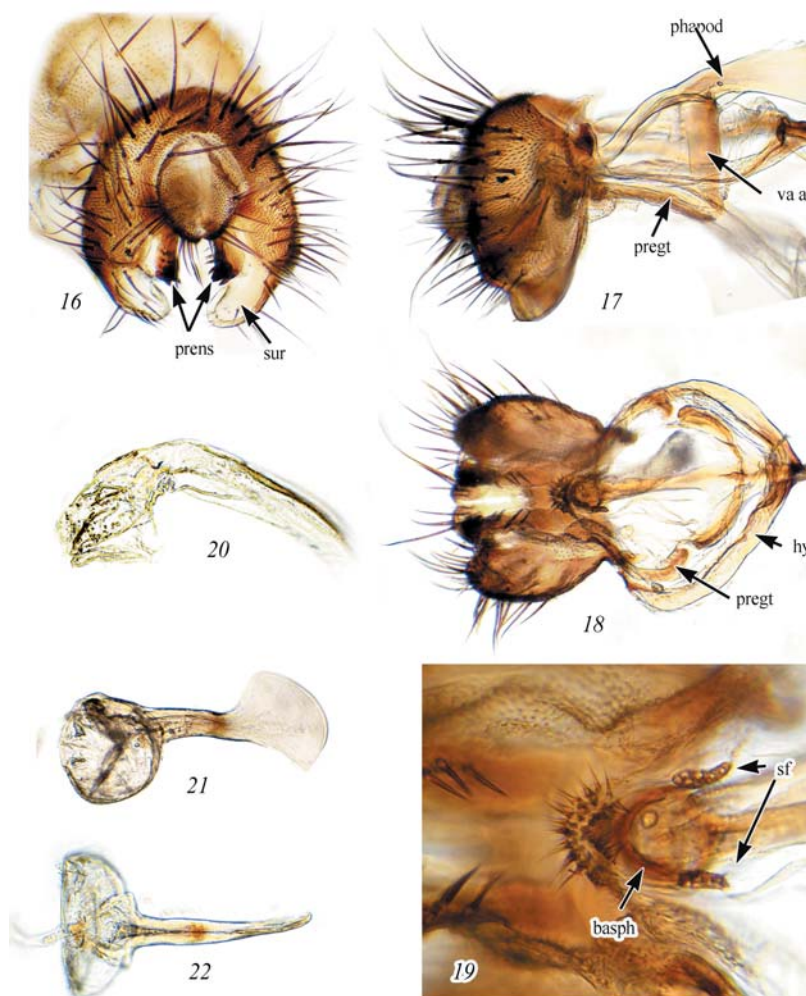


Fig. 16–22. *Prodalmania variabilis*, ♂ genitalia: 16 — epandrium posterior; 17–18 — epandrium and hypandrium, right lateral (17) and ventral (18) view; 19 — basiphallus; 20 — glans of phallus; 21–22 — ejaculatory apodeme, lateral and ventral.

Abbreviations: basph — basiphallus; hypd — hypandrium; phapod — phallapodeme; pregt — pregonite; prens — prenisetae; sf — sensillar field; sur — surstylus; va ap — vanes of apodeme.

with apically darkened tibiae and brownish-black tarsi. Abdomen shining brownish yellow, long black setulose. Male genitalia as on fig. 16–22: epandrium short and rounded, dorsally densely setulose, with short outer surstyli; inner surstylus with row of setulae and 2–4 prenisetae (fig. 16, 18); hypandrium with widely separated vanes connected to equal paired pregonites (fig. 17–18); sensillar fields (remnants of postgonites) allied to basiphallus present; border of basiphallus and subepandrial sclerite with fold covered by ciliae or microtrichia (fig. 19); phallus bare, with short and very poorly sclerotized glans (fig. 20); ejaculatory apodeme fan-like, with very large sperm pump (fig. 20–21). Female sternites 3–6 transverse, setulose (fig. 23); terminalia: oviscape very wide, shining black (fig. 6); ventrally with tongue-like flap formed by 9–10 thick setae (fig. 6, 15).

Remarks. The only data on possible host-parasite relationships of this species is Paramonov's report based on the Common's and Straatman's observations on the females of *P. variabilis* apparently attempting to oviposit upon adult beetles *Phyllotocus macleayi*

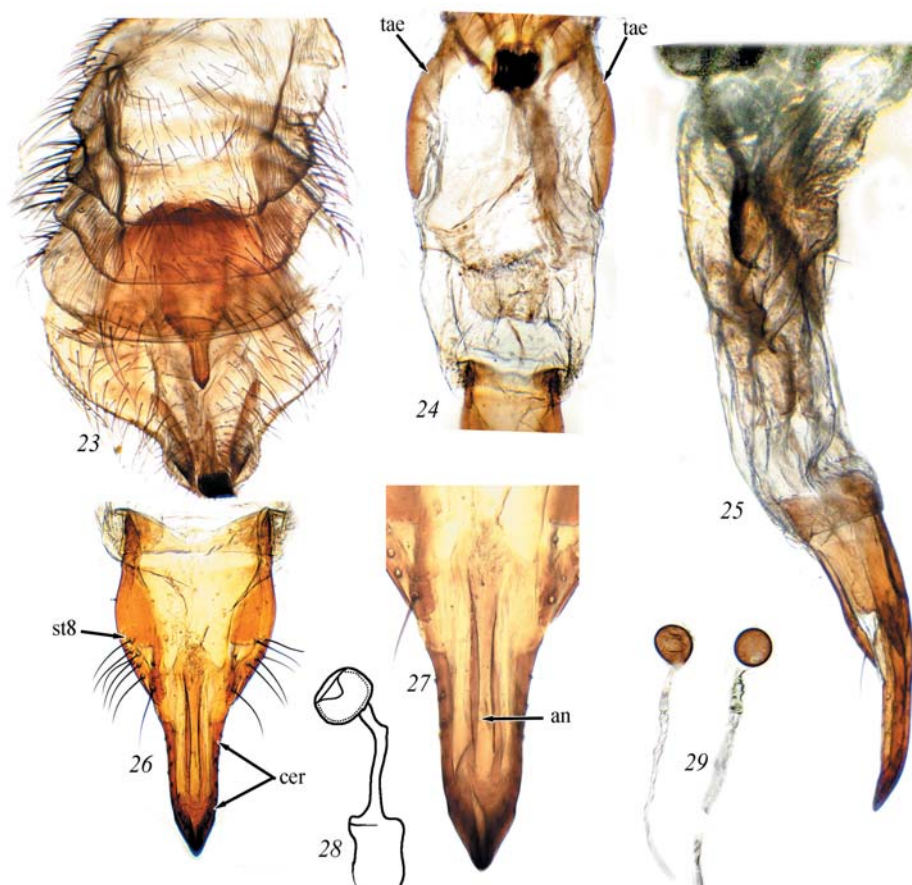


Fig. 23–29. *Prodalmania variabilis*, ♀ genitalia: 23 — abdomen, ventral view; 24 — eversible membrane ventral; 25 — eversible membrane and aculeus, lateral (left) view; 26 — aculeus; 27 — same, cercal unit, enlarged; 28 — ventral receptacle; 29 — spermathecae.

Abbreviations: an — anal opening; cer — cercal unit; st8 — 8th sternite; tae — taenia.

Fischer (Scarabaeidae: Melolonthinae: Sericini) (fig. 7) at light trap crawling over a sheet (Paramonov, 1958); this is, however, not a rearing record, so I consider that only as a *possible* host. It is interesting that most or all known hosts of the pyrgotid flies of the basal lineages belong to Sericini (Korneyev, unpublished data).

Tribe Toxopyrgotini trib. n.

Type genus: *Toxopyrgota* Hendel, 1914.

Diagnosis. Ocelli absent; frontal setae present; antennae very short, pedicel with deep incision (P); face with short, partly fused antennal grooves; epistome not developed; subcranial membrane between face and clypeus very large, but non-sclerotized (P); wing with subcostal vein entire and reaching costal vein at acute angle (?A); costal vein with humeral and subcostal break (P); cell cup closed by arcuate crossvein without posteroapical lobe (A); abdomen with sternites 1 and 2 fused (SA with other Pyrgotinae); male genitalia: phallic guide not developed (P); epandrium densely setose dorsally (P); inner surstylus with at least one preniseta (thickened seta) (P); female: oviscape unmodified; eversible membrane without taeniae (SA with Pyrgotini and Toxurini); aculeus small, as long as oviscape width at aperture (SA with Pyrgotini and Toxurini), with sternite 8 inconspicuous (SA with

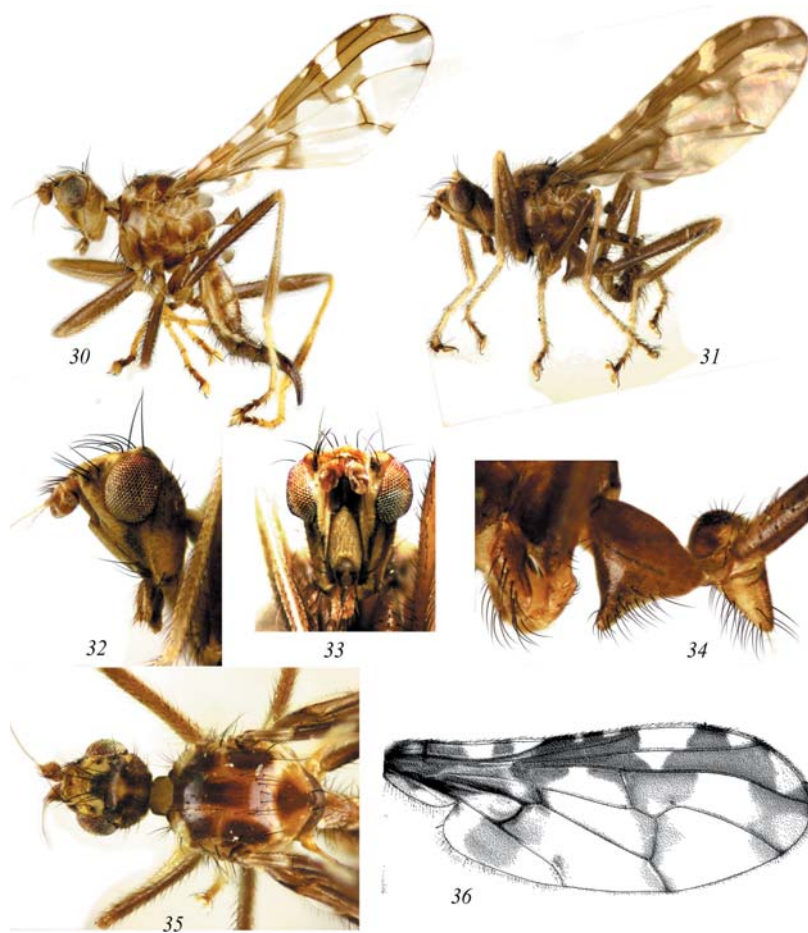


Fig. 30–36. *Toxopyrgota inclinata*, ♀ (30, 35, 36) and ♂ (31–34): 30, 31 — habitus, left; 32, 33 — head, left and anterior view; 34 — ♂ mid coxa, hind coxa and hind trochanter; 35 — head and thorax, dorsal view; 36 — wing.

Pyrgotini and Toxurini), without anal slit (SA with Pyrgotini and Toxurini); ventral receptacle scepter-like (SA with other Pyrgotinae).

This tribe is represented by its type genus, *Toxopyrgota* Hendel, 1914 from the Afro-tropical Region.

Taxonomic position. *Toxopyrgotini* share the modified structure of eversible membrane and aculeus (see above **synapomorphies**) with Pyrgotini and Toxurini, clearly differing from them by several characters keeping their plesiomorphic mode: antenna with a deep pedicellar incision (notch), membranous area between face and clypeus instead of sclerotized epistome, male genitalia with inner surstylus bearing preniseta. It is therefore believed to be a sister-group to the Pyrgotini + Toxurini lineage. This is a sufficient cause to establish the new tribe.

The setose pedicel, large subcranial membrane, vestigial proboscis and cell cup closed by arcuate vein are the reasons to hypothesize possible relationships of the *Toxopyrgotini* trib. n. with the enigmatic family Ctenostylidae; however, most of these characters are reductions strongly subject to homoplasy and thus having very small weight for phylogenetic reconstructions.

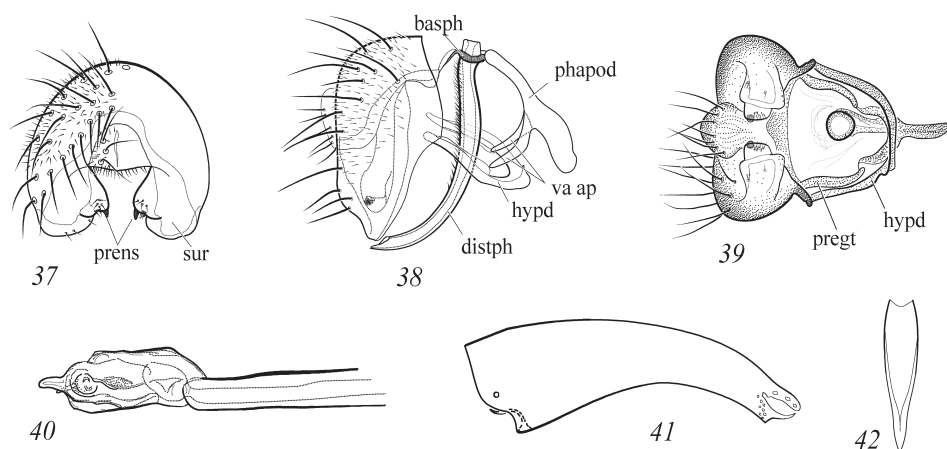


Fig. 37–42. *Toxopyrgota inclinata*, ♂ (37–40) and ♀ (41–42): 37 — epandrium, posterior view; 38–39 — epandrium and hypandrium, lateral (38) and posterior (39) view; 40 — glans of phallus, ventral view; 41 — oviscape, lateral left view; 42 — aculeus, ventral view. Fig. 41–42 redrawn from Steyskal (1972), with changes.

Abbreviations: basph — basiphallus; distph — distiphallus; hypd — hypandrium; phapod — phallapodeme; pregt — pregonite; prens — prensisetae; sur — surstylus; va ap — vanes of apodeme.

Genus *Toxopyrgota* Hendel, 1914

Type species: *Toxopyrgota inclinata* Hendel, 1914 (by original designation).

Toxopyrgota inclinata Hendel, 1914: 78; 1917: 34; Steyskal, 1972: 8; 1980: 562.

Diagnosis. The genus can be distinguished from other pyrgotids by the combination of the tribal characters (see above) and the ocelli lacking (**apomorphy**, apparently lost independently from most other tribes of the Pyrgotinae); body densely and long setulose, subshining, not microtrichose; frontal plates with 2–5 pairs or irregular setae; membrane of subcranial cavity between arms of subgenae non-sclerotized, forming no epistome; gena as high as eye, subocular sclerite not developed; mesonotum with full set of setae, and numerous additional dorsocentral setae; femora not swollen, without femoral organ or short spinulae, strongly elongated, long and densely setulose; and wing with bare vein R_{4+5} and brownish-grey mottled pattern; abdomen with very wide sternites in both sexes; phallus with almost non-sclerotized glans.

Remarks. This monotypic genus occurs only in the mountains of the Subsaharan Africa.

Toxopyrgota inclinata Hendel, 1914 (fig. 30–42)

Toxopyrgota inclinata Hendel, 1914: 78; 1917: 35; Vanschuytbroeck, 1963: 7; Steyskal, 1972: 8; 1980: 562.

Material. Type. Syntype ♀: **Tanzania**: “Afrique or. allemande / Kilimandjaro / versant sud-est / Alaud & Jeannel,” “Zone inférieure / Neu-Moschi / 800’” / Avril 1912 St. 72”, “*Toxopyrgo-* / *ta / inclinata* / H. det. Hendel”, “Coll. Hendel” (MNHW).

Non-type. **Ethiopia**: Bahar Dar, 06–07.1969, 3 ♂, 1 ♀ (dissected) (Schäufelle) (SMNS); **Kenya**: S. Masai Reservat, 30.01.1935, 1 ♂ (B. Benzon) (NMKE). **Zimbabwe**: Karoi, 01.1956, 3 ♀ (R. Phelps) (NMSA). **Malawi**: Kasungu Nat. Park, Lifupa Camp, 1333Aa, *Brachystegia*, 1000 m, 9–10.11.1980, 5 ♂, 3 ♀ (Stuckenberg & Londt) (NMSA).

Short description. Small (wing length 2.5–4.0 mm) crane-fly-like, motley black-and-yellow insects with patterned wings and very long, haired legs (fig. 30–31), with black or brown spots on vertex, occiput, parafacial, gena, mesonotum and pleura. Frons opaque, setae and setulae black, one orbital seta at posterior one-third; vertex shining brown to black, ocellar triangle with 1–2 pairs of ocellar and 1 pair

of long postocellar setae; orbital plate with dark spot and one long, proclinate orbital seta; frons mostly bare. Antenna brownish-yellow, microtrichose, matt; scape with one row of setae; pedicel with 2–3 rows of long setae; flagellomere 1 rounded, as long as wide; arista 3-segmented, microtrichose (fig. 32). Parafacial brownish-yellow, with brown sclerite (frontal plate) bearing 2–5 frontal setae and smaller setulae; gena opaque yellowish brown, soft, wider than vertical diameter of eye and 0.8–1.0 times as high as vertical diameter of eye. Face brown to black; antennal grooves separated by low carina; its lower margin very narrow, dark brown, as well as subgena; subcranial membrane opaque; clypeus black. Palp yellow, black setose, moderately large; proboscis yellow, setulose, with vestigial labellum and obviously non-functional. Thorax yellow, shining, with brown or black pattern (fig. 30, 35), long black setose and setulose; mesonotum with 1 postpronotal, 1 presutural supra-alar, 8–10 (4–5 presutural and 4–5 postsutural) dorsocentral and 1 presutural acrostichal seta present; scutellum shining yellow at margins, medially brown to black brownish yellow, single pair of apical setae, bare on disk; katepisternum and meron with black marks; mediotergite shining brown to black. Wings hyaline, with variable greyish pattern (fig. 30, 31, 36); in some specimens, additional dark spots present at middle of cells m and cua. Halteres pale yellowish, with largely brown or black knob. Coxae, trochanters and femora brown, tibiae yellow with brown subapical area, black setose and setulose, tarsi creamy-white, except 2 apical tarsomeres brown; male hind coxa and trochanter strongly modified, with large flap of trochanter posteromedially densely setulose (fig. 34). Abdomen shining brownish yellow, long black setulose. Male genitalia as on fig. 37–40: epandrium short and rounded, dorsally densely setulose, with short outer surstyli; inner surstylus with 5–6 of setulae and single preniseta (fig. 38); hypandrium with widely separated vanes connected to equal aired pregonites (fig. 37, 39); sensillar fields allied to basiphallus lacking; phallus basally microtrichose, simple glans (fig. 40), bearing rudimentary sclerites of acrophallus and simple apicodorsal lobe; ejaculatory apodeme fan-like. Female sternites 3–6 transverse, setose; terminalia: oviscape wide, black, triangular, apically narrowed, curved ventrally (fig. 41); without modified flaps or hooks; aculeus moderately short, with thin, non-setulose ventral lobes and no anal opening.

Remarks. No data on biology of this species are available. The long setulose body and long legs allows to hypothesize them to be swarming insects. The vestigial labellum of proboscis and the absence of anal aperture apparently show that they are aphagous flies with very short lifespan of adults.

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