APIOCERIDAE 46

(Apiocerid Flies)

Torsten Dikow

Fig. 46.1. Male of *Apiocera* (*Pyrocera*) *painteri* Cazier (non-Afrotropical) (photograph © S.A. Marshall).

Diagnosis

Afrotropical species are medium-sized (body length: 16–21 mm), brown to black flies, with grey pubescent patterned head, thorax and abdomen (Figs 1–3).

Head dichoptic in both sexes; frons virtually parallel-sided; vertex slightly depressed; ocelli circular; ocellar triangle formed by 2 posterior ocelli, anterior ocellus positioned at considerable distance anterior to posterior ocelli; antenna positioned in ventral ½ of head; antennal scapes separated proximally; postpedicel broadest medially, short; stylus composed of 1 element, with seta-like sensory element positioned apically on stylus; proboscis projecting beyond frontoclypeal suture; labellum well-developed; large pseudotracheae separated from prementum; palpus 2-segmented; distal segment laterally compressed, extending beyond frontoclypeal suture.

Thorax with postpronotal lobe entirely fused to mesonotum; cervical sclerite smoothly rounded and elevated above lateral postpronotum; prosternum separated from proepisternum, triangular in shape; proepisternum not fused to lateral

Kirk-Spriggs, A.H. & Sinclair, B.J. (eds). 2017. Manual of Afrotropical Diptera. Volume 2. Nematocerous Diptera and lower Brachycera. *Suricata* 5. South African National Biodiversity Institute, Pretoria; pp. 1057–1061.

2 *Apiocera* (*Ripidosyrma*) ♂

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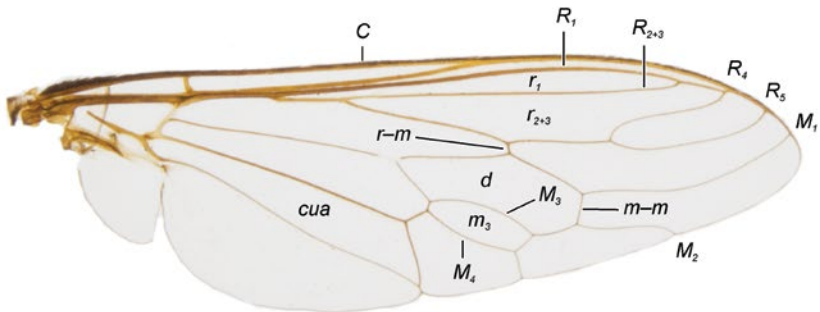
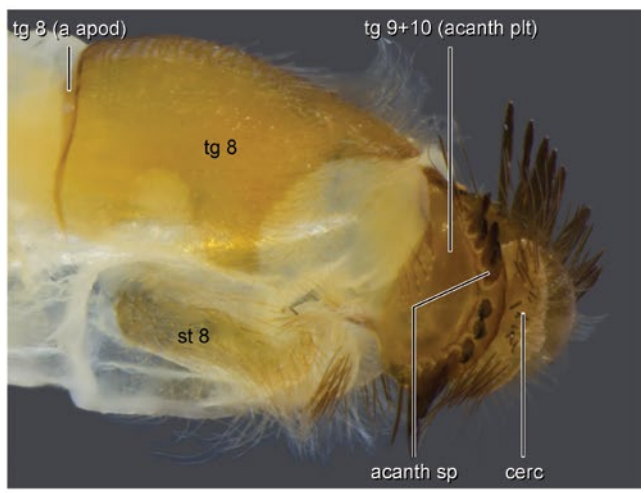


4 *Apiocera* (*Ripidosyrma*)

5 *Apiocera* (*Ripidosyrma*) ♂



6 *Apiocera* (*Ripidosyrma*) ♀

Figs 46.2–6. Habitus, wing and terminalia of Apioceridae: (2) habitus of *Apiocera* (*Ripidosyrma*) *alastor* (Walker), dorsal view ♂; (3) same, *A.* (*R.*) *braunsi* Melander, lateral view ♂; (4) same, wing, dorsal view; (5) same, male terminalia, lateral view; (6) same, female terminalia.

Abbreviations: a apod – anterior apodeme; acanth plt – acanthophorite plate; acanth sp – acanthophorite spine; ant – antenna; *C* – costal vein; cerc – cercus; *cua* – anterior cubital cell; *CuA+CuP* – anterior branch of cubital vein + posterior branch of cubital vein; *d* – discal cell; epand – epandrium; goncx – gonocoxite; goncx apod – gonocoxal apodeme; hypd – hypandrium; M_1 – first branch of media; M_2 – second branch of media; M_3 – third branch of media; m_3 – third medial cell; M_4 – fourth branch of media; *m–m* – medial crossvein; prbs – proboscis; R_1 – anterior branch of radius; r_1 – first radial cell; R_{2+3} – second branch of radius; r_{2+3} – second + third radial cell; R_4 – upper branch of third branch of radius; R_5 – lower branch of third branch of radius; *r–m* – radial–medial crossvein; st – sternite; tg – tergite.

postpronotum, macrosetulose and setulose; anterior proepimeron, anterior and superoposterior anepisternum, anterior basalare and katepimeron asetose; 3 or more notopleural setae and 1 supra-alar and postalar seta present; scutellum large, mesopostnotum not visible in dorsal view; apical scutellar macrosetae present; metakatepisternum small and not visible between mesothoracic and metathoracic coxae; metathoracic coxa macrosetulose laterally, with blunt protuberance anteriorly. Legs with femur cylindrical throughout length, with 1 anteroventral row of macrosetae; proximal tarsomere as long as or longer than tarsomeres 2–3 combined; pulvillus with single dorsal ridge; setiform empodium absent. Wing membrane hyaline; cells r_1, r_{2+3}, m_3, and *cua* closed (Fig. 4); costal vein (*C*) circumambient, or terminating at vein *CuA+CuP*; auxiliary crossvein (R_3) absent; veins M_1 and M_2 separated; vein M_1 terminating in costal vein anterior to wing apex.

Abdomen elongate, tapered towards apex; male (Fig. 5) with tergites and sternites 1–8 fully-developed; abdominal tergites without anterodorsal apodemes; male terminalia with epandrium separated medially and joining proximally; hypandrium large, elongate; hypandrium and gonocoxite entirely free; short gonocoxal apodeme present; gonostylus present, positioned medially on gonocoxite; lateral ejaculatory apodeme small, triangular in shape; phallus with 1 functional phallic prong; gonocoxite with distal, feathery plume extending beyond tip of hypopygium (Figs 2, 3, 5); female terminalia (Fig. 6) with tergite 8 with apodeme on anterior margin, without auxiliary spiracle; sternite 8 plate-like, divided into 2 halves; tergites 9 and 10 entirely fused, acanthophorite spines present on acanthophorite plate (tergite 10); 3 equally large, poorly-sclerotised spermathecae present; furca shaped as an inverted U.

Apioceridae may possibly be confused in the field with certain medium-sized species of Asilidae (see Chapter 48). The non-predacious proboscis (Fig. 3), short antenna (Fig. 3) and peculiar wing venation (Fig. 4), however, will easily differentiate *Apiocera* Westwood from Asilidae.

Biology and immature stages

The immature stages of Afrotropical *Apiocera* are unknown and information on other species is scarce. Larvae and pupae of the Australian species *A.* (*Apiocera*) *maritima* Hardy, 1933 (English 1946), as well as the Nearctic *A.* (*Pyrocera*) *hispida* Cazier, 1941 (Toft & Kimsey 1982) (Figs 7–11), *A.* (*P.*) *haruspex* Osten Sacken, 1877 (Wharton 1982) and *A.* (*P.*) *painteri* Cazier, 1963 (Cazier 1963) have been described. All of these were found in sandy habitats (although not necessarily sand dunes) and the same habitat type is most probably also utilised by Afrotropical species. *Apiocera* larvae are believed to be predatory, feeding on other larvae, as is the case with the families Asilidae (see Chapter 48) and Mydidae (see Chapter 47). The head morphology of the fifth-instar larva (more or less flattened maxilla and laterally inserted maxillary palpus; Fig. 8) is more similar to those of Asilidae than to Mydidae – its closest relative. Imagines are nectar or pollen-feeders and their annual adult activity period may, therefore, coincide with the flowering of certain plant species. There is no evidence, however, that *Apiocera* rely on specific plant species for food. All specimens examined in collections were collected between December and February.

Economic significance

No species of Apioceridae are known to have economic importance.

Classification

Apioceridae is placed in the superfamily Asiloidea and is closely related to Asilidae and Mydidae. Hennig (1973), Irwin & Wiegmann (2001), Yeates (2002) and Yeates & Irwin (1996) have established the close phylogenetic relationship between Apioceridae and Mydidae, while Dikow (2009*a*, *b*) proposed that a clade (Apioceridae + Mydidae) is the sister-group to Asilidae, based on both morphological and molecular data. This set of relationships has also been supported by molecular analyses focusing on Asiloidea (Trautwein *et al*. 2010) and Diptera in general (Wiegmann *et al*. 2011).

Apioceridae has a unique distribution, in that the current 143 valid species are distributed in Australia (73 species), Chile (4), South Africa (3) and western North America (Canada, Mexico, United States, 64 species). The North American species are primarily Nearctic with a few species found in the Neotropical states of Mexico. Yeates & Irwin (1996) published the only phylogenetic hypothesis of relationships within the family and proposed to apply available genus-group names, plus a newly-described one to be ranked as subgenera of the single, worldwide genus *Apiocera*. These subgenera correspond to the zoogeographical distribution, in that the Australasian species are grouped in *A.* (*Apiocera*), the Neotropical (Chilean) species in *A.* (*Anypenus* Philippi), the Afrotropical species in *A.* (*Ripidosyrma* Hermann) and the Nearctic and Neotropical (Mexican) species in *A.* (*Pyrocera* Yeates & Irwin). Stuckenberg (1966) described the morphologically unique genus, *Tongamya*, from the South Africa/Mozambique border in Apioceridae, but this taxon was subsequently transferred to Mydidae by Yeates & Irwin (1996).

The study by Yeates & Irwin (1996) proposed that *A.* (*Pyrocera*) represents the sister-group to the Southern Hemisphere species and that the Afrotropical *A.* (*Ripidosyrma*) spp. are in turn the sister-group to the clade of Chilean and Australian species, which presents evidence for a true Gondwanan origin.

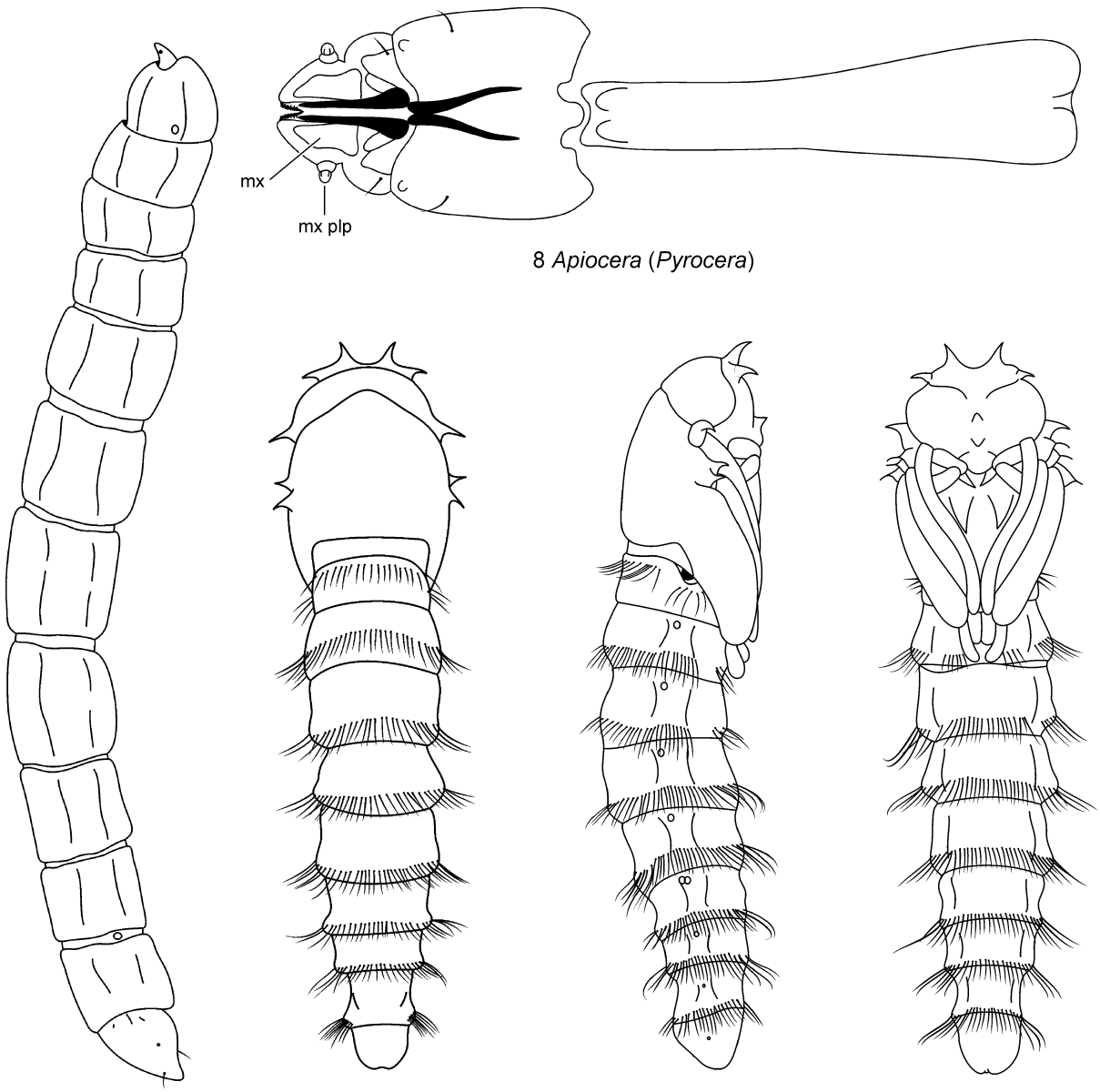
Identification

Yeates (1994) published a revision of the Afrotropical *Apiocera* and provided an identification key to the three valid species. The key relies in part on the pubescence of the thorax and it is pertinent to have well-preserved specimens at hand to make correct identifications. Apioceridae should be direct-pinned in the field (see Chapter 2).

Synopsis of the fauna

***Apiocera* Westwood.** A genus of 143 species, occurring in the Afrotropical, Australasian, Nearctic and Neotropical Regions. Three valid species (all in the subgenus *A.* (*Ripidosyrma*)) have been described from the Afrotropics, with one name in synonymy (Dikow & Agosti 2015; Yeates 1994). These Afrotropical

species are restricted to South Africa, and in particular, to the Eastern Cape and Western Cape Provinces, from Graaff-Reinet and Willowmore in the east to the Tankwa Karoo National Park and the Ceres District in the west. In general, apiocerid flies are rarely collected and are scarce in collections, with Afrotropical species being no exception. Apioceridae (as is the case with Mydidae) may, however, be locally abundant and specialist collectors may be able to collect long series when visiting suitable habitat at the correct time of year. While the fauna has been recently reviewed (Yeates 1994), it is possible that additional fieldwork will reveal undescribed species, given that male specimens from Matjiesfontein and "Janfontein, Ceres Division" (Western Cape) have been examined (Dikow, unpubl.), which appear to be undescribed. *Apiocera* (*R.*) *badipeniculata* Yeates,



8 *Apiocera* (*Pyrocera*)

7 *Apiocera* (*Pyrocera*) 9 *Apiocera* (*Pyrocera*) 10 *Apiocera* (*Pyrocera*) 11 *Apiocera* (*Pyrocera*)

Figs 46.7–11. Fifth-instar larva and pupa of Apioceridae: (7) fifth-instar larva of *Apiocera* (*Pyrocera*) *hispida* Cazier (non-Afrotropical), lateral view (anterior top); (8) same, head, dorsal view (anterior left); (9) same, male pupa, dorsal view (anterior top); (10) same, lateral view; (11) same, ventral view. Figs 7–11 (after Toft & Kimsey 1982, figs 6, 2, 9–11, respectively).

Abbreviations: mx – maxilla; mx plp – maxillary palpus.

1994 is only known from a single collecting event, although Yeates (1994) identified other specimens from the same series as *A. alastor*. The remaining two species are more widespread, with *A.* (*R.*) *braunsi* (Fig. 3) found in the eastern and *A.* (*R.*) *alastor* (Fig. 2), transferred by Stuckenberg (1968) from Asilidae to *Apiocera*, in the western parts of their distribution range.

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