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A New Genus and Species of the Subfamily Tachiniscinae (Diptera, Tephritidae) from Australia

VALERY A. KORNEYEV

I.I.Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine,
Bogdan Chmielnicki St. 15, 01601 Kiev, Ukraine
valery.korneyev@gmail.com

ABSTRACT. A parasitic fly *Aliasutra australica* new genus and species is described, and the subfamily Tachiniscinae is recorded from Australia for the first time. The new species superficially resembles pyrgotid flies by lacking frontal setae and wing pattern, and by having numerous proepisternal setae and brownish yellow body. It possesses a unique structure of female terminalia, which is a synapomorphy of the Tachiniscinae, and the incomplete costal vein, long tubular phallus and elongate spermathecae, which are considered synapomorphies of the tribe Tachiniscini, and is placed in that tribe.

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KEYWORDS: Tephritoidea; Tephritidae; Tachiniscinae; Tachiniscini; new genus; new species; Australia.

Tephritid flies of the subfamily Tachiniscinae are rare in collections and are poorly known biologically, but they are important to understanding the phylogeny of the Tephritidae, as they appear to be the earliest branch of the family. As far as known, some species are parasites of caterpillars of saturniid moths, and this is believed to be true for all the Tachiniscinae, as they share similar structure of female ovipositor. Such uncommon habits, different from other Tephritidae, which have phytophagous or saprophagous larvae, along with odd appearance of some species mimetic of bumblebees or wasps, has resulted in establishment of a nominal family Tachiniscidae, which later was shown to include some species of typically tephritid habitus and synonymised with Tephritidae (Korneyev, 1999). All hitherto known data were summarised by Korneyev & Norrbom (2006).

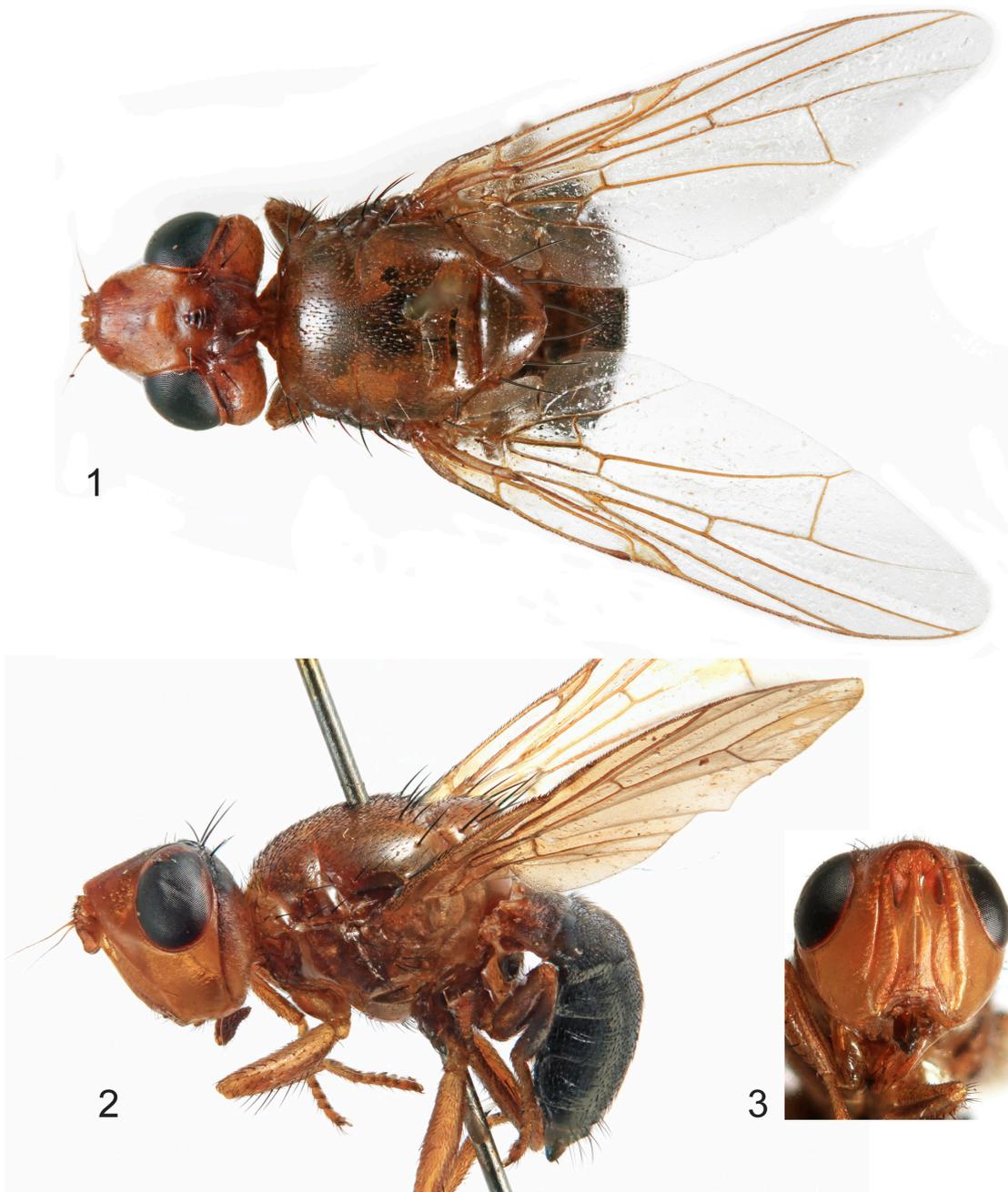
The subfamily included 20 described species belonging to 9 genera of two tribes, Tachiniscini and Ortalotrypetini, which were known to occur in the Afrotropical and

Neotropical Regions and also in south eastern provinces of China, usually considered to belong in the Palaearctic Region. An undescribed genus and species related to *Tachinisca* is recognised in collections from the Oriental Region (T. Saigusa, pers. comm.).

While studying the Diptera collection at the Australian Museum (Sydney), VAK found a series of odd flies recognized by David K. McAlpine as a new genus and species, superficially resembling some Pyrgotidae and therefore preliminarily sorted with the pyrgotid genera. Detailed study of female genitalia shows that they possess essential characters of the subfamily Tachiniscinae. The new taxa are described below.

Type material is deposited in the collections as follows:

AMS Australian Museum, Sydney;
SIZK I. I. Schmalhausen Institute of Zoology, Kiev;
MNVM Museum of Victoria, Melbourne.



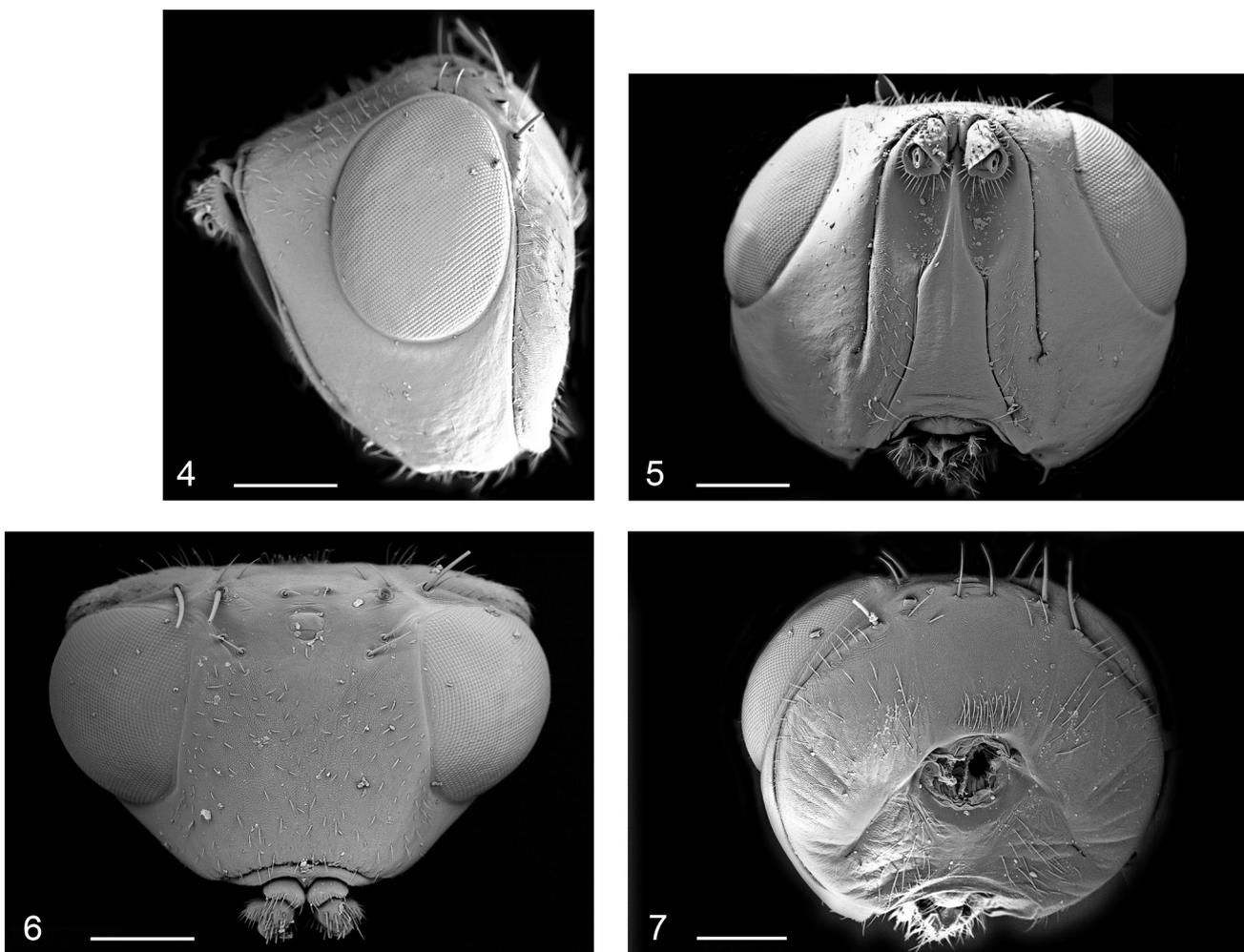
Figs 1–3. *Aliasutra australica* n.sp., paratype female, photographs. (1) dorsal view; (2) lateral left view; (3) head, anterior view.

***Aliasutra* n.gen.**

Type species: *Aliasutra australica* n.sp.

Diagnosis. Medium-sized flies (Figs 1–3), which can be recognized from other Tachiniscinae by the combination of: arista bare; costal vein not reaching apex of vein M; head and thorax uniformly brownish yellow; frontal and ocellar setae absent; 2 pairs of latero-clinate orbital setae; postvertical seta short, only 2× as long as occipital setulae; proepisternal ridge with 5–6 long biseriate setae; 2 postpronotal and 1–2 postsutural supra-alar setae; 1 dorsocentral seta aligned with intraalar setae; 3 pairs of scutellar setae; wing hyaline without pattern.

Description. Head (Figs 4–7) slightly higher than long. Frons slightly longer than wide, setulose. Frontal setae absent. Orbital plates short, only slightly extending anterior to ocellar triangle, with 2 short, latero-clinate and slightly reclinate setae. Face receding, slightly convex in profile, with distinct antennal grooves extending ventrally to 0.4 height of face, and with sharply margined medial carina, very broad on ventral 0.6; fronto-facial sutures reaching bases of antennal grooves (Fig. 5). Facial ridge as wide as antennal groove, with supravibrissal setulae in 3–5 rows, but no prominent vibrissae; lowermost setulae only twice as long as other setulae. Ptilinal fissure ending slightly below level of ventral margin of eye. Ocellar seta lacking; medial vertical seta half as long as horizontal diameter of eye and

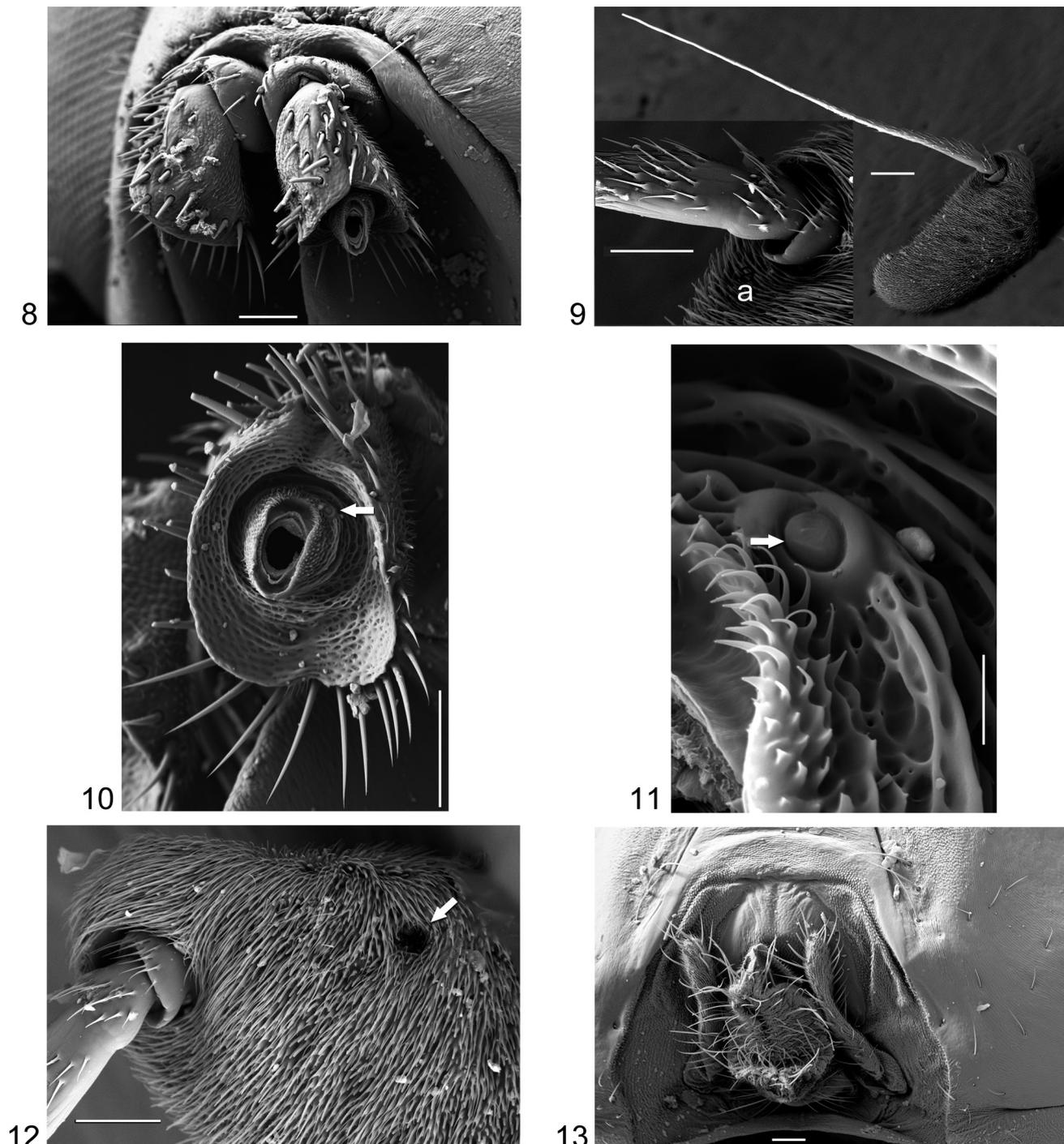


Figs 4–7. *Aliasutra australica* n.sp., head, SEM. (4) left; (5) anterior; (6) dorsal; (7) posterior. Scale = 0.2 mm.

1.8× as long as lateral vertical seta; postvertical seta small, at most twice as long as occipital setulae. Postocellar seta 1.5× as long as orbital setae. Postocular setulae acuminate, weak, not differentiated from occipital setulae. No genal setae. Postgenal groove very long, reaching upper half of compound eye. Antenna attached at level of upper 0.6 of eye height; scape (Fig. 8) very short, anteriorly directed, setose in apicodorsal half; pedicel (Fig. 10) as long as wide, with dorsal cleft and pedicellar button (Fig. 11) well developed; margins of pedicel setulose, ventromedial surface sparsely microtrichose, but not setulose; 1st flagellomere (Fig. 9) oval, densely microtrichose, with laterobasal sacculus (Fig. 12); arista 2-segmented (antennal segments 4 and 5 partly fused), very short pubescent at base. Palp (Fig. 13) elongate ovoid, dorsal margin slightly concave, setulose. Prementum small, not strongly convex; labella shorter and narrower than flagellomere 1, linear.

Thorax. Proepisternum less than twice as high as long, convex, with 5–6 subequal setae. Postpronotal lobe with 2–3 strong setae. Scutum with 1 presutural and 1 or 2 postsutural supra-alar, 1 intrapostalar, 1 postalar and 1–2 intra-alar setae; 1 acrostichal seta aligned slightly anterior or posterior to intra-alar and postalar setae; 1–2 dorsocentral setae (sometimes setula-like) aligned slightly anterior to intra-alar and postalar setae. Scutellum slightly convex, setulose, with 3, rarely 2 pairs of strong subequal

setae. Anepisternum not produced laterally, setulose medially and posteriorly; 2 strong postsutural anepisternal setae. Anepimeron with 2(1) setae, sometimes weak (not mounted on projection). Katepisternum with 1 moderately strong latero-clinate posterodorsal seta and 10–14 reclinate setae anterior to midcoxa. Katepimeron not modified. Postnotum at most sparsely and short microtrichose or bare. Metathoracic postcoxal area unsclerotized. Legs (Figs 14–21). Fore coxa with 4–5 setae at anteroventral margin; fore trochanter with a few short setulae; fore femur with two postero-dorsal rows and one postero-ventral row of setae. Mid tibia (Fig. 17) with 1 anterodorsal seta and 1 posterodorsal setae on apical half, and with 2 long and 2 short spur-like ventroapical setae (Fig. 19); hind tibia (Fig. 20) with anterodorsal row of 4–7, and dorsal row of 7–11 setulae. Wing (Fig. 24) hyaline, without dark pattern. Subcostal vein distally curved to meet costa at right angle, but not broken apically. Vein R_{4+5} with 5–7 setulae to level of r-m (or slightly beyond it) on dorsal side, bare on ventral side. Costal vein with many equally short spinules (sensu Hackman & Väisänen, 1985) on anterodorsal margin to the mid-distance between R_{2+3} and R_{4+5} apices and sparse fine setulae along ventral and dorsal surface, but no differentiated costal spines proximal to costal break. Abdomen. Tergites 3–5 of female of equal length, tergite 6 half as long as tergite 5. Sternites (Figs 27, 29) broad,



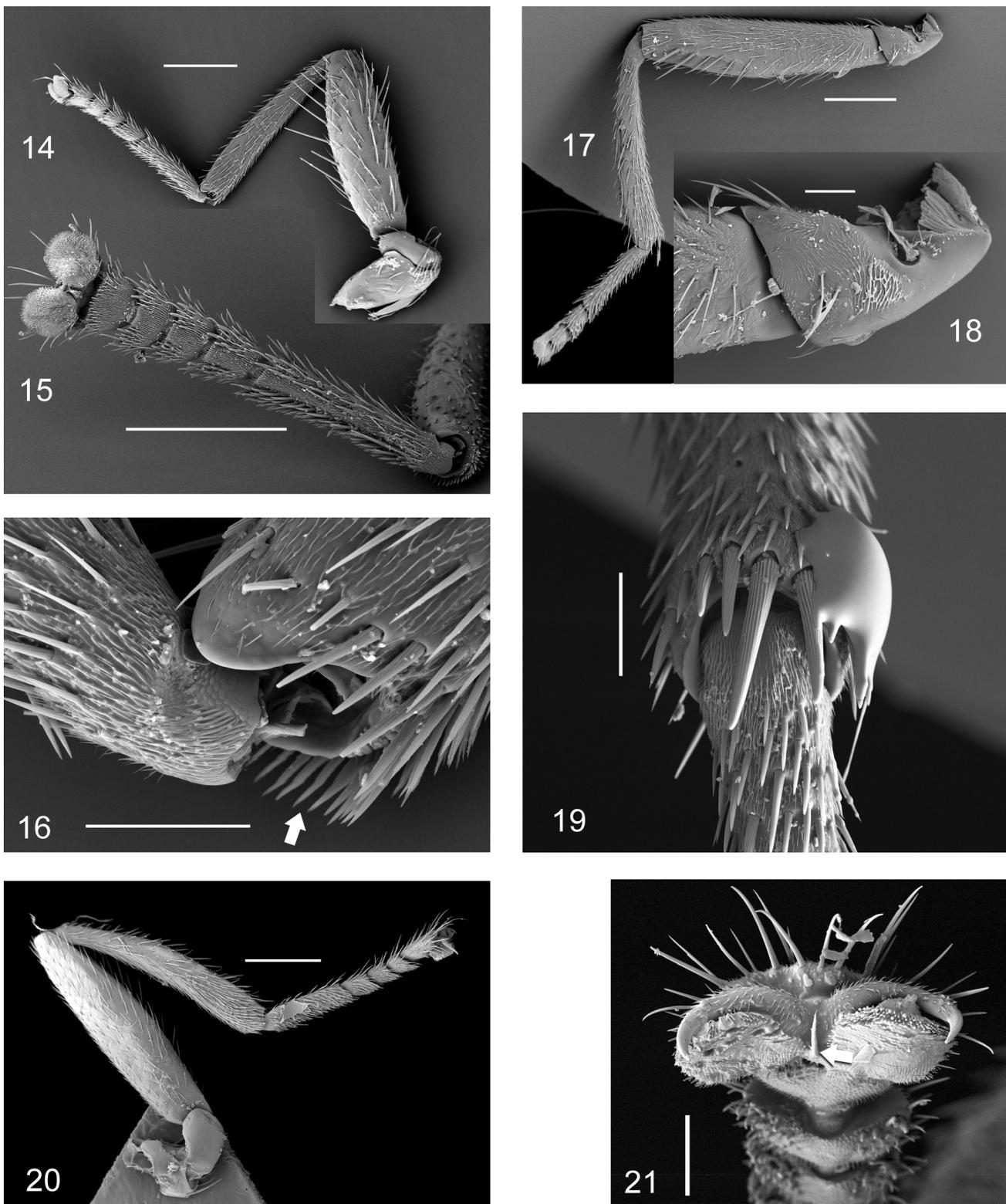
Figs 8–13. *Aliasutra australica* n.sp., head appendages, SEM. (8) antennae (flagellomeres detached); (9) flagellomere 1 and arista (a, base of arista, enlarged); (10) pedicel after removal of flagellomeres, apical, pedicellar button indicated; (11) pedicellar button; (12) base of flagellomere 3, sacculus indicated; (13) subcranial area and mouthparts, anteroventral view. Scale = 0.1 mm (8, 9, 10, 13) and 0.05 mm (9a, 11, 12).

trapezoid; sternite 1 poorly sclerotized, separated from sternite 2.

Male terminalia (Figs 27–28, 32–37). Cerci (Fig. 32–33) mostly membranous, with very short setulae, ventrobasally with subtriangular, dorsally curved sclerotized portion (subepandrial sclerite). Epandrium suboval, dorsally with very long setae; with moderately short and wide lateral (outer) surstylus and 2 prenisetae on mesal (inner) surstylus. Hypandrium with posteriorly expanded phallapodeme connected to two gonites by widely separated vanes.

Phallus (Figs 28, 35–36) with short bare stipe and narrow, non-sclerotized glans (half as long as stipe) and laterally projected, serrate lobe of preglans (Fig. 36); membrane posterior to basiphallus with postero-dorsally directed microtrichia (similarly to most examined Tephritidae).

Female terminalia. Oviscape short, with large dorso-apical opening, setae on dorsal side along opening (Figs 25–26, 29) 2× as long as setulae on ventral side. Eversible membrane with large ventral area of dark scales (Figs 25–26, 30); aculeus with nonsetulose anterodorsal dilation,

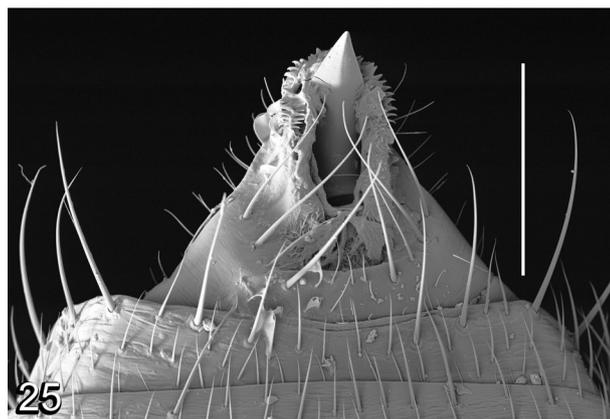
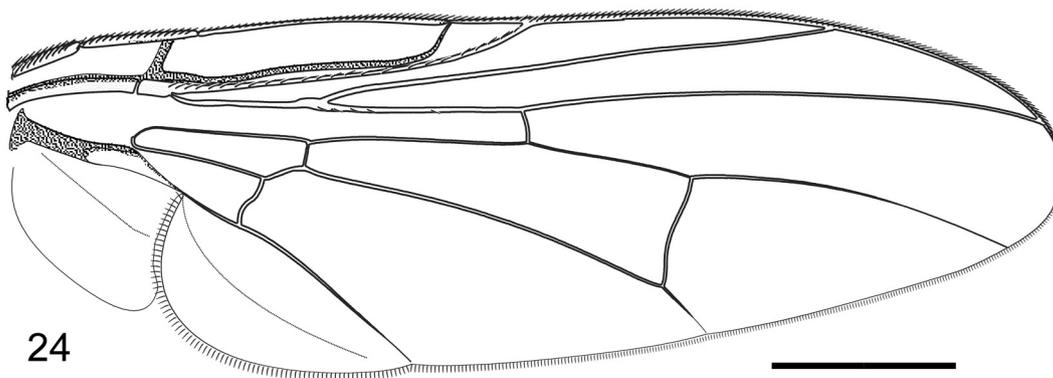
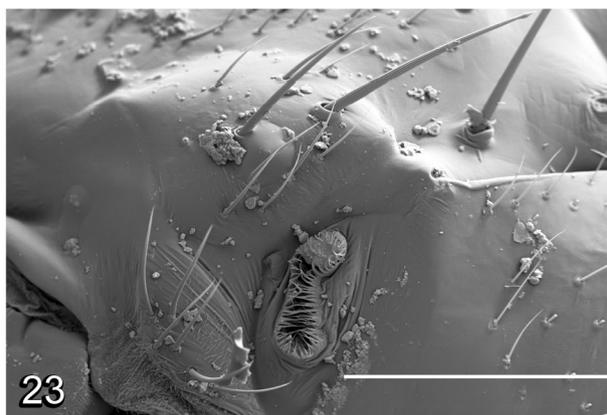
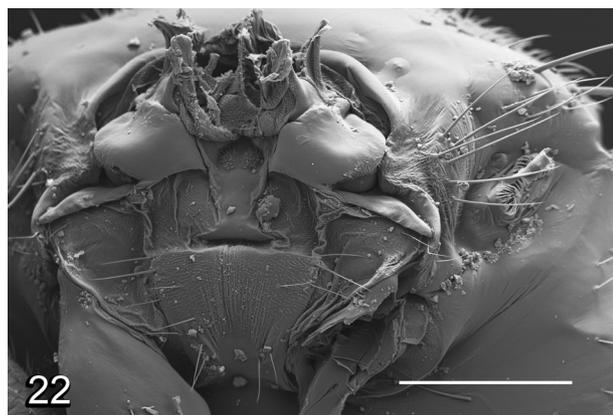


Figs 14–21. *Aliasutra australica* n.sp., left fore (14–16), mid (17–19) and hind (20–21) legs, SEM. (14) total, posterior view; (15) tarsus, ventral; (16) apex of fore tibia and base of tarsus, posterior, comb of apicoventral setulae indicated; (17) total, posterior view, apical tarsomere broken off; (18) mid coxa; (19) apex of mid tibia, ventral view; (20) total, anterior view; (21) last tarsomere, apical view, empodium indicated. Scale = 0.5 mm (14–15, 17, 20), 0.1 mm (16, 18–19, 21).

slightly narrowed in medial half, and dilated apical portion with smooth edges; ventral lobes (8th sternite) indistinct; in dissected paratype, 4 spermathecae elongate and wrinkled, spermathecal ducts separate to vagina, much shorter than

spermatheca itself; ventral receptacle unrecognizable or absent.

Etymology. The genus name is an anagram of “Australia”.



Figs 22–26. *Aliasutra australica* n.sp. (22–23 and 25–26, SEM). (22) prosternal region, anterior view (head detached); (23) postpronotal lobe, proepisternum and anterior thoracic spiracle; (24) wing; 25–26, tergite 6 and ovipositor, dorsal (25) and laterodorsal view (26). Scale = 0.5 mm (22–23, 25–26) and 1 mm (24).

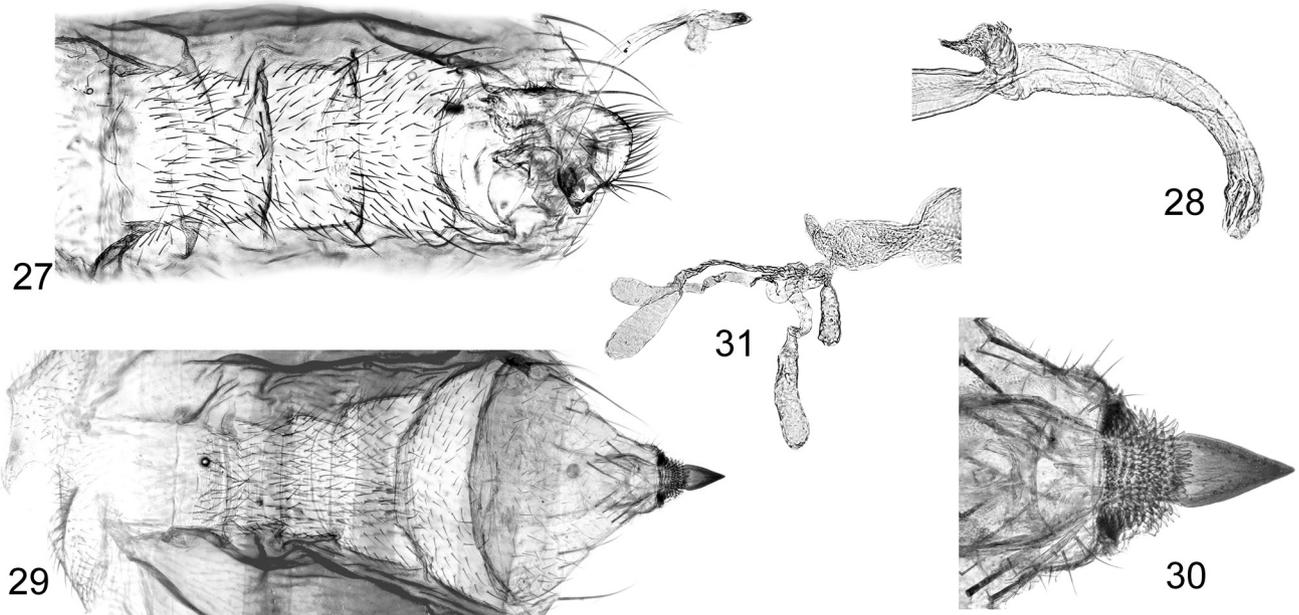
***Aliasutra australica* n.sp.**

Figs 31–43

Material examined. Holotype ♀. Queensland: “3 mi NW Mt. Mowbull, Bunya Mtns, Qld. 3350' [c. 1020 m], 7–8 Jan. 1970, MV lamp, G.A. Holloway Coll.” (AMS K351925). Paratypes. Queensland: 6♂♂, same label data as holotype (1♀ mounted on SEM stub, wings remaining on mount) (AMS, SIZK); 1♂, 2♀♀, Burnett R., Eidsvold, 230' [c. 70 m] 9 Jan. 1970, MV lamp, G.A. Holloway (AMS, SIZK); 3♀♀, Pistol Gap, near Byfield, 23°10'S 150°40'E, 10 Jan. 1970, MV lamp, G.A. Holloway (AMS). New South Wales: 1♂, Goonoo State Forest, 5 km S of Mendooran, 24 Mar. 1971, D.K. McAlpine (SIZK); 1♂, Binnaway State Forest, 31 Mar. 1972, A. & G. Daniels (AMS); 1♀, Wheogo, 13 miles [c. 21 km] E of Dunedoo, 17 Mar. 1963, R. Lossin (AMS); 1♀, Dunedoo, 23 Mar. 1963, R.B. (MNVM).

Diagnosis. Medium-sized reddish-yellow flies with hyaline wings and brownish-black abdomen (sometimes with brown vertex and dorsal portion of occiput and brownish-yellow abdomen).

Description. Head. Reddish yellow, with ocellar triangle usually black, vertex and dorsal portion of occiput often brown; head ratio (length : height : width) = 1:1.1:1.33. Frons 1.1–1.2× as long as wide, black setulose. Two orbital setae on posterior one-fourth of frons, 0.5× as long as medial vertical seta. Eye ratio (height: length) = 1.4–1.5. Parafacial (maximum) : eye length ratio = 0.55; eye : gena height ratio = 0.5. Facial ridge with 2–3 rows of small brown or black



Figs 27–31. *Aliasutra australica* n.sp., male (27–28) and female (29–31). (27, 29) abdomen, ventral view; (28) phallus glans, enlarged; (30) ovipositor, partly everted and compressed, ventral view; (31) spermathecae and vagina.

setulae on ventral two-thirds. Antenna short, length less than half height of face; pedicel black setulose; 1st flagellomere short, somewhat narrowed to apex, twice as long as wide and 1.7–1.8× as long as pedicel. Palp yellow, black setulose. Proboscis brown.

Thorax orange to dark brown, mostly nonmicrotrichose. Mesonotum 3.15 mm long, scutum as long as wide at pre-sutural supraalar setae. Scutellum setulose dorsally; apical setae crossed, intermediate setae as long as basal and apical setae. Proepisternum with 6–7 long setae as long as postpronotal setae. Katatergite and anatergite short and sparsely microtrichose; subscutellum and mediotergite bare. Setae black.

Legs. Yellow to brown.

Wing. Entirely hyaline, with yellow veins, 3–3.2× as long as wide, with yellowish stigma. Crossvein r-m at distal 0.6 of cell dm; 2nd costal section (cell c) 3.1× as long as 3rd costal section (stigma) and 0.95× as long as 4th section (cell r1); 2nd section of vein M 1.25× as long as 1st and 3rd section and 0.7× as long as 4th section. Cell bcu with posteroapical lobe much shorter than broadest width of cell.

Abdomen 1.1–1.2× as wide as long. Tergites nonmicrotrichose, black setose, normal in width. Female tergite 6 exposed, 0.5× as long as tergite 5.

Setae and setulae. All black.

Male terminalia. As in Figs 27–28, 32–37.

Female terminalia. As in Figs 25–26 and 30–31. Oviscape 0.55 mm long.

Measurements. Body length 7.5–8.0 mm. Wing length 5.0–6.0 mm.

Etymology. The species name is a New Latin adjective — Australian.

Remarks. The new species superficially reminds flies of the family Pyrgotidae in such characters as the frontal setae lacking, the postocular groove well expressed, the proepisternal setae long and numerous, and the wing mostly

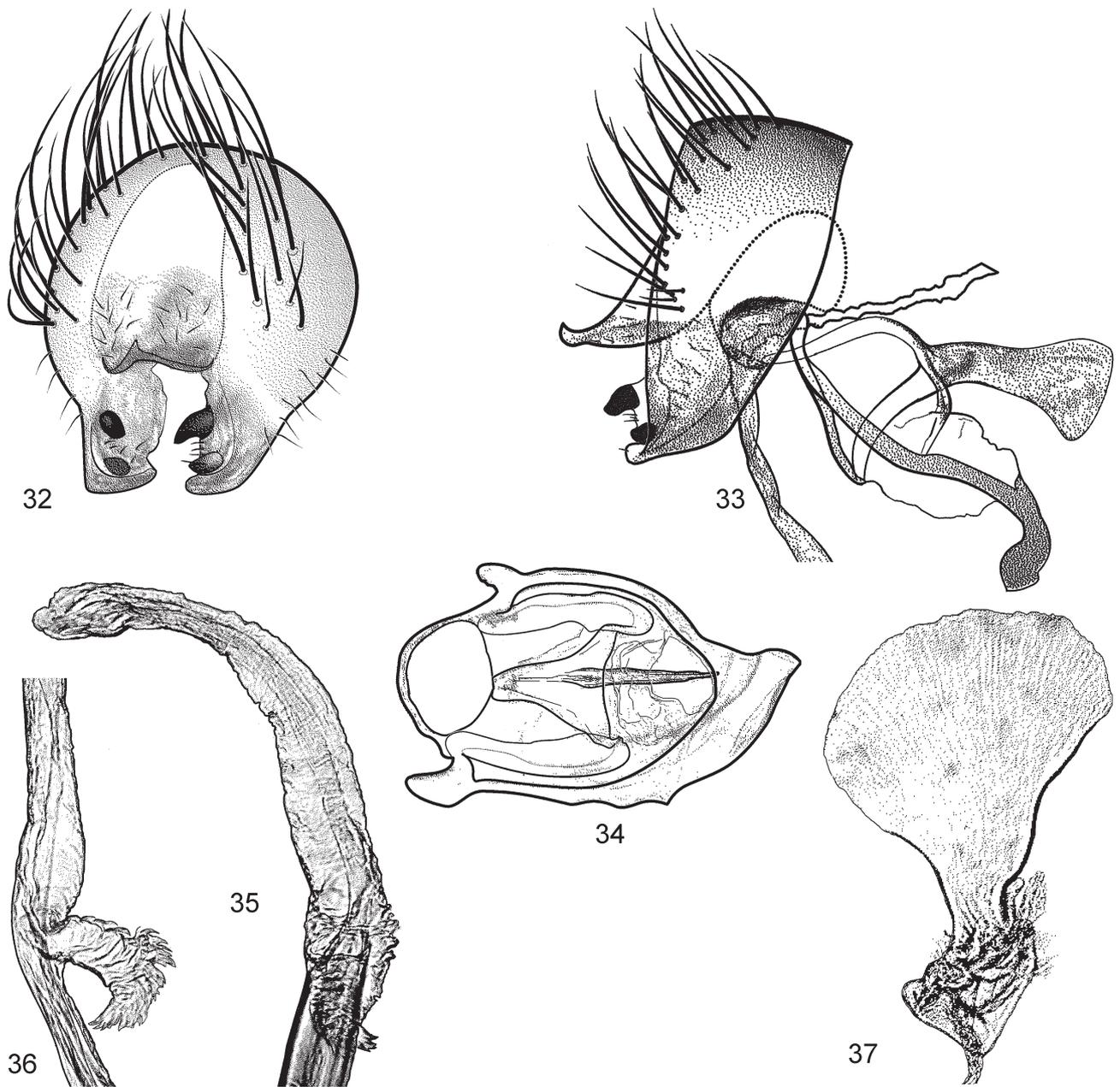
hyaline, differing from pyrgotids by the structure of the oviscape (aperture apicodorsal rather than apical).

Systematic position. Phylogenetic relationships in the subfamily and its classification were analysed by Korneyev & Norrbom (2006).

Aliasutra n.gen. belongs in the subfamily Tachiniscinae sharing its much specialised structure of female terminalia (oviscape with dorsoapical aperture, ventrally spinulose eversible membrane, and aculeus shape), which are the synapomorphies of the Tachiniscinae and do not occur anywhere else in the superfamily Tephritoidea. Otherwise, it shows very slight similarity to other genera of the subfamily. Its head shape (high gena, receding face) and the absence of anepimeral projection are similar to *Cyaforma* Wang, *Ortalotrypeta* Hendel, *Neortalotrypeta* Norrbom and *Agnitrena* Korneyev, but polarity of the first two characters is unclear, and the third character is obviously plesiomorphic. As in *Neortalotrypeta*, *Agnitrena* and *Bibundia*, the frontal setae are lacking in *Aliasutra*. The new genus also shares the additional postpronotal setae with *Ortalotrypeta*, *Bibundia* Bischof, *Tachinisca* Kertész, and *Protortalotrypeta* Norrbom.

On the other hand, it shares the short vertical plates with *Tachinisca* and *Protortalotrypeta*, the incomplete costal vein with *Bibundia*, *Tachinisca*, *Tachiniscidia* Malloch, and *Protortalotrypeta*, and the elongate spermathecae and phallus glans with *Bibundia*, *Tachinisca* and *Tachiniscidia* (not examined in the fossil *Protortalotrypeta*). The last 3 characters are the synapomorphies of the tribe Tachiniscini (Korneyev & Norrbom, 2006).

When included in the phylogenetic analysis (see Korneyev & Norrbom [2006] for the matrix and tree), *Aliasutra* takes position of a basal taxon in the tribe Tachiniscini along with the fossil *Protortalotrypeta*, but the polytomy remain unresolved, as the morphological data remain incomplete for the latter genus.



Figs 32–37. *Aliasutra australica* n.sp., male postabdomen. (32) epandrium, posterior view; (33) epandrium and hypandrium, right view (phallus detached); (34) hypandrium, ventral view; (35) phallus glans; (36) same, basal part, showing lobe of preglans; (37) ejaculatory apodeme.

ACKNOWLEDGMENTS. This study resulted from the studies of Australian genera of the family Pyrgotidae supported by Geddes Visiting Collection Fellowship at the Australian Museum (Sydney). I greatly appreciate constant attention to this work and generous assistance by David K. McAlpine, who has collected some of the type specimens and recognized it as a new taxon. He kindly read the manuscript and offered valuable comments and corrections. Suzanne Lindsay carried out scanning electron microscopy and assisted with macro images. Most of the type material was collected by the recently deceased Geoffrey A. Holloway, formerly of the Australian Museum.

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