THE RAFFLES BULLETIN OF ZOOLOGY 2012 **60**(1): 129–136
Date of Publication: 29 Feb.2012

TWO NEW PECULIAR PHORIDAE (DIPTERA: ASCHIZA) FROM VIETNAM

Gábor Dániel Lengyel
Department of Zoology, Hungarian Natural History Museum, H-1088, Baross. u. 13., Hungary
Email: lengyelgabor@gmail.com

László Papp
Department of Zoology, Hungarian Natural History Museum, H-1088, Baross. u. 13., Hungary

ABSTRACT. — One peculiar species each of the genera *Abaristophora* Schmitz and *Postoptica* Disney are described from Vietnam. *Abaristophora hirticornis* is a new species that possesses special appendages on each side of the metathorax, which is unique among the species of Phoridae. The discovery of the second species of the reduced winged genus *Postoptica*, *P. continentalis*, new species, in the continental Asia suggests a broader distribution of the genus in the Oriental region. A checklist of *Abaristophora* with distribution of the described species and a key for the males of *Postoptica* is given.

KEY WORDS. — *Abaristophora*, *Postoptica*, new species, Vietnam, Oriental region

INTRODUCTION

In Apr.2010, a collection trip was made in the northern parts of Vietnam. Two new species were found belonging to the genera *Abarsitophora* Schmitz, 1927 and *Postoptica* Disney, 1987. The systematic relationships of the genus *Postoptica* Disney, 1987 remain unsolved, because *P. continentalis*, new species, is quite similar to the known one, *P. platypezoidea* Disney, 1987, without any common or intermediate feature to other genera.

Abaristophora hirticornis, new species (Fig. 2), seems highly unusual with its special appendages on its thorax, which does not remind us to any known morphological structures. In phorids, however, its systematic relations are clearer: the species belongs to *Abaristophora* subgenus *Antipodiphora* Schmitz, 1939.

MATERIAL AND METHODS

For studies on genitalia we used sodium hydroxide (NaOH) method (Papp, 2008). After removing the postabdomen from the pinned dry specimen, it should be moved into a dish of warm water for softening and cleaning. After a while it is dropped into a small vial filled with ca. 10 % NaOH solution and boiled for a couple of minutes to make it semi-transparent (use a microscope to ensure this). When semi-transparent, the alkali must be rinsed and neutralised with lactic acid ($C_3H_6O_3$). Water is then used to rinse out the lactic acid, and the genitalia could be studied under microscope.

The present work is based on the material of the Diptera Collection of Hungarian Natural History Museum (HNHM) and the holotype of *Postoptica platypezoidea* was borrowed from the University Museum of Zoology, Cambridge, UK. All the voucher specimens are deposited in HNHM.

TAXONOMY

Abaristophora Schmitz, 1927

Type species, *A. arctophila* Schmitz, 1927

The treatment of *Abaristophora* Schmitz, 1927 and *Antipodiphora* Schmitz, 1939 as distinct genera was long disputed (Schmitz, 1939; Borgmeier, 1963; Brown, 1988, 1992) until Disney & Ross (1997) treated *Antipodiphora* as a subgenus of *Abaristophora*. Nakayama & Shima (2006) gave detailed information on the status of each genus and the relation to its closest relative genus *Borophaga*. Before this article, 12 species were known worldwide (Table 1.). The species of subgenus *Abaristophora* are restricted to the northern hemisphere except the undescribed species in Brown (1992) from Venezuela, while the species of the subgenus *Antipodiphora* seems to have an Oriental distribution.

Abaristophora (Antipodiphora) hirticornis Lengyel & Papp, new species

(Figs. 2–8a–e)

Material examined. — **Holotype.** Male, VIETNAM: Hoa Binh Prov., 6 km west of Tan Son, forest edge in a gorge, sweeping,

Table 1. Known species of the genus *Abaristophora* Schmitz and their distribution.

	Name of species	Distibution
subgenus *Abaristophora*		
1.	*Abaristophora arctophila* Schmitz, 1927	Russia – Kamchatka, Europe – Estonia* (Schmitz, 1929)
2.	*Abaristophora diversipennis* Borgmeier, 1962	USA (Borgmeier, 1963)
3.	*Abaristophora sachalinensis* Michailovskaya, 1988	Russia (Michailovskaya, 1988), Japan (Nakayama & Shima, 2006)
4.	*Abaristophora* sp. in Brown (1992)	Venezuela (Brown, 1992)
subgenus *Antipodiphora*		
5.	*Abaristophora austrophila* Schmitz, 1939	New Zealand (Schmitz, 1939)
6.	*Abaristophora brevicornis* Schmitz, 1939	New Zealand (Schmitz, 1939)
7.	*Abaristophora nana* Schmitz, 1939	New Zealand (Schmitz, 1939)
8.	*Abaristophora similicornis* Schmitz, 1939	New Zealand (Schmitz, 1939)
9.	*Abaristophora subarcuata* Schmitz, 1939	New Zealand (Schmitz, 1939)
10.	*Abaristophora tonniori* Schmitz, 1939	New Zealand (Schmitz, 1939)
11.	*Abaristophora nepalensis* Disney, 1997 in Disney & Ross, 1997	Nepal (Disney & Ross, 1997)
12.	*Abaristophora hirticornis* new species	Vietnam
fossil species		
13.	*Abaristophora domicamberae* Disney, 1997 in Disney & Ross, 1997	

*Schmitz (1929) reported an incomplete specimen from North Europe, which probably belongs to this species.

938 m, 20.7417977°N, 104.9401984°E, coll. Papp, L., Peregovits, L., Soltész, Z. & Lengyel, G., 22 Apr.2010.

Diagnosis. — Average-sized phorid fly with specific long membranous appendages on each side of the thorax. Antero- and mediolateral setae lacking on frons. Third antennal segment tapering suddenly after a bulbous part and bearing long rays. Arista emerges apically. Costa short, vein R_{2+3} absent on wing. Anepisternum with setulae and without a furrow.

Description. — **Male.** Body length: 1.3 mm. Head brown. Frons (Fig. 3) approximately as high as broad, its surface covered with small, but not dense setulae. No median furrow, only antial, preocellar, ocellar, posterolateral and vertical setae present. Ocellars divergent, posterolaterals short and convergent. Verticals the shortest, divergent. Antial, preocellar and ocellar setae curving backward. Frons with a nose-like tubercle in the saggital line anteriorly. Antenna (Fig. 4) lies in bare cavity of prefrons. First flagellomere (postpedicel) brownish with a globose basal part which suddenly tapering

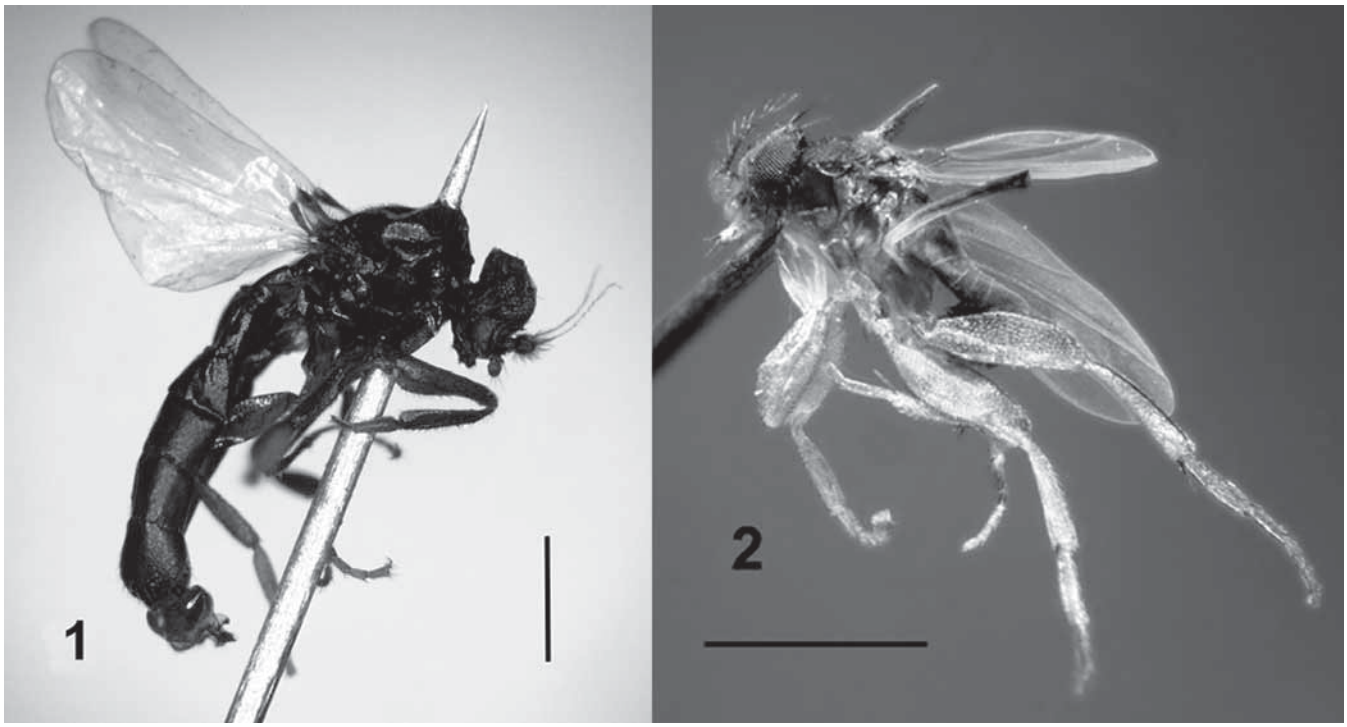


Fig. 1. *Postoptica continetalis* new species male habitus. Scale bar = 1 mm.

Fig. 2. *Abaristophora hirticornis* new species male habitus. Scale bar = 0.5 mm.

to a long appendage with long rays. It is covered with dense long setae. Arista emerges apically from the appendage and covered by short trichia. Palpi yellowish, each with seven dark setae.

Thorax typically hump-backed. Scutum brown. The two scutellar setae emerge far from each other, close to the anterior hair-like setulae. Anepisternum with nine setulae in upper part. A pair of membranous appendages situated on the metathorax at the meeting point of meron, hind coxa and abdominal membrane (Figs. 2, 5). Appendages with small spiny microtrichia, apex pigmented brownish, base pale yellowish. A tube visible inside.

Legs yellowish. Fore leg with palisades on tibia, metatarsus and second tarsal segment. Last tarsal segment longer than fourth (Fig. 6). Claws absent. Mid tibia with two setae basally and with a palisade of setulae, which runs to the end of the first three quarter. Hind tibia with two palisades of setulae.

Membrane of wings (Fig. 7) clear. Subcostal vein short, not reaching costa or R_1. Vein R_{2+3} absent. Three weak longitudinal veins (M_{1+2}, M_{3+4}, Cu) visible on wing membrane, anal vein as a faint fold only. Two hairs present on axillary ridge (on Fig. 7 it is broken). Costa short (costal index: 0.35). Halteres with stalk yellowish, knob brown.

Abdominal tergites brown, posterior margins faded to yellowish. No conspicuous sternites. Epandrium brown, covered in dense microtrichia, higher than wide. Right epandrial lobe long with numerous setae. Cerci with strong setulae. Epandrium much higher than broad or long (Fig. 8a–b), and with a circular orifice for the cerci and hypoproct. Hypoproct small, microtrichose. Cerci with a small ventro-medial sharp process each and with numerous medium long setae. Cercal orifice bordered by setae on epandrium. Epandrium and hypandrium not fused. Epandrium caudally (ventrally) with long setae (Fig. 8c). Hypandrium (Fig. 8d) much smaller than epandrium, almost completely ventral, with 3 pairs of ventral processes, of with the anterior process double. Anterior and dorsal parts of hypandrium membranous and covered by oval to longish incrustations, mostly very narrow U-shaped (Fig. 8d). Basiphallus forms an open ring (Fig. 8e), phallapodeme curved lamelliform (in the sagittal plane). Distiphallus with 2 asymmetrical thorn-like sharp processes (Fig. 8c–e), apical part conical.

Female. — Unknown.

Etymology. — The specific epithet "*hirticornis*" refers to the peculiar antenna with numerous long rays.

Distribution. — Presently known only from Vietnam.

Postoptica Disney, 1987

Type species, *P. platypezoidea* Disney, 1987

The genus was established based on a single male specimen caught in Dumoga-Bone National Park, Sulawesi (Disney, 1987). Brown (1994) mentioned a second male from the Philippines. Otherwise there is no more data on this little-known genus.

Postoptica continentalis Lengyel & Papp, new species

(Figs. 1, 9–12a–f)

Material examined. — **Holotype.** Male, VIETNAM: Hoa Binh Province 6 km W of Tan Son, forest edge in a gorge, sweeping, 938 m, 20.7417977°N, 104.9401984°E, VN2010PL_25, coll. Papp, L., Peregovits, L., Soltész, Z., & Lengyel, G., 22 Apr.2010.

Paratype. — 1 male Vietnam, Bac Kan, Ba Be National Park, forest in the gorge behind the headquarter, 200 m, 22.417137°N, 105.632505°E, sweeping, coll. Papp, L., Peregovits, L., Soltész, Z., & Lengyel, G., 17–18 Apr.2010.

Diagnosis. — *Postoptica continentalis* new species characterised by its genitalic difference.

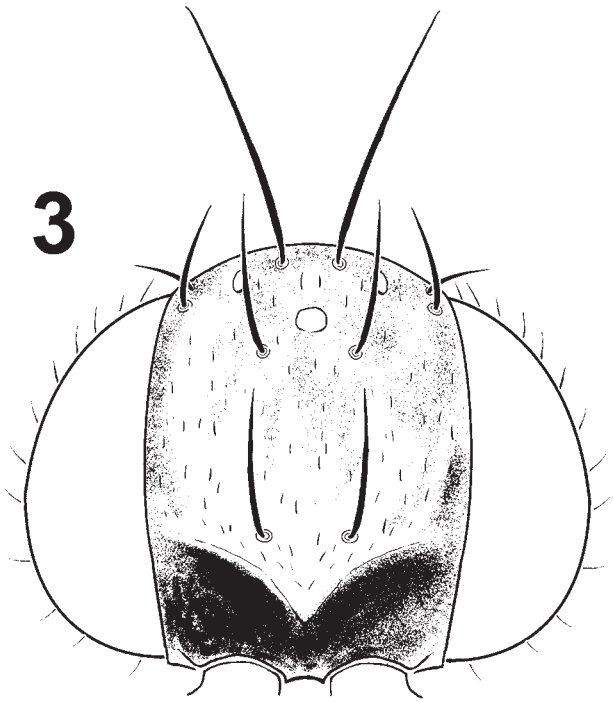
Description. — **Male.** Body length: 4.8 mm. Head dark brown. Eyes almost touching each other behind the ocellar triangle. Third antennal segment with numerous long setae (Fig. 9). Largest pair approximately as long as the diameter of third segment. Arista apical, covered with similar microtrichia as the surface of third segment. Palpus with six strong setae emerging on the distal ventral margin, and many smaller setulae on the inner surface (Fig. 10). Stem of palpus quite long.

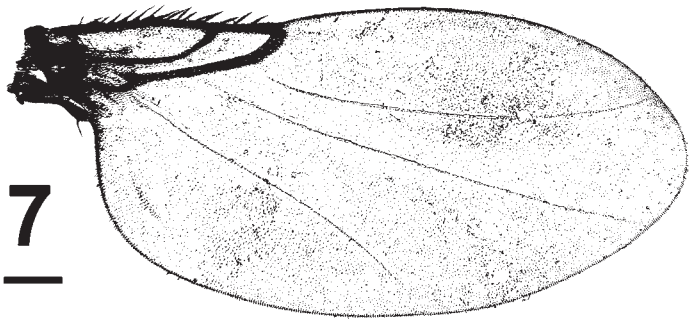
Thorax dark brown. Scutellum with two weak lateral setae. Anepisternum with eight or nine setulae in a cluster at the distal middle part, and seven in the upper portion.

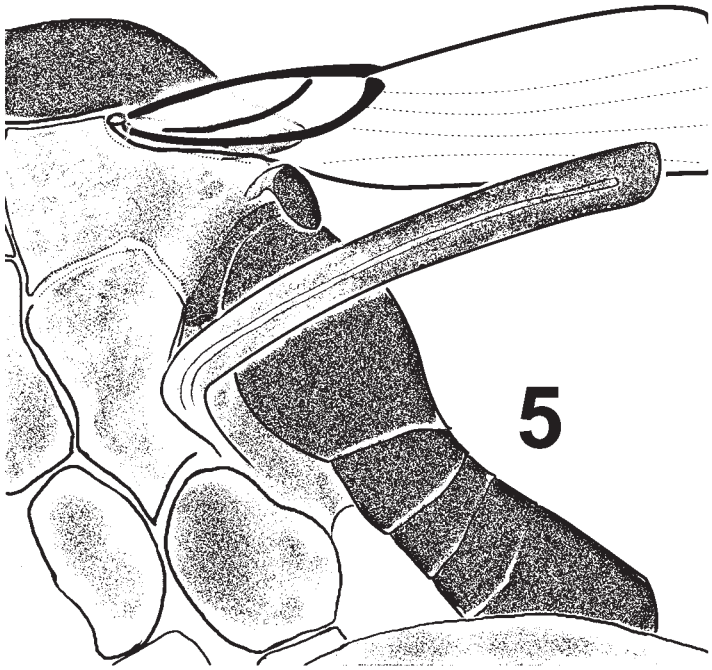
Legs without differentiated setae or palisade of setulae. Fore coxa, femur, tibia and metatarsus with relatively deep and long grooves. Fore tibia strongly, mid tibia slightly, hind tibia a little bit harder widening distally. Claws strong.

Wings (Fig. 11) clear, with very reduced wing venation. Only the costa and R_{4+5} well developed, other veins weak, hardly discernible. Axillary ridge with 12 setae, (10 in *P. platypezoidea*). Haltera brown, knob of haltera relatively large.

Abdominal tergites dark brown. Epandrium and hypandrium fused along a longer section (Fig. 12a–b); epandrium bare, hypandrium with microtrichia (Fig. 12a). Cerci in a semicircular orifice of epandrium (Fig. 12a, d), cerci with short setae. Caudal to cerci there are two intricate processes, the left surstylus and the surstylar process (signed as "s" and "p" on Fig. 12c). Surstylus with a black long thorny peg (i.e. not a thorn) and with a digitiform smaller process (Fig. 12d). Numerous but not long setae emerge on it. Surstylar process quite robust, its apex seems sharp in left lateral view, actually not sharp apically (see Fig. 12a). Cavity of hypandrium with a sack, whose wall is covered by curved short thornlets (Fig. 12e–f). Phallic organ of an intricate structure: a medial well-sclerotised ring, an inner laterally directed subapical process, and an apical "brush" of dark but less sclerotised acrophallus (Fig. 12d) present.







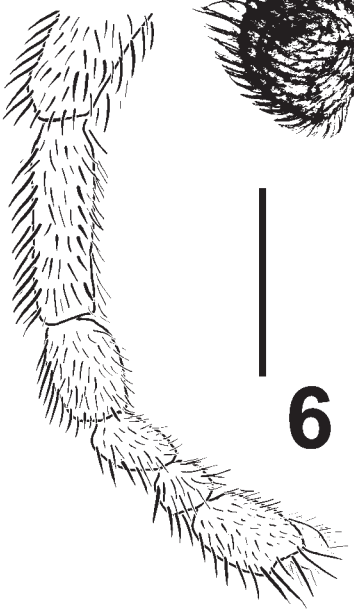


Fig. 3. Frontal chaetotaxy of *Abaristophora hirticornis* new species.

Fig. 4. Left antenna *Abaristophora hirticornis* new species from lateral view. Scale bar = 0.1 mm.

Fig. 5. Metathorax of *Abaristophora hirticornis* new species from lateral view.

Fig. 6. Fore tarsomeres of *Abaristophora hirticornis* new species. Scale bar = 0.1 mm.

Fig. 7. Wing of *Abaristophora hirticornis* new species. Scale bar = 0.1 mm.

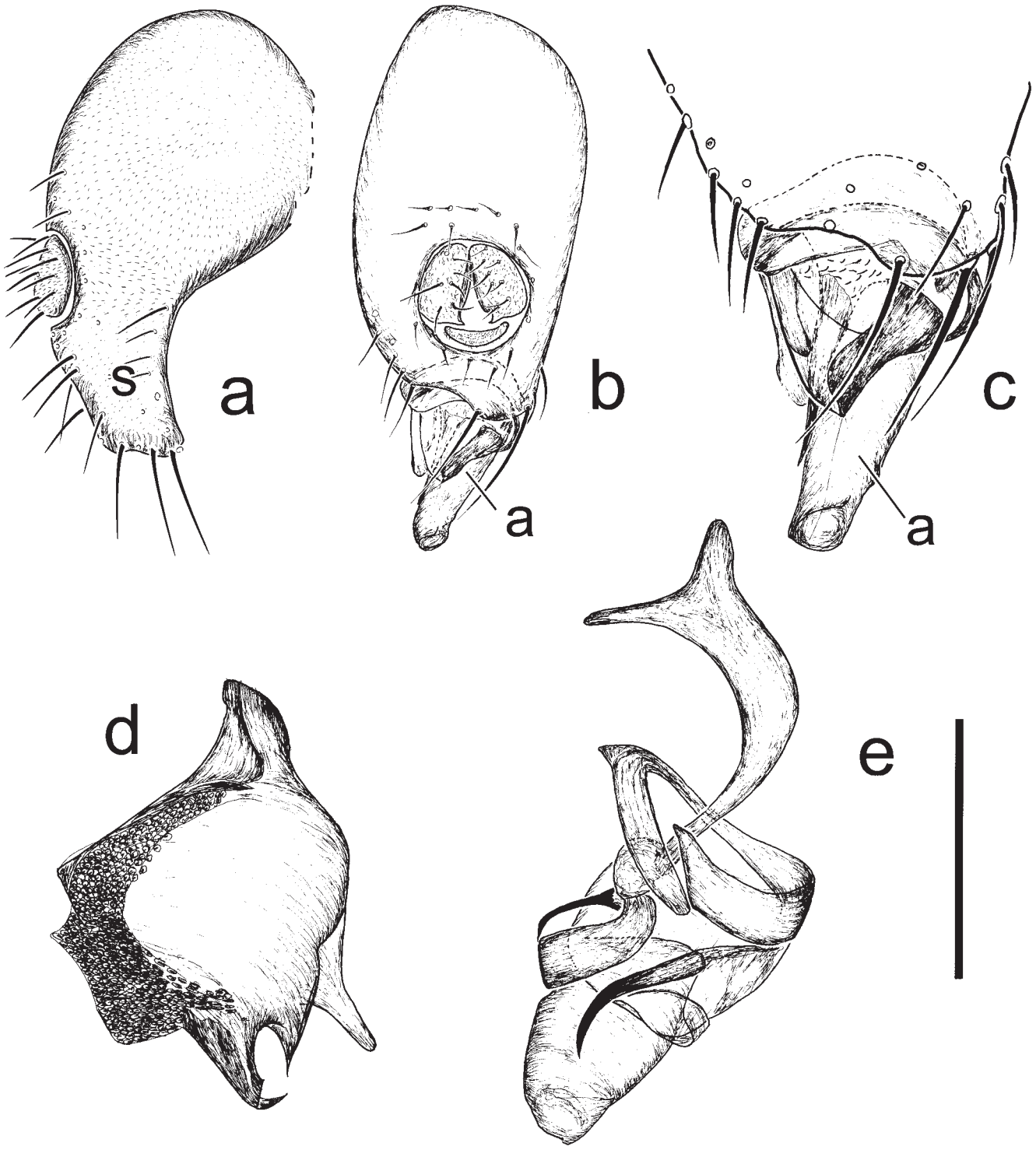


Fig. 8. *Abaristophora hirticornis* new species male, genitalia: a, right face of epandrium in lateral view; b, epandrium and phallic complex, caudal view; c, ventral apical part of epandrium with phallic organ in higher magnification; d, hypandrium, lateral view; e, phallus and phallapodeme, lateral view. Scale bars = 0.2 mm (a–b), 0.1 mm (c–e). Abbreviations: s – surstylus; a – adeagus.

Etymology. — The name '*continentalis*' refers to the species having been found in continental Asia.

Distribution. — At present known only from Vietnam.

Affinities. — *P. continentalis* new species bears close resemblance to *P. platypezoidea*. These two species could be certainly distinguished by the structure of the male genitalia (Fig. 12 a–f). The holotype of *P. platypezoidea* is slide-mounted, therefore it can only be examined in one plane, and this limited the information that could be extracted from the specimen. Brown (1994) provided additional figures of the genitalia for this species. Based on his figures, it appears that the surstylus in case of *P. platypezoidea* is more pointed, short and wide, while in *P. continentalis* it is long, narrower with rounded tip. Additional specimens may help identify more distinctions between these two species.

Key to *Postoptica* males

1. Numerous setae emerging only on the apical margin of the left surstylus. Left surstylus narrow, long and apically rounded .. .. ***P. continentalis* new species**
– Few setae emerging on the entire left surstylus. Left surstylus wide, short and apically pointed ..... ***P. platypeizodea* Disney**

ACKNOWLEDGEMENTS

The authors would like to thank to their colleagues László Peregovits and Zoltán Soltész, and for the Vietnamese partners, Dr. Khanh Le Duc, who helped us much during the collection trip. This research was supported by the Hungarian National Office for Research and Technology, Grant No. VN-10/2006.

LITERATURE CITED

Borgmeier, T., 1963. Revision of the North American phorid flies. Part 1. The Phorinae, Aenigmatiinae and Metopininae, except *Megaselia* (Diptera, Phoridae). *Studia Entomologia*, **6**: 1–256.

Brown, B. V., 1988. Additions to the phorid chapter in the Manual of Nearctic Diptera, Volume 2 (Diptera: Phoridae). *Canadian Entomologist*, **120**: 307–322.

Brown, B. V., 1992. Generic revision of Phoridae of the Nearctic Region and phylogenetic classification of Phoridae, Sciadoceridae and Ironomyiidae (Diptera: Phoridea). *Memoirs of the Entomological Society of Canada*, **164**: 1–144.

Brown, B. V., 1994. Descriptions and subfamily classification of some unusual Phoridae (Diptera). *Canadian Entomologist*, **126**: 703–707.

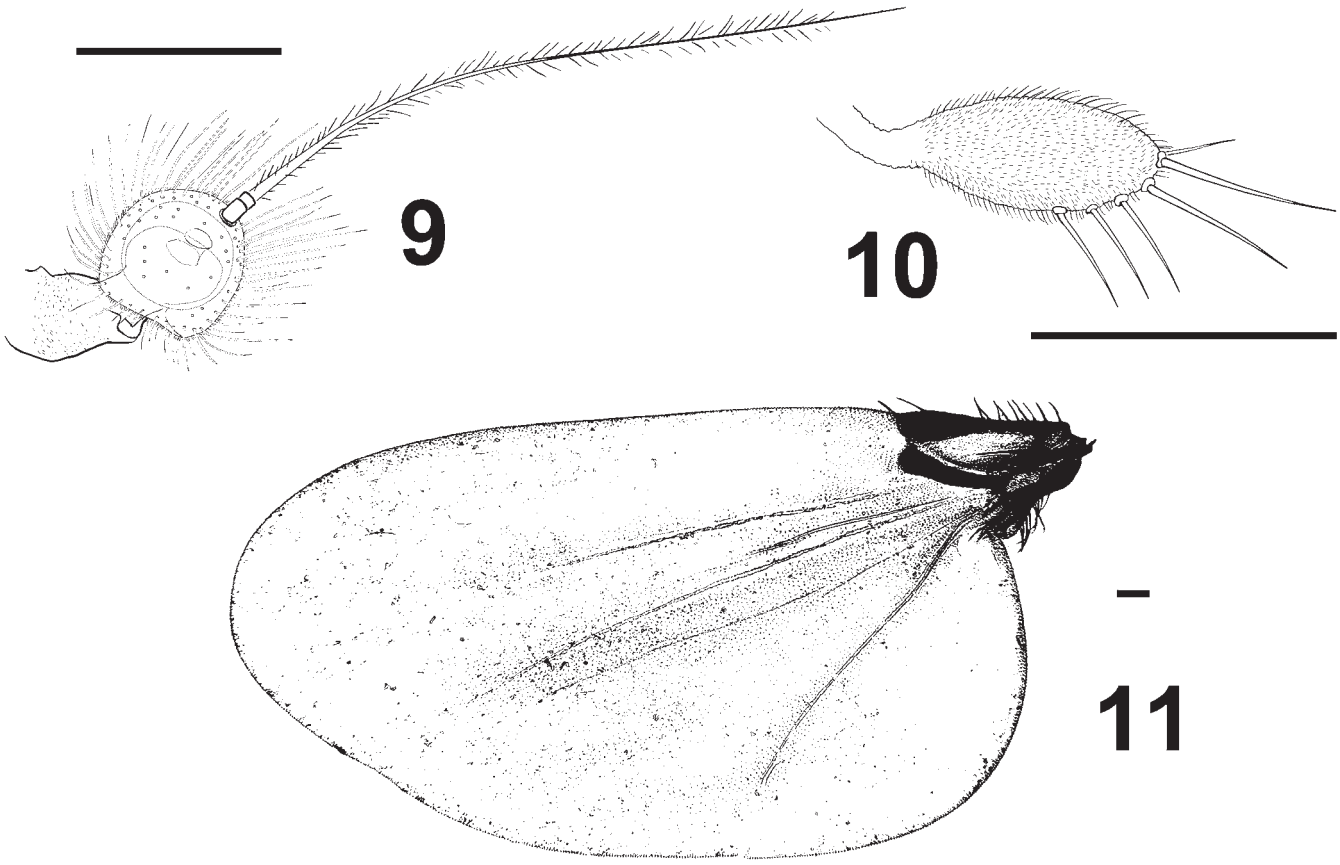


Fig. 9. Right antenna of *Postoptica continetalis* new species from lateral view. Scale bar = 0.1 mm.

Fig. 10. Right palpus of *Postoptica continetalis* new species from lateral view. Scale bar = 0.1 mm.

Fig. 11. Right wing of *Postoptica continetalis* new species. Scale bar = 0.1 mm.

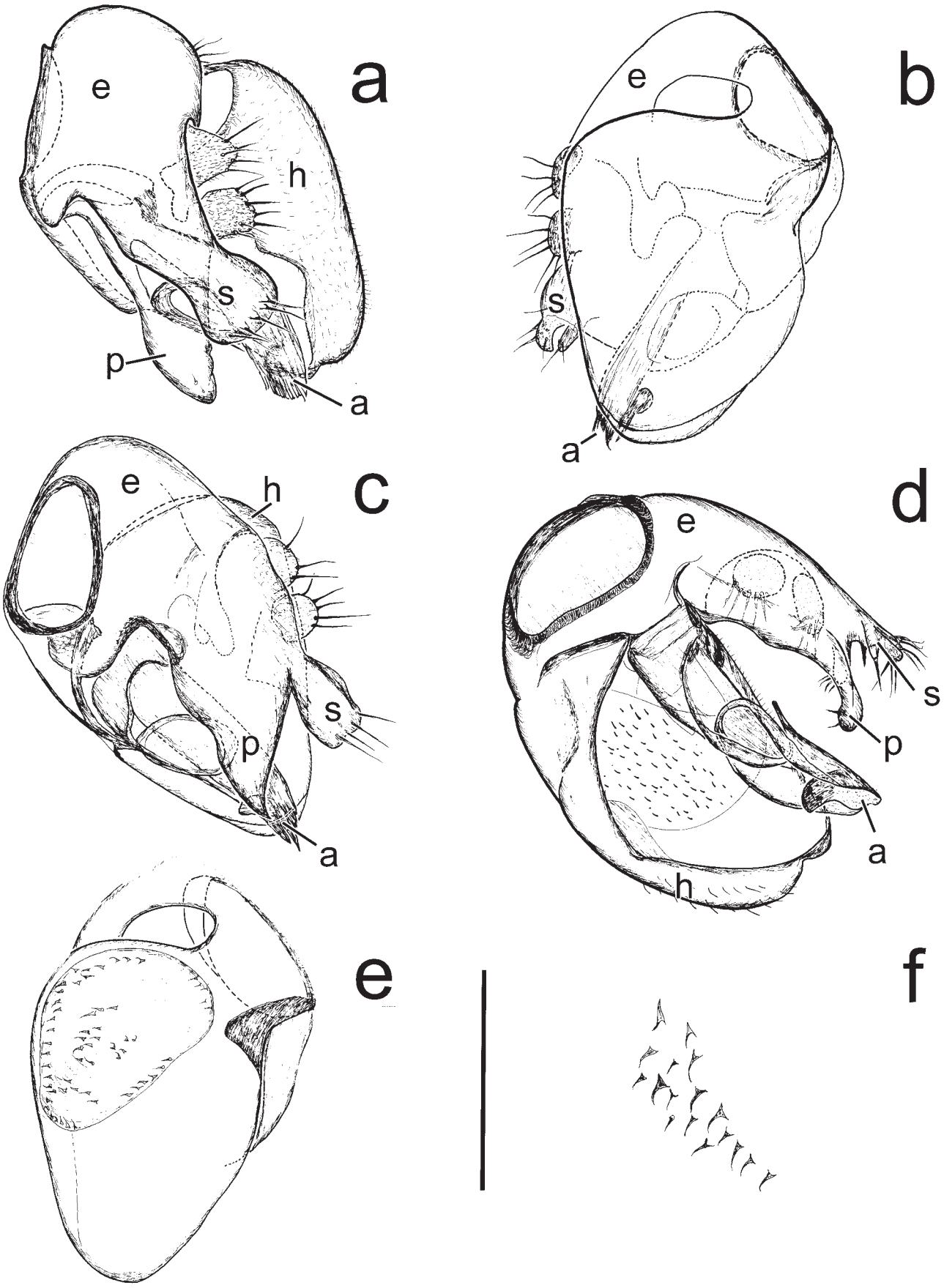


Fig. 12. *Postoptica continentalis* new species, paratype, male genitalia: a, genitalia in the view of Disney's (1987) Fig.(4); b, right lateral view; c, left lateral view; d, subventral view; e, hypandrium with the thorny sack inside, as if hypandrium would be transparent; f, thorns in higher magnification. Scale bars = 0.2 mm (a–e), 0.1 mm for (f). Abbreviations: e – epandrium; h – hypandrium; s – surstylus; p – surstylar process; a – adeagus.

Disney, R. H. L., 1987. A most remarkable new genus of scuttle fly (Diptera: Phoridae) from Sulawesi. *Systematic Entomology*, **12**: 29–32.

Disney, R. H. L. & A. J. Ross, 1997. *Abaristophora* and *Puliciphora* (Diptera: Phoridae) from Dominican amber and revisionary notes on modern species. *European Journal of Entomology*, **93**: 127–135 (1996).

Nakayama, H. & H. Shima, 2006. *Abaristophora sachaliensis* Michailovskaya (Diptera: Phoridae) representing genitalic affinities with the genus *Borophaga* Enderlein. *Entomological Science*, **9**: 313–318.

Papp, L., 2008. Studies on the old world Limosininae (Diptera, Sphaeroceridae). *Acta Zoologica Academiae Scientarum Hungaricae*, **54**(2): 1–45.

Schmitz, H., 1929. *Revision der Phoriden*. F. Dümmler, Bonn, Berlin. 211 pp.

Schmitz, H., 1939. Neuseeländische Phoriden. *Natuurhistorisch Maandblad*, **28**: 34–37, 55–56, 67–68, 75–76, 86–89, 98–101, 110–116, 124–129.