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ARTICLE



Discovery of the genera *Trichacis* Förster and *Piestopleura* Förster (Hymenoptera: Platygastroidea) in Iran with descriptions of three new species

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ABSTRACT

The hymenopteran family Platygastriidae *consisting* of two subfamilies, Platygastriinae and Sceliotrachelinae, is a large group of exclusively parasitoid wasp. Platygastriinae is a taxonomically poorly known subfamily of uniform morphology. A faunistic survey was conducted in the northwest of Iran by Malaise traps and sweeping net to study the Platygastroidea (Hym.: Platygastriidae). Based on collected specimens, two genera *Trichacis* and *Piestopleura* from the subfamily Platygastriinae were found for the first time in Iran. Also, three new species are described: *Trichacis persicus* sp. nov., *Trichacis marandicus* sp. nov. and *Piestopleura iranica* sp. nov. Figures, distribution and comparative diagnosis of each species are provided.

KEYWORDS

Platygastriinae; new species; fauna; Iran

Introduction

The family Platygastriidae in the traditional definition comprises about 1700 described species, grouped in two subfamilies Platygastriinae and Sceliotrachelinae [1]. All species of Platygastriinae are probably koinobiont egg–larval or egg–pupal parasitoids of gall midges (Cecidomyiidae). In many countries, the tiny platygastriid wasps have been largely neglected and are very poorly known [2].

The genus *Trichacis*, koinobiont endoparasitoids of cecidomyiid larvae [3,4], is a large genus with 65 described species worldwide [5]. The genus *Piestopleura* is represented by 19 species worldwide [5], of which 14 species are known from the Palaearctic region. The species of *Piestopleura* parasitises the eggs or larvae of gall midges and polyembryony occurs on much larger hosts [6]. Therefore, these two genera have the potential to be key agents in biological control of gall midges.

The presence of the specialised area on the top of the mesoscutellum allows separation of *Trichacis* from *Piestopleura* and *Synopeas*, as well as from all other genera [4]. *Piestopleura* differs from *Trichacis* by the extreme lateral compression of its thorax and its anteroposteriorly compressed head [7,8]. Both genera have a dorsoventrally compressed metasoma.

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Aims of the present paper are to report the genera *Trichacis* and *Piestopleura*, from Iran, and to describe two new species of *Trichacis* and one of *Piestopleura*.

Materials and methods

Studied wasps in this research were collected by Malaise traps and sweeping net from two different localities in the northwest of Iran: East-Azerbaijan (Marand and Khosroshah) and West-Azerbaijan provinces (Urmia University campus). Collected specimens were card mounted and labelled. The examination of external morphology of dry-mounted specimens was done using an Olympus™ SZH. Morphological terminology and abbreviations follow those of Masner & Huggert [9]. Used abbreviations for description: A1–A10 = antennal segments 1–10; OOL = distance between lateral ocellus and eye; LOL = distance between lateral and anterior ocelli; POL = distance between lateral ocelli and T1–T6 = tergites 1–6. Photos were taken using a BK Lab System by Visionary Digital and also Zerene Stacker 1.04 (Zerene Systems LLC, Richland, Washington, USA) for focus stacking and assemblage and illustrations in the plates were done in Adobe Photoshop CS4© software. Type materials were deposited in the HMIM (Hayk Mirzayans Insect Museum, Iranian Research Institute of Plant Protection, Tehran, Iran).

Results

Descriptions of new species

Trichacis persicus Asadi & Buhl, sp. nov. (Figure 1)

Material examined

Holotype. Female: Iran, East-Azerbaijan province, Marand, Payam (38°48'84"N, 45°77'57.24"E), VIII. 2008, Malaise trap, H. Lotfalizadeh leg.

Paratype. One female: Iran, West-Azerbaijan province, Urmia University Campus (37°39'27"N, 44°58'36"E), V. 2017, Sweeping net, M. Asadi-Farfar leg.

Diagnosis

In female A4 nearly 1.2 times as long as A3, and A9 nearly 1.2 times as wide as long; hyperoccipital carina longer than distance between eyes; scutellum flat, with only a weak tuft behind; wings faintly infuscated; female metasoma 2.25 times as long as wide, T2 striated in most of anterior 0.3.

Description

Female. Body length 1.5–1.8 mm. Black, A2–A10 and coxae hardly lighter; A1, mandibles and legs yellowish brown, tegulae and trochanters dark brown. Head from above 1.75 times as wide as long, 1.05 times as wide as mesosoma; occiput evenly covered by fine and dull rugosity; hyperoccipital carina longer than distance between eyes; occiput finely and smoothly reticulate-coriaceous, behind ocellar area much transversely so; frons smooth except for fine reticulation along inner orbits and a couple of transverse wrinkles above antennal insertions. OOL:POL:LOL = 3.5:10.0:4.0. Head in frontal view 1.2 times as wide

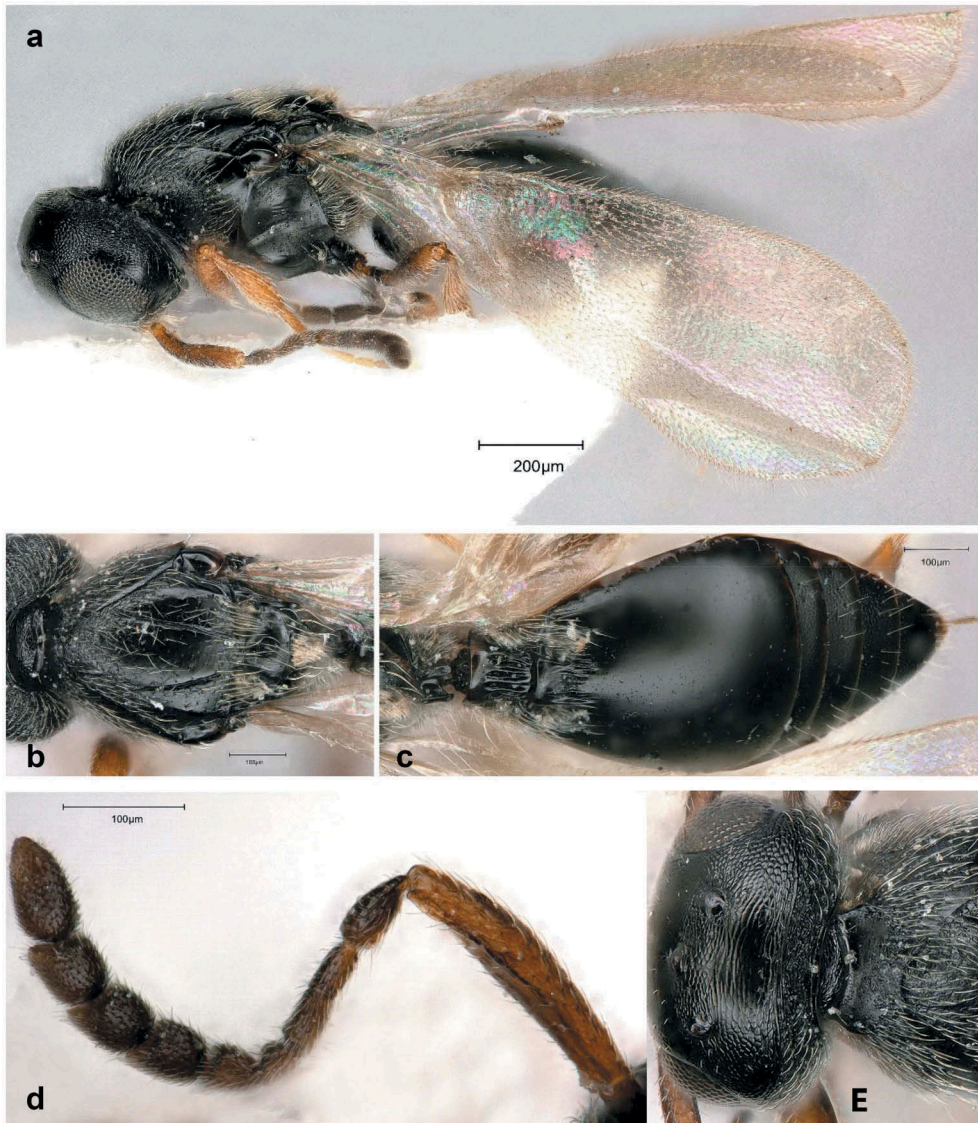


Figure 1. *Trichacis persicus* Asadi & Buhl, sp. nov: (a) Holotype, General habitus in lateral view; (b) holotype, mesosoma in dorsal view; (c) holotype, metasoma in dorsal view; (d) holotype, Antennae; (e) holotype, head in dorsal view.

as high. Antenna with A1 0.95 as long as height of the head, 1.25 as long as distance between inner orbits. Length: width A1–A10 = 20.0:3.8; 5.0:2.0; 3.5:1.5; 4.0:1.8; 3.0:1.8; 3.0:2.3; 3.0:3.0; 3.0:3.2; 3.0:3.5; 5.5:3.0. Flagellar pubescence hardly noticeable.

Mesosoma 1.5 times as long as wide, about as high as wide. Sides of pronotum in most of upper part dull coriaceous, smoother in the lower part but with rather dense hair sockets over most of the surface except upper hind corner. Mesoscutum with numerous hairs anteriorly and laterally, becoming almost bare postero-medially, in anterior third reticulate-coriaceous, rest smooth; notauli distinct, ending shortly before reaching anterior margin,

narrow throughout; mid lobe behind blunt, very slightly longer than lateral lobes; area in front of each scuto-scutellar groove with about seven whitish setae, foveae also with whitish pubescence inside. Mesopleuron smooth, with a couple of very short wrinkles around midlength, slightly above middle; mesopleural carina indicated on anterior third of sclerite. Scutellum smooth, flat, without modifications, with very few hairs, and an unusually weak greyish tuft behind. Metapleuron with pilosity all over, though sparse and short antero-medially. Propodeal carinae parallel; area between them smooth, about as long as wide.

Fore wing about 2.75 times as long as wide, 0.9 times as long as entire body, surpassing tip of metasoma by a distance equal to combined length of T3–T6, faintly infuscated, with fine and dense microtrichia; marginal cilia 0.08 width of wing. Hind wing 5.6 times as long as wide; marginal cilia slightly more than 0.2 width of wing.

Metasoma 1.1–1.2 times as long as rest of body, 2.25 times as long as wide, 1.1 times as wide as mesosoma. Length: width T1–T6 = 7.0:12.5; 28.0:26.0; 6.0:25.0; 5.5:22.5; 5.5:18.0; 8.0:12.5. T1 with anterior margin smooth and slightly upturned (for about 0.3 of length), behind with several weak longitudinal carina, bare in slightly more than medial third, distinctly pubescent towards sides. T2 striated in and between basal foveae to at most 0.3 of length, striation strongest medially; basal foveae partly pubescent, rest of tergite smooth. T3–T6 with fine micropunctuation over most of the surface, with superficially inserted distinct hairs (about six on T3, 16 on each of T4–T5, slightly fewer on T6).

Comments. One similar, perhaps conspecific female found in Germany (Schmira, 1. vi.1986, coll. Museum für Naturkunde, Erfurt) is markedly more hairy on mesoscutum and anterior part of scutellum, and with lighter flagellum than the Iranian specimens. *Trichacis persicus* runs to *T. tristis* (Nees, 1834) in Kieffer's key [10], but this species has A3 longer than A4, and A9 longer than wide. Among Nearctic species, *T. persicus* runs to *T. huberi* Masner, 1983 in Masner's [4] key, but *huberi* has A4 hardly as long as A3, LOL very distinctly longer than OOL, scutellum partly elevated, and it has body appendages characteristically much darker than in *T. persicus*.

Etymology

This species is named after the ancient name of Iran (*Persia*)

Trichacis marandicus Asadi & Buhl, sp. nov. (Figure 2)

Material examined

Holotype. Female: Iran, East-Azerbaijan province, Marand, Dizaj-olya (38°20'N, 45°46'E) 1.VIII.2009, Malaise trap, H. Lotfalizadeh leg.

Diagnosis

Scutellum in dorsal view with a medial longitudinal carina in posterior third, in lateral view rectangular and vertical behind, with only sparse and inconspicuous hairs postero-medially.

Description

Female. Body length 1.7 mm. Black; antennae, mandibles, tegula and legs including coxae dark reddish brown; tibiae and tarsi slightly lighter than rest of legs.

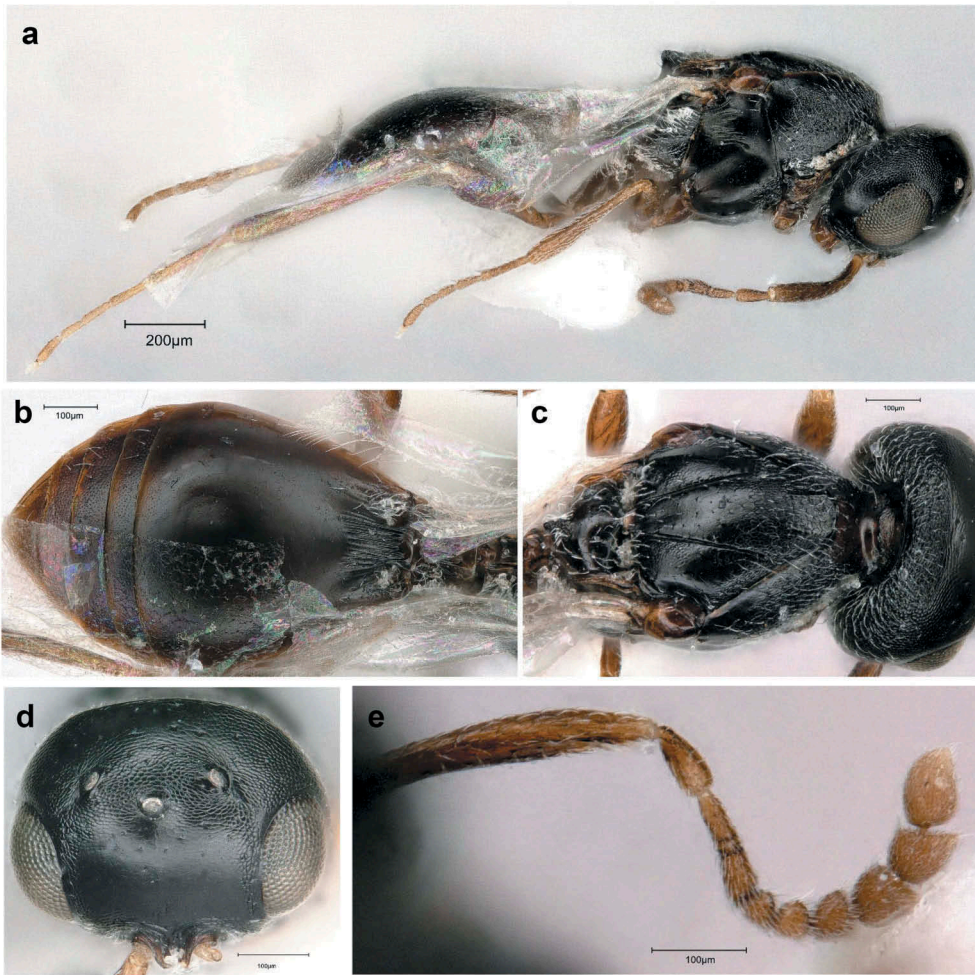


Figure 2. *Trichacis marandicus* Asadi & Buhl, sp. nov. (a) Holotype, General habitus in lateral view; (b) holotype, metasoma in dorsal view; (c) holotype, mesosoma in dorsal view; (d) holotype, head in frontal view; (e) holotype, Antennae.

Head from above 1.75 times as wide as long, 1.1 times as wide as mesosoma; occiput roughly reticulate-coriaceous behind hyperoccipital carina, smoothly so in front of it, hyperoccipital carina about as long as distance between eyes; vertex reticulate-coriaceous until anterior ocellus, reticulation laterally continuing down closely along inner orbits, frons otherwise smooth except for reticulation, and three transverse carina close to antennal insertions; just in front of anterior ocellus is a small depression and at anterior margin of this four small punctures. OOL: POL: LOL = 5.0:8.5:4.0. Head in frontal view 1.1 times as wide as high. Antenna with A1 0.85 as long as height of head, 1.25 as long as distance between inner orbits. Length: width A1–A10 = 21.0:3.0; 5.0:2.0; 4.0:1.5; 3.0:2.0; 2.0:2.0; 2.0:2.3; 2.7:3.0; 3.2:3.6; 3.0:4.0; 4.9:3.3.

Mesosoma 1.5 times as long as wide, slightly higher than wide (about 26:25). Sides of pronotum finely reticulate, smooth along narrow hind margin. Mesoscutum moderately

hairy in anterior third, along margins and very few hairs along notauli, otherwise bare, smooth in about posterior two-thirds, except for weak reticulation postero-laterally, in anterior third reticulate-coriaceous, in anterior 0.25 with two distinct, smooth admedian lines; notauli strong and nearly complete, mid lobe posteriorly blunt, hardly noticeably longer than lateral lobes; scuto-scutellar grooves with whitish hairs. Mesopleuron smooth, with four short longitudinal carinae in upper third, mesopleural carina indicated in anterior 0.15. Scutellum smooth, with a few hairs towards sides, in dorsal view with a medial longitudinal carina in posterior third, in lateral view rectangular and vertical behind, with only sparse and inconspicuous hairs postero-medially. Metapleuron with sparse pilosity except along hind margin. Propodeal carinae dark, parallel; area between them smooth, about as long as wide.

Fore wing 0.9 times as long as entire body, surpassing tip of metasoma by a distance equal to 1.4 combined length of T3–T6, clear, with fine and dense microtrichia and short marginal cilia (all wings somewhat destroyed on unique specimen).

Metasoma about 0.95 as long as rest of body, one and two-thirds times as long as wide, 1.2 times as wide as mesosoma. Length: width T1–T6 = 7.0:12.0; 30.0:30.0; 3.5:28.5; 4.0:26.5; 3.5:20.0; 5.0:14.0. T1 with numerous longitudinal carinae. T2 with basal foveae in hardly anterior third, these with a few striae, pubescent anteriorly, between basal foveae with striation to 0.3 length of tergite, rest of T2 smooth except for micropunctuation along narrow hind margin, such punctuation covers most of apical tergites. T3–T5 each with a transverse row of fine hairs in shallow punctures (about 10 on T3, 14–18 on each of T4–T5).

Comments. Clearly different from the Palaearctic species treated by Kieffer (1926) and Szabó (1981), rather approaching Nearctic *T. arizonensis* (Ashmead, 1893), but scutellum of *T. marandicus* even less hairy, and less elevated, than in *arizonensis*, but still distinctly more elevated behind than in South African *T. denudata* Buhl, 2001 which also lacks the cluster of hairs on scutellum otherwise typical for *Trichacis* spp.; *T. arizonensis* also has OOL distinctly shorter than LOL.

Etymology

Named after the name of the type locality.

Piestopleura iranica Asadi & Buhl, sp. nov. (Figure 3)

Material examined

Holotype. Male: Iran, East-Azerbaijan province, Khosroshah (37°58'28"N, 46°02'55"E), VIII 2008, Malaise trap, H. Lotfalizadeh leg.

Diagnosis

Male A5 more than twice as long as A3 and more than half as long as A4; fore wings without marginal cilia; tooth of scutellum 0.2 as long as propodeal carinae; T2 striated from basal foveae to 0.75 of length.

Description

Male. Body length 1.3 mm. Black; A1–A2 and legs light brownish; A3–A10, mandibles, tegulae and coxae dark brownish.



Figure 3. *Piestopleura iranica* Asadi & Buhl, sp. nov: (a) Holotype, General habitus in lateral view; (b) holotype, mesosoma in dorsal view; (c) holotype, metasoma in dorsal view.

Head from above 1.9 times as wide as long, 1.3 times as wide as mesosoma, rounded, finely and almost uniformly reticulate-coriaceous, in the lower half of frons with transverse elements and a weak medial impression. OOL: POL: LOL = 1:10:4. OOL equal to ocellar diameter. Eyes bare. Head in frontal view 1.25 times as wide as high. Antenna with A1 0.75 times as long as height of head, shorter than distance between inner orbits (13:14). Length: width A1–A10 = 13.0:3.2; 2.7:1.8; 1.1:1.3; 4.0:2.0 (measured at small tooth a little below mid-length); 2.3:1.5; 4.0:1.8; 4.0:2.5; 4.0:2.3; 4.0:2.2; 6.0:2.0. Flagellar pubescence about as long as width of segments.

Mesosoma 1.95 times as long as wide, 1.25 times as high as wide. Sides of pronotum in upper half finely coriaceous anteriorly, smooth in posterior half; in the lower half with longitudinal microsculpture. Mesoscutum rather evenly covered by moderately dense, very short whitish hairs, faintly reticulate-coriaceous; two admedian lines weakly indicated in anterior 0.25; notauli hardly noticeable, indicated at hind margin which is convex, medially almost reaching scutellum, at each side with six long, strong white hairs above moderately large, triangular scuto-scutellar grooves. Mesopleuron with fine longitudinal striation in most of upper half, also closely along lower margin, otherwise smooth. Scutellum sculptured and hairy as mesoscutum, the short and thick hind tooth brownish at tip, in lateral view scutellum without lamella, with vertical part below tooth partly covered by backwards directed long hairs; scutellar tooth only 0.2 as long as propodeal carinae, high above them. Metapleuron smooth and bare in about anterior 0.6, rest with whitish pilosity. Propodeal carinae low, brownish, slightly separated, parallel.

Fore wing about 0.75 times as long as entire body, of average proportions (rather creased in unique specimen), surpassing tip of metasoma by a distance about equal to length of T3–T6, clear, with fine and dense microtrichia, without marginal cilia. Hind wing 5.9 times as long as wide; marginal cilia about 0.25 width of wing.

Metasoma 0.9 times as long as rest of body, 1.2 times as long as mesosoma, nearly 1.3 times as wide as this. Length: width T1–T2 = 7.0:9.0; 24.0:20.5. T3–T7 short, combined hardly 0.4 as long as T2. T1 with two-weak longitudinal carinae in posterior half, smooth and bare between them, at each side with short hairs; anteriorly strongly swollen and smooth. T2 distinctly striated in basal foveae and to 0.75 length of tergite, smooth medially except for a couple of very short carinae, behind striation faintly reticulate; basal foveae slightly pubescent anteriorly. T3–T7 each with a transverse stripe of weak reticulation and some inconspicuous hairs.

Comments. Approaching *P. vanharteni* Buhl, 2010 (from the United Arab Emirates), but that species has distinctly shorter A5, longer and more roughly sculptured scutellar tooth, and T2 striated to only 0.3.

Etymology

Named after the country with the type locality.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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