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First records of the genera *Psilocera* Walker, 1833 and *Stinoplus* Thomson, 1878 (Hymenoptera, Pteromalidae) in Iran

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ABSTRACT. The genera *Psilocera* Walker and *Stinoplus* Thomson (Hymenoptera: Pteromalidae, Pteromalinae) are recorded for the first time from Iran. They are represented by two species, *Psilocera obscura* Walker, 1833 and *Stinoplus etearchus* (Walker, 1848), respectively. First species was collected from central part (Isfahan Province) of Iran, by the Malaise-trap and the second was collected from North East (North Khorasan Province) by sweeping net. Brief diagnosis, with illustrations of the morphological characters are provided for each species.

Key words: Fauna, Iran, new record, parasitoids, diagnosis

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Introduction

Parasitic wasps of the family Pteromalidae are a group of Chalcidoid wasps (Hymenoptera, Chalcidoidea) with a vast morphological variability and a diverse range of taxa, including more than 4,000 described species in 641 genera and 33 subfamilies (Noyes, 2020). Majority of Pteromalidae are known as parasitoids of the eggs, larvae and pupae from many orders of insects (Bouček, 1988). The subfamily Pteromalinae is the largest subgroup in Pteromalidae, with more than 2330 described species in 317 genera (Noyes, 2020), of which 101 species belonging to 49 genera are recorded in Iran (Farahani et al., 2010; Hassan-Pashai-Mehr & Lotfalizadeh, 2015; Mahdavi et al., 2015; Abolhassanzadeh et al., 2017; Moravvej et al., 2018; Lotfalizadeh et al., 2019a, 2019b; Rahmani et al., 2019a, 2019b, 2020; Shojaey et al., 2019). Beside the general faunistic and taxonomic works, there are scattered taxonomic studies on the small genera of Pteromalinae that are rare or uncommon, in general (Farahani et al., 2010; Bayegan et al., 2014; Hassan-Pashai-Mehr & Lotfalizadeh, 2015; Rahmani et al., 2019b; Shojaey et al., 2019). Here we present new distributional data about the genera *Psilocera* Walker, 1833 and *Stinoplus* Thomson, 1878, both representing new generic records for Iran.

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Material and methods

The specimens examined in this study were sporadically collected by the Malaise-traps and sweeping nets from various habitats in central (Isfahan Province) and North Eastern (North Khorasan Province) parts of Iran, during 2011–2018. Identification of species were done using the keys in Graham (1969) and Askew (2011). The external morphology of specimens were studied using a Nikon® SMZ645 stereomicroscope and illustrated by a Canon® EOS 700D (Canon® Inc., Japan) camera mounted with an adapter on Hund® Stereomicroscope (Wetzlar Inc., Germany). Terminology of morphological characters generally follows of Graham (1969) and Bouček (1988). Measurements were taken using an ocular micrometer. Data about distribution of species were extracted from Noyes (2020). The studied specimens are deposited in the collection of Department of Plant Protection, University of Zabol, Iran (DPPZ).

Results

Family Pteromalidae Dalman, 1820

Subfamily Pteromalinae Dalman, 1820

Genus *Psilocera* Walker, 1833

Psilocera Walker, 1833:373. Type species: *Psilocera obscura* Walker, by monotypy.

Diagnosis. Clypeal margin with two distinct teeth. Gena with a hollow at mandibular base (Fig. 1A). Antenna in female with two or three anelli and six or five funicular segments, clava with large micropilosity area. Propodeum with at least a weak costula crossing median carina (Fig. 1D). Basal gastral tergites excised in middle (Fig. 1F) (after Bouček & Rasplus, 1991).

Psilocera obscura Walker, 1833 (Figs 1, 3A)

Psilocera obscura Walker, 1833:373, Lectotype ♂, BMNH, United Kingdom.

Psilocera atra (Walker, 1834) Graham, 1969:464, 465.

Material examined. 1♀, IRAN: Isfahan Province, Najafabad (32°37′59.13″ N, 51°21′29.18″ E, 1654 m), Malaise trap, 20.VIII.2011, leg.: E. Nader.

Diagnosis. *Female.* Body length 1.9 mm. Antenna inserted below middle of face, with three anelli and five funicular segments (Fig. 1A). Eye height 2.4 times longer than malar space (frontal view) (Fig. 1A). Width of head 2.8 times its median length (dorsal view) (Fig. 1B). Eye height 1.8 times its length (lateral view) (Fig. 1C). Propodeum weakly reticulate, median carina and costula complete and distinct; plicae indicated only in anterior half (Fig. 1D). Marginal vein of fore wing 1.21 times longer than postmarginal vein, 2.1 times longer than stigmal vein (Fig. 1E). Gaster sessile, hind margin of first to fifth gastral tergites excised medially (Fig. 1F). Head and mesosoma black. Antenna with scape, pedicel and anelli yellowish brown, remainder black. Legs with coxae concolorous with mesosoma, remainder yellowish brown. wings hyaline, venation brown. Gaster brownish-black (Fig. 3A).

Distribution. Eastern (Kazakhstan) and Western (Bulgaria, Croatia, Czech Republic, France, Germany, Iran (**New record**), Italy, Moldova, Montenegro, Netherlands, Romania, Russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Turkey, United Kingdom) Palaearctic.

Distribution in Iran: Central (Isfahan Province).

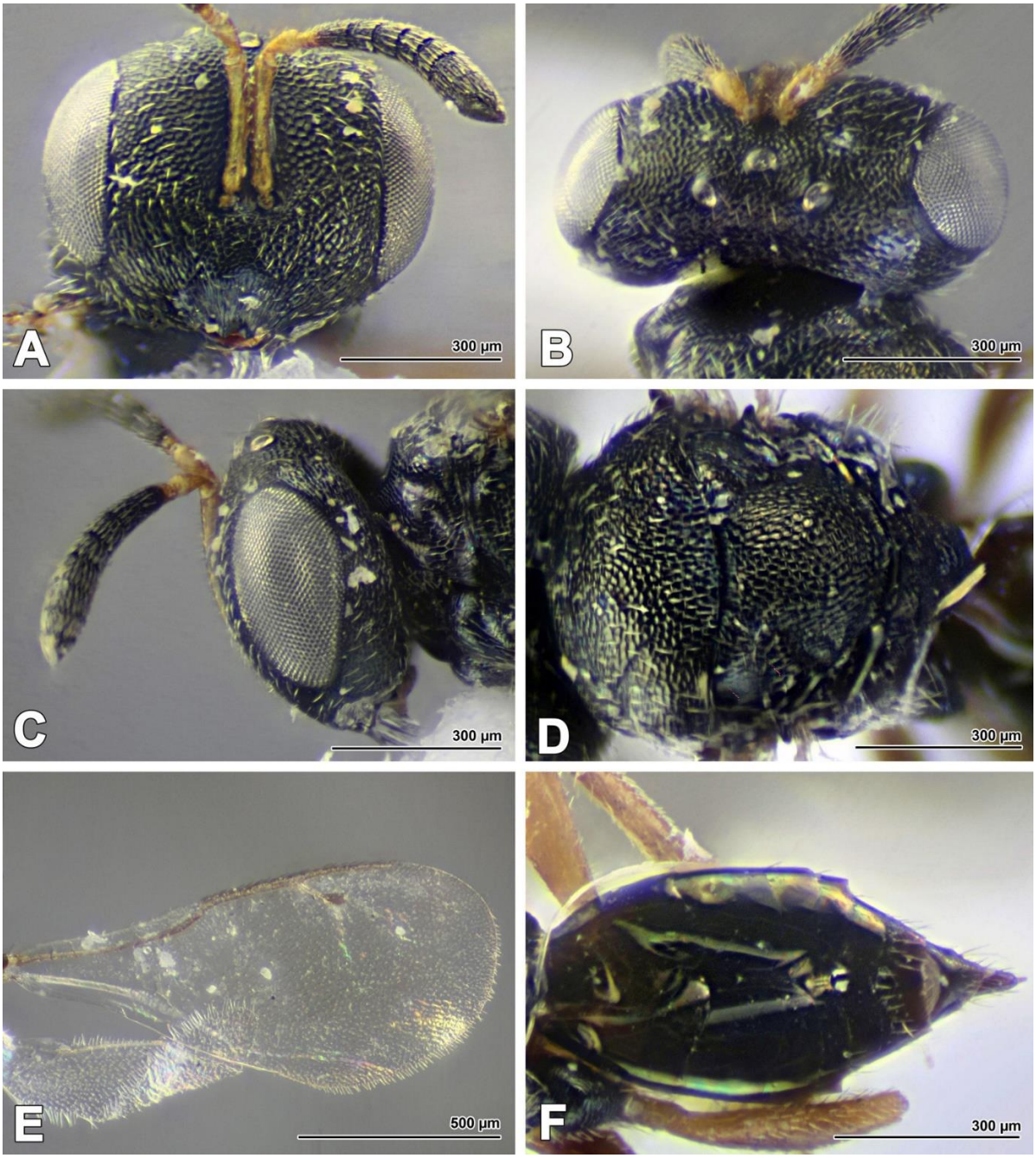

Figure 1. *Psilocera obscura* Walker, 1833. **A.** Head, frontal view; **B**. Head, dorsal view; **C**. Head, lateral view; **D**. Mesonotum and scutellum; **E**. Fore wings; **F**. Metasoma, dorsal view.

Genus *Stinoplus* Thomson, 1878

Stinoplus Thomson, 1878:88, 107. Type species: *Stinoplus militaris* Thomson, 1878. Desginated by Ashmead, 1904.

Diagnosis. Pronotal collar almost absent (Fig. 2D). Pronotum sloping downwards from hind margin, without any differentiation of collar. Propodeum mainly smooth, nucha undeveloped, plicae absent or sharp only posteriorly. Marginal vein slightly thickened throughout (Fig. 2E). Legs and basal part of gaster often pale yellow (after Bouček & Rasplus, 1991).

Stinoplus etearchus (Walker, 1848) (Figs 2, 3B)

Pteromalus etearchus Walker, 1848:126, 205, Lectotype ♀, BMNH, United Kingdom.
Stinoplus aureolus Thomson, 1878:109, ♀ (synonymized by Graham, 1969:693).

Material examined. 1♀, IRAN: North Khorasan Province, Maneh and Semelghan county, Haver mountain (37°25′07.31″ N, 56°49′23.73″ E, 1528 m), swept on weeds, 23.VI.2018, leg.: Z. Rahmani.

Diagnosis. *Female*. Body length 2 mm. Eye height 2.2 times longer than malar space (frontal view) (Fig. 2A). Width of head 2.7 times its median length (dorsal view) (Fig. 2B). Eye height 1.4 times its length (lateral view) (Fig. 2C). Mesoscutum 1.6 times wider than its length (Fig. 2D). Propodeum mainly smooth, without nucha and plicae. Marginal vein of fore wing 9.3 times longer than its basal width, 1.2 times postmarginal vein, 1.8 times longer than stigmal vein, basal cell with 3 hairs and basal vein with 4 hairs (Fig. 2E). Gaster sessile, lanceolate, 2.1 times longer than wide, slightly longer than head plus mesosoma (Fig. 2F). Head and mesosoma bright green with coppery tints. Antennae except scape brown. Legs except coxa, scape of antennae and base of gaster pale yellow; fore coxa testaceous, mid and hind coxa yellowish. Wings hyaline, stigma and venation pale yellow. Apex of gaster dark brown (Fig. 3B).

Distribution. Asutralasian (Australia), Eastern Palaearctic (Kazakhstan), Oceanic (New Zealand) and Western Palaearctic (Croatia, France, Hungary, Iran (**New record**), Isle of Man, Macedonia, Morocco, Netherlands, Serbia, Spain, Sweden, United Kingdom).

Distribution in Iran: North Eastern (North Khorasan Province).

Discussion

Two new generic records of the subfamily Pteromalinae are documented from Iran, each represented by a single species including, *Psilocera obscura* Walker, and *Stinoplus etearchus* (Walker). *Psilocera* with 32 and *Stinoplus* with 10 valid species are known as relatively small genera comprising 12 and 8 known species in the Palaearctic region, respectively (Noyes, 2020). Among the adjacent countries, two species of *Psilocera* are reported from Turkey and Pakistan (Noyes, 2020). Few other species of *Psilocera* are also distributed in central Asian area (four species in Kazakhstan) (Dzhanokmen, 1978, 2005; Tselikh, 2011). Among the Palaearctic species of the genus *Stinoplus*, there was only a single record of *S. etearchus* from Kazakhstan (Dzhanokmen, 2005), its occurrence in Iran representing the second record of this species from Asia. Other *Stinoplus* species are distributed in Europe, North America and Australia (Noyes, 2020).

No clear host evidences are recorded for *Psilocera* species, but it is assumed that they are attacking the larvae of some beetles which dwelling in soil or passing their pupal stage there (Bouček, 1988). On the other hand, some *Psilocera* species were reared from cocoon of the clytrini beetles (Col., Chrysomelidae) (Bouček & Rasplus, 1991). *Stinoplus* species are known as parasitoids within the galls of Cynipidae on various herbaceous plants (stems of Asteraceae) (Bouček, 1988; Askew, 2011). Considering the vast diversity of habitats (Zohary, 1963) with many host plants (Ahmadzadeh et al., 2013) for the known Chrysomellidae (Mirzaei et al., 2015) and Cynipidae (Melika & Karimpour, 2012) in Iran, some other species of *Psilocera* and *Stinoplus* are expected to be discovered by subsequent studies.

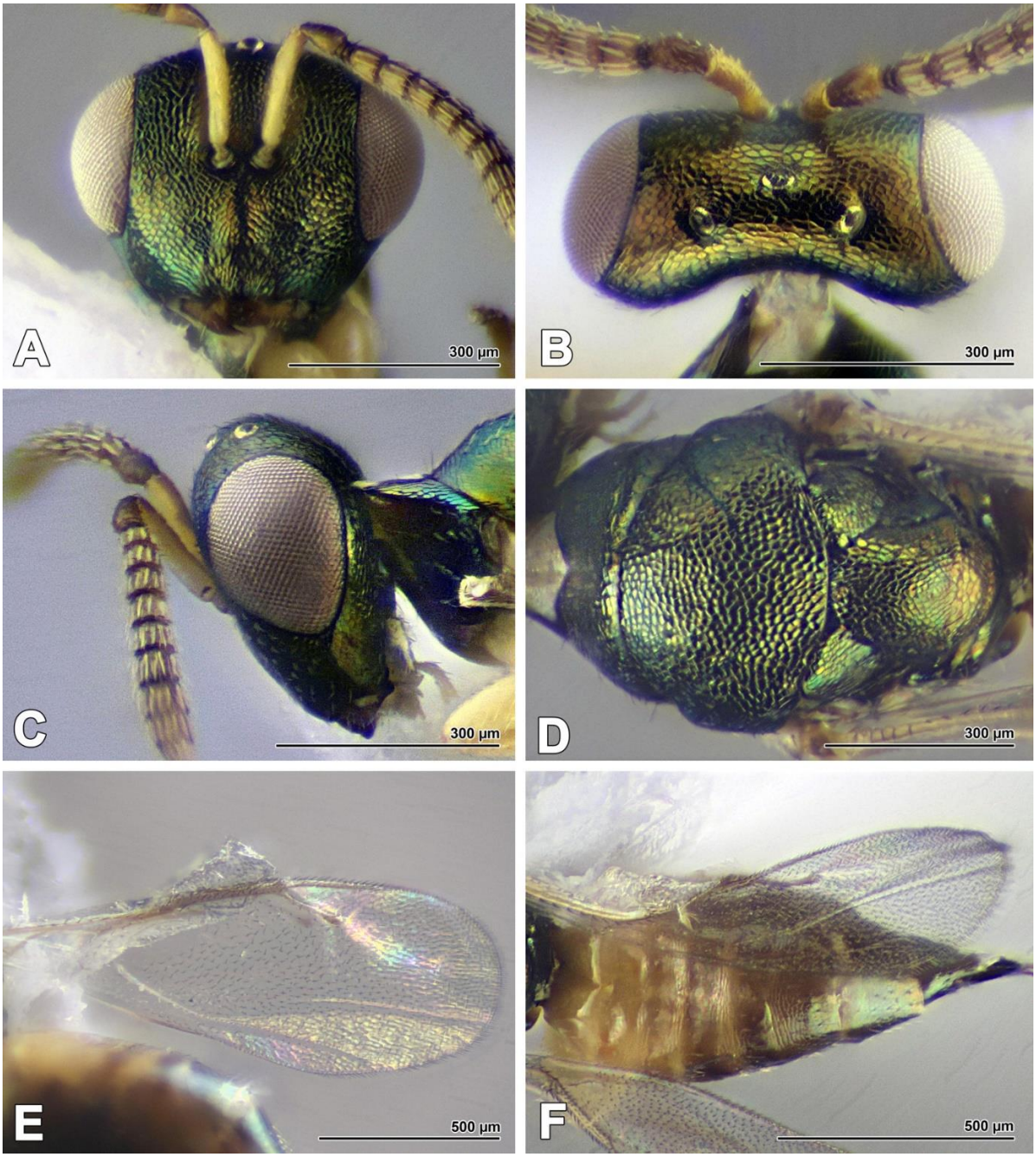

Figure 2. *Stinoplus etearchus* (Walker, 1848). **A.** Head, frontal view; **B**. Head, dorsal view; **C**. Head, lateral view; **D**. Mesonotum and scutellum; **E**. Fore wings; **F**. Metasoma, dorsal view.

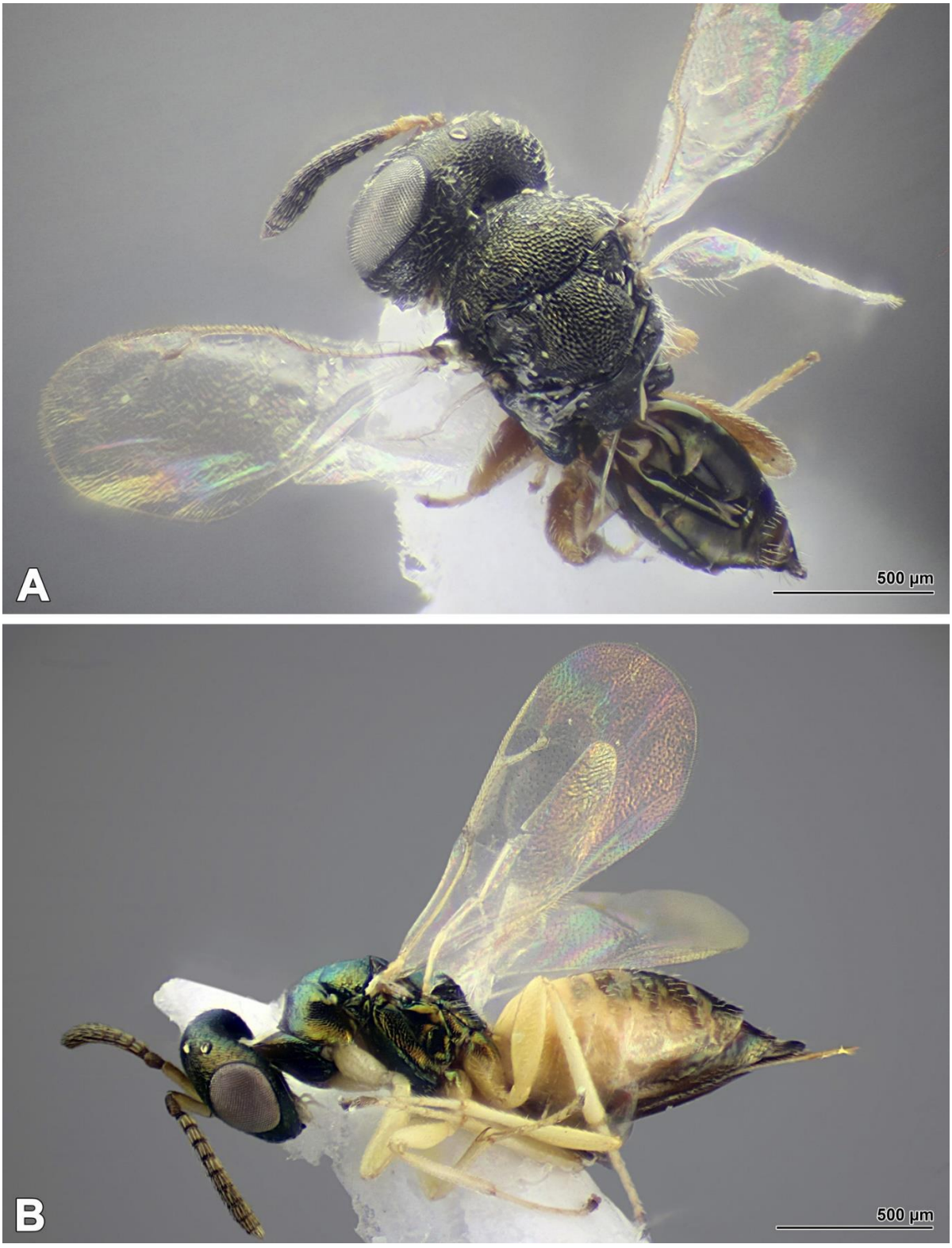

Figure 3. General habitus of female specimens, lateral view; **A.** *Psilocera obscura* Walker, 1833; **B.** *Stinoplus etearchus* (Walker, 1848).

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Conflict of Interests

The authors declare that there is no conflict of interest regarding the publication of this paper.

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اولین گزارش جنس‌های *Psilocera* Walker, 1833 و *Stinoplus* Thomson, 1878 (Hymenoptera, Pteromalidae) در ایران

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چکیـده: جنس‌های *Psilocera* Walker و *Stinoplus* Thomson (Hymenoptera: Pteromalidae, Pteromalinae) برای اولین بار از ایران گزارش شدند. از هر جنس یک گونه، به ترتیب شامل *Psilocera obscura* Walker, 1833 و *Stinoplus etearchus* (Walker, 1848) شناسایی شدند. گونه اول از منطقه مرکزی ایران (استان اصفهان) توسط تله مالیز و گونه دوم از منطقه شمال شرق (استان خراسان شمالی) با روش تورجارو جمع آوری شدند. برای هر گونه توصیف افتراقی کوتاه، با ارایه خصوصیات مرفولوژیک به صورت مصور ارایه شد.

واژگـان کلیدی: ایران، پارازیتویید، توصیف افتراقی، فون، گزارش جدید