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**A NEW SPECIES OF *OSMIA* FROM IRAN  
(HYMENOPTERA: MEGACHILIDAE)**

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**Abstract** – A new species of *Osmia*, subgenus *Helicosmia*, is described and figured from a male and female collected near Karaj, Iran. *Osmia (Helicosmia) mediana* sp. n. can be superficially confused with *O. (H.) indigotea* Morawitz and in other respects *O. (H.) adae* Bingham. The new species is diagnosed and distinguished from other *Helicosmia*.

**KEY WORDS:** Hymenoptera, Apoidea, Anthophila, Megachilinae, Osmiini, Iran, new species, *Osmia*, *Helicosmia*, taxonomy

**Izveček** – NOVA VRSTA RODU *OSMIA* IZ IRANA (HYMENOPTERA: MEGACHILIDAE)

Nova vrsta rodu *Osmia*, podrodu *Helicosmia*, je opisana in prikazana na osnovi samca in samice, ujetih blizu mesta Karaj v Iranu. Vrsto *Osmia (Helicosmia) mediana* sp. n. imamo lahko na prvi pogled za vrsto *O. (H.) indigotea* Morawitz in v drugih pogledih za *O. (H.) adae* Bingham. Nova vrsta je opisana in razločena od drugih vrst podrodu *Helicosmia*.

**KLJUČNE BESEDE:** Hymenoptera, Apoidea, Anthophila, Megachilinae, Osmiini, Iran, nova vrsta, *Osmia*, *Helicosmia*, taksonomija

## Introduction

Bees of *Helicosmia* form a distinctive group of species of the diverse and cosmopolitan genus *Osmia* (Megachilinae: Osmiini). The 58 species of the subgenus are principally distributed across the Palaearctic region (Tkalčič, 1975; Warncke, 1988; Zanden, 1988), although a handful of taxa are also found in the Nearctic (Rust, 1974). Species nest in a diversity of cavities ranging from simple burrows in stems or wood, clay banks, cells of other bees (such as abandoned burrows of *Anthophora*), to old snail shells.

Herein I provide the description of a distinctive new species of *Helicosmia* occurring in Iran. Morphological terminology for the description follows that of Engel (2001).

## Taxonomy

### *Osmia (Helicosmia) mediana* sp. n.

(Figs. 1–4, 6)

**Holotypus:** ♂ Iran, Tehran Province, Karaj, ca. 1200 m [no date or collector]. The holotype (Figs. 1–2) is in the Snow Entomological Collection, Division of Entomology, University of Kansas Natural History Museum, Lawrence, Kansas, USA.

**Paratypus:** ♀ Iran, Tehran Province, Karaj, ca. 1200 m [no date or collector]. The paratype (Figs. 4, 6) is in the Snow Entomological Collection, Division of Entomology, University of Kansas Natural History Museum, Lawrence, Kansas, USA.

**Diagnosis:** Male with metasomal setae largely fuscous except those of first metasomal tergum (Fig. 1); terga without even weakly-defined fasciae; paramedial processes of apical margin of seventh metasomal tergum maximally separated by distance equivalent to length of an individual process; sternal setae black; third metasomal sternum without distinct setal patches along apical margin; apical margin of fifth metasomal medially produced with, short, bluntly-rounded paramedial processes. Female mandible tridentate, teeth broad and blunt; outer surface of mandible without appressed, minute, orange or white setae (Fig. 6); clypeal margin gently concave, without further modifications (Fig. 6), with slender, short patches or orange setae beneath clypeal margin at apicolateral corners, without paramedial setal patches beneath clypeal margin; metasomal setae largely fuscous, weakly formed tergal fasciae composed of fuscous setae with white setae intermixed; sixth metasomal tergum largely obscured by appressed, coarse, dense patch of fuscous setae; scopa black (Fig. 4).

**Description:** ♂ Total body length 7.9 mm; forewing length 6.3 mm. Head wider than long, length 2.5 mm, width 2.9 mm (Fig. 2). Mandible bidentate; malar space vestigial. Scape of moderate length, reaching to median ocellus in repose; first

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flagellar article shorter than second flagellar article; second flagellar article about as long as third flagellar article. Lateral ocellus separated from compound eye by approximately 2.2 times ocellar diameter. Intertergular distance 2.3 mm. Forewing with basal vein confluent with 1cu-a; first submarginal cell about as long as second submarginal cell; 1m-cu entering second submarginal cell at one-third of cell's length; 2m-cu entering second submarginal cell in apical third of cell's length, near 2rs-m. Apical margin of sixth metasomal tergum medio-apically with shallow, concave notch; apical margin of seventh metasomal tergum medio-apically produced into two, short, apically-pointed, paramedial processes, space between processes at maximum about as wide as length of individual process. Sterna relatively simple; apical margin of first metasomal sternum simple, straight; apical margin of second metasomal sternum broadly convex; apical margin of third metasomal sternum broadly concave, without apical, elongate setal patches along margin; apical margin of fourth metasomal sternum weakly convex, with black setae medio-apically longer and directed toward midline, forming loosely-defined medio-apical patch; apical margin of fifth metasomal sternum produced with short, paramedian processes, medial space between processes about as wide as an individual process, division between the two processes rounded (*i.e.*, not slit-like). Male genitalia depicted in figure 3.

Integument of head contiguously punctured (Fig. 2), punctures small and well defined, punctures becoming weaker near preoccipital area and faint on postgena. Integument of mesosoma punctured, punctures of size similar to those on face, punctures contiguous except separated by 0.5 times a puncture width of mesoscutal disc and mesoscutellum; metanotum rugulose; punctures on tegula weaker than those of mesoscutum, separated by 0.5–1 times a puncture width and largely confined to margins, punctures sparse and faint medially; pleura sculptured as on mesoscutum; posterior and lateral surfaces of propodeum with contiguous, irregular punctures giving surfaces a weakly rugose appearance; basal area of propodeum strongly imbricate and impunctate, with extremely faint evidence of basal, longitudinal rugae at extreme anterior margin (scarcely visible). Metasomal terga with small punctures, punctures separated by a puncture width or less except apical margins with punctures separated by 1–2 times a puncture width and punctures fainter, integument between punctures smooth and shining except on apical margins appearing faintly imbricate; anterior-facing surface of first metasomal tergum with punctures minute, separated by 0.5–1 times a puncture width; sterna with punctures weaker than those of terga, separated by 0.5 times a puncture width, integument between punctures distinctly imbricate.

Integument bright metallic blue (Figs. 1–2) except antennae and mandible dark brown; labrum and labiomaxillary complex brown; tegula brown with metallic blue highlights anteriorly; legs dark brown and with faint metallic blue highlights; wings with veins brown, membrane hyaline with a faint tinge of brown; metasomal terga dark brown to black with strong metallic blue hue, sterna dark brown with faint metallic blue hue.

Pubescence white except those setae of mandible, postgena, and legs strongly fuscous; setae of metasoma black except those of first metasomal tergum white, particularly on lateral corners, setae becoming progressively more fuscous on

succeeding terga; terga lacking even weak, apical fasciae; setae of sterna black; setae of gonostylus stiff and black (Fig. 3).

♀ Generally as described for male except for typical sexual differences and the following: Total body length 9.9 mm; forewing length 7.1 mm. Head wider than long, length 2.7 mm, width 3.2 mm. Mandible with characteristic depression along base (as is typical for subgenus *Helicosmia*), with three, relatively blunt and broad teeth along apical margin, mandible brown, outer surface not covered with minute, appressed, orange or white setae (Fig. 6). Apical margin of clypeus simple, gently concave (Fig. 6), with two, relatively short and narrow orange setal patches beneath apical margin at apicolateral corners; apical half of clypeus black without metallic blue hue. First flagellar article distinctly longer than second flagellar article; second flagellar article about as long as second flagellar article. Intertegular distance 2.3 mm. Basal area of propodeum with faint basal rugosity along extreme anterior margin.

Apical margins of metasomal terga distinctly imbricate and impunctate; apical margins of first through fifth metasomal terga with weakly defined apical fasciae composed of fuscous and white setae intermixed, otherwise tergal setae largely fuscous; sixth metasomal tergum apically covered with dense, appressed, coarse, fuscous setae forming distinct patch, setae largely obscuring integumental surface; scopa black (Fig. 4).

**Derivatio nominis:** The specific epithet is the Latin term *medianus*, meaning “in the middle”.

**Comments:** *Osmia (Helicosmia) mediana* is most similar to *O. (H.) indigotea* Morawitz and *O. (H.) adae* Bingham but can be most readily segregated in males from both by the black sternal setae (white in the latter two species) and absence of even weak, white, apical, tergal fasciae (weakly present along apical margins of metasomal terga in latter two species). Females of *O. mediana* can be distinguished from both *O. indigotea* and *O. adae* by the black scopa (Fig. 4) (white in both of the other species; e.g., Fig. 5); presence of only two orange setal patches beneath the clypeal margin (four in the other two species); three mandibular teeth (Fig. 6) (four in the other species, sometimes the uppermost tooth is rather weakly defined; e.g., Fig. 7); absence of appressed, minute, orange setae on outer mandibular surface (Fig. 6) (densely present in other two species; e.g., Fig. 7); and sixth metasomal tergum covered with dense, relatively coarse, appressed, fuscous setae (with velvety white, subappressed setae in the other two species).

Males of *O. mediana* most superficially resemble those of *O. indigotea*, while females can be more easily confused with those of *O. adae*. Further differences from *O. indigotea* include the smaller outer, lateral patches of orange setae beneath the clypeal margin in females (in females apicolateral patches much longer in *O. indigotea*, plus paramedial patches present in *O. indigotea*) and the basal area of the propodeum is strongly imbricate with only a hint of extremely short and faint striae present at the extreme base of the basal area in males (basal area distinctly

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longitudinally rugoso-striate and imbricate in *O. indigotea*). *Osmia mediana* can be further separated from *O. adae* by the relatively simple clypeal margin which is gently concave in females (Fig. 6) (greatly modified with trilobed, medioapical process bearing a longitudinal, medial carina in *O. adae*: Fig. 7); maximal separation of processes on apical margin of seventh metasomal tergum equivalent to about length of an individual process in males (processes distinctly separated by space greater than length of an individual process in *O. adae*); and apical margin of third metasomal sternum broadly concave without setal patches in males (concave, with strong, well developed, white setal patches along apical margin directed toward midline in *O. adae*).

The type locality for *O. mediana* is at 1200 m in the Alborz near Karaj in Iran (a city westward from Tehran and slightly more northerly). It is likely that the species occurs throughout the Alborz and more extensive collecting should attempt to document the range of this new *Osmia* as well as those flowers it visits. *Osmia indigotea* has not been recorded from Iran but assuredly occurs there as the species is widespread in neighboring regions (e.g., specimens examined by the author from Afghanistan and Iraq). It is possible that *O. indigotea* replaces *O. mediana* at lower elevations in Iran. Presently *O. adae* is known only from the Himalayan region, particularly in India and Nepal, although it may well also occur in Tibet, Bhutan, and in the Azad Kashmir and Northern Areas under Pakistani control and Akasi Chin region under Chinese control (the species is already known from the Jammu and Kashmir of India as well as widely in Himachal Pradesh).

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**Figs. 1–3:** *Osmia (Helicosmia) mediana* sp. n., holotype male; 1) Lateral habitus; 2) Facial aspect; 3) Dorsal aspect of genital capsule.

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**Figs. 4–5:** Lateral habitus of *Osmia (Helicosmia)* species, females; 4) Lateral habitus of paratype female of *Osmia (Helicosmia) mediana* sp. n.; 5) Lateral habitus of *O. (H.) adae* Bingham.



**Figs. 6–7:** Facial aspects of *Osmia (Helicosmia)* species, females; 6) Facial view of paratype female of *Osmia (Helicosmia) mediana* sp. n.; 7) Facial view of *O. (H.) adae* Bingham.

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