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A revision of the *Andrena* (Hymenoptera: Andrenidae) fauna of Iran, with the description of 16 new species

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Abstract. Iran is a huge but understudied Middle Eastern country with a rich but chronically understudied bee fauna, including for the highly-speciose bee genus *Andrena*. Examination of unidentified museum material combined with recent field collections and a critical review of the literature has revealed a total of 197 species of *Andrena* in the Iranian fauna, of which 65 are newly reported for the country, with an additional 16 species new for science. *Andrena* (*Aciandrena*) *deminuta* Wood sp. nov., *Andrena* (*Euandrena*) *boustaniae* Wood sp. nov., *Andrena* (*Euandrena*) *oblata* sp. nov., *Andrena* (*Euandrena*) *sani* sp. nov., *Andrena* (*Micrandrena*) *elam* Wood sp. nov., *Andrena* (*Micrandrena*) *subviridula* Wood sp. nov., *Andrena* (*Notandrena*) *idigna* Wood sp. nov., *Andrena* (*Planiandrena*) *flagrans* Wood sp. nov., *Andrena* (*Planiandrena*) *sella* Wood sp. nov., *Andrena* (*Ulandrena*) *bulbosa* Wood sp. nov., *Andrena* (incertae sedis) *hosseiniiae* Wood & Monfared sp. nov., and *Andrena* (incertae sedis) *rostamiae* sp. nov. are described from Iran, *Andrena* (*Micrandrena*) *extenuata* sp. nov. is described from Iran and Syria, *Andrena* (*Micrandrena*) *tabula* Wood sp. nov. and *Andrena* (*Micrandrena*) *obsidiana* Wood sp. nov. are described from Iran and Turkey, and *Andrena* (*Planiandrena*) *huma* sp. nov. is described from Iran, Syria, and the Golan Heights. Eight taxa are synonymised (valid name first): *Andrena* (*Melandrena*) *assimilis* Radoszkowski, 1876 = *Andrena* (*Melandrena*) *gallica* Schmiedeknecht, 1883 syn. nov.; *Andrena* (*Notandrena*) *emesiana* Pérez, 1911 stat. resurr. = *Andrena* (*Notandrena*) *recurvirostra* Warncke, 1975 syn. nov.; *Andrena* (*Plastandrena*) *eversmanni* Radoszkowski, 1867 = *Andrena* (*Plastandrena*) *peshinica* Nurse, 1904 syn. nov.; *Andrena* (incertae sedis) *hieroglyphica* Morawitz, 1876 = *Andrena* (*Carandrena*) *cara* Nurse, 1904 syn. nov. and *Andrena* (*Carandrena*) *halictoides* Nurse, 1904 syn. nov.; *Andrena* (*Melandrena*) *induta* Morawitz, 1894 = *Andrena* (*Melandrena*) *patella* Nurse, 1903 syn. nov.; *Andrena* (incertae sedis) *minor* Warncke, 1975 stat. nov. = *Andrena* (*Carandrena*) *splendula* Osytshnjuk, 1984 syn. nov.; *Andrena* (*Notandrena*) *zostera* Warncke, 1975 = *Andrena* (*Carandrena*) *subsmaragdina* Osytshnjuk, 1984 syn. nov. Overall, these results considerably improve our understanding of the Iranian *Andrena* fauna, and suggest that overall bee diversity in this country is substantially more than 1000 species.

Keywords. Apoidea, endemic species, solitary bees, taxonomy, Zagros.

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Introduction

At over twice the size of its neighbour Turkey, Iran covers a vast area and sits between the Eastern and Western Palearctic biogeographic zones (see Rasmont *et al*. 2017 for discussion and definition). Despite its great size and the presence of many habitats known to support diverse bee communities such as forest and grassland steppes, high mountains, and semi-deserts, Iran has an incompletely documented bee fauna. Only 960 species are listed from Iran, whereas 1764 species are listed from Turkey (Ascher & Pickering 2021). Whilst this is still a huge fauna when compared to most countries in the Mediterranean basin (Lhomme *et al*. 2020; Boustani *et al*. 2021), the true species richness is likely to be much higher once detailed revisionary studies will have been conducted. Indeed, as more studies focus on Iranian material, new species for science or for the country are frequently described, discovered, or elevated (e.g., Kasparek 2021; Litman *et al*. 2021; Radchenko *et al.* 2021; Wood 2021a).

One bee group for which there are expected to be many more species present in Iran than currently recorded is the genus *Andrena* Fabricius, 1775. This huge genus (Gusenleitner & Schwarz 2002), the second most speciose behind *Lasioglossum* Curtis, 1833, contains around 1600 species when including recent taxonomic updates (TJW, unpublished data). Indeed, *Andrena* is one of the three most rapidly speciating genera of bees (Bossert *et al*. 2022), and may become the most rapidly speciating genus as new species are being described or elevated at pace, particularly in the Old World Mediterranean basin (e.g., Scheuchl 2010; Scheuchl & Hazir 2012; Schwenninger 2015; Pisanty *et al*. 2016, 2018, 2022a; Wood 2020a, 2021a, 2021b; Wood *et al.* 2020a; 2020b, 2021).

There are currently 109 species of *Andrena* listed from Iran on Discover Life (Ascher & Pickering 2021), which places Iran below the 172–180 species found in the recently revised Bulgarian and Moroccan faunas (Lhomme *et al*. 2020; Wood 2021b), and well below the 342 species listed from Turkey (Ascher & Pickering 2021). Clearly, there must be many more unrecorded species of *Andrena* present in Iran. Part of the reason for this knowledge shortfall is the near absence of taxonomic work on Iranian *Andrena* by Klaus Warncke, the most important Old World *Andrena* taxonomist of the 20th century. In contrast to his important and extensive revisions of *Andrena* for countries or regions such as Greece, Israel, North Africa, and Turkey (Warncke 1965, 1969, 1974a, 1974b, 1975), Warncke never revised the Iranian fauna of *Andrena*, though he did visit and collect in the country, identify Iranian specimens of *Andrena*, and write contributions for other bee groups (e.g., Warncke 1982). Moreover, until recently (Wood 2021a), there have only been four publications that describe currently valid species of *Andrena* with a locus typicus in Iran (Alfken 1927; Popov 1940, 1949; Ariana *et al*. 2009a), with three other publications describing subspecies or synonymous taxa (Radoszkowski 1871; Strand 1921; Warncke 1975).

Against this background, and given the increase in recent interest in documenting the *Andrena* fauna of Iran (Khodaparast & Monfared 2012; Allahverdi *et al*. 2015, 2016; Khodarahmi Ghahnavieh & Monfared 2019), a full revision of the fauna is warranted. More broadly, because Iran sits between the Western and Eastern parts of the Palearctic, a study of its fauna offers the opportunity to investigate outstanding issues caused by the independent study of *Andrena* by British, Soviet, and German workers on the subcontinental (Nurse 1903, 1904), Central Asian (Osytshnjuk 1983a, 1984; Osytshnjuk *et al*. 2005, 2008), and Turkish faunas (Warncke 1974b, 1975), respectively. Here, we present a full faunal revision of Iranian *Andrena* at the species level, encompassing a review of the literature, review of museum specimens, inspection of undetermined museum specimens, and new field collections.

Material and methods

Morphological terminology follows Michener (2007). Specimens were measured from the centre of the clypeus at the front of the head to the apical tip of the metasoma to the nearest 0.5 mm. Photographs were taken using an Olympus E-M1 Mark II with a 60 mm macro lens. Additional close-ups were taken with

the addition of a Mitutoyo M Plan Apo 10× infinity corrected objective lens or a LOMO 3.7 objective lens in combination with an Olympus M.Zuiko 2× teleconverter lens, a 10 mm Kenko DG extension tube, and a Meike MK-P-AF3B 10 mm extension tube. Photographs were stacked using Zerene Stacker 1.04 (Zerene Systems, USA) and plates were prepared in GNU Image Manipulation Program (GIMP) ver. 2.10. Post-processing of some images was made in Photoshop Elements (Adobe Systems, USA) in order to improve lighting to highlight specific characters.

Newly described species are ordered first by subgenus and then alphabetically in order to facilitate easier diagnoses. The subgeneric concepts of Pisanty *et al*. (2022b) are followed. In the annotated faunal list, species are listed alphabetically for convenience given the large number of incertae sedis species which could hamper navigation.

The following abbreviations are used in the species descriptions:
A = antennal segments
S = metasomal sterna
T = metasomal terga

For species diagnoses, description of key characters is given as well as a comparison with the nearest taxon, with the alternative character state displayed by this comparison taxon given in parentheses.

In the annotated faunal list, for global distributions, countries are listed from west to east, and from south to north for consistency. Use of Gusenleitner & Schwarz (2002) for distributions refers to their presented maps which were drawn by Warncke. For widespread species, only general distributions are given in the interest of brevity. Countries marked with an '*' denote a species newly recorded for said country, with new material presented for understudied countries in order to have the most up to date distributional information. When Iran is among the countries for which the species is newly recorded, the species is also marked with an asterisk. In detailing localities, information enclosed in [square brackets] indicates non-label information that has been added by the authors for additional context.

Because of their aggregative nature without presenting precise specimen records, Grace (2010), Scheuchl & Willner (2016), Aliyev *et al*. (2017), and Ascher & Pickering (2021) are cited only when they represent the only mentions of the presence of a species in Iran in the absence of primary literature. For Ascher & Pickering (2021), some of the country records which are listed for Iran are drawn from the GBIF database, specifically the collection of Donald Baker, which is kept in the Snow Entomological Museum Collection, Lawrence, KS. Several of the species collected and determined by Baker that have been digitised and uploaded to GBIF represent the first known records for Iran. They are therefore treated as new for Iran, as they have not been published previously in the primary literature.

The majority of specimens examined for this study came from the Oberösterreichisches Landesmuseum, Linz, due to the large quantities of undetermined specimens donated by Czech, German, and Austrian collectors. Additional undetermined material of *Andrena* collected in Iran, Syria, and Turkey by Klaus Warncke and Maximillian Schwarz was also recently rediscovered, providing an additional source of important specimens. Some of these specimens had been separated by Warncke as new for science and provisional 'type' labels were added. Some of these taxa are described herein; their provisional but unpublished names are noted in the Remarks sections.

Year of publication for species described by Morawitz follows Kerzhner (1984) and Ebmer (2021), not Gusenleitner & Schwarz (2002).

All material was identified by TJW unless explicitly stated in individual specimen records.

Abbreviations of repositories

AVC	=	Androulla Varnava Collection, Limassol, Cyprus
ICPI	=	Iranian Collection of Pollinator Insects, Yasouj University, Yasouj, Iran
MKC	=	Max Kasparek Collection, Heidelburg, Germany
MNHN	=	Muséum national d'histoire naturelle, Paris, France
MNHNC	=	Museu Nacional de História Natural e da Ciência, Lisbon, Portugal
MSC	=	Maximillian Schwarz Collection, Ansfelden, Austria
NHMUK	=	Natural History Museum, London, United Kingdom
OÖLM	=	Oberösterreichisches Landesmuseum, Linz, Austria
OSCA	=	F.J. Ortiz-Sánchez Collection, Almería, Spain
RMNH	=	Naturalis Biodiversity Center, Leiden, the Netherlands
SEMC	=	Snow Entomological Museum Collection, Lawrence, Kansas, USA
SMNHTAU	=	Steinhardt Museum of Natural History, Tel Aviv, Israel
TJWC	=	Thomas James Wood Collection, Mons, Belgium
ZMHB	=	Museum für Naturkunde, Berlin, Germany

Results

Species descriptions

Class Insecta Linnaeus, 1758
Order Hymenoptera Linnaeus, 1758
Family Andrenidae Latreille, 1802
Genus *Andrena* Fabricius, 1775

Andrena* (*Aciandrena*) *deminuta Wood sp. nov.
urn:lsid:zoobank.org:act:F159660E-5198-42B0-813E-70AF8770C1D0
Figs 1–12

Diagnosis

Andrena deminuta sp. nov. can be placed in the subgenus *Aciandrena* Warncke, 1968 because of its small body size (Fig. 1), black integument, shagreened propodeal triangle (Fig. 4), simple male genitalia (Fig. 11), and yellow male clypeus (Fig. 8). It is closest to *A. israelica* Scheuchl & Pisanty, 2016 and *A. judaea* Scheuchl & Pisanty, 2016 because the facial foveae are relatively broad above and not substantially tapered below, in addition to their small body size of ca 5 mm, which makes them one of the smallest known members of the *Aciandrena*.

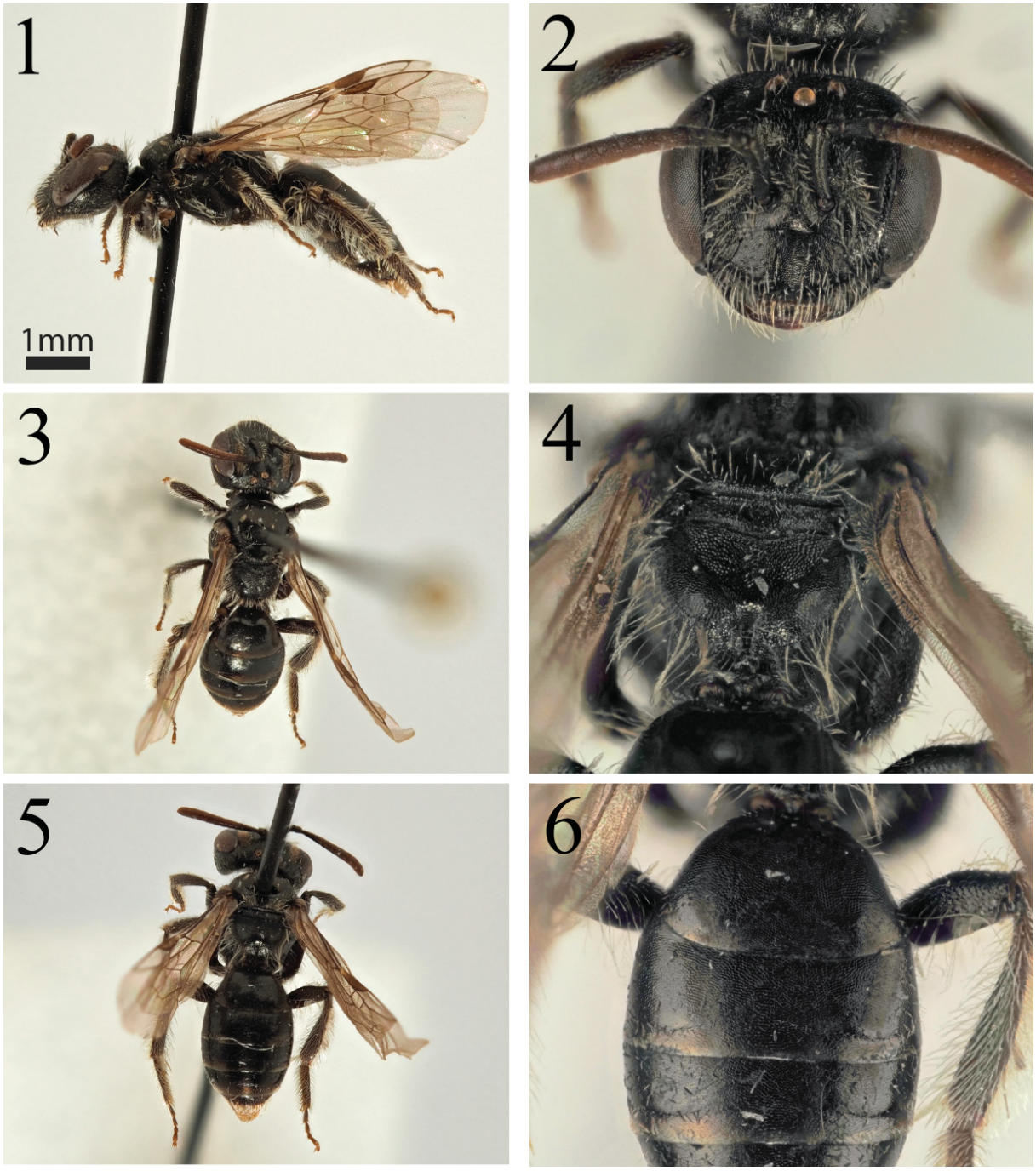
Female material can be separated from *A. judaea* (alternative character state in parentheses) because in dorsal view the foveae are filled with brown hairs (vs whitish hairs) and the nervulus is strongly antefurcal (vs weakly antefurcal). It shares these characters with *A. israelica* and is therefore extremely similar. It can be separated by the stronger punctures on the clypeus (Fig. 2), punctures apically and laterally clearly present, separated by 0.5–1 puncture diameter (clypeal punctures fine, scattered, apically and laterally separated by 1–2 puncture diameters, not obviously contrasting underlying surface).

Male material has a yellow clypeus (Fig. 8) and a strongly antefurcal nervulus, and therefore can be separated from both *A. judaea* (yellow clypeus, but weakly antefurcal nervulus) and *A. israelica* (black clypeus, strongly antefurcal nervulus). The genital capsule also differs from that of both taxa as it has pronounced and apically truncate gonocoxal teeth (Fig. 11), the apices therefore square-shaped (gonocoxal teeth weakly produced and apically rounded in *A. judaea*, gonocoxal teeth more produced but with rounded apices in *A. israelica*), the penis valves are basally broad and sharply narrow apically

(penis valves comparatively narrower basally, narrowing less abruptly apically in *A. israelica* and *A. judaea*), and the outer margin of the gonostyli are more strongly emarginate (outer margin straight to very weakly emarginate, see illustrations in Pisanty *et al*. 2016).

Etymology

From the Latin adjective '*deminuta*', meaning 'small, diminutive', in reference to its small size.



Figs 1–6. *Andrena deminuta* Wood sp. nov., ♀ (OÖLM). **1**. Profile. **2**. Face. **3**. Dorsum. **4**. Propodeal triangle. **5**. Terga. **6**. Terga, detail.

Material examined

Holotype

IRAN • ♂; Lorestan Province, Dorud Lanjaban env.; 33.419° N, 48.986° E; 960 m a.s.l.; [collected in May 2016 but no precise date on label]; M. Kafka leg.; OÖLM.

Paratypes

IRAN • 1 ♀; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; M. Kafka leg.; OÖLM • 4 ♀♀; Lorestan Province, Dorud Lanjaban env.; 670 m a.s.l.; 11 May 2016; M. Kafka leg.; OÖLM • 1 ♀; same collection data as for preceding; TJWC • 1 ♀; Lorestan Province, 10 km SW of Dorud; 1520 m a.s.l.; 20 May 2014; J. Halada leg.; OÖLM • 2 ♀♀; Ham [Ilam] Province, Sar Joob; 1930 m a.s.l.; 13 May 2016; M. Kafka leg.; OÖLM • 1 ♀; same collection data as for preceding; TJWC.

Other material examined (aff. *Andrena deminuta*)

IRAN • 1 ♂, 10 ♀♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 3 ♀♀; same collection data as for preceding; TJWC.

Description

Female

Measurements. Body length 5–6 mm (Fig. 1).

Head. 1.2 times as wide as long (Fig. 2). Clypeus dark, domed, with irregular large punctures, punctures separated by 0.5–3 puncture diameters, broad but unclear longitudinal impunctate midline present centrally; underlying surface uniformly shagreened, weakly shining. Process of labrum variable, generally narrowly trapezoidal, as broad as long or narrower than long, apical margin truncate. Face, gena, vertex, and scape with short whitish hairs. Gena equalling width of compound eye; ocelloccipital distance slightly less than diameter of lateral ocellus. Foveae dorsally broad, occupying half distance between compound eye and lateral ocellus, narrowed to half width below at level of antennal insertions, here separated from inner margin of compound eye by distance subequal to their own width; foveae filled with dark brown hairs (Fig. 3). Antennae basally dark, A(5)6–12 strongly lightened orange below; A3 subequal to A4+5.

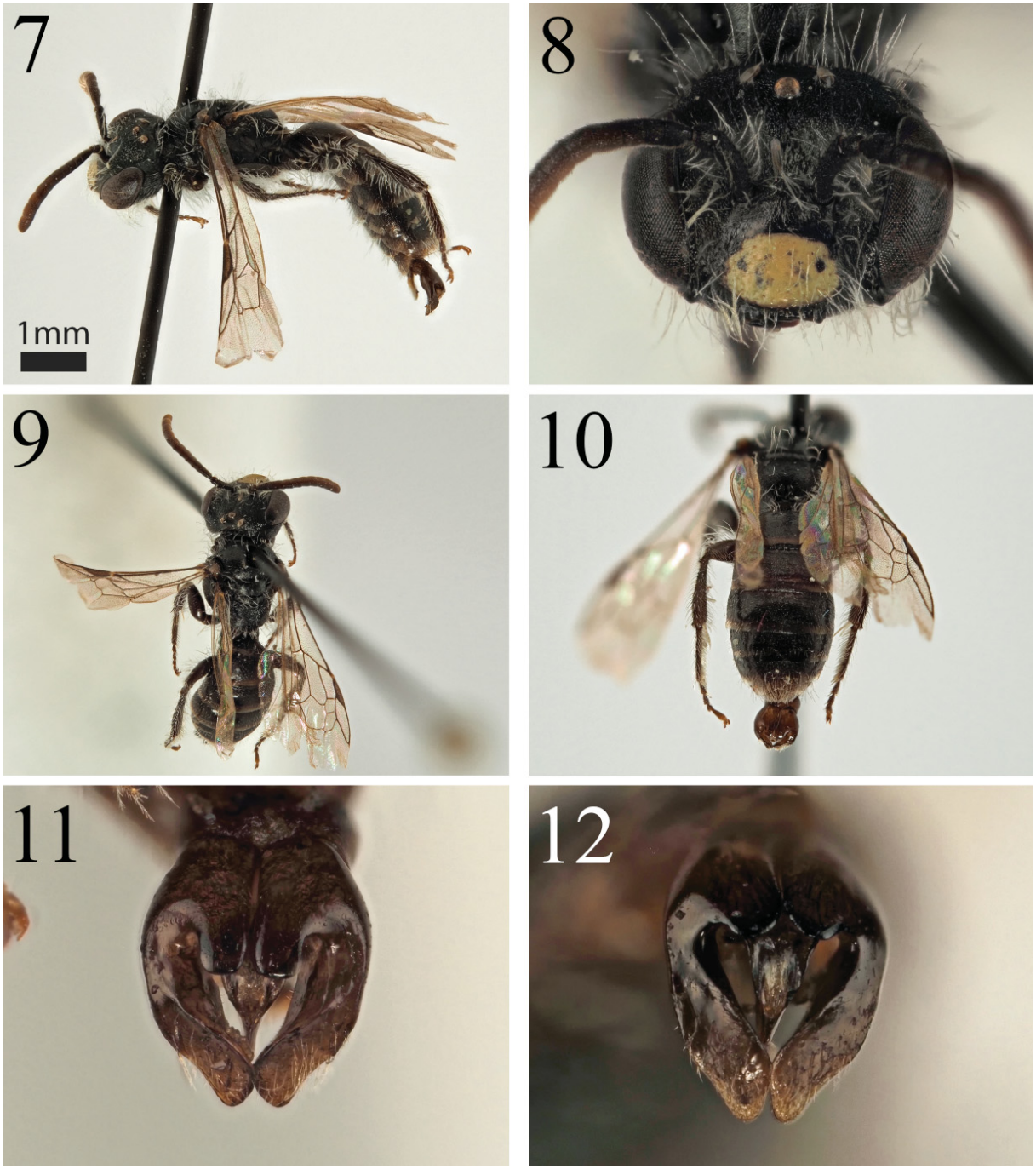
Mesosoma. Scutum and scutellum with very fine granular shagreen, weakly shining, sparsely punctate with fine punctures, punctures separated by 1–5 puncture diameters. Pronotum without humeral angle. Mesepisternum and lateral and dorsolateral faces of propodeum with fine granular shagreen, weakly shining. Propodeal triangle broad, internal surface with extremely fine raised network of circular carinae, thus resembling granular shagreenation, propodeal triangle therefore defined by change in surface sculpture (Fig. 4). Mesosoma with short sparse whitish hairs, propodeal corbiculae incomplete, dorsally composed of weakly plumose whitish hairs, internal surface with sparse whitish simple hairs. Legs dark, apical tarsal segments lightened orange, pubescence whitish. Tibial and femoral scopae and flocculus whitish. Hind tarsal claws unidentate. Wings hyaline, stigma orange with dark brown lateral margin, venation dark orange; nervulus strongly antefurcal, first recurrent vein enters second submarginal cell before its middle.

Metasoma. Terga dark, marginal areas of T2–4 slightly depressed, T1–4 with apical margin lightened dark brown to yellow apically (Fig. 5). Terga finely microreticulate, strongest on T1, becoming progressively weaker by T4, weakly shining; tergal discs essentially impunctate (Fig. 6). Tergal discs with extremely scattered short whitish hairs, apical fringe of T5 and hairs flanking pygidial plate golden. Pygidial plate narrowly rounded triangular, flat, internal surface weakly shagreened.

Male

MEASUREMENTS. Body length 5.5 mm (Fig. 7).

HEAD. 1.3 times as wide as long. Clypeus yellow marked over majority of area, not extending fully to margins, laterally with two small black maculae (Fig. 8). Clypeus with irregular punctures, punctures separated by 0.5–3 puncture diameters, underlying surface uniformly shagreened, weakly shining. Process of labrum narrowly triangular, apical margin truncate. Face, vertex, and scape with whitish



Figs 7–12. 7–11. *Andrena deminuta* Wood sp. nov., ♂ (OÖLM). **7**. Profile. **8**. Face. **9**. Dorsum. **10**. Terga. **11**. Holotype genitalia (Lorestan Province). – **12**. Aff *Andrena deminuta*, ♂, genitalia (Fars Province) (OÖLM).

hairs, gena ventrally with long white hairs, equalling length of scape. Gena slightly exceeding width of compound eye; ocelloccipital distance slightly less than diameter of lateral ocellus. Antennae dark basally, A5–13 lightened orange below; A3 exceeding A4, this sub-square, shorter than A4+5.

Mesosoma. Mesosoma structurally as in female (Fig. 9) with exception of hind tarsal claws with strong inner tooth, wing venation dark brown.

Metasoma. Terga structurally as in female (Fig. 10). S8 columnar, parallel-sided, apical margin truncate, ventral surface covered with short whitish hairs. Genital capsule compact, gonocoxae apically produced into strong square-ended teeth. Gonostyli broad, with strongly raised internal margin, apically flattened, slightly narrowed subapically. Penis valves broad basally, narrowing strongly at their midpoint (Fig. 11).

Remarks

Several specimens were examined from Fars Province (see below). Females were not separable from *A. deminuta* sp. nov., as the only apparent difference is that the tergal shagreenation is stronger, but the single male specimen had a divergent genital capsule. In the holotype male of *A. deminuta*, the gonocoxal teeth are elongate with clearly truncate and square-shaped apices (Fig. 11). However, in the specimen from Fars Province, the gonocoxal teeth are less strongly elongate, and apically more rounded (Fig. 12). Given the presence of cryptic *Aciandrena* species which cannot be morphologically separated in the female sex (Pisanty *et al*. 2022a), it is unlikely that these belong to the same taxon. The material from Fars is not described until more material is available.

Distribution

Southern Iran (provinces of Ilam and Lorestan).

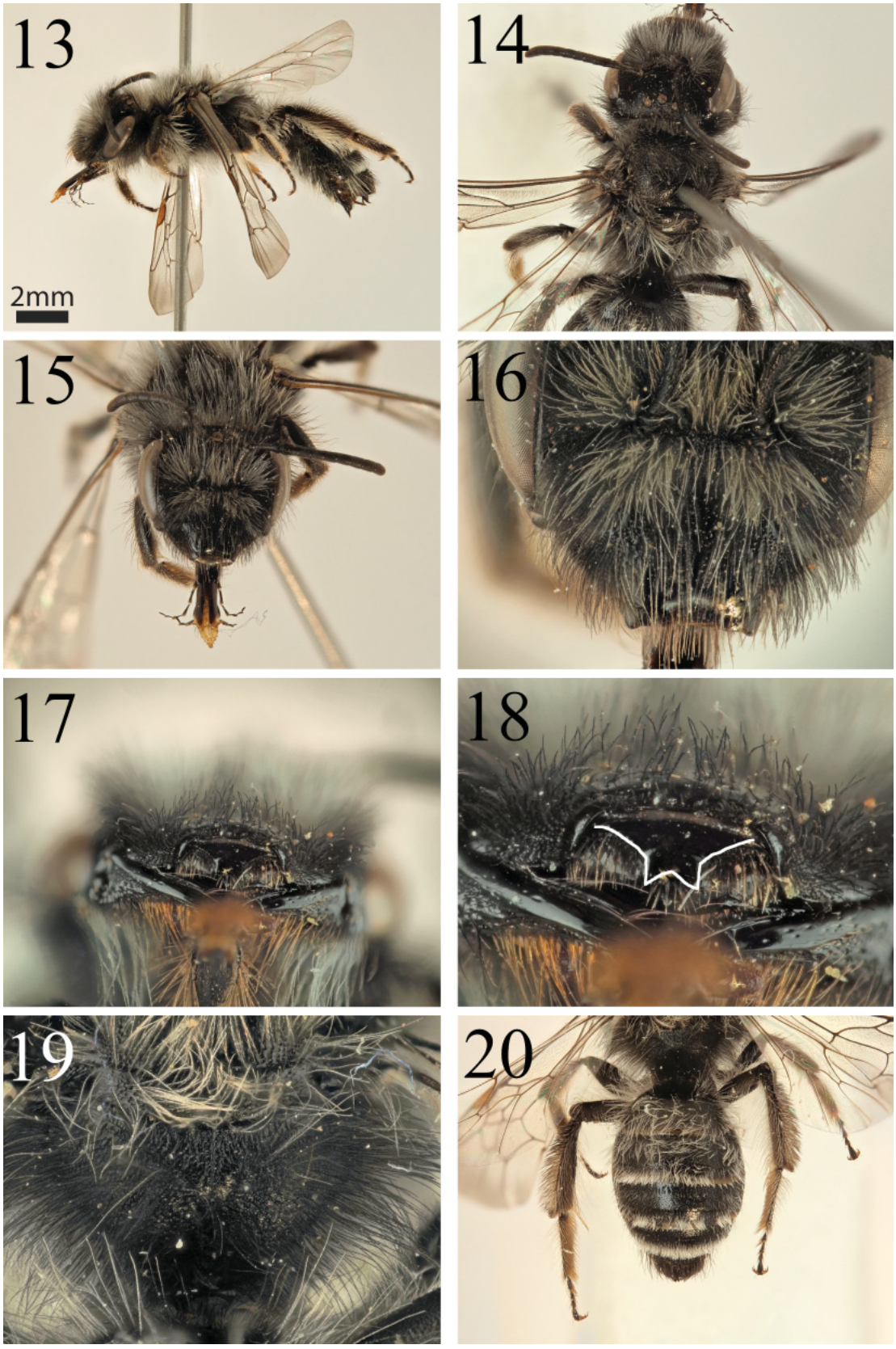
Andrena* (*Euandrena*) *boustaniae Wood sp. nov.
urn:lsid:zoobank.org:act:33AD35D5-FBE2-4BDC-9C7C-0B17C62EB284
Figs 13–24

Diagnosis

Andrena boustaniae sp. nov. can be placed in the subgenus *Euandrena* Hedicke, 1933 in the female sex because of the characteristically drop-shaped foveae which are narrowed below, and the simple scopal hairs. This subgenus is poorly understood in the Eastern Mediterranean to the Middle East (Praz *et al*. 2019; TJW, G. Pisanty & C. Praz unpublished data) and extreme care should be taken when identifying material in this region.

Female material is superficially similar to taxa around *A. allosa* Warncke, 1975 (see Praz *et al*. 2019) due to the light scutal hairs (Fig. 13) and intermixed black and white hairs on the face (Fig. 15). However, females of *A. boustaniae* sp. nov. present several important characters, specifically the flattened clypeus with a slightly raised impunctate longitudinal ridge (Fig. 16), the broad, apically projecting, and medially emarginate process of the labrum (Fig. 18), the finely rugose propodeal triangle, the dorsally wide facial fovea (occupying over half the distance between the compound eye and the lateral ocellus), the dark hind tibiae with bicoloured tibial scopa (Fig. 13, white ventrally, black dorsally), the densely and clearly punctate scutum, the apically hyaline tergal margins (Fig. 20), and the clear white hair bands on T2–4. In combination, these characters allow separation from all described Turkish, Caucasian, and Central Asian taxa of *Euandrena*.

In the male sex, *A. boustaniae* sp. nov. has a unique genital capsule for *Euandrena* in this region, lacking gonocoxal teeth, the inner margins with an almost obtuse angle, thus superficially resembling the genitalia of certain species of *A.* (*Graecandrena*), gonocoxae slightly diverging medially, and the



Figs 13–20. *Andrena boustaniae* Wood sp. nov., ♀ (OÖLM). **13**. Profile. **14**. Dorsum. **15**. Face. **16**. Face, detail. **17**. Process of labrum. **18**. Process of labrum with shape outlined. **19**. Propodeum. **20**. Terga.

penis valves extremely broad at the base (Fig. 24). In the diverging gonocoxae, the genital capsule slightly resembles *A. hermonella* Scheuchl & Pisanty, 2016, but the lateral hyaline extensions of the penis valves are rounded, not forming angular projections.

Etymology

Named after Mira Boustani for her tireless work researching and cataloguing the understudied Lebanese bee fauna (Boustani *et al*. 2021).

Material examined

Holotype

IRAN • ♂; Yazd, Banadak-o sadat; 31.573° N, 54.204° E; 2103 m a.s.l.; 22 Mar. 2021; S. San leg.; OÖLM.

Paratypes

IRAN • 1 ♀; Yazd, Mehriz, Posht e Hosseinie Shohaday gomnam; 1500 m a.s.l.; 28 Feb. 2020; S. San leg.; OÖLM • 1 ♀; Yazd, Sakhvid, Mazraeh Khosraw; 2469 m a.s.l.; 27 Mar. 2019; S. San leg.; ICPI • 5 ♂♂; Yazd, Banadak-o sadat; 2103 m a.s.l.; 22 Mar. 2021; S. San leg.; ICPI • 1 ♂; same collection data as for preceding; TJWC • 1 ♂; same collection data as for preceding; OÖLM • 1 ♂; Yazd, Tezerjan, paen tar az Seyyed Mahmood; 1993 m a.s.l.; 6 Mar. 2020; S. San leg.; OÖLM • 1 ♂; Yazd, Jade konj-e kooh, dakal; 2019 m a.s.l.; 26 Mar. 2021; S. San leg.; ICPI.

Description

Female

Measurements. Body length 11 mm (Fig. 13).

Head. 1.2 times as wide as long (Fig. 15). Clypeus dark, centrally flattened, irregularly punctate with unevenly sized punctures; punctures basally separated by <0.5 puncture diameter, becoming sparse apically, separated by 1–4 puncture diameters; apical rim of clypeus essentially impunctate; clypeus centrally with impunctate, longitudinal, and slightly raised ridge; underlying clypeal surface smooth and shining (Fig. 16). Process of labrum triangular-trapezoidal, strongly narrowing apically, with distinct, strongly bifurcate medioapical extension (Figs 17–18). Face centrally with white hairs on clypeus, supraclypeal area, scape, and frons, intermixing with black hairs laterally, dorsally, and ventrally. Gena ventrally with long white hairs, longest exceeding length of scape, intermixing with black hairs dorsally, hairs on vertex predominantly white. Gena slightly exceeding width of compound eye; ocelloccipital distance slightly exceeding diameter of lateral ocellus. Foveae dorsally broad, occupying slightly over ½ distance between compound eye and lateral ocellus, narrowed to half width below at level of antennal insertions; foveae filled with black hairs. Antennae dark, A4–12 slightly lightened below due to presence of grey cilia; A3 exceeding A4+5, A4 sub-square, A5 longer than broad, A3 shorter than A4+5+6.

Mesosoma. Scutum and scutellum with very fine and even shagreenation, shining; surface densely but slightly irregularly punctate with clear punctures, punctures separated by <0.5–1 puncture diameter (Fig. 14). Pronotum without humeral angle. Mesepisternum and lateral face of propodeum with fine shagreenation, weakly shining, surface covered with large flat punctures, becoming sparse centrally on face of propodeal corbicula. Propodeal triangle wide, well delineated laterally by fine raised carina, internal surface with raised longitudinal carina centrally, remaining surface with fine network of raised rugae, underlying surface more clearly shining than dorsolateral parts of propodeum (Fig. 19). Mesepisternum and majority of propodeum with long black hairs, propodeal corbicula complete, corbicular fringe dorsally composed of long black plumose hairs, becoming entirely white ventrally; internal surface of propodeal corbicula with simple white hairs. Scutum and scutellum dorsally with predominantly white hairs, some shorter black hairs intermixed laterally and centrally. Legs uniformly

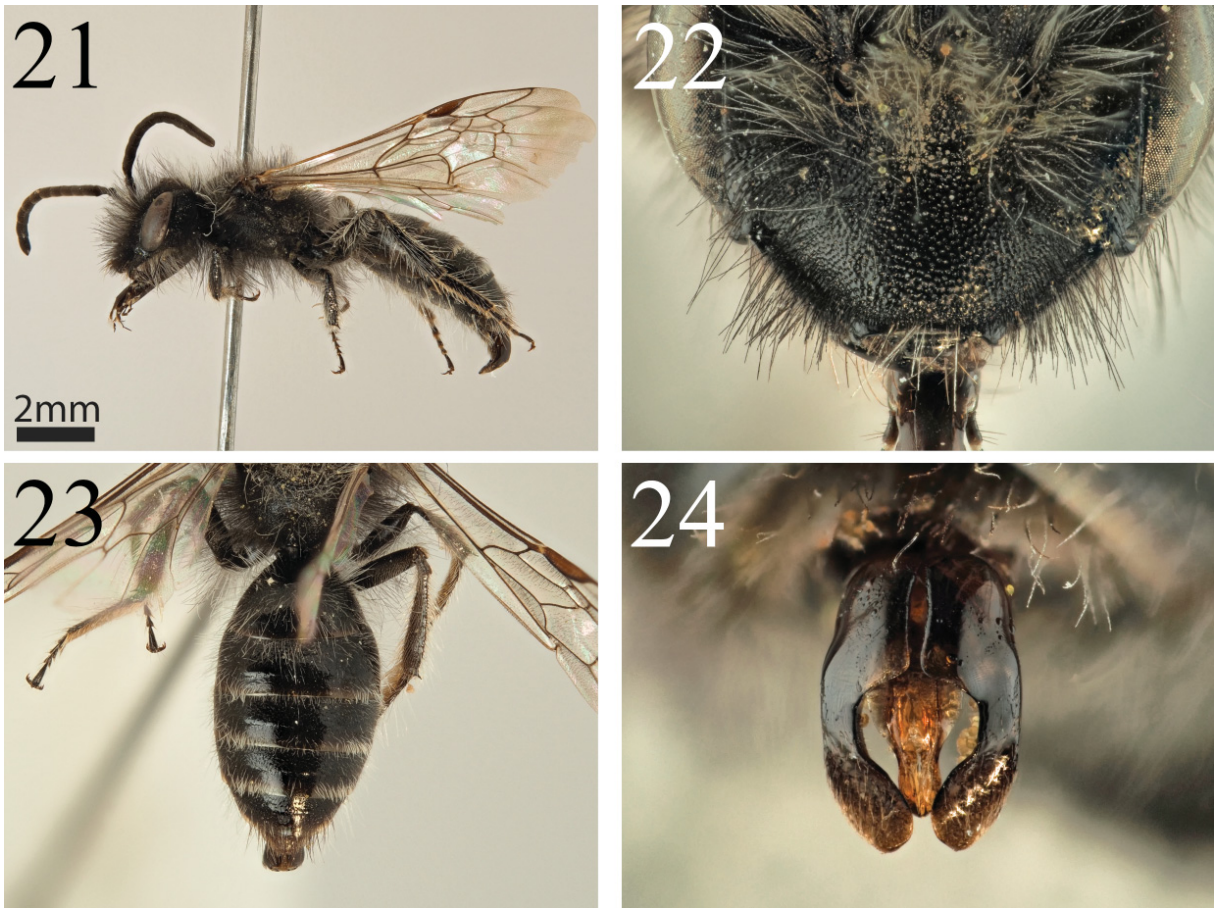
dark, pubescence white, fore femorae ventrally with long fringe of white plumose hairs, equalling length of scape. Tibial scopae bicoloured, white ventrally, blackish dorsally, composed of simple hairs; flocculus and femoral scopae unicolourous white. Hind tarsal claws with inner tooth. Wings hyaline, stigma orange centrally, dark brown laterally, venation dark brown; nervulus interstitial, first recurrent vein enters second submarginal cell beyond its middle.

Metasoma. Terga dark, marginal areas of T2–4 slightly depressed, T1–4 with apical margin narrowly lightened yellow-hyaline (Fig. 20). Terga finely microreticulate, weakly shining, tergal discs deeply and densely punctate, punctures separated by 1–2 puncture diameters. T1–2 on discs with loose long whitish hairs, laterally with additional scattered black hairs, discs of T3–4 with short intermixed black and white hairs; T2–4 apically with dense fringe of short white hairs, obscuring underlying surface. Apical fringe of T5 black centrally, with long white hairs laterally, hairs flanking pygidial plate black; pygidial plate triangular, broadly rounded apically, with large and flat triangular raised area centrally.

Male

Measurements. Body length 9–11 mm (Fig. 21).

Head. 1.2 times as wide as long. Clypeus dark, very weakly domed, densely and evenly punctate, punctures separated by 0.5–1 puncture diameter; underlying surface smooth and shining (Fig. 22). Process of labrum as in female, though longitudinally compressed, with lateral wrinkles and ridges. Face more extensively dark haired than female, though still with white hairs on face centrally, on gena



Figs 21–24. *Andrena boustaniae* Wood sp. nov., ♂ (OÖLM). **21**. Profile. **22**. Face. **23**. Terga. **24**. Genitalia.

ventrally, and on vertex, longest hairs clearly exceeding length of scape. Gena broad, almost twice width of compound eye; ocelloccipital distance 1½ times diameter of lateral ocellus. Antennae dark, A4–13 slightly lightened greyish-brown below due to presence of tiny cilia; A3 slightly shorter than A4.

Mesosoma. Scutum and scutellum more extensively shagreened than in female, dull except for small area on scutum centrally with reduced shagreenation, weakly shining. Mesosoma otherwise structurally as in female. Mesepisternum and propodeum with long, uniformly black hairs, without white hairs laterally, some scattered white hairs ventrally; scutum and scutellum with sparse long and intermixed black and white hairs, white hairs dominating. Legs dark, pubescence intermixed black and white, white hairs dominating on tibiae and tarsi. Hind tarsal claws with inner tooth. Wings hyaline, stigma orange centrally, dark brown laterally, venation dark brown; nervulus slightly antefurcal, first recurrent vein enters second submarginal cell beyond its middle.

Metasoma. Terga dark, apical margins of T2–5 slightly depressed, more extensively lightened hyaline-yellow (Fig. 23). Tergal discs finely shagreened over majority of area, weakly shining, shagreen absent apically and on marginal areas, here smooth and shining; tergal discs evenly punctate, punctures separated by 2 puncture diameters. Discs of T1–2 with sparse, long white hairs, becoming shorter and intermixed with black hairs on T3–4, disc of T5 with only short black hairs. S8 columnar, apically truncate, laterally with short brown hairs. Genital capsule compact, gonocoxa with inner margin slightly diverging medially, inner angle rounded, slightly obtuse, without gonocoxal teeth. Gonostyli with apical blades spatulate, slightly flattened. Penis valves broad basally with large, rounded hyaline extensions laterally, apically narrowed (Fig. 24).

Remarks

Collected from flowers of *Prunus* (*Amygdalus*) spp. (Rosaceae) in February and March. It may therefore be associated with flowering trees in the early spring.

Distribution

Central Iran (Yazd).

Andrena* (*Euandrena*) *oblata sp. nov.
urn:lsid:zoobank.org:act:AC3B3A80-B5BC-49F2-8256-37BDEA1EF690
Figs 25–30

Diagnosis

Andrena oblata sp. nov. can be placed in the subgenus *Euandrena* in the female sex because of the characteristically drop-shaped foveae which are narrowed below, and the simple scopal hairs (Fig. 28). The centrally flattened clypeus places it close to two taxa, *A. canuta* Warncke, 1975 from Turkey, Armenia, and Azerbaijan and *A. alijevi* Osytshnjuk, 1986 from Azerbaijan. *Andrena oblata* can be separated from *A. canuta* because the clypeus is completely flat centrally (Fig. 26) (centrally with a longitudinal excavated groove), the clypeus itself is compact, not noticeably elongated (weakly elongated), and the tibial scopa is golden (tibial scopa white). *Andrena oblata* can be separated from *A. alijevi* by the facial fovea which dorsally occupy ⅓ of distance between lateral ocellus and compound eye (dorsally occupying ½ this distance), the uniformly golden hairs of the vertex, paraocular area, and scutum (hairs here greyish-brown with admixture of black hairs), and the golden tibial scopa (tibial scopa whitish with yellow-brown hairs at base). See also *A. sani* sp. nov. (below).

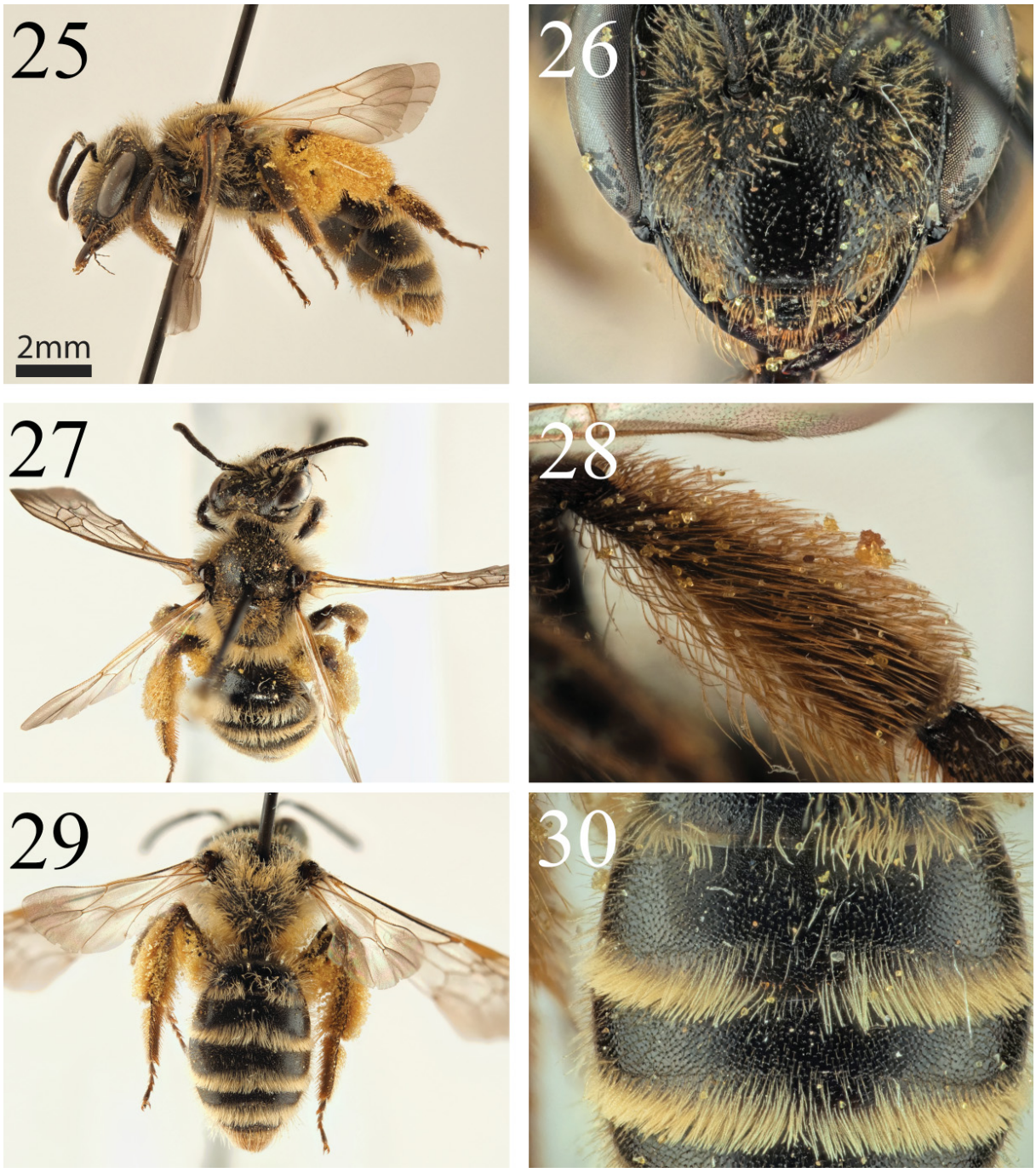
Etymology

From the Latin adjective '*oblatus*', meaning 'flattened', in reference to the flattened clypeus.

Material examined

Holotype

IRAN • ♀; Yasouj, Darreh Grouh Firuz Abad, Faramarz Village; 30.945° N, 51.596° E; 6 May 2021; E. Rostami leg.; OÖLM.



Figs 25–30. *Andrena oblata* sp. nov., ♀ (OÖLM). **25**. Profile. **26**. Face. **27**. Dorsum. **28**. Tibial scopa. **29**. Terga. **30**. Terga, detail.

Paratypes

IRAN • 2 ♀♀; Yasouj, Darreh Grouh Firuz Abad, Faramarz Village; 30.945° N, 51.596° E; 6 May 2021; E. Rostami leg.; OÖLM • 2 ♀♀; same collection data as for preceding; TJWC • 5 ♀♀; same collection data as for preceding; ICPI • 2 ♀♀; Yasouj, 2 km after Davood Abad Village; 1811 m a.s.l.; 6 May 2021; E. Rostami leg.; ICPI.

Description

Female

Measurements. Body length 9.5–11 mm (Fig. 25).

Head. 1.2 times as wide as long. Clypeus dark, centrally flattened, with clear and variable punctures; punctures dense laterally, separated by 0.5 puncture diameter, becoming sparse and irregular centrally, separated by 1–4 puncture diameters (Fig. 26). Surface of clypeus laterally with weak shagreenation, smooth and shining over majority of area. Process of labrum trapezoidal with rounded corners, twice as broad as long. Face, scape, gena, and vertex with uniformly golden hairs, longest approximately half of length of scape. Gena slightly exceeding width of compound eye; ocelloccipital distance equalling diameter of lateral ocellus. Fovea narrow dorsally, occupying ⅓ of distance between lateral ocellus and compound eye, slightly narrowed below at level of antennal insertions; filled with dark brown hairs. Antennae dark, A3 slightly exceeding A4+5, A4 sub-square, slightly wider than long, A4 as long as broad.

Mesosoma. Scutum and scutellum with very fine and irregular shagreenation, surface shining to weakly shining; surface densely and clearly punctate, punctures separated by 0.5–1 puncture diameter (Fig. 27). Pronotum without humeral angle. Mesepisternum finely rugose, dull, lateral faces of propodeum with shagreened, weakly shining. Propodeal triangle poorly delineated with very fine and inconspicuous lateral carinae, internal surface with fine network of slightly raised rugae. Dorsolateral faces of propodeum strongly shagreened and densely punctate with large shallow punctures, punctures separated by 0.5–1 puncture diameter, propodeal triangle therefore distinguished by absence of punctures. Mesosoma with golden hairs, becoming lighter ventrally, longest on mesepisternum, not exceeding length of scape; propodeal corbicula with plumose hairs comprising dorsal fringe and weakly plumose hairs on internal surface. Legs uniformly dark, pubescence brownish basally to golden apically; tibial scopae brownish-golden, femoral scopae and flocculus lighter (Fig. 28). Hind tarsal claws with inner tooth. Wings hyaline, stigma orange, venation basally brown, becoming orange over majority of wing; nervulus weakly antefurcal to antefurcal, first recurrent vein enters second submarginal cell slightly beyond its middle.

Metasoma. Terga dark, marginal areas of T2–4 depressed, T1–4 with apical margins narrowly lightened yellow-hyaline (Fig. 29). Terga faintly shagreened, weakly shining, clearly and deeply punctate, punctures separated by 1–2 puncture diameters, marginal areas weakly and obscurely punctate (Fig. 30). T1–4 on discs with sparse golden hairs, on T1 extending onto margin to form comparatively weak apical band, not obscuring underlying surface, T2–4 with dense complete apical hairbands of long yellowish hairs, obscuring underlying surface. Apical fringe of T5 and hairs flanking pygidial plate golden; pygidial plate narrowly triangular, with raised rounded longitudinal ridge centrally.

Male

Unknown.

Remarks

All specimens were collected from *Elaeagnus angustifolia* L. (Elaeagnaceae) in May, with the majority of individuals having their scopae full of pollen. Further study is required to see if this is an important

part of the pollen diet. Use of pollen of *Elaeagnus* has also been recorded in *Andrena* (*Euandrena*) *nasica* Lebedev, 1933, which is found in Kazakhstan, Turkmenistan, and Uzbekistan (Osytshnjuk *et al*. 2008). This species can easily be separated by its strongly elongated clypeus, fulvous tarsi and hind tibiae, its narrower foveae, and its much less densely punctate terga. However, the association with *Elaeagnus* and broadly similar morphology suggests that this plant and its associated fauna of *Andrena* should be more thoroughly studied in semidesert environments in Iran and Central Asia.

Distribution

Southern Iran (Yasouj).

Andrena* (*Euandrena*) *sani sp. nov.
urn:lsid:zoobank.org:act:BD70A72C-74D6-4DE7-AF60-57D0A3E9BA80
Figs 31–40

Diagnosis

Andrena sani sp. nov. can be placed in the subgenus *Euandrena* in the female sex because of the characteristically drop-shaped foveae which are narrowed below, and the simple scopal hairs. It is most similar to *A. alijevi* and to *A. oblata* sp. nov. because of the centrally flattened clypeus and thick yellow tergal hairbands (Fig. 35). *Andrena sani* can be separated from *A. alijevi* because of the uniformly light brown hairs on the vertex, paraocular area, and scutum (Figs 31–32) (hairs here greyish-brown with admixture of black hairs) and the slightly impressed longitudinal impunctate line on the clypeus surrounded by dense punctures (Fig. 33) (clypeus without impressed longitudinal line, centrally with scattered punctation). *Andrena sani* can be separated from *A. oblata* by the slightly impressed longitudinal impunctate line on the clypeus surrounded by dense punctures (clypeus without impressed longitudinal line, centrally with scattered punctation) and the weaker tergal puncturing, punctures here sparse and obscure (Fig. 36), separated by 2–4 puncture diameters (punctures dense, distinct, separated by 1–2 puncture diameters; compare Figs 30 and 36).

Males are harder to diagnose (as for most *Euandrena*), but the combination of the characters A3=A4, dark, non-metallic terga, predominantly black facial pubescence, non-elongated clypeus, scutum finely granulate and matt, terga finely shagreened with sparse indistinct punctures (Fig. 39), and simple genital capsule (Fig. 40) places it close to *A. alijevi*. It can be separated because of the slightly impressed impunctate longitudinal line on the clypeus, the clypeus otherwise entirely densely punctate (clypeus without longitudinal impunctate line, apical ⅓ smooth and shiny with scattered punctures) and the facial pubescence, which is extensively white centrally, black laterally (predominantly black, with occasional pale hairs).

Etymology

Named after Sina San, who collected many of the new species described in this manuscript.

Material examined

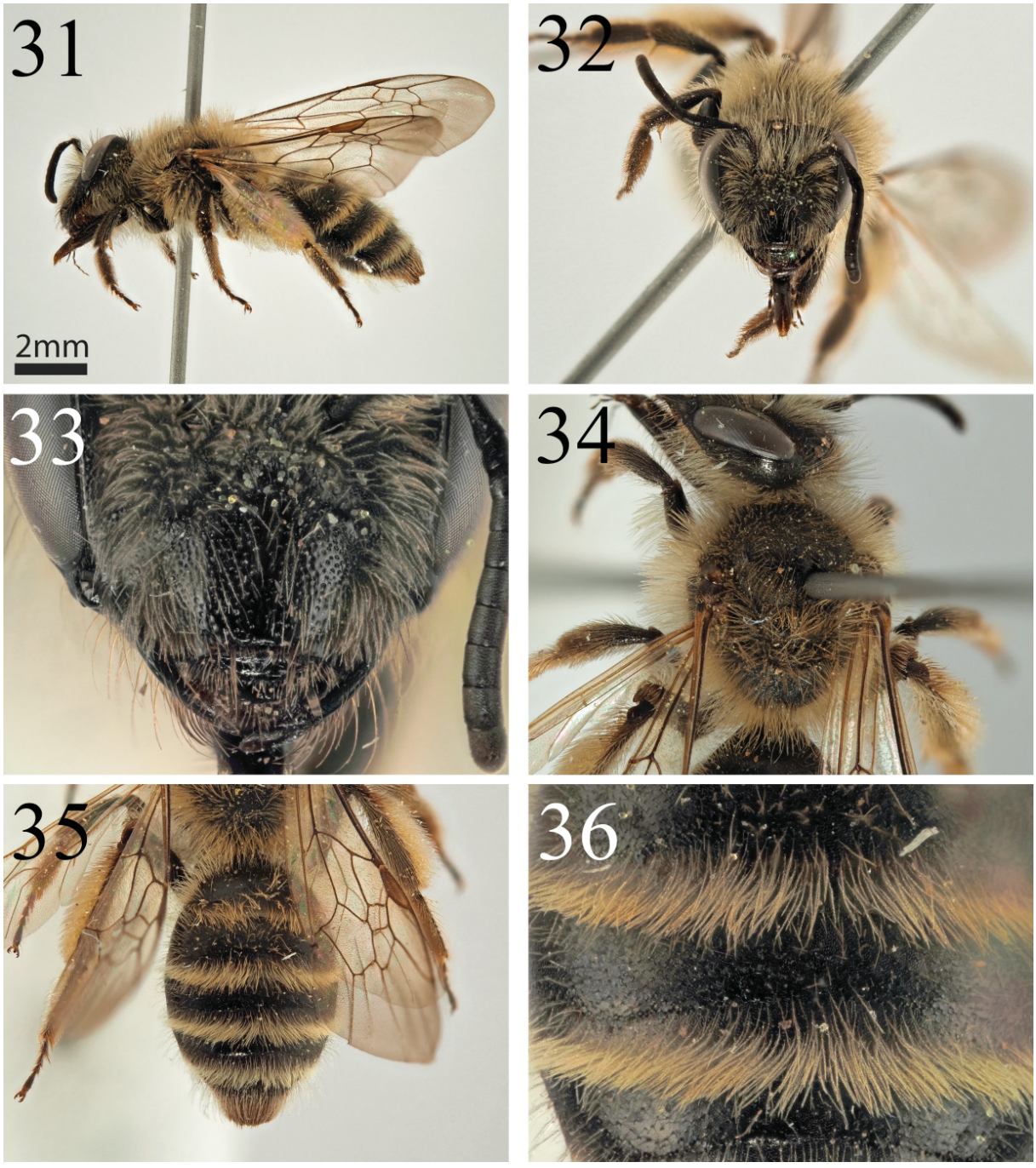
Holotype

IRAN • ♀; Yazd, Sanij Baghe khaleghieh; 31.648° N, 54.015° E; 2060 m a.s.l.; 13 Mar. 2020; S. San leg.; OÖLM.

Paratypes

IRAN • 1 ♂; Yazd, Sakhvid, Mazraeh Khosraw; 2469 m a.s.l.; 27 Mar. 2019; S. San leg.; TJWC • 1 ♂; Yazd, Tezerjan, Hossein Abad, Seyyed mahmood; 1993 m a.s.l.; 5 Mar. 2020; S. San leg.; OÖLM • 1 ♀;

Yazd, Yazd road to Sanij; 2621 m a.s.l.; 27 Mar. 2019; S. San leg.; TJWC • 2 ♀♀; Yazd, Taft, Tezerjan, Mazra ali, Agha seyyed; 2109 m a.s.l.; 24 Mar. 2019; S. San leg.; ICPI • 1 ♀; Yazd, Banadak-o sadat; 2103 m a.s.l.; 22 Mar. 2021; S. San leg.; ICPI • 1 ♂; Yazd, Mehriz, Shohaday gomnam; 1500 m a.s.l.; 8 May 2021; S. San leg.; ICPI • 1 ♂; Yazd, Tezerjan Bagh-e Agha seyyed; 2226 m a.s.l.; 5 May 2021; S. San leg.; ICPI.



Figs 31–36. *Andrena sani* sp. nov., ♀ (OÖLM). **31**. Profile. **32**. Face. **33**. Face, detail. **34**. Dorsum. **35**. Terga. **36**. Terga, detail.

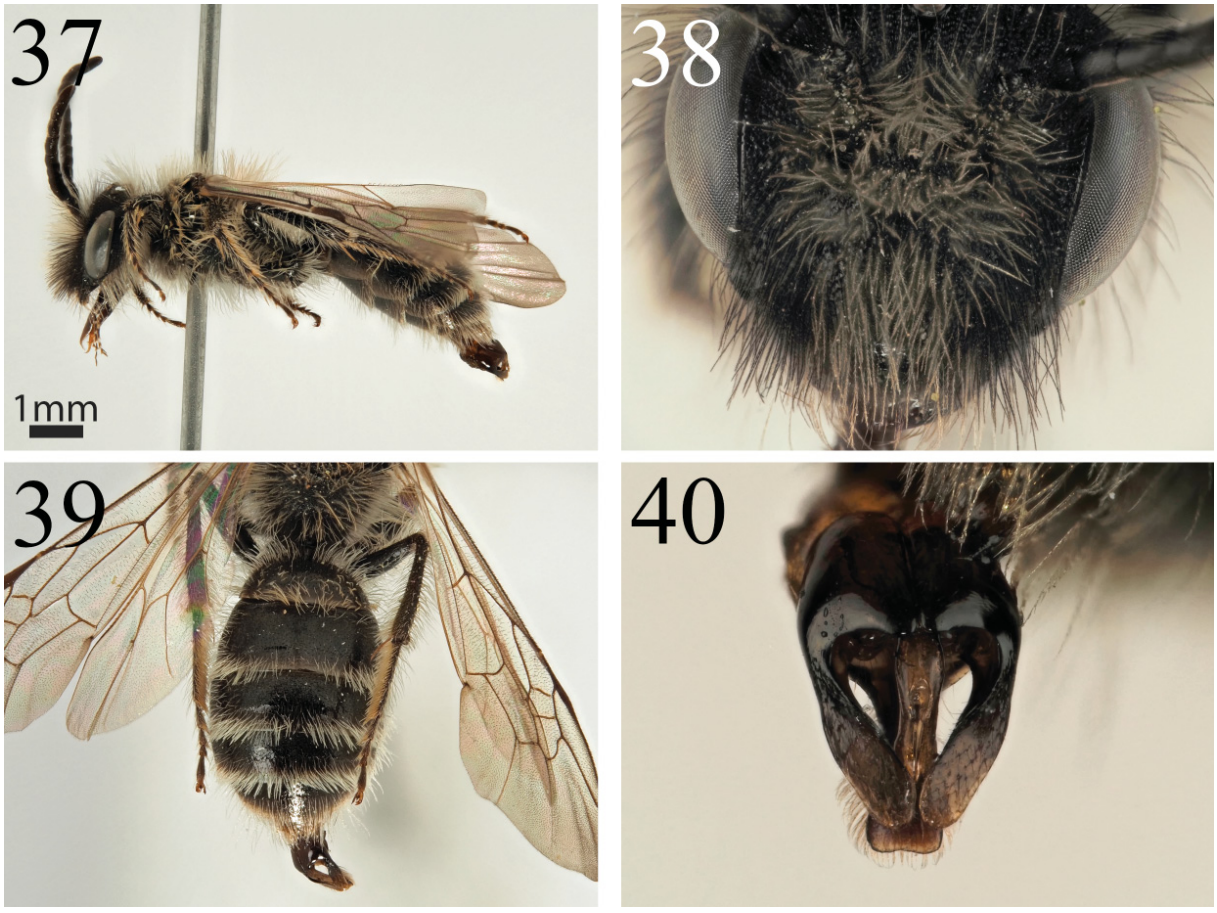
Description

Female

Measurements. Body length 9.5–10.5 mm (Fig. 31).

Head. 1.2 times as wide as long (Fig. 32). Clypeus dark, flattened over majority of its area, densely punctate, punctures separated by 0.5–1 puncture diameter with exception of clear impunctate longitudinal line centrally with width of 2 puncture diameters; longitudinal line slightly impressed, giving impression of weak furrow (Fig. 33). Clypeus basally and laterally shagreened, weakly shining, becoming smooth and shiny apically. Process of labrum rounded-trapezoidal, twice as broad as long, apical margin very weakly emarginate. Face, gena, scape, and vertex with long pale brown hairs, longest equalling length of scape; face laterally and frons with some intermixed black hairs. Gena slightly exceeding width of compound eye; ocelloccipital distance equalling diameter of lateral ocellus. Fovea narrow dorsally, occupying just under ½ distance between lateral ocellus and compound eye, slightly narrowed below at level of antennal insertions; filled with dark brown hairs. Antennae dark, A3 exceeds A4+5, shorter than A4+5+6.

Mesosoma. Scutum and scutellum shagreened, shagreenation slightly irregular, scutum duller laterally, weakly shining centrally; surface punctate, punctures separated by 1–2 puncture diameters (Fig. 34). Pronotum without humeral angle. Mesepisternum and lateral faces of propodeum with fine granular reticulation, weakly shining. Propodeal triangle narrow, weakly delineated laterally with fine carinae, internal surface with fine granular reticulation, dull, basally with slightly raised rugae. Dorsolateral faces



Figs 37–40. *Andrena sani* sp. nov., ♂ (OÖLM). **37**. Profile. **38**. Face. **39**. Terga. **40**. Genitalia.

of propodeum with weakly shining fine granular reticulation and fine raised rugosity, propodeal triangle therefore distinguished by absence of rugosity. Mesosoma with long light brownish hairs, becoming whitish ventrally, longest on mesepisternum, equalling length of scape; propodeal corbicula with plumose hairs comprising dorsal fringe, internal surface with sparse plumose hairs. Legs uniformly dark, pubescence dark to light brownish; tibial scopae light brownish, femoral scopae and flocculus whitish. Hind tarsal claws with inner tooth. Wings hyaline, stigma dark orange centrally with dark brown margin, venation dark brown to dark orange; nervulus interstitial to slightly antefurcal, first recurrent vein enters second submarginal cell at its midpoint.

Metasoma. Terga dark, marginal areas of T2–4 depressed, T1–4 with apical margins widely lightened yellow-hyaline (Fig. 35). Terga strongly shagreened, weakly shining, with faint and obscure fine punctures, punctures separated by 2–4 puncture diameters, marginal areas basally punctate (Fig. 36). T1–4 on discs with sparse long golden hairs, on T1 extending onto margin to form comparatively weak apical band, not obscuring underlying surface, T2–4 with dense complete hairband of long whitish hairs that obscures underlying surface. Apical fringe of T5 whitish laterally, becoming dark brown centrally, hairs flanking pygidial plate dark brown; pygidial plate rounded triangular, with faint raised rounded longitudinal ridge centrally.

Male

Measurements. Body length 8–8.5 mm (Fig. 37).

Head. 1.2 times as wide as long. Clypeus dark, flattened over majority of its area, densely and uniformly punctate, punctures separated by 0.5 puncture diameter with exception of slightly impressed longitudinal impunctate line, width equal to 1 puncture diameter (Fig. 38). Clypeus surface weakly shining throughout. Process of labrum rounded-trapezoidal, apical margin broadly and weakly emarginate. Face centrally with extensive long white hairs from antennal insertions to apex of clypeus, replaced laterally by entirely black hairs that extend onto frons; longest hairs exceeding length of scape. Gena and vertex with predominantly whitish hairs, with occasional intermixed black hairs. Gena slightly elongate, exceeding width of compound eye; ocelloccipital distance equals diameter of lateral ocellus. Antennae dark, A3=A4.

Mesosoma. Scutum and scutellum with fine granular shagreen, weakly shining, irregularly punctate with large shallow punctures, punctures separated by 1–3 puncture diameters. Structurally otherwise as in female. Mesosoma with long whitish-light brownish hairs, only propodeum with scattered individual black hairs intermixed. Legs dark, pubescence whitish with black hairs restricted to fore femorae apically. Hind tarsal claws with inner tooth. Wings as in female.

Metasoma. Terga dark, T1–4 with apical margins slightly depressed, apically lightened yellow-hyaline (Fig. 39). Tergal discs finely shagreened, weakly shining, shagreenation absent from marginal areas, these contrasting, more brightly shining. Tergal discs with obscure faint fine punctures, punctures separated by 2–4 puncture diameters. Disc of T1 with long whitish hairs, T2–5 with shorter whitish hairs, T2–4 with thick white apical hairbands that obscure underlying surface laterally, becoming weaker medially. S8 apically broadened, apex truncate, ventral surface covered with short brown hairs. Genital capsule simple, gonocoxa with very slightly produced rounded apical teeth, gonostyli apically spatulate, flattened, slightly broadened. Penis valves narrow, essentially parallel-sided (Fig. 40).

Distribution

Central Iran (Yazd).

Andrena* (*Micrandrena*) *elam Wood sp. nov.
urn:lsid:zoobank.org:act:339546A8-6F7C-4250-8E6B-49017F4EB6A8
Figs 41–44

Diagnosis

Andrena elam sp. nov. can be placed in the subgenus *Micrandrena* Ashmead, 1899 because of its small body size (Fig. 41), black integument, and strongly rugose propodeal triangle. It has a domed clypeus with faint latitudinal striations (Fig. 42) (common in many Turkish *Micrandrena* and typically reminicient of *A. simontornyella* Noskiewicz, 1939), and shiny and densely punctate scutum (Fig. 43). This places it close to *A. puffina* Warncke, 1975 and *A. stolida* Warncke, 1975. *Andrena elam* can immediately be separated from both these taxa by the sculpturing of the terga which have extremely strong, raised microreticulation covering the entirety of T1 and the discs of T2–4 with large, dense punctures intermixed throughout, punctures particularly large and coarse laterally (Fig. 44). *Andrena puffina* has the terga finely and subtly punctate, and *A. stolida* has the terga with fine punctures that are not clearly visible against the underlying shagreen, not becoming noticeably coarser laterally. See also *A. subviridula* sp. nov. (see below).

Etymology

Named after the ancient kingdom of Elam (ca 3000–500 BC, noun in apposition) that was largely found in the region that is now called Ilam Province.

Material examined

Holotype

IRAN • ♀; Ilam Province, Abda Man, Dinar Gaouh; 1830 m a.s.l.; 12 May 2016; M. Kafka leg.; OÖLM.

Paratypes

IRAN • 9 ♀♀; Ilam Province, Abda Man, Dinar Gaouh; 1830 m a.s.l.; 12 May 2016; M. Kafka leg.; OÖLM • 16 ♀♀; Lorestan Province, Dorud Lanjaban env.; 670 m a.s.l.; 11 May 2016; M. Kafka leg.; OÖLM • 5 ♀♀; same collection data as for preceding; TJWC • 2 ♀♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM.

Description

Female

Measurements. Body length 6.5–7 mm (Fig. 41).

Head. 1.2 times as wide as long. Clypeus dark, domed, punctate, punctures separated by 0.5–3 puncture diameters. Clypeus surface microreticulate, centrally and basally with weakly raised microreticulation giving impression of weak latitudinal striations, becoming obscure apically; underlying surface weakly shining (Fig. 42). Process of labrum narrow, weakly tongue-shaped, slightly wider than long, apical margin weakly rounded. Face, gena, vertex, and scape with short whitish to brownish hairs. Gena slightly exceeding width of compound eye; ocelloccipital distance slightly shorter than diameter of lateral ocellus. Foveae narrow, dorsally occupying ¼ distance between compound eye and lateral ocellus, subequal to width of flagellum, of uniform width throughout; foveae filled with light brownish hairs. Antennae dark, A3=A4+5.

Mesosoma. Scutum and scutellum polished, smooth and shiny over majority of area, with shagreen in anterior ⅕ and laterally as scutum descends to pronotum and pronotal lobes, otherwise without shagreen (Fig. 43). Scutum and scutellum regularly and clearly punctate, punctures separated by 1–2 puncture

diameters. Pronotum without humeral angle. Mesepisternum and lateral and dorsolateral faces of propodeum with fine granular shagreen, weakly shining; mesespisternum anteriorly and dorsolateral faces of propodeum with fine network of raised rugosity. Propodeal triangle delineated laterally with fine carinae, internal surface with fine network of rugae, thus weakly differentiated from sculpture of dorsolateral faces of propodeum. Mesosoma with moderately long whitish hairs; propodeal corbiculae thin, composed of sparse whitish plumose hairs, internal surface with numerous simple white hairs. Legs uniformly dark, pubescence whitish to light brownish; tibial scopae whitish ventrally, light brownish dorsally; femoral scopae and flocculus white. Hind tarsal claws with inner tooth. Wings hyaline, stigma dark brown, venation dark orange to dark brown, nervulus interstitial to weakly antefurcal; first recurrent vein enters second submarginal cell at its middle.

Metasoma. Terga dark, apical margins of T1–4 slightly depressed, depression weakest on T1, strongest on T4, all marginal areas unicolourous black. Tergal discs with extremely dense raised microreticulation, tergal discs also densely punctate, punctures separated by 0.5–1 puncture diameter, punctures and microreticulation combining to form dense network of bead-like punctures separated by slightly raised margins; integument dull (Fig. 44). Entirety of T1 covered with dense microreticulation, discs of T2–4 with microreticulation, becoming progressively weaker, disc of T4 without bead-like punctures, punctures distinct, without raised margins. Marginal areas of T2–4 impunctate, without microreticulation, shagreened and weakly shining. T2–4 medially almost hairless, laterally with weak whitish apical hair fringes, obscure. Tergal hairbands absent. Apical fringe of T5 and hairs flanking pygidial plate dark brown; pygidial plate rounded triangular, flat.

Figs 41–44. *Andrena elam* Wood sp. nov., ♀ (OÖLM). **41**. Profile. **42**. Face. **43**. Dorsum. **44**. Terga.

Male

Unknown.

Distribution

Southern Iran (provinces of Ilam, Lorestan, Fars).

Andrena* (*Micrandrena*) *extenuata sp. nov.
urn:lsid:zoobank.org:act:536BF1F3-74B7-49E7-9CCF-325F9359B54E
Figs 45–53

Diagnosis

Andrena extenuata sp. nov. can be placed in the subgenus *Micrandrena* because of its small body size (Fig. 45), black integument, black male clypeus (Fig. 50), and strongly rugose propodeal triangle (Fig. 47). The propodeal triangle is long and finely rugose, and the facial foveae are very narrow throughout their entire length, which is consistent with the *Andrena fumida* species group (former subgenus *Fumandrena* Warncke, 1975 which now falls within a broad *Micrandrena* concept, Pisanty *et al*. 2022b). Within the *fumida*-group and *Micrandrena* with consistently narrow foveae, *A. extenuata* is closest to *A. protuber* Pisanty, 2022 in the female sex because of the protruding clypeus which is centrally weakly punctate and shiny. However, the foveae of *A. extenuata* are noticeably narrower below, clearly narrower than the width of a flagellum (Fig. 46), linear and without a medial constriction (subequal to width of flagellum, with clear medial constriction), the scutellum is mirror-smooth (scutellum shagreened), and the terga are less densely punctate (Fig. 48) (with clear and moderately dense punctures).

In the male sex, *A. extenuata* sp. nov. can be instantly recognised by its genital capsule, which is narrow with elongated penis valves and gonostyli (Fig. 53). *Andrena protuber* has a more compact and typical '*Micrandrena*' genital capsule (see illustrations in Pisanty *et al*. 2022a); that of *A. extenuata* is more similar to that of *A. sandanskia* Warncke, 1973 (elongate, but with gonostyli that broaden apically) or *A. djelfensis* Pérez, 1895 (gonostyli narrow and pointed, but with strongly developed gonocoxal teeth and gonostyli medially angled, Fig. 54).

Etymology

From the Latin adjective '*extenuatus*', meaning 'thinned, reduced, diminished' and referring to the narrow and pointed genital capsule.

Material examined

Holotype

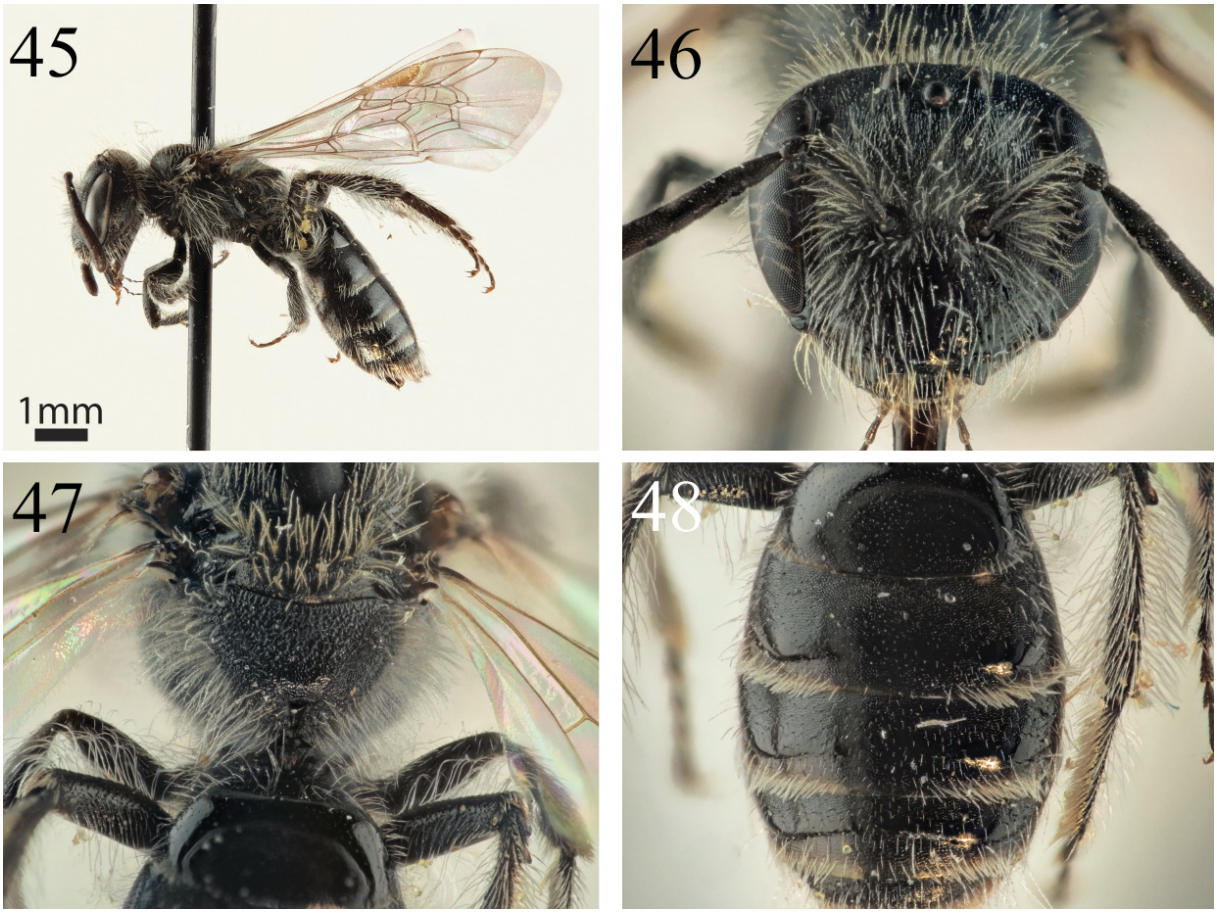
IRAN • ♂; Yasouj, Doposhteh, Dasht-e Rum; 30.589° N, 51.517° W; 2091 m a.s.l.; 10 Apr. 2021; E. Rostami leg.; OÖLM.

Paratypes

IRAN • 3 ♀♀; Yasouj, Deli Bajak, Sepidar; 2181 m a.s.l.; 23 Apr. 2021; E. Rostami leg.; ICPI • 1 ♀; Yasouj, Doposhteh, Dasht-e Rum; 2091 m a.s.l.; 6 Apr. 2021; E. Rostami leg.; ICPI • 3 ♀♀; Yasouj, Doposhteh, Dasht-e Rum; 2091 m a.s.l.; 10 Apr. 2021; E. Rostami leg.; ICPI • 2 ♀♀; same collection data as for preceding; OÖLM • 50 ♂♂, 5 ♀♀; Yazd, Banadak-o sadat; 2103 m a.s.l.; 22 Mar. 2021; S. San leg.; ICPI • 5 ♂♂, 2 ♀♀; same collection data as for preceding; OÖLM • 3 ♂♂, 2 ♀♀; same collection data as for preceding; TJWC • 3 ♂♂, 1 ♀; Yazd, Ghadam gah, Dehbala; 2175 m a.s.l.; 12 Mar. 2020; S. San leg.; ICPI • 1 ♀; Yazd, Hanza, Hosseinie; 1837 m a.s.l.; 6 Mar. 2020; S. San leg.; ICPI • 8 ♂♂; Yazd, Jade konj-e kooh, dakal; 2019 m a.s.l.; 26 Mar. 2021; S. San leg.; ICPI • 7 ♂♂, 1 ♀; Yazd, Khezr abad Ebteday Zorband; 1817 m a.s.l.; 9 Mar. 2020; S. San leg.; ICPI • 1 ♂, 2 ♀♀; Yazd, Khezr

abad Zorband; 1844 m a.s.l.; 21 Mar. 2021; S. San leg.; ICPI • 3 ♂♂; Yazd, Khorashe, Mazre Tadayon; 1808 m a.s.l.; 13 Mar. 2020; S. San leg.; ICPI • 3 ♂♂, 1 ♀; Yazd, Mehriz, Hosseiniyeh, Shohaday gomnam; 1500 m a.s.l.; 28 Feb. 2020; S. San leg.; ICPI • 1 ♂; Yazd, Polis-e rah taft; 1399 m a.s.l.; 12 Mar. 2020; S. San leg.; ICPI • 1 ♂, 2 ♀♀; Yazd, Sakhvid, Mazraeh Khosraw; 2469 m a.s.l.; 27 Mar. 2019; S. San leg.; ICPI • 2 ♂♂; Yazd, Sanij khaleghieh; 2060 m a.s.l.; 13 Mar. 2020; S. San leg.; ICPI • 1 ♂; same collection data as for preceding; OÖLM • 1 ♂, 9 ♀♀; Yazd, Shahneh village, Zorband; 1890 m a.s.l.; 23 Mar. 2019; S. San leg.; ICPI • 4 ♀♀; Yazd, Taft, dare gahan; 1877 m a.s.l.; 21 Mar. 2021; S. San leg.; ICPI • 3 ♀♀; Yazd, Taft, Tezerjan, Hanza; 1949 m a.s.l.; 24 Mar. 2019; S. San leg.; ICPI • 3 ♂♂, 16 ♀♀; Yazd, Taft, Tezerjan, Hosseinabad; 2100 m a.s.l.; 22 Mar. 2019; S. San leg.; ICPI • 2 ♂♂; Yazd, Taft, Tezerjan, Mazraeh Ali, Agha Seyyed; 2109 m a.s.l.; 24 Mar. 2019; S. San leg.; ICPI • 1 ♂; same collection data as for preceding; OÖLM • 6 ♂♂; Yazd, Tezerjan Bagh-e Agha Seyyed; 2226 m a.s.l.; 12 Mar. 2020; S. San leg.; ICPI • 5 ♂♂, 16 ♀♀; Yazd, Tezerjan, Hossein Abad Seyyed Mahmood; 1993 m a.s.l.; 5 Mar. 2020; S. San leg.; ICPI • 5 ♂♂, 2 ♀♀; Yazd, Tezerjan, Seyyed Mahmood, 1993 m a.s.l.; 6 Mar. 2020; S. San leg.; ICPI.

SYRIA • 14 ♂♂, 1 ♀; Bludan [Bloudan], 57 km NW of Damascus; 2000 m a.s.l.; 24 Apr. 1992; K. Warncke leg.; OÖLM • 9 ♀♀; Burg Baniyas/Mt. Hermon; 1500 m a.s.l.; 13 Apr. 1992; K. Warncke leg.; OÖLM • 1 ♀; Maalula [Maaloula], 60 km NE of Damascus; 1400 m a.s.l.; 14 Apr. 1992; K. Warncke leg.; OÖLM.



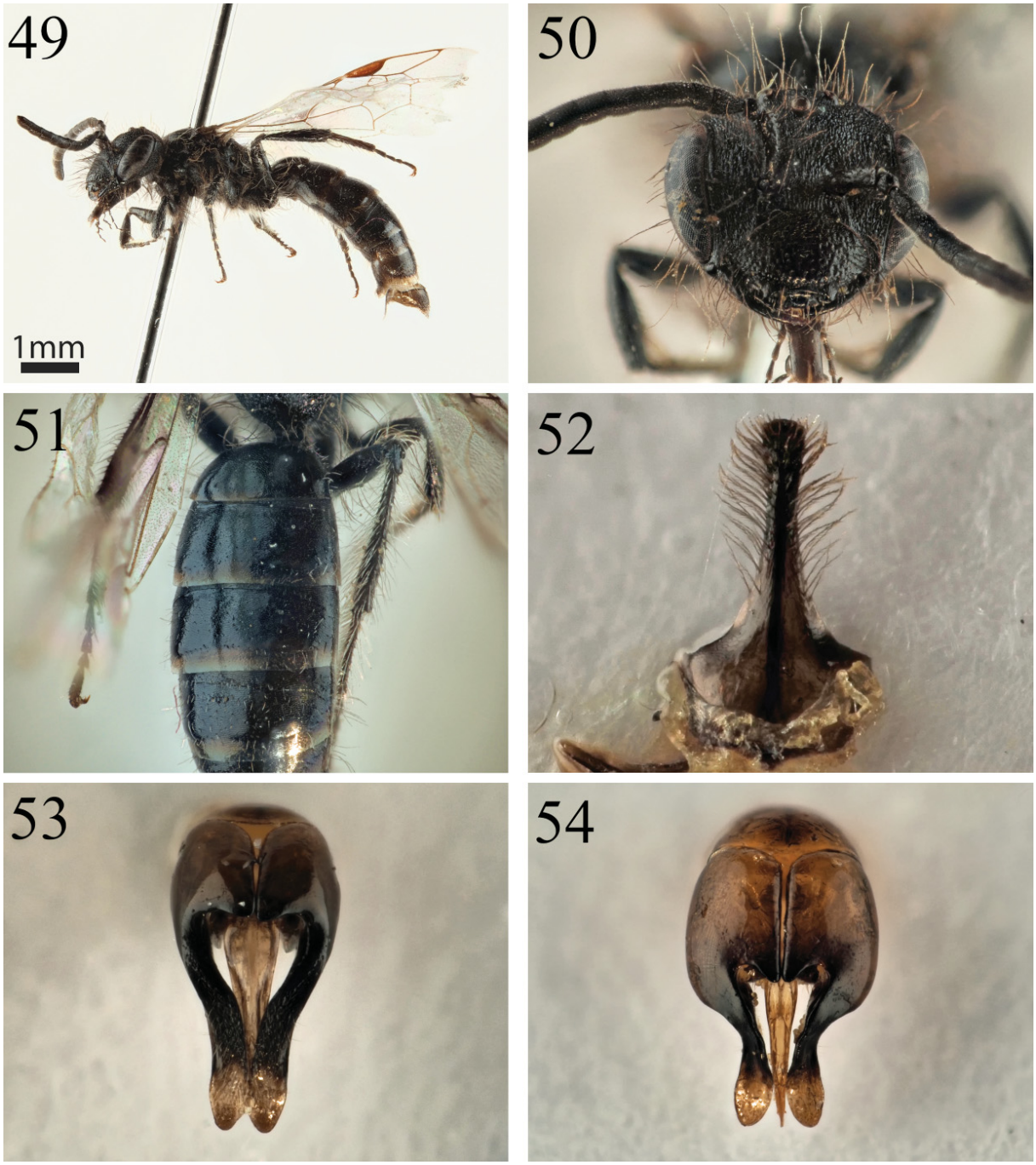
Figs 45–48. *Andrena extenuata* sp. nov., ♀ (OÖLM). **45**. Profile. **46**. Face. **47**. Propodeum. **48**. Terga.

Description

Female

MEASUREMENTS. Body length 6.5–7 mm (Fig. 45).

HEAD. 1.1 times as wide as long. Clypeus dark, domed, irregularly punctate with large punctures, punctures laterally separated by 0.5 puncture diameter, becoming sparser centrally, here separated by up to 4 puncture diameters; clypeus centrally with broad longitudinal impunctate line (Fig. 46). Clypeus



Figs 49–54. 49–53. *Andrena extenuata* sp. nov., ♂ (OÖLM). **49**. Profile. **50**. Face. **51**. Terga. **52**. Sternum 8. **53**. Genitalia. – **54**. *Andrena djelfensis* Pérez, 1895, ♂ (OÖLM), genitalia.

integument narrowly shagreened laterally, smooth and shiny over majority of area. Process of labrum quadrate, essentially parallel-sided, as long as broad, corners slightly rounded. Face, gena, vertex, and scape with long whitish hairs, longest not exceeding length of scape. Integument of paraocular area and frons with weak metallic green lustre, frons with weak longitudinal striations, with large, scattered punctures between individual rugae. Gena exceeding width of compound eye; ocelloccipital distance half diameter of lateral ocellus. Foveae extremely narrow, dorsally occupying ⅕ distance between compound eye and lateral ocellus, half width of flagellum, very slightly narrowed below at midpoint, otherwise essentially equally narrow throughout, extending slightly below level of antennal insertions. Antennae dark, A7–12 slightly lightened brownish-red below; A3 subequal to A4+5.

Mesosoma. Scutum with fine and even microreticulation, weakly shining, surface irregularly punctate with moderately sized punctures, punctures separated by 1–4 puncture diameters. Scutellum strongly contrasting, narrowly shagreened laterally, remaining surface smooth and shining with small, isolated punctures. Pronotum without humeral angle. Mesepisternum and lateral face of propodeum with fine microreticulation, dull to weakly shining. Dorsal face of propodeum long, equalling length of scutellum plus metanotum; propodeal triangle occupying majority of surface, delineated laterally with fine carinae, internal surface covered by network of fine raised rugae (Fig. 47), remaining surface of dorsal face of propodeum microreticulate, dull. Mesepisternum, scutum, and scutellum with long whitish hairs, longest not exceeding length of scape; propodeal corbiculae thin, composed of sparse whitish plumose hairs, internal surface with numerous simple white hairs. Legs dark, apical tarsal segments slightly lightened dark brown, pubescence white, scopae and flocculus white. Hind tarsal claws with inner tooth. Wings hyaline, stigma orange, venation dark brown basally to orange apically, nervulus antefurcal, first recurrent vein enters second submarginal cell slightly before its middle.

Metasoma. Terga dark, apical margins of T2–4 slightly depressed, apically narrowly lightened yellow (Fig. 48). Terga finely microreticulate, weakly shining, microreticulation narrowly disappearing laterally on raised areas immediately above depressed margins, these areas shining. Terga essentially impunctate, with scattered and obscure hair-bearing points disappearing into microreticulation; T2–4 with weak, medially interrupted whitish apical hair bands. Apical fringe of T5 and hairs flanking pygidial plate whitish-golden; pygidial plate triangular, with truncate apex, with raised longitudinal ridge centrally.

Male

Measurements. Body length 5.5–6 mm (Fig. 49).

Head. 1.3 times as wide as long. Clypeus dark, weakly domed, with large shallow punctures, punctures separated by 0.5–1 puncture diameter except basally where a faint impunctate longitudinal line is visible (Fig. 50). Clypeus integument basally and centrally heavily microreticulate, becoming weaker apically, here slightly shining. Process of labrum tongue-shaped, slightly longer than broad, lateral margins weakly converging apically, apical margin straight. Face, gena, vertex, and scape with long black to brown hairs, longest subequal to length of scape. Gena slightly exceeding width of compound eye; ocelloccipital distance less than half diameter of lateral ocellus. Antennae dark, A5–13 slightly lightened greyish-brown below due to presence of tiny cilia; A3 exceeding A4, shorter than A4+5, A4 sub-square.

Mesosoma. Scutum microreticulate, dull, surface with obscure shallow punctures; scutellum with weaker microreticulation, slightly greenish-metallic, punctures larger and more clearly visible. Structurally otherwise as in female.

Metasoma. Terga dark, apical margins of T2–4 slightly depressed, more extensively lightened hyaline-yellow than in female (Fig. 51). Terga evenly microreticulate, weakly shining, presence of reduced shagreenation apicolaterally less pronounced than in female. Terga with scattered fine golden hairs, without hairbands or lateral fringes. S8 columnar, slightly narrowed medially, with brown hairs laterally

(Fig. 52). Genital capsule long, gonocoxa with very weakly pronounced gonocoxal teeth, gonostyli curved inwards apically, remaining essentially of same width throughout, apically slightly flattened, integument slightly brighter; penis valves long triangular, apically sharply pointed (Fig. 53).

Distribution

Syria (Anti-Lebanon mountain range) and southern and central Iran, from Yasouj to Yazd.

Remarks

Collected from flowers of *Acer monspessulanum* L. (Sapindaceae), *Pyrus glabra* Boiss. (Rosaceae), and *Prunus* (*Amygdalus*) spp. (Rosaceae) from late February to April. It thus seems to be associated with flowering trees in the early spring.

Andrena* (*Micrandrena*) *obsidiana Wood sp. nov.
urn:lsid:zoobank.org:act:D3E4C96A-F24F-4E98-8A5B-DD2E17D9957D
Figs 55–60

Diagnosis

Andrena obsidiana sp. nov. can be place in the subgenus *Micrandrena* because of its small body size (Fig. 55), black integument, and strongly rugose propodeal triangle. *Andrena obsidiana* lacks a gradulus at the base of T2–3 (Fig. 60), and has brilliant, completely unshagreened shiny terga. This unusual combination of characters separates it from all Middle Eastern species of *Micrandrena*. The only slightly similar species is *A. omnilaevis* Wood, 2020 from northern Spain and Portugal. Apart from the clear geographic separation, *A. obsidiana* can easily be separated by its narrower foveae which occupy ⅓ of the space between the compound eye and the lateral ocellus (occupying half of this space) and completely shiny scutum and terga (scutum and tergal discs with faint shagreenation).

Etymology

From obsidian, a dark black igneous rock that can be polished to a brilliant shine, in reference to the shiny terga lacking in shagreenation or microreticulation.

Material examined

Holotype

IRAN • ♀; Ilam Province, Abda Man, Dinar Gaouh; 32.915° N, 47.301° E; 1830 m a.s.l.; 12 May 2016; M. Kafka leg.; OÖLM.

Paratypes

IRAN • 44 ♀♀; Ilam Province, Abda Man, Dinar Gaouh; 1830 m a.s.l.; 12 May 2016; M. Kafka leg.; OÖLM • 8 ♀♀; same collection data as for preceding; TJWC • 3 ♀♀; Ham [Ilam] Province, Sar Joob; 1930 m a.s.l.; M. Kafka leg.; OÖLM • 5 ♀♀; Lorestan Province, Dorud Lanjaban env.; 670 m a.s.l.; M. Kafka leg.; OÖLM • 2 ♀♀; Fars Province, Dast Arjan; 2040 m a.s.l.; M. Kafka leg.; OÖLM • 1 ♀; Tehran, Ziyaran, Samgh Abad; 1900 m a.s.l.; M. Kafka leg.; OÖLM • 1 ♀; West Azerbaijan Province, Serou; 1650 m a.s.l.; 28 May 2010; Mi. Halada leg.; OÖLM • 7 ♀♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; M. Kafka leg.; OÖLM.

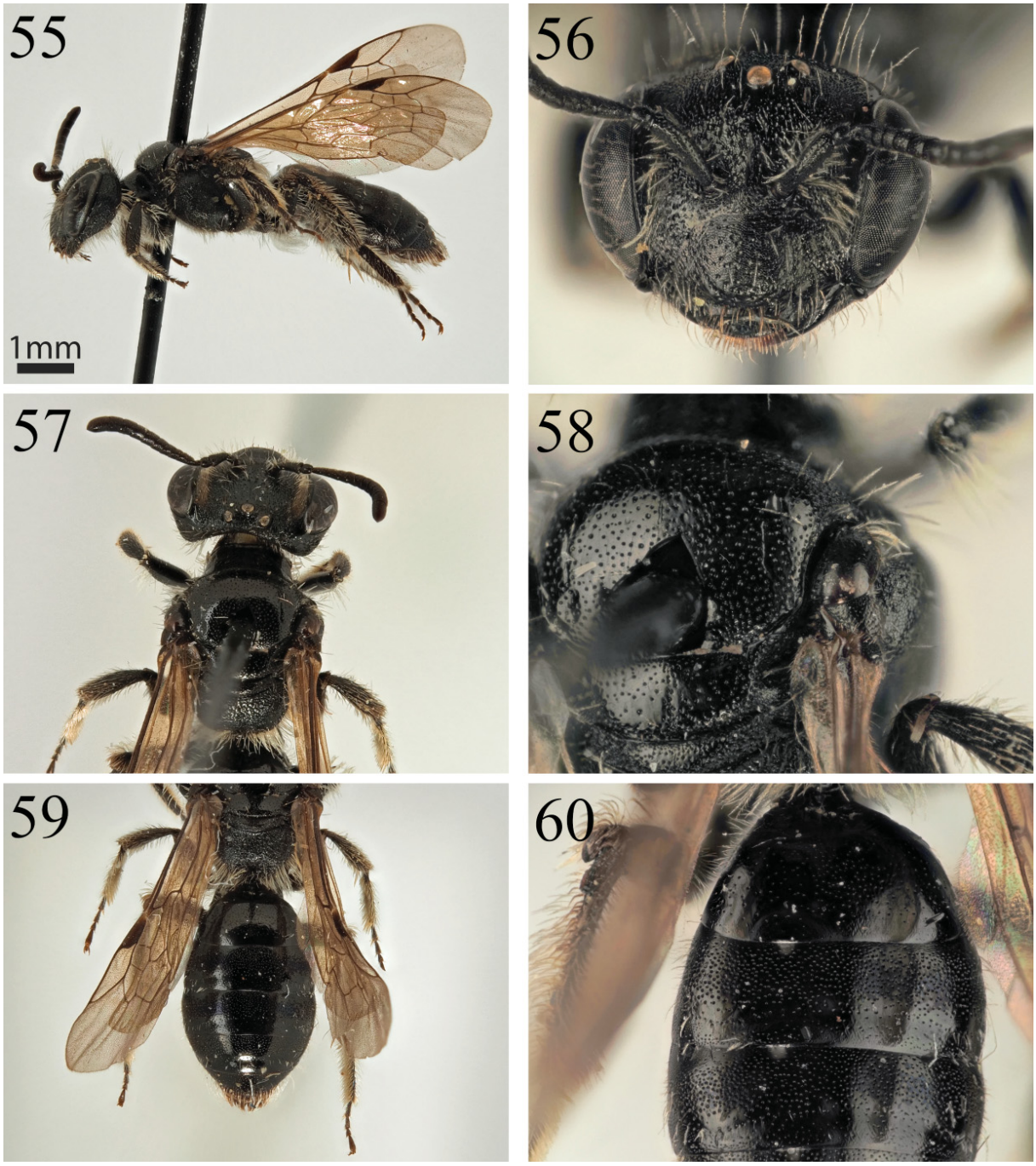
TURKEY • 1 ♀; Hakkâri, Varegös/Mt. Sat; 1800 m a.s.l.; 21 May 1989; K. Warncke leg.; OÖLM • 1 ♀; Hakkâri, Varegös/Mt. Sat; 1700 m a.s.l.; 15 Jun. 1984; K. Warncke leg.; OÖLM • 1 ♀; Hakkâri, Tanin-Tanin Pass; 2300 m a.s.l.; 12 Jun. 1984; K. Warncke leg.; OÖLM • 1 ♀; Hakkâri, Tanin-Tanin Pass; 2300 m a.s.l.; 19 May 1989; K. Warncke leg.; OÖLM • 2 ♀♀; Hakkâri, Beytüşşebap; 25 May

1988; K. Warncke leg.; OÖLM • 13 ♀♀; Nemrut Dag [Dağı]/Adiyaman; 1500 m a.s.l.; 1 Jun. 1983; K. Warncke leg.; OÖLM.

Description

Female

Measurements. Body length 6.5–7 mm (Fig. 55).



Figs 55–60. *Andrena obsidiana* Wood sp. nov., ♀ (OÖLM). **55**. Profile. **56**. Face. **57**. Dorsum. **58**. Scutum, detail. **59**. Terga. **60**. Terga, detail.

Head. 1.3 times as wide as long. Clypeus dark, domed, irregularly punctate, punctures from touching to separated by 2 puncture diameters (Fig. 56). Clypeus integument basally with raised microreticulation, forming latitudinal wrinkles, becoming weaker centrally, absent in apical ⅓; clypeus weakly shining throughout. Process of labrum narrow, weakly tongue-shaped, slightly wider than long, apical margin weakly rounded. Face, gena, vertex, and scape with whitish to brownish hairs, longest on vertex, not equalling length of scape. Gena equalling width of compound eyes; ocelloccipital distance slightly less than diameter of lateral ocellus. Foveae narrow, dorsally occupying ¼ of distance between compound eye and lateral ocellus, equalling width of flagellum, slightly narrowed below at level of antennal insertions; foveae filled with light brownish hairs. A3=A4+5.

Mesosoma. Scutum and scutellum brilliantly polished, dorsally without trace of shagreenation, smooth and shining (Fig. 57). Scutum with dense but irregularly-sized punctures, punctures separated by 1–3 puncture diameters (Fig. 58); scutellum with sparser punctation, punctures separated by 1–5 puncture diameters. Pronotum without humeral angle. Mesepisternum and lateral face of propodeum with fine granular shagreen, weakly shining. Propodeal triangle lateraly delineated with fine carinae, internal surface with network of raised rugosity, rugosity extending laterally over boundaries of propodeal triangle onto dorsolateral faces of propodeum, propodeal triangle therefore poorly defined. Mesosoma with short and scattered whitish hairs; propodeal corbiculae thin, dorsally composed of whitish-brownish plumose hairs, internal surface with numerous simple white hairs. Legs uniformly dark, pubescence whitish to light brownish, scopae and flocculus whitish. Hind tarsal claws with small inner tooth. Wings hyaline, stigma dark brown, venation light to dark brown; nervulus interstitial to weakly antefurcal, first recurrent vein enters second submarginal cell at its middle to slightly beyond its middle.

Metasoma. Terga dark, apical margins of T2–4 very slightly depressed, margins with extremely narrow rim slightly lightened dark red, essentially unicolourous with disc (Fig. 59). Gradulus absent at visible base of T2–3. Terga without shagreen, uniformly polished, brilliant, smooth and shining throughout (Fig. 60). Discs of terga clearly punctate; T1 with punctures separated by 2–3 puncture diameters centrally, laterally extremely sparse; T2–4 punctures more regular, separated by 1–2 puncture diameters throughout; terga margins with scattered irregular weak and fine punctures. Tergal hair bands barely developed, T2–4 laterally with weak and obscure hair fringes. Apical fringe of T5 and hairs flanking pygidial plate dark golden to brownish; pygidial plate narrowly rounded triangular, flat, dull.

Male

Unknown.

Distribution

Southern (province of Adıyaman) and Eastern Turkey (province of Hakkâri) and Iran (provinces of West Azerbaijan, Tehran, Ilam, Lorestan, Fars).

Andrena* (*Micrandrena*) *subviridula Wood sp. nov.
urn:lsid:zoobank.org:act:97FB1684-4A57-4511-ACE3-67A05460053A
Figs 61–69

Diagnosis

Andrena subviridula sp. nov. can be place in the subgenus *Micrandrena* because of its small body size (Fig. 61), black integument, black male clypeus (Fig. 66), and strongly rugose propodeal triangle. The propodeal triangle is long and finely rugose, and the facial foveae are very narrow throughout their entire length (Fig. 62), which is consistent with the *Andrena fumida*-group. In the female sex, it differs from eastern members of this group in the densely microreticulate terga with bead-like punctures (*A. griseigena* Warncke, 1975, with terga almost impunctate, without raised microreticulation) and the weakly shagreened and shining scutum (*A. immaculata* Warncke, 1975 and *A. kopetica* Osytshnjuk, 1993

with scutum uniformly dull). It is similar to *A. elam* sp. nov. because of the dense raised microreticulation of T1–2 (Fig. 64), but the punctures of T4 are faint and sparse, separated by 3–4 puncture diameters (punctures strong, separated by 1–2 puncture diameters; compare Figs 44 and 64) and the scutum has weak granular shagreenation (shagreenation absent, smooth and shining).

In the male sex, *A. subviridula* has the long and dense 'beard' of hairs on the clypeus that project ventrally that is typical of the *fumida* group species (Fig. 66), and closely resembles *A. immaculata* in general appearance. However, the genital capsule is different (lacking basally widened penis valves) and more closely resembles that of a *A. tomora* Warncke, 1975 and *A. fabrella* Pérez, 1903 (Fig. 70). However, the gonocoxae are not produced into apical points, the gonostyli are apically wider, not parallel-sided, and the inner margin of the gonostyli have a noticeable kink (Fig. 69, absent in *A. fabrella*, present in *A. tomora* but other previously mentioned characters apply).

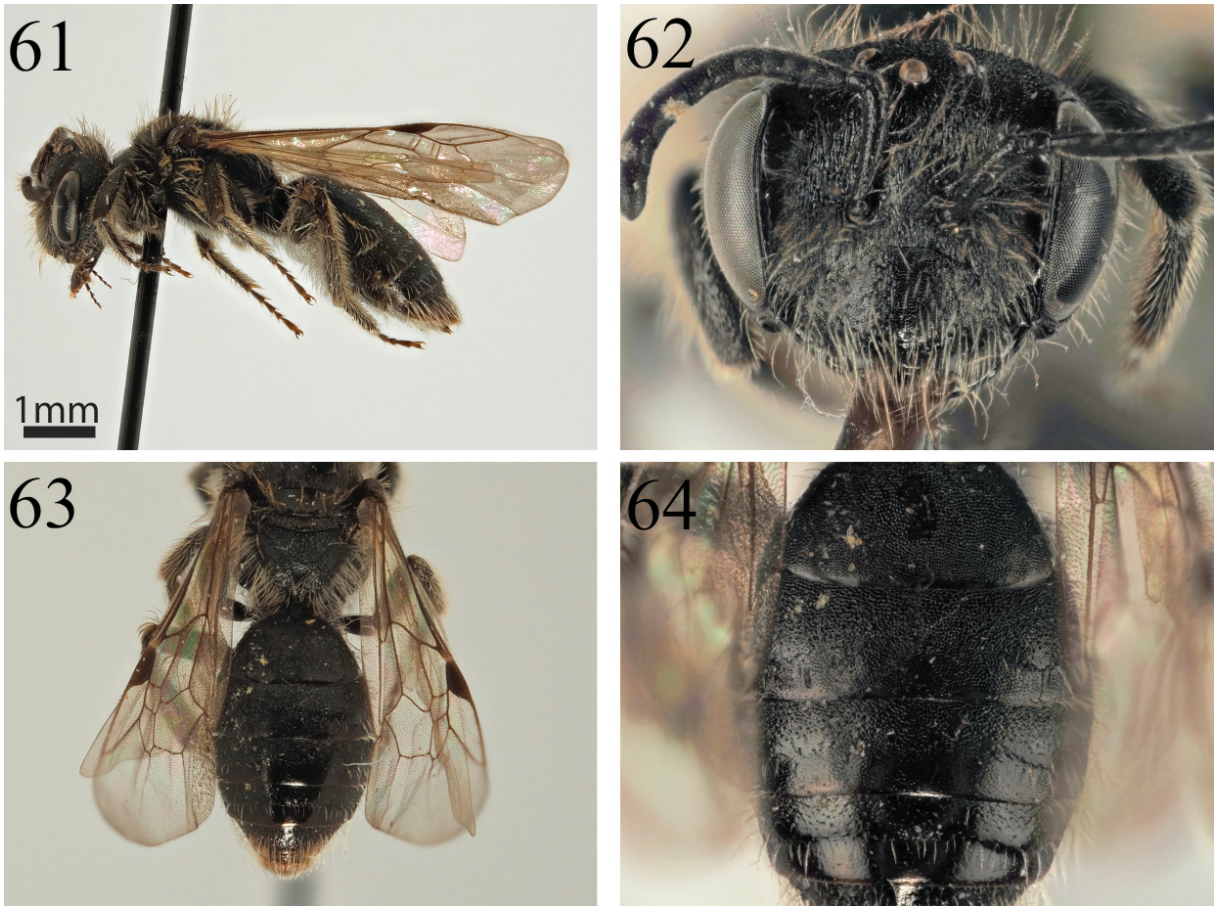
Etymology

From the Latin prefix '*sub*', meaning 'less' and the Latin adjective '*viridulus*', meaning 'green', in reference to the subtle metallic green colouration of its scutal integument.

Material examined

Holotype

IRAN • ♂; Tehran Province, 6 km N of Gačsar [Gachsar]; 36.188° N, 51.307° E; 29 May–2 Jun. 2002; J. Prochazka leg.; OÖLM.



Figs 61–64. *Andrena subviridula* Wood sp. nov., ♀ (OÖLM). **61**. Profile. **62**. Face. **63**. Terga. **64**. Terga, detail.

Paratypes

IRAN • 8 ♂♂, 1 ♀; Tehran Province, 6 km N of Gačsar [Gachsar]; 29 May–2 Jun. 2002; J. Prochazka leg.; OÖLM • 2 ♂♂, same collection data as for preceding; TJWC.

Description

Female

Measurements. Body length 6 mm (Fig. 61).

Figs 65–70. 65–69. *Andrena subviridula* Wood sp. nov., ♂ (OÖLM). **65**. Profile. **66**. Face. **67**. Dorsum. **68**. Terga. **69**. Genitalia. – **70**. *Andrena fabrella* Pérez, 1903, ♂ (TJWC), genitalia.

Head. 1.3 times as wide as long. Clypeus dark, domed, weakly punctate, punctures separated by 1–3 puncture diameters. Clypeus surface microreticulate, centrally and basally with weakly raised latitudinal microreticulation, giving impression of weak latitudinal striations, becoming obscure apically; underlying surface weakly shining (Fig. 62). Process of labrum narrow, slightly longer than wide, narrowly rounded-triangular. Face, gena, vertex, and scape with whitish to brownish hairs, frons laterally with intermixed dark brown hairs at level of antennal insertions. Gena exceeding width of compound eye; ocelloccipital distance subequal to diameter of lateral ocellus. Foveae extremely narrow, dorsally occupying ⅕ distance between compound eye and lateral ocellus, subequal to width of flagellum, uniformly wide, clearly extending below level of antennal insertions; foveae filled with dark brown hairs. Antennae dark, A3=A4+5.

Mesosoma. Scutum and scutellum weakly shagreened over majority of area, weakly shining, shagreenation becoming stronger over anterior part of scutum, here dull. Scutum with weak and subtle metallic green reflections when viewed laterally. Scutum and scutellum irregularly but clearly punctate, punctures separated by 0.5–3 puncture diameters. Pronotum without humeral angle. Mesepisternum and lateral and dorsolateral faces of propodeum with fine granular shagreen, weakly shining; mesespisternum anteriorly and dorsolateral faces of propodeum with fine network of raised rugosity. Propodeal triangle laterally delineated with fine carinae, internal surface covered in fine network of raised rugosity, becoming sparser laterally; propodeal trinangle therefore defined by change in surface sculpture. Mesepisternum with moderately long whitish hairs, scutum and scutellum dorsally with short dark brownish hairs; propodeal corbiculae thin, composed of sparse whitish plumose hairs, internal surface with sparse simple white hairs. Legs dark, apical tarsal segments lightened dark orange, pubescence whitish to light brown; tibial scopae whitish, with scattered brown hairs dorsobasally, femoral scopae and flocculus white. Hind tarsal claws with inner tooth. Wings hyaline, stigma dark orange to dark brown laterally, venation dark orange, nervulus interstitial; first recurrent vein enters second submarginal cell slightly before its middle.

Metasoma. Terga dark, apical margins of T2–4 slightly depressed, depression weakest on T2, strongest on T4, all marginal areas unicolourous black (Fig. 63). Tergal discs of T1–3 with extremely dense raised microreticulation, tergal discs also densely punctate, punctures separated by 0.5–1 puncture diameter, punctures and microreticulation combining to form dense network of bead-like punctures separated by slightly raised margins; integument dull (Fig. 64). Entirety of T1 covered with dense microreticulation, discs of T2–3 with microreticulation, becoming progressively weaker. Disc of T4 without bead-like punctures, punctures distinct, without raised margins, punctures separated by 3–4 puncture diameters. Marginal areas of T2–4 impunctate, T2 with fine microreticulation, T3–4 without microreticulation, shagreened and weakly shining. T2–3 laterally with weak whitish apical hair fringes, obscure, T4 with hair fringe very sparse but complete. Apical fringe of T5 and hairs flanking pygidial plate golden; pygidial plate rounded triangular, flat, with homogenous granular pattern, dull.

Male

Measurements. Body length 5.5–6 mm (Fig. 65).

Head. 1.3 times as wide as long. Clypeus structurally as in female, entirely covered in long, plumose, ventrally directed brownish hairs (Fig. 66). Process of labrum short, trapezoidal, smooth and shining, apical margin shallowly emarginate. Gena, vertex, and scape with long plumose brownish hairs, longest exceeding length of scape. Gena slightly exceeding width of compound eye; ocelloccipital distance slightly less than half diameter of lateral ocellus. Antennae dark, A3 sligtly exceeds A4, shorter than A4+5.

Mesosoma. Mesosoma structurally as in female (Fig. 67), though pubescence exceeding length of scape.

Metasoma. Terga structurally as in female, though terga more densely and strongly punctate, punctures variable in size, separated by 0.5–1 puncture diameter (Fig. 68). S8 columnar, apical margin truncate, ventrally covered in moderately long golden hairs. Genital capsule slightly elongate, gonocoxae medioapically truncate, right-angled, not produced into points. Gonostyli with rounded kink in inner margins basally, apically flattened, broadened, not parallel-sided. Penis valves relatively narrow basally, slightly narrowing apically (Fig. 69).

Distribution

Northern Iran (Tehran Province).

Andrena* (*Micrandrena*) *tabula Wood sp. nov.
urn:lsid:zoobank.org:act:AA2F5C7B-BAAC-4F04-8FA9-4198FA4E564E
Figs 71–78

Diagnosis

Andrena tabula sp. nov. can be placed in the subgenus *Micrandrena* because of its small body size (Fig. 71), black integument, black male clypeus (Fig. 76), and strongly rugose propodeal triangle. It has a strongly flattened clypeus (Fig. 72) and the male genitalia have penis valves that are strongly and conspicuously broadened at the base (Fig. 78), placing it close to *A. saxonica* Stoeckhert, 1935 and *A. garzetta* Warncke, 1975 (eastern limit Hatay Province, Turkey).

Female *A. tabula* sp. nov. can be separated from *A. saxonica* by the comparatively more flattened clypeus (Fig. 72), flattened over the entirety of its surface (clypeus laterally weakly domed, flattened over ¾ of its surface) and the shinier scutum and scutellum, weakly shining with shagreenation that is comparatively weak (clearly and densely microreticulate, generally dull). In addition to the more flattened clypeus, they can be separated from *A. garzetta* by the much stronger sculpture and denser punctation of the scutum, punctures separated by 0.5–1 puncture diameter (finely and moderately punctate, punctures separated by 2 puncture diameters, underlying surface finely shagreened, weakly shining).

In addition to the more clearly flattened clypeus, males can most obviously be separated by their genitalia (Fig. 78). *Andrena tabula* sp. nov. genitalia have the inner margin of the gonostyli raised but straight, more or less parallel with outer margin (*A. saxonica* with inner margin of gonostyli raised, curved towards penis valves, and with clear angle apically, not parallel with outer margin) and the gonocoxae are very weakly produced into apical points (*A. garzetta* with gonocoxae clearly produced into strong, apically extending points).

Etymology

From the Latin noun '*tabula*', meaning 'tablet' or 'board', in reference to the extremely flat clypeus in both sexes.

Material examined

Holotype

IRAN • ♂; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 30.545° N, 51.610° E; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM.

Paratypes

IRAN • 4 ♀♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♂, 1 ♀; same collection data as for preceding; TJWC • 1 ♀; Ham [Ilam] Province, Sar Joob; 1930 m a.s.l.; M. Kafka leg.; OÖLM • 1 ♀;

Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; M. Kafka leg.; OÖLM • 1 ♀; Lorestan Province, Dorud Lanjaban env.; 670 m a.s.l.; M. Kafka leg.; OÖLM.

TURKEY • 1 ♂, 1 ♀; Hakkâri, Suvari Halil-Pass; 2600 m a.s.l.; 15 Jun. 1981; K. Warncke leg.; OÖLM • 1 ♀; same collecting data as for preceeding; SMNHTAU • 1 ♀; Hakkâri, Suvari Halil-Pass; 2800 m a.s.l.; 14 Jun. 1984; K. Warncke leg.; OÖLM • 3 ♀♀; Hakkâri, Tanin-Tanin-Pass; 2500 m a.s.l.; 2 Jun. 1980; K. Warncke leg.; SMNHTAU • 1 ♀; Tanin-Tanin-Pass; 23–2600 m a.s.l.; 3 Jun. 1980; M. Schwarz leg.; OÖLM • 4 ♀♀; Tanin-Tanin-Pass; 1700 m a.s.l.; 12 Jun. 1984; K. Warncke leg.; OÖLM • 1 ♀; Tanin-Tanin-Pass; 2300 m a.s.l.; 19 May 1989; K. Warncke leg.; OÖLM • 1 ♀; Hakkâri, Mt. Sat; 2050–2450 m a.s.l.; 10 Jun. 1981; K. Warncke leg.; SMNHTAU • 1 ♀; Nemrut Dağı, 50 km NE of Kanta [Kahta]; 2–14 Jun. 1996; P. Jelinek leg.; OÖLM.

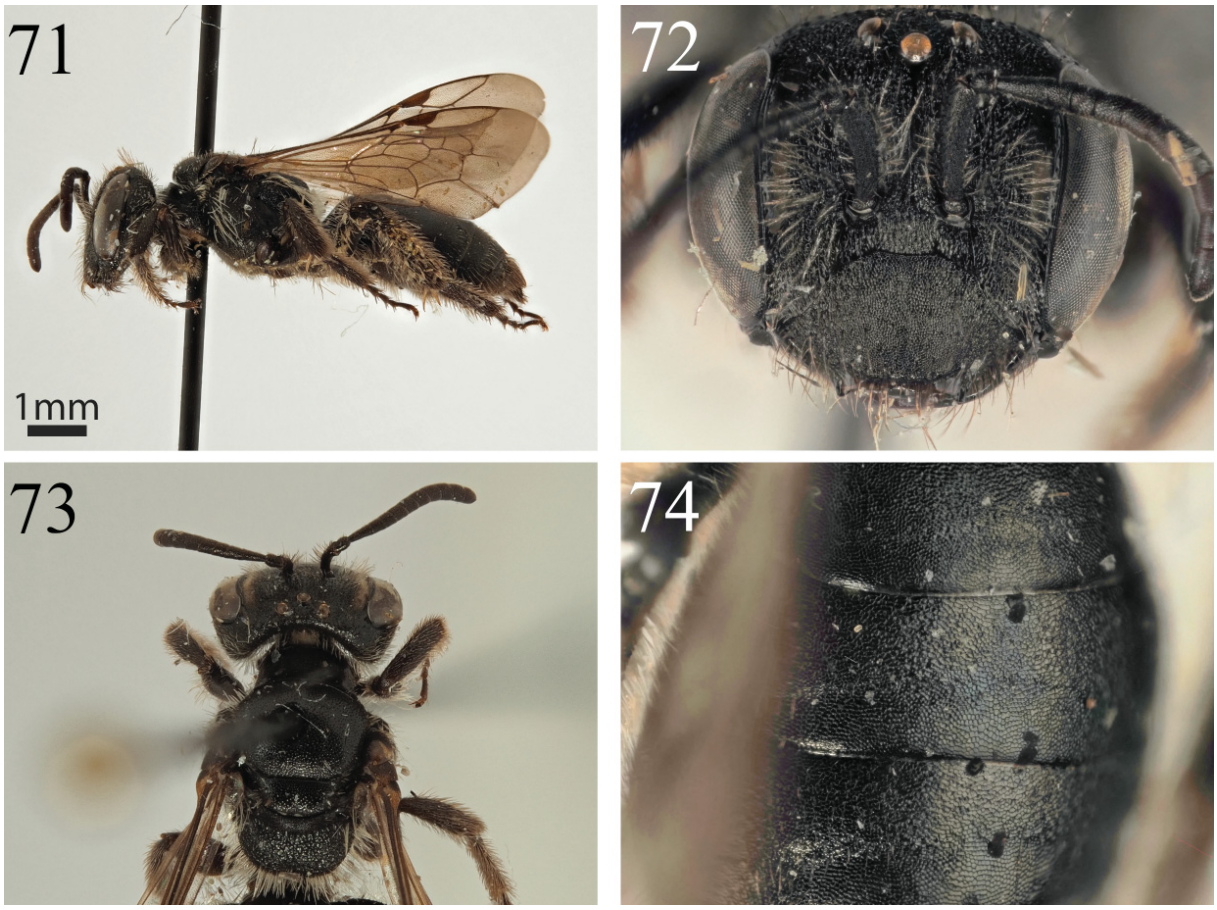
Other material examined (*Andrena saxonica*)

TURKEY • 1 ♀; Hakkâri, Beytüşşebap; 25 May 1988; K. Warncke leg.; OÖLM • 20 ♀♀; Hakkâri, Tanin-Tanin-Pass; 1700 m a.s.l.; 12 Jun. 1984; K. Warncke leg.; OÖLM • 1 ♂, 1 ♀; Kars, 10 km E of Karakurt; 1460 m a.s.l.; 31 May–1 Jun 1988; K. Warncke leg.; OÖLM • 1 ♂, Kars, 20 km W of Sarikamis [Sarıkamış]; 2100 m a.s.l.; 29 May 1983; K. Warncke leg.; OÖLM.

Description

Female

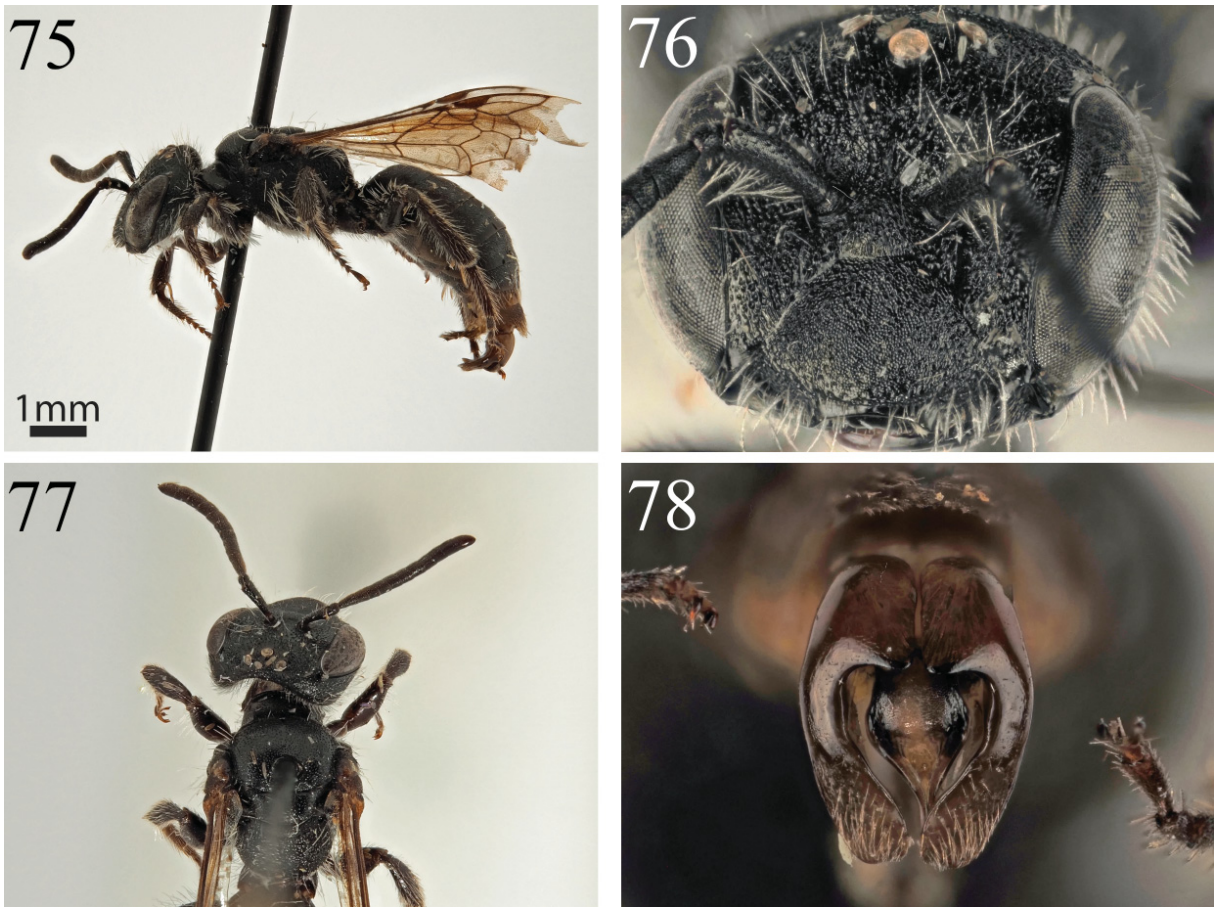
Measurements. Body length 7–8 mm (Fig. 71).



Figs 71–74. *Andrena tabula* Wood sp. nov., ♀ (OÖLM). **71**. Profile. **72**. Face. **73**. Dorsum. **74**. Terga.

Head. 1.2 times as wide as long. Clypeus dark, strongly and conspicuously flattened over entire surface, with irregular and variably sized punctures, punctures separated by 1–4 puncture diameters, becoming gradually sparser centrally, central ⅓ of clypeus impunctate (Fig. 72). Clypeus integument with fine granular microreticulation, dull. Process of labrum trapezoidal, slightly wider than long. Face, gena, vertex, and scape with short whitish to brownish hairs. Gena equalling width of compound eyes; ocelloccipital distance slightly less than diameter of lateral ocellus. Foveae extremely narrow, dorsally occupying ⅕ distance between compound eye and lateral ocellus, slightly narrower than width of flagellum, uniform width throughout; foveae filled with whitish hairs. Antennae dark, A(4)5–12 slightly lightened dark reddish-brown below; A3 slightly exceeding A4+5, clearly shorter than A4+5+6.

Mesosoma. Scutum and scutellum shagreenation, weakly shining, regularly and densely punctate with clear punctures, punctures separated by 0.5–1 puncture diameter (Fig. 73). Pronotum without humeral angle. Mesepisternum, lateral and dorsolateral faces of propodeum with sparse network of raised reticulation, underlying surface dull to weakly shining in places. Propodeal triangle weakly delineated laterally by raised carinae, internal surface strongly and regularly rugose, clearly differing from irregular pattern of reticulation on dorsolateral faces of propodeum. Mesepisternum with moderately long whitish hairs, scutum and scutellum with sparse extremely short brownish hairs, scutellum with occasional scattered long dark brown-black hairs. Propodeal corbiculae thin, dorsally composed of whitish plumose hairs, internal surface with numerous simple white hairs. Legs uniformly dark, pubescence brownish, scopae and flocculus whitish to light brownish. Hind tarsal claws with small inner tooth. Wings hyaline,



Figs 75–78. *Andrena tabula* Wood sp. nov., ♂ (OÖLM). **75**. Profile. **76**. Face. **77**. Dorsum. **78**. Genitalia.

stigma dark orange to dark brown laterally, venation dark brown; nervulus interstitial, first recurrent vein enters second submarginal cell at its middle.

Metasoma. Terga dark, apical margins of T1 weakly, T2–4 more strongly depressed, with extremely narrow hyaline rim (Fig. 74). Terga with discs strongly microreticulate, irregularly and very finely punctured, punctures fading into microreticulation, surface roughened, dull. Marginal areas of terga contrasting, lacking punctures, evenly and finely microreticulate, weakly shining. Terga laterally with sparse short hairs, T2–4 with weak and obscure hair fringes. Apical fringe of T5 and hairs flanking pygidial plate dark brown; pygidial plate rounded triangular, flattened with slightly raised apical rim, internal surface finely punctate, weakly shining.

Male

Measurements. Body length 7–7.5 mm (Fig. 75).

Head. 1.3 times as wide as long. Clypeus dark, strongly and conspicuously flattened over entire surface, with irregular punctures, punctures separated by 0.5–3 puncture diameters (Fig. 76). Clypeus integument with fine granular microreticulation, dull. Process of labrum trapezoidal, wider than long, apical margin weakly emarginate. Face, gena, vertex, and scape with short whitish to brownish hairs. Gena slightly exceeds width of compound eyes; ocelloccipital distance equals diameter of lateral ocellus. Antennae dark, A3 slightly shorter than A4+5.

Mesosoma. Scutum and scutellum shagreened, weakly shining (Fig. 77), structurally otherwise as in female.

Metasoma. Terga dark, apical margins of T1 weakly, T2–4 strongly depressed, with extremely narrow hyaline rim. Tergal discs roughened, strongly microreticulate, densely punctate, punctures separated by 1 puncture diameter. Punctures absent from marginal areas, with microreticulation becoming weaker apically, weakly shining; marginal areas strongly contrasting tergal discs. Tergal discs with scattered irregular short white hairs. S8 columnar, apically rounded, ventral surface covered with short brown hairs. Genital capsule large, gonocoxae very weakly produced into apical points. Gonostyli broad, slightly broadening apically with strongly truncate and square-shaped apices, apically flattened and broadly spatulate. Penis valves strongly broadened basally, strongly narrowing apically (Fig. 78).

Remarks

Some of the specimens from Turkey were separated by Warncke with type labels and were called '*Andrena galacta* Warncke', but he never published this name. Other Turkish specimens were discovered in undetermined material. For *A. saxonica*, though the maps of Gusenleitner & Schwarz (2002) show an eastern range limit in the Bosphorus, Turkey, the two taxa can be found in sympatry in eastern Turkey, based on the examination of previously undetermined material.

Distribution

Southern (province of Adiyaman) and Eastern Turkey (province of Hakkâri) and southern Iran (provinces of Ilam, Lorestan, Fars).

Andrena* (*Notandrena*) *idigna Wood sp. nov.
urn:lsid:zoobank.org:act:E4762290-100B-4C49-94F9-5DB4273D990B
Figs 79–84

Diagnosis

Placement is tricky because of taxonomic confusion surrounding taxa previously placed in the subgenus *Carandrena* Warncke, 1968, which is now a strict synonym of *Notandrena* Pérez, 1890, but *Carandrena*

sensu Warncke is polyphyletic (Pisanty *et al*. 2022b). *Andrena idigna* sp. nov. has the general appearance of a *Carandrena* because of its broad head (Fig. 81), tergal hairbands (Fig. 84), and lack of any obvious derived features, one of the reasons why this former subgenus has been used as a 'waste basket' for species that cannot be easily allocated elsewhere. Its integument lacks metallic reflections or red colouration on the terga, immediately separating it from almost all species in this group. It is therefore superficially similar to *A. euzona* Pérez, 1895, which also has dark terga. However, *A. euzona* has an extremely shiny scutum and is found outside the *Carandrena+Notandrena* group, whereas *A. idigna* has the scutum entirely and uniformly shagreened and dull. Though *A. idigna* lacks a clear humeral angle on the pronotum (faint hint of this trait present but obscure), a character that is usually present in the *Notandrena*, provisional placement in this subgenus is the most appropriate because of the broad head, shagreened scutum, shagreened and essentially impunctate terga, and tergal hairbands. Its dark terga, shagreened scutum, and unusual propodeal triangle, which is delineated laterally by fine carinae but with a narrow, longitudinal, and slightly impressed channel surrounded by irregular latitudinal rugae along its length, allow separation from all related taxa. This subgeneric placement should be reassessed following discovery of male specimens and DNA sampling.

Etymology

From the Sumerian '*idigna*' or '*idigina*', meaning 'running water', in reference to its locus typicus on the Karun River, the largest river in Iran.

Material examined

Holotype

IRAN • ♀; Mollasani, Ahwaz [Ahvaz]; 17 Feb. 1965; S. Tirgari leg.; OÖLM.

Description

Female

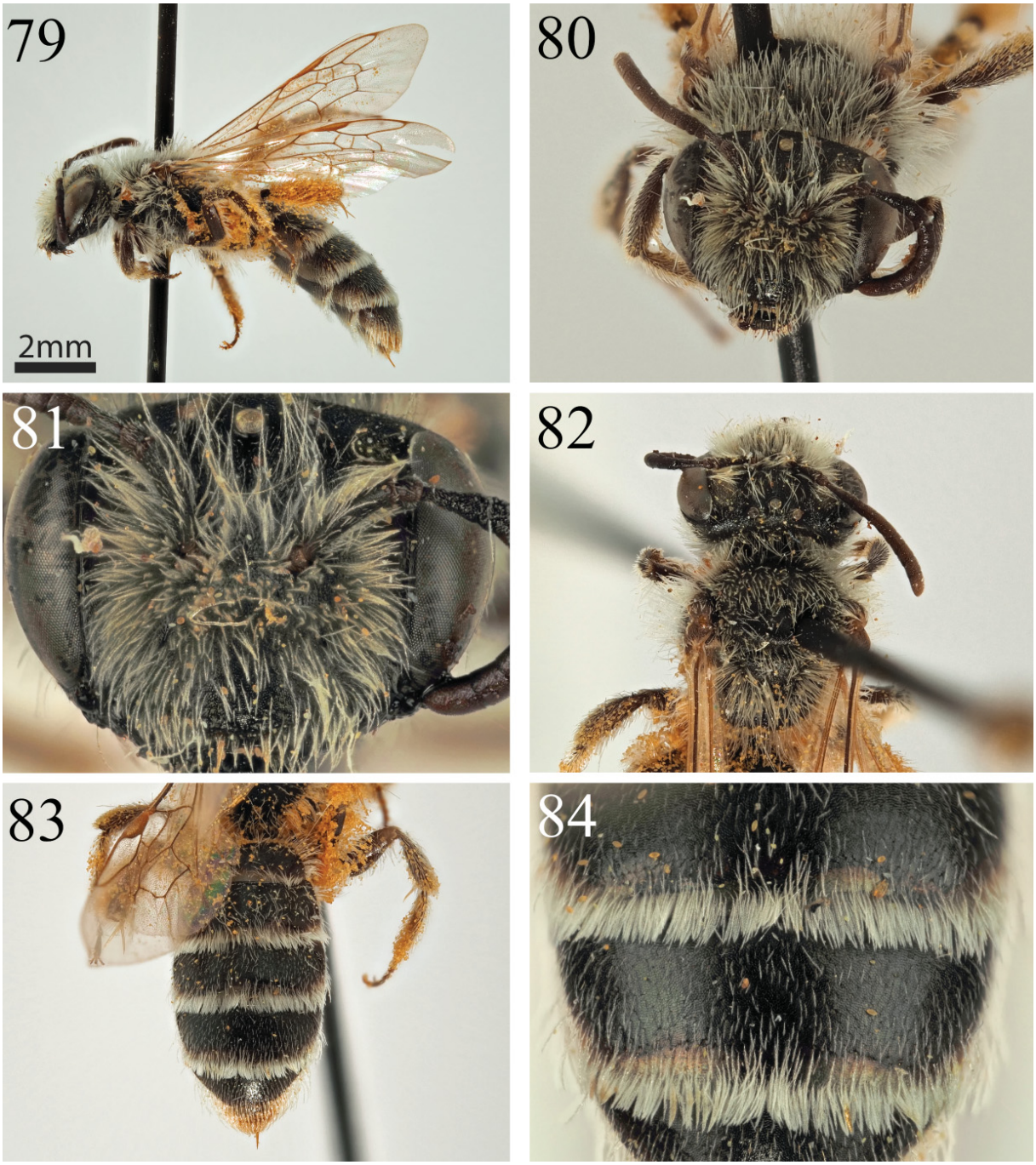
Measurements. Body length 9 mm (Fig. 79).

Head. 1.4 times as wide as long (Fig. 80). Clypeus dark, weakly domed, densely punctate, punctures separated by 0.5–2 puncture diameters (Fig. 81). Clypeus with fine and dense granular shagreen, dull to weakly shining centrally. Process of labrum trapezoidal, two times as wide as long, corners rounded. Face, gena, vertex, and scape with moderately long white hairs, not exceeding length of scape. Gena slightly exceeding width of compound eye; ocelloccipital distance subequal to diameter of lateral ocellus. Foveae dorsally broad, occupying ⅔rd of space between compound eye and lateral ocellus, very slightly narrowed below at level of antennal insertions; filled with whitish hairs. Antennae dark basally, A5–12 lightened dark orange-red below; A3 exceeding A4+5, shorter than A4+5+6.

Mesosoma. Scutum and scutellum densely and uniformly granularly shagreened, dull; surface with irregular and obscure punctures, punctures separated by 2–3 puncture diameters, not well-differentiated from underlying surface (Fig. 82). Pronotum without clear humeral angle, slightly angulate above, obscure. Mesepisternum and lateral and dorsolateral faces of propodeum with fine granular shagreen, dull; dorsolateral faces of propodeum with sparse network of fine, slightly raised rugae. Propodeal triangle declineated laterally with fine carinae, internal surface with narrow, longitudinal, and slightly impressed channel surrounded by irregular latitudinal rugae along its length. Remaining surface of propodeal triangle with fine granular shagreen, finer than on dorsolateral faces of propodeum; propodeal triangle thus defined by change in surface sculpture. Mesosoma with moderately long whitish to greyish hairs, not exceeding length of scape; propodeal corbiculae with weakly plumose hairs dorsally, inner surface with weakly plumose hairs. Legs dark, apical tarsal segments lightened dark orange; pubescence whitish. Scopae and flocculus white. Hind tarsal claws with strong inner tooth. Wings hyaline, stigma

and venation orange, nervulus weakly antefurcal; first recurrent vein enters second submarginal cell at its middle.

Metasoma. Terga dark, apical margins of T2–4 slightly depressed, marginal areas of T1–4 lightened dark red to yellow-hyaline apically (Fig. 83). Terga with uniform granular shagreen, weakly shining, essentially impunctate with only scattered and obscure hair-bearing punctures (Fig. 84). Tergal discs with sparse whitish hairs, longest on T1, becoming progressively shorter apically. T1–4 with white



Figs 79–84. *Andrena idigna* Wood sp. nov., ♀ (OÖLM). **79**. Profile. **80**. Face. **81**. Face, detail. **82**. Dorsum. **83**. Terga. **84**. Terga, detail.

apical hair fringes, weak and interrupted on T1, complete and dense on T2–4, obscuring underlying surface. Fringe of T5 and hairs flanking pygidial plate golden; pygidial plate broadly rounded, centrally densely punctate, with narrow impunctate rim.

Male

Unknown.

Distribution

South-western Iran (Khuzestan Province).

Andrena* (*Planiandrena*) *flagrans Wood sp. nov.
urn:lsid:zoobank.org:act:C5B11605-577C-4490-B0FE-B29E187A8795
Figs 85–90

Diagnosis

Andrena flagrans sp. nov. can be placed in the subgenus *Planiandrena* Osytshnjuk, 1983 because of its very broad process of the labrum (Fig. 88), narrow foveae that tightly follow the inner margin of the compound eye (Fig. 87), broad and finely shagreened propodeal triangle with weakly indicated lateral margins, shiny terga (Fig. 90), hind tibial spur that is slightly broadened submedially, and pygidial plate with slightly raised central area. The subgenus was described from four Central Asian species (Osytshnjuk 1983a), but it reaches to Israel (Pisanty *et al*. 2022a). *Andrena flagrans* differs from Central Asian taxa because the clypeus is convex (not flattened or depressed) and is most similar to *A. veterana* Pisanty, 2022 and *A. huma* sp. nov. (see below for separation from this species). *Andrena flagrans* can easily be separated from *A. veterana* because the terga are entirely shiny (Fig. 90), without shagreen, discs impunctate (tergal discs of T2–4 basally shagreened, sparsely and very finely punctured) and the propodeal triangle lacks short raised longitudinal rugae along its basal margin (propodeal triangle with short raised longitudinal rugae).

Etymology

From the Latin present participle '*flagrans*', meaning 'burning, blazing', or 'shining', in reference to the strongly shining terga.

Material examined

Holotype

IRAN • ♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 30.545° N, 51.610° E; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM

Paratypes

IRAN • 1 ♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; TJWC.

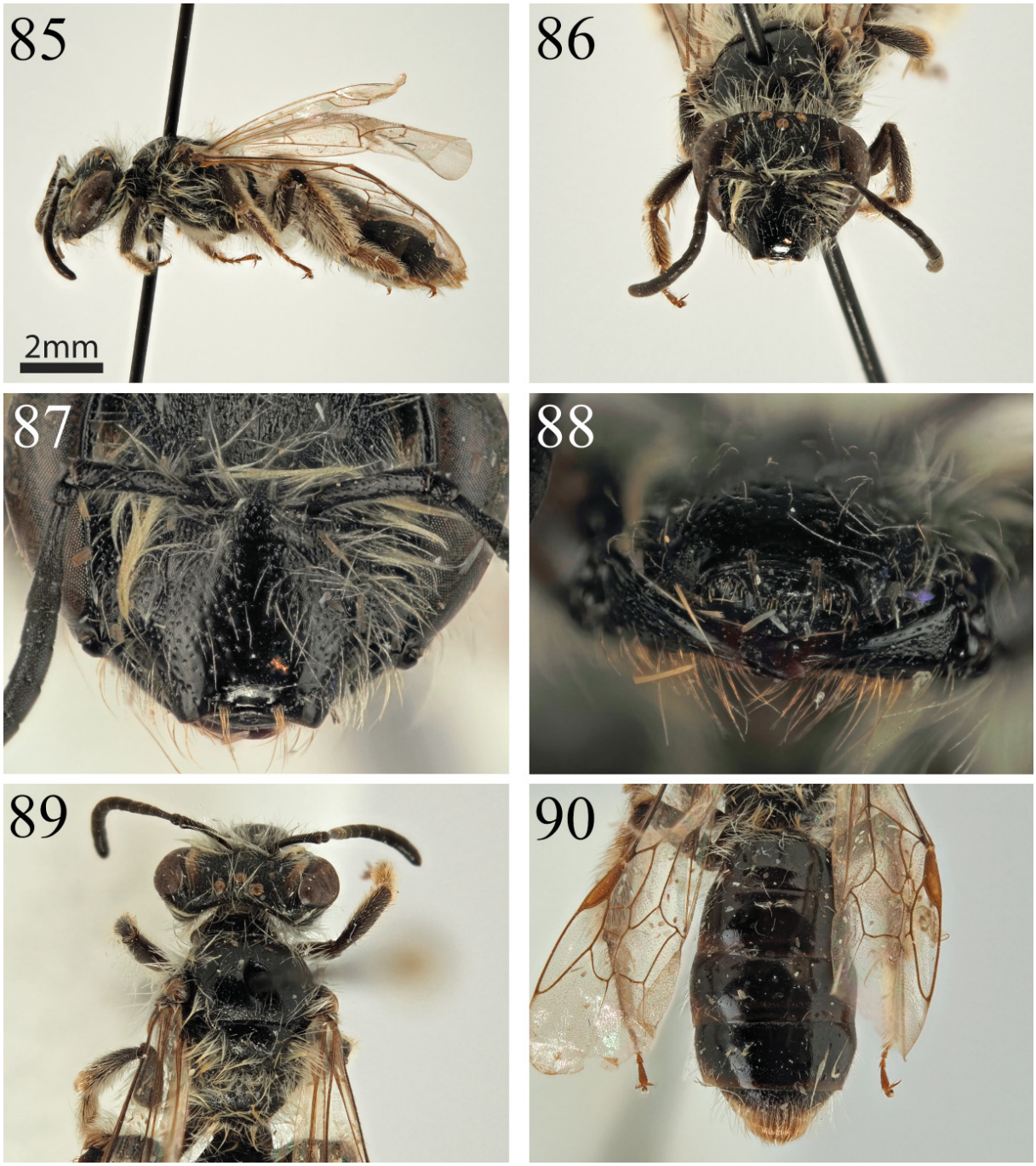
Description

Female

Measurements. Body length 10 mm (Fig. 85).

Head. 1.2 times as wide as long (Fig. 86). Clypeus dark, weakly domed, laterally with large shallow punctures, punctures separated by 1–2 puncture diameters, centrally becoming sparser, separated by 3–4 puncture diameters; clypeus centrally with wide longitudinal impunctate line, becoming wider apically, apical third of clypeus without punctures (Fig. 87). Clypeus surface laterally and basally shagreened,

becoming weaker apically, apical half of clypeus smooth and shining. Process of labrum short, broadly trapezoidal, four times as wide as long, covered in fine latitudinal wrinkles (Fig. 88). Face, gena, vertex, and scape with long whitish hairs, longest equalling length of scape. Gena equalling width of compound eye; ocelloccipital distance small, ½ diameter of lateral ocellus. Foveae narrow dorsally, occupying ⅓ of space between compound eye and lateral ocellus, narrowed slightly below at level of antennal insertions; filled with light brown hairs. Antennae dark, A3 exceeding A4+5, slightly shorter than A4+5+6.



Figs 85–90. *Andrena flagrans* Wood sp. nov., ♀ (OÖLM). **85**. Profile. **86**. Face. **87**. Face, detail. **88**. Process of labrum. **89**. Dorsum. **90**. Terga.

Mesosoma. Scutum and scutellum laterally shagreened, weakly shining, shagreen weaker centrally, here shining more strongly; surface irregularly punctate with shallow punctures, punctures separated by 1–3 puncture diameters, sparser centrally (Fig. 89). Pronotum without humeral angle. Mesepisternum with fine granular reticulation, weakly shining, covered in faint extremely shallow punctures with poorly defined margins. Internal part of propodeal corbiculae with fine granular reticulation, weakly shining. Propodeal triangle broad, not structurally delineated laterally but very slightly depressed, basally with very small and faint raised rugae, elsewhere with granular shagreen, weakly shining. Dorsolateral faces of propodeum with stronger shagreened, duller, propodeal triangle therefore defined by change in surface sculpture. Mesosoma with long whitish hairs, sparser dorsally, longest equalling length of scape; propodeal corbicula with weakly plumose hairs dorsally, inner surface with long simple whitish hairs. Legs dark, basitarsi and apical tarsal segments progressively lightened orange, pubescence whitish. Tibial scopae white with few brownish hairs dorsally at base, femoral scopae and flocculus white. Hind tarsal claws with inner tooth. Hind tibial spur slightly broadened submedially. Wings hyaline, stigma and venation orange, nervulus interstitial; first recurrent vein enters second submarginal cell beyond its middle.

Metasoma. Terga dark, marginal areas of T2–4 very slightly depressed, T1–4 apically narrowly lightened dark brown (Fig. 90). Terga extremely smooth and shiny, almost without shagreen; tergal discs essentially impunctate, tergal margins with small dense punctures, punctures separated by 1–2 puncture diameters. T1 with scattered long whitish hairs, T2–4 with sparse short hairs laterally, apical hairbands absent. Fringe of T5 and hairs flanking pygidial plate golden; pygidial plate rounded triangular with slightly raised area centrally.

Male

Unknown.

Distribution

Southern Iran (Yasouj).

Andrena* (*Planiandrena*) *huma sp. nov.

urn:lsid:zoobank.org:act:F848A003-A55A-448F-8DF0-22E51F524941

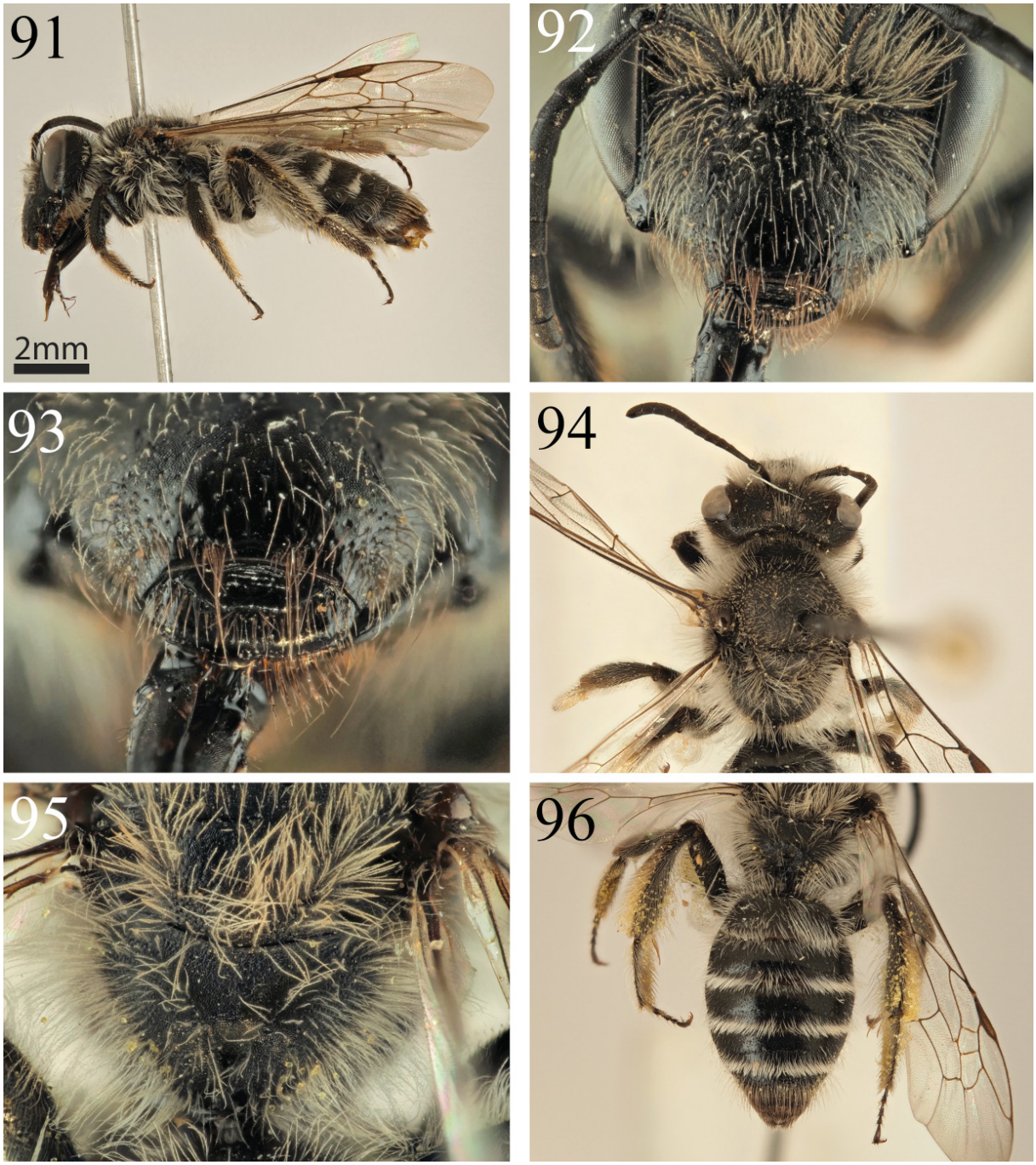
Figs 91–102

Diagnosis

Like *A. flagrans* sp. nov., *A. huma* sp. nov. can be placed within the subgenus *Planiandrena* because of its very broad process of the labrum (Fig. 93), narrow foveae that tightly follow the inner margin of the compound eye, broad and finely shagreened propodeal triangle with weakly indicated lateral margins (Fig. 95), hind tibial spur that is slightly broadened submedially, and pygidial plate with slightly raised central area. Females are most similar to those of *A. veterana* and *A. flagrans* because of the slightly convex clypeus (Fig. 92). *Andrena huma* can easily be separated from both *A. veterana* and *A. flagrans* as T1 is entirely shagreened (vs T1 entirely shiny, without shagreen), the apical ⅓ of the clypeus is smooth and shining (vs entirely shagreened in *A. veterana*), the terga have strong apical hairbands (vs terga without apical hairbands in *A. flagrans*), the weak structure of the basal part of the propodeal triangle (vs propodeal triangle basally with strong longitudinal rugae in *A. veterana*), and the dark hairs on T5 and flanking the pygidial plate (Fig. 96) (vs hairs here golden in *A. flagrans*).

Males have a yellow-marked clypeus (Figs 98–99), putting them close to *A. veterana* and *A. planirostris* Morawitz, 1876, the only two known *Planiandrena* with a yellow clypeus in the male sex. *Andrena huma* sp. nov. can easily be separated from *A. veterana* because the genital capsule is elongate

(Fig. 102), simple, the inner margin of the gonostyli lacks an angular extension, and the gonocoxal teeth are produced into acute points (genital capsule comparatively compact, inner margin of gonostyli with angular extension, gonocoxal teeth truncate, not forming clear apically projecting teeth). The genital capsule of *A. huma* is similar to that of *A. planirostris*, but the gonocoxal teeth are much more strongly pronounced and the penis valves are strongly broadened at the base before narrowing apically, therefore triangular (gonocoxal teeth only slightly pronounced, penis valves very weakly broadened basally, essentially parallel-sided, see illustrations in Osytshnjuk 1983a).



Figs 91–96. *Andrena huma* sp. nov., ♀ (OÖLM). **91**. Profile. **92**. Face. **93**. Process of labrum. **94**. Dorsum. **95**. Propodeum. **96**. Terga.

Etymology

Named after the mythical Huma bird from Iranian legends and fables that was said to never alight upon the ground.

Material examined

Holotype

IRAN • ♂; Yazd, Tezerjan, Hossein Abad Seyyed Mahmood; 31.624° N, 54.214° E; 1993 m a.s.l.; 5–6 Mar. 2020; S. San leg.; OÖLM.

Paratypes

GOLAN HEIGHTS • 2 ♂♂; Har Avital; 15 Mar. 1995; R. Kasher leg.; SMHNTAU.

IRAN • 5 ♂♂; Yazd, Tezerjan, Hossein Abad Seyyed Mahmood; 31.624° N, 54.214° E; 1993 m a.s.l.; 5–6 Mar. 2020; S. San leg.; OÖLM • 3 ♂♂; same collection data as for preceding; TJWC • 19 ♂♂, 2 ♀♀; same collection data as for preceding; ICPI • 1 ♂, 3 ♀♀; Yazd, Banadak-o sadat; 2103 m a.s.l.; 22 Mar. 2021; S. San leg.; OÖLM • 1 ♂, 3 ♀♀; same collection data as for preceding; TJWC • 3 ♂♂, 14 ♀♀; same collection data as for preceding; ICPI • 2 ♂♂, 4 ♀♀; Yazd, Jade konj-e kooh, dakal; 2019 m a.s.l.; 26 Mar. 2021; S. San leg.; ICPI • 2 ♂♂; Yazd, Khezr abad Ebteday Zorband; 1817 m a.s.l.; 9 Mar. 2020; S. San leg.; ICPI • 1 ♀; Yazd, Khezr abad Zorband; 1844 m a.s.l.; 21 Mar. 2021; S. San leg.; ICPI • 6 ♂♂; Yazd, Sakhvid, Mazraeh Khosraw; 2469 m a.s.l.; 27 Mar. 2019; S. San leg.; ICPI • 1 ♀; Yazd, Sanij khaleghieh; 2060 m a.s.l.; 13 Mar. 2020; S. San leg.; ICPI • 1 ♂, 1 ♀; Yazd, Sanij; 2337 m a.s.l.; 22 Mar. 2019; S. San leg.; ICPI • 1 ♀; Yazd, Taft, Tezerjan, Hanza; 1949 m a.s.l.; 24 Mar. 2019; S. San leg.; ICPI • 6 ♀♀; Yazd, Taft, Tezerjan, Hosseinabad; 2100 m a.s.l.; 22 Mar. 2019; S. San leg.; ICPI • 1 ♀; Yazd, Taft, Tezerjan, Mazra ali, Agha Seyyed; 2109 m a.s.l.; 24 Mar. 2019; S. San leg.; ICPI • 1 ♀; Yazd, Tang e chenar, Az konj-e kooh; 2237 m a.s.l.; 23 Mar. 2021; S. San leg.; ICPI.

SYRIA • 1 ♀; Burg Baniyas/Mt. Hermon; 1500 m a.s.l.; 14 Apr. 1992; K. Warncke leg.; OÖLM.

Description

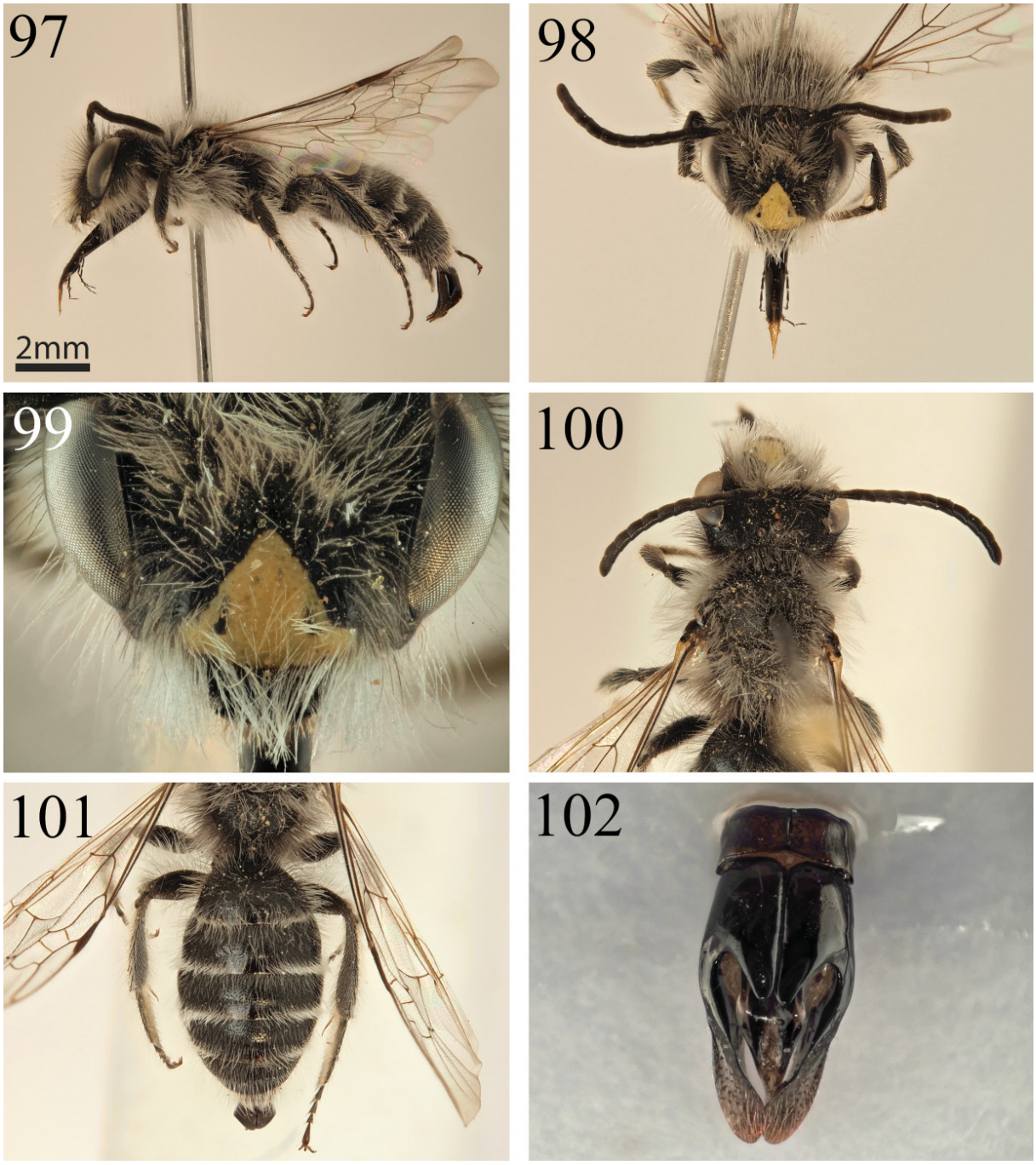
Female

Measurements. Body length 10–11 mm (Fig. 91).

Head. 1.2 times as wide as long. Clypeus dark, weakly domed, with large shallow punctures separated by 2–3 puncture diameters, becoming sparser apically, separated by 3–4 puncture diameters. Clypeus surface laterally and in basal half shagreened with network of fine slightly raised reticulation, weakly shining; in apical ⅓ smooth and shining, strongly contrasting with basal half (Fig. 92). Process of labrum short, three times as wide as long, surface with fine longitudinal wrinkles (Fig. 93). Face, gena, vertex, and scape with long white hairs, longest not exceeding length of scape; vertex and frons with some intermixed black hairs. Gena exceeding width of compound eye; ocelloccipital distance small, slightly less than diameter of lateral ocellus. Foveae narrow dorsally, occupying at most ⅓ of space between compound eye and lateral ocellus, narrowed below at level of antennal insertions; filled with dark brown hairs. Antennae dark, A3 slightly exceeding A4+5+6.

Mesosoma. Scutum and scutellum uniformly strongly shagreened to microreticulate, dull, surface with obscure shallow punctures, punctures separated by 0.5–2 puncture diameters (Fig. 94). Pronotum with hint of humeral angle, inconspicuous. Mesepisternum with fine network of raised reticulation, punctures with slightly raised ‘crater-like’ rims, underlying surface weakly shining. Lateral faces of propodeum shagreened, weakly shining. Propodeal triangle broad, very subtly defined laterally with fine carinae, basally with short raised longitudinal rugae, extending slightly to central part of propodeal triangle; internal surface with granular shagreen, weakly shining (Fig. 95). Dorsolateral faces of propodeum

with sparse raised reticulation, propodeal triangle therefore defined by change in surface sculpture. Mesosoma with long whitish hairs, sparser dorsally, longest not exceeding length of scape; propodeal corbicula with weakly plumose hairs dorsally, inner surface with long simple whitish hairs. Legs dark, pubescence light brownish to whitish. Tibial scopae white with numerous brownish hairs dorsally at base, femoral scopae and flocculus white. Hind tarsal claws with inner tooth. Hind tibial spur slightly broadened submedially. Wings hyaline, stigma dark orange with dark brown margins, venation dark brown, nervulus interstitial; first recurrent vein enters second submarginal cell beyond its middle.



Figs 97–102. *Andrena huma* sp. nov., ♂ (OÖLM). **97**. Profile. **98**. Face. **99**. Face, detail. **100**. Dorsum. **101**. Terga. **102**. Genitalia.

Metasoma. Terga dark, marginal areas of T1–4 slightly depressed, T1–4 apically very narrowly lightened light brown-hyaline (Fig. 96). Terga shagreened, most strongly on T1, becoming progressively weaker apically, weakly shining. Tergal discs and margins with scattered punctures, punctures separated by 1–5 puncture diameters. Tergal discs with scattered white hairs, longest on T1, T1–4 with dense apical fringes of white hairs that form hairbands, broadly interrupted on T1–2, complete on T3–4. Fringe of T5 and hairs flanking pygidial plate dark brown; pygidial plate rounded triangular with slightly raised area centrally.

Male

Measurements. Body length 9–10.5 mm (Fig. 97).

Head. 1.2 times as wide as long (Fig. 98). Clypeus centrally with large triangular yellow mark, occupying majority of surface area, not extending completely to margins, centro-laterally with two black marks (Fig. 99). Clypeus weakly flattened, with weak and even punctures, punctures separated by 1 puncture diameter, slightly sparser centrally; underlying surface shagreened, weakly shining. Process of labrum broadly trapezoidal, three times as wide as long, fore margin widely and shallowly emarginate. Face centrally, clypeus, and scape with white hairs, forming strong and long fringe on apical margin of clypeus; face laterally with strongly contrasting black hairs along inner margin of compound eye. Gena with long white hairs ventrally, extending to vertex, black hairs intermixed dorsolaterally. Gena equalling width of compound eye; ocelloccipital distance slightly less than diameter of lateral ocellus. Antennae dark, A3 exceeding A4, slightly shorter than A4+5.

Mesosoma. Mesosoma structurally as in female, though scutum duller, punctures more obscure (Fig. 100). Pubescence as in female, though lateral faces of propodeum with many intermixed black hairs.

Metasoma. Terga dark, similar to female but with stronger shagreenation, additionally with slightly raised microreticulation on basal parts of terga, forming weak latitudinal wrinkles; terga therefore duller. Terga discs with stronger, more consistent, and more pronounced punctation, separated by 2 puncture diameters. Terga discs more extensively haired, with moderately long whitish hair, not obscuring underlying surface (Fig. 101). T1–4 with apical white hairbands, slightly interrupted medially. S8 weakly triangular, slightly narrowed medially, apical half parallel-sided, apically truncate. Genital capsule long, gonocoxa with strongly pronounced elongate teeth, gonostyli apically broadened. Penis valves broadened basally, laterally exceeding apices of gonocoxal teeth, narrowed apically (Fig. 102).

Remarks

In Iran, collected from flowers of *Prunus* (*Amygdalus*) spp. in March. It may also be associated with flowering trees.

Distribution

Central Iran (Yazd) and the Anti-Lebanon mountain chain (southern Syria, Golan Heights).

Andrena* (*Planiandrena*) *sella Wood sp. nov.
urn:lsid:zoobank.org:act:EDCCBC04-DFE5-46BD-92C6-2EA819162D4C
Figs 103–108

Diagnosis

Andrena sella sp. nov. differs from the two previously described species of *Planiandrena*. It has the same very broad process of the labrum (Fig. 105) and narrow foveae that tightly follow the inner margin of the compound eye, but the propodeal triangle is noticeably narrower (Fig. 107), slightly depressed,

and there is no obviously raised area centrally. The propodeal triangle does, however, still have basal rugae, a feature present in *A. huma* sp. nov. and absent in *A. flagrans* sp. nov. Because the shape of the head is so extremely similar, *A. sella* is confidently placed in the *Planiandrena*. It can be instantly separated from all described species of *Planiandrena* because the apical margin of T1 and the entirety of T2 are red marked (Fig. 108). Structurally, it can be separated by the combination of the shape of the propodeal triangle, which is slightly depressed and medially narrowed (broad and unnarrowed in *A. huma* and *A. flagrans*), by the clypeus, which is domed and highly polished over the majority of its area (Fig. 105) (shiny only in the apical ⅓ in *A. huma* and *A. flagrans*), and by the terga, which are shiny but clearly punctate throughout, both on the discs and the marginal areas (at least basally shagreened in *A. huma*, without shagreen but also with only occasional punctures in *A. flagrans*).

Etymology

From the Latin noun '*sella*', meaning 'saddle', in reference to the red-banded abdomen.

Material examined

Holotype

IRAN • ♀; Yasouj, Deli Bajak, Sepidar; [30.518° N, 51.495° E]; 2181 m a.s.l.; 23 Apr. 2021; E. Rostami leg.; OÖLM.

Description

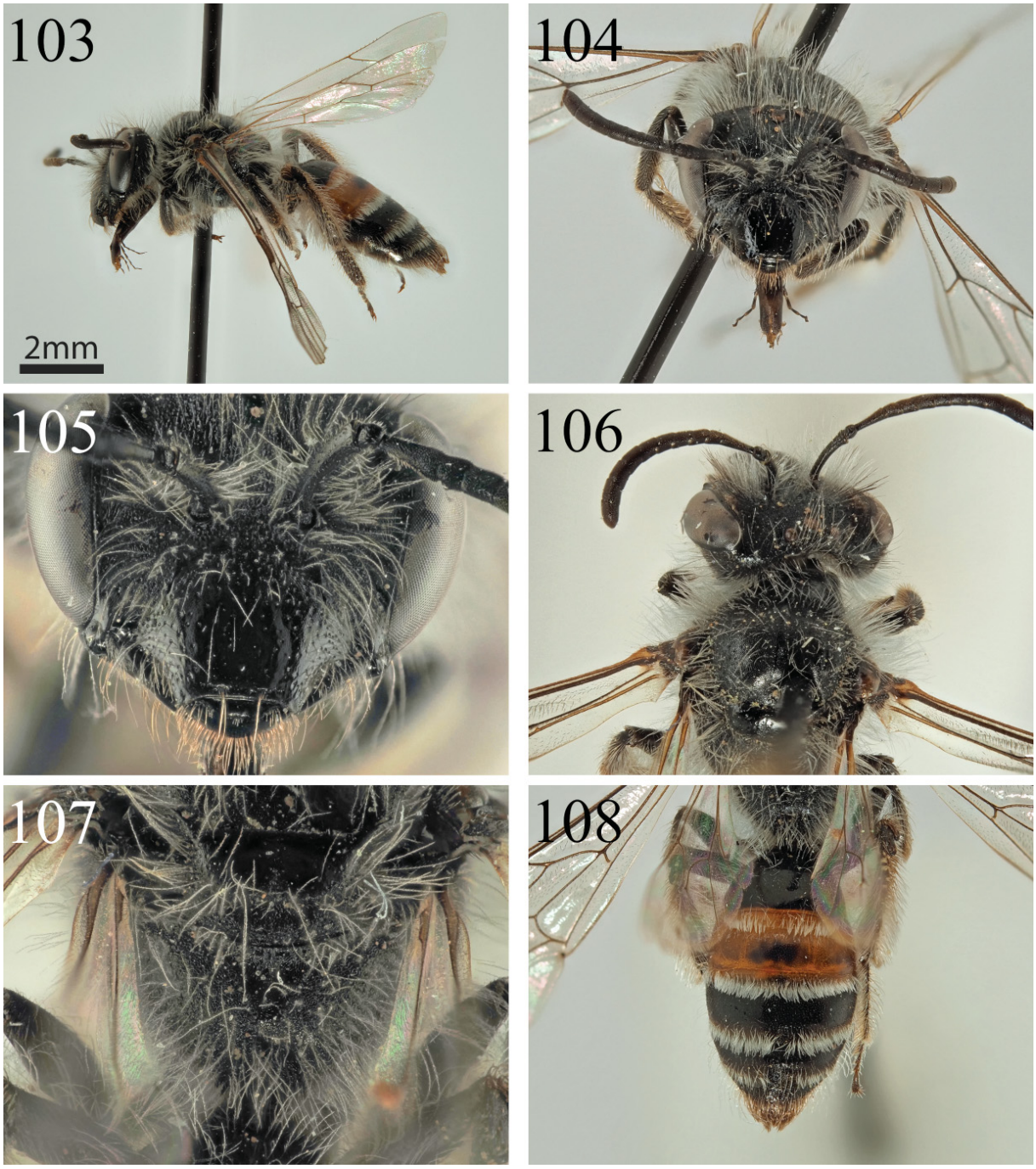
Female

Measurements. Body length 8.5 mm (Fig. 103).

Head. 1.3 times as wide as long (Fig. 104). Clypeus dark, domed, with clear rounded punctures, punctures laterally separated by 0.5–1 puncture diameter; punctures becoming sparse and irregular centrally and apically, punctures here separated by 1–6 puncture diameters (Fig. 105). Clypeus surface laterally and basally with narrow area of slightly raised microreticulation, weakly shining; clypeus strongly polished and shining over majority of remaining area. Process of labrum short, rounded trapezoidal, four times as wide as long. Face, gena, vertex, and scape with long whitish hairs, frons and gena dorsolaterally with some intermixed black hairs, no hairs exceeding length of scape. Gena exceeding width of compound eye; ocelloccipital distance small, ½ diameter of lateral ocellus. Foveae narrow dorsally, occupying ⅓ of space between compound eye and lateral ocellus, narrowed below at level of antennal insertions; filled with dark brown hairs. Antennae dark, A3 exceeding A4+5, shorter than A4+5+6.

Mesosoma. Scutum with dense granular microreticulation, weakly shining, with large shallow punctures, punctures separated by 2–3 puncture diameters (Fig. 106). Scutellum with shagreen restricted to lateral areas, smooth and shining over majority of area, with scattered punctures. Pronotum with hint of humeral angle, inconspicuous. Mesepisternum and lateral and dorsolateral faces of propodeum with granular shagreenation and fine network of raised reticulation, very weakly shining. Propodeal triangle slightly depressed, internal surface with weakly shining granular microreticulation; basally with network of short raised longitudinal rugae, centrally longer and extending into centre of propodeal triangle; propodeal triangle therefore defined by depressed surface area and change in surface sculpture (Fig. 107). Mesosoma with long whitish hairs, equalling length of scape, propodeal corbiculae with long white plumose hairs, internal surface with long white simple hairs. Legs uniformly dark, with whitish to light brownish pubescence; tibial scopae white with intermixed brown hairs dorsobasally. Femoral scopae and flocculus white. Hind tarsal claws with inner tooth. Hind tibial spur parallel-sided. Wings hyaline, stigma dark orange, venation orange to dark orange, nervulus weakly antefurcal; first recurrent vein enters second submarginal cell beyond its middle.

Metasoma. Apical margin of T1 and disc of T2 red marked, with exception of dark mark centrally on T2 (Fig. 108). Remaining terga dark, apical margins of T3–4 lightly lightened yellow-hyaline. Terga with very weak shagreenation, smooth and shining throughout. Terga clearly punctate, T1 with punctures sparse, separated by 3–4 puncture diameters, T2–4 more densely punctate, punctures separated by 1–2 puncture diameters. Tergal discs with extremely scattered short white hairs, T1–4 with dense unbroken apical fringes of white hairs that obscure underlying integument. Fringe of T5 and hairs flanking pygidial plate brown; pygidial plate rounded triangular, broadly flat without obvious structure.



Figs 103–108. *Andrena sella* Wood sp. nov., ♀ (OÖLM). **103**. Profile. **104**. Face. **105**. Face, detail. **106**. Dorsum. **107**. Propodeum. **108**. Terga.

Male

Unknown.

Distribution

Southern Iran (Yasouj).

Andrena* (*Ulandrena*) *bulbosa Wood sp. nov.
urn:lsid:zoobank.org:act:86FAABC5-56AB-4758-AC10-8E045BD9AC28
Figs 109–120

Diagnosis

Andrena bulbosa sp. nov. can swiftly be placed in the subgenus *Ulandrena* Warncke, 1968 by the combination of the inner hind tibial spur that is broadened slightly before its base, the yellow-marked male clypeus (Fig. 116), and generally enlarged genital capsule (Fig. 118). It belongs to the *Andrena polita* species group and is closest to the larger species with red-marked terga, specifically *A. caspica* Morawitz, 1886, *A. unicincta* Friese, 1899, and *A. unifasciata* Friese, 1899. Males can instantly be separated by the unique genitalia, which lack gonocoxal teeth (Fig. 118) (vs strongly produced and pointed in *A. caspica* and *A. unifasciata*, weakly produced and laterally diverging in *A. unicincta*). Females can be separated from *A. unicincta* by the shiny scutum (Fig. 112) (vs dull) and interstitial nervulus (vs postfurcal). Separation from *A. caspica* can be made by the smaller body size of 10 mm (12–13 mm) as well as the comparatively shinier scutum (vs only slightly shiny in *A. caspica*, comparative material required). It is therefore very similar to *A. unifasciata*, and based on the limited female material, separation from this taxon in the female sex is not currently possible.

Similar red-marked female material of *Ulandrena* collected from Uludere in Şırnak Province (Turkey) by Klaus Warncke (16 Jun. 1981) is morphologically inseparable from Levantine specimens of *A. unifasciata* and the Iranian specimen of *A. bulbosa* sp. nov. Males must be found that can resolve the identity of specimens from south-eastern Turkey, which has biogeographical affinities with both the Levant and Iran. Molecular data (G. Pisanty pers. comm.) suggests that there may be cryptic species within this group that require clarification and delineation. Based on morphological knowledge, both *A. unicincta* and *A. caspica* range from the Levant to Iran, but male *A. unifasciata* are currently known only from the Levant. The nomenclatural and distributional situation may therefore change pending revision.

Etymology

From the Latin meaning ‘bulbous’ in reference to the swollen genital capsule that separates this taxon from similar red-marked species of *Ulandrena*.

Material examined

Holotype

IRAN • ♂; Fars, 15 km SE of Sarvestan; 1800 m a.s.l.; K. Warncke leg.; OÖLM.

Paratype

IRAN • 1 ♀; Fars, same collection data as for holotype; OÖLM.

Description

Female

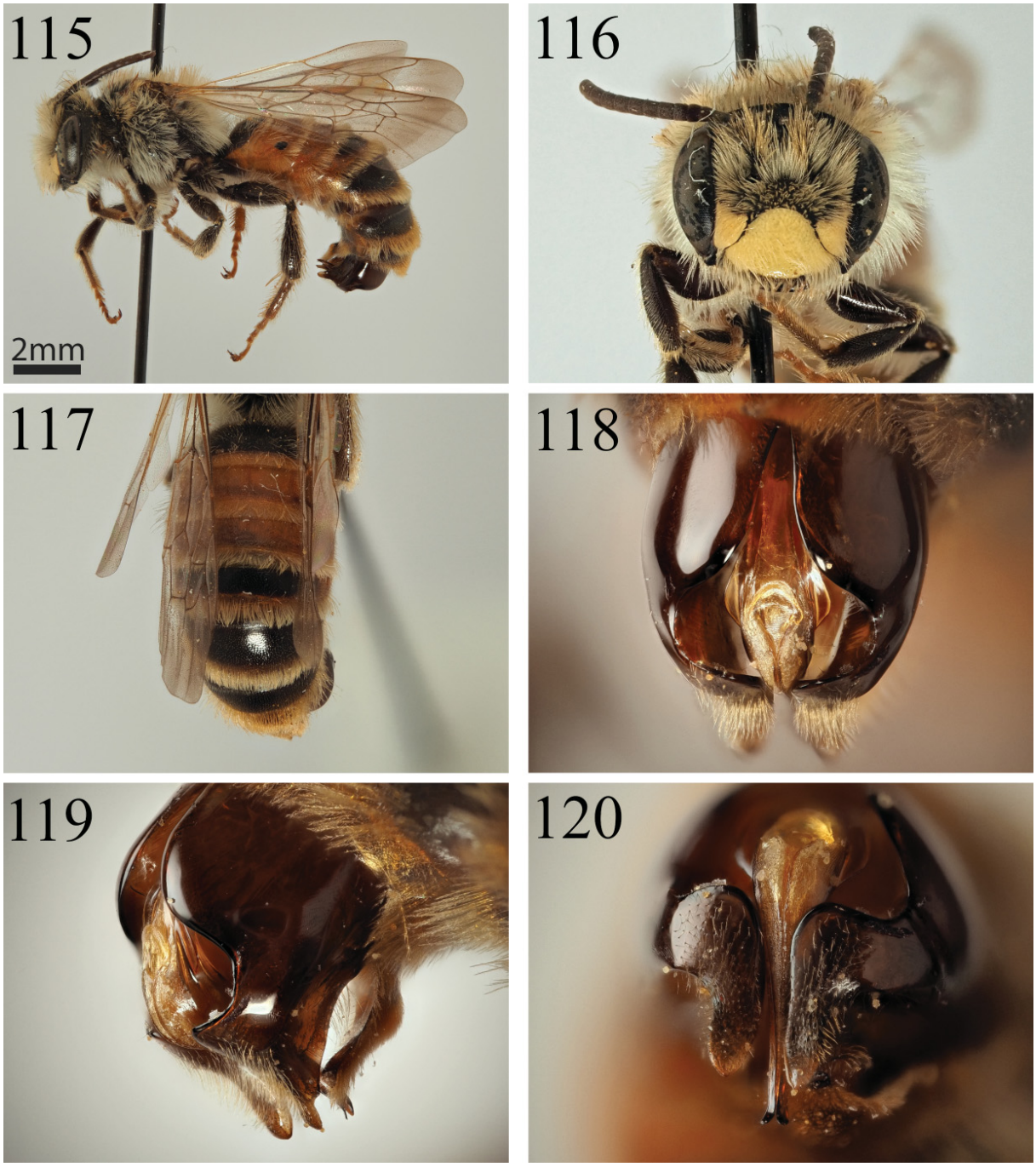
Measurements. Body length 10 mm (Fig. 109).

Head. 1.3 times as wide as long. Clypeus dark, weakly domed, regularly punctate with exception of narrow impunctate longitudinal midline, punctures otherwise separated by 0.5–1 puncture diameter; underlying surface faintly shagreened, shining (Fig. 110). Process of labrum broadly trapezoidal, apical margin with hint of emargination medially, essentially straight (Fig. 111). Face, gena, vertex, and scape with whitish hairs. Gena slightly exceeding width of compound eye; ocelloccipital distance subequal to diameter of lateral ocellus. Foveae dorsally occupying ½ distance between compound eye and lateral

Figs 109–114. *Andrena bulbosa* Wood sp. nov., ♀ (OÖLM). **109**. Profile. **110**. Face. **111**. Process of labrum, detail. **112**. Scutum. **113**. Terga. **114**. Terga 4–5, detail.

ocellus, slightly narrowed below at level of antennal insertions; foveae filled with whitish hairs. Antennae dark, A(4)5–12 slightly lightened dark orange below; A3 slightly exceeding A4+5, shorter than A4+5+6.

Mesosoma. Scutum and scutellum with dense and even punctation, punctures almost contiguous to separated by 0.5 puncture diameter; underlying surface generally smooth and shining, scutum shagreened anteriorly (Fig. 112). Pronotum without humeral angle. Mesepisternum and lateral face of propodeum with fine shagreen, weakly shining, mesepisternum with fine raised pattern of reticulation. Propodeal triangle



Figs 115–120. *Andrena bulbosa* Wood sp. nov., ♂ (OÖLM). **115**. Profile. **116**. Face. **117**. Terga. **118**. Genitalia dorsal view. **119**. Genitalia lateral view. **120**. Genitalia ventral view.

weakly delineated laterally by fine carinae, internal surface with weak pattern of raised rugae basally, disappearing centrally, here with reticulation, dull. Propodeal triangle therefore weakly contrasting with dorsolateral faces of propodeum, these covered in fine but dense raised reticulation, dull. Mesosoma with whitish hairs, longest on mesepisternum; propodeal corbicula dorsally composed of white plumose hairs. Legs dark, apical tarsal segments lightened orange; pubescence white, tibial and femoral scopae and flocculus unicolourous white. Hind tarsal claws with strong inner tooth. Wings hyaline, stigma and venation dark orange, nervulus interstitial, first recurrent vein enters second submarginal cell slightly beyond its middle.

Metasoma. Terga dark with extensive red maculations; red maculations form patches on T1 basally and apically, T2–3 almost entirely red-marked, T4 basally and apically; tergal margins lightened yellow-hyaline (Fig. 113). Terga T1–4 weakly shagreened, shining; T5 dull; all terga densely and uniformly punctate, punctures separated by 1 puncture diameter (Fig. 114). Tergal discs with very fine, short, and sparse whitish hairs, T2–4 with weak white apical hair fringes that do not obscure underlying surface, widely interrupted. Apical fringe of T5 and hairs flanking pygidial plate white to golden; pygidial plate rounded triangular, without surface sculpture.

Male

Measurements. Body length 12 mm (Fig. 115).

Head. 1.2 times as wide as long. Clypeus domed, entirely yellow-marked, yellow colouration extending onto lower paraocular areas; clypeus evenly punctate, punctures separated by 1 puncture diameter; underlying surface weakly shining (Fig. 116). Process of labrum rounded rectangular, broadly emarginate medially. Lower face and gena with white hairs, becoming golden-brown on vertex, scape, and frons. Gena exceeding width of compound eye; ocelloccipital distance 1½ times diameter of lateral ocellus. Antennae dark, A4–13 slightly lightened dark brown below; A3 slightly exceeding A4+5, shorter than A4+5+6.

Mesosoma. Mesosoma structurally as in female. Mesepisternum and propodeum with moderately thick long whitish hairs, becoming golden-brown dorsally on scutum and scutellum. Legs dark, apical tarsal segments lightened orange; pubescence whitish to brownish. Hind tarsal claws with inner tooth. Wings hyaline, stigma and venation orange; nervulus very slightly antefurcal, first recurrent vein enters second submarginal cell clearly beyond its middle.

Metasoma. Terga dark, red maculations cover entirety of T2–3, apical margins of T1 and T4; tergal margins otherwise lightened yellow-hyaline (Fig. 117). Tergal discs weakly shagreened, strongly shining; terga densely and evenly punctate, punctures separated by 1–1.5 puncture diameters. Tergal discs with fine golden pubescence, hairs longest on T1, T2–4 with complete apical hairbands composed of golden hairs, weakest on T2, becoming progressively thicker to T4, here obscuring underlying surface. S8 short, triangular, ventral surface covered by short golden hairs that obscure underlying shape. Genital capsule large, gonocoxae with inner margin evenly rounded, lacking apical teeth (Fig. 118); in lateral view gonocoxae forming rounded 90° angle (Fig. 119). Gonostyli with apical blades flattened, sharply right-angled basally, and produced into ventrally projecting points. Penis valves mediolaterally with short hyaline extensions, apically produced into long narrow projection, very subtly bifurcate apically (Fig. 120).

Distribution

Southern Iran (Fars Province).

Andrena* (incertae sedis) *hosseiniiae sp. nov.
urn:lsid:zoobank.org:act:334B5201-2518-44BE-9F05-18D14CB63906
Figs 121–126

Diagnosis

Andrena hosseiniiae sp. nov. is similar to the previously described species of *Planiandrena*, but it cannot currently be placed there with confidence. It appears similar because the clypeus is domed and shining (Fig. 122), the foveae are dorsally narrow (though slightly constricted and separated from the inner margin of the compound eye medially), and there is a faintly raised longitudinal ridge centrally on the pygidial plate. However, it is smaller, the process of the labrum is not as wide and is generally more rounded (Fig. 123), the integument of the frons and paraocular areas have hints of metallic green reflections, the propodeal triangle is constricted medially, extremely narrow, and slightly depressed, therefore slightly 'T' shaped (Fig. 125), and the hind tibial spur is straight, not broadened submedially. In the absence of male material, no subgenus is currently assigned. *Andrena hosseiniiae* can be recognised and separated from any Middle Eastern *Andrena* by this unusual combination of characters, specifically the domed and shining clypeus along with the unusual, medially constricted 'T' shaped propodeal triangle.

Etymology

Named after Tahereh Hosseinii, who led much of the recent work in Iranian bee collection that is presented here.

Material examined

Holotype

IRAN • ♀; Yasouj, Doposhteh, Dasht-e Rum; 30.589° N, 51.517° E; 2091 m a.s.l.; 10 Apr. 2021; E. Rostami leg.; OÖLM.

Paratypes

IRAN • 1 ♀; Yasouj, Doposhteh, Dasht-e Rum; 2091 m a.s.l.; 10 Apr. 2021; E. Rostami leg.; OÖLM • 1 ♀; same collection data as for preceding; TJWC • 1 ♀; same collection data as for preceding; ICPI • 1 ♀; Yasouj, Doposhteh, Dasht-e Rum; 2091 m a.s.l.; 31 Mar. 2021; E. Rostami leg.; ICPI.

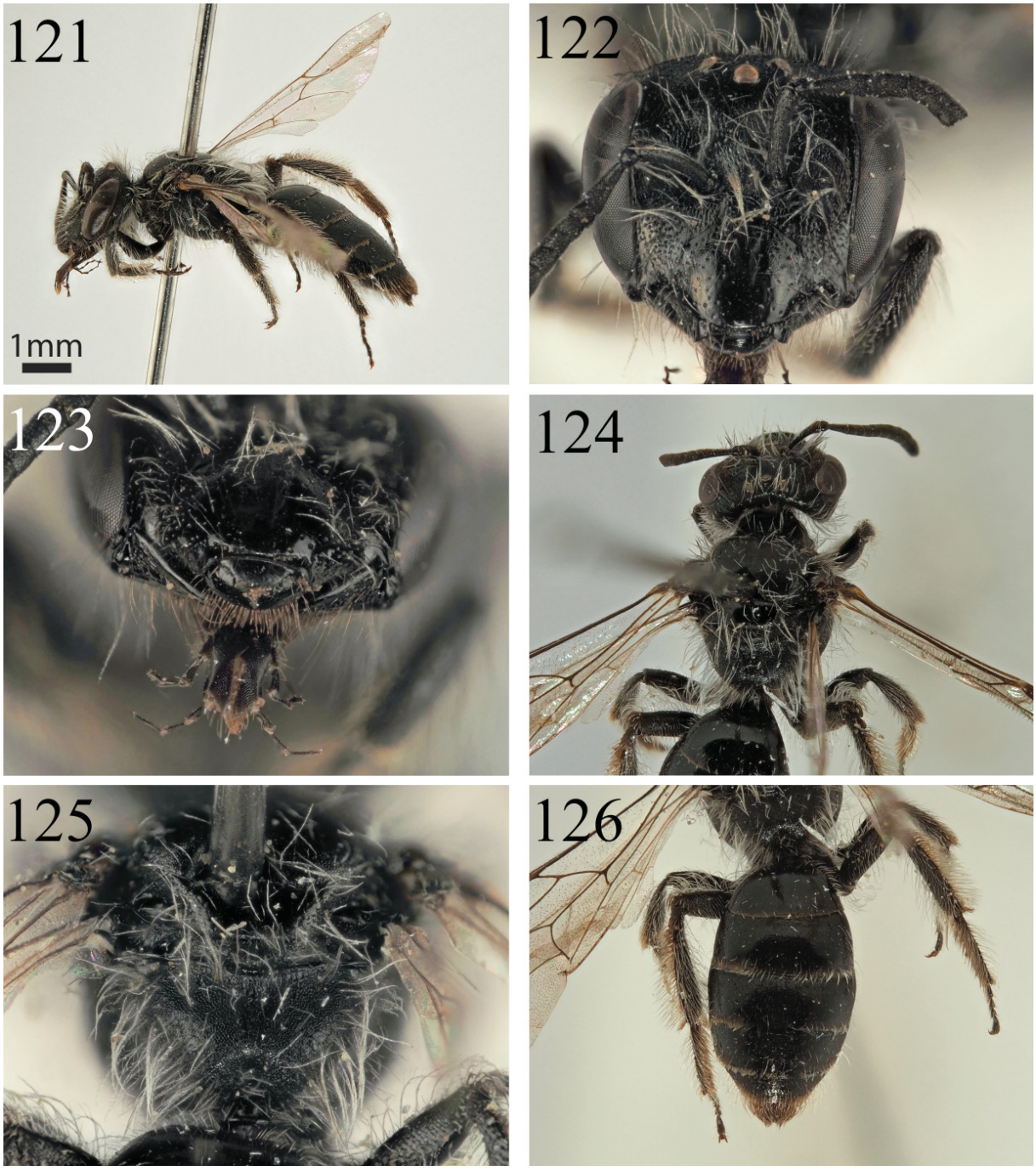
Description

Female

Measurements. Body length 7–7.5 mm (Fig. 121).

Head. 1.1 times as wide as long. Clypeus dark, domed, with few irregular punctures, punctures laterally separated by 1–2 puncture diameters, very sparse centrally and apically, almost impunctate (Fig. 122). Clypeus surface basally and laterally with fine, slightly raised microreticulation, forming latitudinal wrinkles; remainder of surface with very weak shagreen, strongly shining. Process of labrum trapezoidal, twice as broad as long, corners rounded, apical margin very faintly emarginate (Fig. 123). Face, gena, vertex, and scape with sparse whitish hairs, not exceeding length of scape. Integument of frons and paraocular area with slight metallic green reflections. Gena equalling width of compound eye; ocelloccipital distance small, just over ½ diameter of lateral ocellus. Foveae dorsally narrow, occupying ⅓ of space between compound eye and lateral ocellus, medially narrowed, here separated from inner margin of compound eye by a distance subequal to its medial diameter; fovea returning to original width and inner margin of compound eye at level of antennal insertions; fovea filled with dark brown hairs. Antennae dark, A3=A4+5+6, A4 sub-square, slightly wider than long.

Mesosoma. Scutum with fine granular microreticulation, weakly shining, surface with obscure shallow punctures, punctures separated by 1–4 puncture diameters (Fig. 124). Scutellum strongly contrasting, shagreen limited to lateral areas, smooth and shining over majority of area, with scattered obscure punctures. Pronotum with hint of humeral angle, inconspicuous. Mesepisternum and lateral faces of propodeum with fine granular shagreenation, weakly shining. Propodeal triangle slightly depressed, internal area lower than dorsolateral faces of propodeum; basally with subtle longitudinal rugae extending onto internal surface, apically shagreened; triangle apically constricted, thus broadly 'T' shaped when



Figs 121–126. *Andrena hosseiniiae* sp. nov., ♀ (OÖLM). **121**. Profile. **122**. Face. **123**. Process of labrum. **124**. Dorsum. **125**. Propodeal triangle. **126**. Terga.

viewed dorsally (Fig. 125). Dorsolateral faces of propodeum with coarser granular shagreen, propodeal triangle therefore defined by change in surface sculpture. Mesosoma with long whitish hairs, longest not exceeding length of scape; propodeum dorsally and laterally with some intermixed black hairs, propodeal corbiculae dorsally with weakly plumose white hairs, internal surface with long white simple hairs. Legs uniformly dark, pubescence whitish; tibial and femoral scopae and flocculus white. Hind tarsal claws with inner tooth. Hind tibial spur parallel-sided. Wings hyaline, stigma orange with dark brown margin, venation dark brown, nervulus antefurcal; first recurrent vein enters second submarginal cell at its middle to slightly beyond its middle.

Metasoma. Terga dark, apical margin of T1 very narrowly, of T2–4 slightly more extensively lightened yellow-hyaline (Fig. 126). Terga very weakly shagreened, generally shining; terga essentially impunctate with extremely obscure and scattered fine punctures. Terga discs with scattered short white hairs, T2–4 laterally with weak apical fringes of whitish hairs. Fringe of T5 and hairs flanking pygidial plate dark brown; pygidial plate triangular with faintly raised longitudinal ridge centrally.

Male

Unknown.

Remarks

All specimens were collected from *Acer monspessulanum* in April.

Distribution

Southern Iran (Yasouj).

Andrena* (incertae sedis) *rostamiae sp. nov.

urn:lsid:zoobank.org:act:64B3F387-3CCE-4830-8473-AD5C20F83A21

Figs 127–132

Diagnosis

Andrena rostamiae sp. nov. is challenging to place. It is partly similar to previously described species of *Planiandrena* because of the short and broad process of the labrum (Fig. 129) and the similarly sculptured though significantly wider clypeus (Fig. 128) that is wider than long (vs as wide as long or longer than wide in *A. flagrans* sp. nov., *A. huma* sp. nov., and *A. sella* sp. nov.). However, the foveae are substantially wider dorsally, occupying nearly half of the distance between the compound eye and the lateral ocellus (Fig. 130) (vs not occupying more than ¼ of this distance in the three comparison species). The pygidial plate is also flat and the hind tibial spur is unbroadened. It is therefore similar to *A. hulae* Pisanty, 2022 from northern Israel, which is also not possible to place in a subgenus at this time. *Andrena rostamiae* can be separated by the dark antennae (vs antennal segments 5–12 lightened orange below), the flattened clypeus (vs clypeus domed), the shorter ocelloccipital distance that is subequal to the diameter of a lateral ocellus (vs slightly greater than the diameter of a lateral ocellus), the smoother propodeal triangle that lacks basal rugae (vs propodeal triangle with short longitudinal basal rugae), and the impunctate scutum and scutellum (vs shallowly but distinctly punctate). Until male material is available, no firm decision on subgeneric placement is taken.

Etymology

Named after Ehlam Rostami, who collected many of the new species described in this manuscript.

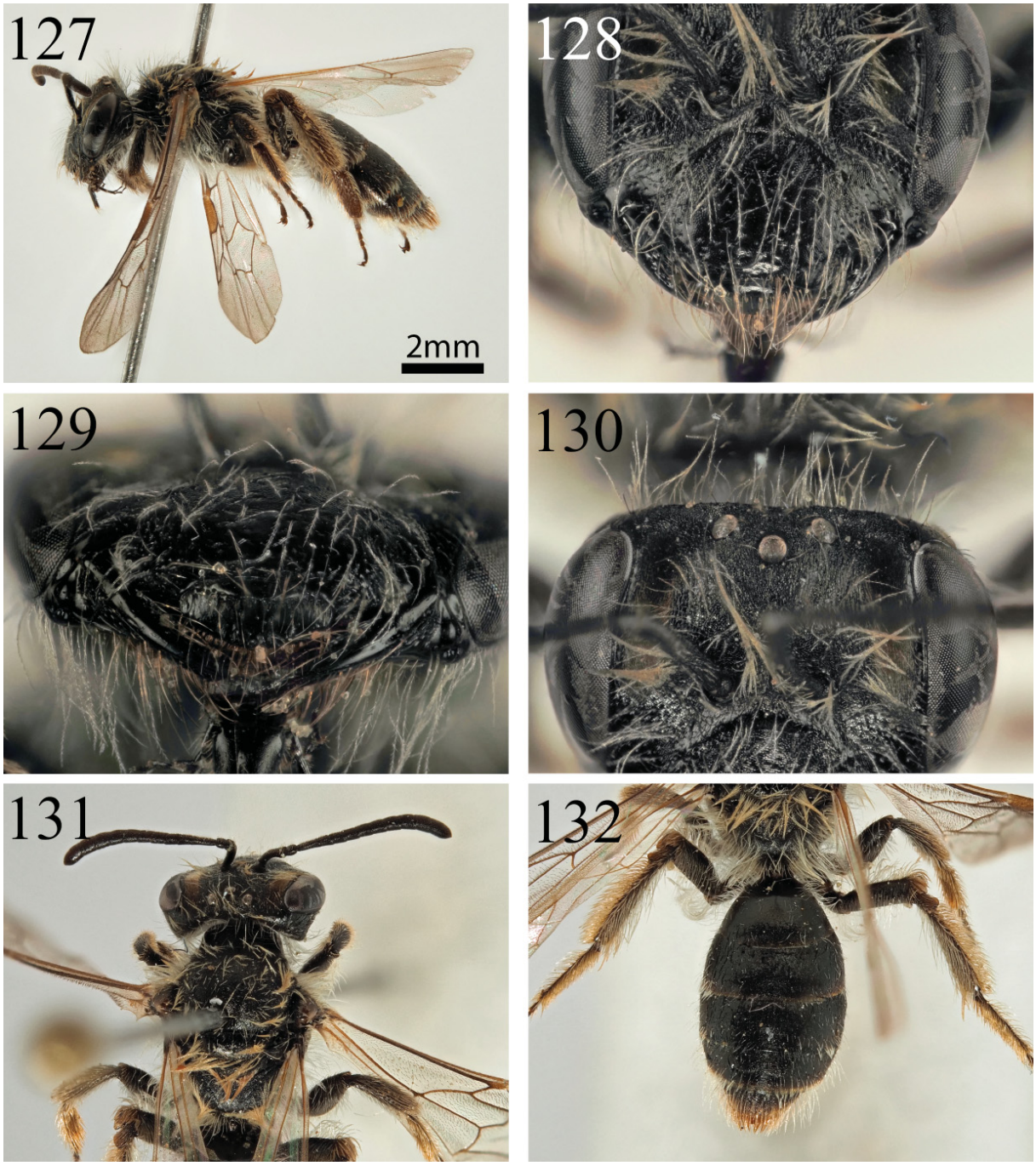
Material examined

Holotype

IRAN • ♀; Yasouj, Doposhteh, Dasht-e Rum; 30.589° N, 51.517° E; 2091 m a.s.l.; 6 Apr. 2021; E. Rostami leg.; OÖLM.

Paratypes

IRAN • 2 ♀♀; Yasouj, Doposhteh, Dasht-e Rum; 2091 m a.s.l.; 6 Apr. 2021; E. Rostami leg.; OÖLM • 1 ♀; same collection data as for preceding; TJWC • 4 ♀♀; same collection data as for preceding; ICPI • 5 ♀♀; Yasouj, Doposhteh, Dasht-e Rum; 2091 m a.s.l.; 10 Apr. 2021; E. Rostami leg.; ICPI • 1 ♀; same collection data as for preceding; TJWC.



Figs 127–132. *Andrena rostamiae* sp. nov., ♀ (OÖLM). **127**. Profile. **128**. Face. **129**. Process of labrum. **130**. Frons, foveae, and ocellar triangle. **131**. Dorsum. **132**. Terga.

Description

Female

Measurements. Body length 8.5–9.5 mm (Fig. 127).

Head. 1.3 times as wide as long. Clypeus dark, broad, 1.5 times as broad as long, weakly flattened over majority of its area, covered with weak and irregular punctures, punctures separated by 1–4 puncture diameters; individual punctures slightly elongated latitudinally; poorly defined longitudinal impunctate line formed centrally (Fig. 128). Clypeus surface basally and laterally with fine, slightly raised microreticulation, forming latitudinal wrinkles; becoming weaker centrally and apically, here weakly shining. Process of labrum rectangular, short and broad, 4 times as wide as long; apical margin weakly and shallowly emarginate (Fig. 129). Face, gena, vertex, and scape with long whitish to light brownish hairs, not exceeding length of scape. Gena equalling width of compound eye; ocelloccipital distance small, just over ½ diameter of lateral ocellus. Fovea dorsally broad, occupying ½ of space between compound eye and lateral ocellus, medially slightly constricted, separated slightly from inner margin of compound eye; foveae filled with light brown hairs (Fig. 130). Antennae dark, A3 slightly exceeding A4+5, distinctly shorter than A4+5+6.

Mesosoma. Scutum with dense granular microreticulation, dull, essentially impunctate; scutellum with similar but slightly weaker sculpturing, very weakly shining (Fig. 131). Pronotum with weak humeral angle, dorsolateral angle pronounced dorsally but becoming rounded ventrally, obscure. Mesepisternum, lateral and dorsolateral faces of propodeum with granular microreticulation, weakly shining. Propodeal triangle broad, laterally defined by narrow dark line lacking granular microreticulation, internal surface with same granular microreticulation as dorsolateral faces of propodeum, becoming coarser basally. Mesosoma covered in whitish hairs laterally and ventrally, becoming light brownish dorsally; propodeal corbiculae with light brownish weakly plumose hairs, internal surface with simple light brownish hairs. Legs dark, apical tarsal segments lightened dark brown, pubescence brownish-white to dark brown; tibial scopae light brownish, femoral scopae and flocculus white. Hind tarsal claws with inner tooth. Hind tibial spur parallel-sided. Wings hyaline, stigma orange, venation dark orange, nervulus antefurcal; first recurrent vein enters second submarginal cell very strongly beyond its middle.

Metasoma. Terga dark, marginal areas of T2–4 very weakly depressed, marginal areas of T1–4 lightened dark brown to narrowly yellow-hyaline apically (Fig. 132). Terga densely and finely microreticulate; microreticulation becoming weaker from mid-point of T3 onwards; overall, terga dull to weakly shining apically. T1–3 essentially impunctate, disc of T4 with obscure scattered punctures. T2–4 with weak apical hair fringes, broadly interrupted on T2–3, complete on T4. Fringe of T5 and hairs flanking pygidial plate golden orange; pygidial plate broadly rounded apically, flattened, internal surface with dense scale-like microreticulation, strongly delineated by impunctate rim.

Male

Unknown.

Remarks

All specimens were collected from *Acer monspessulanum* in April.

Distribution

Southern Iran (Yasouj).

Annotated faunal list

1. *Andrena* (*Ulandrena*) *abbreviata* Dours, 1873

Material examined

IRAN • 1 ♂; Ham [Ilam] Province, Sar Joob; 1930 m a.s.l.; 13 May 2016; M. Kafka leg.; OÖLM • 1 ♂; Kurdistan Province, Paniran; 1450 m a.s.l.; 14 May 2016; M. Kafka leg.; OÖLM.

Literature records

Popov (1967, as *A. leucorhina* Morawitz, 1876); Khodarahmi Ghahnavieh & Monfared (2019, as *A. osychniukae* Osytshnjuk, 1977).

Remarks

The taxonomic status of *A. abbreviata* is not completely clear, as many similar taxa have been described (Gusenleitner & Schwarz 2002). Though female specimens are quite variable, the male genital capsule is extremely similar if not identical across its distributional range. In the absence of genetic revisionary work, the broad species concept as shown in the distributional map presented by Gusenleitner & Schwarz (2002) is adopted here.

Distribution

South-eastern Europe, Ukraine, Russia (European part), Turkey, Cyprus, Levant, Caucasus, Iran, Kazakhstan (Gusenleitner & Schwarz 2002; Proshchalykin *et al*. 2017a).

2. *Andrena* (*Ulandrena*) *acerba* Warncke, 1967 *

Material examined

IRAN • 1 ♀; Lorestan Province, 10 km SW of Dorud; 1520 m a.s.l.; 20 May 2014; J. Halada leg.; OÖLM • 1 ♀; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; 11 May 2016; M. Kafka leg.; OÖLM.

Distribution

Greece, Turkey, Armenia, Iran* (Gusenleitner & Schwarz 2002; Rasmont *et al*. 2017).

3. *Andrena* (*Aciandrena*) *aciculata* Morawitz, 1886

Material examined

IRAN • 1 ♀; West Azerbaijan Province, Serou; 1650 m a.s.l.; 28 May 2010; Mi. Halada leg.; OÖLM • 1 ♂; Gilan Province, 20 km W of Astara; 640 m a.s.l.; 17 Jun. 2010; Mi. Halada leg.; OÖLM • 6 ♂♂, 3 ♀♀; Kašan [Kashan]; 3 May 1999; K. Deneš leg.; OÖLM • 3 ♂♂, 1 ♀; Tehran env.; 2 May 1999; K. Deneš leg.; OÖLM • 1 ♂; West [West Azerbaijan Province], Češme Bigar env. [Çeşmə, or Cheshmeh, 38.594° N, 45.119° E]; 14 May 1999; K. Deneš leg.; OÖLM.

Literature records

Scheuchl & Willner (2016); Aliyev *et al*. (2017). The distribution maps of Warncke (Gusenleitner & Schwarz 2002) also indicate the presence of *A. aciculata* in northern Iran.

Distribution

Central and Eastern Europe through Turkey to northern Iran (Gusenleitner & Schwarz 2002; Scheuchl & Willner 2016).

4. *Andrena* (*Aenandrena*) *aeneiventris* Morawitz, 1872

Material examined

IRAN • 5 ♀♀; East Azerbaijan Province, Sis, 10 km E of Shabestar; 1540 m a.s.l.; 19 Jun. 2010; Mi. Halada leg.; OÖLM • 3 ♂♂, 8 ♀♀; Golestan, 40 km E of Minudasht NP; 750 m a.s.l.; 1 Jun. 2014; J. Halada leg.; OÖLM • 1 ♀; Golestan, 70 km E of Minudasht; 1050 m a.s.l.; 12 Jun. 2010; Mi. Halada leg.; OÖLM • 2 ♂♂; Kerman Prov., Jupar [Joupar]; 1900 m a.s.l.; 1 Jun. 2010; Mi. Halada leg.; OÖLM • 2 ♂♂; Pasagrad env. [Pasargad]; 8 May 1999; K. Deneš leg.; OÖLM.

Literature records

Alfken (1927); Osytshnjuk *et al*. (2005); Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

West and Central Palearctic (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2005).

5. *Andrena* (*Notandrena*) *aerinifrons levantina* Hedicke, 1938

Material examined

JORDAN • 1 ♀; 20 km N of Karak; 1000 m a.s.l.; 27 Apr. 2006; K. Deneš leg.; OÖLM • 2 ♀♀; 30 km N of Tafila [At-Tafilah]; 2 May 1996; Ma. Halada leg.; OÖLM • 1 ♂; Al Karak env. [Kerak]; 6 Apr. 2013; M. Snižek leg.; OÖLM • 2 ♀♀; Kerak, 20 km N of Tafila; 1000 m a.s.l.; 19 Mar. 1988; L. Blank leg.; MSC • 2 ♂♂; Wadi-el-Mawjib; 20 Mar. 2009; V. Barták leg.; OÖLM.

SYRIA • 1 ♂, 4 ♀♀; Damascus Airport; 29 Mar. 1988; L. Blank leg.; MSC • 1 ♀; Homs; 4 Jun. 1962; Kargi leg.; OÖLM • 1 ♀; 20 km E of Homs; 400 m a.s.l.; 1 Apr. 1988; S.M. Blank leg.; MSC.

Literature records

Khodaparast & Monfared (2012, as *levantina*).

Distribution

Morocco, Portugal, Spain, Algeria, Tunisia, Italy (Sicily), Libya, Egypt, Israel and the West Bank, Jordan*****, Syria*****, Iran. Subspecies *levantina* is found in the eastern part of the range.

6. *Andrena* (*Taeniandrena*) *afzeliella* (Kirby, 1802)

Material examined

IRAN • 1 ♀; Kohgiluyeh and Boyer-Ahmad, Kuh Gol, near Sisakht; 2500 m a.s.l.; 9 Jun. 2010; Mi. Halada leg.; OÖLM • 17 ♂♂; Gilan Province, Tutkabon near Roodbar; 16 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♀; Golnar, Ravar, Kerman; 23 May 2016; Z. Khajouee leg.; ICPI • 1 ♂; Kohgiluyeh and Boyer-Ahmad, Chenar; 2092 m a.s.l.; 15 Jun. 2018; F. Arannezhad leg.; ICPI • 1 ♂, 2 ♀♀; Yazd, Bafgh, Moellem square; 994 m a.s.l.; 31 May 2019; S. San leg.; ICPI • 12 ♀♀; Yazd, Dehno pajofar; 19 May 2021; S. San leg.; ICPI • 1 ♀; Yazd, Mehriz Posht e masjed, Abitaleb; 12 May 2020; S. San leg.; ICPI • 4 ♀♀; Kohgiluyeh and Boyer-Ahmad, Yasoj, Park Velayat; 1829 m a.s.l.; 20 Jun. 2018; N. Dehghan leg.; ICPI • 2 ♀♀; Yasouj, Zirtol; 20 Aug. 2016; A. Mirzapour leg.; ICPI.

Literature records

Alfken (1935, as *A. ovatula* (Kirby, 1802)); Khodaparast & Monfared (2012 as *A. ovatula*); Praz *et al*. (2022).

Remarks

The subgenus *Taeniandrena* is taxonomically complex and contains many cryptic species. It has recently undergone a substantial revision (Praz *et al*. 2022), with many changes for the West Palearctic fauna, including the recognition of *A. afzeliella* as a distinct taxon and the senior name of *A. albofasciata* Thomson, 1870.

Distribution

Confused due to historical synonymy with *A. ovatula*. Across Europe to Turkey, the Levant, and Iran (Praz *et al*. 2022).

7. *Andrena* (*Melandrena*) *albifacies* Alfken, 1927

Material examined

JORDAN • 1 ♀; Petra, Wadi Musa; 14 May 1995; K. Deneš leg.; OÖLM • 3 ♀♀; Wadi Rum; 4 May 1996; Mi. Halada leg.; OÖLM.

SYRIA • 7 ♀♀; Ar-Raqqa, Mishirfeh; 4 Jun. 2000; K. Deneš leg.; OÖLM.

Literature records

Alfken (1927, locus typicus).

Remarks

The first currently valid taxon described from Iran, this taxon is found in arid, semi-desert habitats. Reported as new for Jordan and Syria.

Distribution

Morocco, Algeria, Tunisia, Libya, Egypt, Israel and the West Bank, Jordan*****, Syria*****, Iraq, Iran (Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

8. *Andrena* (*Truncandrena*) *albopicta* Radoszkowski, 1874

Material examined

TURKEY • 4 ♀♀; Hakkâri, Beytüşşebap; 25 May 1988; K. Warncke leg.; OÖLM.

Literature records

Grace (2010).

Remarks

The distribution maps of Warncke (Gusenleitner & Schwarz 2002) indicate the presence of *A. albopicta* in northern Iran. No specimens of *A. albopicta* could be found in the Warncke collection, but *A. albopicta* is present in eastern Turkey and so it is considered to be present in Iran.

Distribution

Turkey, Russia (European part), Armenia, Iran (Gusenleitner & Schwarz 2002; Rasmont *et al*. 2017).

9. *Andrena* (*Melandrena*) *albopunctata* (Rossi, 1792)

Material examined

IRAN • 3 ♂♂; West Azerbaijan Province, Serou; 1650 m a.s.l.; 28 May 2010; Mi. Halada leg.; OÖLM • 1 ♀; Gilan Province, Tutkabon near Roodbar; 16 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♂; Golestan Province, 45 km E of Minudasht; 960 m a.s.l.; 11 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♂; Golestan, 70 km E of Minudasht; 1050 m a.s.l.; 12 Jun. 2010; OÖLM • 1 ♀; Mashhad; 1 Apr. 2010; OÖLM.

Literature records

Popov (1967); Osytshnjuk *et al*. (2008); Allahverdi *et al*. (2016); Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

West and Central Palearctic (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

10. *Andrena* (*Brachyandrena*) *alisadra* Ariana, Scheuchl, Tadauchi & Gusenleitner, 2009

Material examined

IRAN • 1 ♀; Fars Province, 10 km E of Kazerum; 1990 m a.s.l.; 23 May 2014; J. Halada leg.; OÖLM.

TURKEY • 2 ♀♀; Mardin; 1000 m a.s.l.; 2 Jul. 1987; R. Hensen leg.; RMHN • 2 ♀♀; Batman, 15 km N of Midyat; 22 Jun. 1997; Ma. Halada leg.; OÖLM • 1 ♀; 40 km E of Midyat/Mardin; 900 m a.s.l.; 25 May 1983; K. Warncke leg.; OÖLM.

Literature records

Ariana *et al*. (2009a).

Distribution

Turkey***** and Iran (Ariana *et al*. 2009a).

11. *Andrena* (*Micrandrena*) *alutacea* Stoeckhert, 1942

Material examined

CRIMEA • 1 ♂, 3 ♀♀; Krim [Crimea], Karadagh [Kara Dag], Vodianja balka, Wald; 17–31 May 2002; Y. Budaschkin leg.; OÖLM.

GEORGIA • 1 ♀; NC, N of Tbilisi, Magaroskarj env.; 19 Jun. 2014; M. Snižek leg.; OÖLM • 2 ♀♀; Tbilisi env.; 21 May 1973; Dr. Svozil leg.; OÖLM.

IRAN • 1 ♀; Kohgiluyeh and Boyer-Ahmad Province, Kuh Gol, near Sisakht; 2500 m a.s.l.; 9 Jun 2010; Mi. Halada leg.; OÖLM • 1 ♀; Esfahan Province, 40 km SE of Aligudars (Nowghan); 2250 m a.s.l.; 31 May 2010; Mi. Halada leg.; OÖLM • 1 ♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Kerman Province, Sirač [?Sirch]; 1640 m a.s.l.; 2 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♀; Lorestan Province, Tootmashour [Tut, Masur-e Abi]; 2000 m a.s.l.; 31 May 2010; Mi. Halada leg.; OÖLM.

MONTENEGRO • 1 ♀; Durmitor Žabljak env.; 25 Jun.–7 Jul. 1958; Bouček leg.; OÖLM.

RUSSIA • 2 ♂♂, 2 ♀♀; N. Kaukasus, Umg. Pjatigorsk; 800 m a.s.l.; 25–30 May 2002; V. Pack leg.; OÖLM.

UKRAINE • 1 ♀; Ivanofrankivskij rajon, 30 km E of Ivano-Frakivsk, Nizvev vill [Nyzhniv] Dnestr River; 7 Jun. 2016; M. Snižek leg.; OÖLM.

Literature records

Schmid-Egger (2005).

Remarks

The presence of *A. alutacea* in Georgia is confirmed from female material (see doubts raised by Schmid-Egger 2005).

Distribution

Switzerland, Germany, Italy, Austria, Croatia, Poland, Latvia, Romania, Bulgaria, Montenegro*****, North Macedonia, Greece, Turkey, Ukraine*****, Crimea*****, Russia, Georgia, Azerbaijan, Iran, and Turkmenistan (Schmid-Egger 2005; Proshchalykin *et al*. 2017a).

12. *Andrena* (*Nobandrena*) *anatolica* Alfken, 1935 *

Material examined

IRAN • 1 ♂; West Azerbaijan Province, Serou; 1650 m a.s.l.; 28 May 2010; Mi. Halada leg.; OÖLM • 1 ♂; Tehran Province, 6 km N of Gačsar [Gachsar]; 29 May–2 Jun. 2002; J. Prochazka leg.; OÖLM.

Distribution

North Macedonia, Greece, Romania, Bulgaria, Turkey, Ukraine, Russia (European part), Lebanon, Iran***** (Wood 2021b).

13. *Andrena* (incertae sedis) *antilibanotica* Wood, 2020 *

Material examined

IRAN • 2 ♂♂; West [West Azerbaijan Province], Češme Bigar env. [Çeşmə, or Cheshmeh, 38.594° N, 45.119° E]; 14 May 1999; K. Deneš leg.; OÖLM.

Remarks

A taxon showing a distribution in both the Anti-Lebanon mountain range and the Zagros Mountains of western Iran.

Distribution

Syria and Iran***** (Wood 2020a).

14. *Andrena* (*Ulandrena*) *armeniaca* Popov, 1940 *

Material examined

IRAN • 1 ♂; Elburz, Pulour [Polour], 22 km N of di Ab Ali; 11 Jul. 1965; G. Soika and G.A. Mavromoustakis leg.; OÖLM.

TURKEY • 1 ♀; Van, town walls; 28 Jun. 1993; Jiroušek leg.; OÖLM.

Remarks

Described from a single female collected in Djulfa (now Julfa, Nakhchivan Autonomous Republic, Azerbaijan; Popov 1940). This town is directly on the border with Iran, and so the presence of this species in Iran is not unexpected.

Distribution

Turkey, Azerbaijan, Iran***** (Popov 1940; Scheuchl 2010).

15. *Andrena* (*Melandrena*) *assimilis* Radoszkowski, 1876 *

Andrena (*Melandrena*) *assimilis* Radoszkowski, 1876: 84 (♀, Caucasus).
Andrena (*Melandrena*) *gallica* Schmiedeknecht, 1883: 549 (♀, France, Mont-de-Marsan). **Syn. nov.**
Andrena (*Melandrena*) *gallica alpicola* Bischoff, 1922: 289 (♀, Italy, Cadenabbia). **Syn. nov.**
Andrena (*Melandrena*) *gallica iberica* Bischoff, 1922: 289 (♀, 'Hispania'). **Syn. nov.**
Andrena (*Melandrena*) *gallica taurica* Bischoff, 1922: 289 (♀, Crimea). **Syn. nov.**
Andrena (*Melandrena*) *gallica fulvitegularis* Bischoff, 1922: 290 (♀, Germany, Groß Machnow). **Syn. nov.**

Material examined

Lectotypes

CAUCASUS • ♀ (lectotype of *Andrena assimilis*); Caucasus; ZMHB (illustrated Figs 133–138).

FRANCE • ♀ (lectotype of *Andrena gallica*); Mont-de-Marsan; MNHN (illustrated Le Divelec 2021).

Syntypes

ITALY • ♀ (syntype of *Andrena gallica alpicola*); Como-S. Cadenabbia; 1–31 Mar. 1903; ZMHB (illustrated Figs 139–140).

IBERIA • ♀ (syntype of *Andrena gallica iberica*); Hispania; 189 [no further information]; ZHMB (illustrated Figs 141–142).

CRIMEA • ♀ (syntype of *Andrena gallica taurica*); Krim [Crimea]; Nordmann leg.; Coll. Gerst. [Gerstaecker]; ZMHB (illustrated Figs 143–144).

GERMANY • ♀ (syntype of *Andrena gallica fulvitegularis*); Mittenwalde, Machn. Weinbg.; 20 Jul. 1921; Hedicke leg.; ZMHB • ♀ [syntype of *A. gallica fulvitegularis*]; Groß Machnow; 21 Jul 1918; ZMHB.

Other material

ALBANIA • 1 ♀; Bizë, b. Shengjergji [Shëngjergj]; 1400–1500 m a.s.l.; 15 Jul. 1961; K. Warncke det. [as *assimilis gallica*]; OÖLM.

AUSTRIA • 1 ♀; Oberweiden; 15 Apr. 1936; K.K. Warncke det. [as *assimilis gallica*]; R. Schmidt leg.; OÖLM.

AZERBAIJAN • 1 ♀; Helendorff [renamed Khanlar, now Göygöl]; 1886; K. Warncke det. [as *assimilis* s. str.]; OÖLM.

CZECH REPUBLIC • 1 ♀; Hovorany; 8 Aug. 1941; K. Warncke det. [as *assimilis gallica*]; V. Zavdil leg.; OÖLM.

FRANCE • 3 ♀♀; Aude, Servies-en-Val; 5 Aug. 1970; R.T. Simon Thomas leg.; RMNH • 2 ♀♀; Montpellier; ZMHB • 1 ♀; Pyr. Or., Mont Louis; 1600 m a.s.l.; 20 Aug. 1957; M.C. and G. Kreuseman; RMNH.

GERMANY • 6 ♂♂, 6 ♀♀; Niemegk, Fläming; 26 Jul. 1953; E. Heidenreich leg.; ZMHB.

GREECE • 1 ♂, 1 ♀; Saloniki; 1–30 Apr. 1932; K. Warncke det.; Paduschin-Kattinger leg.; ZMHB.

Figs 133–138. *Andrena assimilis* Radoszkowski, 1876, ♀, lectotype (ZMHB). **133**. Label, detail. **134**. Profile. **135**. Face. **136**. Scutum, detail. **137**. Wing, detail. **138**. Terga.

IRAN • 1 ♂; East Azerbaijan Province, Sis, 10 km E of Shabestar; 1540 m a.s.l.; 19 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♀; Elburs [Alborz], Pelur [Polour]; ca 2000 m a.s.l.; Wagner leg.; ZMHB • 1 ♀; Elburs [Alborz], Rehne, Demavend [Damavand]; 2700–2600 m a.s.l.; Wagner leg.; ZMHB • 1 ♀; Elburz, 30 km di. of Ab Ali; 9 Jul. 1965; K. Warncke det. [as *assimilis* s. str.]; G. Soika and G.A. Mavromoustakis leg.; OÖLM • 1 ♀; Gilan Province, 15 km SE of Tutkabon; 1100 m a.s.l.; 9 Jun.

Figs 139–144. 139–140. *Andrena gallica alpicola* Bischoff, 1922, ♀, syntype (ZMHB). **139**. Label, detail. **140**. Profile. **141–142**. *Andrena gallica iberica* Bischoff, 1922, ♀, syntype (ZMHB). **141**. Label, detail. **142**. Profile. **143–144**. *Andrena gallica taurica* Bischoff, 1922, ♀, syntype (ZMHB). **143**. Label, detail. **144**. Profile.

2014; J. Halada leg.; OÖLM • 1 ♀; Golestan, 70 km E of Minudasht; 1050 m a.s.l.; 12 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♀; Kerman Province, 20 km E of Ghobira; 1780 m a.s.l.; 5 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♀; Seman Province, 10 km W of Damghan; 1200 m a.s.l.; 10 Jun. 2010; Mi. Halada leg.; OÖLM.

KAZAKHSTAN • 1 ♀; Alma-Ata (Medeo); 12 Jul. 1977; K. Warncke det. [as *assimilis* s. str.]; K. Bleyl leg.; OÖLM.

KYRGYZSTAN • 1 ♀; Alarca [Ala Archa National Park]; 2500 m a.s.l.; 27 May 1974; K. Warncke det. [as *assimilis* s. str.]; Rataj leg.; OÖLM • 1 ♀; Przewalsk [Karakol], Tian-Schan; K. Warncke det. [as *assimilis gallica*]; OÖLM.

MOROCCO • 1 ♀; Dait Achlaf [Lac Hachlaf]; 27 Apr. 1987; K. Warncke det. [as *assimilis barnei* Cockerell, 1931]; M. Kraus leg.; OÖLM • 1 ♂; Ifrane; 22 Jul. 1932; K. Warncke det. [as *assimilis barnei*]; Ad. Nadig leg.; OÖLM.

PORTUGAL • 1 ♂, 1 ♀; Estremadura, Apostiça; 28 Feb 1990; B. Souça leg.; MNHNC • 1 ♀; Baixo Alentejo, Vila Nova de Milfontes; 14 Jul. 1971; E. Scheuchl det.; MNHNC • 2 ♀♀; Carrapateira; 3 Apr. 2015; T.J. Wood leg.; TJWC.

SPAIN • 1 ♀; Aragon, Albarracín; 21 Jul. 1924; K. Warncke det. [as *assimilis gallica*]; Zerny leg.; OÖLM • 1 ♀; Setcases (Girona); 1500 m a.s.l.; F.J. Ortiz-Sánchez leg.; OSCA (illustrated Fig. 145) • 3 ♀♀; Burgos, Hornilloyuso; 24 Apr. 1984; R. Leys leg.; RMNH • 2 ♀♀; Caceres, Villasbuenas de Gata; 1 Jul. 1988; M. Schwarz leg.; MSC • 2 ♀♀; Puerto de Somosierra (Madrid, Sierra de Guadarama); 1355 m a.s.l.; F.J. Ortiz-Sánchez leg.; OSCA (illustrated Fig. 146) • 4 ♀♀; Granada, Sierra Nevada, Trevélez to Refugio La Campiñuela; 1700–2400 m a.s.l.; T.J. Wood leg.; TJWC (illustrated Fig. 147) • 1 ♀; Madrid, Cercedilla; 21 Apr. 1973; J.A.W. Lucas leg.; RMNH • 1 ♂, 2 ♀♀; Ávila, 1 km S of Navacepeda de Tormes; 15 Jul. 2021; T.J. Wood leg.; TJWC (illustrated Fig. 148) • 1 ♀; Sierra de Guadarrama; 18 Aug. 1912; K. Warncke det. [as *assimilis* s. str.]; J. M. Dusmet y Alonso leg.; OÖLM • 1 ♀; Soria; 26 May 1965; K. Warncke det. [as *assimilis gallica*]; W. Linsenmaier leg.; OÖLM.

RUSSIA • 1 ♀; Bijsk [Biysk]; 27 May 1921; ZMHB • 1 ♂ [syntype of *A. gallica fulvitegularis*]; Irkutsk; 28 Apr.–11 May 1913; O. Hesse leg.; ZMHB • 1 ♀ [syntype of *A. gallica fulvitegularis*]; Irkutsk; 14–27 May 1913; O. Hesse leg.; ZMHB.

SERBIA • 1 ♀; Fejértelep [Šušara]; K. Warncke det. [as *assimilis* s. str.]; OÖLM.

SWITZERLAND • 2 ♀♀ [paratypes of *A. gallica alpicola*]; Sierre; 15 Jul. 1884; H. Friese leg.; ZMHB.

TURKEY • 1 ♀; Çıldır, Kars; 2000 m a.s.l.; 19 Aug. 1991; K. Warncke det. [as *assimilis* s. str.]; OÖLM.

UKRAINE • 1 ♂; Desna Nadinovka [Nadynivka]; 29–30 Apr. 2003; Y. Budaschkin leg.; OÖLM.

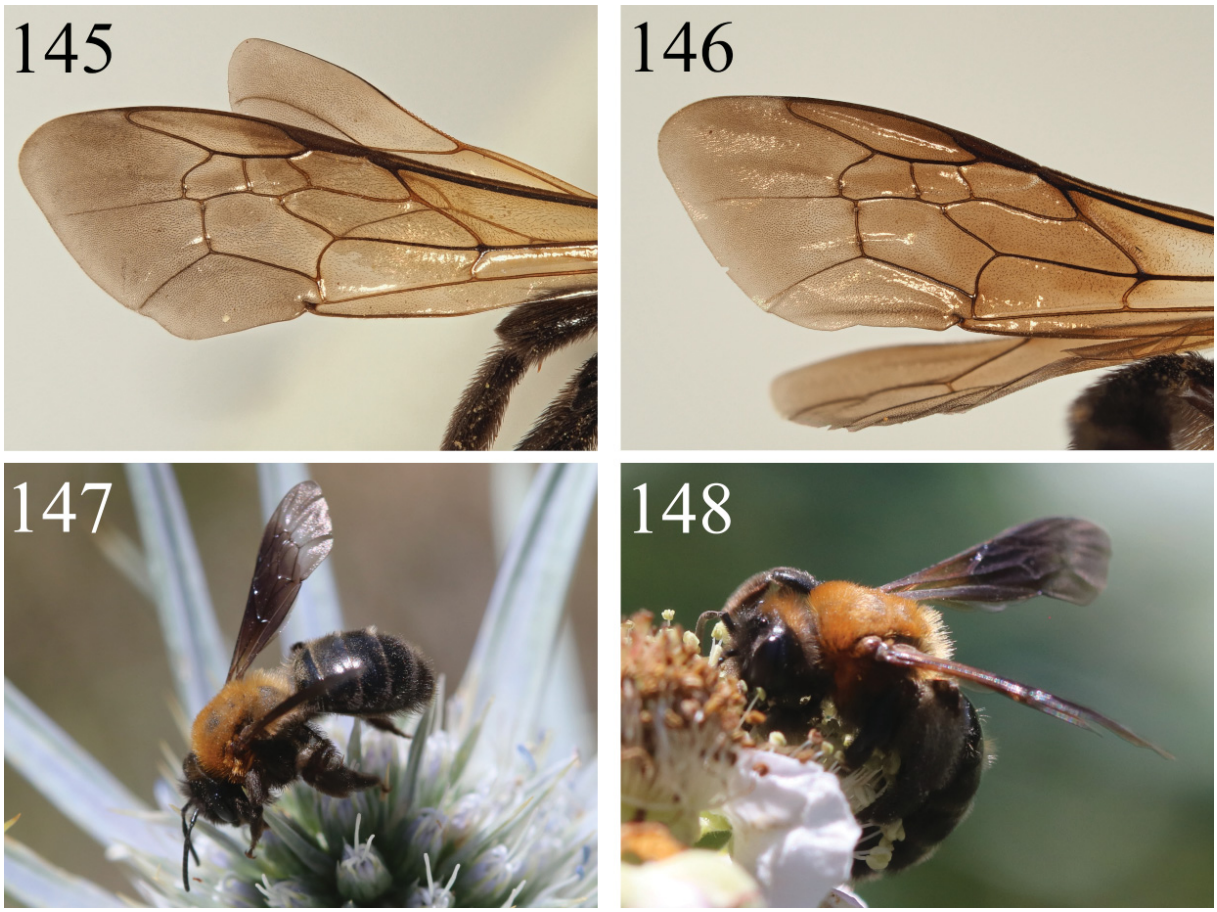
Remarks

The taxonomic history of the two names *A. assimilis* and *A. gallica* is long and confused (Schmid-Egger & Scheuchl 1997; Gusenleitner & Schwarz 2002), in part due to the unclear location of the type material of *A. gallica*, which was recently rediscovered (Le Divelec 2021). The putative criteria used to separate material was in the colour of the wing venation and the degree of infuscation of the wing itself (Osytshnjuk *et al*. 2008; Motyka *et al*. 2016). However, this character is highly variable. Examination of the type of *A. assimilis* in Berlin shows that, though the wings are somewhat infuscate, the veins are not entirely dark, with intermixed dark and light veins, particularly the basal vein (Fig. 137). In contrast, the

type of *A. gallica* (and more broadly all examined specimens from southern France) has hyaline wings with almost uniformly golden veins (see illustrations in Le Divelec 2021).

Problems with the proposed two-species classification can most easily be seen in Iberia. In the Pyrenees, the light form is present (e.g., *A. gallica iberica*, Fig. 140), extending across the northern parts of Spain (Fig. 145) and down the Atlantic coast as far as the Algarve in southern Portugal. However, in central and southern Spain forms with dark infuscate wings can be found that show both light and dark veins in the same wing (Madrid, Fig. 146). In the Sierra Nevada (Granada, at 2100 m a.s.l., Fig. 147) and the Sistema Central (Ávila, 1300 m a.s.l., Fig. 148) forms with extremely dark wings and wing venation can also be found. This increased melanism is even more apparent in Morocco, where populations in the Atlas Mountains (*A. assimilis barnei*) are entirely dark, including all of their body hair.

Warncke treated *A. gallica* as a subspecies of *A. assimilis*, and in his distribution map (Gusenleitner & Schwarz 2002) he presented a clean picture of three separated populations: *A. assimilis* s. str. in the southern Balkans, Turkey, and the Caucasus; *A. assimilis gallica* in continental Europe and Russia; and *A. assimilis barnei* in Morocco. However, Warncke was inconsistent with his determination of material from this group, as specimens listed here from Azerbaijan, Iran, Kazakhstan, Kyrgyzstan, and Serbia with golden wing venation were determined as *A. assimilis* s. str. He also determined specimens from Spain as both *assimilis* s. str. and *assimilis gallica*, contradicting the clean picture presented in



Figs 145–148. *Andrena assimilis* Radoszkowski, 1876 from Spain. **145**. ♀ (OSCA), wing, detail (Setcases, Girona). **146**. ♀ (OSCA), wing, detail (Puerto de Somosierra, Madrid). **147**. ♀, on *Eryngium* sp. (Trevélez, Sierra Nevada, Granada). **148**. ♀, on *Rubus* sp. (Navacepeda de Tormes, Ávila).

his distribution map. Likewise, Osytshnjuk *et al*. (2008) argue that both *A. assimilis* and *A. gallica* are present from Eastern Europe eastwards, Western and Central Europe containing only *A. gallica*. The situation is reminiscent of the taxonomic confusion present in *Bombus* (*Thoracobombus*) concerning *B. laesus* Morawitz, 1875 and *B. mocsaryi* Kriechbaumer, 1877, which vary in hair colour and are present in sympatry across much of Eastern Europe. Though varying in their hair colour, these taxa were recently found to belong to the same broad taxon (Brasero *et al*. 2021).

Due to this extensive variation within *A. assimilis*, including in the type specimen itself, which does not unambiguously show uniformly dark wing venation, *A. gallica* is synonymised under *A. assimilis*. This includes the subspecies described by Bischoff (1922, Figs 139–144), which were previously synonymised under *A. assimilis gallica* by Warncke (1967) but were listed under *A. gallica* by Gusenleitner & Schwarz (2002).

Distribution

Andrena assimilis is distributed across the West and Central Palearctic, from Morocco (absent from the rest of North Africa and the Levant) across continental Europe to Turkey, northern Iran*****, Russia (European part to Eastern Siberia), and Central Asia (Gusenleitner & Schwarz 2002; Proshchalykin *et al*. 2017a). It is unclear why Warncke did not include the Soika and Mavromoustakis record from northern Iran in his distribution maps for this species, since he clearly examined and determined it.

16. *Andrena* (*Chlorandrena*) *astica* Warncke, 1967 *****

Material examined

IRAN • 1 ♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Ilam Province, Abda Man, Dinar Gaouh; 1830 m a.s.l.; 12 May 2016; M. Kafka leg.; OÖLM.

Literature records

Both Popov (1967) and Osytshnjuk *et al*. (2005) cite *A. taraxaci* Giraud, 1861 from Iran. The true *Andrena taraxaci* is distributed from Central Europe to Turkey and Russia, but many morphologically similar species including *A. astica* have different and overlapping distributions, and have been separated by subsequent authors (Schwenninger *et al*. 2015). It is not clear which taxon these previous authors may have been referring to.

Distribution

Greece, Turkey, Cyprus, Israel and the West Bank, Georgia, Iran***** (Schwenninger *et al*. 2015).

17. *Andrena* (*Melandrena*) *atrotegularis* Hedicke, 1923 *****

Material examined

IRAN • 1 ♀; West Azerbaijan Province, Serou, NW Orumiye; 1800 m a.s.l.; S. Kadlec leg.; OÖLM • 1 ♀; Kohgiluyeh and Boyer-Ahmad, Kuh Gol, near Sisakht; 2500 m a.s.l.; 9 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♀; Gilan, 5 km E of Rudbar; 400 m a.s.l.; 8 Jun. 2014; J. Halada leg.; OÖLM • 1 ♀; Tehran env.; 2 May 1999; K. Deneš leg.; OÖLM.

Distribution

Hungary, Romania, North Macedonia, Greece, Turkey, the Caucasus, Syria, Iran***** (Wood 2021b).

18. *Andrena* (*Notandrena*) *azerbaidshanica* Lebedev, 1932

Literature records

Allahverdi *et al*. (2016).

Distribution

Azerbaijan and Iran (Gusenleitner & Schwarz 2002; Allahverdi *et al*. 2016).

19. *Andrena* (*Micrandrena*) *biarmica* Warncke, 1975 *

Material examined

IRAN • 1 ♀; Fars Province, Dasht Arjan; 2040 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 2 ♀♀; Ilam Province, Abda Man, Dinar Gaouh; 1830 m a.s.l.; 12 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Ilam Province, Sar Joob; 1930 m a.s.l.; 13 May 2016; M. Kafka leg.; OÖLM • 2 ♀♀; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; 10 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Tehran env.; 2 May 1999; K. Deneš leg.; OÖLM • 3 ♀♀; Yasouj, Deli Bajak, Sepidar; 2181 m a.s.l.; 23 Apr. 2021; E. Rostami leg.; ICPI.

SYRIA • 1 ♂; Bloudan; 16 May 1995; K. Deneš leg.; OÖLM.

Distribution

Turkey, Syria*, Iran* (Gusenleitner & Schwarz 2002).

20. *Andrena* (*Euandrena*) *bicolor* Fabricius, 1775

Material examined

IRAN • 1 ♀; Fars Province, 10 km E of Kazerum; 1990 m a.s.l.; 23 May 2014; J. Halada leg.; OÖLM • 1 ♂, 1 ♀; Fars Province, Dasht Arjan; 2040 m a.s.l.; M. Kafka leg.; OÖLM • 1 ♀; Ilam Province, Abda Man, Dinar Gaouh; 1830 m a.s.l.; 12 May 2016; M. Kafka leg.; OÖLM.

Literature records

Morice (1921, as *A. gwynana* (Kirby, 1802)).

Remarks

The subgenus *Euandrena* is highly taxonomically challenging, and requires much work. The presence of *A. bicolor* in Iran should be confirmed by barcoding, as *A. bicolor* is both a variable species, and also a species complex that contains cryptic taxa. A deep revision is required.

Distribution

Probably West and Central Palearctic (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

21. *Andrena* (*Plastandrena*) *bimaculata aulica* Morawitz, 1876

Material examined

IRAN • 7 ♂♂, 21 ♀♀; Golestan, 70 km E of Minudasht; 1050 m a.s.l.; 12 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♂; Kerman Province, 8 km N of Bardsir; 2050 m a.s.l.; 6 Jun. 2010; Mi. Halada leg.; OÖLM • 9 ♀♀; Kerman Province, Deh Bakri, Gebal Barez Mts; 1640 m a.s.l.; 3 Jun. 2010; Mi. Halada leg.; OÖLM • 2 ♂♂, 1 ♀; Khorasan Province, 10 km W of Raz, Koppe Dag [Kopet Dag]; 1200 m a.s.l.; 27 May 2014; J. Halada leg.; OÖLM • 2 ♂♂; Yazd, Abarkooh, Faraghe; 1698 m a.s.l.; 6 Mar. 2021; S. San leg.; ICPI.

Literature records

Morice (1921, as *A. bimaculata* (Kirby, 1802)); Alfken (1935, as *A. bimaculata*); Khodaparast & Monfared (2012, as *A. aulica*).

Remarks

The taxonomic status of *A. bimaculata* and the many taxa that have been described and synonymised with it is highly complicated. Gusenleitner & Schwarz (2002) give an overview of this subject, but what is clear is that although a number of coloured female forms exist (e.g., *morawitzi* Thomson, 1872, *atrorubicata* Dours, 1872, *aulica*, *bluethgeni* Stoeckhert, 1930), the male genitalia associated with these forms are extremely similar, leading many authors to group taxa together into a broad *A. bimaculata*. This problem of morphological variability exists in many taxa found within the subgenus *Plastandrena*, and detailed molecular revision encompassing a wide geographic range is necessary to fully resolve their statuses.

Distribution

Unclear due to ongoing taxonomic confusion. *Andrena bimaculata* s. lat. is found throughout the West and Central Palearctic to Mongolia (Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

22. *Andrena* (*Aenandrena*) *bisulcata* Morawitz, 1877 *

Literature records

Centr. Alborz, Chalus valley, 4 km above Waliabadl; 1850 m a.s.l.; 7 Jun. 1966; D. Baker leg.; SEMC; via GBIF occurrence 784988719.

Material examined

IRAN • 1 ♂, 1 ♀; Elburz Mountains, 60 km E of Minudasht; 26 May 2007; O. Sauša leg.; OÖLM • 1 ♂; Mazandaran Prov., 10 km N of Gashar [Gachsar]; 2300–2700 m a.s.l.; 7 Jun. 2014; J. Halada leg.; OÖLM • 1 ♀; Kirmanschahad, 70 km SE of Shahabad; 1200 m a.s.l.; 11 May 1976; Holzschuh leg.; OÖLM.

Distribution

Italy and Austria eastwards to Turkey, the Caucasus, the Levant, Iran* (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2005; Wood *et al*. 2020a).

23. *Andrena* (*Aenandrena*) *bonasia* Warncke, 1969 *

Material examined

IRAN • 2 ♂♂; West Azerbaijan Province, Serou; 1650 m a.s.l.; 28 May 2010; Mi. Halada leg.; OÖLM • 1 ♀; Kohgiluyeh and Boyer-Ahmad Province, Kuh Gol, near Sisakht; 2500 m a.s.l.; 9 Jun. 2010; Mi. Halada leg.; OÖLM.

JORDAN • 1 ♂, 1 ♀; Ajlun, S of Anjara; 27 Apr. 2002; M. Snižek leg.; TJWC • 1 ♂, 2 ♀♀; North Shuna; 29 Apr. 1996; Ma. Halada leg.; OÖLM.

SYRIA • 1 ♀; 60 km S of Damascus, Khahab; 14 May 1996; Ma. Halada leg.; OÖLM • 1 ♀; Anata, 50 km SE of Suwayda; 20–21 May 1996; Mi. Halada leg.; OÖLM.

Distribution

Turkey, Israel and the West Bank, Jordan*, Syria*, Iran* (Gusenleitner & Schwarz 2002).

24. *Andrena* (*Euandrena*) *boustaniae* Wood sp. nov.

Distribution

Iran.

25. *Andrena* (*Cryptandrena*) *brumaniensis* Friese, 1899 *

Material examined

IRAN • 1 ♂; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM.

Distribution

Southern Europe to Turkey and the Near East, Iran* (Gusenleitner & Schwarz 2002).

26. *Andrena* (*Ulandrena*) *bulbosa* Wood sp. nov.

Distribution

Iran.

27. *Andrena* (*Graecandrena*) *butea* Warncke, 1965 *

Material examined

IRAN • 1 ♂; Fars Province, Komehr; 2380 m a.s.l.; 9 Jun. 2010; Mi. Halada leg.; OÖLM.

JORDAN • 1 ♀; 20 km N of Karak; 1000 m a.s.l.; 27 Apr. 2006; K. Deneš leg.; OÖLM • 1 ♂, 3 ♀♀; 20 km NW of Amman; 420 m a.s.l.; 5 May 2006; K. Deneš leg.; OÖLM • 1 ♀; 20 km SW of Madaba; 1–31 May 2006; F. Kantner leg.; OÖLM • 1 ♂; 20 km SW of Madaba; 26 May 2006; Z. Kejval leg.; OÖLM • 1 ♀; 30 km NW of Aljun; 600 m a.s.l.; 29 Apr. 2006; K. Deneš leg.; OÖLM • 62 ♂♂, 6 ♀♀; North Shuna; 29–30 Apr. 1996; Ma. Halada leg.; OÖLM.

SYRIA • 4 ♀♀; 30 km N of Dara, Nawa; 18 May 1996; Ma. Halada leg.; OÖLM • 1 ♀; Hasake [Al Hasakah]; 8 May 1996; Ma. Halada leg.; OÖLM.

Distribution

Turkey, Israel and the West Bank, Jordan*, Syria*, Armenia, Iran* (Gusenleitner & Schwarz 2002).

28. *Andrena* (*Ulandrena*) *cantiaca* Warncke, 1975 *

Material examined

ARMENIA • 1 ♂; Achtarak, near Mt. Arailer; 1–30 Jun. 2003; M. Můčka leg.; OÖLM.

IRAN • 1 ♀; Kohgiluyeh and Boyer-Ahmad Province, Kuh Gol, near Sisakht; 2500 m a.s.l.; 9 Jun 2010; Mi. Halada leg.; OÖLM • 1 ♂, 1 ♀; Fars Province, Dasht Arjan; 2040 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 4 ♀♀; Ilam Province, Abda Man, Dinar Gaouh; 1830 m a.s.l.; 12 May 2016; M. Kafka leg.; OÖLM.

Distribution

Greece, Turkey, Syria, Armenia*, Iran* (Gusenleitner & Schwarz 2002).

29. *Andrena* (*Ulandrena*) *caspica* Morawitz, 1886 *

Material examined

IRAN • 1 ♂, 3 ♀♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Ham [Ilam] Province, Sar Joob; 1930 m a.s.l.; 13 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Ilam Province, Abda Man, Dinar Gaouh; 1830 m a.s.l.; 12 May 2016; M. Kafka leg.; OÖLM • 2 ♀♀; Kohgiluyeh and Boyer, Ahmad Prov., Likak, Gach Bolland; 1640 m a.s.l.; 7 May 2016; M. Kafka leg.; OÖLM • 1 ♂; Kurdistan: Sonnate [Sonnat-e Olya]; 11 May 1976; Holzschuh leg.; OÖLM • 1 ♂, 7 ♀♀; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; 10 May 2016; M. Kafka leg.; OÖLM.

JORDAN • 2 ♀♀; 20 km S of North Shuna, Tall Al Arbatin; 19 Apr. 1996; Ma. Halada leg.; OÖLM • 1 ♂; Aljoun; 28 Apr. 2012; M. Kafka leg.; OÖLM.

SYRIA • 1 ♂; Latakia, Saladinburg [Citadel of Saladin]; 900 m a.s.l.; 4 Apr. 1988; L. Blank leg.; OÖLM • 1 ♂; Tartus, 10 km E of Safita; 300 m a.s.l.; 3 Apr. 1988; L. Blank leg; TJWC.

TURKEY • 1 ♂; Hakkâri, 10 km W of Uludere; 1000 m a.s.l.; 4 Jun. 1980; M. Schwarz leg.; OÖLM • 6 ♀♀; Uludere, Hakkâri; 1000 m a.s.l.; 16 Jun 1981; K. Warncke and M. Kraus leg.; OÖLM.

Literature records

Khodarahmi Ghahnavieh & Monfared (2019).

Remarks

Molecular revision of the *polita* group of *Ulandrena* is required, particularly the red-marked species that includes *A. caspica*, as additional cryptic taxa may be present.

Distribution

Unclear due to taxonomic confusion, but probably Greece, Turkey, Israel and the West Bank, Jordan*, Syria*, the Caucasus, Russia (European part, Derbent), Iran*.

30. *Andrena* (*Pallandrena*) *christineae* Dubitzky, 2006

Literature records

Dubitzky (2006).

Distribution

Golan Heights, Lebanon, Turkey, Iran (Dubitzky 2006; Wood *et al*. 2020a; Pisanty *et al*. 2022a).

31. *Andrena* (*Melandrena*) *cineraria* s. lat. (Linnaeus, 1758)

Literature records

Popov (1967); Ascher & Pickering (2021): Centr. Alborz, Karaj valley, Gach-e-Sar; 2150 m a.s.l.; 17–19 July 1965; D. Baker leg.; SEMC; via GBIF occurrence 686218276.

Remarks

The exact identity of this species in Iran is not clear, as previous authors have not distinguished between *A. barbareae* Panzer, 1805 and *A. danuvia* Stoeckhert, 1950. This was the case for Warncke, and his distribution maps include dots for *A. cineraria* in northern Iran (Gusenleitner & Schwarz 2002). In

Turkey, the only taxon is *A. danuvia* (Hazir *et al*. 2014; Scheuchl & Willner 2016), and this therefore may be the taxon present in Iran, but this cannot be verified without the inspection of specimens. Of the specimens collected by Baker, some were on the wing in July and are therefore clearly bivoltine, further suggesting that they are not *A. cineraria* in a narrow sense.

Distribution

In a broad sense, Palearctic (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

32. *Andrena* (*Chlorandrena*) *cinereophila* Warncke, 1965 *

Material examined

IRAN • 1 ♀; Fars Province, Dasht Arjan; 2040 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Ham [Ilam] Province, Sar Joob; 1930 m a.s.l.; 13 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Ilam Province, Abda Man, Dinar Gaouh; 1830 m a.s.l.; 12 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Lorestan Province, 10 km SW of Dorud; 1520 m a.s.l.; 20 May 2014; J. Halada leg.; OÖLM • 3 ♀♀; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; 10 May 2016; M. Kafka leg.; OÖLM.

JORDAN • 1 ♀; 15 km W of Jerash, Dibbin; 2 May 2006; K. Deneš leg.; OÖLM • 1 ♀; Aljoun; 6 May 2012; M. Kafka leg.; OÖLM • 1 ♀; Jerash, Dibbeen; 4 May 2012; M. Kafka leg.; OÖLM.

Distribution

Greece, North Macedonia, Romania, Bulgaria, Turkey, Cyprus, Russia (European part, Derbent), Israel and the West Bank, Jordan*, Iran*, Afghanistan (Warncke 1974c; Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2005).

33. *Andrena* (*Hoplandrena*) *clusia* Warncke, 1966

Material examined

IRAN • 2 ♀♀; Elburz, Ov Zanak-Ski, 1 km N of Ab Ali; 2300 m a.s.l.; 11 Jul. 1965; K. Warncke det.; G. Soika and G.A. Mavromoustakis leg.; OÖLM • 1 ♀; Elburz, Pulour [Polour], 22 km N of di Ab Ali; 13 Jul. 1965; K. Warncke det.; G. Soika and G.A. Mavromoustakis leg.; OÖLM • 1 ♀; Elburz, Stausee [Resevoir] W Karaj, 1700 m a.s.l.; K. Warncke det.; OÖLM.

Remarks

Label data of these specimens were never published, but dots are present in the distribution map for *A. clusia* drawn by Warncke (Gusenleitner & Schwarz 2002). This species is therefore not reported as new for Iran.

Distribution

North Macedonia, Turkey, Armenia, Azerbaijan, Iran, Turkmenistan, Uzbekistan (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

34. *Andrena* (*Brachyandrena*) *colletiformis* Morawitz, 1873

Material examined

IRAN • 1 ♂; Bakhtiyari Province, 20 km SE of Lordegan; 31 May 2014; J. Halada leg.; OÖLM • 1 ♂; Boyer-A. o. Kohg Prov., Kuh Gol, near Sisakht; 2500 m a.s.l.; 9 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♂; Lorestan Province, Tootmashour [Tut, Masur-e Abi]; 2000 m a.s.l.; 31 May 2010; Mi. Halada leg.;

OÖLM • 1 ♂; Mazandaran Prov., 10 km N of Gashar [Gachsar]; 2300–2700 m a.s.l.; 7 Jun. 2014; J. Halada leg.; OÖLM.

Literature records

Popov (1967); Osytshnjuk *et al*. (2005).

Distribution

Mediterranean basin to Central Asia (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2005).

35. *Andrena* (*Simandrena*) *combinata* (Christ, 1791)

Material examined

IRAN • 1 ♀; Elburz Mountains, 60 km E of Minudasht; 26 May 2007; O. Sauša leg.; OÖLM • 1 ♂; Tehran Province, 6 km N of Gačsar [Gachsar]; 29 May–2 Jun. 2002; J. Prochazka leg.; OÖLM.

Literature records

Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

Palearctic (Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

36. *Andrena* (*Truncandrena*) *combusta* Morawitz, 1876

Andrena (*Truncandrena*) *oulskii rubicunda* Warncke, 1975: 42 (♀, Turkey, Yeşilhisar).

Other material

SYRIA • 1 ♂, 1 ♀; Aleppo, 500 m, Simeons-Kloster; 19 Apr. 1988; L. Blank leg.; OÖLM.

Literature records

Khodaparast & Monfared (2012).

Remarks

See Pisanty *et al.* (2022a) for discussion of similar species.

Distribution

Syria*, Turkey, Azerbaijan, Iran, Afghanistan, Tajikistan (Schuberth *et al*. 2001; Wood 2021b).

37. *Andrena* (*Nobandrena*) *comptaeformis* Gusenleitner & Schwarz, 2000

Literature records

Gusenleitner & Schwarz (2000, paratype female).

Distribution

Turkey and Iran (Gusenleitner & Schwarz 2000).

38. *Andrena* (*Cordandrena*) *cordialis* Morawitz, 1877

Literature records

Khodarahmi Ghahnavieh & Monfared (2019).

Material examined

IRAN • 1 ♂; West Azerbaijan, Bazargan; 1380 m a.s.l.; 11 May 1978; M. Kraus leg.; OÖLM.

Distribution

Eastern Europe through Turkey and the Caucasus to Central Asia (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2005).

39. *Andrena* (incertae sedis) *coromanda* Warncke, 1975 *

Material examined

IRAN • 1 ♂; Yasouj, Abshar; 2 Mar. 2011; H. Elahi and M. Mesavian leg.; ICPI.

Distribution

Turkey and Iran* (Gusenleitner & Schwarz 2002).

40. *Andrena* (*Poecilandrena*) *crassana* Warncke, 1965 *

Material examined

CYPRUS • 1 ♀; Kykkos; 800 m a.s.l.; 11 May 2014; M. Kafka leg.; OÖLM.

IRAN • 7 ♀♀; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; 10 May 2016; M. Kafka leg.; OÖLM.

JORDAN • 1 ♀; 10 km W of Jarash; 1 May 1996; Ma. Halada leg.; OÖLM • 2 ♀♀; 30 km NW of Aljun; 600 m a.s.l.; 29 Apr. 2006; K. Deneš leg.; OÖLM • 2 ♀♀; Jarash env.; 1 May 1996; Ma. Halada leg.; OÖLM • 1 ♀; N. Shuna env.; 30 Apr. 1996; Mi. Halada leg.; OÖLM • 1 ♀; North Shuna; 20–22 Apr. 1996; Ma. Halada leg.; OÖLM.

Distribution

North Macedonia, Greece, Turkey, Cyprus*, Israel and the West Bank, Jordan *, Syria, Iran* (Gusenleitner & Schwarz 2002; Pisanty *et al*. 2018).

41. *Andrena* (incertae sedis) *curiosa* (Morawitz, 1877) *

Literature records

IRAN • 1 ♂; Mazanderan Province, Kujur, 2 km SE of Hassanabad; 500 m a.s.l.; 29 Apr. 1967; D. Baker leg.; SEMC; via GBIF occurrence 784990468.

Material examined

IRAN • 16 ♂♂; Tehran Province, 6 km N of Gačsar [Gachsar]; 29 May–2 Jun. 2002; J. Prochazka leg.; OÖLM.

Distribution

Turkey, Israel and the West Bank, Syria, Russia (European part), Armenia, Iran* (Gusenleitner & Schwarz 2002).

42. *Andrena* (*Melandrena*) *cussariensis* Morawitz, 1886

Material examined

IRAN • 1 ♀; Kameran val., Kameran vil.; 7 Jun. 2013; V. Major leg.; OÖLM • 1 ♀; Tehran env.; 2 May 1999; K. Deneš leg.; OÖLM.

Literature records

Osytshnjuk *et al*. (2008).

Distribution

Crimea, Russia (European part, Urals), Turkey, the Caucasus, Iran, Central Asia, Mongolia (Osytshnjuk *et al*. 2008; Proshchalykin *et al*. 2017a).

43. *Andrena* (*Cordandrena*) *cypria* Pittioni, 1950

Material examined

IRAN • 1 ♂; Ali Sadr; 14 May 1999; K. Deneš leg.; OÖLM • 1 ♀; Lorestan Province, Dorud Lanjaban env.; 670 m a.s.l.; 11 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Tehran Province, 6 km N of Gačsar [Gachsar]; 29 May–2 Jun. 2002; J. Prochazka leg.; OÖLM • 1 ♂; Luristan [Lorestan], 30 km SE of Khoramabad; 2000 m a.s.l.; 17 May 1976; C. Holzschuh leg.; OÖLM • 1 ♂; Luristan [Lorestan], 50 km SE of Khoramabad; 1700 m a.s.l.; 13–15 May 1976; C. Holzschuh leg.; OÖLM • 1 ♀; Tehran, NW Qazvin; 1500 m a.s.l.; 19 May 1976; C. Holzschuh leg.; OÖLM.

JORDAN • 8 ♀♀; 20 km N of Karak; 1000 m a.s.l.; 27 Apr. 2006; K. Deneš leg.; OÖLM • 1 ♀; North Shuna env.; 29–30 Apr. 1996; Mi. Halada leg.; OÖLM • 1 ♀; S of At Tafila; 27 Mar. 2013; M. Snižek leg.; OÖLM.

SYRIA • 1 ♀; 10 km SE of Suwayda, Kafr; 19 May 1996; Mi. Halada leg.; OÖLM • 3 ♂♂, 10 ♀♀; Hasake [Al Hasakah]; 8 May 1996; Ma. Halada leg.; OÖLM • 18 ♀♀; Salkhad env.; 6 May 1996; Mi. Halada leg.; OÖLM.

Literature records

Khodaparast & Monfared (2012); Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

Turkey, Cyprus, Israel and the West Bank, Jordan*, Syria*, Iran (Gusenleitner & Schwarz 2002).

44. *Andrena* (*Ulandrena*) *dauma* Warncke, 1969 *

Material examined

IRAN • 1 ♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 4 May 2016; M. Kafka leg.; OÖLM • 2 ♀♀; Ham [Ilam] Province, Sar Joob; 1930 m a.s.l.; 13 May 2016; M. Kafka leg.; OÖLM • 2 ♀♀; Ilam Province, Abda Man, Dinar Gaouh; 1830 m a.s.l.; 12 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Lorestan Province, 10 km SW of Dorud; 1520 m a.s.l.; 20 May 2014; J. Halada leg.; OÖLM • 1 ♂, 2 ♀♀; Lorestan Province, Dorud Lanjaban env.; 670 m a.s.l.;

11 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; 10 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Kurdistan, 20 km N of Samandaj; 1500 m a.s.l.; 11 May 1976; Holzschuh leg.; OÖLM.

Distribution

Turkey, Israel and the West Bank, Lebanon, Jordan, Syria, Iran* (Gusenleitner & Schwarz 2002; Wood *et al*. 2020a).

45. *Andrena* (*Holandrena*) *decipiens* Schenck, 1861

Material examined

IRAN • 1 ♀; Nafch, Share kord [Chaharmahal and Bakhtiari]; 2 Aug. 2016; S. Nazari leg.; ICPI.

TAJIKISTAN • 1 ♀; Dusambe [Dushanbe] env.; 14 Jun. 1966; K. Deneš leg.; OÖLM.

UZBEKISTAN • 2 ♀♀; 35 km S of Sammarkand, Aman Kutan; 39.312° N, 66.947° E; 30 Jun. 1981; M. Kocourek leg.; OÖLM • 11 ♀♀; same collection data as for preceding; MSC.

Literature records

Osytshnjuk *et al*. (2008).

Distribution

Not completely clear because of the recent separation of *A. flavilabris* Schenck, 1874 (see Manderey *et al*. 2008). Probably broadly West Palearctic, excluding desert regions (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008), Iran, Tajikistan*, Uzbekistan*. Cited from "Central Asia" by Schönitzer *et al*. (1995) but without details.

46. *Andrena* (*Aciandrena*) *deminuta* Wood sp. nov.

Distribution

Iran.

47. *Andrena* (*Parandrenella*) *dentiventris* Morawitz, 1873

Material examined

IRAN • 1 ♀; Kašan [Kashan]; 3 May 1999; K. Deneš leg.; TJWC • 1 ♂; Yazd, Khezr abad Zorband; 1844 m a.s.l.; 21 Mar. 2021; S. San leg.; ICPI.

Literature records

Popov (1967).

Distribution

Turkey, Russia (European part), the Caucasus, Iran, Kazakhstan (Gusenleitner & Schwarz 2002; Proshchalykin *et al*. 2017a).

48. *Andrena* (*Truncandrena*) *derbentina* Morawitz, 1886

Literature records

Allahverdi *et al*. (2016); Ascher & Pickering (2021): Mazandaran, Kujur, 2 km SE of Hassanabad; 500 m a.s.l.; 30 Mar. 1966; D. Baker leg.; SEMC; via GBIF occurrence 784990193.

Distribution

Unclear because of confusion with *A. mizorhina* Warncke, 1975 which is found in the Levant (Pisanty *et al*. 2022a). Probably restricted to Turkey, the Caucasus, Russia (European part), Iran.

49. *Andrena* (*Simandrena*) *dorsata* (Kirby, 1802)

Material examined

IRAN • 1 ♂; Mazandaran Province, Kojuk; 36°23 N, 51°40 E; 7 Jun. 2014; J. Halada leg.; OÖLM • 1 ♂; Mazdaran Province, 10 km S of Chaloos [Chalus]; 380 m a.s.l.; 15 Jun. 2010; Mi. Halada leg.; OÖLM.

Literature records

Morice (1921); Alfken (1935); Ghahnavieh and Monfared (2019).

Distribution

Unclear because of historical confusion with *A. propinqua* Schenck, 1853, but probably from Europe to Central Asia (Gusenleitner & Schwarz 2002).

50. *Andrena* (*Melandrena*) *dubiosa* Kohl, 1905

Literature records

Osytshnjuk *et al*. (2008).

Distribution

Greece, Syria, Turkey, Iran (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

51. *Andrena* (*Poecilandrena*) *efeana* Scheuchl & Hazir, 2012 *

Material examined

IRAN • 1 ♀; Tehran Province, Samgh Abad; 1900 m a.s.l.; 16 May 2016; M. Kafka leg.; OÖLM.

Distribution

Turkey and Iran* (Scheuchl & Hazir 2012).

52. *Andrena* (*Micrandrena*) *elam* Wood sp. nov.

Distribution

Iran.

53. *Andrena* (*Lepidandrena*) *elisaria* Gusenleitner, 1998 *

Material examined

IRAN • 1 ♂; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM.

Remarks

Confusion exists between this taxon and *A. statusa* Gusenleitner, 1998, which may be conspecific (see Pisanty *et al*. 2018). Further study is required.

Distribution

Israel, Turkey and Iran* (Gusenleitner 1998; Pisanty *et al*. 2018).

54. *Andrena* (*Melandrena*) *elmaria* Gusenleitner, 1998

Literature records

Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

Turkey, Cyprus, Israel and the West Bank, Lebanon, Syria, Iran (Gusenleitner & Schwarz 2002; Wood *et al*. 2020a).

55. *Andrena* (*Notandrena*) *emesiana* Pérez, 1911 stat. resurr. *

Andrena (*Notandrena*) *emesiana* Pérez, 1911: 41 (♀, Syria, Homs).
Andrena (*Notandrena*) *recurvirostra* Warncke, 1975: 90 (♀, Turkey, Beyşehir). **Syn. nov.**

Material examined

Lectotype

SYRIA • ♀ (of lectotype of *Andrena emesiana*); Homs; MNHN (illustrated Figs 149–152).

Holotype

TURKEY • ♀ (holotype of *Andrena recurvirostra*); Beyşehir; 4 Jun. 1964; J. Gusenleitner leg.; OÖLM.

Figs 149–152. *Andrena emesiana* Pérez, 1911, ♀, lectotype (MNHN). **149**. Labels, detail. **150**. Profile. **151**. Face. **152**. Terga.

Other material

IRAN • 1 ♀; Lorestan Province, Tootmashour [Tut, Masur-e Abi]; 2000 m a.s.l.; 31 May 2010; Mi. Halada leg.; OÖLM.

SYRIA • 1 ♀; Salkhad env.; 6 May 1996; Mi. Halada leg.; OÖLM.

TURKEY • 1 ♂; Mus Dağı; 1 Jun. 1932; M.D. leg.; OÖLM.

Remarks

Warncke (1967) synonymised *A. emesiana* with *A. erythrocnemis* Morawitz, 1871 auct. (=*A. griseobalteata* Dours, 1872, see Gusenleitner & Schwarz 2002; Proshchalykin *et al*. 2017b; Le Divelec 2021). As is typical of Pérez's writing, the description itself is unhelpful, and does not allow diagnosis. Inspection of the female lectotype in Paris (designated by Warncke in 1967, though automatically the holotype since the taxon was described from a single specimen) shows that it is not a synonym of *A. griseobalteata*, as the body size is too small, the scutum is less densely punctate, the tarsi are orange, and the first tergum is extremely finely and densely punctate (Figs 150–152). It is instead the senior synonym of *A. recurvirostra*, which was later described from Turkey (Warncke 1975). Unification under the name *A. emesiana* clarifies this situation, and means that *A. griseobalteata* has never been recorded from the Levant, as mentioned by Grace (2010, as *A. erythrocnemis*), this mention probably deriving from Warncke's incorrect synonymisation. Note, the name is misspelled on one of the specimen labels as '*emesiensis*' (Fig. 149); the correct spelling is *emesiana* (Pérez 1911).

Distribution

Turkey*, Syria, Iran*.

56. *Andrena* (*Micrandrena*) *enslinella* Stoeckhert, 1924

Literature records

Ascher & Pickering (2021): Centr. Alborz, Kandavan Pass, 8 km above Siahbishe; 2400 m a.s.l.; 7 Jun. 1966; D. Baker leg.; SEMC; via GBIF occurrence 686218963.

Remarks

The presence of *A. enslinella* in Iran was indicated by the distribution maps of Warncke (Gusenleitner & Schwarz 2002), so it is not treated as new for the country.

Distribution

Central Europe eastwards to Russia (European part, Urals, Western Siberia), Turkey, the Caucasus, Iran (Gusenleitner & Schwarz 2002; Proshchalykin *et al*. 2017a).

57. *Andrena* (*Campylogaster*) *erberi* Morawitz, 1871

Material examined

IRAN • 1 ♂; East Azerbaijan Province, Sis, 10 km E of Shabestar; 1540 m a.s.l.; 19 Jun. 2010; Mi. Halada leg.; OÖLM.

Literature records

Popov (1967); Osytshnjuk *et al*. (2008).

Distribution

Greece, North Macedonia, Romania, Ukraine, Bulgaria, Egypt, Turkey, the Caucasus, Iran (Gusenleitner & Schwarz 2002).

58. *Andrena* (incertae sedis) *eremobia* Guiglia, 1933

Material examined

IRAN • 1 ♀; Khuzistan, Shadegan; 15 Feb. 1956; K. Warncke det.; R. Schäuffele leg.; OÖLM.

Remarks

The distribution maps of Warncke included a dot in northern Iran, but not a dot in southern Iran from this specimen, which is nonetheless part of the Warncke collection. No other specimens from Iran could be located in his collection.

Distribution

Tunisia, Libya, Egypt, Israel and the West Bank, Iran (Gusenleitner & Schwarz 2002).

59. *Andrena* (incertae sedis) *euzona* Pérez, 1895

Material examined

IRAN • 1 ♀; Shah Abas Kabir; 8 May 1972; K. Warncke det.; Bytinski-Salz leg.; OÖLM.

IRAQ • 1 ♂, 3 ♀♀; Baghdad; 15 Feb. 1963; Seipka leg.; OÖLM.

SYRIA • 1 ♂, 3 ♀♀; Palmyra; 400 m a.s.l.; 10 Apr. 1986; K.M. Guichard leg.; NHMUK • 3 ♀♀; 80 km E of Palmyra; 22 Apr. 1992; K. Warncke leg.; OÖLM.

Remarks

This taxon is possibly synonymous with *A. splendidicollis* Morawitz, 1894, which is found in Central Asia (Osytshnjuk *et al.* 2005). Type revision is needed. Molecular analysis shows that *A. euzona* belongs to a currently undescribed subgenus, and not to the former subgenus *Carandrena* (=*Notandrena*, Pisanty *et al*. 2022b). The distribution maps of Warncke (Gusenleitner & Schwarz 2002) indicate the presence of *A. euzona* in Iran, so this taxon is not considered newly recorded here.

Distribution

Morocco, Algeria, Tunisia, Libya, Egypt, Israel and the West Bank, Jordan, Syria*****, Iraq*****, Iran (Gusenleitner & Schwarz 2002).

60. *Andrena* (*Plastandrena*) *eversmanni* Radoszkowski, 1867

Andrena (*Plastandrena*) *eversmanni* Radoszkowski, 1867: 74 (♀♂, Central Asia).
Andrena (*Plastandrena*) *peshinica* Nurse, 1904: 559 (♀, Pakistan, Quetta). **Syn. nov.**
Andrena (*Plastandrena*) *eversmanni ciscaspica* Popov, 1949: 390 (♀♂, Caucasus).

Material examined

Syntype

PAKISTAN • ♀ (syntype of *Andrena peshinica*); Quetta; 1–30 Jun. 1902; C.G. Nurse leg.; NHMUK (illustrated Figs 153–156).

Other material

IRAN • 3 ♂♂; Kerman Province, 20 km E of Ghobira; 1780 m a.s.l.; 5 Jun. 2010; Mi. Halada leg.; OÖLM • 2 ♂♂; Kerman Province, 8 km N of Bardsir; 2050 m a.s.l.; 6 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♂; Kerman Province, Deh Bakri, Gebal Barez Mts; 1640 m a.s.l.; 3 Jun. 2010; Mi. Halada leg.; OÖLM •

1 ♂, 1 ♀; Kerman Province, Serač [Sirch]; 2 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♀; Kerman, Ravar, garden of Davarpanah; 1164 m a.s.l.; 9 May 2011; A. Polaszek leg.; NHMUK • 2 ♂♂, 1 ♀; Persepolis env.; 9 May 1999; K. Deneš leg.; OÖLM • 1 ♂, 3 ♀♀; Yazd, Hanza, Hosseinie; 1837 m a.s.l.; 3 Jul. 2020; S. San leg.; ICPI.

IRAQ • 1 ♂, 1 ♀; Abu Ghuraib [Abu Ghraib]; 5–16 May 1945; H.A. Hamid leg.; OÖLM.

KAZAKHSTAN • 1 ♂, 2 ♀♀; Baigakum [Baygekum] bei Djulek Turkest; MNHN.

Literature records

Popov (1949); Ghahnavieh & Monfared (2019, as *A. ciscaspica*).

Remarks

Though the specimen of *A. peshinica* in the NHMUK is marked as a type, it is strictly a syntype, as Nurse never designated a type, and no subsequent authors have redescribed this taxon or designated a lectotype. Gusenleitner & Schwarz (2001) noted that this taxon is extremely close to *A. eversmanni* based on personal correspondence from Warncke and, as suspected by Popov (1949), *A. peshinica* is indeed synonymous with *A. eversmanni*. Examination of the syntype shows the same small body size, squamous hairs on the scutum, thick tergal hairbands, and light terminal fringe (Figs 153–156).

Figs 153–156. *Andrena peshinica* Nurse, 1904, ♀, syntype (NHMUK). **153**. Label information. **154**. Profile. **155**. Dorsum. **156**. Terga.

The justification given by Nurse (1904) that it differed from *A. eversmanni* because of the red-coloured tergal segments is insufficient, as *A. eversmanni* often has red coloured terga in other parts of its range, for example in Iran where all examined specimens were at least partially red-marked, and in Kazakhstan where one examined female had red-marked terga, the other with black-marked terga. Note, the name is misspelled on the syntype label as '*pishinica*'; the correct spelling is *peshinica* (Nurse 1904).

Distribution

Turkey, Armenia, Iran, Iraq*, Russia (European part), Turkmenistan, Uzbekistan, Kazakhstan, Tajikistan, Pakistan*, Mongolia, China (Popov 1949; Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

61. *Andrena* (*Chlorandrena*) *exquisita* Warncke, 1975 *

Material examined

CYPRUS • 2 ♀♀; Kykkos; 800 m a.s.l.; 11 May 2014; M. Kafka leg.; OÖLM.

IRAN • 1 ♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Ham [Ilam] Province, Sar Joob; 1930 m a.s.l.; 13 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Lorestan Province, Dorud Lanjaban env.; 670 m a.s.l.; M. Kafka leg.; OÖLM.

Remarks

Also newly reported from Cyprus, the range of this taxon has expanded substantially eastwards following recent revisions.

Distribution

Bulgaria, Cyprus*, Turkey, Lebanon, Syria, Israel and the West Bank, Jordan, Iran* (Gusenleitner & Schwarz 2002; Pisanty *et al*. 2018; Wood *et al*. 2020a).

62. *Andrena* (*Micrandrena*) *extenuata* sp. nov.

Distribution

Syria and Iran.

63. *Andrena* (*Notandrena*) *falcinella* Warncke, 1969

Material examined

CYPRUS • 4 ♂♂, 2 ♀♀; 23 Feb.–10 Mar. 2017; A. Varnava leg.; AVC • 22 ♂♂, 15 ♀♀; Limassol, Yermasoyia Dam; 7 Mar. 2017; AVC.

Literature records

Khodaparast & Monfared (2012).

Distribution

Turkey, Cyprus*, Israel and the West Bank, Iran (Gusenleitner & Schwarz 2002).

64. *Andrena* (*Plastandrena*) *ferghanica* Morawitz, 1876

Literature records

Popov (1967); Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

Iran, Turkmenistan, Uzbekistan (Ascher & Pickering 2021).

65. *Andrena* (*Hoplandrena*) *ferox* Smith, 1847

Literature records

Allahverdi *et al*. (2016); Scheuchl & Willner (2016).

Distribution

Europe to Turkey, Syria, Jordan, Iran (Gusenleitner & Schwarz 2002; Scheuchl & Willner 2016).

66. *Andrena* (*Parandrenella*) *figurata* Morawitz, 1866

Literature records

Ascher & Pickering (2021).

Remarks

The distribution maps of Warncke (Gusenleitner & Schwarz 2002) may indicate the presence of *A. figurata* in northern Iran. It is unclear whether the Ascher & Pickering (2021) listing is based on this source. As *A. figurata* is known from eastern Turkey and the Caucasus it is included in the Iranian fauna.

Distribution

Italy eastwards to Russia (European part, Urals), south to Turkey, Cyprus, Iran (Gusenleitner & Schwarz 2002; Proshchalykin *et al*. 2017a).

67. *Andrena* (*Planiandrena*) *flagrans* Wood sp. nov.

Distribution

Iran.

68. *Andrena* (*Melandrena*) *flavipes* Panzer, 1799

Literature records

Morice (1921); Alfken (1935); Khodaparast & Monfared (2012); Allahverdi *et al*. (2016).

Remarks

Andrena flavipes is the most common Iranian *Andrena*, with 169 female and 201 male specimens examined during this revision from across Iran. In the interests of brevity, these are not detailed here.

Distribution

West Palearctic to Central Asia, China, India (Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

69. *Andrena* (incertae sedis) *florea* Fabricius, 1793

Literature records

Aliyev *et al*. (2017).

Remarks

Aliyev *et al*. (2017) report *A. florea* from Iran with no precise details. The distribution maps of Warncke (Gusenleitner & Schwarz 2002) indicate that *A. florea* is present in Iran. However, no specimens

demonstrating this could be found in the Warncke collection. Because of the presence of this species in eastern Turkey and its ease of identification, we consider *A. florea* to be present in Iran, though this should be positively confirmed with specimens.

Distribution

West Palearctic (Gusenleitner & Schwarz 2002).

70. *Andrena* (*Micrandrena*) *floricola* Eversmann, 1852

Material examined

IRAN • 2 ♀♀; Kurdistan Province, Paniran; 1450 m a.s.l.; 14 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; 10 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Pass SW Chalus-Karaj/Mazandaran; 2470 m a.s.l.; 28 May 1978; M. Kraus leg.; OÖLM.

Literature records

Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

West Palearctic (Gusenleitner & Schwarz 2002).

71. *Andrena* (*Lepidandrena*) *florivaga* Eversmann, 1852

Literature records

Ascher & Pickering (2021): Mazandaran, Kalar, Sardabrud 3–5 km above Rudbarak; 1500 m a.s.l.; 14 May 1966; D. Baker leg.; SEMC; via GBIF occurrence 658462868.

Distribution

Germany eastwards to Russia (European part, Urals, Western Siberia), Turkey, the Caucasus, Kazakhstan (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

72. *Andrena* (*Holandrena*) *forsterella* Osytshnjuk, 1978

Literature records

Allahverdi *et al*. (2016); Ascher & Pickering (2021): 15 km N of Gazvin; 19 Jul. 1975; K. Warncke det.; P.F. Torchio leg.; SEMC; via GBIF occurrence 658366176.

Distribution

Slightly unclear because of confusion between *A. forsterella* and *A. wilhelmi* Schuberth, 1995 (see Schönitzer *et al*. 1995), but probably found from Italy, through the Balkans, to Turkey, Lebanon, Israel, Iran (Schönitzer *et al*. 1995; Wood *et al*. 2020a; Pisanty *et al*. 2022a).

73. *Andrena* (*Chrysandrena*) *fulvago* (Christ, 1791) *

Material examined

IRAN • 16 ♀♀; Mazandarn Province, 15 km S of Alamdeh; 7 Jun. 2014; J. Halada leg.; OÖLM.

Distribution

West Palearctic (Gusenleitner & Schwarz 2002), including Iran.

74. *Andrena* (*Notandrena*) *fulvicornis* Schenck, 1853

Material examined

IRAN • 1 ♀; Gilan, 5 km E of Rudbar; 400 m a.s.l.; 8 Jun. 2014; J. Halada leg.; OÖLM • 1 ♂, 2 ♀♀; Kašan [Kashan]; 3 May 1999; K. Deneš leg.; OÖLM • 1 ♂; Mazandaran Province, 20 km S of Amol; 640 m a.s.l.; 6 Jun. 2014; J. Halada leg.; OÖLM • 1 ♂; Mazandaran, 20 km S of Nowshahr, Weysser [Veysar]; 1400 m a.s.l.; 9–14 Jun. 1977; C. Holzschuh and F. Ressl leg.; OÖLM.

Literature records

Morice (1921, as *A. lucens* Imhoff, 1868); Khodarahmi Ghahnavieh & Monfared (2019).

Remarks

Though Morice reported specimens from Iran as *A. lucens*, a synonym of *A. nitidiuscula*, we consider them to be *A. fulvicornis* because they were collected in February. *Andrena nitidiuscula* is strictly univoltine, flying in the summer, whereas *A. fulvicornis* is bivoltine, flying in the spring and the summer (Schmid-Egger & Doczkal 1995).

Distribution

Unclear because of the historical synonymy by Warncke with *A. nitidiuscula* Schenck, 1853 (see Schmid-Egger & Doczkal 1995; Gusenleitner & Schwarz 2002). *Andrena fulvicornis* has a more southerly distribution in hotter and more Mediterranean areas, and is found across the Mediterranean basin to the Middle East (Wood *et al*. 2020b).

75. *Andrena* (*Ulandrena*) *fulvitarsis* Brullé, 1832 *

Material examined

IRAN • 1 ♀; Fars Province, Dasht Arjan; 2040 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Kurdistan Province, Paniran; 1450 m a.s.l.; 14 May 2016; M. Kafka leg.; OÖLM.

Distribution

Italy, Slovenia, Croatia, Albania, North Macedonia, Greece, Bulgaria, Ukraine, Turkey, Israel and the West Bank, Lebanon, Jordan, Iran* (Gusenleitner & Schwarz 2002; Wood *et al*. 2020a).

76. *Andrena* (*Melandrena*) *fuscocalcarata* Morawitz, 1877 *

Material examined

IRAN • 1 ♀; Elburz, Chur [Khur]; 2400 m a.s.l.; 7–12 Jun. 2005; V. Major leg.; OÖLM.

Distribution

Turkey, Israel, Armenia, Azerbaijan, Iran* (Osytshnjuk *et al*. 2008; Pisanty *et al*. 2018).

77. *Andrena* (*Melanapis*) *fuscosa* Erichson, 1835

Material examined

IRAN • 1 ♂; West Azerbaijan Province, Serou; 1650 m a.s.l.; 28 May 2010; Mi. Halada leg.; OÖLM • 1 ♂; Fars Province, Dast Arjan; 2040 m a.s.l.; 6 May 2016; M. Kafka leg.; OÖLM • 1 ♂; Gilan Province, 15 km SE of Tutkabon; 1100 m a.s.l.; 9 Jun. 2014; J. Halada leg.; OÖLM • 1 ♂; Kerman Prov., 25 km E of Jiroft (Mijan); 1650 m a.s.l.; 27 May 2014; J. Halada leg.; OÖLM • 1 ♀; Kerman Prov., Jupar [Joupar]; 1900 m a.s.l.; 1 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♂; Kerman Province, 20 km E of

Ghobira; 1780 m a.s.l.; 5 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♀; Kerman Province, Deh Bakri, Gebal Barez Mts; 1640 m a.s.l.; 3 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♀; Kerman Province, Kūh-e Madvār; 3 Jun. 2008; V. Major leg.; OÖLM • 6 ♂♂, 1 ♀; Mazdaran Province, 10 km S of Chaloos [Chalus]; 380 m a.s.l.; 15 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♀; Sahne env. [Sahneh]; 13 May 1999; K. Deneš leg.; OÖLM • 1 ♀; Shiraz-Yasouj road (15 km to Yasouj); 20 May 2011; A. Monfared leg.; ICPI • 1 ♀; Yasouj, Gachsaran Shadega; 26 May 2009; A. Monfared leg.; ICPI.

Literature records

Popov (1967); Khodaparast & Monfared (2012); Allahverdi *et al*. (2016); Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

West and Central Palearctic to India (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

78. *Andrena* (incertae sedis) *garrula* Warncke, 1965 *

Material examined

IRAN • 1 ♀; Kurdistan Province, Paniran; 1450 m a.s.l.; 14 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Lorestan Province, Dorud Lanjaban env.; 670 m a.s.l.; 11 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; 10 May 2016; M. Kafka leg.; OÖLM.

Distribution

Bulgaria, Turkey, Israel and the West Bank, Lebanon, Jordan, Syria, Iran* (Gusenleitner & Schwarz 2002; Wood *et al*. 2020a; Wood 2021b).

79. *Andrena* (*Simandrena*) *gasparella* Patiny, 1998

Literature records

Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

Turkey and Iran (Gusenleitner & Schwarz 2002; Khodarahmi Ghahnavieh & Monfared 2019).

80. *Andrena* (*Melandrena*) *gazella* Friese, 1922

Material examined

IRAN • 1 ♂; Fars Province, Dast Arjan; 2040 m a.s.l.; 6 May 2016; M. Kafka leg.; OÖLM • 1 ♀; 20 km W of Neyriz/Fars Steppe; 1550 m a.s.l.; 18 May 1978; K. Warncke leg.; K. Warncke det.; OÖLM.

JORDAN • 1 ♀; 20 km N of Karak; 1000 m a.s.l.; 27 Apr. 2006; K. Deneš leg.; OÖLM • 1 ♀; Al Karak env. [Kerak]; 16 Apr. 2002; M. Snižek leg.; OÖLM • 1 ♀; Aljoun; 6 May 2012; M. Kafka leg.; OÖLM • 3 ♂♂; Petra [Wadi Musa]; 14 May 1995; K. Deneš leg.; OÖLM.

Literature records

Khodaparast & Monfared (2012); Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

Egypt, Israel and the West Bank, Jordan*, Syria, Turkey, Iran (Gusenleitner & Schwarz 2002).

81. *Andrena* (*Melandrena*) *grandilabris* Pérez, 1903 *

Material examined

Holotype

TURKEY • ♀; Mardin; MNHN.

Other material

IRAN • 2 ♀♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; 10 May 2016; M. Kafka leg.; OÖLM • 2 ♂♂; Yasouj, Abshar; 2 Mar. 2011; H. Elahi & M. Mesavian leg.; ICPI • 1 ♂; Yasouj, Khakalan; 6 Jun. 2011; A. Monfared leg.; ICPI • 1 ♂; Yasouj, Tange Tamoradi; 2247 m a.s.l.; 9 Mar. 2021; E. Rostami leg.; ICPI • 1 ♀; Yasouj, Vezg. [Kūh-e Vezg] Khakalan; 12 Jun. 2011; S. Hossein Zade leg.; ICPI.

TURKEY • 3 ♀♀; Tanin-Tanin-Pass [Şırnak Province]; 1900 m a.s.l.; 3 Jun. 1980; K. Warncke det.; K. Warncke leg.; OÖLM • 1 ♀; Uludere, Hakkâri; 5 Apr. 1977; K. Warncke det.; K. Warncke leg.; OÖLM.

Distribution

Unclear, due to confusion with *A. elmaria* (see Gusenleitner 1998). Probably only confirmed from eastern Turkey and Iran*****. Records from Israel and the West Bank (Warncke 1969) are *A. elmaria* (Pisanty *et al*. 2022a); records from Cyprus (Varnava *et al*. 2020) are probably all referable to *A. elmaria*. Inspection of material previously assigned to these two species is necessary to clarify exact ranges.

82. *Andrena* (*Melandrena*) *gussakovskii* Lebedev, 1932

Literature records

Popov (1967); Osytshnjuk *et al*. (2008).

Remarks

The taxonomic status of *A. gussakovskii* requires investigation; as noted by Gusenleitner & Schwarz (2002) it is very similar to *A. marmora* Nurse, 1904*,* which was described from Pakistan and is found also in Israel and the West Bank (Warncke 1969). The two taxa may be conspecific.

Distribution

Iran, Central Asia, Russia (Western Siberia) (Osytshnjuk *et al*. 2008; Proshchalykin *et al*. 2017a).

83. *Andrena* (*Trachandrena*) *haemorrhoa* (Fabricius, 1781)

Literature records

Alfken (1935); Khodarahmi Ghahnavieh & Monfared (2019).

Material examined

IRAN • 1 ♀; West Azerbaijan, Bazargan; 1380 m a.s.l.; 11 May 1978; M. Kraus leg.; OÖLM.

Distribution

Palearctic (Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

84. *Andrena* (*Aenandrena*) *hedikae* Jaeger, 1934

Literature records

Aliyev *et al*. (2017); Ascher & Pickering (2021).

Remarks

The original records supporting these listings are not clear. The distribution maps of Warncke (Gusenleitner & Schwarz 2002) indicate the presence of this species in northern Iran, so it is included in the fauna.

Distribution

North Africa and Southern Europe to Russia (European part), Turkey, Azerbaijan, Iran (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2005).

85. *Andrena* (*Chrysandrena*) *hesperia* Smith, 1853

Material examined

IRAN • 1 ♂, 1 ♀; Tehran Province, 6 km N of Gačsar [Gachsar]; 30 May 2002; J. Prochâzka leg.; OÖLM.

Literature records

Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

West and Central Palearctic (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2005).

86. *Andrena* (incertae sedis) *hieroglyphica* Morawitz, 1876 *

Andrena (*Carandrena*) *hieroglyphica* Morawitz, 1876: 192 (♂, Uzbekistan, Samarkand).
Andrena (*Carandrena*) *temporalis* Morawitz, 1876: 204 (♀, Uzbekistan, Sokh).
Andrena (*Carandrena*) *cara* Nurse, 1904: 560 (♀, Pakistan, Peshin). **Syn. nov.**
Andrena (*Carandrena*) *halictoides* Nurse, 1904 (nec Smith): 566 (♂, Pakistan, Peshin). **Syn. nov.**

Material examined

Syntypes

PAKISTAN • ♀ (syntype of *Andrena cara*); Peshin; 1–31 Mar. 1902; C.G. Nurse leg.; NHMUK (illustrated Figs 157–160) • ♂ (syntype of *Andrena halictoides*); Peshin; 1–31 Mar. 1902; C.G. Nurse leg.; NHMUK (illustrated Figs 161–164).

Other material

IRAN • 1 ♂, 2 ♀♀; Yasouj, Isfahan Road, Tange Seriz; 1687 m a.s.l.; 10 Apr. 2021; E. Rostami leg.; ICPI.

TAJIKISTAN • 1 ♀; Fajsabad [Faizobod], 60 km E of Duschanbe; 5–7 May 1991; J. Halada leg; OÖLM.

TURKMENISTAN • 8 ♀♀; Nebit-Dag [Balkanabat], 25 km NW of Jebel; 28 Apr. 1993; K. Deneš leg.; OÖLM • 1 ♀; Repetek; 8 Apr. 1992; M. Snižek leg.; OÖLM.

UZBEKISTAN • 1 ♀; 80 km SE of Karschi [Qarshi]; 31 Apr. 1991; J. Halada leg; OÖLM • 2 ♀♀; Derbent, 13 km SE of Karschi [Qarshi]; 1450 m a.s.l.; 2 May 1991; J. Halada leg; OÖLM.

Figs 157–164. 157–160.*Andrena cara* Nurse, 1904, ♀ syntype (NHMUK). **157**. Label information. **158**. Profile. **159**. Face. **160**. Terga. – **161–164**. *Andrena halictoides* Nurse, 1904, ♂, syntype (NHMUK). **161**. Label information. **162**. Profile. **163**. Face. **164**. Gena and underside of head, profile view.

Remarks

See comments on *A. minor* Warncke, 1975 stat. nov. at the end of the annotated list.

Distribution

Iran*, Turkmenistan, Uzbekistan, Tajikistan, Pakistan* (Osytshnjuk *et al*. 2005).

87. *Andrena* (incertae sedis) *hosseiniiae* sp. nov.

Distribution

Iran.

88. *Andrena* (*Planiandrena*) *huma* sp. nov.

Distribution

Golan Heights, Syria, Iran.

89. *Andrena* (*Poecilandrena*) *hybrida* Warncke, 1975 *

Material examined

IRAN • 1 ♂; Meymeh/Esfahan [Isfahan]; 2000 m a.s.l.; 14 May 1978; M. Kraus leg.; K. Warncke det.; OÖLM.

Distribution

Ukraine, Russia (European part), Turkey, Iran* (Osytshnjuk 1978; Gusenleitner & Schwarz 2002).

90. *Andrena* (*Graecandrena*) *hyemala* Warncke, 1973

Material examined

IRAN • 1 ♂; Pass SW Chalus-Karaj/Mazandaran; 2470 m a.s.l.; 28 May 1978; M. Kraus leg.; OÖLM.

JORDAN • 1 ♀; 20 km N of Amman; 620 m a.s.l.; 23 Apr. 2006; K. Deneš leg.; OÖLM • 2 ♀♀; 30 km NW of Aljun; 600 m a.s.l.; 29 Apr. 2006; K. Deneš leg.; OÖLM • 3 ♀♀; Aljun env.; 840 m a.s.l.; 1 May 2006; K. Deneš leg.; OÖLM.

SYRIA • 1 ♂; occ. An Nasrah env. [Al-Nasrah]; 8–13 Apr. 2005; J. Saki leg.; OÖLM.

Literature records

Ascher & Pickering (2021).

Remarks

The distribution maps of Warncke (Gusenleitner & Schwarz 2002) indicate the presence of *A. hyemala* in Iran, and one specimen could be found in the Warncke collection. It is unclear whether the listing of Ascher & Pickering (2021) is supported by an additional source. The status of *A. hyemala repressa* Warncke, 1975 is unclear and requires revision, as it may consistitute a distinct species.

Distribution

South-eastern Europe, Ukraine, Russia (European part), Turkey, Israel and the West Bank, Jordan*, Syria*, Iran, Turkmenistan, Kazakhstan (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

91. *Andrena* (incertae sedis) *hypopolia* Schmiedeknecht, 1884

Literature records

Morice (1921); Scheuchl & Willner (2016).

Remarks

Morice (1921) lists *A. hypopolia* Pérez, which is not the correct species authority. This may by a similar situation to that of the type of *A. gallica*, which was described by Schmiedeknecht but the type material was collected by Pérez in southern France, and hence the type series remained in the Pérez collection in Paris (Le Divelec 2021). Moreover, the taxonomic situation is highly confused. Warncke treated *A. hypopolia* as a subspecies of *A. numida* Lepeletier, 1841 (Warncke 1967), but also described taxa such as *A. numida albiscopa* Warncke, 1967 from Turkey, and used several other names in combination to describe 'regional' variation (see map in Gusenleitner & Schwarz 2002). It is the opinion of the lead author that all taxa should probably be synonymised under *A. numida*, and that he observed variation is predominantly one of colouration, not structural variation. For now, *A. hypopolia* is included on the Iranian list, but this may be subsumed into *A. numida* following molecular revision.

Distribution

Unclear. Taking a broad concept with all taxa synonymised under *A. numida*, this taxon has a pan-Mediterranean distribution (see map in Gusenleitner & Schwarz 2002).

92. *Andrena* (*Notandrena*) *idigna* Wood sp. nov.

Distribution

Iran.

93. *Andrena* (*Micrandrena*) *incognita* Warncke, 1975 *

Material examined

IRAN • 2 ♀♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 5 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Tehran Province, 6 km N of Gačsar [Gachsar]; 29 May–2 Jun. 2002; J. Prochazka leg.; OÖLM • 1 ♀; Tehran Province, Samgh Abad; 1900 m a.s.l.; 16 May 2016; M. Kafka leg.; OÖLM.

Distribution

Turkey and Iran* (Gusenleitner & Schwarz 2002).

94. *Andrena* (*Melandrena*) *induta* Morawitz, 1894

Andrena (*Melandrena*) *induta* Morawitz, 1894: 62 (♀♂, Turkmenistan, Charki).
Andrena (*Melandrena*) *patella* Nurse, 1903: 542 (♀, Kashmir). **Syn. nov.**

Material examined

Syntype

KASHMIR • ♀ (syntype of *Andrena patella*); 6000–7000 feet a.s.l.; 1–31 May 1901; NHMUK (illustrated Figs 165–168).

Other material

IRAN • 1 ♂; Elburz Mountains, 60 km E of Minudasht; 1280 m a.s.l.; 26 May 2007; O. Sauša leg.; OÖLM • 1 ♂, 2 ♀♀; Elburz, Ov Zanak-Ski, 1 km N of Ab Ali; 2300 m a.s.l.; 11 Jul. 1965; K. Warncke

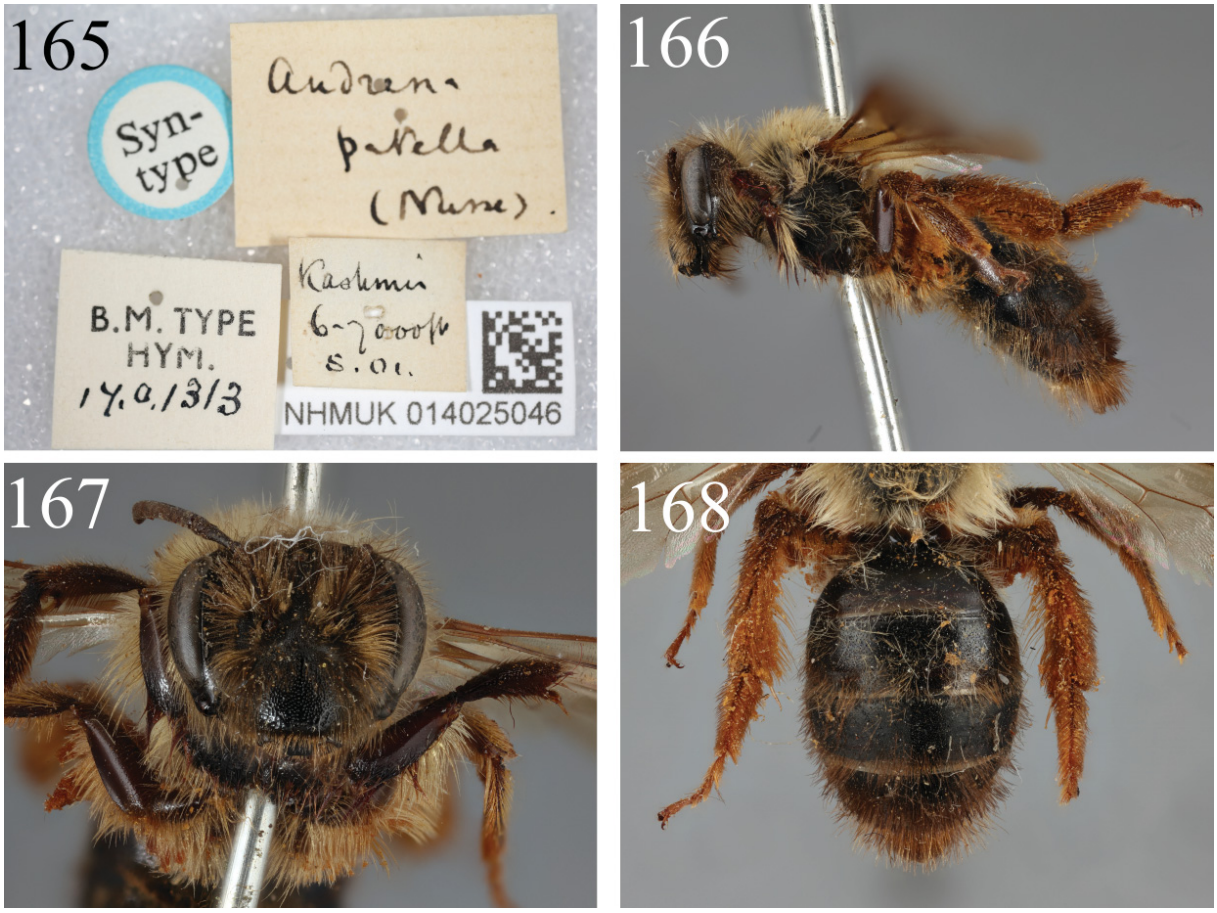
det.; G. Soika and G.A. Mavromoustakis leg.; OÖLM • 1 ♂; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♂; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; 10 May 2016; M. Kafka leg.; OÖLM.

KASHMIR • 1 ♀; Gulmarg; summer 1913; NHMUK • 1 ♀; West Himalaya, Khalatse [Khalsi], Kashmir; 4000–5000 m a.s.l.; 6 May 1939; K. Warncke det.; OÖLM.

TURKEY • 1 ♂; Başaklı, Erzurum; 20 May 1972; K. Warncke det.; H. Ozbek leg.; OÖLM • 3 ♀♀; Hakkâri Şivelan; 18 May 1975; K. Warncke det.; K. Warncke leg.; OÖLM • 1 ♂; Tanyeri, Erzincan; 22 Apr. 1976; K. Warncke det.; K. Warncke leg.; OÖLM.

Remarks

Andrena induta is closely related to *A. infirma* Morawitz, 1876, which is found in Kazakhstan, Turkmenistan, Uzbekistan, Kyrgyzstan, and Tajikistan (Osytshnjuk *et al*. 2008). Structurally, there do not appear to be clear differences, but *A. induta* has much brighter pubescence, and females can be separated by the light (*induta*) or dark (*infirma*) scopal hairs. Gusenleitner & Schwarz (2002) argue that *A. induta* may therefore simply be a colour form of *A. infirma*. However, more study is required before a synonymy can be made with confidence.



Figs 165–168. *Andrena patella* Nurse, 1903, ♀, syntype (NHMUK). **165**. Label information. **166**. Profile. **167**. Face. **168**. Terga.

In contrast, the type specimen of *A. patella* is clearly identical to *A. induta*, as it has the same strong raised longitudinal impunctate line on the clypeus (Fig. 167), and the scopae are golden (Figs 166, 168). It also falls within the known distributional range of *A. induta*, this taxon being known from the western Himalayas in Kashmir. A prudent first step is to synonymise *A. patella* with *A. induta*, and for further synonymy between *A. infirma and A. induta* to wait until type inspection is possible and ideally molecular work is conducted.

As Warncke's distribution maps included points in northern Iran, *A. induta* is not reported here as new for the country.

Distribution

Turkey, Armenia, Iran, Uzbekistan, Tajikistan, Afghanistan, Kashmir, India (Warncke 1974c, 1975a; Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

95. *Andrena* (incertae sedis) *innesi* Gribodo, 1894

Literature records

Khodaparast & Monfared (2012).

Distribution

Morocco, Algeria, Tunisia, Libya, Egypt, Israel and the West Bank, Turkey, Iran (Gusenleitner & Schwarz 2002; Khodaparast & Monfared 2012).

96. *Andrena* (*Campylogaster*) *iranella* Popov, 1940

Literature records

Popov (1940, paratypes); Osytshnjuk *et al*. (2005).

Distribution

Iran, Turkmenistan (Osytshnjuk *et al*. 2005). Material from the Arabian Peninsula (Ascher & Pickering 2021) must be investigated because of a lack of taxonomic clarity regarding *A. skorikovi* Popov, 1940 (see below).

97. *Andrena* (*Leimelissa*) *ispida* Warncke, 1965 *

Material examined

IRAN • 2 ♂♂; West Azerbaijan Province, Serou; 1650 m a.s.l.; 28 May 2010; Mi. Halada leg.; OÖLM.

SYRIA • 3 ♂♂, 1 ♀; Bloudan; 16 May 1995; K. Deneš leg.; OÖLM • 1 ♀; Maalula [Maaloula]; 17 May 1995; K. Deneš leg.; OÖLM.

Distribution

Hungary, Albania, Romania, Bulgaria, Greece, Turkey, Syria*, Georgia, Armenia, Azerbaijan, Iran* (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

98. *Andrena* (*Aciandrena*) *konyella* Warncke, 1975 *

Material examined

IRAN • 2 ♀♀; Kohgiluyeh and Boyer-Ahmad Province, Kuh Gol, near Sisakht; 2500 m a.s.l.; 9 Jun. 2010; Mi. Halada leg.; OÖLM.

Distribution

Turkey and Iran* (Gusenleitner & Schwarz 2002).

99. *Andrena* (*Holandrena*) *labialis* (Kirby, 1802)

Material examined

IRAN • 1 ♂; Bakhtiyari Province, 20 km SE of Lordegan; 31 May 2014; J. Halada leg.; OÖLM • 1 ♂; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 28 May 2014; J. Halada leg.; OÖLM • 1 ♀; Kerman Prov., Jupar [Joupar]; 1900 m a.s.l.; 1 Jun. 2010; P. Tymer leg.; OÖLM • 3 ♂♂; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; 10 May 2016; M. Kafka leg; OÖLM • 2 ♂♂; Pasagrad env. [Pasargad]; 8 May 1999; K. Deneš leg.; OÖLM • 1 ♂; Yasouj, Vezg; 2159 m a.s.l.; 23 Mar. 2019; E. Rostami leg.; ICPI.

Literature records

Popov (1967); Warncke (1975, subspecies *A. labialis megala* Warncke, 1975); Khodaparast & Monfared (2012); Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

West and Central Palearctic (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

100. *Andrena* (*Poecilandrena*) *labiata* Fabricius, 1781

Material examined

IRAN • 1 ♂; Elburz Mountains, 60 km E of Minudasht; 26 May 2007; O. Sauša leg.; OÖLM • 1 ♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM.

Literature records

Popov (1967).

Distribution

West and Central Palearctic (Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

101. *Andrena* (*Aciandrena*) *lamiana* Warncke, 1965

Material examined

SYRIA • 1 ♂; Bosra; 3 May 1995; K. Deneš leg.; OÖLM • 1 ♂; Hasake; 8 May 1996; Ma. Halada leg.; OÖLM • 29 ♂♂, 5 ♀♀; Latakia, Salahidin env. [Castle of Saladin]; 10 Jun. 2000; K. Deneš leg.; OÖLM • 1 ♂; Maalula [Maaloula]; 17 May 1995; K. Deneš leg.; OÖLM • 1 ♂; Ras al Basit; 19 May 1995; K. Deneš leg.; OÖLM.

Literature records

Ascher & Pickering (2021).

Remarks

No primary literature could be found to support the record of Ascher & Pickering, but based on the distribution maps of Warncke (Gusenleitner & Schwarz 2002), *A. lamiana* is present in northwestern Iran. It is therefore included in the faunal list.

Distribution

North Macedonia, Greece, Turkey, Cyprus, Syria*, Iran (Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

102. *Andrena* (incertae sedis) *lateralis* Morawitz, 1876

Material examined

AFGHANISTAN • 2 ♀♀; Saripul [Sar-e Pol], Goslandi distr., Malekan village; 21 May 1996; G.G.M. Schulten leg.; RMNH.

IRAN • 1 ♀; S.W. Persia, Escalera; K. Sefiet leg.; NHMUK.

Literature records

Alfken (1935); Popov (1967); Allahverdi *et al*. (2016).

Distribution

Portugal, Spain, North Macedonia, Greece, Turkey, Israel and the West Bank, Georgia, Armenia, Azerbaijan, Iran, Turkmenistan, Kazakhstan, Uzbekistan, Tajikistan, Kyrgyzstan, Afghanistan* (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2005).

103. *Andrena* (*Osychnyukandrena*) *laticalcar* Osytschnjuk, 1985

Literature records

Ariana *et al*. (2009b).

Distribution

Iran and Turkmenistan (Ariana *et al*. 2009).

104. *Andrena* (*Poecilandrena*) *laticeps* Morawitz, 1877

Material examined

TURKEY • 1 ♀; Hakkâri, S. Varegös/Mt. Sat; 2000 m a.s.l.; 17 Jun. 1984; K. Warncke leg.; OÖLM • 1 ♂; Hakkâri, Beytüşşebap; 25 May 1988; K. Warncke leg.; OÖLM • 3 ♀♀; Van, Muradiye env., 120 km NE of Van; 2000 m a.s.l.; K. Deneš leg.; OÖLM • 1 ♂; Van, Güzeldere Gecidi, 70 km SE of Van; 2730 m a.s.l.; 7 Jun. 2001; K. Deneš leg.; OÖLM.

Literature records

Ascher & Pickering (2021).

Remarks

No primary literature could be found to support the record of Ascher & Pickering, but based on the distribution maps of Warncke (Gusenleitner & Schwarz 2002) as well as examined specimens from Hakkâri and Van provinces, *A. laticeps* is present in eastern Turkey very close to the border of Iran, so the species is considered to be present in north-western Iran.

Distribution

Turkey, Georgia, Armenia, Iran (Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

105. *Andrena* (*Simandrena*) *lepida* Schenck, 1861

Material examined

IRAN • 1 ♂; East Azerbaijan Province, Sis, 10 km E of Shabestar; 1540 m a.s.l.; 19 Jun. 2010; Mi. Halada leg.; OÖLM • 2 ♀♀; Fars Province, 10 km E of Kazerum; 1990 m a.s.l.; 23 May 2014; J. Halada leg.; OÖLM • 1 ♀; Fars Province, Dast Arjan; 2040 m a.s.l.; 6 May 2016; M. Kafka leg.; OÖLM • 2 ♀♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 2 ♀♀; Kohgiluyeh and Boyer, Ahmad Prov., Likak, Gach Bolland; 1640 m a.s.l.; 7 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Yasouj, Darreh Grouh Firuz Abad, Faramarz Village; 1960 m a.s.l.; 6 Apr. 2021; E. Rostami leg.; ICPI • 11 ♂♂, 2 ♀♀; Yasouj, Doposhteh, Dasht-e Rum; 2091 m a.s.l.; 31 Mar. 2021; E. Rostami leg.; ICPI • 2 ♂♂, 11 ♀♀; Yasouj, Doposhteh, Dasht-e Rum; 2091 m a.s.l.; 6 Apr. 2021; E. Rostami leg.; ICPI • 10 ♂♂, 1 ♀; Yasouj, Tange Tamoradi; 2247 m a.s.l.; 21 Mar. 2021; E. Rostami leg.; ICPI • 1 ♀; Yasouj, Vezg; 2159 m a.s.l.; 23 Mar. 2019; E. Rostami leg.; ICPI.

Literature records

Khodaparast & Monfared (2012).

Distribution

West Palearctic (Gusenleitner & Schwarz 2002).

106. *Andrena* (*Taeniandrena*) *leucopsis* Warncke, 1967 *

Material examined

IRAN • 1 ♀; Azer. e Garbi. Prov. [West Azerbaijan Province], Serou; 1650 m a.s.l.; 28 May 2010; Mi. Halada leg.; OÖLM • 1 ♀; East Azerbaijan Province, Sis, 10 km E of Shabestar; 1540 m a.s.l.; 19 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♀; Kerman Prov., Deh Bakri Pass; 2300 m a.s.l.; 28 May 2014; J. Halada leg.; OÖLM • 1 ♀; 15 km SE of Sarvestan/Fars; 1800 m a.s.l.; 17 May 1978; K. Warncke leg.; OÖLM.

Remarks

Barcoded Iranian specimens were used in the analysis of Praz *et al*. (2022).

Distribution

Romania, Bulgaria, North Macedonia, Greece, Turkey, Cyprus, Lebanon, Iran* (Gusenleitner & Schwarz 2002; Varnava *et al.* 2020; Wood 2021b; Boustani *et al*. 2021).

107. *Andrena* (*Melandrena*) *limata* Smith, 1853

Material examined

IRAN • 1 ♀; Gilan Province, 20 km W of Astara; 640 m a.s.l.; 17 Jun. 2010; Mi. Halada leg.; OÖLM • 2 ♀♀; Kamyaran, Asr abad; 17 Jul. 2017; H. Fatehi leg.; ICPI • 1 ♀; Kerman Province, Kuhha Qohrud, Hane-ye Sorkh [Gardaneh-ye]; 2700 m a.s.l.; V. Major leg.; OÖLM • 1 ♀; Mazandaran Prov., 10 km N of Gashar [Gachsar]; 2300–2700 m a.s.l.; J. Halada leg.; OÖLM • 1 ♀; NE Iran, Kuh-e Sorgh-Hesar [?], 10 km S of Ataiye; 1700 m a.s.l.; 28 May 2003; V. Major leg.; OÖLM • 1 ♂; Tehran Province, 6 km N of Gačsar [Gachsar]; 29 May–2 Jun. 2002; J. Prochazka leg.; OÖLM.

Literature records

Alfken (1935, as *A. pectoralis* Schmiedeknecht, 1883); Popov (1967, as *A. pectoralis*); Osytshnjuk *et al*. (2008).

Distribution

West and Central Palearctic (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

108. *Andrena* (incertae sedis) *limbata* Eversmann, 1852

Literature records

Aliyev *et al*. (2017); Ascher & Pickering (2021).

Remarks

The primary source for these listings is unclear. The distribution maps of Warncke (Gusenleitner & Schwarz 2002) include a dot on the Iran/Turkmenistan border, which may be within Iran. Given that *A. limbata* is present in eastern Turkey and the Caucasus, it is considered highly likely to be present in Iran.

Distribution

Southern Europe to Russia (European part, Urals), Turkey, the Caucasus, Iran, and Turkmenistan (Gusenleitner & Schwarz 2002).

109. *Andrena* (*Longandrena*) *longiceps* Morawitz, 1894

Literature records

Radchenko *et al*. (2021).

Distribution

Iran, Turkmenistan, Uzbekistan, Kazakhstan (Radchenko *et al*. 2021).

110. *Andrena* (*Micrandrena*) *luscinia* Warncke, 1975 *

Material examined

IRAN • 5 ♂♂; East Azerbaijan Province, Sis, 10 km E of Shabestar; 1540 m a.s.l.; 19 Jun. 2010; Mi. Halada leg.; OÖLM • 3 ♀♀; Boyer-A. o. Kohg Prov., Kuh Gol, near Sisakht; 2500 m a.s.l.; 9 Jun. 2010; Mi. Halada; OÖLM • 1 ♂, 3 ♀♀; Fars Province, 10 km E of Kazerum; 1990 m a.s.l.; 23 May 2014; J. Halada leg.; OÖLM • 1 ♂, 6 ♀♀; Fars Province, Dasht Arian; 2040 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 3 ♂♂; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 4 May 2016; M. Kafka leg.; OÖLM • 57 ♀♀; Ilam Province, Abda Man, Dinar Gaouh; 1830 m a.s.l.; 12 May 2016; M. Kafka leg.; OÖLM • 3 ♀♀; Kohgiluyeh and Boyer, Ahmad Prov., Likak, Gach Bolland; 1640 m a.s.l.; 7 May 2016; M. Kafka leg.; OÖLM • 4 ♂♂; Lorestan Province, 10 km SW of Dorud; 1520 m a.s.l.; 20 May 2014; J. Halada leg.; OÖLM • 1 ♂, 6 ♀♀; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; 10 May 2016; M. Kafka leg.; OÖLM • 1 ♂; Lorestan Province, Tootmashour [Tut, Masur-e Abi]; 2000 m a.s.l.; 31 May 2010; Mi. Halada leg.; OÖLM • 4 ♂♂; Mazandaran Province, Kojuk [36’23, 51’40]; 7 Jun. 2014; J. Halada leg.; OÖLM • 2 ♀♀; Pasagrad [Pasargad]; 8 May 1999; K. Deneš leg.; OÖLM • 1 ♂; Persepolis env.; 9 May 1999; K. Deneš leg.; OÖLM • 3 ♀♀; Yasouj, Doposhteh, Dasht-e Rum; 2091 m a.s.l.; 31 Mar. 2021; E. Rostami leg.; ICPI • 9 ♀♀; Yasouj, Doposhteh, Dasht-e Rum; 2091 m a.s.l.; 6 Apr. 2021; E. Rostami leg.; ICPI • 1 ♀; Yasouj, Doposhteh, Dasht-e Rum; 2091 m a.s.l.; 10 Mar. 2021; E. Rostami leg.; ICPI • 1 ♂; Yasouj, Tang

Konareh, Dasht-e Rum; 1858 m a.s.l.; 30 Apr. 2021; E. Rostami leg.; ICPI • 1 ♂, 5 ♀♀; Yasouj, Tange Tamoradi; 2247 m a.s.l.; 21 Mar. 2021; E. Rostami leg.; ICPI.

Distribution

Golan Heights, Turkey, and Iran* (Gusenleitner & Schwarz 2002; Pisanty *et al*. 2018).

111. *Andrena* (*Chlorandrena*) *macula* Pisanty & Wood, 2022

Literature records

Pisanty *et al*. (2022a).

Distribution

Israel and the West Bank, Jordan, Iran (Pisanty *et al*. 2022a).

112. *Andrena* (*Truncandrena*) *medeninensis usura* Warncke, 1967 *

Material examined

IRAN • 2 ♀♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 4 May 2016; M. Kafka leg.; OÖLM.

SYRIA • 5 ♂♂, 2 ♀♀; Bludan, 57 km NW of Damascus; 24 Apr. 1992; K. Warncke leg.; OÖLM.

Distribution (subspecies *usura*)

Turkey, Cyprus, Lebanon, Syria*, Iran* (Gusenleitner & Schwarz 2002; Wood *et al*. 2020a).

113. *Andrena* (*Simandrena*) *melba* Warncke, 1966

Material examined

IRAN • 1 ♂, 1 ♀; Golestan, 70 km E of Minudasht; 1050 m a.s.l.; 12 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♀; Yazd, Mehriz, Shohaday gomnam, 1500 m a.s.l.; 23 Mar. 2021; S. San leg.; ICPI • 1 ♀; Yazd, Mehriz, Shohaday gomnam; 1500 m a.s.l.; 8 May 2021; S. San leg.; ICPI.

Literature records

Khodaparast & Monfared (2012); Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

Turkey, Georgia, Armenia, Azerbaijan, Iran (Gusenleitner & Schwarz 2002).

114. *Andrena* (*Chrysandrena*) *merula* Warncke, 1969 *

Material examined

IRAN • 1 ♂, 1 ♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; 10 May 2016; M. Kafka leg.; OÖLM.

Distribution

Bulgaria, Greece, Turkey, Cyprus, Israel and the West Bank, Lebanon, Jordan, Syria, Iran*, Afghanistan (Warncke 1974c; Gusenleitner & Schwarz 2002; Wood *et al*. 2020a; Wood 2021b).

115. *Andrena* (*Micrandrena*) *minutula* (Kirby, 1802) *

Material examined

IRAN • 4 ♂♂, 1 ♀; Elburz Mountains, 60 km E of Minudasht; 26 May 2007; O. Sauša leg.; OÖLM • 10 ♀♀; Mazandaran Province, 3.2 km S of Kandelous; 1877 m a.s.l.; 4 Jun. 2015; M. Obořil leg.; OÖLM.

Distribution

Palearctic (Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

116. *Andrena* (*Micrandrena*) *minutuloides* Perkins, 1914

Literature records

Aliyev *et al*. (2017); Ascher & Pickering (2021).

Remarks

The primary source for these listings is unclear. The distribution maps of Warncke (Gusenleitner & Schwarz 2002) indicate that *A. minutuloides* is present in northwestern Iran. The species is common in the Caucasus region, so is considered to be present in Iran.

Distribution

West Palearctic (Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

117. *Andrena* (*Suandrena*) *mirna* Warncke, 1969

Material examined

IRAN • 3 ♀♀; Khuzestan, Dezful, Rozgah; 15 Mar. 2017; A. Monfared leg.; ICPI • 1 ♂, 9 ♀♀; Yazd, Abarkooh, Faraghe; 1698 m a.s.l.; 17 Mar. 2021; S. San leg.; ICPI • 1 ♂; Yazd, Hanza to Mehriz; 1928 m a.s.l.; 22 Mar. 2021; S. San leg.; ICPI • 1 ♀; Yazd, Mehriz, Shohaday gomnam; 1500 m a.s.l.; 23 Mar. 2021; S. San leg.; ICPI • 5 ♀♀; Yazd, Polis e rah taft, entehay kooche; 1399 m a.s.l.; 12 Mar. 2020; S. San leg.; ICPI • 1 ♂; Yazd, Taft, Tezerjan, Mazra ali, Agha Seyyed; 2109 m a.s.l.; 24 Mar. 2019; S. San leg.; ICPI.

Literature records

Khodaparast & Monfared (2012); Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

Egypt, Israel and the West Bank, Lebanon, Jordan, Syria, Turkey, Iran (Wood *et al*. 2020a; Wood 2021a; Kratochwil 2021).

118. *Andrena* (*Andrena*) *mitis* Schmiedeknecht, 1883 *

Material examined

IRAN • 1 ♀; Kohgiluyeh and Boyer-Ahmad Province, Kuh Gol, near Sisakht; 2500 m a.s.l.; 9 Jun. 2010; Mi. Halada leg.; OÖLM.

Distribution

Central Europe to Russia (European part), Turkey, the Caucasus, Iran* (Gusenleitner & Schwarz 2002).

119. *Andrena* (incertae sedis) *monacha* Warncke, 1965 *

Material examined

IRAN • 1 ♂; Lorestan Province, Dorud Lanjaban env.; 670 m a.s.l.; 11 May 2016; M. Kafka leg.; OÖLM.

Distribution

Greece, Turkey, Cyprus, Lebanon, Syria, Iran* (Gusenleitner & Schwarz 2002; Wood *et al*. 2020a).

120. *Andrena* (*Plastandrena*) *mongolica* Morawitz, 1880

Material examined

IRAN • 1 ♂; East Azerbaijan Province, Sis, 10 km E of Shabestar; 1540 m a.s.l.; 19 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♂; Elburz, Pulour [Polour], 22 km N of di Ab Ali; 13 Jul. 1965; K. Warncke det.; G. Soika and G.A. Mavromoustakis leg.; OÖLM • 1 ♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Isfahan, Semirom, Yasouj-semirom road, LahJaru; 2263 m a.s.l.; 30 Mar. 2018; A. Monfared leg.; ICPI • 2 ♂♂; Yasouj, Abshar; 2 Mar. 2011; H. Elahi and M. Mesavian; ICPI • 1 ♀; Yasouj, Khakalan; 6 Jun. 2011; A. Monfared leg.; ICPI • 1 ♂; Yasouj, Vezg. [Kūh-e Vezg]; 12 Apr. 2011; A. Monfared leg.; ICPI • 6 ♂♂; Yazd, Banadak-o sadat; 2103 m a.s.l.; 22 Mar. 2021; S. San leg.; ICPI • 1 ♂; Yazd, Ghadam gah, Dehbala; 2175 m a.s.l.; 12 Mar. 2020; S. San leg.; ICPI • 4 ♂♂; Yazd, Jade konj-e kooh, dakal; 2019 m a.s.l.; 26 Mar. 2021; S. San leg.; ICPI • 8 ♂♂, 2 ♀♀; Yazd, Mehriz to Tang Chenar; 1965 m a.s.l.; 30 Mar. 2021; S. San leg.; ICPI • 6 ♂♂; Yazd, Mehriz, Posht e Hosseinie Shohaday gomnam; 1500 m a.s.l.; 28 Feb. 2020; S. San leg.; ICPI • 4 ♂♂; Yazd, Shahneh village, Zorband; 1890 m a.s.l.; 23 Mar. 2019; S. San leg.; ICPI.

Literature records

Popov (1967).

Distribution

Turkey, Armenia, Iran, Turkmenistan, Uzbekistan, Kazakhstan, Afghanistan, Kyrgyzstan, China, Mongolia (Popov 1967; Ascher & Pickering 2021). Records from within the current political boundaries of Mongolia require confirmation (Y. Astafurova pers. comm.).

121. *Andrena* (*Orandrena*) *monilia* Warncke, 1967

Literature records

Khodaparast & Monfared (2012).

Distribution

Spain, Morocco, Algeria, Tunisia, Israel and the West Bank, Jordan, Iran (Gusenleitner & Schwarz 2002; Wood *et al*. 2020b).

122. *Andrena* (*Melandrena*) *morio* Brullé, 1832

Material examined

IRAN • 2 ♂♂; Azer. e Garbi. Prov. [West Azerbaijan Province], Serou; 1650 m a.s.l.; 28 May 2010; Mi. Halada leg.; OÖLM • 1 ♂; Golestan, 40 km E of Minudasht NP; 750 m a.s.l.; 1 Jun. 2014; J. Halada leg.; OÖLM • 1 ♂; Khorasan Province, Kuh-e Gamal, 20 km W of Deyhuk; 1 Jun. 2005; V. Major leg.; OÖLM • 3 ♀♀; Tehran env.; 2 May 1999; K. Deneš leg.; OÖLM • 1 ♀; W Elburz, Kalardasht pl. NE

of Rudbarak; 1350 m a.s.l.; 12 Aug. 1970; OÖLM • 3 ♀♀; Zagros, 15 km Semirom; 2600 m a.s.l.; 24 May 2013; V. Major leg.; OÖLM • 1 ♀; Zangan [Qazvin] Province, Aveq; 2500 m a.s.l.; 9 Jun. 2013; V. Major leg.; OÖLM.

Literature records

Strand (1921, as *A. asterbadiae* Strand, 1921); Alfken (1935); Popov (1967); Allahverdi *et al*. (2016); Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

West and Central Palearctic (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

123. *Andrena* (*Melandrena*) *nigroaenea* (Kirby, 1802)

Literature records

Alfken (1935); Osytshnjuk *et al*. (2008).

Distribution

West and Central Palearctic (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

124. *Andrena* (*Parandrenella*) *nisoria* Warncke, 1969

Material examined

IRAN • 1 ♀; Kašan [Kashan]; 3 May 1999; K. Deneš leg.; OÖLM • 2 ♂♂; Tehran Province, 6 km N of Gačsar [Gachsar]; 29 May–2 Jun. 2002; J. Prochazka leg.; OÖLM.

JORDAN • 1 ♀; 15 km W of Madaba; 760 m a.s.l.; 27 Apr. 2006; K. Deneš leg.; OÖLM • 4 ♀♀; 20 km N of Amman; 620 m a.s.l.; 23 Apr. 2006; K. Deneš leg.; OÖLM • 2 ♂♂, 13 ♀♀; 20 km N of Karak; 1000 m a.s.l.; 27 Apr. 2006; K. Deneš leg.; OÖLM • 1 ♀; North Shuna env.; 29 Apr. 1996; Mi. Halada leg.; OÖLM.

SYRIA • 1 ♀; Bosra; 3 May 1995; K. Deneš leg.; OÖLM • 1 ♀; Hasake [Al Hasakah]; 8 May 1996; Ma. Halada leg.; OÖLM • 1 ♂, 1 ♀; 20 km E of Homs; 400 m a.s.l.; 1 Apr. 1988; L. Blank leg.; OÖLM.

Literature records

Khodaparast & Monfared (2012); Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

Turkey, Cyprus, Israel and the West Bank, Jordan*, Syria*, Iran (Gusenleitner & Schwarz 2002; Scheuchl *et al*. 2011).

125. *Andrena* (*Melandrena*) *nitida* (Müller, 1776)

Literature records

Osytshnjuk *et al*. (2008); Allahverdi *et al*. (2016); Ascher & Pickering (2021): Mazandaran, Sardabrud, 3–5 km above Rudbarak; 1500 m a.s.l.; 17 Apr. 1966; D. Baker leg.; SEMC; via GBIF occurrence 658462936.

Distribution

West and Central Palearctic (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

126. *Andrena* (*Melandrena*) *nitidemula* Scheuchl & Hazir, 2012 *

Material examined

ARMENIA • 1 ♀; Mount Aragats; 11 Jun. 2017; M. Kasparek leg.; MKC.

GEORGIA • 1 ♀; Dedoplistskaro [Dedoplis Tskaro], Eagle Canyon; 13 May 2016; M. Kasparek leg.; MKC.

IRAN • 1 ♀; Tehran Province, 6 km N of Gačsar [Gachsar]; 29 May 2002; J. Prochazka leg.; OÖLM.

SYRIA • 1 ♀; Kassab env. [Kesab]; 28 Mar. 1994; S. Becvar leg.; OÖLM.

Distribution

Greece, Turkey, Syria*, Georgia*, Armenia*, Iran* (Scheuchl & Hazir 2012; Rasmont *et al*. 2017).

127. *Andrena* (incertae sedis) *nitidicollis* Morawitz, 1876 *

Figs 169–174

Material examined

IRAN • 1 ♀; 10 km SW of Rayen/Kerman [Kūh-e Hazār mountain, 29.518° N, 57.271° E]; 2350 m a.s.l.; 25 May 1978; K. Warncke leg.; OÖLM.

Remarks

Andrena nitidicollis is an obscure species that was previously known only from desert habitat in southern Kazakhstan. Its phylogenetic affinities are not clear, being placed in the *Graecandrena* Warncke, 1968 by Gusenleitner & Schwarz (2002), but not by Osytshnjuk *et al*. (2008). Due to the rarity of this taxon, it is illustrated here (Figs 169–174).

Through its combination of small body size (Fig. 169), shiny scutum with short, semi-squamous hairs (Fig. 171), orange hind tibiae, thick white tergal hairbands (Fig. 173–174), and predominantly smooth propodeal triangle (Fig. 172), *A. nitidicollis* can be compared to two sets of species in two subgenera: 1) *A.* (*Aciandrena*) *pavonia* Warncke, 1974, *A.* (*Aciandrena*) *palmyriae* Wood, 2021, and *A.* (*Aciandrena*) *xera* Pisanty, 2022 and 2) *A.* (*Graecandrena*) *schwarzi* Warncke, 1975. In group 1, the propodeal triangle is entirely shagreened, leading to placement in the subgenus *Aciandrena*, whereas in group 2, the propodeal triangle has basal rugae, which along with the male genitalia leads to placement in subgenus *Graecandrena*. The propodeal triangle of the Iranian specimen has a narrow area with basal rugae, making it somewhat intermediate and resulting in its incertae sedis placement in the absence of genetic data.

Comparison with photographs of the type of *A. nitidicollis* (Astafurova *et al*. 2022) shows that the Iranian specimen is conspecific due to the combination of its completely smooth scutum (completely shagreened in *A. pavonia*, partially shagreened in *A. xera*), its truncate labral process that lacks an apical notch (deeply notched in *A. palmyriae*), scutum with sparse punctures centrally, separated by > 2 puncture diameters (separated by 1–2 puncture diameters in *A. schwarzi*), broad facial foveae that occupy almost the entire space between the compound eye and the lateral ocellus (occupying ½ to ¾ of this space in all other species), and finally and most importantly, the relatively strongly and deeply punctate lateral parts of T3–4, punctures separated by 1–2 puncture diameters (punctures weaker, sparser, or absent in

all other species). Its presence in Iran is reminiscent of *A. longiceps*, which has a predominantly Central Asian distribution, but which was recently recorded in Iran for the first time (Radchenko *et al*. 2021).

Distribution

Iran*, Kazakhstan.

Figs 169–174. *Andrena nitidicollis* Morawitz, 1876, ♀ (OÖLM). **169**. Profile. **170**. Face. **171**. Scutum. **172**. Propodeum. **173**. Terga. **174**. Terga, detail.

128. *Andrena* (*Nobandrena*) *nobilis* Morawitz, 1873

Literature records

Popov (1967); Khodaparast & Monfared (2012).

Distribution

Central and Eastern Europe eastwards to Russia (European part, Urals), Turkey, the Caucasus, Iran, and Turkmenistan (Gusenleitner & Schwarz 2002; Proshchalykin *et al*. 2017a; Ascher & Pickering 2021).

129. *Andrena* (*Euandrena*) *oblata* sp. nov.

Distribution

Iran.

130. *Andrena* (*Micrandrena*) *obsidiana* Wood sp. nov.

Distribution

Turkey and Iran.

131. *Andrena* (*Micrandrena*) *oedicnema* Warncke, 1975 *

Material examined

IRAN • 1 ♂; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 4 ♂♂; Yasouj, Deli Bajak, Sepidar; 2181 m a.s.l.; 23 Apr. 2021; E. Rostami leg.; ICPI • 1 ♂; Yasouj, Doposhteh, Dasht-e Rum; 2091 m a.s.l.; 6 Apr. 2021; E. Rostami leg.; ICPI.

Distribution

Greece, Turkey, Israel and the West Bank, Lebanon, Jordan, Syria, Turkey, Iran* (Gusenleitner & Schwarz 2002; Pisanty *et al*. 2018; Wood *et al*. 2020a).

132. *Andrena* (*Truncandrena*) *optata* Warncke, 1975 *

Material examined

IRAN • 1 ♂; West Azerbaijan Province, Tazenkendkaragolchange [?Tazeh Kand-e-Nosrat]; 15 May 2001; J. Prochazka leg.; OÖLM • 4 ♂♂, 1 ♀; Tehran Province, 6 km N of Gačsar [Gachsar]; 29 May–2 Jun. 2002; J. Prochazka leg.; OÖLM.

SYRIA • 1 ♀; Aleppo, Simeons-Kloster; 500 m a.s.l.; 19 Apr. 1988; L. Blank leg.; OÖLM.

Distribution

Albania, Greece, Bulgaria, Ukraine, Turkey, Lebanon, Syria*, Iran* (Wood *et al*. 2020a; Wood 2021b).

133. *Andrena* (*Chlorandrena*) *orientana* Warncke, 1965 *

Material examined

IRAN • 1 ♂; Fars Province, Dasht Arjan; 2040 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 6 ♀♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♂; Lorestan Province, Dorud Lanjaban env.; 670 m a.s.l.; 11 May

2016; M. Kafka leg.; OÖLM • 1 ♀; Yasouj, Kakan [Fars Province]; 14 Feb. 2011; A. Monfared leg.; ICPI.

Literature records

Both Popov (1967) and Osytshnjuk *et al*. (2005) cite *A. taraxaci* Giraud, 1861 from Iran. The true *Andrena taraxaci* is distributed from Central Europe to Turkey and Russia, but many morphologically similar species including *A. orientana* have different and overlapping distributions, and have been separated by subsequent authors (Schwenninger *et al*. 2015). It is not clear which taxon these previous authors may have been referring to.

Distribution

Hungary, North Macedonia, Romania, Bulgaria, Ukraine, Turkey, Cyprus, Israel and the West Bank, Lebanon, Jordan, Syria, Iran* (Schwenninger *et al*. 2015; Wood *et al*. 2020a).

134. *Andrena* (*Truncandrena*) *oulskii* Radoszkowski, 1867

Andrena (*Truncandrena*) *oulskii roseotincta* Warncke, 1975: 42 (♀♀, Iran, Khuzistan).

Material examined

Holotypes

AZERBAIJAN • ♀ (holotype of *A. oulskii*); Baku; ZMHB.

IRAN • ♀ (holotype of *A. oulskii roseotincta*); Khuzistan, Haft Tepe [Hafttapeh], southeast Shush; 22 Mar. 1956; K. Warncke det.; R. Schäuffele leg.; OÖLM.

Other material

IRAN • 1 ♂, 1 ♀; Kašan [Kashan]; 3 May 1999; A. Ariana det.; K. Deneš leg.; OÖLM • 2 ♀♀; Kohgiluyeh and Boyer-Ahmad, Yasoj, Semeron [Semerun]; 1529 m a.s.l.; 2 May 2019; S. Dowlatkhan leg.; ICPI • 2 ♂♂, 2 ♀♀; Kohgiluyeh and Boyer-Ahmad, Yasoj, Semron [Semerun]; 1895 m a.s.l.; 25 Jan. 2019; Z. Mohammadi leg.; ICPI • 1 ♀; Kohgiluyeh and Boyer-Ahmad, Yasuj, Kakan; 2326 m a.s.l.; 14 Apr. 2018; S. Mahdi and R. Esfandiari leg.; ICPI • 1 ♀; Lorestan Province, 10 km SW of Dorud; 1520 m a.s.l.; 20 May 2014; J. Halada leg.; OÖLM • 1 ♂, 4 ♀♀; Persepolis env.; 9 May 1999; A. Ariana det.; K. Deneš leg.; OÖLM • 1 ♂; South, Bandar-e Bušehr; 11 May 1999; K. Deneš leg.; OÖLM • 1 ♂; West [West Azerbaijan Province], Češme Bigar env. [Çeşmə, or Cheshmeh, 38.594° N, 45.119° E]; 14 May 1999; K. Deneš leg.; OÖLM.

Literature records

Warncke (1975, as *A. oulskii roseotincta* Warncke, 1975); Khodaparast & Monfared (2012, as *roseotincta*).

Remarks

The use of this name has been confused, but was recently clarified by Wood (2021b) after type inspection. Material described as *A. oulskii roseotincta* by Warncke is not sufficiently differentiated to merit subspecific status. See also Pisanty *et al*. (2022a).

Distribution

Syria, Turkey, Azerbaijan, Iran (Warncke 1975), possibly Afghanistan, but the species concept used by Warncke (1974c) is unclear.

135. *Andrena* (*Chlorandrena*) *panurgimorpha* Mavromoustakis, 1957

Material examined

ALBANIA • 1 ♀; N Arras; 3 Jun. 2013; K. Deneš leg.; OÖLM • 1 ♂; Tepelenë; 27 May 2013; K. Deneš leg.; OÖLM.

IRAN • 2 ♂♂, 6 ♀♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♂; Gilan Province, 15 km SE of Tutkabon; 1100 m a.s.l.; J. Halada leg.; OÖLM • 1 ♂, 1 ♀; Kurdistan Province, Paniran; 1450 m a.s.l.; M. Kafka leg.; OÖLM • 1 ♀; Lorestan Province, Dorud Lanjaban env.; 670 m a.s.l.; M. Kafka leg.; OÖLM • 3 ♀♀; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; M. Kafka leg.; OÖLM • 1 ♂, 5 ♀♀; West [West Azerbaijan Province], Češme Bigar env. [Çeşmə, or Cheshmeh, 38.594° N, 45.119° E]; 14 May 1999; K. Deneš leg.; OÖLM.

Literature records

Khodaparast & Monfared (2012); Allahverdi *et al*. (2016); Khodarahmi Ghahnavieh & Monfared (2019).

Remarks

Unpublished barcode data suggest that *A. panurgimorpha* is a complex of at least two distinct species (G. Pisanty pers. comm.).

Distribution

Albania*, Bulgaria, Greece, Ukraine, Turkey, Cyprus, Israel and the West Bank, Lebanon, Jordan, Syria, Iran (Gusenleitner & Schwarz 2002; Wood *et al*. 2020a; Wood 2021b).

136. *Andrena* (incertae sedis) *paradisaea* Warncke, 1975 *

Material examined

IRAN • 1 ♀; Tehran Province, Samgh Abad; 1900 m a.s.l.; 15 May 2016; M. Kafka leg.; OÖLM.

Remarks

Following the revised concept of *Poecilandrena* (Pisanty *et al.* 2022b), *A. paradisaea* is hereby removed from *Poecilandrena* and considered incertae sedis. The curved tibial spurs and atypical genitalia clearly place this species outside the *Andrena labiata* and *A. viridescens* species group concepts.

Distribution

Israel and West Bank, Turkey, and Iran* (Gusenleitner & Schwarz 2002; Pisanty *et al*. 2018).

137. *Andrena* (*Leucandrena*) *parviceps* Kriechbaumer, 1873

Literature records

Ascher & Pickering (2021): Mazandaran; coastal plain between Chalus and Shahsavar; 20 m a.s.l.; 10 Apr. 1965; D. Baker leg.; SEMC; via GBIF occurrence 784988907.

Material examined

IRAN • 1 ♀; Yasouj, Isfahan Road, Tange Seriz; 1687 m a.s.l.; 8 Apr. 2021; E. Rostami leg.; ICPI • 1 ♀; Mazandaran, 20 km S of Nowshahr, Weysser [Veysar]; 1400 m a.s.l.; 9–14 Jun. 1977; C. Holzschuh and F. Ressl leg.; OÖLM.

Remarks

The distribution maps of Warncke (Gusenleitner & Schwarz 2002) indicate the presence of *A. parviceps* in Iran, so this species is therefore not reported as new.

Distribution

Southern Europe, Turkey, the Caucasus, Iran, Turkmenistan (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

138. *Andrena* (*Pallandrena*) *persica* Wood, 2021

Literature records

Wood (2021a).

Distribution

Iran.

139. *Andrena* (*Plastandrena*) *pilipes* Fabricius, 1781

Literature records

Popov (1967, as *A. carbonaria* L., 1767); Khodaparast & Monfared (2012); Allahverdi *et al*. (2016); Scheuchl & Willner (2016, as *nigrospina* Thomson, 1872).

Remarks

As for *A. bimaculata* and *A. tibialis*, members of the subgenus *Plastandrena* are taxonomically highly challenging, with a great deal of variation and many described taxa. A deep molecular revision of the *A. pilipes* group is needed to establish whether multiple good taxa exist. *Andrena pilipes* s. lat. is commonly recorded in Iran, and therefore for brevity additional records are not detailed here.

Distribution

In a broad sense, Palearctic (Gusenleitner & Schwarz 2002; Ascher & Picking 2021).

140. *Andrena* (*Brachyandrena*) *pinguis* Ariana, Scheuchl, Tadauchi & Gusenleitner, 2009 *****

Material examined

IRAN • 55 ♂♂; Azer. e Garbi. Prov. [West Azerbaijan Province], Serou; 1650 m a.s.l.; 28 May 2010; Mi. Halada leg.; OÖLM • 2 ♂♂, 1 ♀; Kohgiluyeh and Boyer-Ahmad Province, Kuh Gol, near Sisakht; 2500 m a.s.l.; 9 Jun 2010; Mi. Halada leg.; OÖLM • 1 ♂; Fars Province, Komehr; 2380 m a.s.l.; 9 Jun 2010; Mi. Halada leg.; OÖLM.

RUSSIA • 1 ♀; Сталингр. обл. [Stalingrad obl. = Volgograd Oblast], Тингута [Tinguta]; 5 Aug. 1952; Г. Викторов leg. [G. Viktorov]; OÖLM.

TURKEY • 1 ♀; Mardin; 1000 m a.s.l.; 2 Jul. 1987; R. Hensen leg.; RMNH • 1 ♂, 25 ♀♀; Burdur, 20 km SW of Burdur; 940 m a.s.l.; 7 Jul. 2006; M. Halada and M. Kadlecová leg.; OÖLM.

Remarks

The presence of this species in southern Russia is surprising, as it was not reported from Russia in the recent revision of the subgenus (Ariana *et al*. 2009a). What is more surprising is that the collecting locality of Tinguta is the locus typicus for *Andrena* (*Brachyandrena*) *limonii* Osytshnjuk, 1983, the holotype of

which is a female from Vologrd reg., Tinguta, 13 Aug. 1954, leg. Razumova (see Osytshnjuk 1983b; Osytshnjuk *et al*. 2005). The specimen examined here was found in boxes of undetermined material at Linz that were part of the Warncke collection. It was part of a series of specimens of various species that were collected by the Russian entomologists G. Viktorov, D. Panfilov, and L. Zimina. These specimens were borrowed by Warncke from the Zoological Museum of Moscow University (Y. Astafurova pers. comm.) at some point and never identified.

The specimen itself perfectly matches material of *A. pinguis* from Turkey and Iran, and the two taxa cannot be confused, as *A. pinguis* has the mesepisternum coarsely areolate, whereas it is smooth in *A. limonii*. Ariana *et al*. (2009a) did not examine the female type (in the Moscow State University collection), but they did examine a male from the locus typicus collected 3 Aug. 1954, leg. Razumova, which would therefore not be a paratype, unless this is a typographical error and the specimen was collected on 13 Aug. 1954, in which case it would be part of the type series (see Osytshnjuk 1983b for details of paratypes). The holotype should be examined to ensure that it corresponds to *A. limonii* sensu Ariana *et al*., though given the strong morphological differences it seems more likely that the two taxa simply (though unexpectedly) occur in sympatry.

Distribution

Russia*****, Turkey, Iran***** (Ariana *et al*. 2009b).

141. *Andrena* (*Simandrena*) *propinqua* Schenck, 1853 *

Material examined

IRAN • 2 ♀♀; East Azerbaijan Province, Sis, 10 km E of Shabestar; 1540 m a.s.l.; 19 Jun. 2010; Mi. Halada leg.; OÖLM.

Distribution

Unclear because of synonymy with *A. dorsata*; probably distributed from north-western Africa throughout Europe to Turkey (Gusenleitner & Schwarz 2002; Hazir *et al*. 2014).

142. *Andrena* (incertae sedis) *pruinosa succinea* Dours, 1872

Material examined

JORDAN • 1 ♂; 30 km N of Tafila [At-Tafilah]; 2 May 1996; Ma. Halada leg.; OÖLM.

LIBYA • 1 ♀; Cyrenaika, Brega; 4–31 Mar. 1958; K.M. Guichard leg.; NHMUK.

SAUDI ARABIA • 1 ♀; S of Riyadh, Al Kharj; 20 Mar. 1980; K.M. Guichard leg.; NHMUK.

SYRIA • 1 ♀; NW of Aleppo, Afrin; 23 Jun. 2000; M. Halada leg.; OÖLM.

Literature records

Khodaparast & Monfared (2012, as *pruinosa* Erichson, 1835).

Remarks

The subspecies *succinea* will be elevated to species status in a subsequent publication dealing with the *Andrena* fauna of the Iberian Peninsula.

Distribution (subspecies *succinea*)

Morocco, Algeria, Tunisia, Libya*****, Egypt, Israel and the West Bank, Jordan*****, Syria*****, Saudi Arabia*****, Iran.

143. *Andrena* (*Aciandrena*) *pulicaria* Warncke, 1975 *

Material examined

IRAN • 4 ♀♀; Fars Province, 15 km S of Dasht Arjan; 2261 m a.s.l.; 2–6 May 2016; M. Obořil leg.; OÖLM.

Distribution

Greece, Turkey, Iran* (Warncke 1975).

144. *Andrena* (*Melandrena*) *pyropygia* Kriechbaumer, 1873

Literature records

Osytshnjuk *et al*. (2008).

Distribution

Greece, Ukraine, Russia (European part), Turkey, Cyprus, Israel and the West Bank, Lebanon, Syria, the Caucasus, Iran (Gusenleitner & Schwarz 2002; Wood *et al*. 2020a).

145. *Andrena* (*Melandrena*) *quadrimaculata* Friese, 1921

Material examined

ARMENIA • 1 ♀; S of Vedi-Chozrov; 4 Jun. 2003; M. Múčka leg.; OÖLM.

TURKEY • 1 ♀; Kars, 10 km E of Karakurt; 1500 m a.s.l.; 28 May 1983; K. Warncke leg.; OÖLM • 1 ♀; Hakkâri, S. Beytüşşebap; 1300 m a.s.l.; 13 Jun. 1984; K. Warncke leg.; OÖLM.

Literature records

Ascher & Pickering (2021).

Remarks

The source of the Ascher & Pickering listing is unclear. The distribution maps of Warncke (Gusenleitner & Schwarz 2002) indicate that *A. quadrimaculata* is present in northern Iran, though no specimens could be found in the Warncke collection. The species does occur in eastern Turkey and Armenia, so it is considered highly likely to be present in Iran.

Distribution

Albania, Turkey, Armenia, Azerbaijan, Iran (Gusenleitner & Schwarz 2002).

146. *Andrena* (*Micrandrena*) *querquedula* Warncke, 1975 *

Material examined

IRAN • 1 ♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Yasouj, Deli Bajak, Sepidar; 2181 m a.s.l.; 23 Apr. 2021; E. Rostami leg.; ICPI • 2 ♂♂, 21 ♀♀; Yasouj, Doposhteh, Dasht-e Rum; 2091 m a.s.l.; 31 Mar.–10 Apr. 2021; E. Rostami leg.; ICPI • 1 ♂; Yasouj, Tang Konareh, Dasht-e Rum; 1858 m a.s.l.; 29 Mar. 2021; E. Rostami leg.; ICPI • 7 ♂♂, 25 ♀♀; Yasouj, Tange Tamoradi; 2247 m a.s.l.; 9–29 Mar. 2021; E. Rostami leg.; ICPI.

Remarks

Collected from *Acer monspessulanum* in the Yasouj area, supporting the morphological link with *Andrena dividicincta* Pisanty, 2022 (Pisanty *et al*. 2022a).

Distribution

Greece, Turkey, Iran* (Gusenleitner & Schwarz 2002; Rasmont *et al*. 2017).

147. *Andrena* (incertae sedis) *ranunculorum* Morawitz, 1877

Material examined

IRAN • 1 ♀; Elburz Mountains, Kandelouz; 2100 m a.s.l.; O. Sauša leg.; OÖLM • 1 ♀; Mazandaran Prov., 10 km N of Gashar [Gachsar]; 2300–2700 m a.s.l.; 7 Jun. 2014; J. Halada leg.; OÖLM • 1 ♀; Pass SW of Chalus-Karaj/Mazandaran; 2100 m a.s.l.; 28 May 1978; M. Kraus leg.; OÖLM • 1 ♀; Khorasan, 15 km W of Bodjnurd; 1300 m a.s.l.; 30 May 1977; C. Holzschuh leg.; OÖLM.

Literature records

Indicated as present in Iran by the distribution maps of Warncke (Gusenleitner & Schwarz 2002), though these specimens could not be found in his collection.

Distribution

Spain, France, Switzerland, Italy, Ukraine, Turkey, Russia (European part, Urals, Western Siberia, Eastern Siberia), Iran, Turkmenistan, Uzbekistan, Kazakhstan, Tajikistan (Gusenleitner & Schwarz 2002; Proshchalykin *et al*. 2017a; Ascher & Pickering 2021).

148. *Andrena* (*Hoplandrena*) *rosae* Panzer, 1801

Material examined

IRAN • 2 ♂♂; Boyer-A. o. Kohg Prov., Kuh Gol, near Sisakht; 2500 m a.s.l.; 9 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♀; Fars Province, 10 km E of Kazerum; 1990 m a.s.l.; 23 May 2014; J. Halada leg.; OÖLM • 1 ♂; Fars Province, Dast Arjan; 2260 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♂; Gilan Province, Tutkabon near Roodbar; 16 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♀; Mazandaran Prov., 10 km N of Gashar [Gachsar]; 2300–2700 m a.s.l.; 7 Jun. 2014; J. Halada leg.; OÖLM • 8 ♀♀; Yasouj, 3 km after Davood Abad Village; 1898 m a.s.l.; 6 Apr. 2021; E. Rostami leg.; ICPI • 3 ♂♂; Yasouj, Deli Bajak, Sepidar; 2181 m a.s.l.; 23 Apr. 2021; E. Rostami leg.; ICPI • 1 ♀; Yasouj, Doposhteh, Dasht-e Rum; 2091 m a.s.l.; 31 Mar. 2021; E. Rostami leg.; ICPI • 1 ♀; Yasouj, Khahkaloon; 2037 m a.s.l.; 25 Apr. 2021; E. Rostami leg.; ICPI • 1 ♀; Yasouj, Sisakht, Mishi Spring; 2341 m a.s.l.; 10 Apr. 2021; E. Rostami leg.; ICPI.

Literature records

Alfken (1935); Popov (1967); Osytshnjuk *et al*. (2008).

Distribution

Palearctic (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

149. *Andrena* (incertae sedis) *rostamiae* sp. nov.

Distribution

Iran.

150. *Andrena* (*Truncandrena*) *rufomaculata* Friese, 1921 *

Material examined

IRAN • 1 ♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Yasouj, Doposhteh, Dasht-e Rum; 2091 m a.s.l.; 31 Mar. 2021; E. Rostami leg.; ICPI • 1 ♂; Yasouj, Tang Konareh, Dasht-e Rum; 1858 m a.s.l.; E. Rostami leg.; ICPI.

Distribution

Turkey, Israel and the West Bank, Lebanon, Jordan, Syria, Iran* (Wood *et al*. 2020a).

151. *Andrena* (*Micrandrena*) *rugulosa* Stoeckhert, 1935

Literature records

Khodaparast & Monfared (2012); Allahverdi *et al*. (2016).

Distribution

Central Europe to Turkey, Lebanon, the Caucasus, Iran (Gusenleitner & Schwarz 2002; Boustani *et al*. 2021).

152. *Andrena* (*Taeniandrena*) *russula* Lepeletier, 1841

Material examined

IRAN • 3 ♀♀; East Azerbaijan Province, Sis, 10 km E of Shabestar; 1540 m a.s.l.; 19 Jun. 2010; Mi. Halada leg.; OÖLM • 3 ♀♀; Lorestan Province, Tootmashour [Tut, Masur-e Abi]; 2000 m a.s.l.; 31 May 2010; Mi. Halada leg.; OÖLM • 1 ♀; Shiraz-Yasouj road (15 km to Yasouj); 20 May 2011; A. Monfared leg.; ICPI • 1 ♂; Tehran env.; 2 May 1999; K. Deneš leg.; OÖLM.

Literature records

Khodaparast & Monfared (2012); Khodarahmi Ghahnavieh & Monfared (2019); Praz *et al*. (2022).

Remarks

Praz *et al*. (2022) synonymised *A. similis* Smith, 1849 with *A. russula*.

Distribution

West Palearctic (Gusenleitner & Schwarz 2002; Praz *et al*. 2022).

153. *Andrena* (*Troandrena*) *saettana* Warncke, 1975 *

Material examined

IRAN • 1 ♂; East Azerbaijan Province, Sis, 10 km E of Shabestar; 1540 m a.s.l.; 19 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♀; Yasouj, Deli Awlad Alimomen; 2068 m a.s.l.; 30 Apr. 2021; E. Rostami leg.; ICPI • 2 ♀♀; Yasouj, Sisakht, Mishi Spring; 2341 m a.s.l.; 10 Apr. 2021; E. Rostami leg.; ICPI • 1 ♀; Yazd, Tezerjan Bagh-e Agha Seyyed; 2226 m a.s.l.; 5 May 2021; S. San leg.; ICPI • 2 ♀♀; Pass E Neyriz/Fars; 18 May 1978; K. Warncke leg.; OÖLM.

JORDAN • 1 ♀; Petra; 14 May 1995; E. Scheuchl det.; K. Deneš leg.; SMNHTAU • 1 ♀; Petra [Wadi Musa]; K. Deneš leg.; OÖLM.

Distribution

Greece, Turkey, Cyprus, Golan Heights, Jordan*, Iran* (Warncke 1975; Pisanty *et al*. 2018).

154. *Andrena* (*Euandrena*) *sani* sp. nov.

Distribution

Iran.

155. *Andrena* (*Suandrena*) *savignyi* Spinola, 1838 *

Material examined

IRAN • 1 ♀; Lar, Fars; 18 Apr. 2012; S. Khazraie leg.; ICPI • 1 ♀; Yasouj; 1–30 Apr. 2015; M. Davoodi leg.; ICPI • 1 ♂; Yazd, Khezr abad Karkhane asphalt; 1317 m a.s.l.; 21 Mar. 2021; S. San leg.; ICPI • 1 ♂; Yazd, Kouch e talar e yazd; 1200 m a.s.l.; 1 Apr. 2020; S. San leg.; ICPI.

JORDAN • 1 ♀; Wadi Rum; 4–5 May 1996; Mi. Halada leg.; OÖLM.

OMAN • 1 ♂; Hajar Mountains, Ghubrah Canyon; 7 Feb. 2016; J. Monks leg.; NHMUK • 1 ♂, 1 ♀; NW of Bahla, Al Ayshi; 6 Mar. 2017; M. Snižek leg.; OÖLM • 1 ♂, 1 ♀; Samed Ashan, Asswareej; 1 Dec. 2019; A. Al Jahdhami leg.; NHMUK.

YEMEN • 1 ♂; San'a [Sana'a]; 7,900 feet [ca 2400 m]; 2–9 Oct. 1937; Dr. C. Rathjens; NHMUK • 1 ♂; W. Aden Prot., Jebel Jihaf [Djabal Djihaf]; ca. 7100 feet [2100 m]; 1–31 Oct. 1937; H. Scott and E.B. Britton; NHMUK.

Distribution

Spain (Canary Islands), Morocco, Algeria, France (Corsica), Italy (Sardinia), Tunisia, Libya, Egypt, Israel and the West Bank, Jordan*, Saudi Arabia, Yemen*, Iraq, Iran*, United Arab Emirates, Oman*, Afghanistan, Pakistan, India (Warncke 1974c; Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

156. *Andrena* (*Opandrena*) *schencki* Morawitz, 1866

Material examined

IRAN • 9 ♂♂; West Azerbaijan Province, Serou; 1650 m a.s.l.; 28 May 2010; Mi. Halada leg.; OÖLM • 1 ♀; Gilan Province, 15 km SE of Tutkabon; 1100 m a.s.l.; 9 Jun. 2014; J. Halada leg.; OÖLM • 1 ♀; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; 10 May 2016; M. Kafka leg.; OÖLM.

Literature records

Osytshnjuk *et al*. (2008).

Distribution

West Palearctic to Turkmenistan (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

157. *Andrena* (*Scitandrena*) *scita* Eversmann, 1852

Material examined

IRAN • 1 ♀; Gilan, 5 km E of Rudbar; 400 m a.s.l.; 8 Jun. 2014; J. Halada leg.; OÖLM.

Literature records

Popov (1967).

Distribution

West and Central Palearctic (Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

158. *Andrena* (*Euandrena*) *scrophulariae* Wood, 2020 *

Material examined

IRAN • 1 ♂, 1 ♀; Yasouj, Deli Bajak, Sepidar; 2181 m a.s.l.; 23 Apr. 2021; E. Rostami leg.; ICPI • 1 ♀; Yasouj, Kakan [Fars Province]; 30 Mar. 2010; M. Najafi leg.; ICPI.

Distribution

Golan Heights, Lebanon, Turkey, Iran* (Wood *et al*. 2020a; Pisanty *et al*. 2022a).

159. *Andrena* (*Micrandrena*) *sedentaria* Warncke, 1975 *

Material examined

IRAN • 1 ♀; Elburz Mountains, 60 km E of Minudasht; 26 May 2007; O. Sauša leg.; OÖLM • 1 ♂, 18 ♀♀; Golestan, 40 km E of Minudasht NP; 750 m a.s.l.; 1 Jun. 2014; J. Halada leg.; OÖLM.

Remarks

The relationship between *Andrena sedentaria* and *A.* (*Micrandrena*) *dmitrii* Osytshnjuk, 1993, which was described from the Turkmenistani side of the Kopet Dag mountain range, is unclear and should be investigated, as the latter may be a junior synonym. As noted by Gusenleitner & Schwarz (2002), female *A. sedentaria* are very similar to *A. luscinia*, but the tergal margins are shagreened and with scattered punctures, a trait mentioned in their comments on *A. dmitrii*. Type revision is required.

Distribution

Turkey and Iran* (Gusenleitner & Schwarz 2002).

160. *Andrena* (*Planiandrena*) *sella* Wood sp. nov.

Distribution

Iran.

161. *Andrena* (incertae sedis) *seminuda* Friese, 1896

Material examined

TURKEY • 1 ♀; Hakkâri, S. Varegös/Mt. Sat; 1700 m a.s.l.; 15 Jun. 1984; K. Warncke leg.; OÖLM.

Literature records

Ascher & Pickering (2021).

Remarks

The source of the listing of Ascher & Pickering is unclear. The distribution maps of Warncke (Gusenleitner & Schwarz 2002) indicate that *A. seminuda* is present in northwestern Iran. Given that *A. seminuda* is found in eastern Turkey, it is considered highly likely to be present in Iran.

Distribution

Central Europe to Russia (European part), Turkey, the Caucasus, Iran (Gusenleitner & Schwarz 2002).

162. *Andrena* (incertae sedis) *shakuensis* Popov, 1949

Literature records

Popov (1949); Osytshnjuk *et al*. (2005).

Remarks

The taxonomic status and placement of *A. shakuensis* is completely unclear. Originally described in the subgenus *Plastandrena* (Popov 1949), Gusenleitner & Schwarz (2002) commented that the type lacks the rugose areolate propodeal triangle that helps characterise this subgenus, suggesting placement in the subgenus *?Poliandrena* instead. Osytshnjuk *et al*. (2005) placed *A. shakuensis* in the subgenus *Campylogaster*, noting the squamous hairs on the scutum in the female sex. As the former subgenus *Poliandrena* has been found to be strongly polyphyletic, and since most taxa placed in *Campylogaster* probably do not belong there (Pisanty *et al*. 2022b), type revision is required to establish the identity of *A. shakuensis* and its phylogenetic placement.

Distribution

Iran.

163. *Andrena* (*Micrandrena*) *sillata histrionica* Warncke, 1975 *

Material examined

IRAN • 17 ♀♀; Ilam Province, Abda Man, Dinar Gaouh; 1830 m a.s.l.; 12 May 2016; M. Kafka leg.; OÖLM • 2 ♀♀; Ilam Province, Sar Joob; 1930 m a.s.l.; 13 May 2016; M. Kafka leg.; OÖLM • 5 ♀♀; Kurdistan Province, Paniran; 1450 m a.s.l.; 14 May 2016; M. Kafka leg.; OÖLM • 7 ♀♀; Tehran Province, Samgh Abad; 1900 m a.s.l.; 16 May 2016; M. Kafka leg.; OÖLM.

Distribution (*sillata* s. str.)

Greece, Turkey, Israel and the West Bank, Lebanon, Jordan; subspecies *histrionica* in Turkey and Iran* only (Gusenleitner & Schwarz 2002; Pisanty *et al*. 2022a).

164. *Andrena* (*Cnemidandrena*) *simillima sischkai* Warncke, 1988 *

Material examined

TURKEY • 1 ♂, 1 ♀; Hakkâri, Tal S Gevria-Pass; 3000 m a.s.l.; 4 Aug. 1986; S. Blank and K. Warncke leg.; OÖLM.

Literature records

Central Alborz, Kandavan Pass, nr Pol-e-Zanguleh; 2200 m a.s.l.; 17 Aug. 1967; D. Baker leg.; SEMC; via GBIF occurrence 784989096.

Remarks

This material is almost certainly referable to the subspecies *sischkai* that is known from high mountains in the Balkan Peninsula, eastern Turkey, and the North Caucasus. It, along with the other 'subspecies' of *A. simillima*, is likely to represent a good taxon (Wood *et al*. 2020b; Wood 2021b; Le Divelec 2021), but a revision is required.

Distribution (subspecies *sischkai*)

Greece, Bulgaria, Russia (Teberda), Turkey*, Iran* (Warncke 1988).

165. *Andrena* (*Campylogaster*) *skorikovi* Popov, 1940

Literature records

Popov (1940, locus typicus).

Remarks

The taxonomic status of *A. skorikovi* is unclear and should be resolved. It is known from a single female specimen collected in southern Iran (Shellali near Dizful, Arabistan [now Dezful, Khuzestan Province]) on 4 March 1904. In his description, Popov compared *A. skorikovi* to *A. iranella*, noting a strong similarity, but giving characters related to the density of tergal puncturing. Gusenleitner & Schwarz (2002) remark on the strong structural similarity, noting that the dark coloured *A. skorikovi* may represent the first generation of the red-coloured *A. iranella* (citing a specimen in their possession from July). However, Osytshnjuk *et al*. 2005 write that *A. iranella* flies in April and May, and Popov listed specimens from March–May in the type series; further collection is required to establish whether *A. iranella* and *A. skorikovi* are distinct taxa.

Distribution

Iran (Popov 1940).

166. *Andrena* (*Ulandrena*) *speciosa* Friese, 1899

Literature records

Khodarahmi Ghahnavieh & Monfared (2019).

Distribution

Morocco, Algeria, Tunisia, Libya, Egypt, Israel and the West Bank, Jordan, Syria, Iran (Gusenleitner & Schwarz 2002; Wood *et al*. 2020b).

167. *Andrena* (*Micrandrena*) *spreta* s. lat. Pérez, 1895 *

Material examined

IRAN • 2 ♀♀; Yazd, Abarkooh, Faraghe; 1698 m a.s.l.; 17 Mar. 2021; S. San leg.; ICPI • 1 ♀; Yazd, Hossein Abad to Banadak Sadat; 2067 m a.s.l.; 22 Mar. 2021; S. San leg.; ICPI • 2 ♀♀; Yazd, Mehriz, Bagh e Safa Khanoom; 1500 m a.s.l.; 7 Mar. 2020; S. San leg.; ICPI • 9 ♀♀; 30 km S of Yazd, Mt Sir Kuh; 7 May 1999; K. Deneš leg.; OÖLM • 1 ♀; Kašan [Kashan]; 3 May 1999; K. Deneš leg.; OÖLM • 22 ♂♂, 59 ♀♀; Persepolis env.; 9 May 1999; K. Deneš leg.; OÖLM • 2 ♂♂, 7 ♀♀; Tehran env.; 2 May 1999; K. Deneš leg.; OÖLM.

Remarks

The *A. spreta* complex is highly taxonomically challenging, with currently no clear interpretation (Gusenleitner & Schwarz 2002). A broad interpretation is taken here; much more taxonomic work is needed, including a molecular revision. The taxon *A.* (*Micrandrena*) *aiderensis* Osytshnjuk, 1993 was described from Aýdere on the Turkmenistani side of the Kopet Dag. This taxon should be included in future revisions of the group as it may be *A. spreta* (Gusenleitner & Schwarz 2002).

Distribution

Unclear, but in the opinion of the lead author there is a broad pan-Mediterranean *A. spreta* taxon.

168. *Andrena* (*Melandrena*) *stigmatica* Morawitz, 1894

Literature records

Ascher & Pickering (2021).

Remarks

The source of the Ascher & Pickering listing is unclear. The distribution maps of Warncke (Gusenleitner & Schwarz 2002) indicate a single recorded locality of *A. stigmatica* in northern Iran. No specimens could be found in the Warncke collection. The species is included in this list, but further investigation is required.

Distribution

Crimea, Iran, Turkmenistan (Osytshnjuk *et al*. 2008).

169. *Andrena* (*Micrandrena*) *stoeckhertella* Pittioni, 1948

Material examined

ARMENIA • 1 ♀; Bjurakan [Byurakan] env.; 1500 m a.s.l.; 5 Jun. 1989; J. Strejček leg.; OÖLM.

Literature records

Aliyev *et al*. (2017); Ascher & Pickering (2021).

Remarks

The original records supporting these listings are not clear. The distribution maps of Warncke (Gusenleitner & Schwarz 2002) indicate that *A. stoeckhertella* is present in northern Iran. Given its presence in the Caucasus, the taxon is considered to be present in Iran.

Distribution

Ukraine, Russia (European part), Turkey, Georgia, Armenia*, Azerbaijan, Iran (Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

170. *Andrena* (*Micrandrena*) *subviridula* Wood sp. nov.

Distribution

Iran.

171. *Andrena* (*Euandrena*) *symphyti* Schmiedeknecht, 1883

Material examined

IRAN • 1 ♂; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♂; Tehran Province, 6 km N of Gačsar [Gachsar]; 29 May–2 Jun. 2002; J. Prochazka leg.; OÖLM.

Literature records

Khodaparast & Monfared (2012).

Distribution

For *A. symphyti* Schmiedeknecht, 1883 in a broad sense, Europe to Turkey, the Levant, the Caucasus, Iran (Gusenleitner & Schwarz 2002; Scheuchl & Willner 2016; Pisanty *et al*. 2022a).

172. *Andrena* (*Micrandrena*) *tabula* Wood sp. nov.

Distribution

Turkey and Iran.

173. *Andrena* (*Chlorandrena*) *tadauchii* Gusenleitner, 1998 *

Material examined

IRAN • 1 ♂; Lorestan Province, Dorud Lanjaban env.; 960 m a.s.l.; 10 May 2016; M. Kafka leg.; OÖLM.

Distribution

Turkey, Israel and the West Bank, Syria, Iran* (Pisanty *et al*. 2022a).

174. *Andrena* (*Ulandrena*) *tecta* Radoszkowski, 1876

Material examined

IRAN • 1 ♂; Azerbaidjan [Province], 30 km SE of Shahpur; 1500 m a.s.l.; 4 Jun. 1978; C. Holzschuh leg.; OÖLM.

TURKEY • 1 ♂, 2 ♀♀; Hakkâri, 5 km N of Oramar [river]; 1450 m a.s.l.; 16 Jun. 1984; K. Warncke leg.; OÖLM • 1 ♂; Hakkâri, Suvari Halil-Pass; 2300 m a.s.l.; 14 Jun. 1984; K. Warncke leg.; OÖLM • 9 ♂♂, 1 ♀; Hakkâri, S. Varegös/Mt Sat; 15 Jun. 1984; K. Warncke leg.; OÖLM.

Literature records

Allahverdi *et al*. (2015).

Remarks

Full distribution unclear because of historical synonymy with *A. concinna* Smith, 1853 (see Gusenleiter & Schwarz 2002). Probably restricted to the Caucasus and immediately neighbouring areas. It is also the likely senior synonym of *A. carinata* Morawitz, 1877, which was also described from the Caucasus.

Distribution

Turkey, Georgia, Armenia, Azerbaijan, Iran (Ascher & Pickering 2021).

175. *Andrena* (*Aciandrena*) *tenuis* Morawitz, 1877

Literature records

Popov (1967); Osytshnjuk *et al*. (2005).

Distribution

Turkey, Georgia, Armenia, Azerbaijan, Iran, Turkmenistan (Gusenleiter & Schwarz 2002; Osytshnjuk *et al.* 2005).

176. *Andrena* (*Simandrena*) *thomsonii* Ducke, 1898

Material examined

IRAN • 1 ♀; Yasouj, Sisakht, Mishi Spring; 2341 m a.s.l.; 10 Apr. 2021; E. Rostami leg.; ICPI • 2 ♀♀; Yasouj, Tange Tamoradi; 2247 m a.s.l.; 21–29 Mar. 2021; E. Rostami leg.; ICPI.

Literature records

Khodaparast & Monfared (2012).

Distribution

Southern Europe to Central Asia, Turkey, Golan Heights, Lebanon, Iran (Gusenleiter & Schwarz 2002; Pisanty *et al*. 2022a).

177. *Andrena* (*Melandrena*) *thoracica* (Fabricius, 1775)

Material examined

IRAN • 1 ♀; Rahatabad, Tehran; 18 Apr. 2011; A. Monfared leg.; ICPI • 1 ♂, 2 ♀♀; Yasouj, Vezg [Kūh-e Vezg]; 19 Apr. 2011; H. Elahi and M. Mesavian leg.; ICPI • 1 ♂, 1 ♀; Yazd, Abarkooh, Faraghe; 1698 m a.s.l.; 6 Mar. 2021; S. San leg.; ICPI • 2 ♀♀; Yazd, Tezerjan Bagh-e Agha Seyyed; 2226 m a.s.l.; 12 Jun. 2020; S. San leg.; ICPI • 1 ♀; Yazd, Tezerjan Bagh-e Agha Seyyed; 2226 m a.s.l.; 13 May 2021; S. San leg.; ICPI • 1 ♂; Yazd, Tezerjan, paen tar az Seyyed Mahmood; 1993 m a.s.l.; 6 Mar. 2020; S. San leg.; ICPI • 1 ♀; Yazd, Yazd road to Sanij; 2621 m a.s.l.; 27 Mar. 2019; S. San leg.; ICPI**.**

Literature records

Morice (1921); Alfken (1935); Popov (1967); Osytshnjuk *et al*. (2008).

Distribution

Palearctic (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008; Ascher & Pickering 2021).

178. *Andrena* (*Micrandrena*) *tiaretta* Warncke, 1974

Literature records

Kratochwil (2015).

Distribution

Spain, Morocco, Algeria, Libya, Egypt, Israel, Syria according to the broad interpretation of Warncke (Gusenleitner & Schwarz 2002). Kratochwil (2015) split *A. tiaretta* into three taxa, though not all individuals (including Iranian material) could be placed within this system. In the absence of genetic data, a broad interpretation of this taxon is taken here.

179. *Andrena* (*Plastandrena*) aff. ***tibialis*** (Kirby, 1802)

Material examined

IRAN • 1 ♂; Yasouj, Abshar; 2–8 Mar. 2011; H. Elahi and M. Mesavian leg.; ICPI • 1 ♂; Yasouj, Vezg; 19 Apr. 2011; H. Elahi and M. Mesavian leg.; ICPI.

Literature records

Alfken (1935); Popov (1967); Allahverdi *et al*. (2016).

Remarks

The two male specimens examined here have the genital capsules of *A. tibialis*, but S8 is noticeably broadened apically, and should be recorded as 'aff. *tibialis*'. As noted by Gusenleitner & Schwarz (2002), *A. tibialis* shows considerable variation across its range, particularly in Turkey and the Middle East. A revision of this taxon is needed, preferably with molecular techniques.

Distribution

In a broad sense, Palearctic (Gusenleitner & Schwarz 2002; Scheuchl & Willner 2016).

180. *Andrena* (*Micrandrena*) *tkalcui* Gusenleitner & Schwarz, 2002 *

Material examined

IRAN • 4 ♀♀; Bakhtiyari Province, 20 km SE of Lordegan; 31 May 2014; J. Halada leg.; OÖLM • 2 ♀♀; Gilan Province, 20 km W of Astara; 640 m a.s.l.; 17 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♂, 5 ♀♀; Kašan [Kashan]; 3 May 1999; K. Deneš leg.; OÖLM • 1 ♀; Lorestan Province, 10 km SW of Dorud; 1520 m a.s.l.; 20 May 2014; J. Halada leg.; OÖLM.

Distribution

Turkey, Israel and the West Bank, Jordan*, Syria*, Iran* (Gusenleitner & Schwarz 2002).

181. *Andrena* (*Lepidandrena*) *tomentosa* Morawitz, 1877 *

Material examined

IRAN • 1 ♀; Mazandaran Prov., 10 km N of Gashar [Gachsar]; 2300–2700 m a.s.l.; 7 Jun. 2014; J. Halada leg.; OÖLM • 1 ♂; Pass SW Chalus-Karaj/Mazandaran; 2470 m a.s.l.; 28 May 1978; K. Warncke det.; M. Kraus leg.; OÖLM.

Literature records

Centr. Alborz, Kandavan Pass, 8 km above Siahbishe; 2400 m a.s.l.; 10 Jun. 1967; D. Baker leg.; SEMC; via GBIF occurrence 658462817.

Distribution

Turkey, Armenia, Iran* (Osytshnjuk *et al*. 2008; Ascher & Pickering 2021).

182. *Andrena* (*Cordandrena*) *torda* Warncke, 1965 *

Material examined

IRAN • 1 ♀; Mazandaran Prov., 10 km N of Gashar [Gachsar]; 2300–2700 m a.s.l.; 7 Jun. 2014; J. Halada leg.; OÖLM • 1 ♂; Pass SW of Chalus-Karaj/Mazandaran; 2470 m a.s.l.; 28 May 1978; K. Warncke det.; M. Kraus leg.; OÖLM.

Distribution

Greece, Turkey, Cyprus, Israel and the West Bank, Iran* (Gusenleitner & Schwarz, 2002). Records from Lebanon, Jordan, and Syria reported by Wood *et al*. (2020a) were incorrectly identified female *A. cypria*. *Andrena torda* is likely still present in these countries, but must be confirmed with unambiguously distinctive male material.

183. *Andrena* (*Simandrena*) *transitoria* Morawitz, 1871

Material examined

IRAN • 1 ♂; West Azerbaijan Province, Serou; 1650 m a.s.l.; 28 May 2010; Mi. Halada leg.; OÖLM • 1 ♂; Golestan Province, Gorgan env. [36°82′ N, 54°28′ E]; 7 Jun. 2009; J. Voříšek leg.; OÖLM • 1 ♀; Golestan, 70 km E of Minudasht; 1050 m a.s.l.; 12 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♀; Khorasan Province, 10 km W of Raz; 1200 m a.s.l; 27 May 2014; J. Halada leg.; OÖLM.

Literature records

Allahverdi *et al*. (2016).

Distribution

Central Europe to Central Asia and the Middle East (Warncke 1974c; Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

184. *Andrena* (*Hoplandrena*) *trimmerana* (Kirby, 1802) *

Material examined

IRAN • 1 ♂; Yasouj, Abshar; 2 Mar. 2011; H. Elahi and M. Mesavian leg.; ICPI • 1 ♂; Yasouj, Tange Tamoradi; 2247 m a.s.l.; 21 Mar. 2021; E. Rostami leg.; ICPI.

Literature records

Mazandaran; coastal plain between Chalus and Shahsavar; 20 m a.s.l.; 6 Mar. 1968; D. Baker leg.; SEMC; via GBIF occurrence 784989671.

Distribution

Not completely clear because of problems separating females from those of *A. scotica* Perkins, 1916 (see below), but it appears to be distributed across Europe into north-western Africa, Turkey, Lebanon, Golan Heights, Iran (Gusenleitner & Schwarz 2002; Wood *et al*. 2020a).

185. *Andrena* (*Truncandrena*) *truncatilabris* Morawitz, 1877

Material examined

IRAN • 1 ♂; Chalus, Marzan Abad; 28 Apr. 1995; M. Kafka leg.; OÖLM • 1 ♀; Mazandaran Province, Kojuk [36°23′ N, 51°40′ E?; 7 Jun. 2014; J. Halada leg.; OÖLM • 1 ♀; West [West Azerbaijan Province], Češme Bigar env. [Çeşmə, or Cheshmeh, 38.594° N, 45.119° E]; 14 May 1999; K. Deneš leg.; OÖLM.

Literature records

Popov (1967).

Distribution

West and Central Palearctic (Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

186. *Andrena* (*Aciandrena*) *turmalina* Pisanty & Wood, 2022

Literature records

Pisanty *et al*. (2022a).

Distribution

Golan Heights, Turkey, and Iran (Pisanty *et al*. 2022a).

187. *Andrena* (*Notandrena*) *ungeri* Mavromoustakis, 1952 *

Material examined

IRAN • 1 ♀; Persepolis env.; 9 May 1999; K. Deneš leg.; OÖLM.

Distribution

South-eastern Europe, Turkey, Cyprus, Israel and the West Bank, Lebanon, Jordan, Syria, Iran* (Wood *et al*. 2020a).

188. *Andrena* (*Ulandrena*) *unicincta* Friese, 1899

Material examined

IRAN • 1 ♂, 1 ♀; 50–70 km E of Minudasht, Golestan Forest; 450–700 m a.s.l.; 23 Apr. 1978; Holzschuh leg.; OÖLM.

SYRIA • 1 ♀; Apamea; 29 Apr. 1995; K. Deneš leg.; OÖLM • 1 ♀; Ganawat [Qanawat]; 16 May 1995; K. Deneš leg.; OÖLM • 4 ♀♀; Jisr al-Shughur; 26 May 1996; Ma. Halada leg.; OÖLM.

TURKEY • 1 ♂; Hakkâri, 5 km N of Oramar [river]; 1450 m a.s.l.; 11 Jun. 1981; K. Warncke leg.; OÖLM • 1 ♀; Şemdinli, Hakkâri; 1700 m a.s.l.; 12 Jun. 1981; K. Warncke leg.; OÖLM.

Literature records

Khodarahmi Ghahnavieh & Monfared (2019).

Remarks

Molecular revision of the *polita* group of *Ulandrena* is required, particularly the red-marked species that includes *A. unicincta*, as additional cryptic taxa may be present.

Distribution

Turkey, Israel and the West Bank, Lebanon, Jordan, Syria*, Iran (Wood *et al*. 2020a).

189. *Andrena* (*Truncandrena*) *urfanella* Scheuchl & Hazir, 2012 *

Material examined

IRAN • 1 ♂; West [West Azerbaijan Province], Češme Bigar env. [Çeşmə, or Cheshmeh, 38.594° N, 45.119° E]; 14 May 1999; K. Deneš leg.; OÖLM.

JORDAN • 1 ♀; 15 km W of Jerash, Dibbin; 2 May 2006; K. Deneš leg.; OÖLM • 1 ♂, 3 ♀♀; 20 km N of Karak; 1000 m a.s.l.; 27 Apr. 2006; K. Deneš leg.; OÖLM • 2 ♀♀; 30 km N of Tafila [At-Tafilah]; 2 May 1996; Ma. Halada leg.; OÖLM • 2 ♀♀; Ajlun S of Anjara; 27 Apr. 2002; M. Snižek leg.; OÖLM • 1 ♀; Amman; 26 Mar. 1986; M. Kraus leg.; OÖLM • 6 ♀♀; Irbid, Saham vill.; 19–25 Apr. 2003; I. Pljushtch leg.; OÖLM • 2 ♀♀; North Shuna; 20 Apr. 1996; M. Halada leg.; OÖLM.

SYRIA • 2 ♂♂; 8 km N of Shaykh Miskin [Al Sheikh Maskin]; 28 Mar. 1994; S. Becvar leg.; OÖLM • 1 ♀; SW of Aleppo; 700 m a.s.l.; 7 Apr. 1988; L. Blank leg.; OÖLM.

Distribution

Turkey, Israel and the West Bank, Jordan*, Syria*, Iran* (Scheuchl & Hazir 2012).

190. *Andrena* (*Melandrena*) *vaga* Panzer, 1799

Literature records

Allahverdi *et al*. (2016).

Distribution

Europe, Russia (European part, Urals, Western Siberia, Eastern Siberia), the Caucasus, Iran, Central Asia (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008; Proshchalykin *et al*. 2017a).

191. *Andrena* (*Holandrena*) *variabilis* Smith, 1853

Material examined

IRAN • 3 ♂♂; West Azerbaijan Province, Serou; 1650 m a.s.l.; 28 May 2010; Mi. Halada leg.; OÖLM • 1 ♀; Gilan Province, 15 km SE of Tutkabon; 1100 m a.s.l.; 9 Jun. 2014; J. Halada leg.; OÖLM • 1 ♀; Gilan Province, 5 km E of Rudbar; 400 m a.s.l.; 8 Jun. 2014; J. Halada leg.; OÖLM • 1 ♀; Yasouj; 7 May 2012; A. Arsalannia leg.; OÖLM • 1 ♀; Yasouj, Kakan [Fars Province]; 22 Apr. 2011; A. Monfared leg.; OÖLM.

Literature records

Popov (1967).

Distribution

West and Central Palearctic (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008).

192. *Andrena* (*Cryptandrena*) *ventricosa* Dours, 1873 *

Material examined

IRAN • 1 ♀; East Azerbaijan Province, Sis, 10 km E of Shabestar; 1540 m a.s.l.; 19 Jun. 2010; Mi. Halada leg.; OÖLM • 1 ♂; Esfahan [Isfahan], Ardestan, Rahmatabad; 23 Jun. 2018; O. Mazlum leg.; OÖLM • 2 ♀♀; Fars Province, Dasht Arjan; 2040 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♂; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 2030 m a.s.l.; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♂, 3 ♀♀; Gilan Province, 15 km SE of Tutkabon; 1100 m a.s.l.; 9 Jun. 2014; J. Halada leg.; OÖLM • 1 ♀; Ilam Province, Abda Man, Dinar Gaouh; 1830 m a.s.l.; 12 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Kohgiluyeh and Boyer-Ahmad, Yasoj, Naregah; 1790 m a.s.l.; 12 May 2019; T.M. Mohamadnejad leg.; ICPI • 1 ♂; Kohgiluyeh and Boyer-Ahmad, Yasoj, Park Velayat; 1829 m a.s.l.; 17 Jun. 2018; Z. Samadi leg.; ICPI • 3 ♂♂; Kurdistan Province, Paniran; 1450 m a.s.l.; 14 May 2016; M. Kafka leg.; OÖLM • 3 ♂♂, 1 ♀; Mazandaran Prov., 10 km N of Gashar [Gachsar]; 2300–2700 m a.s.l.; 7 Jun. 2014; J. Halada leg.; OÖLM.

Distribution

West Palearctic (Gusenleitner & Schwarz 2002).

193. *Andrena* (*Simandrena*) *vetula* Lepeletier, 1841

Material examined

IRAN • 1 ♂, 3 ♀♀; Kašan [Kashan]; 3 May 1999; K. Deneš leg.; OÖLM • 2 ♂♂, 74 ♀♀; Persepolis env.; 9 May 1999; K. Deneš leg.; OÖLM • 2 ♂♂, 2 ♀♀; Yasouj; 24 May 2017; F. Arajpour leg.; ICPI • 1 ♀; Yasouj, Choram; 6 May 2011; S. Zarifi leg.; ICPI.

TAJIKISTAN • 2 ♀♀; Vose, 120 km SE of Dushanbe; 12 May 1991; J. Halada leg.; OÖLM.

UZBEKISTAN • 3 ♂♂; 80 km SE of Karschi [Qarshi]; 31 Apr. 1991; J. Halada leg.; OÖLM.

Literature records

Khodaparast & Monfared (2012).

Distribution

West Palearctic to Russia (European part), Turkmenistan, Uzbekistan*, Tajikistan* (Gusenleitner & Schwarz 2002; Ascher & Pickering 2021).

194. *Andrena* (*Poecilandrena*) *viridescens* Viereck, 1916

Material examined

IRAN • 1 ♀; Ilam Province, Abda Man, Dinar Gaouh; 1830 m a.s.l.; 12 May 2016; M. Kafka leg.; OÖLM.

Literature records

Ascher & Pickering (2021): Mazandaran; coastal plain between Chalus and Shahsavar; 20 m a.s.l.; 2 May 1965; D. Baker leg.; SEMC; via GBIF occurrence 784990358.

Remarks

The presence of *A. viridescens* in Iran was indicated by the distribution maps of Warncke (Gusenleitner & Schwarz 2002), so it is not treated as new for the country.

Distribution

Europe to Turkey, Iran (Gusenleitner & Schwarz 2002).

195. *Andrena* (*Micrandrena*) *yelkouan* Warncke, 1975 *

Material examined

IRAN • 1 ♀; West [West Azerbaijan Province], Češme Bigar env. [Çeşmə, or Cheshmeh, 38.594° N, 45.119° E]; 14 May 1999; K. Deneš leg.; OÖLM.

JORDAN • 1 ♀; 15 km E of Petra; 26 Apr. 2008; K. Deneš leg.; OÖLM • 1 ♀; 15 km W of Madaba; 760 m a.s.l.; 27 Apr. 2006; K. Deneš leg.; OÖLM • 2 ♀♀; Al Karak env. [Kerak]; 6 Apr. 2013; M. Snižek leg.; OÖLM • 8 ♀♀; Irbid, Saham vill.; 19 Apr. 2003; I. Pljushtch leg.; OÖLM • 1 ♂; Ma'an, Wadi Rum; 900 m a.s.l.; 17 Mar. 1988; L. Blank leg.; TJWC.

SYRIA • 1 ♀; Apamea; 29 Apr. 1995; K. Deneš leg.; OÖLM • 5 ♀♀; Bosra; 3 May 1995; K. Deneš leg.; OÖLM • 1 ♀; Euphrat, Dura Europos; 10 Apr. 2001; J. Plass leg.; OÖLM • 1 ♀; Maalula [Maaloula]; 17 May 1995; K. Deneš leg.; OÖLM.

Distribution

Turkey, Israel and the West Bank, Jordan*, Syria*, Iran*, Turkmenistan (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2005).

196. *Andrena* (*Pallandrena*) *zagrosa* Wood, 2021

Literature records

Wood (2021a).

Distribution

Iran.

197. *Andrena* (*Notandrena*) *zostera* Warncke, 1975
Figs 175–176

Andrena (*Carandrena*) *zostera* Warncke, 1975: 99 (♂, Turkey, Diyarbakır).
Andrena (*Carandrena*) *subsmaragdina* Osytshnjuk, 1984: 13 (♀, Turkmenistan, Kushka). **Syn. nov.**

Material examined

Holotype

TURKEY • ♂ (holotype of *Andrena zostera*); Diyarbakır; 15–16 Apr. 1972; K. Warncke leg.; OÖLM.

Other material

IRAN • 1 ♂, 1 ♀; Fars Province [Kohgiluyeh and Boyer-Ahmad Province], Yasuj [Yasouj], Sarb-e Taveh [Sarab-e Taveh]; 4 May 2016; M. Kafka leg.; OÖLM • 1 ♀; Ilam Province, Abda Man, Dinar Gaouh; 1830 m a.s.l.; 12 May 2016; M. Kafka leg.; OÖLM • 3 ♂♂; Kašan [Kashan]; 3 May 1999; K. Deneš leg.; OÖLM • 1 ♀; Khuzistan, 30 km SE of Shush Ufer am Diss; 23 Mar. 1956; K. Warncke det.; R. Schäuffele leg.; OÖLM • 1 ♀; Persepolis env.; 9 May 1999; K. Deneš leg.; OÖLM • 3 ♂♂; Yazd, Hanza to Mehriz; 1928 m a.s.l.; 22 Mar. 2021; S. San leg.; ICPI • 8 ♂♂, 16 ♀♀; Yazd, Mehriz, Shohaday gomnam; 1500 m a.s.l.; 23 Mar. 2021; S. San leg.; ICPI • 4 ♀♀; Yazd, Mehriz esmat abad; 1500 m a.s.l.; 7 Mar. 2021; S. San leg.; ICPI • 1 ♀; Yazd, Mehriz, Bagh e Safa Khanoom; 1500 m a.s.l.; S. San leg.; ICPI • 2 ♀♀; Yazd, Mehriz, Khiaban e Valieasr, Kouch e sheikh kahn; 1502 m a.s.l.; 4 May 2020; S. San leg.; ICPI.

IRAQ • 1 ♂; Mosul, edges of a river; 7 Apr. 1988; Olejníček leg.; OÖLM.

SYRIA • 6 ♂♂; Damascus airport; 29 Mar. 1988; L. Blank leg.; MSC (genital capsule illustrated Fig. 175).

TURKMENISTAN • 5 ♀♀; Kara-Kala; 29 Apr.–3 May 1989; S. Bečvář leg.; OÖLM • 2 ♂♂; Ashabad [Ashgabat]; 20–22 Apr. 1989; S. Bečvář leg.; OÖLM.

UZBEKISTAN • 1 ♂; 80 km SE of Karschi [Qarshi]; 31 Apr. 1991; J. Halada leg.; OÖLM • 1 ♂; Derbent, 13 km SE of Karschi [Qarshi]; 1450 m a.s.l.; 2 May 1991; J. Halada leg.; OÖLM (genital capsule illustrated Fig. 176).

Figs 175–176. *Andrena zostera* Warncke, 1975. **175**. Male genitalia, specimen from Syria (TJWC). **176**. Male genitalia, specimen from Uzbekistan (TJWC).

Literature records

Osytshnjuk *et al*. (2005, as *A. subsmaragdina*); Khodaparast & Monfared (2012).

Remarks

Andrena zostera is very close to *A. falcinella* but can be separated by its genital capsule and weaker scutal puncturing in the female sex. In Central Asia, *A. subsmaragdina* is easily separable from other members of the former subgenus *Carandrena* (= *Notandrena*, see Pisanty *et al*. 2022b) because it is the only member in this region with a yellow clypeus in the male sex. Comparison of the genital capsule to that of material from the Levant to Uzbekistan (Figs 175–176, also illustrated in Osytshnjuk 1984; Osytshnjuk *et al*. 2005) shows that they are identical, and are therefore synonymised. This synonymy joins the West and Central Palearctic populations of this taxon.

Distribution

Israel and the West Bank, Syria*, Turkey, Azerbaijan, Iraq*, Iran, Turkmenistan, Uzbekistan, Tajikistan (Warncke 1975; Osytshnjuk 1984; Osytshnjuk *et al*. 2005).

Species excluded from the fauna of Andrena of Iran

Due to the difficulty of identifying Middle Eastern *Andrena* because of their high degree of taxonomic complexity combined with the lack of identification resources, there are a number of taxa that have been reported from Iran, which are excluded from this list. The reasons for exclusion are detailed for each species.

1. *Andrena* (*Lepidandrena*) *curvungula* Thomson, 1870

Literature records

Allahverdi *et al*. (2015).

Reason for exclusion

Andrena curvungula is present in eastern Turkey (Gusenleitner & Schwarz 2002), and hence is likely present in northwestern Iran, but based on the photographs provided by Allahverdi *et al*. (2015) their specimens are not *A. curvungula* and are probably *A. transitoria*. Specimens were also collected from Brassicaceae, whereas *A. curvungula* is a specialist of *Campanula* L. (Campanulaceae).

2. *Andrena* (*Micrandrena*) *falsifica* Perkins, 1915

Literature records

Allahverdi *et al*. (2016).

Reason for exclusion

Andrena falsifica is a species of cool, *Potentilla*-rich (Rosaceae) grassland environments. It has never been recorded from Turkey or the Caucasus (Gusenleitner & Schwarz 2002), and so its presence in Iran would be a notable range extension.

3. *Andrena* (*Holandrena*) *fimbriata* Brullé, 1832

Literature records

Alfken (1935).

Reason for exclusion

This taxon is restricted to the Balkan Peninsula (Schönitzer *et al*. 1995; Gusenleitner & Schwarz 2002).

4. *Andrena* (*Nobandrena*) *flavobila* Warncke, 1965

Literature records

Allahverdi *et al*. (2016).

Reason for exclusion

This taxon is known only from Greece, Crimea, and western Turkey (Gusenleitner & Schwarz 2002). It has never been recorded from eastern Turkey or the Caucasus. Its presence in Iran is considered unlikely, and the record presented by Allahverdi *et al*. (2016) may well be a different species of *A.* (*Nobandrena*), such as *A. comptaeformis* or *A. nobilis*.

5. *Andrena* (*Poecilandrena*) *fukuokensis* Hirashima, 1952

Literature records

Mazandaran, Haraz Valley, 40 km above Amol; 600 m a.s.l.; 7 Apr. 1968; D. Baker leg.; SEMC; via GBIF occurrence 784990412.

Reason for exclusion

This taxon is found in East Asia (Gusenleitner & Schwarz 2002).

6. *Andrena* (*Cnemidandrena*) *fuscipes* (Kirby, 1802)

Literature records

Allahverdi *et al*. (2015).

Reason for exclusion

Andrena fuscipes is a specialist of Ericaceae, and has a broad Atlantic distribution across Europe and Russia (European part and Urals, Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2005; Proshchalykin *et al*. 2017a), typically in areas with *Calluna vulgaris* (L.)Hull (Ericaceae). The specimens recorded by Allahverdi *et al*. (2015) were also collected in May, whereas *A. fuscipes* (along with other species of *Cnemidandrena* Hedicke, 1933) flies in the summer, predominantly in July and August. The specimen in the presented photographs appear to be *A. flavipes*.

7. *Andrena* (*Melandrena*) *gravida* Imhoff, 1832

Material examined

TURKEY • 1 ♂; Hakkâri Şivelan; 18 May 1975; K. Warncke leg.; OÖLM • 1 ♂; Hakkâri, 10 km SW of Yüksekova; 10 Jun. 1981; K. Warncke leg.; OÖLM • 1 ♀; Hakkâri, 25 km NE of Hakkâri; 2200 m a.s.l.; 30 May 1980; K. Warncke leg.; OÖLM • 2 ♀♀; Hakkâri, 25 km NW of Yüksekova; 2200 m a.s.l.; 30 May 1980; K. Warncke leg.; OÖLM • 1 ♂; Hakkâri, S. Varegös/Mt Sat; 1700 m a.s.l.; 15 Jun. 1984; K. Warncke leg.; OÖLM • 3 ♂♂; Hakkâri, S. Varegös/Mt Sat; 1800 m a.s.l.; 17 Jun. 1984; K. Warncke leg.; OÖLM • 2 ♂♂, 2 ♀♀; Karakurt/Arastal; 22 May 1975; K. Warncke leg.; OÖLM • 2 ♂♂; Kars, 10 km E of Karakurt; 1500 m a.s.l.; 28 May 1983; K. Warncke leg.; OÖLM • 53 ♂♂, 1 ♀; Kars, 20 km W of Sarikamis [Sarıkamış]; 2150 m a.s.l.; K. Warncke and M. Schwarz leg.; OÖLM.

Literature records

Allahverdi *et al*. (2016).

Reason for exclusion

Andrena gravida is a species primarily of deciduous woodland in Europe to western Turkey (Gusenleitner & Schwarz 2002). Additionally, the taxon is present in eastern Turkey (Kars and Hakkâri provinces) based on previously unidentified specimens examined by the lead author that were collected by Klaus Warncke and Maximillian Schwarz (Linz). However, it is easy to confuse with other members of the former subgenus *Zonandrena* (= *Melandrena* Pérez, 1890, see Pisanty *et al*. 2022b) such as *A. gazella*, which is present in Iran. The records presented by Allahverdi *et al*. (2016) also include specimens collected from late July, which is inconsistent with the ecology of *A. gravida*, which is univoltine and flies in the spring only, with the latest recorded date for examined Turkish specimens being June 17th. Given the presence of this taxon in eastern Turkey, it may well be present in northwestern Iran, but this remains to be confirmed.

8. *Andrena* (*Graecandrena*) *impunctata* Pérez, 1895

Literature records

Centr. Alborz, Kandavan Pass, 8 km above Siahbishe; 2400 m a.s.l.; 7 Jun. 1966; D. Baker leg.; SEMC; via GBIF occurrence 686218978.

Reason for exclusion

Andrena impunctata has an eastern range limit in central Turkey; it has never been recorded from eastern Turkey or the Caucasus (Gusenleitner & Schwarz 2002; Osytshnjuk *et al*. 2008). It is therefore considered unlikely to be present in Iran.

9. *Andrena* (*Taeniandrena*) *intermedia* Thomson, 1870

Literature records

Ascher & Pickering (2021): Mazandaran, Neka (25 km E of Sari); 7 Apr. 1968; D. Baker leg.; SEMC; via GBIF occurrence 684782674.

Reason for exclusion

It is not clear whether the specimens collected from Iran by Baker were males or females. April is very early for this taxon, which in Europe typically flies in June and July. Given the extreme taxonomic challenge associated with the morphological identification of members of the subgenus *Taeniandrena* (Praz *et al*. 2022), and given that several taxa found in eastern Turkey were described after the capture of this specimen (e.g., *A. producta* Warncke, 1973, *A. hova* Warncke, 1975, *A. solitaria* Warncke, 1975), this taxon cannot be confirmed from Iran until male specimens with their distinctive genital capsule have been examined.

10. *Andrena* (*Micrandrena*) *magunta* Warncke, 1965

Literature records

Allahverdi *et al*. (2016).

Reason for exclusion

Andrena magunta is known from south-eastern Europe, western Turkey, Lebanon, and Israel (Gusenleitner & Schwarz 2002; Pisanty *et al*. 2018; Wood *et al*. 2020a). It has never been recorded from eastern Turkey or the Caucasus. Given the very high difficulty of identifying Turkish and Middle Eastern *Micrandrena*, this record must be treated as unconfirmed.

11. *Andrena* (*Micrandrena*) *nanaeformis* Noskiewicz, 1925

Literature records

Ghahnavieh and Monfared (2019)

Reason for exclusion

Andrena nanaeformis was described from Ukraine, and is sparingly distributed from east Germany and Austria eastwards to Russia (European part, Urals, Western Siberia, Eastern Siberia; Schmid-Egger & Scheuchl 1997; Gusenleitner & Schwarz 2002; Proshchalykin *et al*. 2017a). It therefore has a distribution across the Eurasian cold steppe; Warncke did not record this taxon from the steppe of Turkey. Instead, he described two very similar species, *A. luscinia* and *A. sedentaria* (see above), that are found on the forest steppes of Turkey and Iran. Because of this different ecological distribution, we consider *A. nanaeformis* to be unconfirmed from Iran until this specimen can be carefully compared to Warncke's type material.

12. *Andrena* (*Notandrena*) *nitidiuscula* Schenck, 1853

Literature records

Morice (1921).

Reason for exclusion

See comments under *A. fulvicornis*.

13. *Andrena* (*Lepiandrena*) *pandellei* Pérez, 1895

Literature records

Allahverdi *et al*. (2015).

Reason for exclusion

Based on the photographs provided by Allahverdi *et al*. (2015), their specimens are a species of *A.* (*Brachyandrena*). As was the case for the reported records of *A. curvungula*, their specimens were also collected from Brassicaceae, whereas *A. pandellei* is a specialist of *Campanula* (Campanulaceae).

14. *Andrena* (*Ulandrena*) *polita* Smith, 1847

Literature records

Aliyev *et al*. (2017); Ascher & Pickering (2021).

Reason for exclusion

Warncke presented a distribution map (Gusenleitner & Schwarz 2002) that contained many taxa close to *A. polita* with a similar male genital capsule (e.g., including records from Israel and the West Bank and Libya from which true *A. polita* is absent). The dot present in Iran may be the basis for the listings of Aliyev *et al*. and Ascher & Pickering; either way, neither source presents precise details. This dot could be represented by *A. caspica*, *A. unicincta*, or true *A. polita*, which is present in eastern Turkey. What is clear is that specimens could not be located in the Warncke collection. True *A. polita* must be considered to be unconfirmed from Iran.

15. *Andrena* (*Hoplandrena*) *scotica* Perkins, 1916

Literature records

Scheuchl & Willner (2016, as *A. carantonica* Pérez, 1902).

Reason for exclusion

The taxa *A. scotica* and *A. trimmerana* have been endlessly confused (for use of the name *scotica*, this will be clarified in a manuscript, TJW *et al*. in prep.), as female material cannot be consistently separated morphologically. Confident determination can only be made from spring generation males. *Andrena scotica* must therefore be considered unconfirmed until such males can be examined.

16. *Andrena* (*Micrandrena*) *semilaevis* Pérez, 1903

Literature records

Allahverdi *et al*. (2016).

Reason for exclusion

Andrena semilaevis has never been recorded from Turkey or the Caucasus, instead being found across temperate Europe to the European part of Russia, avoiding the Mediterranean basin (Gusenleitner & Schwarz 2002). The presence of *A. semilaevis* in Iran is considered extremely unlikely.

17. *Andrena* (*Leucandrena*) *sericata* Imhoff, 1868

Literature records

Allahverdi *et al*. (2015).

Reason for exclusion

Based on the photographs provided by Allahverdi *et al*. (2015), both female and male specimens identified as *A. sericata* are actually all males of *A. truncatilabris*.

18. *Andrena* (*Chlorandrena*) *taraxaci* Giraud, 1861

Literature records

Popov (1967); Osytshnjuk et al. (2005).

Reason for exclusion

The species concept of *A. taraxaci* has changed enormously, with many distinct taxa now being recognised after the broad concept adopted by Warncke (see Schwenninger 2015). As a result, it is unclear as to whether older publications apply a broad or narrow species concept, and so *A. taraxaci* s. str. is excluded from the Iranian fauna until specimens can conclusively demonstrate its presence (see comments under *A. astica* and *A. orientana*).

Other species examined

Andrena* (incertae sedis) *minor Warncke, 1975 stat. nov.

Andrena (*Carandrena*) *cara minor* Warncke, 1975: 90 (♂, Turkey, Diyarbakır).
Andrena (*Carandrena*) *splendula* Osytshnjuk, 1984: 5 (♀, Tajikistan, Tigrovaya Balka). **Syn. nov.**

Material examined

Holotype
TURKEY • ♂ (holotype of *Andrena cara minor*); Diyarbakır; 15–16 Apr. 1972; K. Warncke leg.; OÖLM.

Other material
TURKEY • 2 ♂♂, 20 ♀♀; Halfeti env.; 3–5 May 1994; M. Halada leg.; OÖLM • 5 ♀♀; Birecik/Urfa; 19 Apr. 1984; K. Warncke leg.; OÖLM.

Remarks

The status of species formerly placed in the subgenus *Carandrena* (= *Notandrena*) is problematic, both at a species level and also because the subgenus is polyphyletic (Pisanty *et al*. 2022b). Osytshnjuk (1984, reproduced with additional data in Osytshnjuk *et al*. 2005) revised Central Asian *Carandrena* sensu Warncke. In her key, for males with black clypeal markings, she separated two taxa with the gena extended below into either a sharp projection (*A. hieroglyphica*) or a rounded projection (*A. splendula*), and described the latter as a new species. However, this conflicts with the work of Warncke. In his revision of Turkish *Andrena*, Warncke (1974b, 1975) described a subspecies of *A. cara* with a rounded projection on the male gena. This character was illustrated by Warncke (1975), who treated the form with the sharp projection (Fig. 164) as *A. cara cara*, and the form with the rounded projection as *A. cara minor*. He must have treated *A. halictoides* as the male of *A. cara*, as no male for this taxon was described by Nurse (1904), though Warncke never published the synonym (e.g., Warncke 1967), which was later made by Gusenleitner & Schwarz (2002).

The problem thus arises that *A. cara* and its male (described as *A. halictoides*) are synonymous with *A. hieroglyphica* because of this distinct genal spine. *Andrena cara minor* is therefore not a subspecies of this taxon, but a good species, and the senior synonym of *A. splendula*. The male genital capsules of *A. minor* and *A. splendula* are identical (see illustrations in Osytshnjuk 1984; Osytshnjuk *et al*. 2005). As Warncke's collection and hence his types were not available to Osytshnjuk for study, or indeed the types of Nurse in London, this independent duplication of names by workers on the Turkish, Pakistani, and Central Asian faunas occurred, when the taxa themselves are found across similarly arid parts of these regions.

For a wider classification, *Andrena hieroglyphica* is placed in incertae sedis; the extensive shiny areas that cover most of the scutum are strongly remenicient of *A. euzona*, which is found outside the *Carandrena*+*Notandrena* (Pisanty *et al*. 2022b). *Andrena minor* is also placed as incertae sedis until genetic work can be conducted to fully define the limits of the new, more restricted subgenus *Notandrena* (Pisanty *et al*. 2022b). More broadly, though *A. cara* was not the type species of the former subgenus *Carandrena* (type species: *A. aerinifrons* Dours, 1873; Warncke 1968), the likely reality that *A. cara* occurs outside of the expanded *Notandrena* sensu Pisanty *et al*. 2022b further justifies the decision to synonymise these two subgenera in order to reduce nomenclatural confusion.

Distribution

Turkey, Turkmenistan, Tajikistan (Osytshnjuk *et al*. 2005, as *A. splendula*).

Discussion

The present work substantially improves our understanding of the Iranian *Andrena* fauna, with 65 species newly reported for the country in addition to the 16 newly described species. The increase from 116 to 197 documented species of *Andrena* represents a 70% increase in faunal richness. If applied uniformly across the Iranian bee fauna, the 960 species listed by Ascher & Pickering (2021) would increase to 1630, a number comparable to the size of the Turkish bee fauna. Whilst it would be an unproven assumption to suppose that previous shortfalls in our understanding of Iranian *Andrena* are representative of the state of our knowledge of the entire Iraninan bee fauna, and this estimate is therefore probably wildly generous, it does suggest that the overall size of the Iranian bee fauna is likely to be substantially more than 1000 species following a detailed and comprehensive revision for each constituent group.

For *Andrena* specifically, more specimen collection and taxonomic work is needed to connect or definitively separate the Iranian *Andrena* fauna from species present in nearby mountainous areas and countries, most clearly from species in the subgenera *Euandrena*, *Graecandrena*, and *Micrandrena* described from the Turkmenistani parts of the Kopet Dag mountain range and the South Caucasus (Osytshnjuk 1986, 1993, 1994), with possible synonyms suggested in the present work or by previous authors (Gusenleitner & Schwarz 2002). Furthermore, type inspection of poorly known taxa described from Iran (Popov 1940, 1949) is needed to establish their status, both in terms of their validity and also their phylogenetic placement.

Large parts of Iran remain poorly sampled, most clearly eastern Iran in the areas bordering Afghanistan and Pakistan, and more generally arid areas during the short spring flowering period. Many taxa of *Andrena* were described from arid parts of north-western Pakistan by Nurse (1904), as well as some parts of Afghanistan by Warncke (1975c), and these could well be present in eastern Iran. The small faunas of *Andrena* in Oman and the United Arab Emirates contain several taxa not currently recorded from Iran, namely *A. aegyptiaca* Friese, 1899, *A. arsinoe* Schmiedeknecht, 1900, *A. helouanensis* Friese, 1899, *A. isis* Schmiedeknecht, 1900, and *A. maidiqi* Scheuchl & Gusenleitner, 2007. Any or all of these taxa may be present in coastal Iran along the Persian Gulf, as there is a known faunal link between these two regions (e.g., Kasparek & Griswold 2021). Finally, further sampling in steppic and mountainous areas of north-western Iran close to Turkey and the Caucasus will also increase the richness of the Iranian fauna due to the incredibly high number of *Andrena* species known from this region; the true size of the Iranian *Andrena* fauna could be in excess of 250 species.

While it is still too soon to discuss faunal affinities in depth given the high diversity of *Andrena* of the Middle Eastern region, which is still being actively described (Pisanty *et al*. 2016, 2018, 2022a; Wood *et al*. 2020a; Wood 2021a), some clear trends can be seen. The first is that there is a clear link between the Anti-Lebanon mountain range, the mountains of south and south-eastern Turkey (predominantly in Hakkâri Province), and the Zagros Mountains of Iran. Several taxa are found across these disparate regions, most typically at high altitudes such as *A. antilibanotica*, *A. extenuata* sp. nov., *A. huma* sp. nov., *A. scrophulariae*, *A. christineae*, and *A. turmalina*, all of which have been described since 2006. Such links can be seen in other groups such as for *Habropoda hakkariensis* Schwarz & Gusenleitner, 2001 (Boustani *et al*. 2021).

More broadly, it is clear that a Turco-Levantine fauna extends across into the Zagros Mountains and is preserved at high altitude into southern provinces such as Fars and Kohgiluyeh and Boyer-Ahmad. This is well-illustrated by the Sarab-e Taveh site in Kohgiluyeh and Boyer-Ahmad Province in southern Iran, which was visited by M. Kafka in early May 2016. The site clearly supports a rich Levantine (*A. dauma*, *A. medeninensis usura*, *A. rufomaculata*), Iranian endemic (*A. flagrans* sp. nov., *A. elam* sp. nov., *A. persica*, *A. zagrosa*), and Turco-Iranian (*A. incognita*, *A. luscinia*, *A. obsidiana* sp. nov., *A. querquedula*, *A. tabula* sp. nov.) *Andrena* fauna. As hypothesised by Pisanty *et al*. (2022a), the very

short flowering period in late March and early April in these regions may have led to these taxa being overlooked by collectors, in addition to the remote nature of these sampling areas.

The same can be said more broadly for Iran itself, where many of the new taxa described were collected from flowering trees and shrubs in the period from February to April, specifically *Andrena boustaniae* sp. nov., *A. extenuata* sp. nov., *A. huma* sp. nov., *A. hosseiniiae* sp. nov., and *A. rostamiae* sp. nov., which were all collected from flowers of *Acer*, *Pyrus*, and *Prunus*. This mirrors the situation on Mount Hermon (the most southerly point of the Anti-Lebanon mountain chain), where *A. veterana* and *A. dividicincta* were both observed to forage strongly on *Acer monspessulanum*, along with rare species such as *A. najadana* Warncke, 1975 (Pisanty *et al*. 2022a). An increased concentration of sampling effort on deciduous flowering trees in mountainous parts of the Middle Eastern region during the early spring is likely to continue to produce more new species of *Andrena* from this extraordinarily biodiverse region that is the likely centre of diversity for this genus (Pisanty *et al*. 2022a, 2022b).

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