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Annales de la Société entomologique de France (N.S.)
International Journal of Entomology

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/tase20

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To cite this article: Thomas J. Wood , Mira Boustani & Pierre Rasmont (2020): A revision of the *Andrena* (Hymenoptera: Andrenidae) of Lebanon with the description of six new species, Annales de la Société entomologique de France (N.S.)

To link to this article: https://doi.org/10.1080/00379271.2020.1794960

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A revision of the *Andrena* (Hymenoptera: Andrenidae) of Lebanon with the description of six new species

Thomas J. Wood*, Mira Boustani & Pierre Rasmont

Laboratoire de Zoologie, Université de Mons, 7000, Mons, Belgium

(Accepté le 7 juillet 2020; publié en ligne le 23 septembre 2020)

Summary. Lebanon has a rich but chronically understudied bee fauna. As part of ongoing efforts to better understand bee diversity in Lebanon we present a critical revision of the speciose genus *Andrena* based primarily on the examination of specimens collected from contemporary surveys, as well as previously undetermined material from museum collections. *Andrena* (*Aciandrena*) *abruptifovea* **n. sp**. from Lebanon, *A*. (*incertae sedis*) *cedricola* **n. sp**. from Lebanon and Syria, *A*. (*Euandrena*) *scrophulariae* **n. sp**. from Lebanon, and *A*. (*incertae sedis*) *prodigiosa* **n. sp**., from Lebanon, are described. *A*. (*Chlorandrena*) *edentula* **n. sp**. and *A*. (*Rufandrena*) *parvispinae* **n. sp**., both from north-western Syria, are described due to their proximity to northern Lebanon. The previously unknown male of *A*. (*Pallandrena*) *christineae* Dubitzky, 2006 is also described. *A*. (*Poliandrena*) *unifasciata* Friese, 1899 **stat. rev**. which was described from Lebanon is removed from synonymy with *A*. (*Poliandrena*) *caspica* Morawitz, 1886, and the relationship between these two taxa and *A*. (*Poliandrena*) *unicincta* Friese, 1899 is clarified. Altogether, these changes increase the number of *Andrena* species known from Lebanon to 86, including species known previously only from Turkey or Israel. In total, 25 and 23 species are also reported as newly recorded for Jordan and Syria, respectively. Based on the diversity of *Andrena* in neighbouring countries in the Levant, it is probable that the true number of *Andrena* species in Lebanon is well over 100.

Résumé. Révision des *Andrena* (Hymenoptera : Andrenidae) du Liban, avec la description de six espèces nouvelles. Le Liban a une riche faune d'abeilles trop peu étudiée de manière chronique. Comme contribution à l'effort actuel pour mieux comprendre la diversité des abeilles du Liban, nous présentons ici une révision critique du genre *Andrena*, connu pour être riche en espèce. Cette révision est basée sur l'examen de spécimens collectés durant des recherches récentes, ainsi que de matériel indéterminé de collections de musées. Les espèces nouvelles suivantes sont décrites du Liban : *Andrena* (*Aciandrena*) *abruptifovea* **n. sp**. (Liban), *A*. (*incertae sedis*) *cedricola* **n. sp**. (Liban et Syrie), *A*. (*Euandrena*) *scrophulariae* **n. sp**. (Liban), and *A*. (*incertae sedis*) *prodigiosa* **n. sp**. (Liban). Les espèces suivantes sont décrites du nord-ouest de la Syrie, à proximité du Liban : *A*. (*Chlorandrena*) *edentula* **n. sp**. et *A*. (*Rufandrena*) *parvispinae* **n. sp**. Le mâle encore inconnu d'*A*. (*Pallandrena*) *christineae* Dubitzky, 2006, est aussi décrit. *A*. (*Poliandrena*) *unifasciata* Friese, 1899 **stat. rev**., décrit du Liban, est retiré de la synonymie d'*A*. (*Poliandrena*) *caspica* Morawitz, 1886, tandis que les relations entre ces deux derniers taxons et *A*. (*Poliandrena*) *unicincta* Friese, 1899, sont clarifiées. Tout compté, ces changements augmentent le nombre d'espèces d'*Andrena* connues du Liban à 86, y compris des espèces qui auparavant n'étaient connues que de Turquie et Israël. Au total, 25 et 23 espèces sont aussi comptées pour la première fois de Jordanie et de Syrie, respectivement. En se basant sur la diversité des *Andrena* dans les autres pays du Levant, il est probable que le nombre total d'espèces du Liban excède 100.

http://www.zoobank.org/urn:lsid:zoobank.org:pub:9FC27F37-A201-4C17-BE46-1C2AAA337CCB

Keywords: Levant; endemic species; alpine; solitary bees; taxonomy

The genus *Andrena* Fabricius, 1775 is the second most species-rich genus of bees worldwide after *Lasioglossum* Curis, 1833 (Ascher & Pickering 2020). The genus is richest in Mediterranean and xeric areas, so unsurprisingly the Eastern Mediterranean including the Levant is a hotspot of *Andrena* diversity. The *Andrena* fauna of the Eastern Mediterranean was extensively revised by Klaus Warncke in the 1960s and 1970s, with important papers focusing on Greece (Warncke 1965a), Israel (Warncke 1969a), and Turkey (Warncke 1965b, 1969b, 1975a, 1975b). Despite these extensive efforts, new *Andrena* species continue to be described from this region at regular intervals (e.g. Gusenleitner 1998; Scheuchl et al. 2004; Grünwaldt et al. 2005; Scheuchl & Hazir 2012; Schwenninger 2015; Kratochwil 2015; Pisanty et al. 2016, 2018), and it is still too early to put a number on the true species richness of Eastern Mediterranean *Andrena*.

*Corresponding author. Email: thomasjames.wood@umons.ac.be

Published online 23 Sep 2020

Lebanon is a small country in the Levant, but it has a wide variety of ecological regions and biotypes (Abi-Saleh & Safi 1988), and a rich but chronically understudied bee fauna. For example, there are only four published papers that report detailed *Andrena* records from Lebanon (Friese 1899; Mavromoustakis 1962; Warncke 1969a; Schuberth et al. 2001). This situation is not helped by historical changes in the geographic scope of Lebanon. In the early part of the 20th century Lebanon was part of Ottoman Syria until the end of the First World War, where what is today modern Lebanon, Syria, and Hatay province in Turkey was ceded to France as part of the Mandate for Syria and the Lebanon following the Sykes–Picot agreement between Britain and France (Traboulsi 2012). Therefore, literature prior to 1918 would refer simply to 'Syria' (e.g. Friese 1899) without allowing contemporary authors to identify a locality or distinguish between modern day Lebanon or Syria. Even later works would simply give very little distributional information, for example Friese (1922) who reported *Andrena cubiceps* Friese, 1914 var. *fulvopilosa* from "Syrien, Adana [Turkey]", making it impossible to know if this taxon is present in Lebanon or not. However, though there is a lack of clarity over the exact country referred to in what historic literature is available, this does not greatly change the overall picture of a lack of literature itself and historical study. Only three species of *Andrena* have been described with a *locus typicus* in what is now modern day Syria (one currently considered valid) and two from modern day Lebanon (two considered valid, see entry for *Andrena unifasciata* Friese, 1899 below) compared to the nearly 200 species described from Israel and Turkey (e.g. Warncke 1969b; Warncke 1975b; Gusenleitner 1998; Scheuchl & Hazir 2012; Pisanty et al. 2016, 2018). Against this background, the contemporary study is not particularly limited by the confusion over historical geographic terminology.

As part of efforts to improve our understanding of Lebanese bees, the country has been surveyed for multiple years and museum material located in order to critically revise the national fauna. Collection efforts focused on important plant areas such as Tannourine Cedars, Bcharre Cedars and Horch Ehden in northern Lebanon which harbour a high proportion of endemic plants (Bou Dagher-Kharrat et al. 2018), and which may therefore also contain range-restricted and previously undescribed bee species, as is the case for other invertebrate groups (Larsen 1974; Németh 2019). As part of this effort, here we revise the *Andrena* fauna of Lebanon, describe six new species from Lebanon and Syria, and present additional data on some species newly recorded in the nearby countries of Jordan and Syria. Collecting sites for material examined by this project are shown in Figure 1, with full geographic coordinate details in online supplementary material. This paper is not intended to be a revision of the Syrian or Jordanian *Andrena* faunas, but as part of an extensive revision of undetermined museum material from the Levant by the lead author a number of new country records were detected. Therefore, where species listed here as present in the Lebanese fauna were also newly detected in these two other countries, this information is given. The Jordanian and Syrian *Andrena* faunas will be revised in later publications.

Methodology

Revisions to the *Andrena* subgeneric system of classification are ongoing (Pisanty et al. 2020), and classifications are likely to change substantially in the future. However, this will require extensive revisionary work over many years, and so for now we broadly follow the subgeneric system of Warncke (1968) with modifications for when changes to this system are simple, clear, and well-supported (Gusenleitner & Schwarz 2002; Pisanty et al. 2020).

Specimens collected during this study were collected by hand net and killed with ethyl acetate or by freezing. At some collection localities, blue, yellow, and white pan traps were used. These were filled to the ¾ mark with water plus colourless and odourless soap and left for 48 hours before collection. Each collection station used three sets of triplets (one of each colour, separated by 1 m) which were themselves separated by 10 m.

All data were digitised using Data Fauna Flora 5.1.2 (Barbier et al. 2000) and mapped with Quantum GIS 2.18.27. All geographic co-ordinates are given using the datum World Geodetic System of 1984 (WGS 1984). Where detailed records are available from the literature, these are included (Friese 1899; Mavromoustakis 1962; Schuberth et al. 2001). An additional publication (Grace 2010) presented an overview of the wild bee species of the Eastern Mediterranean, reporting 55 species of *Andrena* from Lebanon. However, the underlying data supporting these listings is unclear and so here we take a conservative position and only list this publication where other lines of evidence exist, never in isolation. Twenty-three unconfirmed species from Grace (2010) are listed in online supplementary material with notes. Species marked with an asterisk * in the main manuscript have not previously been reported from Lebanon in any form.

Morphological terminology follows Michener (2007). Specimens were measured from the vertical plane of the front of the head to the 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 and were stacked using Zerene Stacker 1.04 (Zerene Systems, USA) and plates were prepared in GNU Image Manipulation Program (GIMP) 2.10.

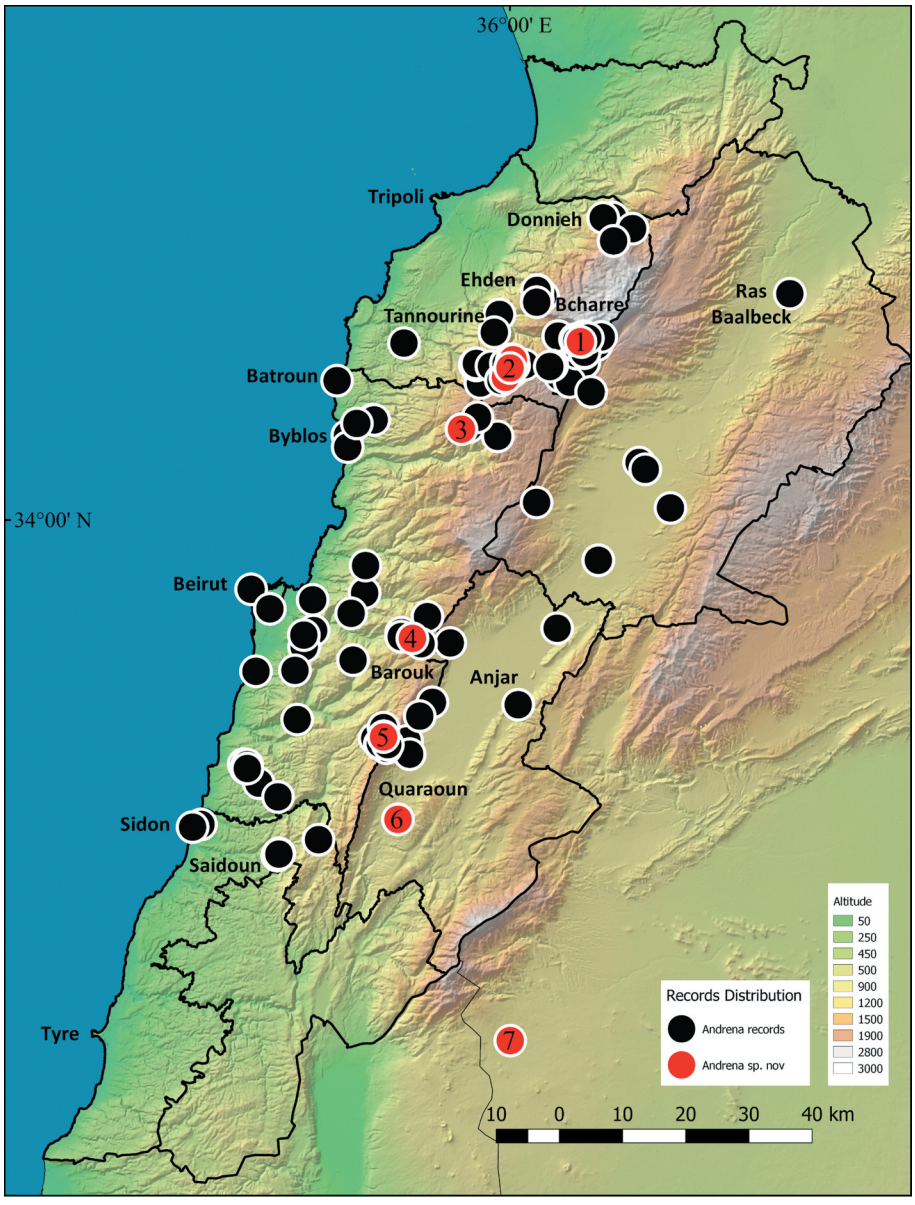


Figure 1. Map of Lebanon with the collecting locations of material examined during this project (black dots). Additionally, specific collection locations for species newly described here from Lebanon are indicated (red dots), including one additional location from Syria. Full sampling details can be found in online supplementary material. Geographic relief is indicated, with altitude measured in metres above sea level.

Abbreviations

DACN = Department of Agriculture collection, Nicosia, Cyprus
MSC = Maximillian Schwarz personal collection, Ansfelden, Austria
OÖLM = Oberösterreich Landesmusum, Linz, Austria
RBIN = Royal Belgian Institute of Natural Sciences, Brussels, Belgium
SOILS = Soils Permaculture Association, Saidoun, Lebanon
TCFNR = Tannourine Cedar Forest Nature Reserve, Tannourine, Lebanon
TJW = Personal collection of Thomas Wood, Mons, Belgium
USEK = Holy Spirit University of Kaslik, Jounieh, Lebanon
UMONS = University of Mons, Mons, Belgium
XVA = Xavier van Achter personal collection, Mons, Belgium

Results

Descriptions of new species

Andrena (*Aciandrena*) *abruptifovea* Wood, n. sp.

http://www.zoobank.org/urn:lsid:zoobank.org:act:97069DFB-7648-4BA8-A0BD-B37FF27F55EB

Type material. Holotype: ♂, LEBANON, Mount Lebanon, Chouf Biosphere Reserve, Barouk trails, 1772 m [33°41'10"N 35°41'56"E, Figure 1, location 5], 16.V.2019, leg. Boustani, *Thlaspi* spp. Deposited at the RBIN.

Paratypes: LEBANON: Mount Lebanon, Chouf Biosphere Reserve, Barouk trails, 1772 m, 16.V.2019, 5♂ [#1–5], 1♀ [#6], leg. Boustani, *Thlaspi* spp.; N Lebanon, Harrisa, Al Jawar, 1758 m, 11.V.2019, 1♂ [#7], 1♀ [#8], leg. Boustani, *Brassica* spp. (Figure 1, location 2); N Lebanon, Tannourine Reserve, 1781 m, 13.V.2019, 1♀ [#9], leg. Boustani, *Thlaspi* spp. (Figure 1, location 2); N Lebanon, Arz Tannourine Gate area, 1754 m, 2.IV.2018, 1♀ [#10], leg. Boustani (Figure 1, location 2); N Lebanon, Hadath El Jebbe, border of the Cedar forest, 1618 m, 5.V.2017, 1♀ [#11], leg. Boustani (Figure 1, location 2); N Lebanon, Arz Bcharre, Forest of the Cedars of God, 1897 m, 20.V.2019, 1♂ [#12], leg. Boustani, *Alyssum* spp. (Figure 1, location 1). Paratypes are deposited at the RBIN [#1–5; #9; #11], the DACN [#7–8], and in the personal collection of TJW [#6; #10; #12].

Description of female. Body length 6 mm (Figure 2).

Head. Slightly longer than broad, frons, paraocular areas, gena, and vertex dull metallic green, clypeus black (Figure 3). Clypeus clearly domed and weakly punctured, punctures separated by 2–3 puncture diameters. Underlying surface shagreened and weakly shining, becoming shinier at the apical margin. Process of labrum narrow, triangular, pointed, clearly longer than wide (Figure 4). Face, gena, vertex, and scape with short white hairs, these not exceeding the length of the scape. Antennal segments 1–5 black, segments 6–12 predominantly orange below and above, segment 3 slightly exceeding 4 + 5 in length. Fovea narrow, equalling the width of an antenna above where they occupy half the distance between a lateral ocellus and the top of the compound eye, fovea abruptly narrowed to approximately 30% of their maximum width about 2/3rd of the way from the top of the compound eye to the level of the antennal insertions. Ocelloccipital distance extremely short, almost non-existent, posterior ocellus almost touching vertex.

Mesosoma. Scutum and scutellum densely shagreened, weakly shining, with a subtle green-purple metallic sheen (Figure 4), weakly and shallowly punctured, punctures separated by 2–3 puncture diameters. Pronotum non-carinate. Episternum and propodeum finely shagreened, weakly shining, propodeal triangle well differentiated, finely reticulate, weakly shining. Episternum and propodeum laterally with long white hairs, these not exceeding the length of the scape, scutum and scutellum with shorter white hairs. Legs dark, apical tarsal segments lightened orange, pubescence white. Floccus, femoral, and tibial scopa white. Wings hyaline, venation amber, nervulus antefurcal.

Metasoma. Terga dark with hints of a bronze metallic sheen, evenly shagreened and weakly shining, apical margins of T2–4 slightly depressed and lightened pale yellow (Figure 5). T2–3 with weak apical lateral hair fringes, these widely interrupted. T5 and hairs flanking pygidial plate orange-golden. Pygidial plate triangular, pointed, flattened and without a raised central area.

Description of male. Body length 5–5.5 mm (Figure 6).

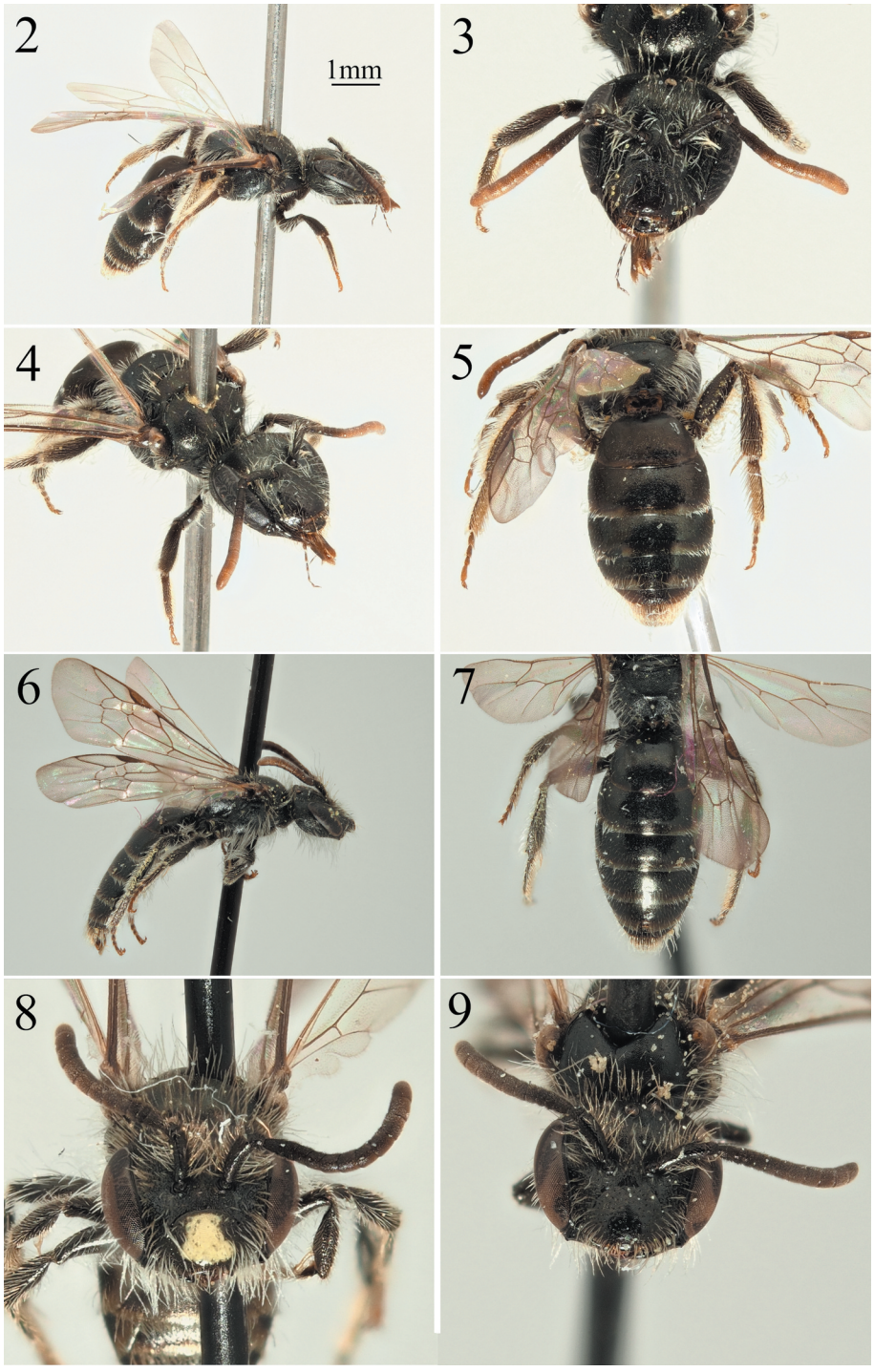
Head. Black, as wide as long. Clypeus domed, evenly shagreened, weakly shining, clearly punctured, punctures separated by 1–2 puncture diameters laterally, becoming sparser centrally to form a broad almost impunctate line. Clypeus most commonly predominantly yellow marked (Figure 8) but this can vary from 80–90% coverage to 50% coverage to completely black (Figure 9). Pubescence as in the female. Antennal segments 1–6 dark, segments 7–13 slightly lightened orange below, segment 3 slightly shorter than 4 + 5 in length. Ocelloccipital distance short, wider than female, at most ¼ width of posterior ocellus.

Mesosoma. As in the female.

Metasoma. Tergites as in the female, weakly shining with uniform even shagreenation (Figure 7). T2–4 with weak apical lateral hair fringes, also interrupted widely. Genitalia simple (Figure 10), gonocoxites with weak rounded apical teeth, penis valve slightly widened centrally, gonostyli with parallel sides, forming a slight apical point, becoming slightly translucent at their apexes.

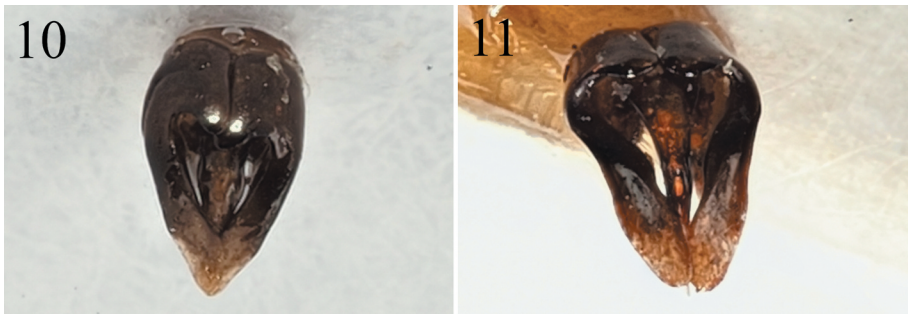
Diagnosis. *Andrena abruptifovea* can be placed into the subgenus *Aciandrena* in the female sex by the combination of small size, black integument, narrow facial fovea, and a shagreened propodeal triangle, and in the male sex by the additional character of a yellow marked clypeus.

Is most similar to *Andrena* (*Aciandrena*) *pulicaria* Warncke, 1975 from Greece and Turkey, most notably in the male sex where the clypeus is domed and partly yellow marked (Figure 8, though the coloration can be variable, see Figure 9), in contrast to other *Aciandrena* species where the male clypeus is completely flat or flattened and completely or almost completely yellow marked (e.g. *A. pratincola* Warncke, 1974 and *A. lamiana* Warncke, 1965, respectively). It can easily be separated by a comparison of the genitalia as *A. pulicaria* has a



Figures 2–9. *Andrena* (*Aciandrena*) *abruptifovea* **n. sp. 2**, Female profile, **3**, female face, **4**, female labrum, **5**, female tergites, **6**, male profile, **7**, male tergites, **8**, male face, yellow marked form, **9**, male face, black form.

clear, rounded protrusion on the inner margin of the gonostyli (Figure 11; also illustrated in Warncke 1975b). The genital capsule is similar to the recently described *A. israelica* Scheuchl & Pisanty, 2016 with moderately pronounced gonocoxal teeth, but the gonostyli of *A. abruptifovea* are longer and come to a clearer point (Figure 10, but not as clear as in species like *A. aciculata* Morawitz, 1886, see illustrations in Warncke 1972). The two species can also be separated because the clypeus of *A. israelica* is flattened and black. In a series of six males



Figures 10–11. *Andrena* (*Aciandrena*), male genitalia. **10**, *A*. (*A*.) *abruptifovea* **n. sp.; 11**, *A*. (*A*.) *pulicaria* Warncke, 1975.

of *A. abruptifovea* taken from the type locality, two had a predominantly yellow clypeus, three had a partially yellow clypeus, and one was completely black. However, they were all domed, and the two species can be separated on this basis rather than simply by colour.

In the female sex, *A. abruptifovea* can also be placed close to *A. pulicaria* because of the domed clypeus that is basally and centrally shagreened and weakly shiny but becoming clearly shiny at the apical margin. However, the two can be clearly separated by the labral process which like an equilateral triangle in *A. pulicaria* (roughly as long as wide) but like an isosceles triangle in *A. abruptiofovea* (clearly longer than wide, Figure 4). The foveae are also more sharply and abruptly narrowed below (Figure 4, also clearly distinguishing this taxon from *A. israelica* and *A. judaea* Scheuchl & Pisanty, 2016) and the tergal integument is much less strongly sculptured, shagreened and therefore weakly shining (Figure 5), hammer shagreened and dull in *A. pulicaria*.

Additional *Aciandrena* material is available from lower elevations from Israel and Syria that is very close morphologically to *A. abruptifovea*. However, it differs in the male sex because the clypeus is flatter, and the genital capsule is shorter, with comparatively shorter and less pointed gonostyli, and the penis valve is thinner and more parallel sided without the slightly bulging sides medially that can be seen in *A. abruptifovea* (Figure 10). In the female sex, the clypeus is slightly less domed and the fovea, whilst constricted below like *A. abruptifovea*, are narrower overall (occupying slightly less than half of the space between a lateral ocellus and the compound eye at their maximal width, for *A. abruptifovea* occupying half this space). These differences are subtle, particularly in the female sex, but given the difference in male genitalia morphology we take the position that these are not the same taxon as *A. abruptifovea*, and their status needs to be established, preferably with molecular techniques.

Other material examined *(Andrena* (*Aciandrena*) species close to *A. abruptifovea)***.** ISRAEL: Jerusalem env., 20.III.1993, 3♀, leg. D. Abel; SYRIA: An Nasrah env. [Al-Nasrah], 8–13.IV.2005, 2♀, leg. S. Jald; Tartus, 250 m, St. Georg-Klost., 3.IV.1988, 1♀, leg. L. Blank; Tartus, Safita, 10 km N, 300 m, 3.IV.1988, 2♂, 1♀, leg. L. Blank; Aleppo, 500 m, Simeons-Kloster, 19.IV.1988, 1♀, leg. L. Blank; Latakia, 750 m, Qaranjah, 3.IV.1988, 1♀, leg. L. Blank, currently all TJW.

Distribution. Known from high altitude sites in central and northern Lebanon.

Floral preferences. All floral records were made from Brassicaceae. Other *Aciandrena* species for which data are available show exclusive use of Brassicaceae (TJW *unpublished data*), and this may be the case for *A. abruptifovea* but more study is required.

Etymology. The name *abrupti* (abrupt, sudden) + *fovea* (the facial fovea that help to characterise *Andrena* in the female sex) was chosen to describe the abruptly constricted fovea that run along the inner margins of the compound eyes, helping distinguishing this species from other Levantine members of the subgenus.

Andrena (*Chlorandrena*) *edentula* Wood, n. sp.

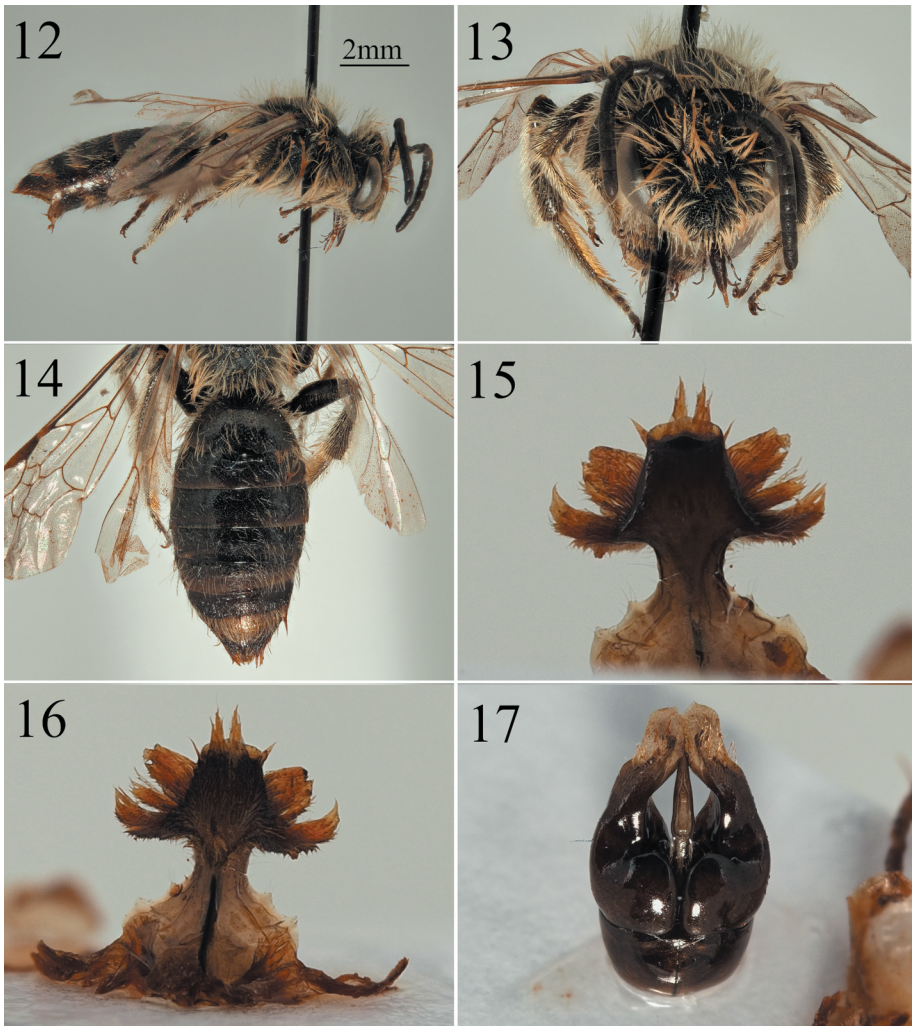
http://www.zoobank.org/urn:lsid:zoobank.org:pub:25E04964-3516-4666-9871-82DD924CC373

Type material. Holotype: ♂, SYRIA occ., An Nasrah env [Al-Nasrah, 34°47'37"N 36°17'23"E], 8–13.IV.2005, leg. J. Saki. Deposited at the OÖLM.

Female. Unknown.

Description of male. Body length 11 mm (Figure 12).

Head. As long as wide, dark but with a very subtle slight metallic sheen, most obvious in the centre of the clypeus (Figure 13). Clypeus black, with shallow raised reticulation forming weak lateral carinae, underlying surface microreticulate, weakly shining. Process of labrum broadly trapezoidal, twice as wide as long, front margin widely and shallowly emarginate. Face, gena, vertex, and scape with light brown-yellow hairs, the longest of these equalling the scape in length. Antennae dark, antennal



Figures 12–17. *Andrena* (*Chlorandrena*) *edentula* **n. sp. 12**, Male profile; **13**, male face; **14**, male tergites; **15**, male sternite 8; dorsal view; **16**, male sternite 8; ventral view; **17**, male genitalia.

segments 3–13 below with extremely short and dense hairs giving a lightened silvery impression, segment 3 shorter than 4 + 5. Ocelloccipital distance slightly exceeding diameter of posterior ocellus.

Mesosoma. Scutum and scutellum strongly shagreened, densely punctate, punctures separated by 0.5–1 puncture diameter, underlying surface weakly shining. Pronotum non-carinate. Scutellum centrally with a very small area free of punctures, underlying surface smooth and shining. Episternum and propodeum reticulate, underlying surface weakly shining, propodeal triangle well marked with a weak carina and by a change in sculpture, basally with short longitudinal carinae, dull. Episternum, propodeum, scutum, and scutellum with long light brown-yellow hairs, the longest of these on the episternum clearly exceeding the length of a scape. Legs dark, final tarsal segments slightly lightened red-brown, pubescence yellow. Wings hyaline, venation and stigma amber, nervulus interstitial.

Metasoma. Tergites dark, apical margins of T2–5 slightly lightened red-brown (Figure 14). Tergites clearly and densely punctured, punctures of typical *Chlorandrena* crater form with raised rim, this most apparent on T1, punctures on following tergites progressively with less clearly marked rims, punctures separated by 1 puncture diameter. Underlying surface on tergal discs weakly shagreened, shining, tergal margins with clear lateral microreticulation, dull. Pubescence weak, without clear pattern, T1–5 generally with sparse yellow to dark brown hairs, T6 with apical margin covered by a loose fringe of yellow hairs, these not obscuring the underlying surface. S8 in dorsal view greatly widened, with short laterally projecting teeth basally, apically with a short lamellate projection, weakly pointed (Figure 15). S8 in ventral view

with thick laterally projecting hair tufts that clearly obscure the underlying surface (Figure 16). Centrally and ventrally at the level of the laterally teeth with a thin and inconspicuous ventrally projecting hair tuft, perpendicular to the sternal plate itself. Genitalia with weakly pronounced gonocoxite teeth, these almost absent (Figure 17). Penis valve very narrow, almost the same width throughout its length. Gonostyli broad, only slightly narrowing apically where they form a flattened and lamellate apex with a small projecting point, internal margin with a raised carina.

Diagnosis. *Andrena edentula* can be quickly placed into the *Chlorandrena* because of the deep and distinct 'crater punctures' on the terga that are impressed with a slightly raised rim. It can be further placed into the *rhenana*-group because sternite 8 is broad with lateral tooth-like projections (Figure 15; Schwenninger 2015). The *rhenana*-group was recently revised in the West Palearctic (Schwenninger 2015), but *A. edentula* is unlike any previously described member, as sternite 8 is extremely short and has thick lateral hair tufts (Figure 16), centrally and ventrally at the level of the lateral teeth with a tuft of long hairs that projects perpendicularly and ventrally away from the sternal plate, and the genitalia are unique with the normally clear gonocoxal teeth greatly reduced and an extremely narrow penis valve (Figure 17). The gonostyli show an affinity to other members of the *rhenana*-group as their apexes are flattened and lamellate, forming only a weak point, with a raised carina along their inner margin, like *A. orientana* Warncke, 1965 and *A. taraxaci* Giraud, 1861, but the combination of weak gonocoxal teeth and the narrow penis valve are unique. Using the key of Schwenninger (2015), *A. edentula* keys to couplet 10 at which point it matches neither species as the genitalia are markedly divergent.

Distribution. Known only from the *locus typicus* in north-western Syria. This locality is just 20 km north of the Lebanese border, and so the species may be present in northern Lebanon.

Floral preferences. None recorded but members of the *Chlorandrena* are very strongly tied to Asteraceae (Cichorieae or Anthemideae, Schmid-Egger & Scheuchl 1997; Amiet et al. 2010; TJW unpublished data).

Etymology. The name *edentula* (toothless) was chosen because the male genitalia have greatly reduced gonocoxal teeth which is unusual for members of the *rhenana*-group (Schwenninger 2015).

Andrena (*Euandrena*) *scrophulariae* Wood, n. sp.

http://www.zoobank.org/urn:lsid:zoobank.org:pub:A8E26F5F-D7DB-4AE8-A82F-FA3C0C098122

Type material. Holotype: ♀, LEBANON: N Lebanon, Arz Tannourine, Gate Area, 1754 m [34°12'25"N 35° 55'55"E, Figure 1, location 2], 20.V.2018, leg. Boustani, *Scrophularia* spp. Deposited at the RBIN. BOLD sequence entry number: HYMAA061-20.

Paratypes: LEBANON: N Lebanon, Arz Tannourine, Gate Area, 1754 m, 20.V.2018, 3♀ [#1-3], leg. Boustani, *Scrophularia* spp. Paratypes are deposited at the RBIN [#1], the DACN [#2], and in the personal collection of TJW [#3].

Description of female. Body length 9–9.5 mm (Figure 18).

Head. Dark, but with a clear greenish metallic sheen, this particularly pronounced on the basal part of the clypeus as the colour transitions from weak metallic green (clypeus margins) to black (centre of the clypeus, Figure 19). Clypeus domed and centrally flattened, clearly and strongly punctured, punctures separated by 1 (laterally) to 2 (centrally) puncture diameters. Clypeus with a faint longitudinal impunctate line centrally. Clypeus shagreened laterally, transitioning to smooth and shining centrally. Process of labrum twice as long as broad, clearly emarginate apically (Figure 20). Face centrally with white hairs, laterally with black hairs. Gena and scape with white hairs, vertex with a mixture of black and white hairs, the longest of these hairs equalling the length of the scape. Antennae dark, segments 5–12 slightly lightened grey below, segment 3 exceeding 4 + 5 in length, slightly shorter than 3 + 4 + 6. Foveae comma shaped, equalling the width of an antenna above where they occupy half of the space between a lateral ocellus and the top of the compound eye, narrowing below to 60% of their maximum width, filled with a light brown to dark brown pilosity depending on the angle of observation. Ocelloccipital distance slightly shorter than width of posterior ocellus.

Mesosoma. Scutum densely shagreened, weakly shining, clearly punctured, punctures separated by 1–2 puncture diameters, underlying integument with faint metallic sheen but not as pronounced as on the face. Pronotum non-carinate. Scutellum laterally the same as the scutum, but centrally smooth and shining, without shagreenation. Episternum and propodeum dull, weakly reticulate, propodeal triangle visible by a change in sculpturing, almost without rugosity except basally. Episternum, propodeum, scutum, and scutellum with long whitish branched hairs, these equalling the length of the scape. Legs dark, tarsi not noticeably lightened, pubescence light brown. Floccus and femoral scopa white, tibial scopa light orange, composed of simple hairs. Wings slightly yellowed, venation amber, nervulus antefurcal.

Metasoma. Tergites dark, narrow apical part of tergal margins lightened translucent yellow (Figure 21). T1 without shagreenation, smooth and shiny, following tergites with subtle shagreenation, predominantly shiny. T1

Figures 18–21. *Andrena* (*Euandrena*) *scrophulariae* **n. sp. 18**, Female profile; **19**, female face; **20**, female labrum; **21**, female tergites.

with sparse but clear and small punctures, punctures separated by 3 puncture diameters, following tergites more densely and weakly punctured, punctures separated by 2 puncture diameters. T1 with a fringe of long hairs on its apical margin, these hairs clearly exceeding the length of the margin itself. T2–4 with fringes of shorter and denser hairs, these only slightly exceeding the length of the margins themselves and obscuring the underlying surface. T5 and the hairs flanking the pygidial plate dark brown. Pygidial plate flat, without central raised portion, densely punctured, with impunctate and slightly raised margin.

Male. Unknown.

Diagnosis. *Andrena scrophulariae* clearly has comma-shaped fovea that are relatively broad above and narrowed below, and would initially seem to be a good fit for the *Euandrena*. However, it has an elongate face (Figure 19) and the process of the labrum is much more elongate than is typical for *Euandrena* (Figure 20), suggesting possibly affinity with *Didonia* (Warncke 1968). Most specifically, *A. scrophulariae* resembles *A.* (*Didonia*) *solenopalpa* from France and Spain that has a similarly elongate face. However, COI barcode data unequivocally places *A. scrophulariae* within the *Euandrena* (C. Praz and TJW unpublished data). Additionally, provisional molecular *Andrena* phylogenies (S. Bossert *in litt*.) suggest that *A. solenopalpa* may be nested within the *Euandrena* and the *Ptilandrena* (Pisanty et al. 2020; see also Praz et al. 2019 for discussion over the paraphyly of these two subgenera). Indeed, previous authors have found problems with the concept of *Didonia* and have split off several previous *Didonia* species into a new subgenus *Hamandrena* based on the presence of strong hooked bristles on the galea (not including *A. solenopalpa* that lacks these bristles, Dubitzky et al. 2010). Given these outstanding problems surrounding *Andrena* classification, we take the approach of placing this taxon within the large *Euandrena* group, and await future subgeneric reclassification efforts with interest.

Andrena scrophulariae can easily be separated from *A. solenopalpa* by the shape of the labral process, which is widely triangular in *A. solenopalpa* but elongate trapezoidal in *A. scrophulariae* with a clearly emarginate front margin. It has a longer face than any currently described species of Eastern Mediterranean *Euandrena*.

Distribution. Known only from Arz Tannourine (Harissa) in northern Lebanon, but given what is known about other high altitude Cedar forests and their associated *Andrena* communities this species is likely to be more widespread across this region.

Floral preferences. All specimens were collected from unidentified *Scrophularia* (Scrophulariaceae) species. The one available pollen load contained pure *Scrophularia* pollen. The elongated face of the female suggests a strong association with flowers with deep corollas, but

more study is required before firm conclusions can be drawn.

Etymology. The name *scrophulariae* (of *Scrophularia*) was chosen because of the use of this genus as a pollen source.

***Andrena* (*incertae sedis*) *cedricola* Wood, n. sp.**

http://www.zoobank.org/urn:lsid:zoobank.org:pub:53413ABA-919A-4D87-BC94-0545BAF4191A

Type material. Holotype: ♀, LEBANON, N Lebanon, Hadath El Jebbe, border of the Cedar forest, 1646 m [34° 12'58"N 35°56'13"E, Figure 1, location 2], 13.V.2017, leg. Boustani, Brassicaceae. Deposited at the RBIN.

Paratypes: LEBANON: N Lebanon, Hadath El Jebbe, border of the Cedar forest, 1618 m, 5.V.2017, 1♂ [#1], 1♀ [#2], leg. Boustani; Mount Lebanon, Falougha, Cedar woods, 1480 m, 27.IV.2019, 1♀ [#3], leg. Boustani (Figure 1, location 4); Mount Lebanon, Laqlouq, Matoube, 1657 m, 30.IV.2017, 1♀ [#4], leg. Boustani (Figure 1, location 3); N Lebanon, Harrisa, Al Jawar, 1758 m, 11.V.2019, 2♂ [#5-6], leg. Boustani, white *Brassica* (Figure 1, location 2); SYRIA: Faouar [probably Camp Faouar UNDOF, Golan Heights, c. 1000 m – it is not clear exactly where this sampling point is, and the author may have been at a higher altitude towards Mount Hermon], 31.III.2001, 1♂ [#7], leg. J. Plass (Figure 1, location 7). Paratypes are deposited at the RBIN [#2; #6], the DACN [#3; #5], the OÖLM [#7], and the personal collection of TJW [#1; #4].

Description of female. Body length 7.5–8 mm (Figure 22).

Head. Black, as long as wide (Figure 23). Clypeus slightly domed, shagreened, weakly shining, with scattered but clear punctures, punctures separated by 1–3 puncture diameters. Process of labrum triangular, slightly longer than wide (Figure 24). Face, gena, and scape with short white hairs, these becoming longer and more yellowish on the vertex, the length of these hairs approaching but not exceeding the length of the scape. Antennae predominantly dark, segments 9–12 becoming very slightly lightened orange below, segment 3 slightly longer than 4 + 5, shorter than 4 + 5 + 6. Fovea relatively broad above, exceeding the width of an antenna, but only occupying 1/3rd of the distance between a lateral ocellus and the top of the compound eye, narrowing below to 50% of their maximum width. Ocelloccipital distance narrow, at most 2/3 width of posterior ocellus.

Mesosoma. Scutum and scutellum shagreened, weakly to strongly shining centrally, surface clearly and evenly punctured, punctures separated by 1–2 puncture diameters. Pronotum non-carinate. Episternum and propodeum shagreened and reticulated, dull, propodeal triangle clearly delineated with a shallow marginal carina, internal surface with clear raised reticulation. Episternum and propodeum laterally with white hairs, scutum and scutellum dorsally with shorter light brown hairs. Legs uniformly dark, pubescence whitish. Floccus, femoral and tibia scopa white. Wings hyaline, venation brown, nervulus antefurcal.

Metasoma. Tergites dark, T1 entirely and T2–4 with apical areas without shagreenation, smooth and shiny (Figure 25). T2–4 basally with shagreenation and extremely scattered and sparse punctures. T1 sparsely but finely punctured, punctures separated by 2–3 puncture diameters. T2–4 both basally and apically with loose lateral hair patches and hair fringes respectively (Figure 25). T5 and hairs flanking pygidial plate light brown, laterally with scattered white hairs. Pygidial plate flat, without raised central portion, densely punctate with a thin impunctate margin.

Description of male. Body length 6.5–7 mm (Figure 26).

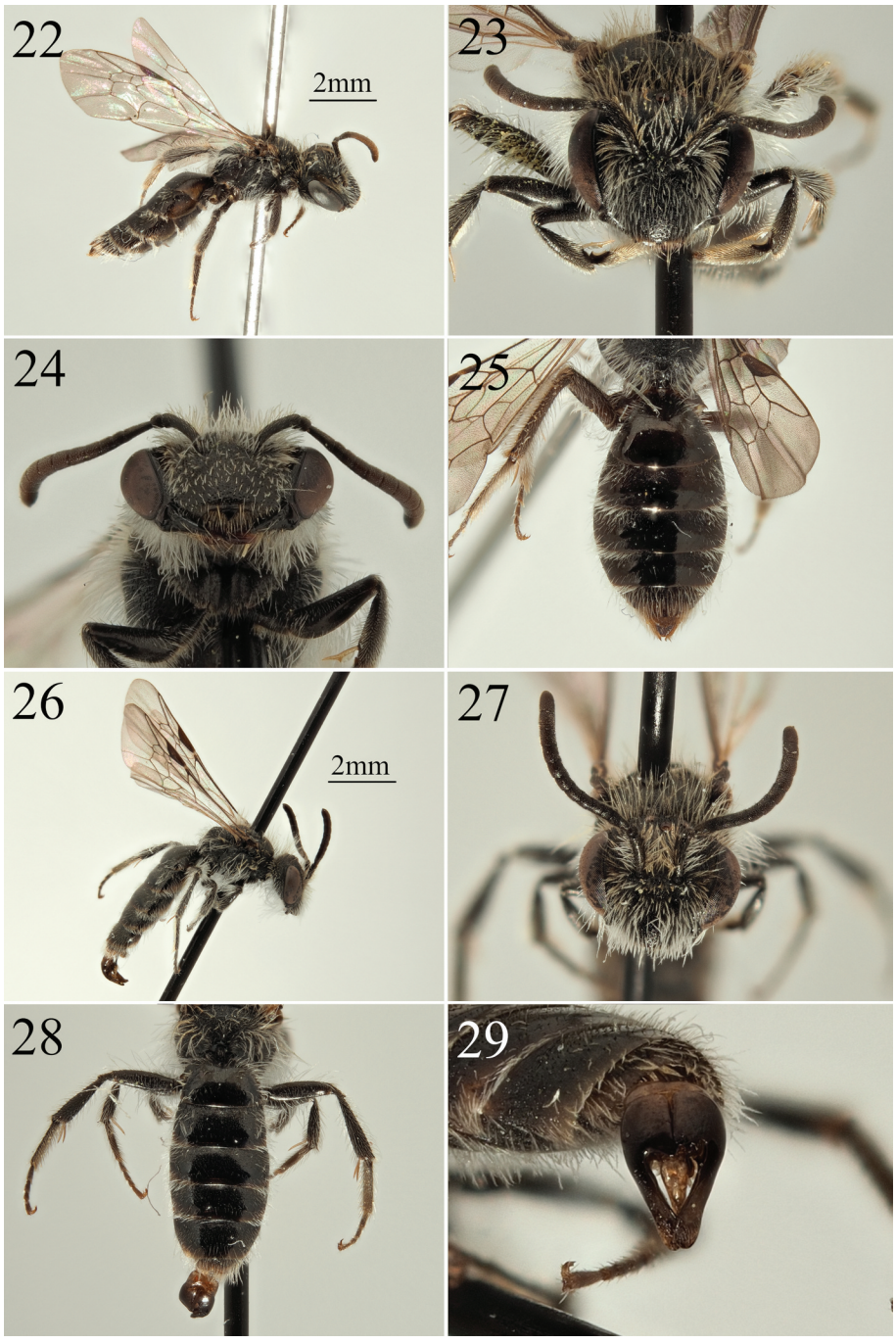
Head. Black, slightly wider than long (Figure 27). Clypeus black, sculpturing as in the female. Process of labrum roughly square, slightly wider than long. Pilosity and ocelloccipital distance as in the female, antennae uniformly dark, segment 3 shorter than 4 + 5.

Mesosoma. Scutum and scutellum strongly shagreened, weakly shining, shallowly and unevenly punctured, punctures with slightly raised rims, separated by 1–2 puncture diameters. Episternum and propodeal sculpturing, mesosomal pilosity, and pronotal carination as in the female. Legs dark, apical tarsal segments slightly lightened. Wings hyaline, venation dark brown, nervulus slightly antefurcal.

Metasoma. As in the female, T1 and T2–5 apically smooth and shiny, without shagreenation, contrasting with the basally shagreened and dull parts (Figure 28). Pubescence as in the female. Genitalia long and slim, gonocoxites with weak rounded teeth, penis valve narrow, and gonostyli parallel sided, slightly wider at their apex than in their middle (Figure 29).

Diagnosis. *Andrena cedricola* morphologically resembles members of the subgenus *Poecilandrena* based on the criteria outlined by Pisanty et al. (2018), specifically *A. stenofovea* Scheuchl & Pisanty, 2018. However, this subgenus has been treated as a 'wastebasket' for species lacking apomorphies, and is strongly paraphyletic (Pisanty et al. 2020). As such, we do not formally place *A. cedricola* into a subgenus at this time, but it can be grouped with the *Poecilandrena* more generally for species recognition and identification purposes.

In the female sex it is most similar to *A. stenofovea* because of the aberrant small and triangular labral process (Figure 24). However, the tergites are completely



Figures 22–29. *Andrena* (*incertae sedis*) *cedricola* **n. sp. 22**, Female profile; **23**, female face; **24**, female labrum; **25**, female tergites; **26**, male profile; **27**, male face; **28**, male tergites; **29**, male genitalia.

different, with wide and shiny marginal areas (Figure 25), whereas in *A. stenofovea* the tergites are uniformly shagreened, with the margins barely differentiated and difficult to see. Though they do narrow below, the facial foveae are also wider than the width of an antenna above, whereas they are narrower than the width of an antenna throughout their entire length in *A. stenofovea*.

The male genitalia are simple (Figure 29) and closest to species like *A. sedumella* Scheuchl & Pisanty, 2018 and *A. limassolica* Mavromoustais, 1948, but are unique amongst Levantine species by the combination of gonocoxal teeth and uncurved gonostyli that broaden slightly at their apex, as well as by the unique sculpturing of the tergal margins as in the female.

Modifying the key of Pisanty et al. (2018), the female of *A. cedricola* keys to couplet 3 at which point it meets some of the characters of *A. stenofovea* (triangular labrum), but not others (facial fovea extremely narrow and elongate) but also does not agree with the alternative (facial fovea uniformly broad, labral process trapezoidal to rectangular). The male of *A. cedricola* keys to couplet 5 at which point it does not agree with either pathway (gonocoxites have a dorsal lobe, but the clypeus is not yellow marked). Both sexes can therefore be easily separated from other similar Levantine *Andrena*.

Distribution. Known from high altitude sites in central and northern Lebanon and the Golan Heights, Syria.

Floral preferences. One female and two males were collected from Brassicaceae. A different female specimen (N Lebanon, Hadath El Jebbe, border of the Cedar forest, 1618 m, 5.V.2017) with no floral visitation data had a scopa full of pollen. Pollen analysis of this load showed that it contained pure Brassicaceae pollen (18 µm in diameter, *Thlaspi*-type). More study is required before any firm conclusions can be drawn for this species.

Etymology. The name *cedri* (Cedar, *Cedrus*, genus of Old World trees) + *cola* (inhabiting, living in a place) was chosen because Lebanese specimens were collected from high altitude sites characterised by stands of *Cedrus libani* (Pinaceae), the national emblem of Lebanon.

Andrena (*Rufandrena*) *parvispinae* Wood, n. sp.

http://www.zoobank.org/urn:lsid:zoobank.org:pub:DACFB7F0-5A14-4E86-A8C9-25CB79428CB8

Type material. Holotype: ♂, SYRIA, Latakia, Qaranjah, 750 m [probably 35.783°N 35.900°E], 3.IV.1988, leg. L. Blank. Deposited at the OÖLM.

Paratypes: SYRIA: Latakia, Qaranjah, 750 m, 3.IV.1988, 4♂, leg. L. Blank; Tartus, Safita, 10 km E, 300 m [probably Alhulu west forests], 1♂, leg. L. Blank. Paratypes are deposited at the OÖLM with one retained in the personal collection of TJW.

Female. Unknown.

Description of male. Body length 5 mm (Figure 30).

Head. Black, clearly wider than long (Figure 33). Clypeus arched, weakly shagreened basally and laterally, centre weakly shiny, entire surface yellow with coloration extending onto the lower paraocular areas. Clypeus surface weakly and shallowly punctured, centrally with punctures separated by 3–4 puncture diameters, laterally by 2–3 puncture diameters. Process of labrum weakly trapezoidal, twice as broad as long. Face, gena, vertex, and scape with white hairs, these not exceeding the length of the scape. Antennae black, antennal segments slightly lightened orange-brown below from segment 5 onwards, segment 3 slightly exceeding 4 + 5 in length, shorter than 4 + 5 + 6. Ocelloccipital distance short, at most ½ width of posterior ocellus.

Mesosoma. Scutum and scutellum strongly shagreened but weakly shining, sparsely, shallowly, and subtly punctured, punctures separated by 2–3 puncture diameters. Pronotum non-carinate. Episternum shagreened, weakly shining. Propodeal triangle slightly marked by a weakly raised external carina, centrally with weak rugosity. Mesosoma with white hairs, these densest and longest on the episternum, the longest hairs equalling the length of the scape. Legs dark, lightened to dark red-orange at the apex of the tarsi, pubescence white. Wings hyaline, venation amber, nervulus clearly postfurcal.

Metasoma. Tergites dark, apical margins lightened yellow to amber, hyaline (Figure 32). Tergal integument shagreened, the strength of the shagreenation decreasing from the T1 to T5, therefore becoming shinier. T1 almost impunctate, with the density of punctures increasing across tergites, T5 therefore moderately but very shallowly punctate, punctures separated by 2 puncture diameters. Tergites laterally with small patches of white hairs, very widely interrupted, these most pronounced on T2–4. S7 widely emarginate, S8 widened and flattened, mallet shaped, laterally with two short but clearly projecting spines (Figure 31). Genitalia long, gonocoxa with moderately pronounced and rounded teeth, gonostyli curved with a thin, hyaline outer margin (Figure 34). Penis valve centrally with two lateral translucent semicircular projections.

Diagnosis. *Andrena parvispinae* can be instantly recognised as a member of the subgenus *Rufandrena* because of the characteristic structure of sternite 8 in the male sex which is strongly widened, and which possesses a clear spine on each side that clearly projects through surrounding hairs (Figures 30, 31). This character is so clear and distinctive that it is actually the first couplet in Warncke's (1968) key to West Palearctic *Andrena* subgenera. Only two species have been placed into the *Rufandrena, A. rufiventris* Lepeletier, 1841 (Morocco to Libya) and *A. orbitalis* Morawitz, 1871 (north-western Africa, Iberia, France, and Italy, Gusenleitner & Schwarz 2002). As well as being separable simply by their much larger size (10–11 mm in the male sex against 5 mm in *A. parvispinae*), both *A. rufiventris* and *A. orbitalis* have quite different genitalia with a marked emargination in the apical part of the gonostyli (Figures 34, 37, 40). The three species share a similar broader than long head shape, and similar

Figures 30–40. *Andrena* (*Rufandrena*). **30–34**, *A*. (*R*.) *parvispinae* **n. sp.: 30**, male profile; **31**, male sternite eight; **32**, male tergites; **33**, male face; **34**, male genitalia; **35–37**, *A*. (*R*.) *orbitalis* Morawitz, 1871: **35**, male tergites; **36**, male face; **37**, male genitalia; **38–40**, *A*. (*R*.) *rufiventris* Lepeletier, 1841: **38**, male tergites; **39**, male face; **40**, male genitalia.

white facial markings, though those in *A. parvispinae* are more extensive (Figures 33, 36, 39).

Distribution. Known only from Syria from Tartus to Latakia. The locality labels suggest inland locations in wooded districts. The species may be in northern Lebanon and south-eastern Turkey as both localities are within 20 km of the respective borders, but these areas must be searched.

Floral preferences. None recorded. Its relative *Andrena orbitalis* may be a specialist of *Plantago* (Plantaginaceae, TJW unpublished data), and so *Plantago* species could be searched in the spring. Nothing is known of the floral preferences of *A. rufiventris*.

Etymology. The name *parvi* (small) + *spinae* (spines) was chosen to describe the two tiny spines in the sides of sternite eight that place this bee in the subgenus *Rufandrena*. The name can also have a double meaning, referring to the small body size of the species itself relative to the other two members of this subgenus (i.e. the small bee in the group of *Andrena* with spines on sternite eight).

Figures 41–46. *Andrena* (*incertae sedis*) *prodigiosa* **n. sp. 41**, Male profile; **42**, male face; **43**, male tergites; **44**, male genitalia; **45**, male genitalia in profile; **46**, male genitalia in reverse view, view of bifurcate penis valve.

***Andrena* (*incertae sedis*) *prodigiosa* Wood, n. sp.**

http://www.zoobank.org/urn:lsid:zoobank.org:pub:F7A264EC-C11D-4009-B6E7-1C1683AA9C9F

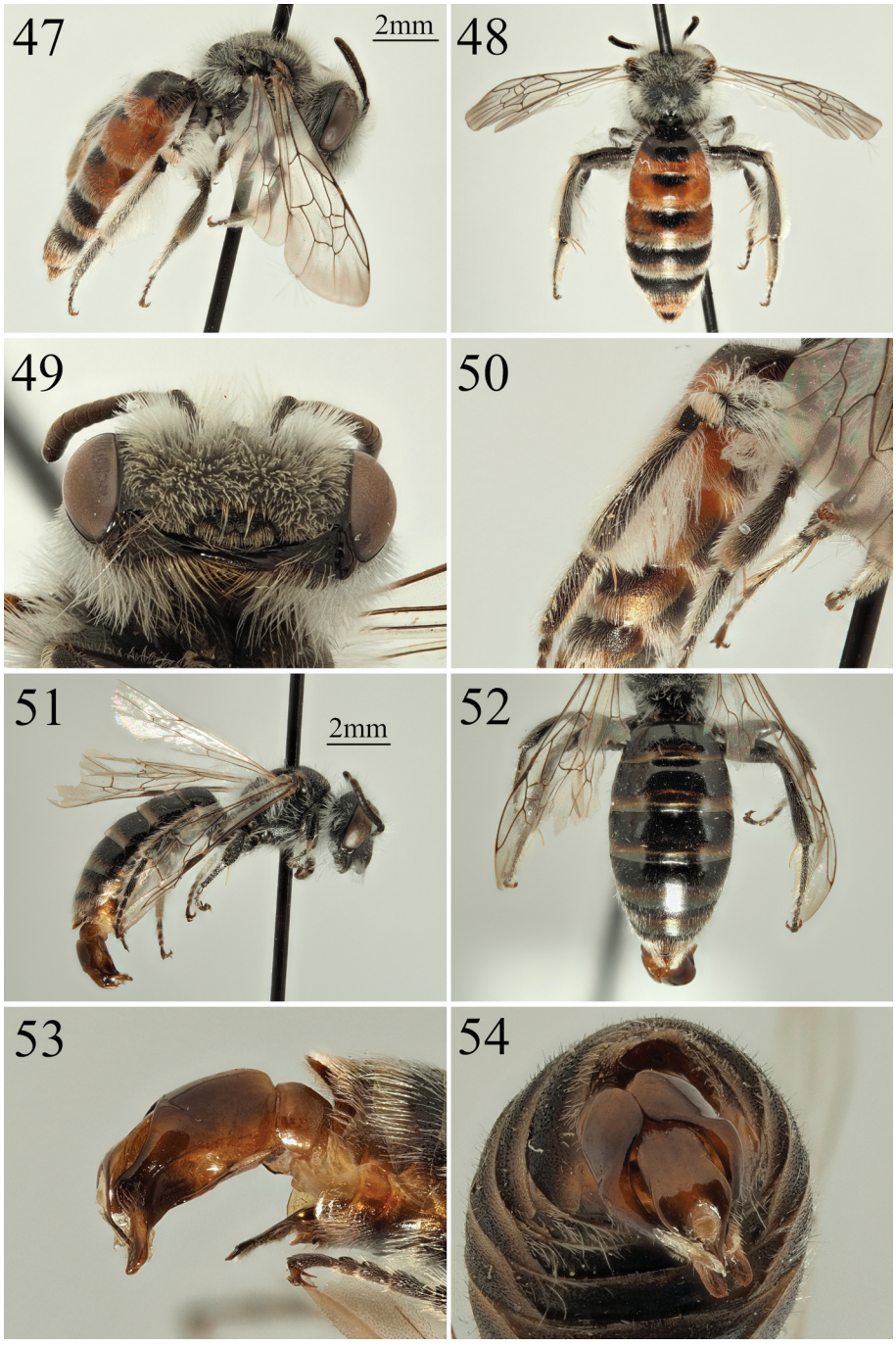
Type material. Holotype: ♂, LEBANON, Beka'a, Qaraoun Lake [33°33'57"N 35°42'28"E, Figure 1, location 6], 24.III.2013, leg. M. Kasparek. Deposited at the OÖLM.

Female. Unknown.

Description of male. Body length 8 mm (Figure 41).

Head. Black, clearly broader than long (Figure 42). Clypeus arched, apically truncate. Underlying surface very weakly shagreened in the apical half and shiny, strongly shagreened basally and laterally, dull. Shiny areas of clypeus sparsely punctured, punctures separated by 2–3 puncture diameters, dull areas of clypeus densely punctate, punctures separated by 0.5–1 puncture diameters. Process of labrum rectangular, three times wider than long, weakly shining. Face, gena, vertex, and scape with whitish to yellowish hairs, some of these exceeding the length of the scape. Antennal segments 1–3 entirely dark, segments 4–13 orange below. Segment 3 equals segments 4 + 5. Ocelloccipital distance equalling width of posterior ocellus.

Mesosoma. Scutum and scutellum densely shagreened, dull, with irregular shallow punctures with clearly raised rims, punctures separated by 0.5–2 puncture diameters. Pronotum non-carinate. Episternum strongly shagreened, dull, with dense shallow punctures without rim, punctures separated by 0.5–1 puncture diameters. Propodeum shagreened and reticulate, dull, propodeal triangle smooth, therefore indicated by this lack of reticulation. Episternum, propodeum, scutum, and scutellum with long whitish to yellowish hairs, these exceeding the length of the scape. Legs dark, tarsal segments 3–5 lightened



Figures 47–54. *Andrena* (*Pallandrena*) *christineae* Dubitzky, 2006. **47**, Female profile; **48**, female tergites; **49**, female labrum; **50**, female scopa; **51**, male profile; **52**, male tergites; **53**, male genitalia in profile; **54**, male genitalia.

orange-red, pubescence whitish to yellowish. Wings hyaline, venation amber, nervulus interstitial.

Metasoma. Tergites dark, shagreened, weakly shining, apical margins lightened yellow-brown (Figure 43). Tergal margins laterally with loose fringes of whitish yellow hairs. Sternite 8 arched (Figure 45), covered in golden hairs (Figure 46). Genitalia abnormal (Figure 44), gonocoxites with strong apical teeth, ground colour brown transitioning into translucent yellow as the gonocoxites meet the gonostyli which are flattened and shovel

shaped, coming to an apical point that is covered in yellow hairs (Figure 44). Penis valve apically strongly bifurcate apically (Figure 46).

Diagnosis. The genitalia of this specimen are unlike any West Palearctic *Andrena* species, and even placing it into a subgenus is difficult, as its combination of characters does not fit any of the current subgeneric concepts. Structurally, the specimen is unremarkable except for the extraordinary genitalia (Figures 44–46) that has hugely enlarged and flattened gonostyli with apical hair tufts, and a penis valve that is apically bifurcate (Figure 37). Sternite 8 is centrally arched and covered in projecting golden hairs (Figures 45, 46). The genitalia are reminiscent of *Parandrenella* with strong gonocoxites leading to partially flattened gonostyli with hair tufts on their internal margin in combination with a penis valve that forms a triangle basally. The subgenus also often has sternite 8 ornamented with elaborate hair patterns (e.g. *Andrena nisoria* Warncke, 1969, see Scheuchl et al. 2011 for good illustrations), but the gonostyli are never this flattened, the penis valve is never bifurcate, and the male clypeus is always yellow in all species described to date. We would hesitantly associate this species with *Parandrenella* on the basis of the overall shape of the genital construction, but we feel that placement in this subgenus before a female can be located would be presumptive.

Distribution. Known only from the *locus typicus* in eastern Lebanon.

Etymology. The name *prodigiosa* (bizarre, prodigious, amazing) was chosen because of the remarkable male genitalia.

Andrena *species of Lebanon*

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

Distribution. Central Europe eastwards to the Caucasus, Turkey, and the Near East (Gusenleitner & Schwarz 2002).

Literature. Grace (2010): Lebanon.

Material examined. JORDAN: Pella env. [Tabaqat Fahl], −80 m, 29.IV.2006, 1♀, leg. K. Deneš, OÖLM; North Shuna environs, 29.IV.1996, 1♀, leg. Mi. Halada, OÖLM; South of Irbid, 13.IV.2009, 1♂, leg. M. Snižek, OÖLM; 10 km N, NE of Jarash [Jerash], 20.IV.2002, 1♀, leg. M. Snižek, OÖLM; LEBANON: Mount Lebanon, Fidar, 25.IV.2017, 1♀, leg. Z. Mahfouz, USEK; Jubayl [Byblos], 5.IV.2017, 1♂, leg. T. Iskandar, USEK; SYRIA: Tartus, St. Georg-Kloster, 250 m, 3.IV.1988, 1♂, leg. L. Blank, MSC.

Notes. This species is reported as new for Jordan and Syria.

Andrena (*Brachyandrena*) *colletiformis* Morawitz, 1874

Distribution. Southern Europe and North Africa to the Near East and Central Asia (Gusenleitner & Schwarz 2002).

Literature. Grace (2010): Lebanon.

Material examined. JORDAN: Pella env. [Tabaqat Fahl], −80 m, 29.IV.2006, 1♀, leg. K. Deneš, OÖLM; 30 km WWN of Aljun, 30.IV.2006, 1♀, leg. F. Kantner, OÖLM; LEBANON: Mount Lebanon, Chamis, Wadi Cheber, 372 m, 26.IV.2019, 1♀, leg. P. Rasmont, UMONS, *Chaetosciadium trichospermum*; N Lebanon, Kfar Hay, Monastere St. Youhanna Maroun, 327 m, 3.V.2017, 1♀, leg. Boustani, TCFNR.

Notes. This species is reported as new for Jordan.

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

Distribution. Bulgaria, Turkey and Israel (Gusenleitner & Schwarz 2002; Pisanty et al. 2018).

Material examined. JORDAN: Aljoun, 28.IV.2012, 1♀, leg. M. Kafka, OÖLM; Aljun environs, 1.V.2006, 1♀, leg. K. Deneš, OÖLM; 15 km W Jerash, Dibbin, 2.V.2006, 4♀, leg. K. Deneš, OÖLM; LEBANON: Bekaa, Kefraya, Horch El Kaser, 992 m, 9.IV.2019, 1♂, 3♀, leg. Boustani, TCFNR, *Crepis sancta*; Bekaa, West Bekaa, Ammiq, 871 m, 27. IV.2019, 1♀, leg. Boustani, TCFNR, *Sonchus oleraceus*; N Lebanon, Tannourine El Tahta, Wadi Ain Al Raha, 900 m, 27.III.2017, 2♂, 2♀; 11.IV.2017, 1♂; 18.IV.2017, 3♀; 3.V.2017, 2♀, all leg. Boustani, TCFNR; N Lebanon, Tannourine El Tahta, Al Mahbase, 893 m, 5.V.2019, 1♂, leg. Boustani, TCFNR; N Lebanon, Fehta, El Biara, 1664 m, 11.V.2019, 1♀, leg. Boustani, TCFNR, *Crepis sancta*; N Lebanon, Arz Tannourine, Gate, 1796 m, 11.V.2019, 1♂, leg. Boustani, TCFNR; N Lebanon, Ehden, Horch, Trail 1, 1534 m, 2.V.2017, 2♀, leg. Boustani, TCFNR; SYRIA: Latakia, Qaranjah, 750 m, 3.IV.1988, 11♂, leg. L. Blank, MSC; Tartus, St. Georg-Kloster, 250 m, 3.IV.1988, 1♀, leg. L. Blank, TJW; Aleppo, 500 m, Simeons-Kloster, 19. IV.1988, 1♀, leg. L. Blank, MSC.

Notes. This species is reported as new for Jordan and Syria. It was only recently reported from Israel for the first time (Pisanty et al. 2018), so it is clearly quite widespread but previously unnoticed in the Levant.

Andrena (*Chlorandrena*) *humabilis* Warncke, 1965 *

Distribution. Balkans, Turkey and Israel (Gusenleitner & Schwarz 2002)

Material examined. JORDAN: 15 km W Jerash, Dibbin, 2.V.2006, 1♀, leg. K. Deneš, OÖLM; LEBANON: S Lebanon, Saidoun, El Mrouj, 26.III.2017, 1♀, leg. A. Baghdadi, SOILS; Saidoun, 10-11.II.2018, 1♂, 2♀, leg A. Baghdadi, SOILS/TJW; SYRIA: Tartus, St. Georg-Kloster, 250 m, 3.IV.1988, 1♀, leg. L. Blank, MSC.

Notes. This species is reported as new for Jordan and Syria.

Andrena (*Chlorandrena*) *humilis* Imhoff, 1832 *

Distribution. Europe, north-western Africa, Turkey, and eastwards into Russia and the Caucasus (Gusenleitner & Schwarz 2002; Hazir et al. 2014).

Material examined. LEBANON: N Lebanon, Fehta, El Biara, 1664 m, 24.IV.2018, 1♂, leg. Boustani, TJW, *Crepis* spp.; 11.V.2019, 2♂, leg. Boustani, TCFNR, *Crepis sancta*; N Lebanon, Arz Tannourine, Tannourine Forest Reserve Outskirts, 1794 m, 6.V.2017, 5♂, leg. Boustani, TCFNR, *Geranium* spp.; N Lebanon, Ehden, Jord, 1983 m, 7.V.2019, 1♂, leg. Boustani, TCFNR, *Medicago* spp.; N Lebanon, Arz Bcharre, Forest of the Cedars of God, Forest Limit, 1873 m, 6.V.2019, 2♀, leg. Boustani, TCFRN/TJW, *Crepis* spp.

Notes. The taxonomic situation surrounding *A. humilis* is complicated. It is the most widespread of the West Palearctic members of the *Chlorandrena* and indeed is the only species of this subgenus found in northern Europe, where it is easily identified due to a unique combination of characters. However, in southern Europe the situation is complicated by the presence of many similar species, and also by *A. humilis* itself which is variable. The usually consistently yellow male clypeus can show a reduced yellow marking, or be entirely black (e.g. Switzerland, Amiet et al. 2010). Because of this variation, Warncke (1975a, 1975b) described several subspecies including *Andrena humilis indigena* Warncke, 1975 and *Andrena humilis prunella* Warncke, 1975 from central and south-eastern Turkey respectively. Gusenleitner (1998) re-examined the later form and elevated it to species rank as *Andrena tadauchii* Gusenleitner, 1998 based on the clearly divergent male genitalia.

Examination of material collected from high elevation sites in Lebanon is difficult to immediately assign to a species as whilst the male genitalia conform, they also have entirely black clypei whereas the yellow marking is reduced but present in subspecies such as *A. h. indigena*. Given the variation in clypeal coloration across the range of *A. humilis*, Lebanese specimens were assigned to this taxon because of the strong similarity in genital construction. True *A. humilis* is widespread in Turkey (Hazir et al. 2014), and the seeming restriction of Lebanese specimens to high elevation sites would be consistent with the idea that the species is on the very edge of its southern range. *Andrena tadauchii* is known from lower elevation sites Turkey, Syria, and Israel (Gusenleitner & Schwarz 2002) and may well be present in Lebanon, but this must be confirmed.

Andrena (*Chlorandrena*) *orientana* Warncke, 1965 *

Distribution. South-eastern Europe and Ukraine to the Near East (Schwenninger et al. 2015).

Material examined. LEBANON: Bekaa, Kefraya, 1009 m, 27.IV.2019, 2♀, leg. Boustani, TCFNR/TJW, *Crepis* spp.

Andrena (*Chlorandrena*) *panurgimorpha* Mavromoustakis, 1957

Distribution. Greece, Turkey and the Caucasus, Cyprus, Ukraine and Israel (Gusenleitner & Schwarz 2002).

Literature. Grace (2010): Lebanon.

Material examined. JORDAN: Pella env. [Tabaqat Fahl], −80 m, 4.V.1995, 1♀; 29.IV.2006, 1♀, both leg. K. Deneš, OÖLM; North Shuna environs, 29–30.IV.1996, 1♂, leg. Mi. Halada, OÖLM; 20 km N of Karak, 1000 m, 27.IV.2006, 1♂, leg. K. Deneš, OÖLM; NW of Ajlun, 850 m, 20.V.2007, 4♀, leg. Z. Kevjal, OÖLM; Ajlun, 30 km W Jarash, 2.VI.2006, 2♀, leg. Z. Kevjal, OÖLM; Aljun environs, 1.V.2006, 2♂, 2♀, leg. F. Kantner, OÖLM; Aljun environs, 5.V.1995, 1♀, leg. K. Deneš, OÖLM; Ajlun env [Aljoun], 840 m, 1.V.2006, 5♂, 3♀, leg. K. Deneš, OÖLM; Irbid, Saham village, 19–25. IV.2003, 1♂, 2♀, leg. I. Pljushtch, OÖLM; 10 km W Jarash, 1.V.1996, 1♀, leg. Ma. Halada, OÖLM; 15 km W Jerash, Dibbin, 2.V.2006, 2♀, leg. K. Deneš, OÖLM; 10 km N, NE of Jarash [Jerash], 20.IV.2002, 1♀, leg. M. Snižek, OÖLM; 20 km NW of Amman, 420 m, 5.V.2006, 1♀, leg. K. Deneš, OÖLM; LEBANON: N Lebanon, Arz Tannourine, Tannourine Forest Reserve Outskirts, 1739 m, 6.V.2017, 1♂, leg. Boustani, TJW; N Lebanon, Jairoun, 29.V.2012, 2♀, leg. M. Kasparek, TCFNR; SYRIA: Aleppo, 500 m, Simeons-Kloster, 19.IV.1988, 1♂, leg. L. Blank, TJW; 60 km S Damascus, Khahab, 14.V.1996, 1♀, leg. Ma. Halada, OÖLM.

Notes. This species is reported as new for Jordan and Syria.

Andrena (*Chlorandrena*) *pinkeunia* Warncke, 1969 *

Distribution. Israel (Gusenleitner & Schwarz 2002).

Material examined. JORDAN: Pella env. [Tabaqat Fahl], −80 m, 29.IV.2006, 1♀, leg. K. Deneš, TJW; Aljoun, 28. IV.2012, 1♀, leg. M. Kafka, OÖLM; LEBANON: S Lebanon, Saidoun, 8.V.2018, 1♀, leg. A. Baghdadi, SOILS.

Notes. This species is reported as new for Jordan.

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

Distribution. Circum-Mediterranean to Central Asia (Gusenleitner & Schwarz 2002).

Literature. Grace (2010): Lebanon.

Material examined. JORDAN: Pella env. [Tabaqat Fahl], −80 m, 29.IV.2006, 1♀, leg. K. Deneš, OÖLM; Aljoun, 28.IV.2012, 1♀, leg. M. Kafka, OÖLM; Aljun environs, 1.V.2006, 2♀, leg. K. Deneš, OÖLM; Irbid, Saham village, 19–25.IV.2003, 4♂, 2♀, leg. I. Pljushtch, OÖLM; 15 km W Jerash, Dibbin, 2.V.2006, 8♀, leg. K. Deneš, OÖLM; LEBANON: Mount Lebanon, Ksaibe, 518 m, 18.IV.2019, 1♂, leg. Boustani, TCFNR, *Sonchus* spp.; Mount Lebaon, Bentael, 369 m, 23.IV.2019, 1♀, leg. Bous, Rasm, Neme, TCFNR, *Crepis* spp.; N Lebanon, Tannourine El Tahta, Wadi Ain aA Raha, 900 m, 3.V.2017, 1♀, leg. Boustani, TCFNR; N Lebanon, Fehta, El Biara, 1664 m, 11.V.2019, 1♀, leg. Boustani, TCFNR, *Trifolium resupinatum*; N Lebanon, Harissa: Chir El Ribez, 1730 m, 31.V.2017, 2♀, leg. Boustani, TCFNR, *Crepis reuteriana*; N Lebanon, Horch Ehden, Nabeh Jouit, 1410 m, 20.V.2019, 1♂, 1♀, leg. Boustani, TCFNR, *Crepis* spp.; N Lebanon, Bcharre, Dahr el Adib, 2585 m, 27.V.2017, 2♂, leg. P. Rasmont & Boustani, TCFNR; SYRIA: Latakia, Qaranjah, 750 m, 3.IV.1988, 1♂, leg. L. Blank, MSC.

Notes. This species is reported as new for Jordan and Syria.

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

Distribution. Greece, Turkey and Israel (Gusenleitner & Schwarz 2002).

Material examined. JORDAN: NW of Ajlun, 850 m, 20.V.2007, 1♀, leg. Z. Kevjal, OÖLM; Aljoun, 27.IV.2012, 1♀, leg. M. Kafka, OÖLM; Irbid, Saham village, 19–25.IV.2003, 1♂, 2♀, leg. I. Pljushtch, OÖLM; 15 km W Jerash, Dibbin, 2.V.2006, 2♀, leg. K. Deneš, OÖLM; 10 km N, NE of Jarash [Jerash], 20.IV.2002, 2♀, leg. M. Snižek, OÖLM; LEBANON: Mount Lebanon, Barja, Marj Barja Daher, 350 m, 7.III.2017, 1♂, leg. Boustani, TCFNR; N Lebanon, Tannourine el Tahta, Al Mahbase, 893 m, 25.IV.2019, 1♂, leg. Boustani, TCFNR; SYRIA: 40 km SW Hama, Masyat [Masyaf], 1.V.2000, 1♂, leg. F. Kantner, OÖLM.

Notes. Very similar to *A. hesperia* but without orange coloured legs and with slightly finer tergal sculpturing. This species is reported as new for Jordan and Syria.

Andrena (*Cordandrena*) *torda* Warncke, 1965

Distribution. Greece, Turkey and Israel (Gusenleitner & Schwarz 2002).

Literature. Grace (2010): Lebanon.

Material examined. JORDAN: North Shuna environs, 29.IV.1996, 1♀, leg. Mi. Halada, OÖLM; S of At Tafila, 27–30.III.2013, 1♀, leg. M. Snižek, OÖLM; 20 km N of Karak, 1000 m, 27.IV.2006, 1♀, leg. K. Deneš, OÖLM; LEBANON: Bekaa, Quaraoun, 24.III.2013, 1♀, leg. M. Kasparek, TJW; N Lebanon, South of Jairoun, 23.V.2012, 1♀, leg. M. Kasparek, TCFNR; SYRIA: Aleppo, SW, 700 m, 7.IV.1988, 1♀, leg. L. Blank, TJW.

Notes. This species is reported as new for Jordan and Syria.

Andrena (*Cryptandrena*) *aruana* Warncke, 1967 *

Distribution. Israel and probably Syria (Warncke 1967; Gusenleitner & Schwarz 2002).

Material examined. LEBANON: Bekaa, Quaraoun, 24.III.2013, 1♂, leg. M. Kasparek, TJW.

Notes. Extremely similar to *A. monacha* (below) in the female sex, this species is best separated using the clearly different male genitalia.

Andrena (*Cryptandrena*) *brumanensis* Friese, 1899

Distribution. Southern Europe to Turkey and the Near East (Gusenleitner & Schwarz 2002).

Literature. Friese (1899): Mount Lebanon, Brumana [Broummana, close to Beirut], 30.IV.1899, leg. F. Morice. Friese listed the country as Syria, but the actual location is in modern day Lebanon; Grace (2010): Lebanon.

Material examined. JORDAN: North Shuna environs, 29.IV.1996, 1♀, leg. Mi. Halada, OÖLM.

Notes. This species is reported as new for Jordan.

Andrena (*Cryptandrena*) *monacha* Warncke, 1965

Distribution. Greece, Turkey and Cyprus (Gusenleitner & Schwarz 2002).

Literature. Grace (2010): Lebanon.

Material examined. LEBANON: Mount Lebanon, Khaldah [Khalde], 18.IV.1973, 1♂, (no collector information), TCFNR; SYRIA: Tartus, Safita, 10 km E, 300 m, 3.IV.1988, 1♂, leg. L. Blank, MSC.

Notes. This species has not yet been reported from Israel or Jordan, and so it may be on the edge of its southern range in Lebanon, and is reported as new for Syria.

Andrena (*Cryptandrena*) *ventricosa* Dours, 1873

Literature. Grace (2010): Lebanon.

Material examined. LEBANON: N Lebanon, Jairoun, 29.V.2012, 1♀, leg. M. Kasparek, TCFNR.

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

Distribution. Europe, north-western Africa, Turkey, the Near East, and eastward to Central Asia (Gusenleitner & Schwarz 2002)

Material examined. LEBANON: N Lebanon, Hadath El Jebbe, Al Fouar, 1529 m, 12.IV.2019, 1♀, leg. Boustani, TCFNR, *Galium* spp.

Notes. The *Andrena bicolor*-group, as well as the rest of the subgenus *Euandrena*, are badly in need of an in-depth revision across the Mediterranean region (Pisanty et al. 2018; Praz et al. 2019). There are several probably undescribed *Euandrena* species present in Lebanon (see Discussion), so here we only present one record of a specimen that can be confidently placed as *A. bicolor*. The status of *Euandrena* in the Mediterranean basin is likely to change dramatically in coming years.

Andrena (*Euandrena*) *rufitibialis limosa* Warncke, 1969

Distribution. Jordan, Israel, Syria and Turkey (Gusenleitner & Schwarz 2002).

Material examined. JORDAN: 15 km W Jerash, Dibbin, 750 m, 2.V.2006, 6♀, leg. K. Deneš, OÖLM/TJW; 20 km N of Karak, 1000 m, 27.IV.2006, 1♂, leg. K. Deneš, OÖLM; Ajlun S of Anjara, 27.IV.2002, 2♀, leg. M. Snižek, OÖLM; Aljoun, 28.IV.2012, 1♂, 1♀, leg. M. Kafka, TJW; Aljun environs, 5.V.1995, 1♀, leg. K. Deneš, OÖLM; Aljun environs, 840 m, 1.V.2006, 2♂, 1♀, leg. K. Deneš & F. Kantner, OÖLM; Aljun Hills env, 29.IV–1.V.2006, 1♀, leg. K. Deneš, OÖLM; Irbid, Saham village, 25.IV.2003, 1♀, leg. I. Pljushtch, OÖLM/TJW; LEBANON: Donnieh, 1600 m, 23.V.2012, 1♀, leg. M. Kasparek, TJW; Donnieh, Wadi Cehennem oberth. Quemmamine, 1393 m, 23.V.2012, 2♀, leg. M. Kasparek, TJW; south of Jairoun, 1648 m, 23.V.2012, 1♀, leg. M. Kasparek, TJW.

Notes. *A. rufitibialis* was originally described from Jericho, in the modern-day West Bank, though the type locality is listed as [Jordan] by Gusenleitner and Schwarz (2002), so it is not actually clear if it has been previously reported from Jordan or not. As its name suggests, one of its defining characters are the red-coloured hind tibiae and tarsi. Warncke later described the subspecies *limosa* with type material from Turkey, Jordan and Israel (Warncke 1969a). This bee is darker, lacking the red-coloured legs of the nominate type, but shares the shiny clypeus, densely and clearly punctate tergites, and clear hair fringes on the tergites. All examined material from Jordan and Lebanon conformed to *A. r. limosa*, with no specimens displaying red-coloured legs or tergites. *Andrena r. limosa* is considered a valid taxon by some authors (Rasmont et al. 2017), and further investigation into *A. rufitibialis* is needed to clarify the relationship between these different colour forms.

Andrena (*Euandrena*) *rufula* Schmiedeknecht, 1883 *

Distribution. Southern Europe from France and Spain eastwards to Ukraine and with a patchy distribution south into Greece and Turkey (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: N Lebanon, Horch Ehden, Nabeh Jouit, 13.IV.2019, 1410 m, 1♀, leg. Boustani, TCFNR, *Crataegus* cf *monogyna*; N Lebanon, Horch Ehden, Nabeh Jouit, 24.IV.2019, 1337 m, 1♀, leg. P. Rasmont, TCFNR, *Salix libani*; N Lebanon, Arz Bcharre, Forest of the Cedars of God, 1913 m, 9.V.2017, 2♀, leg. Boustani, TCFNR, *Cotoneaster* spp.

Notes. *Andrena rufula* was reported from the western Taurus mountains of Turkey between Akseki and Beyşehir at 1300 m (Warncke 1975a). Its presence in Lebanon whilst unexpected is not unprecedented, and the high altitude Lebanese sites are ecologically and climatically comparable to the Taurus mountains. *Andrena rufula* is a univoltine polylectic species that flies in the spring (Amiet et al. 2010), and the flower records here would suggest that it forages from flowering broadleaved trees. *Andrena rufula* can be an abundant visitor to flowering apple trees in eastern France, collecting pure loads of Rosaceae pollen (TJW, *unpublished data*), so these observations are consistent with this picture. This is the first record of this species from the Levant, but it may also be present at high altitude sites in Syria and Israel.

Andrena (*Fuscandrena*) *stenofovea* Scheuchl & Pisanty, 2018 *

Distribution. Israel (Pisanty et al. 2018).

Material examined. LEBANON: Mount Lebanon, Barja, Marj Barja Daher, 350 m, 7.III.2017, 2♂, leg. Boustani, TCFNR; Bekaa, Quaraoun, 24.III.2013, 1♀, leg. M. Kasparek, TCFNR; N Lebanon, Tannourine El Tahta, Wadi Ain El Raha, 900 m, 27.III.2017, 1♀, leg. Boustani, TJW; SYRIA: Tartus, St. Georg-Kloster, 250 m, 3.IV.1988, 2♀, leg. L. Blank, MSC.

Notes. Originally placed in the *Poecilandrena*, this species is better placed in the *Fuscandrena* (Pisanty et al. 2020). This species is reported as new for Syria.

Andrena (*Holandrena*) *forsterella* Osytchnjuk, 1978

Distribution. The exact distribution of *A. forsterella* is unclear because its putative first generation was split off as a distinct species *A. wilhelmi* Schuberth, 1995. The two taxa have a similar distribution (Schuberth 1995) and *A. forsterella* is probably distributed from Italy, through the Balkans, to Turkey and further eastwards. True *A. forsterella* has not been recorded from Israel, where records conform to *A. wilhelmi* (Pisanty et al. 2018). See Notes.

Literature. Grace (2010): Lebanon.

Material examined. LEBANON: Bekaa, Der el Ahmar, 989 m, 3.VII.2019, 1♀, leg. Boustani, TJW.

Notes. *Andrena wilhelmi* is a spring-flying species, on the wing in March to June, whereas true *A. forsterella* flies between June and August (Schuberth 1995). This record represents the most southerly extent of its range, as re-examination of specimens reported as *A. forsterella* by Warncke (1969) collected in March and April confirm their identity as *A. wilhelmi* (Pisanty et al. 2018). Both taxa are likely to be present in Lebanon.

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

Distribution. Europe and north-western Africa eastwards to Turkey and Central Asia, south to Israel (Gusenleitner & Schwarz 2002; Pisanty et al. 2018).

Material examined. LEBANON: Mount Lebanon, Horch el Barouk, Chouf Biosphere Reserve, 1678 m, 2.VII.2019, 1♀, X. van Achter, VXA, *Medicago* spp.; N Lebanon, Hadath El Jebbeh, Chemin Wadi Ain El Raha, 1519 m, 29.VI.2017, 1♂, 1♀, leg. Boustani, TCFNR, *Ononis natrix*; N Lebanon, Harissa: Al Jawar, 1738 m, 28.VI.2017, 1♂, leg. Boustani, TCFNR; N Lebanon, Arz Tannourine Gate area, 1754 m, 23.VI.2018, 1♂, 1♀, leg. Boustani, TCFNR, *Allium phanerantherum*; N Lebanon, Hadath El Jebbe, Border of the Cedar forest, 1632 m, 5.VII.2019, 1♀, leg. Boustani, TCFNR, *Stachys cretica*; N Lebanon, Tannourine Reserve Trail 4, 6.VII.2017, 1747 m, 1♂, leg. Boustani, TCFNR, *Campanula stricta*; N Lebanon, Horch Ehden, Nabeh Jouit, 1410 m, 27.VI.2019, 1♀, leg. Boustani, TCFNR, *Stachys cretica*; Arz Bcharre, Forest of the Cedars of God, 22.VI.2017, 1815 m, 22.VI.2017, 1♀, leg. Boustani, TCFNR, *Vicia tenuifolia*; Arz Bcharre, Bcharre Reforestation Area, 1993 m, 22.VI.2017, 1♂, 2♀, leg. Boustani, TCFNR, *Medicago* spp.; 2.VII.2019, 1♂, leg. G. Ghisbain, UMONS; N Lebanon, Bcharre, 2042 m, 12.VII.2019, 1♀, leg. X. van Achter, XVA, *Vicia* spp.; Bekaa, Ainata, 1556 m, 30.V.2017, 5♂, leg. P. Rasmont, TCFNR.

Notes. *Andrena labialis* was recently reported from Israel for the first time from Mount Hermon at comparable altitudes (1600–1650 m, Pisanty et al. 2018) to the Lebanese sites reported here.

Andrena (*Holandrena*) *variabilis* Smith, 1853

Distribution. LEBANON: Southern Europe and north-western Africa eastwards to Turkey, the Near East, and into Central Asia (Gusenleitner & Schwarz 2002).

Literature. Grace (2010): Lebanon.

Material examined. Mount Lebanon, Laqlouq, 1752 m, 30.VI.2019, 1♀, leg. G. Ghisbain, UMONS.

Andrena (*Hoplandrena*) *trimmerana* (Kirby, 1802) *

Distribution. The true distribution of *A. trimmerana* is obscured by long-standing taxonomic confusion with another member of the *Hoplandrena* that has been referred to as *A. carantonica* Pérez, 1902, but it appears to be distributed across Europe into north-western Africa, Turkey and Israel (Gusenleitner & Schwarz 2002; Pisanty et al. 2018).

Material examined. LEBANON: N Lebanon, Arz Bcharre, Forest of the Cedars of God, 1913 m, 9.V.2017, 1♂, leg. Boustani, TCFNR; Bekaa, Donnieh, Wadi Cehennem, (no date), 1♀, leg. M. Kasparek, TCFNR; Bekaa, Ras Baalbeck, 5.V.2018, 1♂, leg. E. Harran, USEK.

Notes. True *A. trimmerana* is best and most confidently identified from spring males which have unidentate mandibles (lacking an internal mandibular tooth) and also possess a genal spine.

Andrena (*Lepidandrena*) *statusa* Gusenleitner, 1998 *

Distribution. Israel and Turkey (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: N Lebanon, Tannourine El Tahta, Wadi Ain El Raha, 936 m, 11.IV.2017, 1♂, leg. Boustani, TJW.

Notes. Both *A. statusa* and *A. elisaria* Gusenleitner, 1998 (Turkey) were described in the same publication and from the same type locality and date. They differ mostly by the colour of the integument. Pisanty et al. (2018) argue that they likely represent variation within a single species, as both forms can be found together in Israel. For now, only one specimen has been found in Lebanon so we can make no comment as to the validity of this conclusion.

***Andrena* (*Margandrena*) *krausiella* Gusenleitner, 1998**

Distribution. Israel and Jordan (Gusenleitner & Schwarz 2002; Al-Ghzawi et al. 2006).

Literature. Grace (2010): Lebanon.

Material examined. LEBANON: S Lebanon, Saidoun, 20.I.2018, 2♀, leg. A. Baghdadi, SOILS/TJW.

***Andrena* (*Melanapis*) *fuscosa* Spinola, 1838 ***

Distribution. Circum-Mediterranean to Central Asia (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: Bekaa, American University of Beirut farm, 15.IV.1962, 1♂, leg. K. Bedirian, AUB; 12.V.1962, 1♀, leg. S. Khan, AUB; SYRIA: Aleppo, 500 m, Simeons-Kloster, 19.IV.1988, 3♂, leg. L. Blank, MSC.

Notes. Seemingly not previously reported from Syria.

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

Distribution. Circum-Mediterranean to Central Asia (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: S Lebanon, Sidon [Saida], 25.V.1981, 1♀, (no collector information), TCFNR; Mount Lebanon, Chhim, Khallat Chiim, 25. IV.1981, 1♂, (no collector information), AUB; Bekaa, American University of Beirut farm, 19.IV.1962, 1♀, leg. N Samman; 27.IV.1962, 1♀, leg. K. Bedirian; 26. V.1962, 1♀, leg. Z. Rafii; 20.IV.1964, 1♀, leg. G. Siddloul, all AUB; Bekaa, Baalbeck, Hoch Sneid, 21. V.1964, 1♀, leg. B. Ayyash, AUB.

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

Distribution. Cyprus, Israel, Syria, and Turkey (Gusenleitner & Schwarz 2002).

Literature. Grace (2010): Lebanon.

Material examined. LEBANON: N Lebanon, Tannourine El Tahta, Al Mahbase, 893 m, 12.IV.2019, 1♀, leg. Boustani, TJW; 5.V.2019, 1♀, leg. Boustani, TCFNR; N Lebanon, Arz Tannourine Gate area, 1754 m, 2.IV.2018, 1♂, leg. Boustani, TCFNR; N Lebanon, Ehden, Nabeh Jouit, 1336 m, 24.IV.2019, 1♀, leg. P. Rasmont, UMONS, *Salix* cf *libani*.

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

Distribution. Europe and north-western Africa to the Near East, Turkey, and Central Asia (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: Mount Lebanon, Falougha, 17.VII.1975, 1♂, (no collector information), AUB; Bekaa, American University of Beirut farm, 2. IV.1963, 1♀, leg. Babikir; 10.VI.1971, 1♂, leg. Anwar; 11.IV.1980, 1♀, leg. A. Fakher, all AUB.

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

Distribution. Europe, North Africa, the Middle East, and into Central Asia (Gusenleitner & Schwarz 2002).

Literature. Mavromoustakis (1962): N Lebanon, Near Becharré [Bcharre], 19.VI.1960, 1♀; Focke, 20.VI.1960, 2♀; N Lebanon, Kadisha river, 20.VI.1960, 1♀; Grace (2010): Lebanon.

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

Distribution. Europe, Mediterranean, Turkey, the Near East, and into Central Asia (Gusenleitner & Schwarz 2002).

Literature. Mavromoustakis (1962): N Lebanon, Near Becharré [Bcharre], 27.VI.1960, 1♀; N Lebanon, Kadisha river, 21-26.VI.1960, 6♀; Grace (2010): Lebanon.

Material examined. LEBANON: N Lebanon, Bcharre, 1900 m, 14.VII.2019, 1♀, leg. X. van Achter, XVA; Mount Lebanon, Hboub, 29.III.2017, 1♀, leg. E. Harran, USEK; N Lebanon, Tannourine El Tahta, Wadi Ain El Raha, 900 m, 1♂, leg. Boustani, TCFNR; N Lebanon, Hadath El JEbbEh, Road to Wadi Al Fouar, 1553 m, 28.VI.2018, 1♀, leg. Boustani, TCFNR; N Lebanon, Hadath el Jebbe, Al Fouar, 1529 m, 12.VI.2019, 1♂, leg. Boustani, TCFNR; N Lebanon, Tannourine Reserve, Trail 4, 1781 m, 3.VI.2019, 1♀, leg. Boustani, TCFNR; N Lebanon, Jairoun, 29.V.2012, 1♀, leg. M. Kasparek, TCFNR.

***Andrena* (*Melandrena*) *pyropygia* Kriechbaumer, 1873**

Distribution. Eastern Mediterranean to Ukraine and into Central Asia (Gusenleitner & Schwarz 2002).

Literature. Mavromoustakis (1962): Mount Lebanon, Baabdate, 24–25.V.1953, 2♂, 1♀; S Lebanon, Djezzine [Jezzine], 20.V.1953, 1♂; Grace (2010): Lebanon.

***Andrena* (*Melandrena*) *thoracica* (Fabricius, 1775)**

Distribution. Europe, North Africa, the Near East, and into Central Asia (Gusenleitner & Schwarz 2002).

Literature. Mavromoustakis (1962) (as *A. t. kotschyi* Mavromoustakis, 1953): N Lebanon, Near Becharré [Bcharre], 19–20.VI.1960, 3♀; N Lebanon, Kadisha river, 25.VI.1960, 1♀; N Lebanon, Cedars [Arz Bcharre], 4.VII.1960, 1♀; Grace (2010): Lebanon.

Material examined (*A. t. kotschyi*). LEBANON: Mount Lebanon, Berbara, 10.IV.1961, 1♀, leg. H. Nasr, AUB; Bekaa, American University of Beirut farm, 10.V.1961, 1♀, leg. R. Hajj, AUB; (*A. thoracica* sensu strictu)

Bekaa, American University of Beirut farm, 29.III.1964, 1♀, leg. Taylor, AUB.

Notes. There are outstanding taxonomic issues surrounding *A. thoracica* and its described subspecies. In typical nominate *A. thoracica* from northern Europe, the hind tibial spurs are black, but in Mediterranean forms such as *A. t. kotschyi* the hind tibial spurs are light red or amber, similar to *A. limata*. Specimens from the same site in Lebanon (Bekaa, American University of Beirut farm) produced specimens with both colour forms. *Andrena thoracica* could benefit from molecular investigation across its range.

Andrena (*Melittoides*) *melittoides* Friese, 1899 *

Distribution. Israel and Turkey (Gusenleitner & Schwarz 2002).

Literature. Friese (1899) described this species from Jerusalem, but also listed below this "Syria". It is not clear exactly what he meant by this as he did not detail specific specimens, and in the same paper he made reference to "Jaffa (Syria)" (p. 343) which today is in modern Israel. However, we can definitively report that the species is present in Lebanon based on contemporary material.

Material examined. LEBANON: Mount Lebanon, Wadi Chahrour, 22.V.2009, 1♂, leg. N Nemer, USEK.

Andrena (*Micrandrena*) *alfkenella* Perkins, 1914 *

Distribution. Morocco and Europe to Turkey (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: Mount Lebanon, Chouf Biosphere Reserve, Barouk Gate, 1428 m, 16.V.2019, 1♀, leg. Boustani, TCFNR, *Peltaria angustifolia*; N Lebanon, Tannourine Reserve, Trail 4, 1781 m, 30.VI.2019, 1♀, leg. Boustani, TCFNR, *Euphorbia* spp.; N Lebanon, Arz Tannourine, Main gate, 1796 m, 4.VII.2019, 14♀, leg. Boustani, X. van Achter, & G. Ghisbain, TCFNR/TJW/UMONS/XVA, *Chaerophyllum aurantiacum*; N Lebanon, Arz Tannourine, reserve entrance, 1797 m, 12.VII.2019, 3♀, leg. X. van Achter, VXA, *Chaerophyllum aurantiacum*; N Lebanon, Horch Ehden, Nabeh Jouit, 1336 m, 24.IV.2019, 2♀, leg. Boustani, TCFNR; N Lebanon, Ehden, Horch Ehden, 1567 m, 1♀, leg. Boustani & W. Yammine, TCFNR.

Notes. *Andrena alfkenella* is widespread throughout Europe, extending to mountains in Turkey including the Taurus Mountains. The species is bivoltine, though the second generation is much more abundant and easier to find, showing a strong preference for Apiaceae pollen (TJW, unpublished data). Its presence at altitude in northern Lebanon is consistent with the trend shown in other species more typically found in Europe.

Andrena (*Micrandrena*) *alfkenelloides* Warncke, 1965 *

Distribution. Balkans to Turkey and the Near East (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: N Lebanon, Tannourine El Tahta, Wadi Ain El Raha, 900 m, 24–27.III.2017, 4♀, leg. Boustani, TCFNR/TJW.

Andrena (*Micrandrena*) *lindbergella* Pittioni, 1950

Literature. Grace (2010): Lebanon.

Material examined. LEBANON: N Lebanon, Bcharre, Dahr El Adib, 2585 m, 27.V.2017, 3♂, leg. P. Rasmont & Boustani, TCFNR/TJW; N Lebanon, Bcharre, Dahr El Adib, 2437 m, 8.VI.2017, 2♀, leg. Boustani, TCFNR/TJW; N Lebanon, Arz Bcharre, Forest of the Cedars of God, Forest Limit, 1897 m, 20.V.2019, 1♂, leg. Boustani, TCFNR, *Alyssum* spp.; N Lebanon, Tannourine, Jabal Al Mnaitra, 2469 m, 28.V.2017, 1♂, leg. P. Rasmont & Boustani, TCFNR, *Ranunculus demissus*.

Notes. Recently recorded from Israel for the first time from Mount Hermon, also at altitude (1950–2200 m, Pisanty et al. 2018). With a *locus typicus* in the Troodos mountains in Cyprus, this is clearly an alpine species.

Andrena (*Micrandrena*) *magunta* Warncke, 1965 *

Distribution. Eastern Europe through the Balkans to Turkey and Israel (Gusenleitner & Schwarz 2002; Pisanty et al. 2018).

Material examined. LEBANON: Mount Lebanon, Jamhour, 2.IV.1973, 1♀, (no collector information), TCFNR; Bekaa, Quaraoun, 24.III.2013, 1♀, leg. M. Kasparek, TCFNR; N Lebanon, Tannourine El Tahta, Wadi Ain El Raha, 900 m, 5.V.2017, 1♀, leg. Boustani, TJW; 11.V.2017, 2♂, leg. Boustani, TCFNR/TJW, *Carduus argentatus*.

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

Distribution. North-western Africa, through Europe to Cyprus and Turkey (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: N Lebanon, Hadath El Jebbe, Al Fouar, 1529 m, 12.IV.2019, 1♀, leg. Boustani, TJW.

Notes. Another more typically 'European' species found at altitude.

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

Distribution. Morocco and Europe to Turkey and the Caucasus (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: N Lebanon, Ehden, Ain El Naasa, 1598 m, 22.V.2019, 1♀, leg. Boustani, TJW.

Notes. Another more typically 'European' species found at altitude.

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

Distribution. Greece and Turkey to Israel (Gusenleitner & Schwarz 2002; Pisanty et al. 2018).

Material examined. JORDAN: Irbid, Saham villiage, 19–25.IV.2003, 3♀, leg. I. Pljushtch, OÖLM/TJW; LEBANON: Mount Lebanon, Barja, Marj Barja Daher, 350 m, 7.III.2017, 1♂, leg. Boustani, TCFNR; Mount Lebanon, Marej Barja, Kaleet El Besten, 358 m, 26. IV.2019, 1♀, leg. Boustani, TCFNR; N Lebanon, Tannourine El Tahta, Wadi Ain El Raha, 900 m, 24. III.2017, 1♂, leg. Boustani, TCFNR; SYRIA: Tartus, St. Georg-Kloster, 250 m, 3.IV.1988, 1♂, leg. L. Blank, TJW; Latakia, Saladinburg [Citadel of Saladin], 900 m, 4.IV.1988, 1♂, leg. L. Blank, TJW.

Notes. Recently reported from Israel for the first time (Pisanty et al. 2018), this species is reported as new to Jordan and Syria.

Andrena (*Micrandrena*) *rugothorace* Warncke, 1965 *

Distribution. Italy and the Balkans to Turkey and Israel (Gusenleitner & Schwarz 2002; Pisanty et al. 2018).

Material examined. LEBANON: N Lebanon, Tannourine El Tahta, Wadi Ain El Raha, 900 m, 11–18.IV.2017, 1♂, 1♀, leg. Boustani, TCFNR; N Lebanon, Tannourine El Tahta, Al Mahbase, 893 m, 25.IV–5.V.2019, 4♀, leg. Boustani, TCFNR/TJW.

Notes. Predominantly found at altitude, as is the case in Israel (Mount Hermon 1500 m, Pisanty et al. 2018).

Andrena (*Micrandrena*) *simontornyella corpana* Warncke, 1965

Distribution. Southern Europe and north-western Africa to Turkey and the Near East. The south-eastern form found in Greece, Turkey, and the Levant is smaller and was described as *A. corpana* (Warncke 1965).

Literature. Grace (2010): Lebanon.

Material examined. LEBANON: Bekaa, Qaraoun Lake, 24.III.2013, 1♀, leg. M. Kasparek, TJW.

Andrena (*Micrandrena*) *spreta* Pérez, 1895 aggregate

Distribution. The *Andrena spreta* complex is taxonomically challenging and controversial. In a broad sense, the species is found around the Mediterranean, and north into central and northern Europe (Gusenleitner & Schwarz 2002).

Literature. Grace (2010): Lebanon.

Material examined. LEBANON: N Lebanon, Tannourine El Tahta, Wadi Ain El Raha, 934 m, 11. V.2017, 1♂, leg. Boustani, TCFNR.

Notes. The taxonomic status of *A. spreta* and its subspecies is unclear. It is currently in the process of being revised and is likely to be broken up into multiple species in the future. The form likely to be present in Lebanon was described as *A. s. scirpacea* Warncke, 1975 from Turkey.

Andrena (*Micrandrena*) *tiaretta* Warncke, 1974

Distribution. North Africa to Israel and Syria (Gusenleitner & Schwarz 2002).

Literature. Grace (2010): Lebanon.

Material examined. LEBANON: N Lebanon, Tannourine El Tahta, Wadi Ain El Raha, 901 m, 11.IV.2017, 1♀, leg. Boustani, TCFNR; N Lebanon, Tannourine El Tahta, Wadi Ain El Raha, 878 m, 18.IV.2017, 1♀, leg. Boustani, TJW; N Lebanon, Tannourine El Tahta, Al Mahbase, 893 m, 5. V.2019, 1♀, leg. Boustani, TCFNR.

Notes. *Andrena tiaretta* can be differentiated from other Near Eastern *Micrandrena* by the sculpturing of the scutum, and by the male genitalia. Kratochwil (2015) revised the *A. tiaretta* group, describing *A. orientalis* Kratochwil, 2015 from Israel and Syria. We do not follow this interpretation as the characters described for separating the putative taxa are extremely slight, and we take the position that these constitute acceptable variation within a single species concept.

Andrena (*Micrandrena*) *tringa* Warncke, 1973 *

Distribution. Eastern Europe to Turkey and Israel (Gusenleitner & Schwarz 2002; Pisanty et al. 2018).

Material examined. LEBANON: Mount Lebanon, Chouf Biosphere Reserve, Maaser El Chouf Gate, 1726 m, 16. V.2019, 1♀, leg. Boustani, TCFNR; Mount Lebanon, Chouf Biosphere Reserve, Barouk Gate, 1428 m, 16. V.2019, 1♀, leg. Boustani, TCFNR; Mount Lebanon, Barouk, Chouf Biosphere Reserve, 1690 m, 4.VII.2019, 1♀, leg. X. van Achter, VXA; N Lebanon, Tannourine El Tahta, Al Mahbase, 893 m, 12.IV.2019, 1♀, leg. Boustani, TJW; N Lebanon, Harissa, Al Jawar, 1758 m, 11.V.2019, 1♂, 2♀, leg. Boustani, TCFNR; N Lebanon, Hadath El Jebbeh, Road to Wadi Al Fouar, 1553 m, 6.VI.2018, 1♀, leg. Boustani, TCFNR; N Lebanon, Tannourine Reserve, Trail 4, 1781 m, 13.V.2019, 1♀, leg. Boustani, TCFNR; N

Lebanon, Arz Tannourine Gate area, 1754 m, 2.IV.2018, 2♀, leg. Boustani, TCFNR; N Lebanon Arz Bcharre, Forest of the Cedars of God, Forest Limit, 1897 m, 20.V.2019, 4♂, 5♀, leg. Boustani, TCFNR/TJW; N Lebanon, Arz Bcharre, Forest of the Cedars of God Reforestation Area, 1933 m, 18.IV.2018, 1♀, leg. Boustani, TCFNR.

Notes. Predominantly found at altitude, as is the case in Israel (Mount Hermon 1300 m, Mount Meron 1000 m, Pisanty et al. 2018).

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

Literature. Grace (2010): Lebanon.

Distribution. Greece, Turkey, and the Near East to Russia and the Caucasus (Gusenleitner & Schwarz 2002; Pisanty et al. 2018).

Material examined. LEBANON: N Lebanon, Arz Bcharre, Forest of the Cedars of God, 1883 m, 27.V.2018, 3♀, leg. Boustani, TCFNR, *Vicia tenuifolia*; N Lebanon, Arz Bcharre, Forest of the Cedars of God, Forest Limit, 1897 m, 2♂, 2♀, leg. Boustani, TCFNR, *Erysimum* spp.

Notes. This species was collected in association with *Erysimum* (Brassicaceae), a likely pollen host as some members of the *Nobandrena* are known to be specialised on Brassicaceae (Amiet et al. 2010; TJW unpublished data). This species was recently reported from Israel for the first time, also at a high altitude site (Mount Hermon 1500 m, Pisanty et al. 2018).

Andrena (*Nobandrena*) *asiatica* Friese, 1921

Distribution. Turkey and Lebanon (Schuberth et al. 2001); Grace (2010) Lebanon.

Literature. Schuberth et al. (2001): N Lebanon, Cedars [Arz Bcharre], 10–23.VI.1962, 1♀, Sw, 1♂, Coll. Schmiedeknecht, Zoological Museum Berlin.

Andrena (*Notandrena*) *ungeri* Mavromoustakis, 1952 *

Distribution. The map presented by Gusenleitner and Schwarz (2002) presents incorrect data. *Andrena ungeri* is found from south-eastern Europe through the Balkans and Turkey to Israel and Syria (Warncke 1969a; Hazir et al. 2014).

Material examined. JORDAN: Kerak, Mazra'a, −390 m, 19.III.1988, 18♀, MSC; LEBANON: Mount Lebanon, Arz Al Barouk, 19.V.1972, 1♀, (no collector information), AUB; Mount Lebanon, Dahr El Baïdar, 8.III.1973, 1♀, leg. E. Baram, AUB; Bekaa, Bawarij, 10.V.1975, 1♀, (no collector information), AUB; Bekaa, Anjar, 27.IV.2016, 1♀, leg. Boustani, Y. Zgheib, TCFNR.

Notes. This species is reported as new for Jordan.

Andrena (*Opandrena*) *schencki* Morawitz, 1866

Distribution. Europe to Turkey, the Near East, and Central Asia (Gusenleitner & Schwarz 2002).

Literature. Grace (2010): Lebanon.

Material examined. LEBANON: Beyrouth [Beirut], 1.V.1979, 1♀, leg. Japrin, TCFNR.

Andrena (*Orandrena*) *gallinula* Warncke, 1975 *

Distribution. Turkey and Armenia (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: N Lebanon, Horch Ehden, Nabeh Jouit, 1410 m, 20.V.2019, 1♀, leg. Boustani, TJW, *Diplotaxis* spp.; N Lebanon, Horch Ehden, Ain El Naasa, 1560 m, 22.V.2019, 2♀, leg. Boustani, TCFNR, *Diplotaxis* spp.; SYRIA: 400 m NN Homs E 20 km, 1.IV.1988, 1♀, leg. S.M. Blank, TJW.

Notes. Close to *A. oralis* Morawitz, 1876 but smaller. Most similar to *A. acrana* Warncke, 1967 but can be separated by the more densely shagreened scutum. This species is reported as new for Syria.

Andrena (*Orandrena*) *garrula lomvia* Warncke, 1969 *

Distribution. Turkey and Israel (Gusenleitner & Schwarz 2002).

Material examined. JORDAN: Aljoun, 28.IV.2012, 1♀, leg. M. Kafka, OÖLM; LEBANON: Mount Lebanon, Barja, Marj Barja Daher, 350 m, 31.I.2016, 2♂, leg. Boustani, Y. Zgheib, TCFNR; N Lebanon, Tannourine El Tahta, Wadi Ain al Raha, 900 m, 24.III.2017, 4♀, leg. Boustani, TCFNR/TJW; SYRIA: Tartus, St. Georg-Kloster, 250 m, 3.IV.1988, 4♀, leg. L. Blank, MSC/TJW.

Notes. This taxon is reported as new for Jordan and Syria.

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

Distribution. Turkey (Ağrı; Hakkâri) and Iran (Kermanshahan, Dubitzky 2006).

Material examined. LEBANON: N Lebanon, Arz Bcharre Forest of the Cedars of God Reforestation Area, 1933 m, 18.IV.2018, 2♂, 2♀, leg. Boustani, TCFNR/TJW, *Geranium libanoticum*; Arz Bcharre, Forest of the Cedars of God, Forest Limit, 1897 m, 20.V.2019, 1♂, leg. Boustani. Allotype male deposited at the OÖLM.

Description of male. Body length 11 mm (Figure 51).

Head. Black, clearly wider than long. Clypeus black, broad, strongly domed, evenly reticulate with reticulation forming weak lateral carinae, underlying surface impunctate, weakly shining. Process of labrum twice as broad as long, only very shallowly raised above the rest of the labrum but smooth and shiny and therefore well differentiated from the clearly punctured remaining surface area. Face, gena, vertex, and scape with long white hairs, those on the lower part of the gena clearly exceeding the length of the scape. Gena slightly wider than the width of the compound eye. Antennae uniformly dark, segment 3 equalling 4 + 5. Ocelloccipital distance wide, twice width of posterior ocellus.

Mesosoma. Scutum and scutellum weakly shagreened, weakly shining, moderately but very shallowly punctate, punctures separated by 1–2 puncture diameters. Pronotum non-carinate. Episternum and propodeum shagreened with raised moderately strong reticulation, propodeal triangle clearly differentiated from the rest of the propodeum by a change in surface sculpture from moderate to shallow reticulation. Legs dark, only tarsal claws slightly lightened to red, pubescence white. Wings hyaline, venation dark brown to amber apically, nervulus interfurcal.

Metasoma. Tergites dark, margins lightened orange to yellow, clearly hyaline apically (Figure 52). Tergal integument very subtly shagreened, predominantly shining, weakly punctured throughout, punctures separated by 1–2 puncture diameters. S8 long and narrow, apically narrowly emarginate, therefore clearly forked. Genitalia long (Figure 53), generally reminiscent of members of the *Ulandrena* due to the widely parting gonocoxites and the large penis valve with an apical blister (Figure 54), though without apical gonocoxal teeth. Gonostyli narrow, forming projecting points that stand out in profile (Figure 53).

Notes. Described only from the female, *A. christineae* was known from high-elevation mountain sites in eastern Turkey and western Iran. Females can be easily recognised as *Pallandrena* because of the deep emargination in the labrum (Figure 49) and the plumose scopa (Figure 50). *Andrena christineae* females can be recognised easily because of the red coloration of the tergites (Figures 47, 48, Dubitzky 2006). Where altitudes were recorded, specimens were collected from 2050–2450 m (Turkey, Hakkari, Mt. Sat, 10.VI.1981), 1600 m (Turkey, Ağrı, 10 km N Tutak, 28.V.1980), and 1900–2000 m (Iran, Kermanshahan, Buchan, 19.V.1975, Dubitzky 2006). Sites in northern Lebanon are therefore at an ecologically consistent elevation. The bee may also be present in Turkish mountains closer to Lebanon, linking the populations together, and given this specialised ecological niche, the species is probably under-recorded.

Lebanese material represents the earliest recorded flight date of 18.IV for this species, but even this early in the season male material shows extensive wing wear (Figure 51), perhaps explaining why males were not captured by previous collectors. *Andrena christineae*, as well as other *Pallandrena* species such as *A. byrsicola* Schmiedeknecht, 1900, are likely to be a specialised on *Geranium* or other member of the Geraniaceae, in part because of the extraordinary plumose scopa that defines the subgenus *Pallandrena* (Figure 50, TJW *unpublished data*). This scopa type is reminiscent of the plumose scopa of the specialist *A. hattorfiana* (Fabricius, 1775) that is presumably an adaptation to collecting the similarly large grains of *Knautia* (Dipsacaceae) that can reach 100 µm in diameter. The scopal hairs of specialised bees often reflect the characteristics of the particular pollen type that they specialise on, with long simple hairs in bees specialised on large grains from Onagraceae or Cucurbitaceae or dense plumose or branched hairs in bees specialised on small grains from Asteraceae (Linsley 1958; Thorp 1979; Portman & Tepedino 2017). To date, morphological adaptations to pollen harvesting in *Andrena* have received little attention, though see LaBerge (1987) and Dubitzky et al. (2010) for the subgenera *Scoliandrena* and *Hamandrena*, respectively.

Andrena (*Pallandrena*) *pallidicincta* Brullé, 1832 *

Distribution. From the Balkans to Turkey and Israel (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: N Lebanon, Ehden, Horch Ehden, Gate area, 1424 m, 2.V.2017, 6♂, leg. Boustani, TCFNR/TJW, *Geranium* spp.; N Lebanon, Donnieh, 23.V.2012, 1♀, leg. M. Kasparek, TCFNR; SYRIA: 50 km NE Tartus, Banyas, 1.V.2000, 1♀, leg. F. Kantner, OÖLM.

Notes. Probably a specialist on *Geranium* like *A. christineae* based on the floral associations and the remarkable plumose scopa that are typical of the *Pallandrena*. Reported as new for Syria.

Andrena (*Plastandrena*) *pilipes* Fabricius, 1781

Distribution. Taking a broad interpretation, *A. pilipes* is found around the Mediterranean into Central Asia (Gusenleitner & Schwarz 2002).

Literature. Grace (2010): Lebanon.

Material examined. LEBANON: Bekaa, Der el Ahmar, 3.VII.2019, 1♂, leg. G. Ghisbain, UMONS.

Notes. *Andrena pilipes* may contain additional taxa such as *A. spectabilis* Smith, 1853 which was reported from

Jordan (Al-Ghzawi et al. 2006). For now, we take a broad approach for this taxon.

Andrena (*Poecilandrena*) *bytinskii* Warncke, 1969 *

Distribution. Israel and (unpublished) Turkey (Pisanty et al. 2018)

Material examined. JORDAN: Aljun environs, 1.V.2006, 1♀, leg. F. Kantner, OÖLM; Ajlun S of Anjara, 27.IV.2002, 1♀, leg. F. M. Snižek, OÖLM; 15 km W Jerash, Dibbin, 2.V.2006, 5♀, K. Deneš, OÖLM/TJW; LEBANON: N Lebanon, Fehta, El Biara, 1632 m, 24.IV.2018, 1♂, leg. Boustani, TJW.

Notes. Not restricted to high altitude sites in Israel (Pisanty et al. 2018) or Jordan, so the single Lebanese site is probably not representative of its ecological niche. Newly recorded for Jordan.

Andrena (*Poecilandrena*) *freidbergi* Pisanty & Scheuchl, 2018 *

Distribution. Previously known only from Israel (Mount Hermon, Pisanty et al. 2018).

Material examined. LEBANON: N Lebanon, Arz Bcharre, Forest of the Cedars of God, Forest Limit, 1873 m, 20.V.2019, 1♀, leg. Boustani, TJW, *Veronica polifolia*.

Notes. No previous flower records (Pisanty et al. 2018), but the association with *Veronica* would be consistent with the subgenus, many members of which are specialists or have strong association with this plant genus. The species seems to be restricted to high elevation sites in both Israel and Lebanon.

Andrena (*Poecilandrena*) *labiata regina* Friese, 1921 *

Distribution. This subspecies is known from Israel and Turkey (Pisanty et al. 2018).

Material examined. LEBANON: N Lebanon, Arz Tannourine Reserve Trail 4, 1800 m, 6.V.2017, 1♀, leg. Boustani, TCFNR; N Lebanon, Hadath El Jebbeh, Border of Cedar Forest, 1681 m, 19.IV.2018, leg. Boustani, 1♀, TCFNR, *Bellevalia flexuosa*; N Lebanon, Bcharre, Dahr El Adib, 2306 m, 27.V.2017, 1♂, 2♀, leg. Boustani, TCFNR, *Gagea* spp.; N Lebanon, Bcharre, Bcharre Reforestation Area, 2347 m, 27.VI.2017, Boustani, 1♀, TCFNR, *Veronica polifolia*.

Notes. The nominate subspecies of *A. labiata* is polylectic with no clear preferences (Wood & Roberts 2017), so this may also be true for this subspecies as well given the range of flower visits.

Andrena (*Poecilandrena*) *rusticola* Warncke, 1975 *

Distribution. Known from Israel and Turkey (Pisanty et al. 2018).

Material examined. JORDAN: Aljoun, 28.IV.2012, 2♀, leg. M. Kafka, OÖLM/TJW; LEBANON: N Lebanon, Horch Ehden, Nabeh Jouit, 1336 m, 24.IV.2019, 1♂, leg. Bous & Rasm, TJW, *Veronica syriaca*; SYRIA: Latakia, Qaranjah, 750 m, 3.IV.1988, 1♂, leg. L. Blank, MSC; Tartus, Safita, 10 km E, 300 m, 3.IV.1988, 1♀, leg. L. Blank, MSC.

Notes. The association with *Veronica* is consistent with data from Israel (*Veronica leiocarpa*, Pisanty et al. 2018). This species is reported as new for Jordan and Syria.

Andrena (*Poecilandrena*) *sphecodimorpha mediterranea* Scheuchl & Pisanty, 2016 *

Distribution. This subspecies is known from Israel (Pisanty et al. 2018).

Material examined. JORDAN: Ajlun env [Aljoun], 840 m, 1.V.2006, 1♀, leg. K. Deneš, OÖLM; LEBANON: N Lebanon, Tannourine Reserve, Trail 4, 1781 m, 13.V.2019, 1♂, leg. Boustani, TJW, *Thlaspi* spp.; N Lebanon, Horch Ehden, Nabeh Jouit, 1336 m, 24.IV.2019, 1♂, leg. Bous & Rasm, TJW, *Veronica syriaca*; N Lebanon, south of Jairoun, 23.V.2012, 1♀, leg. M. Kasparek, TCFNR; SYRIA: Crac des Chevaliers, 30.V.1995, 1♀, leg. K. Deneš, OÖLM.

Notes. Most of the records reported here occur a little later in the season than the February–April flight period reported by Pisanty et al. (2016, 2018). However, many do occur further north and at a higher altitude, possibly explaining this discrepancy. This species is reported as new for Jordan and Syria.

Andrena (*Poliandrena*) *unicincta* Friese, 1899 *

Distribution. Known from Israel (Gusenleitner & Schwarz 2002), but the identification of this group of red-marked *Poliandrena* has historically been difficult and confused, see comments on *Andrena unifasciata* below.

Material examined. ISRAEL: 10 km E of Kiryat Gat, 13.V.2019, 6♀, leg. M. Halada, OÖLM; Bet Shemesh, Britannia Park, 23.IV.2018, 13♀, leg. M. Halada, OÖLM; R70, 10 km NNE Nahariya, 28.IV.2018, 1♀, leg. M. Halada, OÖLM; Ramot Naftali, 10 km S of Kiryat Shmona, 27.IV.2018, 13♀, leg. M. Halada, OÖLM; JORDAN: 30 km NW Aljun, 600 m, 29.IV.2006, 1♀, leg. K. Deneš, OÖLM; 10 km W Jarash, 1.V.1996, 1♀, leg. Ma. Halada, OÖLM; Irbid, Alkfarat, 28–29.IV.2012,

1♀, leg. M. Kafka, OÖLM; 15 km W Jerash, Dibbin, 2.V.2006, 2♀, leg. K. Deneš, OÖLM; LEBANON: S Lebanon, Saidoun, 5.III.2018, 1♀, leg. A. Baghdadi, SOILS; 24.III.2019, 1♂, leg. A. Baghdadi, SOILS; N Lebanon, Tannourine El Tahta, Al Mahbase, 893 m, 5.V.2019, 1♀, leg. Boustani, TCFNR, *Sonchus oleraceus*.

Notes. See comments on *Andrena unifasciata*. This species is reported as new for Jordan.

Andrena (*Poliandrena*) *unifasciata* Friese, 1899 stat. rev.

Distribution. Jordan, Lebanon, and the West Bank.

Literature. Friese (1899): Beirut, 28.IV.1889, 1♂, 1♀, leg. F. Morice.

Material examined (*Andrena unifasciata*). WEST BANK: [specimen labelled 'Israel'] Wadi el Kelt [Wadi Qelt], 5.III.1954, 1♀, (no collector information), OÖLM; JORDAN: 15 km W Jerash, Dibbin, 2.V.2006, 4♀, leg. K. Deneš, OÖLM; (*Andrena caspica* Morawitz, 1886): ISRAEL: 10 km E of Kiryat Gat, 13.V.2019, 5♀, leg. M. Halada, OÖLM; JORDAN: 20 km S of North Shuna, Tall Al Arbatin, 19.IV.1996, 3♀, leg. Ma. Halada, OÖLM; Aljoun, 28.IV.2012, 1♂, leg. M. Kafka, OÖLM; SYRIA: Latakia, Saladinburg [Citadel of Saladin], 900 m, 4.IV.1988, 1♂, leg. L. Blank, MSC; Tartus, Safita, 10 km E, 300 m, 3.IV.1988, 1♂, leg. L. Blank, MSC.

Notes. The situation within Near Eastern *Poliandrena* is complex and has historically been greatly confused. As summarised in Gusenleitner & Schwarz (2002), there are six taxa (*A. basimacula* Alfken, 1929; *A. caspica* Morawitz, 1886; *A. kriechbaumeri* Schmiedeknecht, 1883; *A. polita* Smith, 1847; *A. unicincta*; and *A. westensis* Warncke, 1965) that form a group with the same genital construction. *Andrena basimacula* is found in Libya and can be easily separated due to its dark pubescence and *A. kriechbaumeri* (Balkans to Turkey) can also be separated because of the very strongly postfurcal position of the nervulus. This leaves four taxa occurring in the Eastern Mediterranean that have been dealt with confusingly and in various combinations with each other.

For example, *Andrena westensis* was originally described as a subspecies of *A. unicincta* from Greece (Warncke 1965a), then later he suggested that it was instead a subspecies of *A. caspica*, also including *A. unicincta* and *A. unifasciata* as junior synonyms (Warncke 1967). However, he later listed both *A. caspica* and *A. unicincta* as good species (Warncke 1969a), but then moved *A. westensis* and *A. caspica* into synonymy with *A. polita* (Warncke 1975a). As a result, the true distribution of all these data is unclear; the map presented in Gusenleitner and Schwarz (2002) is possibly the broadest possible interpretation of *A. polita* containing all six taxa.

Within a Lebanese context, it is best to identify the true taxa occurring in the Levant. Friese described two similar species from the Near East. *Andrena unicincta* from Jerusalem, 7–10.IV.1899, 2♂, 2♀, leg. F. Morice, and *Andrena unifasciata* Friese, 1899 from Beirut, 28.IV.1899, also leg. F. Morice. According to Friese, the two taxa are very similar but *A. unifasciata* differs in the female sex by the clearly shiny mesonotum ("sonst wie *unicincta* und nur an dem glänzenden, sparsam und tief punctirten Mesonotum", sculpturing clearly dull in *unicincta*) and the black clypeus in the male (yellow in *A. unicincta*).

Andrena unifasciata was synonymised with *A. caspica* by Warncke (1967) without any justification or written reasoning, as was often the case (e.g. Schmid-Egger & Doczkal 1995). It is noted by Gusenleitner and Schwarz (2002) that *A. caspica* are variable in size, sometimes containing smaller individuals (p. 164) and that sometimes the colour of the clypeus varies from yellow to black (p. 165). Examination of material from the Levant shows that the original position of Friese was correct, and *A. unifasciata* is a valid taxon that can be separated from other similar *Poliandrena* in the Levant in the female sex by the degree of shagreenation on the scutum, the shape of the labral process, the overall body size, and the position of the nervulus and additionally in the male sex by the coloration of the clypeus (Table 1). *Andrena kriechbaumeri* is not included in this determination table because it can be easily separated in both sexes by the position of the nervulus which is strongly postfurcal, and it is probably absent from the Levant. There are therefore three red-marked *Poliandrena* in the Levant, all of which probably have overlapping distributions. Museum material should be carefully re-examined to clarify their exact distributional ranges.

Grace (2010) reports *A. caspica* from Lebanon, but given the confusion over *A. caspica* and *A. unifasciata* this could refer to either taxon, and possibly refers simply to the type locality of *A. unifasciata*, and so the presence of true *A. caspica* in Lebanon is for now considered unproven. The true identity of Levantine material identified as *A. caspica* should be reviewed. For now, we consider that only *A. unicincta* and *A. unifasciata* are present in Lebanon.

Andrena (*Simandrena*) *thomsoni* Ducke, 1898 *

Distribution. Southern Europe from France to Turkey and Central Asia (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: Bekaa, Kefraya, 1101 m, 27.IV.2019, 2♂, leg. Boustani, TCFNR; Bekaa, West Bekaa, Ammiq, 871 m, 27.IV.2019, 1♂, leg. Boustani, TJW, *Sonchus oleraceus*; N Lebanon,

Table 1. Determination table for *Poliandrena* that have historically been confused in the Near East region. Characters require direct comparison across different taxa.

	A. caspica Morawitz, 1886	*A. polita* Smith, 1847	*A. unicincta* Friese, 1899	*A. unifasciata* Friese, 1899	*A. westensis* Warncke, 1965
♀ labral process	Clearly and deeply emarginate	Rounded with tiny emargination	Rounded with tiny emargination	Slightly emarginate	Rounded with tiny emargination
♀ scutum structure	Slightly shiny	Slightly shiny	Dull	Shiny	Dull
♀ nervulus	Interfurcal	Postfurcal	Postfurcal	Interfurcal	Postfurcal
♀ size	Larger, 12–13 mm	Larger, 12–13 mm	Larger, 11–12 mm	Smaller, 10–11 mm	Larger, 12–13 mm
♀♂ abdomen colour	Partly red on tergal discs	Black, tergal margins lightened	Partly red on tergal discs	Partly red on tergal discs	Black, tergal margins lightened
♂ clypeus colour	Completely yellow, sometimes also with small yellow marks on lower paraocular area	Completely black	Yellow front margin, occupying 1/3 of the total clypeal area	Completely black	Completely yellow

Tannourine El Tahta, Wadi Ain El Raha, 900 m, 24.III.2017, 1♀, leg. Boustani, TJW; N Lebanon, Arz Tannourine, Tannourine Forest Reserve Outskirts, 1739 m, 25.V.2017, 1♂, leg. Boustani, TCFNR, *Crepis reuteriana*.

Notes. *Andrena thomsoni* was reported from the western and southern coasts of Turkey in high elevation areas such as the Taurus mountains (Warncke 1975a), making this a similar situation to that of *A. rufula*. Lebanese specimens conform closely to comparative *A. thomsoni* material from southern France. *Andrena gasparella* Patiny, 1998 was described from a single locality in western Turkey (Akşehir, Konya) and is similar to *A. thomsoni*, but Lebanese material have a scutellum that is dull, not shiny (Patiny 1998), in line with true *A. thomsoni*.

Andrena (*Simandrena*) *transitoria* Morawitz, 1871

Distribution. Central Europe and Italy eastwards to Turkey, the Near East, and Central Asia (Gusenleitner & Schwarz 2002).

Literature. Mavromoustakis (1962): Mount Lebanon, Hammana, 16.V.1953, 1♀; Mount Lebanon, Ein el Arar, 25.V.1953, 1♀.

Material examined. JORDAN: 30 km N Tafila [At-Tafilah], 2.V.1996, 1♀, leg. Ma. Halada, OÖLM; 16 km WWN Aljun [Aljoun], 600 m, 21.V.2007, 3♂, leg. Z. Kejval, OÖLM; LEBANON: Beirut, American University of Beirut, 1.V.1980, 1♀, leg. O.K. Rima, AUB.

Notes. This species is reported as new for Jordan.

Andrena (*Simandrena*) *vetula* Lepeletier, 1841

Distribution. Circum-Mediterranean to Central Asia (Gusenleitner & Schwarz 2002).

Literature. Mavromoustakis (1962): Mount Lebanon, Ein el Arar (near Baabdate), 25.V.1953, 1♀; S Lebanon Djezzine [Jezzine], 2.VI.1953, 1♀.

Material examined. LEBANON: S Lebanon, Saidoun, 15.IV.2018, 1♂, *Rapistrum rugosum*; 22.IV.2018, 1♀; 5.V.2018, 1♀, all leg. A. Baghdadi, SOILS; Mount Lebanon, Daichouniyé, Nahr Beirut Climbing Site, 133 m, 27.IV.2017, 3♂, 3♀, leg. Boustani, TCFNR.

Notes. Originally placed in the *Ptilandrena, A. vetula* clearly falls within with *Simandrena* (Pisanty et al. 2020).

Andrena (*Suandrena*) *cyanomicans mirna* Warncke, 1969 *

Distribution. Iberia, north-western Africa, and the Near East (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: Mount Lebanon, Fanar, 11.III.1965, 1♀, (no collector information, from the R. Traboulsi Collection), USEK; Bekaa, American University of Beirut farm, 15.III.1965, 1♂, 2♀, leg. M. A. Sawsan, TCFNR.

Notes. The *Suandrena* are in need of revision. The subspecies *A. c. fratella* Warncke, 1968 (Morocco) is highly likely to be a valid species more closely related to the *Andrena maderensis* Cockerell, 1922 group (Kratochwil et al. 2014), and it is also likely that *A. c. mirna* is a valid species.

Andrena (*Taeniandrena*) *hova* Warncke, 1975 *

Distribution. Central and eastern Turkey (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: N Lebanon, Fehta, El Biara, 1632 m, 25.V.2018, 1♀, leg. Boustani, TCFNR, *Vicia tenuifolia*; N Lebanon, Hadath El Jebbe, Al Fouar, 1529 m, 25.V.2018, 1♀, leg. Boustani, TCFNR, *Vicia tenuifolia*; N Lebanon, Arz Tannourine, Gate area, 1754 m, 29.VI–6.VII.2019, 1♀, leg. Boustani & G. Ghisbain, TCFNR, *Vicia tenuifolia*; N Lebanon, Arz Bcharre, Forest of the Cedars of God, 1883 m, 29.VI.2019, 2♂, 2♀, leg. Boustani & Jabbour, TCFNR, *Vicia tenuifolia* and *Vicia canescens*; N Lebanon, Arz Bcharre, Forest of the Cedars of God, Forest Limit, 1873 m, 5.VI.2019, 7♀, leg. Boustani, TCFNR, *Vicia tenuifolia*; N Lebanon, Arz Bcharre, Bcharre Reforestation Area, 1993 m, 27.VI.2017, 4♂, 3♀, leg. Boustani, TCFNR, *Vicia tenuifolia* and *Vicia canescens*; N Lebanon, Bcharre Reforestation Area, 2216 m, 2.VII.2019, 3♂, 5♀, leg. Boustani, TCFNR, *Vicia canescens*.

Notes. *Andrena hova* was described from central (Ankara, Madenşehri) and eastern (Erzurum) Turkey (Warncke 1975a, 1975b). Like other members of the *Taeniandrena, A. hova* is probably oligolectic on Fabaceae (Wood & Roberts 2017). All females were collected from *Vicia* species, so far the only confirmed pollen host.

Andrena (*Taeniandrena*) *ovatula* (Kirby, 1802) aggregate *

Distribution. Following a broad interpretation, *A. ovatula* is a circum-Mediterranean species extending eastwards into Central Asia (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: N Lebanon, Horch Ehden, Ain Al Bayada Gate, 1597 m, 5.VII.2019, 3♀, leg. Boustani & G. Ghisbain, TJW, *Medicago* spp. & *Coronilla varia*; N Lebanon, Arz Bcharre, Forest of the Cedars of God, Forest Limit, 1897 m, 2.VII.2019, 1♂, leg. Boustani, TJW, *Anarrhinum orientale*.

Notes. This taxon contains several cryptic species that are identifiable using COI barcoding throughout the Western Palearctic, even in well-studied regions such as central and western Europe, and the group therefore requires a deep revision (Praz & Wood, in prep.). It is not at all clear which name should be applied to Lebanese material, and so these specimens are reported as *A. ovatula* in the broadest possible sense (e.g. Warncke 1969a records from Israel) as *A. ovatula* sensu stricto, a western taxon with a strong Atlantic distribution (Praz & Wood, in prep.), is almost certainly not found in the Eastern Mediterranean.

Andrena (*Taeniandrena*) *similis* Smith, 1849

Distribution. There is currently some taxonomic uncertainty surrounding animals from North Africa; we favour a single circum-Mediterranean taxon. *Andrena similis* is otherwise found across Europe to Turkey, the Caucasus, and the Near East (Gusenleitner & Schwarz 2002).

Literature. Grace (2010): Lebanon.

Material examined. JORDAN: North Shuna environs, 29–30.IV.1996, 1♂, leg. Mi. Halada, OÖLM; Ajlun S of Anjara, 27.IV.2002, 1♀, leg. M. Snižek, OÖLM; 15 km W of Jerash, 2.V.2006, 1♀, leg. K. Deneš, OÖLM; South of Irbid, 13.IV.2009, 1♂, leg. M. Snižek, OÖLM; LEBANON: S Lebanon, Sidon [Saida], 14.III.1973, 1♀, (no collector information), AUB; Mount Lebanon, Ksaibe, 518 m, 18.IV.2018, 1♂, leg. Boustani, TCFNR, *Sonchus* spp.; Mount Lebanon, Bhamdoun, 1.V.1975, 1♀, (no collector information), AUB; Mount Lebanon, Bentael, 337 m, 23.IV.2019, 1♀, leg. Bous, Rasm, Neme, TCFNR, *Trifolium* spp.; N Lebanon, Tannourine El Tahta, Wadi Ain El Raha, 900 m, 27.III.2017, 1♀, leg. Boustani, TCFNR; N Lebanon, Tannourine El Tahta, Wadi El Fouar, 1187 m, 19.IV.2018, 1♂, leg. Boustani, TCFNR, *Anchusa hybrida*; N Lebanon, Tannourine El Tahta, Mar Boutrous, 1207 m, 25.IV.2019, 1♀, leg. Boustani, TCFNR, *Hymenocarpos circinnatus*; N Lebanon, Hadath El Jebbeh, Chemin Wadi Ain El Raha, 1519 m, 29.VI.2017, 2♀, leg. Boustani, TCFNR, *Ononis natrix*; N Lebanon, Arz Tannourine, Tannourine Forest Reserve Outskirts, 1766 m, 6.V.2017, 1♂, leg. Boustani, TCFNR; N Lebanon, Arz Tannourine Reserve Trail 4, 1800 m, 6.V.2017, 1♀, leg. Boustani, TCFNR; N Lebanon, Ehden, Jord, 1983 m, 5.VII.2019, 1♀, leg. G. Ghisbain, UMONS, *Onobrychis cornuta*; N Lebanon, Tannourine, Jord Tannourine, 2296 m, 30.VI.2019, 1♀, leg. A. Gekiere, UMONS, *Onobrychis cornuta*; Arz Bcharre, Forest of the Cedars of God, Forest Limit, 1897 m, 5.VI.2019, 3♀, leg. Boustani, TCFNR, *Onobrychis cornuta*; N Lebanon, south of Jairoun, 23.V.2012, 1♀, leg. M. Kasparek, TCFNR.

Notes. This species is reported as new for Jordan.

Andrena (*Truncandrena*) *doursana mizorhina* Warncke, 1975 *

Distribution. *Andrena doursana s.l.* is found from Morocco across North Africa and north to south-east Turkey (Gusenleitner & Schwarz 2002). The subspecies *A. d. mizorhina* is found in Adana, Turkey (Warncke 1975a) and probably Israel (Warncke 1969a, see Notes for explanation).

Material examined. LEBANON: Bekaa, Kefraya, 27.IV.2019, 1♂, 1♀, leg. Boustani, TCFNR.

Notes. *Andrena doursana* is a highly variable species, with many described subspecies, several of which may be valid taxa. The form occurring in the Levant was originally called *A. doursana derbentina* Morawitz, 1886 (Warncke 1969a) after they were synonymised by Warncke (1967). *Andrena derbentina* was described from the Caucasus whereas *A. doursana* is a Mediterranean taxon. Writing later, Warncke (1975b) described the form in south-eastern Turkey as *A. d. mizorhina*, writing that this was the bee formerly referred to as *A. d. derbentina* (presumably referring to his 1969 publication) and that *A. derbentina* was a different, and valid, species. *Andrena d. mizorhina* has a male clypeus that is entirely dark, in contrast with North African and Iberian forms of *A. doursana*, and examination of paratype males of *A. derbentina* show that they have a yellow tip to the end of the clypeus, at least in some specimens (Gusenleitner & Schwarz 2002). The Lebanese specimen has an entirely dark clypeus, and we therefore take the position that this material is consistent with *A. d. mizorhina* sensu Warncke (1975b).

Andrena (*Truncandrena*) *fuligula* Warncke, 1965 *

Distribution. Israel and Turkey (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: Beka'a [Bekaa], Qaraoun Lake, 24.III.2013, 1♂, 1♀, leg. M. Kasparek, TJW; SYRIA: 8 km N of Shaykh Miskin [Al Sheikh Maskin], 28.III.1994, 1♂, leg. S. Becvar, OÖLM; An Nasrah [Al-Nasrah], 8-13.IV.2005, 1♂, leg. S. Jaki, OÖLM.

Notes. This species is reported as new for Syria.

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

Distribution. Iberia, North Africa, Cyprus, and Turkey (Gusenleitner & Schwarz 2002). The subspecies *A. m. usura* is found in Cyprus and Turkey.

Material examined. LEBANON: Mount Lebanon, Chouf Biosphere Reserve, Barouk Trails crossing, 1772 m, 16.V.2019, 1♂, leg. Boustani, TCFNR, *Thlaspi* spp.; N Lebanon, Tannourine Reserve, Trail 4, 1781 m, 13.V.2019, 2♀, leg. Boustani, TCFNR/TJW, *Thlaspi* spp.; N Lebanon, Arz Tannourine, Gate, 1796 m, 11.V.2019, 1♀, leg. Boustani, TCFNR; Mount Lebanon, Mazraat al Daher, 529 m, 19.VI.2019, 1♀, leg. Boustani, TCFNR.

Notes. Another *Truncandrena* species that shows a huge degree of variation over its range. This taxon and *Truncandrena* species in general would benefit from molecular investigation.

Andrena (*Truncandrena*) *optata* Warncke, 1975

Distribution. The exact distribution of *A. optata* is slightly unclear because it was originally described from Greece as a subspecies of *A. rufomaculata* (below). It is probably found in Eastern Europe, the Balkans, and Turkey, but the southern limit of its range is unclear (see Gusenleitner & Schwarz 2002 for combined map).

Literature. Grace (2010): Lebanon.

Material examined. LEBANON: Mount Lebanon, Chouf Biosphere Reserve, Barouk-Maaser dirt road, 1769 m, 16.V.2019, 1♂, leg. Boustani, TCFNR, *Cynoglossum nebrodense*; N Lebanon, Tannourine El Tahta, Mar Boutrous, 1207 m, 1♂, leg. Boustani, TJW.

Notes. Subsequent authors have accepted *A. optata* as a valid species from *A. rufomaculata* as it is larger, has significantly longer mouthparts, and there are consistent differences in the male genitalia. The species is widespread in Turkey (Hazir et al. 2014).

Andrena (*Truncandrena*) *rotundilabris rila* Warncke, 1969

Literature. Warncke (1969a): N Lebanon, Cedars near Bscharré [Bcharre], 1900 m, 12-19.VI.1931, leg. W. Zerny (paratype); Grace (2010): Lebanon.

Distribution. Turkey and the Caucasus to Lebanon and Israel (Gusenleitner & Schwarz 2002).

Andrena (*Truncandrena*) *rufomaculata* Friese, 1921

Distribution. For the same reasons as *A. optata*, the true distribution of *A. rufomaculata* is unclear. It is probably found in Turkey and the Levant (Gusenleitner & Schwarz 2002; Hazir et al. 2014).

Literature. Grace (2010): Lebanon.

Material examined. LEBANON: S Lebanon, Hilaliyah, 8.IV.1975, 1♂, (no collector information, from the R. Traboulsi Collection), AUB; Beyrouth, (no date), 1♂, leg. E. Baram, AUB; S Lebanon, Saidoun, 18.III.2018, 1♂, leg. A. Baghdadi, TJW; 3.IV.2018, 1♂, leg. A. Baghdadi, SOILS; Mount Lebanon, Bchetfîne, 6.V.1995,

1♂, leg. A. Fayad, AUB; Mount Lebanon, Fanar, 15. III.1965, 1♂, (no collector information), USEK; Mount Lebanon, Daichouniyé, Nahr Beirut Climbing Site, 133 m, 3.IV.2017, 2♂, 1♀, leg. Boustani, TCFNR/TJW; Mount Lebanon, Jubayl [Byblos], 17.IV.2017, 1♂, leg. O. Murr, M. Fakhry, USEK; N Lebanon, Tannourine El Tahta, Wadi Ain El Raha, 900 m, 27.III.2017, 1♂, leg. Boustani, TCFNR; Bekaa, American University of Beirut farm, 17.IV.1961, 1♂, (no collector information), AUB.

Andrena (*Truncandrena*) *serraticornis* Warncke, 1965 *

Distribution. Greece, Turkey and Israel (Gusenleitner & Schwarz 2002).

Material examined. JORDAN: Jarash environs, 1. V.1996, 1♀, leg. Ma. Halada, OÖLM; 15 km W Jerash, Dibbin, 2.V.2006, 1♀, leg. K. Deneš, OÖLM; LEBANON: Mount Lebanon, Chammis, Wadi Cheber, 377 m, 5.IV.2019, 1♂, 2♀, leg. Boustani, TCFNR/TJW, *Sonchus tenerrimus*; Mount Lebanon, Falougha, Cedar woods, 1480 m, 27.IV.2019, 3♀, leg. Boustani, TCFNR, *Myagrum perfoliatum*; SYRIA: Tartus, St. Georg-Kloster, 250 m, 3.IV.1988, 1♂, leg. L. Blank, TJW.

Notes. This species is reported as new for Jordan and Syria.

Andrena (*Truncandrena*) *tscheki tritica* Warncke, 1965 *

Distribution. Central Europe to Turkey and the Near East. Subspecies *tritica* is found in the Eastern Mediterranean (Gusenleitner & Schwarz 2002).

Material examined. LEBANON: S Lebanon, Saidoun, 18. III.2018, 1♀; 24.III.2019, 1♀; 15.IV.2019, 1♀, all leg. A. Baghdadi, SOILS/TJW; S Lebanon, Saidoun, Joura, 25. III.2018, 1♂, 1♀, leg. A. Baghdadi, SOILS, *Raphanus raphanistrum*; N Lebanon, Tannourine El Tahta, Wadi Ain El Raha, 900 m, 24–27.III.2017, 2♀, leg. Boustani, TCFNR.

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

Distribution. Israel and Turkey (Gusenleitner & Schwarz 2002).

Material examined. JORDAN: 20 km N of Karak, 1000 m, 27.IV.2006, 1♀, leg. K. Deneš, OÖLM; NW of Ajlun, 850 m, 20.V.2007, 4♀, leg. Z. Kejval, OÖLM; Ajlun S of Anjara, 27.IV.2002, 1♀, leg. M. Snižek, OÖLM; 17 km SW of Amman, 23.IV.2006, 2♀, leg. F. Kantner, OÖLM; LEBANON: N Lebanon, Arz Tannourine, Tannourine Forest Reserve Outskirts, 1739 m, 6.V.2017, 1♂, 1♀, leg. Boustani, TCFNR/TJW; N Lebanon, Arz Lubnan, Bcharre Reforestation Area, 1967 m, 12.V.2017, 1♀, leg. Boustani, TCFNR; SYRIA: 25 km W Damascus, Burqush environs [near Baddoûaa], 5.V.2000, 1♀, leg. F. Kantner, OÖLM.

Notes. This species is reported as new for Jordan and Syria.

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

Distribution. Italy, Ukraine, and the Balkans to Turkey and Israel (Gusenleitner & Schwarz 2002).

Material examined. JORDAN: 20 km S of North Shuna, Tall Al Arbatin, 19.IV.1996, 2♀, leg. Ma. Halada, OÖLM/TJW; LEBANON: Arz Bcharre, Forest of the Cedars of God, Forest Limit, 1873 m, 20.V.2019, 1♀, leg. Boustani, TJW.

Notes. This species is reported as new for Jordan.

Andrena (*Ulandrena*) *isabellina* Warncke, 1969 *

Distribution. Israel and Turkey (Gusenleitner & Schwarz 2002).

Material examined. JORDAN: Pella env. [Tabaqat Fahl], −80 m, 29.IV.2006, 1♀, leg. K. Deneš, OÖLM; 30 km NW Aljun, 600 m, 29.IV.2006, 1♀, leg. K. Deneš, OÖLM; 30 km WWN of Aljun, 30.IV.2006, 1♀, leg. K. Deneš, OÖLM; Aljoun, 28.IV.2012, 1♀, leg. M. Kafka, OÖLM; Aljun environs, 1.V.2006, 4♀, leg. K. Deneš, OÖLM; Irbid, Saham village, 19–25.IV.2003, 1♂, 1♀, leg. I. Pljushtch, OÖLM; Aman environs., Hisban villiage, 9.IV.2003, 1♀, leg. I. Pljushtch, OÖLM; 15 km W Jerash, Dibbin, 2. V.1996, 1♀, leg. K. Deneš, OÖLM; 10 km N, NE of Jarash [Jerash], 20.IV.2002, 1♂, 2♀, leg. M. Snižek, OÖLM/TJW; LEBANON: Bekaa, Kefraya, 1009 m, 27. IV.2019, 2♀, leg. Boustani, TCFNR/TJW, *Crepis* spp.; N Lebanon, Hadath El Jebbe, Border of the Cedar forest, 1646 m, 13.V.2019, 2♀, leg. Boustani, TCFNR, *Crepis* cf *sancta*; SYRIA: Tartus, St. Georg-Kloster, 250 m, 3. IV.1988, 1♂, leg. L. Blank, TJW; Tartus, Safita, 10 km E, 300 m, 1♂, leg. L. Blank, MSC; 60 km S Damascus, 14. V.1996, 1♀, leg. Ma. Halada, OÖLM.

Notes. This species is reported as new for Jordan and Syria.

Andrena (*Zonandrena*) *flavipes* Panzer, 1799

Distribution. The most widespread taxon in the West Palearctic, found throughout Europe, North Africa, the Middle East, and into Central Asia (Gusenleitner & Schwarz 2002).

Literature. Mavromoustakis (1962) S Lebanon, Djezzine [Jezzine], 2.VI.1952, 4♀; Mount Lebanon, Hammana, 16. V.1953, 1♀; Mount Lebanon, Ein el Arar, 25.VI.1953, 1♀; Kadisha river, 21.VI.1960, 1♀.

Material examined and notes. LEBANON: 4♂ and 29♀ constituting 23 records between 1975 and 2019 from across Lebanon, this taxon is common and widespread.

***Andrena* (*Zonandrena*) *sigiella* Gusenleitner, 1998 ***

Distribution. Israel (Gusenleitner & Schwarz 2002).

Material examined. JORDAN: Pella env. [Tabaqat Fahl], −80 m, 29.IV.2006, 1♀, leg. K. Deneš, OÖLM; S of At Tafila, 27–30.III.2013, 1♀, leg. M. Snižek, OÖLM; Al Karak env [Kerak], 6.IV.2013, 1♀, leg. M. Snižek, OÖLM; 20 km NNW Al Karak, 1–30.IV.2006, 1♀, leg. F. Kantner, OÖLM; LEBANON: Mount Lebanon, Barja, Terbe, 326 m, 17. IV.2017, 2♀, leg. Boustani, TCFNR; Bekaa, American University of Beirut farm, 13.IV.1962, 1♀, leg. C. Christian; 2.VI.1962, 1♀, leg. Z. Rafii, both AUB; SYRIA: Salkhad, 6.V.1996, 1♀, leg. Ma. Halada, OÖLM.

Notes. This species is reported as new for Jordan and Syria.

Discussion

Altogether, the critical review of the literature and museum specimens combined with contemporary survey efforts have produced a total of 86 *Andrena* species from Lebanon, with 53 species reported for the first time (including newly described species), as well as 25 and 23 species reported for the first time from Jordan and Syria, respectively. In-depth studies of other insect groups are scarce for Lebanon, but the revisionary works that have been compiled follow the same trend; high diversity with several new records for Lebanon, and new species for science described from mountainous areas (Larsen 1974; Németh 2019).

Discussion of the biogeography of Lebanese *Andrena* species is difficult because most of the knowledge of their distribution in neighbouring areas comes from Israel and Turkey, and what we know about their faunas themselves continues to change, with 35 species newly reported for Israel very recently, a faunal richness increase of around 20% (Pisanty et al. 2018). The knowledge of the faunas of Jordan and Syria is also highly incomplete, as evidenced by the new records presented here. That said, three interesting groups of species can be identified in the Lebanese *Andrena* fauna presented here.

The largest is the surprising collection of species more typically found in temperate Europe, specifically *A. alfkenella* (average site 1618 m above sea level), *A. humilis* (1789 m), *A. labialis* (1728 m), *A. minutula* (1529 m), *A. minutuloides* (1598 m), *A. rufula* (1553 m), and *A. thomsoni* (1152 m) which were all found at altitude. Altogether, these species were found at an average of 1567 m above sea level, illustrating their isolation. In this regard, the mountains of northern Lebanon show a strong affinity with the Taurus mountains in south-east Turkey where these species can also be found at what was thought to be their south-eastern range limit (Warncke 1975a). This broadly mirrors the situation in bumble bees (*Bombus*) where *B. melanurus* Lepeletier, 1836 and *B. niveatus* Kriechbaumer, 1870 show isolated populations at altitude in the Lebanese mountains, with the latter only extending further south to mountains in northern Israel (Rasmont & Iserbyt 2014; Boustani et al. 2020).

The second group is more Levantine in nature, and contains species previously endemic to Israel, specifically *A. aruana, A. freidbergi, A. pinkeunia, A. sigiella, A. sphecodimorpha mediterranea*, and *A. stenofovea*. This group is particularly rich in *Poecilandrena*, and the Lebanese has gone from zero to five confirmed species of *Poecilandrena*, including two species or subspecies (*A. friedburgi* and *A. sphecodimorpha mediterranea*) described since 2016. Because of the small geographic area of the countries of the Levant, it was highly likely that *Poecilandrena* species known only from Israel would be found more widely when the opportunity for scientific study became available (Pisanty et al. 2018). Finally, the smallest group is for species previously restricted to mountains in Turkey and Armenia, specifically *A. gallinula* and *A. hova*, and in the case of *A. christineae*, mountains in Iran as well. The smaller number of more typically 'Turkish' species suggests that the relationship between the montane faunas of Lebanon and Turkey may be relatively weak. However, as evidenced by these new discoveries the level of sampling in this region is low and it is difficult to draw strong conclusions at the present time.

This problem is further illustrated by the limitations placed on the program of sampling underlying the current work, as little to no material was available for study from the most southerly or northerly parts of Lebanon (Figure 1), specifically the governorates of Akkar, Nabatieh, and South governorate, as these areas are difficult to access safely and have not been the subject of historical collections. These governorates contain some of the most low-lying parts of the country with the most extensive areas of thermomediterranean and eumediterranean habitat (Abi-Saleh & Safi 1988), suggesting that additional sampling here is likely to detect many of the typical faunal elements from low-lying parts of the Near East such as *A. iliaca* Warncke, 1969, *A. nisoria* Warncke, 1969, *A. toelgiana* Friese, 1921, and *A. venerabilis* Alfken, 1935, as well as more recently described species to date known only from Mediterranean Israel (Pisanty et al. 2016, 2018).

There remains substantial uncertainty over several East Mediterranean *Andrena* groups, most notably in *Carandrena, Euandrena*, and *Micrandrena* (Pisanty et al. 2018; Praz et al. 2019). There are at least four additional possibly undescribed *Euandrena* species in Lebanon that are not listed here and which are the subject of molecular investigation, including some of the cryptic members of the *Andrena bicolor* complex in southern Europe identified

by Praz et al. (2019), as well as several *Micrandrena* species that cannot yet be confidently assigned a name. Combined with the high species richness of *Andrena* in neighbouring countries in the Levant, the large number of unconfirmed species records for the country (online supplementary material), and the need for increased study in undersampled areas, it is highly likely that the true number of *Andrena* species in Lebanon will be well over 100. The new species described here, combined with other recent work (Pisanty et al. 2016, 2018), support the position that studies of *Andrena* in the Levant are far from complete.

Acknowledgements

Our thanks to Fritz Gusenleitner, Esther Ockermüller and Martin Schwarz for access to the Warncke Collection and hospitality at Linz, to Maximillian Schwarz (Ansfelden, Austria) for access to his collection, and to Christophe Praz (University of Neuchâtel, Switzerland) for valuable discussion of Mediterranean *Andrena*. Maps were made using raster files prepared by Jonathan de Ferranti (Scotland), interactive coverage maps supplied by Christoph Hormann. We would also like to thank the Tannourine Cedar Forest Nature Reserve (Lebanon), especially scientific expert Dr Nabil Nemer for his advice and help in planning and carrying out the field work, and director Challita Tanios for his logistic support, Sandra Koussa Saba (Director of Horch Ehden Nature Reserve) and Charbel Tawk (Committee of the Cedar Forest Friends, Bcharre) for their kind facilitation of field work. We thank the American University of Beirut (Lebanon), University of the Holy Spirit Kaslik (Lebanon), Dr Max Kasparek (Heidelberg, Germany), and SOILS Permaculture Association (Saidoun, Lebanon) for the loan of specimens, and to all the people who participated in collecting the specimens; Antoine Gekière, Guillaume Ghisbain, Jad Jabbour, Mariam Fakhry, Nancy Abi Khalil, Wael Yammine, and Xavier Van Achter.

Supplementary material

The supplemental data for this article can be accessed here.

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