Belgian Journal of Entomology 117: 1–39 (2021) ISSN: 2295-0214
www.srbe-kbve.be

urn:lsid:zoobank.org:pub:C2A66EFE-03AE-4BD8-9E8B-1D301FCBF143

Belgian Journal of Entomology

Revision of the *Andrena* (Hymenoptera: Andrenidae) fauna of Bulgaria and North Macedonia with description of three new species

Thomas J. WOOD

Laboratory of Zoology, University of Mons, Mons, Belgium. E-mail: thomasjames.wood@umons.ac.be

Published: Brussels, 07 September, 2021

Citation: WOOD T.J., 2021. - Revision of the *Andrena* (Hymenoptera: Andrenidae) fauna of Bulgaria and North Macedonia with description of three new species. *Belgian Journal of Entomology,* 117: 1–39.

ISSN: 1374-5514 (Print Edition)
ISSN: 2295-0214 (Online Edition)

The Belgian Journal of Entomology is published by the Royal Belgian Society of Entomology, a non-profit association established on April 9, 1855.

Head office: Vautier street 29, B-1000 Brussels.

The publications of the Society are partly sponsored by the University Foundation of Belgium.

In compliance with Article 8.6 of the ICZN, printed versions of all papers are deposited in the following libraries:

- Royal Library of Belgium, Boulevard de l'Empereur 4, B-1000 Brussels.
- Library of the Royal Belgian Institute of Natural Sciences, Vautier street 29, B-1000 Brussels.
- American Museum of Natural History Library, Central Park West at 79th street, New York, NY 10024-5192, USA.
- Central Library of the Museum national d'Histoire naturelle, rue Geoffroy Saint Hilaire 38, F-75005 Paris, France.
- Library of the Muséum d'Histoire naturelle de Genève, route de Malagnou 1, CH-1208 Genève, Suisse.
- Zoological Record, Thomson Reuters, Publication Processing, 1500 Spring Garden Street, Fourth Floor, Philadelphia PA 19130, USA.

Publishing editors: Isabelle Coppée
Jurate De Prins
Editor-in-chief: Arno Thomaes

Front cover: *Andrena kocoureki* sp. nov., male, lateral view. © Thomas J. Wood.

Belgian Journal of Entomology 117: 1–39 (2021)

Revision of the *Andrena* (Hymenoptera: Andrenidae) fauna of Bulgaria and North Macedonia with description of three new species

Thomas J. WOOD

Laboratory of Zoology, University of Mons, Mons, Belgium. E-mail: thomasjames.wood@umons.ac.be.

Abstract

Located in the Balkan Peninsula, Bulgaria has a rich bee fauna due to the interaction of both Mediterranean and continental climatic affinities in combination with its extensive mountainous areas that support many different ecological niches. The genus *Andrena* is the largest in Europe, and though the *Andrena* fauna of Bulgaria was the subject of some taxonomic study in the 1960s and 1970s, very little has been written about it since then, presenting an opportunity for an up to date comprehensive revision. Examination of undetermined *Andrena* material collected from Bulgaria has resulted in 35 species newly recorded for the country, two of which are new for science, *Andrena* (*Simandrena*) *kocoureki* **sp. nov.** and *Andrena* (*Micrandrena*) *pirinia* **sp. nov.** Altogether, these findings increase the number of *Andrena* species known from Bulgaria from 137 to 172, a 25.5% faunal richness increase. Five species are also reported as new for the neighbouring country of North Macedonia, and *Andrena* (*Euandrena*) *pelagonia* **sp. nov.** is described from Mount Kožuf on the border with Greece. These findings reinforce the need for further study of the species-rich Balkan bee fauna, both to gain a more complete understanding of the true distribution of bees in these countries and also to ensure that potentially overlooked endemic diversity is discovered and documented.

Keywords: Balkan Peninsula, endemic species, Mediterranean, solitary bees, taxonomy

Introduction

The genus *Andrena* is the second most species-rich amongst the bees with around 1,500 species listed in the most recent catalogues and revisions (GUSENLEITNER & SCHWARZ, 2002; GUSENLEITNER *et al.*, 2005; DUBITZKY *et al.*, 2010), behind only the genus *Lasioglossum* with approximately 1850 species (ASCHER & PICKERING, 2021). However, this total is already out of date as new *Andrena* species continue to be published at a rapid rate, particularly in the Old World Mediterranean basin (e.g. SCHWENNINGER, 2015; PISANTY *et al.*, 2018; WOOD *et al.*, 2020a, b, c).

Though the Mediterranean basin has a long history of the taxonomic study of bees, many species residing here were not described until the 1960s and 1970s by Klaus WARNCKE (e.g. 1965, 1967, 1975), the leading Old World *Andrena* taxonomist. The reason for these relatively late descriptions are a result of genuinely very high species diversity combined with a lack of collectors and resident taxonomic authorities. For example, despite its great diversity of bees, not a single Moroccan bee species has been described by a Moroccan-born taxonomist (LHOMME *et al.*, 2020). This problem persists to this day, and is acutely felt in the Balkan Peninsula which is chronically under-collected and under-studied. This situation is exemplified by Bulgaria, the second largest Balkan country after Greece. Given its size, its location in the southern Balkans close to Greece and Turkey, and its combination of biogeographical affinities

(Mediterranean, Black Sea, montane) it would be expected to have a rich *Andrena* fauna, but to date has received little attention in this regard.

Three currently valid *Andrena* species have been described with a *locus typicus* inside Bulgaria, these being *Andrena sphecodimorpha* Hedicke, 1942, *Andrena bulgariensis* Warncke, 1965, and *Andrena sandanskia* Warncke, 1973, with four further species described with Bulgarian paratypes (WARNCKE, 1973). The most important works revising the Bulgarian *Andrena* fauna are by WARNCKE (1966; 1973), which present totals of 50 and 56 species for Bulgaria, respectively. Inexplicably, each list presents unique species that are not mentioned in the other, for example *A. erberi* Morawitz, 1871 is listed as present in Bulgaria in the 1966 publication, but not in the 1973 publication. Collectively, these papers list 79 unique species. Later, ATANÁSSOV & VASILEVA (1990) added another eight species (many reported as new but were in fact recorded in one of Warncke's earlier papers, see references below). This total compares poorly to the neighbouring country of Romania with 154 species (TOMOZII, 2010) and even to more northerly eastern European countries like Poland that lack Mediterranean influences yet still support a fauna of 95 species (MOTYKA *et al*., 2018; WIŚNIOWSKI *et al*., 2018). However, it is important to note that many more *Andrena* species are listed from Bulgaria in other sources (SCHEUCHL & WILLNER, 2016; ASCHER & PICKERING, 2021), as these draw on unpublished records. It is therefore important for these reports to be confirmed by the examination of traceable specimens housed in a public collection.

Several of the taxa described by WARNCKE (1973) using Bulgarian material were collected by the Czech entomologist Miroslav Kocourek (1923–1994), whose collection was donated to the Oberösterreiches Landesmuseum, Linz, Austria, the most important Old World repository for *Andrena* material. Though specimens were shared with Warncke, there remained many thousands of specimens in need of determination, as well as other specimens deposited from more recent collecting trips by a range of contemporary collectors from central Europe. This material therefore offered an excellent opportunity to revise the Bulgarian *Andrena* fauna, to investigate and confirm the presence of species supported by unpublished records, and potentially to identify undescribed species that may have been overlooked by previous workers.

Examination of 2,953 female and 1,819 male *Andrena* specimens from Bulgaria revealed 152 valid species, 33 of which are newly reported to Bulgaria, as well as two species that were unknown to science and which are described herein. Additionally, the examination of 55 female and 20 male *Andrena* specimens from North Macedonia revealed 27 valid species, five of which were new for the country and which are indicated below, with one additional species previously unknown to science which is also described here.

Material and methods

Many of the subgeneric concepts used in *Andrena* are in need of a deep revision, as many are polyphyletic (PISANTY *et al*., 2021). The updated subgeneric classifications are used here, with Note made where listed subgenera are clearly in need of attention but the necessary taxonomic work has not yet been completed.

In the interests of space, full details of distributions and examined material are not given for species with a well-established presence in Bulgaria so that more attention can be paid to newly recorded taxa, or taxa with unclear statuses. Where the only available source is an aggregative work that does not report precise specimen details, data on examined material are provided if these are available. Species marked with an asterisk (*) are new for Bulgaria. In the distribution or Note sections, those species newly recorded for North Macedonia are directly marked with an asterisk (*). Geographical distributions for *Andrena* species can be seen in GUSENLEITNER

& SCHWARZ (2002), and more information is only given where substantial differences in or additions to current thought have developed since the publication of this work.

Morphological terminology follows MICHENER (2007). Specimens were measured from the centre of the clypeus at the front of the head to the apical tip of the metasoma to the nearest 0.5 mm. Photographs were taken using an Olympus E-M1 Mark II with a 60 mm macro lens. Additional close-ups were taken with the addition of a Mitutoyo M Plan Apo 10× infinity corrected objective lens in combination with an Olympus M. Zuiko 2× teleconverter lens, a 10 mm Kenko DG extension tube, and a Meike MK-P-AF3B 10 mm extension tube. Photographs were stacked using Zerene Stacker 1.04 (Zerene Systems, USA) and plates were prepared in GNU Image Manipulation Program (GIMP) 2.10. Post-processing of some images was made in Photoshop Elements (Adobe Systems, USA) in order to improve lighting to highlight specific characters. Species are ordered alphabetically.

The following abbreviations are used in the species descriptions:

A = antennal segments, A1, A2, = first, second antennal segments, and T = metasomal terga, T1, T2, = first, second metasomal terga.

Acronyms used for the collections:

NMNL	=	Naturalis Biodiversity Center, Leiden, the Netherlands
OÖLM	=	Oberösterreiches Landesmuseum, Linz, Austria
TJWC	=	Thomas J. Wood personal collection, Mons, Belgium
ZMNB	=	Museum für Naturkunde, Berlin, Germany.

Results

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

Description of new species

Andrena (*Simandrena*) *kocoureki* sp. nov.

urn:lsid:zoobank.org:act:695304BF-4509-433B-AEC0-35A25F676463

(Figs 1–6, 11–16)

DIAGNOSIS. *Andrena kocoureki* can be swiftly placed into the subgenus *Simandrena* in the female sex because of the complete propodeal corbicula with the internal surface (the lateral faces of the propodeum) completely hairless. As for all *Simandrena*, males are more difficult to place, but the very short A3 (just over half the length of A4) and the comparatively long tarsal segment 2 of the hind legs are key characters. The very densely punctate and shiny terga with narrow, impunctate, and lightened apical rims immediately places *A. kocoureki* close to *A. combinata* (Christ, 1791) and *A. lepida* Schenck, 1853 in both sexes.

The three species can be separated using a combination of characters detailed in Table 1. Most importantly, in the female sex *A. kocoureki* has a distinctively sculptured clypeus with deep and irregular recessed punctures that form lateral furrows, in strong contrast to *A. combinata* (clypeus wrinkled, with pattern of raised lateral ridges, Fig. 7) and *A. lepida* (clypeus without lateral furrows or ridges, instead finely very wrinkled, wrinkles running more longitudinally, surface more densely and evenly punctured, Fig. 9). In the male sex, *A. kocoureki* has a combination of a shiny scutum and light brown hairs on the face, in contrast to *A. combinata*

Table 1. Determination table to allow separation of Bulgarian *Andrena* (*Simandrena*) species with extremely dense tergal punctation.

Morphological character	***Andrena kocoureki* sp. nov.**	***Andrena combinata* (Christ, 1791)**	***Andrena lepida* Schenck, 1861**
Female, scutellar punctation	Densely and uniformly punctate, punctures separated by 0–0.5 puncture diameters	Densely and uniformly punctate, punctures separated by 0.5–1 puncture diameters	Laterally regularly punctate, punctures separated by 1 puncture diameter, becoming weaker centrally, separated by 2–3 puncture diameters
Female, scutellar integument	Underlying surface polished over entire surface, shiny (Fig. 6)	Underlying surface microreticulate, weakly shining (Fig. 8)	Underlying surface polished over majority of surface, shiny, laterally microreticulate, weakly shining (Fig. 10)
Female, clypeal sculpturing	Clypeus with deep irregular punctures, these separated by 0-1 puncture diameters, punctures forming a pattern of lateral furrows, clearly recessed, remaining surface very finely wrinkled, weakly shining (Fig. 5)	Clypeus wrinkled by regular pattern of slightly raised lateral ridges, moderately punctate, punctures separated by 0.5–1 puncture diameters, remaining surface very finely wrinkled, weakly shining (Fig. 7)	Clypeus without lateral ridges, very finely wrinkled, wrinkles instead running more longitudinally, more densely punctures, punctures separated by 0-0.5 puncture diameters, remaining surface shagreened, dull to weakly shining apically (Fig. 9)
Female, hairs of T5 and flanking pygidial plate	Hairs brown	Hairs golden	Hairs brown
Male, scutellar integument	Polished over entire disc, shiny (Fig. 15)	Microreticulate, dull (Fig. 17)	Polished over majority of disc, shiny, laterally microreticulate, dull (Fig. 19)
Male, facial hair colour	Predominantly light brown, some individuals with some darker hairs centrally on the clypeus and along inner margin of compound eye	Light brown, at most with some scattered dark hairs at base of antennal insertions	Face predominantly black haired, with lighter brown hairs around base of antennal insertions
Male, penis valva	Comparatively broad (Fig. 16)	Comparatively broad (Fig. 18)	Comparatively narrow (Fig. 20)

Figs 1–4. *Andrena kocoureki* **sp. nov.**, female. 1, habitus, lateral view. 2, head, frontal view. 3, metasoma, dorsal view. 4, tergal apex and pygidial plate, dorsal view. © Thomas J. Wood.

(scutum dull, light brown hairs on face, Fig. 17) and *A. lepida* (scutum shiny, black hairs on face, Fig. 19). The genital capsules of all three species are very similar (Figs 16, 18, 20).

ETYMOLOGY. This species is named after the Czech entomologist Miroslav Kocourek who collected the type material, as well as thousands of other *Andrena* specimens in Bulgaria and many other countries.

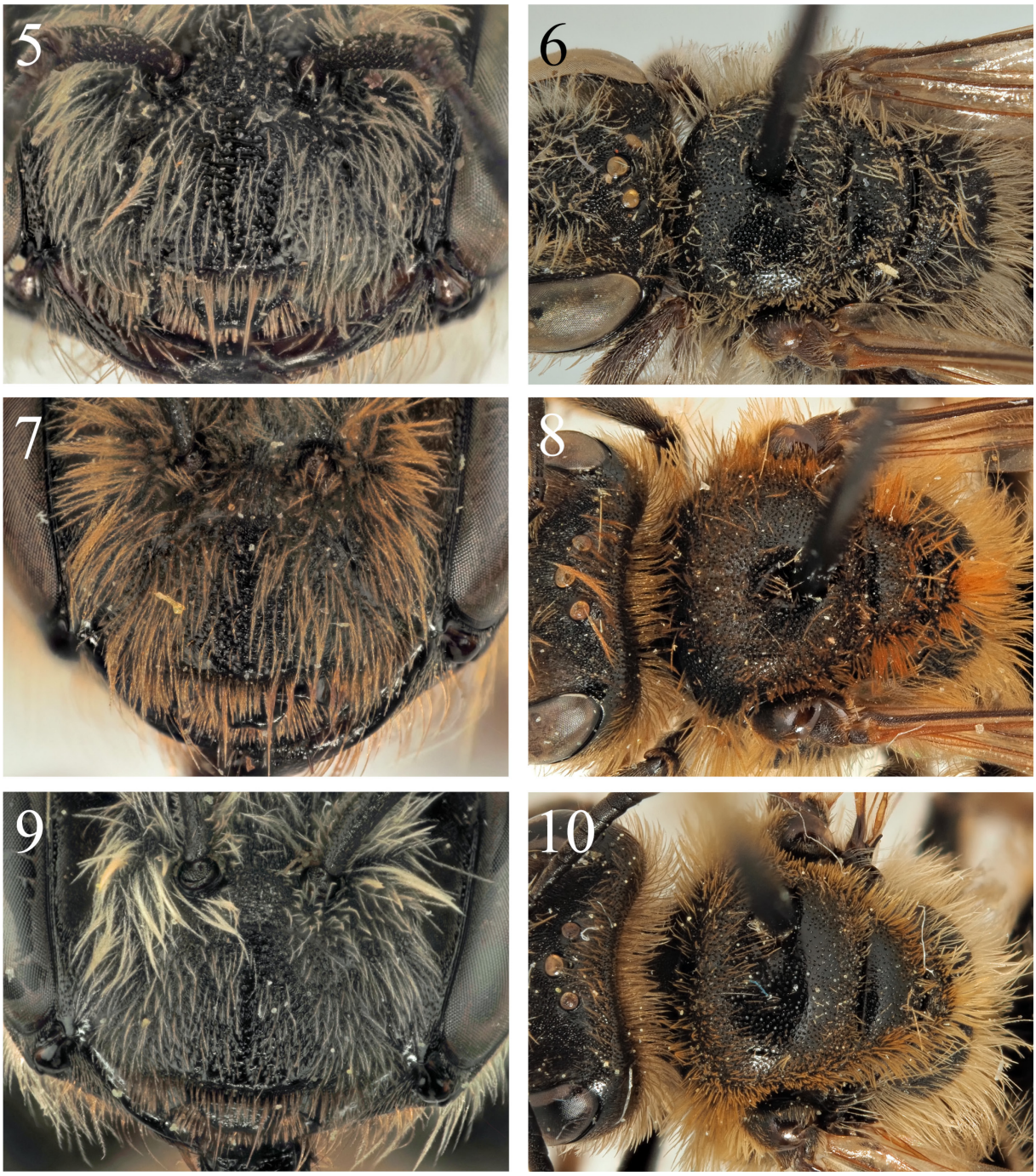
HOLOTYPE. BULGARIA**:** • 1♀, Sandanski [Сандански], vi.1969, leg. Kocourek, OÖLM.

PARATYPES. BULGARIA**:** • 1♂, SW Kresna [Кресна], 41.7230ºN, 23.1458ºE, 24.vi.2008, leg. M. & Z. Halada, OÖLM; • 1♂, Sandanski [Сандански], vi.1969, leg. Kocourek, OÖLM; • 10♂, Sandanski [Сандански], vii.1966, leg. Kocourek, OÖLM/TJWC; • 1♂, Sandanski [Сандански], 1–8.vi.1967, leg. Kocourek, OÖLM; • 1♂, Sandanski [Сандански], 26–31.v.1967, leg. Kocourek, OÖLM.

OTHER SPECIES EXAMINED. *Andrena combinata*: BULGARIA: • 1♂, Sandanski, 1–8.vi.1967, leg. Kocourek, TJWC; *Andrena lepida*: BULGARIA: • 2♀, Sandanski, 26–31.v.1967, leg. Kocourek, OÖLM; • 1♂, Sandanski, 1–8.vi.1967, leg. Kocourek, OÖLM.

DESCRIPTION. FEMALE. Body length 11 mm (Fig. 1).

Head: Black, 1.3× wider than long (Fig. 2). Clypeus weakly domed, irregularly punctate, punctures separated by 0 (touching) to 1 puncture diameter, recessed and collectively forming lateral furrows (Fig. 5), remaining clypeal integument finely wrinkled, weakly shining. Process of labrum broadly trapezoidal, apical margin very weakly emarginate, surface faintly wrinkled, dull. Gena equalling width of compound eye, ocelloccipital distance almost two times width of



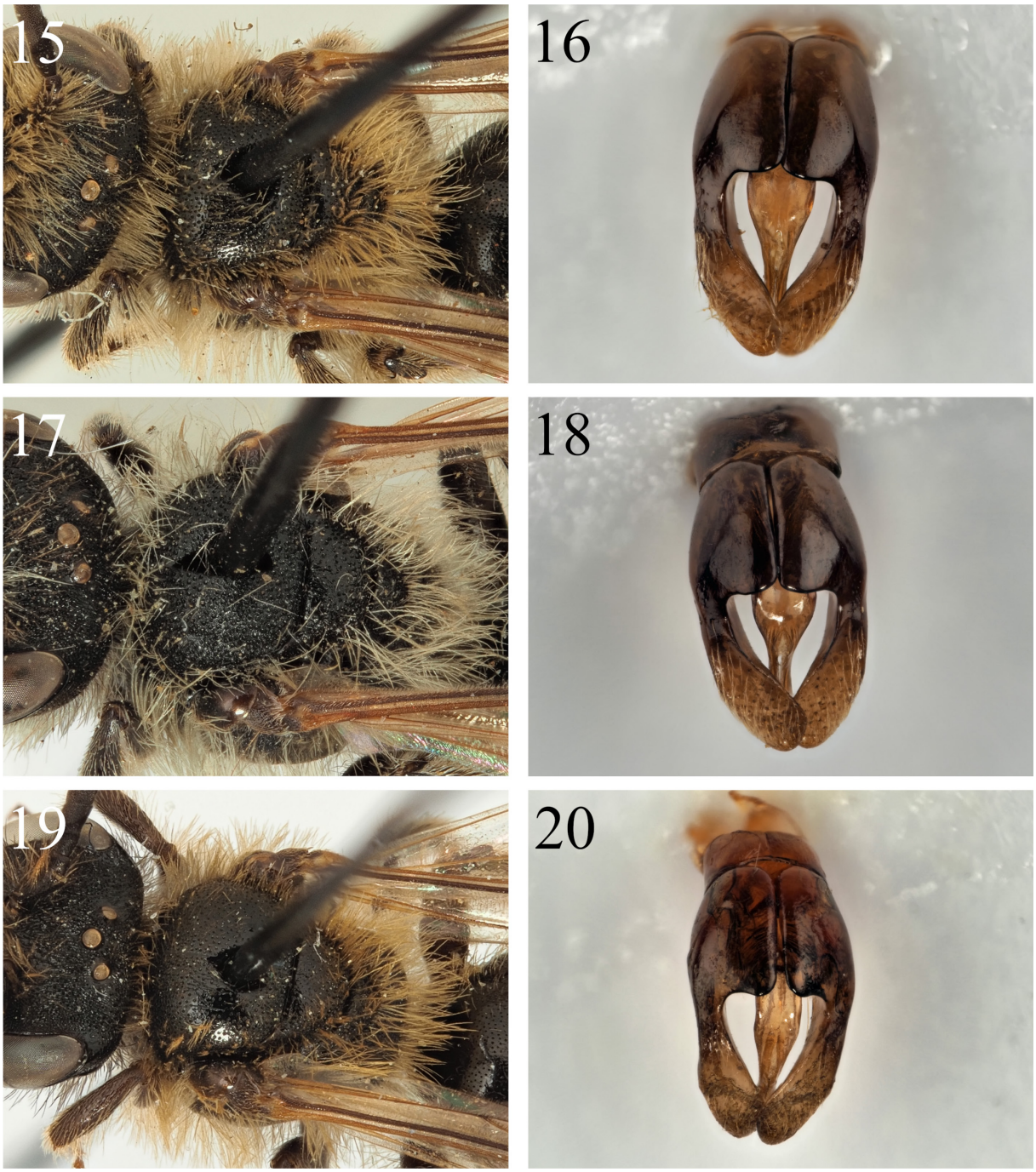
Figs 5–10. *Andrena kocoureki* **sp. nov.**, female. 5, clypeus detail. 6, mesosoma, dorsal view. *Andrena combinata* (Christ, 1791), female. 7, clypeus detail. 8, mesosoma, dorsal view. *Andrena lepida* Schenck, 1853, female. 9, clypeus detail. 10, mesosoma, dorsal view. © Thomas J. Wood.

Figs 11–14. *Andrena kocoureki* **sp. nov.**, male. 11, habitus, lateral view. 12, head, frontal view. 13, head, lateral view. 14, metasoma, dorsal view. © Thomas J. Wood.

lateral ocellus. Fovea moderately broad, occupying ¾ of area between lateral ocellus and compound eye, slightly narrowing below at level of antennal insertions, not separated from inner margin of compound eye. Gena, vertex, face, and scape with whitish hairs, longest not exceeding length of scape. Antennae dark, A5 apically and A6–12 lightened greyish-white below by presence of adpressed pubescence, A3 exceeding A4+5 in length, shorter than A3+4+5.

Mesosoma: Scutum and scutellum densely and regularly punctate, punctures separated by 0.5 puncture diameters, underlying surface polished, smooth and shiny (Fig. 6). Pronotum without humeral angle. Episternum and propodeum moderately rugose, dull; propodeal triangle lateral delineated by fine carina, internal surface less strongly rugose than rest of propodeum, dull. Episternum and propodeum with whitish hairs, these not exceeding length of scape. Scutum and scutellum with short light brownish hairs, largely confined laterally. Legs dark, apical tarsal segments slightly lightened orange, pubescence whitish-brown, scopa whitish-brown. Wings hyaline, venation and stigma dark orange, nervulus slightly antefurcal.

Metasoma: Terga dark with rims narrowly lightened translucent yellow-brown, discs and margins uniformly densely and evenly punctate with exception of narrow rims, punctures separated by 0.5 puncture diameters (Fig. 3). Underlying tergal surface polished, smooth and shining, apical margins of T2–4 very slightly depressed, otherwise indistinguishable from discs, T2 laterally, T3–4 with complete whitish hair bands (though abraded centrally on T3), obscuring underlying surface. Apical fringe of T5 and hairs flanking pygidial plate dark brown (Fig. 4), pygidial plate triangular, without distinguishing features.



Figs 15–20. *Andrena kocoureki* **sp. nov**., male. 15, mesosoma, dorsal view. 16, genitalia, dorsal view. *Andrena combinata* (Christ, 1791), male. 17, mesosoma, dorsal view. 18, genitalia, dorsal view. *Andrena lepida* Schenck, 1853, male. 19, mesosoma, dorsal view. 20, genitalia, dorsal view. © Thomas J. Wood.

MALE. Body length 8–9 mm (Fig. 11).

Head: Black, 1.3× longer than broad (Fig. 12). Clypeus weakly domed, very densely and uniformly punctate, punctures separated by <0.5 puncture diameters, underlying surface smooth and shiny. Process of labrum broadly trapezoidal, emarginate. Gena equalling width of compound eye, ocelloccipital distance two times width of lateral ocellus. Gena, vertex, face, and scape with light golden brown hairs, longest not exceeding length of scape (Fig. 13). Antennae dark, A4–13 lightened greyish-white below by presence of adpressed pubescence, A3 short, approximately ¾ length of A4.

Mesosoma: Scutum and scutellum clearly and deeply punctate, punctures separated by 0.5–1 puncture diameter, becoming sparser and more irregular centrally, here separated by up to 2 puncture diameters (Fig. 15); underling surface polished, smooth and shiny. Remaining characters as in female, but pubescence more uniformly golden brown.

Metasoma: Terga structurally as in female, but pubescence more extensive, with additional continuous basal hair bands on T2+3 (Fig. 14). Genital capsule nondescript, gonocoxa truncate without apical teeth, penis valve moderately broad, narrowing apically, gonostyli evenly spatulate (Fig. 16).

REMARKS. All three species (*A. combinata*, *A. kocoureki*, and *A. lepida*) can be found in sympatry around Sandanski. More work is needed to establish the phenology of *A. kocoureki*, as both comparison species are bivoltine (SCHMID-EGGER & SCHEUCHL, 1997).

Andrena (*Micrandrena*) *pirinia* sp. nov.

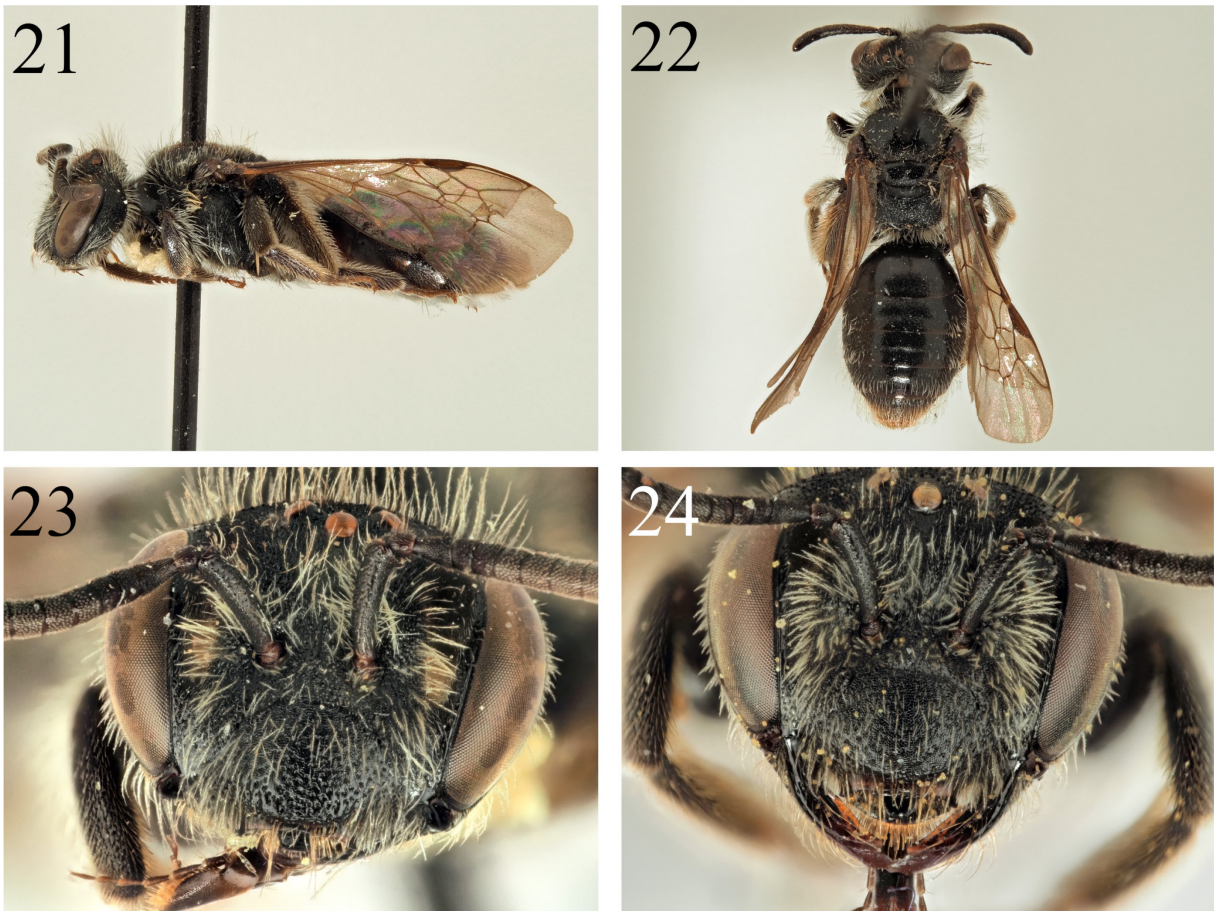
urn:lsid:zoobank.org:act:3497F93C-0519-4E6A-81D4-C60629FCFB78

(Figs 21–23, 25, 27, 29)

DIAGNOSIS. *Andrena pirinia* can be placed in the subgenus *Micrandrena* due to its small size, black integument, and strongly rugose propodeal triangle. The metasomal terga lack a gradulus (visible in profile, see AMIET *et al*., 2010) and the marginal areas of T2–4 are depressed (T2 least strongly, T4 most strongly) which immediately places them close to *A. anthrisci* Blüthgen, 1925, *A. omnilaevis* Wood, 2020, and *A. semilaevis* Pérez, 1903, the only European *Micrandrena* taxa with this combination of characters. *Andrena omnilaevis* can be immediately separated because of its completely shiny terga, and it is also restricted to Iberia, with the remaining taxa having some degree of shagreen on the tergal discs. Following SCHWENNINGER (2009), *A. semilaevis* has the margins of T2–4 strongly depressed and shiny, lacking shagreen, whereas these are less strongly depressed and strongly shagreened in *A. anthrisci*. *Andrena pirinia* is therefore closer to *A. anthrisci* as the margins of T2–4 are both comparatively weakly depressed and strongly shagreened but (alternative character state for *A. anthrisci* in parentheses), the clypeus is more densely punctate, punctures separated by 0.5–1 puncture diameters (less densely and more irregularly punctate, punctures separated by 1–2 puncture diameters, Fig. 24), the foveae are comparatively wider occupying 1/2 of the space between the lateral ocellus and the compound eye (comparatively narrower, occupying 1/3 of this space, Fig. 26), the scutum is more finely and regularly punctate, punctures separated by 1 puncture diameter (more coarsely and irregularly punctate, punctures separated by 1–2 puncture diameters, Fig. 28), and the tergal discs have few, fine and scattered punctures (T2 laterally, T3–4 extensively punctate, punctures separated by 1–2 puncture diameters, Fig. 30).

ETYMOLOGY. This species is named after the Pirin mountain range in south-western Bulgaria.

HOLOTYPE. BULGARIA: • 1♀, Popina Luka [Попина Лъка], 1800 m, 14.vii.1966, leg. Kocourek, OÖLM.



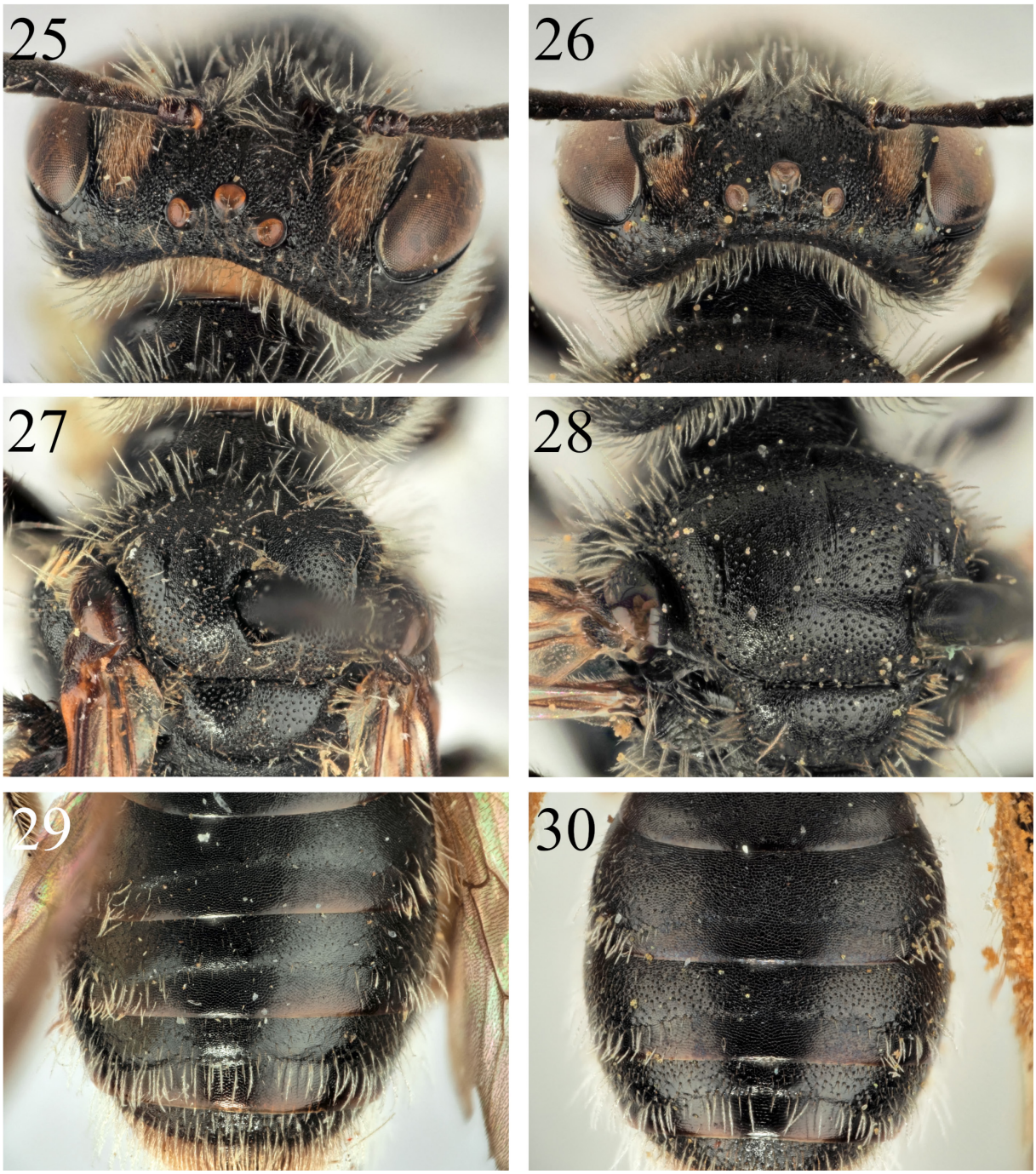
Figs 21–24. *Andrena pirinia* **sp. nov.**, female. 21, habitus, lateral view. 22, habitus, dorsal view. 23, head, frontal view. *Andrena anthrisci* Blüthgen, 1925, female. 24, head, frontal view. © Thomas J. Wood.

PARATYPES. BULGARIA: • 3♀, Popina Luka [Попина Лъка], 1800 m, 14.vii.1966, leg. Kocourek, OÖLM/TJWC.

OTHER SPECIES EXAMINED. *Andrena anthrisci*: FRANCE: • 2♀, Pyr. Or., Col de Jau, 1500 m, 30.vi.1994, leg. H. & J.E. Wiering, NMNL; • 8♀, Pyr. Or., Estavar, 1200 m, 15.vi.2000, leg. H. & J.E. Wiering, NMNL; • 2♀, Pyr. Or., Gorges du Segré, 1600 m, 19.vi.2000, leg. H. & J.E. Wiering, NMNL; SPAIN: • 2♀, Ávila, Hoyocasero, 1350 m, 20.v.1995, leg. H. & J.E. Wiering, NMNL; • 2♂, Cuenca, La Ciudad Encantada, 10.vi.1983, leg. H. Teunissen, NMNL; • 1♂, Guadalajara, Milmarcos, 4.vi.1980, leg. H. Teunissen, NMNL; • 16♀, Huesca, Olivan, 3.vi.1995, leg. H. & J.E. Wiering, NMNL; • 2♂, Soria, Tardejos de Duero, 24.vi.1981, leg. H. Teunissen, NMNL.

DESCRIPTION. FEMALE. Body length 7–8 mm (Figs 21–22).

Head: Black, 1.3× wider than long (Fig. 23). Clypeus weakly domed, regularly punctate, punctures separated by 0.5–1 puncture diameters, punctures becoming more irregular centrally where weak and inconsistent longitudinal impunctate line is present; underlying surface shagreened, weakly shining. Process of labrum trapezoidal, slightly wider than long, shiny. Gena slightly exceeding width of compound eye, ocelloccipital distance half width of lateral ocellus. Fovea moderately broad, occupying ½ of area between lateral ocellus and compound eye (Fig. 25), slightly narrowing below at level of antennal insertions, not separated from inner margin of compound eye. Gena, vertex, face, and scape with white hairs, longest clearly not exceeding length of scape. Antenna dark, A5 apically and A6–12 lightened greyish-white below



Figs 25–30. *Andrena pirinia* **sp. nov.**, female. 25, head, dorsal view. 27, mesosoma, dorsal view. 29, metasoma, dorsal view; *Andrena anthrisci* Blüthgen, 1925, female. 26, head, dorsal view. 28, mesosoma, dorsal view. 30, metasoma, dorsal view. © Thomas J. Wood.

by presence of adpressed pubescence, A3 almost equalling A4+5 in length, these broader than long.

Mesosoma: Scutum and scutellum densely and regularly punctate, puncture separated by 1 puncture diameter, underlying surface shagreened and weakly shining, shagreenation weaker around parapsidal lines and on scutellum, these areas more clearly shining (Fig. 27). Pronotum with extremely weak and essentially absent humeral angle. Episternum and propodeum weakly reticulate, weakly shining to dull; propodeal triangle laterally delineated by fine carina, internal surface finely but strongly and clearly rugose, dull. Episternum and propodeum with sparse whitish hairs, these not exceeding length of scape. Scutum and scutellum with a mixture of

short to long brownish hairs, denser laterally, almost absent centrally, longest not exceeding length of scape. Legs dark, apical tarsal segments slightly lightened orange, pubescence white, scopa white with some brown hairs dorsally laterad of basitibial plate. Hind tarsal claws with inner teeth. Wings hyaline, venation and stigma dark orange to brown, nervulus slightly antefurcal to interstitial.

Metasoma: Terga uniformly dark, tergal margins depressed, T2 weakly, T3–4 more strongly; underlying surface of discs and margins finely and evenly shagreened with very fine, scattered, and inconspicuous punctures (Fig. 29). Terga without graduli. T2–3 laterally with loose white hair fringes, T4 with complete but weak fringe composed of separated hairs, not obscuring underlying surface. Apical fringe of T5 laterally white, centrally golden, hairs flanking pygidial plate golden, pygidial plate triangular with slightly raised longitudinal carina centrally.

MALE. Unknown.

REMARKS. The exact distribution of *A. anthrisci* is unclear because of uncertainty over its taxonomic status and how to correctly identify it. It has been confirmed from France, Germany, and Switzerland (SCHWENNINGER, 2009; AMIET *et al*., 2010), and Warncke gave its nominal distribution as western and central Europe from Spain to Slovakia (GUSENLEITNER & SCHWARZ, 2002). In Spain, DARDÓN *et al*. (2014) combined *A. semilaevis*, *A. omnilaevis* (unknowingly recorded as *A. semilaevis*), and *A. anthrisci* into a single taxon, but all three taxa are present in the Iberian Peninsula (WOOD *et al.*, 2020c, see other species examined). However, *A. anthrisci* has never been recorded from the Balkan Peninsula. Genetic analysis on freshly collected material of *A. pirinia* is needed to investigate the suspected close relationship with *A. anthrisci*.

***Andrena* (*Euandrena*) *pelagonia* sp. nov.**

urn:lsid:zoobank.org:act:3F4EB6EC-0B3E-4D72-A645-9200285DB89B

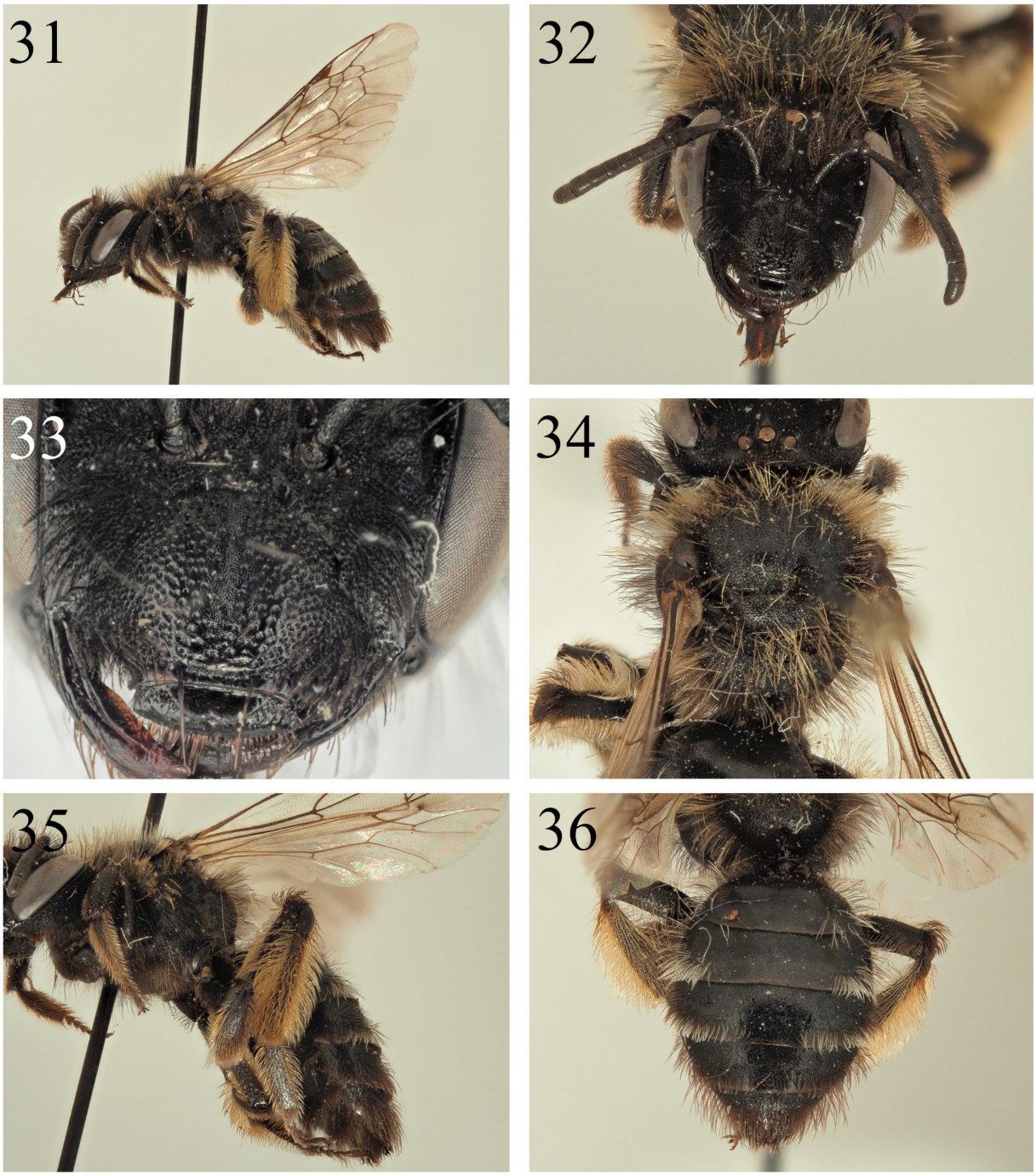
(Figs 31–36)

DIAGNOSIS. *Andrena pelagonia* can be placed in the subgenus *Euandrena* because of the narrow, comma-shaped fovea, antennal segment A3 longer than A4+5, propodeal triangle weakly wrinkled, hind femur without thorn-like projections, and dorsolateral angle of propodeum without elevated transverse carina (PRAZ *et al*., 2019). It can be immediately placed close to the species around *A. angustior* (Kirby, 1802) because of the presence of an impressed longitudinal line on the clypeus. It is closest to *A. fulvata* Stoeckhert, 1930 because the tergal margins are shagreened, not shiny as in *A. angustior*, but can be separated (*A. fulvata* character states in parentheses) by the stronger punctation of the clypeus, strongly contrasting with and delineating the impunctate longitudinal line (punctation less strong, less strongly contrasting with impunctate longitudinal line), the presence of extensive black pubescence on the face, episternum, propodeum, and intermixed on the scutum (almost without black hairs, at most with some black hairs around antennal insertions), the lateral white hair fringes of T2–3, these strongly contrasting with the dark brown hairs on T4+5 (T2–4 with light brownish hair fringes, these not contrasting strongly with the dark brown hairs on T5), and the comparatively broad and centrally impressed and finely rugose propodeal triangle (propodeal triangle comparatively narrow, lacking central impression, weakly differentiated from remaining propodeum).

ETYMOLOGY**.** This species is named after the ancient Hellenic kingdom of Pelagonia which roughly corresponds to what is now the southern part of North Macedonia.

HOLOTYPE. NORTH MACEDONIA: • 1♀, Mount Kožuf [Козоф], Smrdliva Voda [Смрдлива Вода], 1750 m, 7.v.2017, leg. K. Deneš, OÖLM.

PARATYPES. NORTH MACEDONIA: • 2♀, Mount Kožuf [Козоф], Smrdliva Voda [Смрдлива Вода], 1750 m, 7.v.2017, leg. K. Deneš, OÖLM.



Figs 31–36. *Andrena pelagonia* **sp. nov.**, female. 31, habitus, lateral view. 32, head, frontal view. 33, clypeus detail. 34, mesosoma, dorsal view. 35, scopa, lateral view. 36, metasoma, dorsal view. © Thomas J. Wood.

DESCRIPTION. FEMALE. Body length 11 mm (Fig. 31).

Head: Black, 1.2 times wider than long (Fig. 32). Clypeus slightly domed, weakly flattened over majority of centre, densely punctate with exception of an impunctate longitudinal line extensing 4/5 of way from base to apex, punctures otherwise separated by 0.5 puncture diameters (Fig. 33); underlying clypeus surface shagreened, weakly shining. Process of labrum broad, weakly trapezoidal to weakly, narrowly and faintly emarginate centrally. Gena slightly exceeding width of compound eye, ocelloccipital distance slightly exceeding width of lateral ocellus. Fovea narrow, occupying at most 1/3 of space between lateral ocellus and compound eye, narrowing below level with antennal insertions, not separated from inner margin of compound eye. Gena and face with black hairs, scape with mixture of black and dark brown

Figs 37–40. *Andrena oulskii* Radoszkowski, 1867, female. 37, specimen labels. 38, head, frontal view. 39, habitus, dorsal view. 40, lateral view. © Thomas J. Wood.

hairs, vertex predominantly with light brown hairs with some black hairs intermixed, longest hairs on vertex slightly exceeding length of scape. Antennae dark, A5 apically and A6–12 lightened greyish-white below by presence of adpressed pubescence, A3 exceeding A4+5, shorter than A4+5+6.

Mesosoma: Scutum and scutellum shallowly and somewhat irregularly punctate, punctures separated by 0.5–2 puncture diameters, underlying surface shagreened, dull (Fig. 34). Pronotum without humeral angle. Episternum and propodeum with fine granular reticulation forming a net pattern, episternum densely and shallowly punctate, punctures separated by 0.5 puncture diameters; propodeum with fine network of rugosity, propodeal triangle faintly delineated with a carina laterally, internal surface slightly sunken, with dense raised rugosity. Episternum with black hairs over majority of surface, becoming light brown dorsally, propodeal corbicula composed of mixture of black and light brown hairs (Fig. 35); scutum and scutellum predominantly with light brown hairs, some shorter black hairs intermixed on disc. Legs dark, apical tarsal segments slightly lightened dark brown, pubescence apically light brown, becoming darker, basally black. Flocculus dark brown, femoral and tibial scopa pale orange, basitibial plate dorsally with dark brown hairs. Wings hyaline, stigma and venation dark orange brown, nervulus interstitial.

Metasoma: Terga dark with exception of very narrow apical rim lightened orange-brown, underlying surface shagreened, weakly shining, with very faint and scattered punctures, these separated by 3–4 puncture diameters (Fig. 36). T2–3 laterally with widely separated hair patches on apical margins, T4–5 apically with dark brown hair fringes, hairs flanking pygidial

plate dark brown, pygidial plate apically rounded, centrally with weakly raised longitudinal triangular area with fine granular shagreen.

MALE. Unknown.

REMARKS. It is important to note that the subgenus *Euandrena* could be considered to be a junior synonym of *Ptilandrena* (PRAZ *et al*., 2019; PISANTY *et al*., 2021), but upcoming taxonomic changes restrict use of the name *Ptilandrena* to the Nearctic fauna, with most former Palearctic *Ptilandrena* being placed in the *Euandrena* (PISANTY *et al*., 2021). The available barcode sequence from *A. pelagonia* places it as sister to *A. angustior* + *A. fulvata* (TJW and C. Praz, unpublished data), confirming the morphological similarities.

Annotated checklist of the *Andrena* of Bulgaria with new data for North Macedonia

(Species recorded here as new for the studied area are indicated with an asterisk)

1. *Andrena* (*Taeniandrena*) *abberans* Eversmann, 1852

SCHEUCHL & WILLNER (2016).

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

WARNCKE (1966, as *A. leucorhina* Morawitz, 1876); WARNCKE (1967b, as *A. leucorhina*); WARNCKE (1973, as *A. abbreviata osychniuki* ssp. nov. = *A. osychniukae* Osytshnjuk, 1977).

NOTE. This taxon has been hugely confused over time due to its variable nature. Though it needs to be investigated using molecular markers, a broad interpretation of the taxon is favoured here, with a distribution from south-eastern Europe, through Turkey and the East Mediterranean islands, to the Levant, the Caucasus, and Iran (e.g. GHAHNAVIEH & MONFARED, 2019) given the lack of variation in the male genital capsule across this range.

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

PITTIONI & STOECKHERT (1950, as *Andrena strymonia* Pittioni sp. nov.); WARNCKE (1966; 1973); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1966; 1967b; 1973); ATANÁSSOV & VASILEVA (1990); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

5. *Andrena* (*Taeniandrena*) *albofasciata* Thomson, 1870

WARNCKE (1966; 1973, as *A. ovatula* (Kirby, 1802)); ATANÁSSOV (1972, as *A. ovatula*); BANASZAK & DOCHKOVA (2014, as *A. ovatula*).

NOTE. The status of the taxon *A. ovatula* has been difficult to understand due to variation in this group. Authors such as Warncke favoured a broad species concept with *A. ovatula* ranging from Morocco and the Iberian Peninsula, throughout Europe, and east to Turkey, the Levant, and Russia (GUSENLEITNER & SCHWARZ 2002). However, this broad taxon is actually composed of several valid species, with two major taxa in northern and central Europe, the Atlantic *A. ovatula* and the continental *A. albofasciata* (see VAN DER SMISSEN, 2010; TJW and C. Praz, unpublished data), the taxon which is present in Bulgaria. The name *A. albofasciata* is used here, though more work is needed to investigate whether this is the oldest available name.

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

ATANÁSSOV (1972).

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

WARNCKE (1969; 1973); ATANÁSSOV & VASILEVA (1990); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1973); ATANÁSSOV & VASILEVA (1990, as *A. alfkenelloides* s.s. and *A. cardalia* Warncke, 1975).

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

SCHMID-EGGER (2005); SCHEUCHL & WILLNER (2016).

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

DISTRIBUTION. North Macedonia, Greece, Romania, Ukraine, Russia, Turkey, Caucasus, Lebanon (GUSENLEITNER & SCHWARZ, 2002; TOMOZEI, 2006; WOOD *et al*., 2020a)

MATERIAL EXAMINED. BULGARIA: • 1♂, Hrabrino, 20.v.1997, leg. A. Zaykov, OÖLM; • 1♀, Nevša [Nevsha], 50 km E Varna, 7.vi.2017, leg. L. Bica, OÖLM; • 1♀, Sandanski, 1–30.vi.1969, leg. Kocourek, OÖLM; • 1♀, Sliven env., 400 m, 19.v.2012, leg. P. Pacholátko, OÖLM.

11. *Andrena* (*Leucandrena*) *argentata* Smith, 1844

SCHEUCHL & WILLNER (2016).

MATERIAL EXAMINED. BULGARIA: • 1♀, Valkovo, Sandanski, 15.vi.2017, leg. L. Bica, OÖLM.

NORTH MACEDONIA: • 1♂, Oteshevo, 900 m, 1.vi.2013, leg. K. Deneš, OÖLM.

NOTE. Newly recorded for North Macedonia*.

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

WARNCKE (1973); ATANÁSSOV (1972); SCHEUCHL & WILLNER (2016).

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

DISTRIBUTION. Greece, Turkey, Cyprus, Israel, Georgia (SCHWENNINGER 2015).

MATERIAL EXAMINED. BULGARIA: • 1♀, Slančev Brjag [Sunny Beach], 1–30.vi.1972, leg. Kocourek, OÖLM.

14. *Andrena* (*Nobandrena*) *athenensis* Warncke, 1965*

DISTRIBUTION. North Macedonia, Greece, Romania, Ukraine, Russia, Turkey, and the Caucasus (GUSENLEITNER & SCHWARZ, 2002; TOMOZII, 2010).

MATERIAL EXAMINED. BULGARIA: • 1♀, 5 km NE Harmandli [Harmanli], 14.vi.2008, leg. M. & Z. Halada, OÖLM; • 1♂, Sandanski, 28.v.1978, leg. Kocourek, OÖLM; • 1♀, Vinogradi, Melnik, 370 m, 16.vi.2017, leg. M. Halada, OÖLM.

15. *Andrena* (*Parandrenella*) *atrata* Friese, 1887

ATANÁSSOV (1972, as *A. bicarinata* auct. nec. Morawitz, 1876); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

MATERIAL EXAMINED. BULGARIA: • 1♀, Nessebr [Nessebar], 1–31.v.1970, leg. Kocourek, OÖLM; • 2♂, 1♀, Parvenec [Parvenets], 25.v.1997, • 2♀, 12.vi.1996, all leg. A. Zaykov, OÖLM.

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

DISTRIBUTION. Hungary, Romania, North Macedonia, Greece, to Turkey, the Caucasus, and Syria (GUSENLEITNER & SCHWARZ, 2002; TOMOZII, 2010).

MATERIAL EXAMINED. BULGARIA: • 1♀, Sandanski, 1–30.vi.1972, leg. Brokeš; • 1♀, 7.v.1978, leg. A. Hoffer; • 1♀, 1–8.vi.1967, leg. Kocourek; • 1♂, 1♀, 1–30.vi.1969 leg. Kocourek, all OÖLM.

17. *Andrena* (*Melandrena*) *barbarae* Panzer, 1805

SCHEUCHL & WILLNER (2016).

18. *Andrena* (*Euandrena*) *bicolor* (Kirby, 1802)

WARNCKE (1966; 1967b; 1973); ATANÁSSOV (1972); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

19. *Andrena* (*Ulandrena*) *biguttata* Friese, 1923

DISTRIBUTION. Bulgaria, Greece, North Macedonia, Turkey, Azerbaijan (WARNCKE, 1973; GUSENLEITNER & SCHWARZ 2002).

WARNCKE (1966; 1967b; 1973); ATANÁSSOV & VASILEVA (1990, as *A. bigguttata* [sic]).

MATERIAL EXAMINED. AZERBAIJAN: • 1♀, Ordubad 13 Klzr. (no further information), det. Warncke, OÖLM.

BULGARIA: • 1♀, Balčik [Balchik], vi.1986, leg. J. Halada, OÖLM; • 1♀, 29.vi.1976, • 1♂, 17.v.1989, both leg. O. Tkalců, OÖLM; • 3♀, Galata, 21.vi.1977, leg. O. Tkalců, OÖLM; • 1♂, Kresna, 12.v.1989, leg. Kocourek, OÖLM; • 3♀, Liljanovo, 300 m, 7.vii.1974, leg. A. Hoffer, OÖLM; • 7♂, Sandanski, 26–31.v.1967; • 11♂, 2♀, 1–8.vi.1967; • 9♂, 6♀, vi.1969; • 1♂, 28.v.1978, all leg. Kocourek, OÖLM; • 3♀, Sandanski / Liljanovo, 2.vi.1989, leg. B. & O. Tkalců, OÖLM; • 1♀, Simitli, 15.vi.1987, leg. J. Halada, OÖLM; • 1♂, Slanĉev Brjag [Sunny Beach], 5.vi.1977, leg. Z. Pédr, OÖLM; • 1♀, Stara Kresna, 20.vi.1987, leg. J. Halada, OÖLM; • 1♀, Varna Galata, 19.v.1989, leg. O. Tkalců.

NORTH MACEDONIA: • 1♀, Ohrid, 29.v.–10.vi.1972, det. Warncke, leg. H. Teunissen, OÖLM; • 2♂, 1♀, St. Dorjan, 4.vi.1974, leg. M. Hladil, OÖLM.

TURKEY: • 1♀, Gürün, 130 km S Sivas, 11.vi.2001, leg. K. Deneš, OÖLM (det. *A. oulskii* Radoszkowski, 1867 by E. Scheuchl, 2002).

NOTE. The nomenclature surrounding this taxon has been greatly confused, specifically the concerning the application of the name *A. oulskii*. When writing about *A.* (*Truncandrena*) species, SCHUBERTH *et al*. (2001) commented that Warncke had incorrectly interpreted the taxon *A. oulskii* as a *Truncandrena* based on examination of female material in Berlin (listed as the type depository, WARNCKE 1967a; GUSENLEITNER & SCHWARZ, 2002). They argue that the specimen examined by Warncke (even though Warncke did not actually give details of which specimen he examined in his 1967a paper) was collected in Afghanistan (not the *locus typicus* of Azerbaijan as stated by Radoszkowski) and corresponds to *A. combusta* Morawitz, 1876, which is a *Truncandrena* species. They state that the true type of *A. oulskii* was found (by W. Grünwaldt) in the Natural History Museum, London, and is a *Ulandrena*, therefore making *A. oulskii* the priority name for the taxon found in Bulgaria (see also Note on these taxa in KUHLMANN *et al*., 2021).

However, this situation is unsatisfactory. In the original description of *A. oulskii* (RADOSZKOWSKI, 1867), it is noted that material was collected in Baku in modern-day Azerbaijan. Examination of material in the Museum für Naturkunde in Berlin shows the

presence of a specimen of *A. oulskii* from Baku from the Radoszkowski Collection (Figs 37–40). No specimen from Afghanistan putatively identified as *A. oulskii* could be found in the collection. Though the specimen from Baku does not bear a type label, it conforms perfectly to Radoszkowski's original description, and clearly belongs to the subgenus *Truncandrena*, not *Ulandrena*, lacking the clearly broadened inner hind tibial spur of the latter subgenus. Importantly, RADOSZKOWSKI (1867) writes that *A. oulskii* has "*Les pieds noirs, les jambes et les tarses ainsi que les cuisses des pieds postérieurs, ferrugineux; les pieds couverts de poils jaune doré*". This categorically cannot correspond to the *Ulandrena* taxon described by Friese and found in Bulgaria, because it has entirely black legs. It does however clearly correspond to the specimen from Baku (Fig. 40). Based on this evidence, the position is taken that the interpretation of Warncke was correct, and that the *Ulandrena* displaying a red-marked abdomen in the female sex that is present in Bulgaria should be correctly referred to as *A. biguttata* Friese.

OTHER SPECIES EXAMINED: *Andrena oulskii*: AZERBAIJAN: • 1♀, Baku (undated), ZMHB (illustrated Figs 37–40).

20. *Andrena* (*Plastandrena*) *bimaculata* (Kirby, 1802)

WARNCKE (1966; 1967b; 1973); ATANÁSSOV (1972); SCHEUCHL & WILLNER (2016).

21. *Andrena* (*Aenandrena*) *bisulcata* Morawitz, 1878

WARNCKE (1973); ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1973, as *A. clypeata* Brullé, 1832).

23. *Andrena* (*Hoplandrena*) *bucephala* Stephens, 1846

WARNCKE (1966; 1967b); SCHEUCHL & WILLNER (2016).

24. *Andrena* (*Andrena*) *bulgariensis* Warncke, 1965

WARNCKE (1965): Holotype, • 1♀, Bulgaria, Situjakowo, Tschetér Tepél, iv-v.1916–1917, leg. V. Boettlicher; BANASZAK & DOCHKOVA (2014).

25. *Andrena* (*Avandrena*) *canohirta* (Friese, 1923)*

DISTRIBUTION. North Macedonia, Greece, Turkey (GUSENLEITNER & SCHWARZ, 2002).

MATERIAL EXAMINED. BULGARIA: • 1♀, Mostovo, 790–890 m, 12.v.2012, leg. P. Pacholátko, OÖLM; • 1♀, Sandanski, 30.iv.2006, leg. R. Mucska, OÖLM; • 1♀, Stara Kresna, v.2010, leg. P. Pacholátko, OÖLM.

26. *Andrena* (*Euandrena*) *chrysopus* Pérez, 1903

BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

27. *Andrena* (*Melandrena*) *chrysopyga* Schenck, 1853

SCHEUCHL & WILLNER (2016).

28. *Andrena* (*Notandrena*) *chrysosceles* (Kirby, 1802)

ATANÁSSOV (1972); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

29. *Andrena* (*Melandrena*) *cineraria* (Linnaeus, 1758)

SCHEUCHL & WILLNER (2016).

30. *Andrena* (*Chlorandrena*) *cinerea* Brullé, 1832*

DISTRIBUTION. Mediterranean basin not including the extreme Eastern Mediterranean (GUSENLEITNER & SCHWARZ, 2002).

MATERIAL EXAMINED. BULGARIA: • 1♂, 60 km NW Sofia, Glbovei env, 1.v.2012, leg. M. Snižek, OÖLM; • 79♂, 4♀, Mostovo, 790–890 m, 12.v.2012, leg. P. Pacholátko, OÖLM.

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

WARNCKE (1966; 1967b); ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

35. *Andrena* (*Ulandrena*) *combaella* Warncke, 1966

WARNCKE (1973); ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1973); ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

37. *Andrena* (*Simandrena*) *confinis* Stoeckhert, 1930*

DISTRIBUTION. The distribution of *A. confinis* is unclear because of its historical synonymy with *A. congruens* Schmiedeknecht, 1884. The two taxa are nonetheless distinct (SCHMID-EGGER & SCHEUCHL, 1997) and whilst their relative distributions are clearer in northern Europe (*A. confinis* extending further northwards, true *A. congruens* more restricted to central Europe) the situation in south-eastern Europe is completely unclear and requires a full revision.

MATERIAL EXAMINED. BULGARIA: • 1♀, Vlahi, 14.viii.1993, leg. M. Halada, OÖLM.

38. *Andrena* (*Simandrena*) *congruens* Schmiedeknecht, 1884*

DISTRIBUTION. For the same reasons as *A. confinis*, the distribution of true *A. congruens* is unclear and requires a complete revision.

MATERIAL EXAMINED. BULGARIA: • 1♀, Rhodopes, Pamporovo env., 1600 m, 23.vi.2016, leg. Barták & Kubik, TJWC; • 1♀, SW of Bansko, 1100–1800 m (undated), leg. Barták & Kubik, OÖLM.

39. *Andrena* (*Cordandrena*) *cordialis* Morawitz, 1878

WARNCKE (1966); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

40. *Andrena* (*Notandrena*) *curvana* Warncke, 1965

WARNCKE (1973); SCHWENNINGER (2013); SCHEUCHL & WILLNER (2016).

41. *Andrena* (*Lepidandrena*) *curvungula* Thomson, 1870

ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

42. *Andrena* (*Melandrena*) *danuvia* Stoeckhert, 1950

SCHEUCHL & WILLNER (2016).

MATERIAL EXAMINED. BULGARIA: • 1♀, Kresna, Javorov, 1–31.v.2010, leg. P. Pacholátko, OÖLM; • 1♀, Mostovo, 790–890 m, 12.v.2012, leg. P. Pacholátko, OÖLM.

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

WARNCKE (1973); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

MATERIAL EXAMINED. BULGARIA: • 1♂, 50 km S Sofia, 11.ix.1997, leg. J. Halada, OÖLM; • 1♀, Galata, 8.vii.1976, leg. O. Tkalců, OÖLM; • 1♂, Micurin [Tsarevo], 4.viii.1979, leg. A. Hoffer, OÖLM; • 1♂, Primorsko, 4.viii.1988, leg. P. Tyrner, OÖLM; • 1♀, Slanĉev Brjag

[Sunny Beach], 1–31.vii.1986, leg. J. Kovařík, OÖLM; • 1♀, 10.vi.1972, leg. Kocourek, OÖLM.

NOTE. The spring-flying *A. flavilabris* Schenck, 1874 was recently separated from *A. decipiens* (see entry below), but true *A. decipiens* (active in the summer) is also present in Bulgaria.

44. *Andrena* (*Cnemidandrena*) *denticulata* (Kirby, 1802)

SCHEUCHL & WILLNER (2016).

MATERIAL EXAMINED. BULGARIA: • 1♂, Sandanski, 4.vi.1978, leg. Kocourek, OÖLM.

45. *Andrena* (*Distandrena*) *distinguenda* Schenck, 1871

SCHEUCHL & WILLNER (2016).

46. *Andrena* (*Lepidandrena*) *dorsalis* Brullé, 1832*

DISTRIBUTION. Austria and Italy southwards and eastwards to Romania and Greece (GUSENLEITNER & SCHWARZ, 2002; TOMOZII, 2010).

MATERIAL EXAMINED. BULGARIA: • 1♂, Mostovo, 790–890 m, 12.v.2012, leg. P. Pacholátko, OÖLM.

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

WARNCKE (1966; 1973); ATANÁSSOV (1972); ATANÁSSOV & VASILEVA (1990); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

48. *Andrena* (*Ulandrena*) *elegans* Giraud, 1863

WARNCKE (1966; 1967b; 1973); ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1966); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1966); SCHEUCHL & WILLNER (2016).

51. *Andrena* (*Notandrena*) *erythrocnemis* Morawitz, 1870

ATANÁSSOV & VASILEVA (1990).

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

WARNCKE (1975): Paratype: Nessebar.

53. *Andrena* (*Micrandrena*) *falsifica* Perkins, 1915

BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

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

SCHEUCHL & WILLNER (2016).

MATERIAL EXAMINED. BULGARIA: • 1♀, Gorno Sabrane, 1–9.v.2018, leg. Barták & Kubik, OÖLM.

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

BANASZAK & DOCHKOVA (2014).

56. *Andrena* (*Holandrena*) *flavilabris* Schenck, 1874*

DISTRIBUTION. Because of historical synonymy with *A. decipiens*, the exact distribution of *A. flavilabris* is unclear, but it is likely to include central, southern, and eastern Europe and western Asia (MANDEREY *et al*., 2008; SCHEUCHL & WILLNER, 2016).

MATERIAL EXAMINED. BULGARIA: • 1♂, Plovdiv, 1.v.1997, leg. A. Zaykov, OÖLM.

NOTE. MANDEREY *et al*. (2008) separated *A. flavilabris* from *A. decipiens*, the former having been considered the spring-flying generation of the latter.

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

WARNCKE (1966; 1967b; 1969; 1973); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

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

ATANÁSSOV (1972); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1973); ATANÁSSOV & VASILEVA (1990); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

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

ASCHER & PICKERING (2021).

MATERIAL EXAMINED. BULGARIA: • 1♀, Arkutino, 1–31.vii.1968, leg. A. Görtler, OÖLM; • 1♀, Kresna, 12.vii.1990, leg. B. & O. Tkalců, OÖLM; • 1♂, Trakia, Proslav, 15.viii.1996, leg. A. Zaykov, OÖLM; • 1♂, 1♀, Varvara, 6–12.viii.1970, leg. Kocourek, OÖLM.

NOTE. No primary sources could be found to support the Ascher and Pickering listing, as the taxon was not listed in the revision of the subgenus *Holandrena* of SCHÖNITZER *et al*. (1995), though material was listed from Greece and North Macedonia, but examined material shows that the species is indeed present in Bulgaria.

61. *Andrena* (*Andrena*) *fulva* (Müller, 1766)

WARNCKE (1966); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1966; 1967b); ATANÁSSOV (1972); SCHEUCHL & WILLNER (2016).

63. *Andrena* (*Euandrena*) *fulvata* Stoeckhert, 1930

BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

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

DISTRIBUTION. Because of historical synonymy with *A. nitidiuscula* (see NOTE), the exact distribution of *A. fulvicornis* is unclear. However, it is likely to be found across central Europe, southern Europe (where it is the dominant taxon of the two), North Africa and the Levant (the only one of these two taxa present in this region), and into Turkey (SCHMID-EGGER & DOCZKAL, 1995; SCHWENNINGER, 2013; HAZIR *et al*., 2014; WOOD *et al*., 2020b).

MATERIAL EXAMINED. BULGARIA: • 1♂, 7 km NE Hristo, Danovo, 1160 m, 15.vi.2017, leg. Barták & Kubik, OÖLM; • 1♀, Galata, 19.vii.1979, leg. O. Tkalců, OÖLM; • 1♀, Neseber [Nessebar], 20.vii–5.viii.1965, leg. Z. Pédr, OÖLM; • 1♂, Rhodope, Galabovo, 10.vi.1997, leg. A. Zaykov, OÖLM; • 1♂, Sandanski, 16.vii.1966; • 1♀, 18.v.1979, both leg. Kocourek, OÖLM; • 1♀, Slanĉev Brjag [Sunny Beach], 20.vii–5.viii.1965, leg. Z. Pédr; • 2♀, 28.vi–14.vii.1971,

leg. Z. Pédr; • 1♂, 18–30.v.1989, leg. J. Halada, all OÖLM; • 1♂, Trakia, Proslav, 10.vii.1997, leg. A. Zaykov, OÖLM;

NORTH MACEDONIA: • 1♀, Lake Dojran, 10.vii.1968, leg. Z. Pédr, OÖLM.

NOTE. The status of *A. fulvicornis* has been unclear until relatively recently when it was removed from synonymy from *A. nitidiuscula* Schenck, 1853 (SCHMID-EGGER & DOCZKAL, 1995; see also SCHWENNINGER, 2013). It is bivoltine, whereas *A. nitidiuscula* is univoltine and flies only in the summer. *Andrena fulvicornis* is the more southerly of the two species, and dominates in warmer more Mediterranean environments, and was correspondingly more frequently encountered in Bulgarian material (see entry for *A. nitidiuscula* below). It is also newly recorded for North Macedonia*.

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

WARNCKE (1966; 1967b).

66. *Andrena* (*Cnemidandrena*) *fuscipes* (Kirby, 1802)

SCHEUCHL & WILLNER (2016).

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

WARNCKE (1966); SCHEUCHL & WILLNER (2016).

68. *Andrena* (*Lepidandrena*) *gamskrucki* Warncke, 1965*

DISTRIBUTION. North Macedonia, Greece, and Turkey, as subspecific taxa described by Warncke that are found in Turkey and the Levant have been elevated to full species status (GUSENLEITNER & SCHWARZ, 2002; DUBITZKY *et al*., 2010; PISANTY *et al*., 2018, 2021).

MATERIAL EXAMINED. BULGARIA: • 1♀, Plovdiv, 1.v.1997; • 3♀, 1.v.1996, all leg. A. Zaykov, OÖLM; • 1♀, Trakia, Proslav, 15.v.1996, leg. A. Zaykov, OÖLM.

NOTE. Though placed in the subgenus *Osychnyukandrena* by ARIANA *et al*. (2009) and in *Calcarandrena* by DUBITZKY *et al*. (2010), *A. gamskrucki* should be placed in the subgenus *Lepidandrena* following PISANTY *et al*. (2021).

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

DISTRIBUTION. Turkey, Israel, Jordan, Lebanon, and Syria (GUSENLEITNER & SCHWARZ, 2002; WOOD *et al*., 2020a).

MATERIAL EXAMINED. BULGARIA: • 1♀, Kresna, 5–9.v.2010, leg. P. Pacholátko, OÖLM.

NOTE. *Andrena garrula* does not fall within the true *Orandrena* (PISANTY *et al*., 2021), and is treated as *incertae sedis* until a new subgenus can be erected.

70. *Andrena* (*Taeniandrena*) *gelriae* van der Vecht, 1927

WARNCKE (1973); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

71. *Andrena* (*Graecandrena*) *graecella* Warncke, 1965

WARNCKE (1966; 1973).

72. *Andrena* (*Euandrena*) *granulosa* Pérez, 1902*

DISTRIBUTION. Morocco, western and central Europe, North Macedonia (GUSENLEITNER & SCHWARZ, 2002).

MATERIAL EXAMINED. BULGARIA: • 1♀, Slanĉev Brjag [Sunny Beach], 1–30.vi.1972, leg. Kocourek, OÖLM; • 1♀, 18–30.v.1989, leg. J. Halada, OÖLM.

76. *Andrena* (*Andrena*) *helvola* (Linnaeus, 1758)

SCHEUCHL & WILLNER (2016).

MATERIAL EXAMINED. BULGARIA: • 2♀, Kresna, 1–31.v.1967, leg. Kocourek, OÖLM.

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

WARNCKE (1966; 1967b); SCHEUCHL & WILLNER (2016).

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

ASCHER & PICKERING (2021).

MATERIAL EXAMINED. BULGARIA: • 1♀, NE Sandanski, W Ploski, 3.v.2012, leg. M. Snižek, OÖLM.

NOTE. No primary literature could be found to support the Ascher and Pickering listing. However, the distribution maps of Warncke presented by GUSENLEITNER & SCHWARZ (2002) show a dot present in Bulgaria, so the material examined here is not treated at the first record of this species.

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

WARNCKE (1966, 1967b, 1973); ATANÁSSOV (1972); SCHEUCHL & WILLNER (2016).

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

ASCHER & PICKERING (2021).

MATERIAL EXAMINED. BULGARIA: • 2♀, Sliven env, 400 m, 19.v.2012, leg. P. Pacholátko, OÖLM.

NOTE. The distribution of *A. hyemala* has been confused. WARNCKE (1965) proposed *A. graecella* as a replacement name for *A. strymonia* Pittioni, 1950 which was described from southern Bulgaria. However, the holotype male actually corresponds to *A. aciculata* (see entry for *A. aciculata* above), and so Warncke applied the name *A. graecella* to female material, and listed new specimens from Greece. Importantly, the material from southern Bulgaria has a widened vertex, and the material cited from Greece lacks this character, Warncke believing that this simply represented local variation. However, it later became clear that individuals with a narrow vertex represented a valid taxon which was described as *A. hyemala*. Because of this confusion, care must be taken when understanding the application of the name *A. graecella*, the true *A. graecella* showing a range restricted to the southern Balkans, whereas *A. hyemala* is much more widespread. Both species are found in Bulgaria.

81. *Andrena* (*Thysandrena*) *hypopolia* Schmiedeknecht, 1884

WARNCKE (1973, as *Andrena numida* Lepeletier, 1841); ATANÁSSOV & VASILEVA (1990, as *Andrena numida hypopolia*); SCHEUCHL & WILLNER (2016).

82. *Andrena* (*Graecandrena*) *impunctata* Pérez, 1895

WARNCKE (1969); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

MATERIAL EXAMINED. BULGARIA: • 1♀, Irakli, 16.vii.1987, leg. Barták, OÖLM; • 4♂, 1♀, Nessebar, 28–29.vi.1982, leg. Kocourek, OÖLM; • 1♀, Rhodope, Galabovo, 1.viii.1997, leg. A. Zaykov, OÖLM; • 3♀, Sandanski, 1–30.vi.1969, leg. Kocourek, OÖLM; • 1♀, Slanĉev Brjag [Sunny Beach], 28.vii.1968, leg. Kocourek; • 5♀, 1–30.vi.1972, leg. Kocourek; • 1♀, 7.viii.1968, leg. Kocourek; • 1♀, 18.v.1989, leg. J. Halada; • 1♂, 5.vi.1977, leg. Z. Pédr, all OÖLM; • ♀, Sozopol, 8.vii.1986, 1 leg. K. Poláček, OÖLM; • 1♀, Zidarevo [Zidaravo], S of Burgas, 12.vi.2017, leg. M. Halada, OÖLM.

83. *Andrena* (*Taeniandrena*) *intermedia* Thomson, 1870

WARNCKE (1973); ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1973).

85. *Andrena* (*Simandrena*) *kocoureki* sp. nov.*

DISTRIBUTION. Bulgaria.

NOTE. See species descriptions above.

86. *Andrena* (*Ulandrena*) *kriechbaumeri* Schmiedeknecht, 1883

WARNCKE (1973).

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

WARNCKE (1966; 1969; 1973; 1975, as *A. labialis megala* Warncke, 1975); ATANÁSSOV (1972); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1966; 1973); ATANÁSSOV (1972); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1973); ATANÁSSOV & VASILEVA (1990).

90. *Andrena* (*Andrena*) *lapponica* Zetterstedt, 1838*

DISTRIBUTION. From northern Europe (Scandinavia) south to the northern part of the Iberian Peninsula, central Europe, Romania, and eastwards into Russia (GUSENLEITNER & SCHWARZ, 2002; TOMOZII, 2010).

MATERIAL EXAMINED. BULGARIA: • 1♂, Pirin-Begovica, 1500 m, 9.v.2010, leg. P. Pacholátko, OÖLM; • 2♀, Sandanski, 26–31.v.1967, leg. Kocourek, OÖLM;

NORTH MACEDONIA: • 1♂, 2♀, Mount Kožuf, Smrdliva Voda, 1750 m, 7–8.v.2017, leg. K. Deneš, OÖLM; • 1♀, Mount Titov, Popova Shapka [Popova Šapka], 8.v.2017, K. Deneš, OÖLM.

NOTE. These records extend the range of *A. lapponica* further south into the mountains of the southern Balkans. It is polylectic with a strong preference for Ericaceae (MÜLLER, 2018) and is presumably restricted to these mountainous areas with a cooler temperature profile and plant communities that are more similar to central and northern Europe. It is also newly recorded for North Macedonia*.

91. *Andrena* (*Taeniandrena*) *lathyri* Alfken, 1899

WARNCKE (1966; 1973); ATANÁSSOV (1972); SCHEUCHL & WILLNER (2016).

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

ATANÁSSOV (1972); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1973).

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

WARNCKE (1966; 1967b); ATANÁSSOV & VASILEVA (1990, as *Andrena pectoralis limata*); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1966); ATANÁSSOV (1972).

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

DISTRIBUTION. Ukraine, Romania, Greece, Turkey, the Caucasus, Lebanon, and Israel (TOMOZII, 2010; PISANTY *et al*., 2018; WOOD *et al*., 2020a; KUHLMANN *et al*., 2021).

MATERIAL EXAMINED. BULGARIA: • 1♂, Neseber [Nessebar], 1–30.viii.1970, leg. Kocourek, OÖLM; • 2♀, Parvenez [Parvenets], 12.vi.1996, leg. A. Zaykov, OÖLM; • 3♂, Sandanski, 1–30.vi.1969, leg. Kocourek, OÖLM; • 1♂, 1–31.vii.1967, leg. Kocourek, OÖLM; • 1♂, Slanĉev Brjag [Sunny Beach], 1–30.vi.1972, leg. Kocourek, OÖLM; • 1♂, 28.vi–14.vii.1971, leg. Z. Pédr, OÖLM; NORTH MACEDONIA: • 1♀, National Park „Galichitsa", 600–1500 m, 26.vi.2014, leg. J. Halada, OÖLM.

NOTE. This species is also newly recorded for North Macedonia*.

97. *Andrena* (*Margandrena*) *marginata* Fabricius, 1776

WARNCKE (1966); SCHEUCHL & WILLNER (2016).

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

DISTRIBUTION. Greece, Turkey, Israel, Jordan, Lebanon, Syria (GUSENLEITNER & SCHWARZ, 2002; WOOD *et al*., 2020a).

MATERIAL EXAMINED. • 1♀, BULGARIA: Nessebar, 28.vi.1982, leg. Kocourek, OÖLM; • 3♀, Sinemorec, Veleka riv, 20.v.2012, leg. P. Pacholátko, OÖLM; • 13♂, Slanĉev Brjag [Sunny Beach], 18.v.1989, leg. J. Halada, OÖLM.

NOTE. All records come from the south-east of the country, on or close to the Black Sea coast.

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

WARNCKE (1966; 1967b; 1973); ATANÁSSOV & VASILEVA (1990); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1973); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

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

DISTRIBUTION. Western and central Europe eastwards with scattered records from Greece and Turkey (GUSENLEITNER & SCHWARZ 2002).

MATERIAL EXAMINED. BULGARIA: • 1♀, Gorno Sahrane, 1–9.v.2018, leg. Barták & Kubik, OÖLM; • 1♀, Mostovo, 790–890 m, 12.v.2012, leg. P. Pacholátko, OÖLM.

102. *Andrena* (*Lepidandrena*) *mocsaryi* Schmiedeknecht, 1884

SCHEUCHL & WILLNER (2016).

MATERIAL EXAMINED. BULGARIA: • 1♂, 60 km NW Sofia, Glbovei env., 1.v.2012, leg. M. Snižek, OÖLM; • 1♂, Kjustendil, Bobosevo [Boboshevo], 2.v.2012, leg. M. Snižek, OÖLM; • 1♀, Rhodope, Momchilgrad, 400 m, 18.v.2012, leg. P. Pacholátko, OÖLM.

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

WARNCKE (1966; 1973); SCHEUCHL & WILLNER (2016).

104. *Andrena* (*Didonia*) *mucida* Kriechbaumer, 1873

WARNCKE (1973); ATANÁSSOV (1972); SCHEUCHL & WILLNER (2016).

105. *Andrena* (*Micrandrena*) *nana* (Kirby, 1802)

BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

106. *Andrena* (*Hamandrena*) *nasuta* Giraud, 1863

BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

107. *Andrena* (*Ulandrena*) *neocypriaca* Mavromoustakis, 1956*

DISTRIBUTION. Cyprus, Greece, and Turkey (GUSENLEITNER & SCHWARZ, 2002).

MATERIAL EXAMINED. BULGARIA: • 1♀, Kiten, Coral Beach, 10.vi.2017, leg. M. Halada, OÖLM; • 1♀, Sinemorec, Veleka riv, 20.v. 2012, leg. P. Pacholátko, OÖLM.

108. *Andrena* (*Cnemidandrena*) *nigriceps* (Kirby, 1802)

ATANÁSSOV (1972); ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

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

ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

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

ATANÁSSOV (1972); WARNCKE (1973); SCHEUCHL & WILLNER (2016).

111. *Andrena* (*Notandrena*) *nitidiuscula* Schenck, 1853

WARNCKE (1966; 1967b; 1973); ATANÁSSOV & VASILEVA (1990); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

MATERIAL EXAMINED. BULGARIA: • 5♂, 10♀, Melnik, 13.viii.1993, leg. M. Halada, OÖLM; • 3♂, 8♀, Vlahi, 14.viii.1993, leg. M. Halada, OÖLM.

NOTE. As noted above, there has been great confusion over the differences between *A. nitidiuscula* and *A. fulvicornis*. Examined material illustrated that true *A. nitidiuscula* is also present in Bulgaria.

112. *Andrena* (*Micrandrena*) *niveata* Friese, 1887

BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

113. *Andrena* (*Nobandrena*) *nobilis* Morawitz, 1874

WARNCKE (1966; 1967b; 1973); SCHEUCHL & WILLNER (2016).

114. *Andrena* (*Simandrena*) *nucleola* Warncke, 1973*

DISTRIBUTION. Greece, Turkey, and Azerbaijan (WARNCKE, 1973).

MATERIAL EXAMINED. BULGARIA: • 1♀, Kresna, 20 km N Sandanski, 27.iv.1997, leg. J. Bares, OÖLM.

115. *Andrena* (*Hoplandrena*) *nuptialis* Pérez, 1902*

DISTRIBUTION. Western and central Europe east to Ukraine (GUSENLEITNER & SCHWARZ, 2002).

MATERIAL EXAMINED. BULGARIA: • 1♂, Pirin-Begovica, 13.viii.1993, leg. J. Halada, OÖLM.

116. *Andrena* (*Andrena*) *nycthemera* Imhoff, 1868

SCHEUCHL & WILLNER (2016).

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

DISTRIBUTION. The exact distribution of *A. optata* is unclear because it was regarded by Warncke as a subspecies of *A. rufomaculata* Friese, 1921, though it is clearly distinct. It is

probably distributed in eastern Europe, the Balkans, Turkey, and south to Lebanon (HAZIR *et al*., 2014; WOOD *et al*., 2020a; KUHLMANN *et al*., 2021).

MATERIAL EXAMINED. BULGARIA: • 1♂, Melnik, 4.vi.1984, leg. Bares, OÖLM; • 1♀, NE Sandanski, W Ploski, 3.v.2012, leg. M. Snižek, OÖLM.

118. *Andrena* (*Orandrena*) *oralis* Morawitz, 1876*

DISTRIBUTION. Central and eastern Europe eastwards, south to Greece and Turkey (GUSENLEITNER & SCHWARZ, 2002).

MATERIAL EXAMINED. BULGARIA: • 23♀, Sliven env, 400 m, 19.v.2012, leg. P. Pacholátko, OÖLM.

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

WARNCKE (1966, as *A. taraxaci orientana*); SCHWENNINGER (2015).

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

DISTRIBUTION. Western Balkans, through Greece and Turkey to Lebanon and Israel (WARNCKE, 1966; GUSENLEITNER & SCHWARZ, 2002; WOOD *et al*., 2020a).

MATERIAL EXAMINED. BULGARIA: • 1♀, Kresna, Javorov, 1–31.v.2010, leg. P. Pacholátko, OÖLM.

121. *Andrena* (*Lepidandrena*) *pandellei* Pérez, 1895

ATANÁSSOV (1972); SCHEUCHL & WILLNER (2016).

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

DISTRIBUTION. Greece, Turkey and the Caucasus, Cyprus, Ukraine and Israel (GUSENLEITNER & SCHWARZ, 2002).

MATERIAL EXAMINED. BULGARIA: • 1♀, Slanĉev Brjag [Sunny Beach], 18–30.v.1989, leg. J. Halada; • 1♀, 2.vi–7.vii.2008, leg. J. Batelka, both OÖLM.

123. *Andrena* (*Leucandrena*) *parviceps* Kriechbaumer, 1873

WARNCKE (1973); ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

124. *Andrena* (*Lepidandrena*) *paucisquama* Noskiewicz, 1924

WARNCKE (1966; 1967b; 1973); ATANÁSSOV (1972); SCHEUCHL & WILLNER (2016).

125. *Andrena* (*Taeniandrena*) *phoenicura* Warncke, 1975*

DISTRIBUTION. Greece and Turkey (KUHLMANN *et al*., 2021).

MATERIAL EXAMINED. BULGARIA: • 12♂, 3♀, Sandanski, 1–30.vi.1969, leg. Kocourek, OÖLM/TJWC; • 1♀, Sandanski, 1–8.vi.1967, leg. Kocourek, OÖLM; • 1♂, Slanĉev Brjag [Sunny Beach], 2.vii.1978, Z. Pédr, OÖLM.

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

WARNCKE (1966; 1973); BANASZAK & DOCHKOVA (2014, as *A. carbonaria* L.); SCHEUCHL & WILLNER (2016).

127. *Andrena* (*Micrandrena*) *pirinia* sp. nov.*

DISTRIBUTION. Bulgaria.

NOTE. See species descriptions above.

128. *Andrena* (*Ulandrena*) *polita* Smith, 1847

ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

129. *Andrena* (*Poecilandrena*) *potentillae* Panzer, 1809

SCHEUCHL & WILLNER (2016).

130. *Andrena* (*Taeniandrena*) *producta* Warncke, 1973

WARNCKE (1973, as *Andrena gelriae producta*), Paratype: Sandanski; ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

131. *Andrena* (*Simandrena*) *propinqua* Schenck, 1853*

DISTRIBUTION. The exact distribution of *A. propinqua* is unclear because of historical synonymy with *A. dorsata*. *Andrena propinqua* is probably distributed from north-western Africa throughout Europe to Turkey (GUSENLEITNER & SCHWARZ, 2002; HAZIR *et al*., 2014).

MATERIAL EXAMINED. BULGARIA: • 1♂, 7♀, Biser-Harmanli, 28.vi.1978, leg. Z. Pédr, OÖLM; • 1♀, Kresna, 20 km N Sandanski, 27.iv.1997, leg. J. Bares, OÖLM; • 3♀, Parvenez [Parvenets], 12.vi.1996, leg. A. Zaykov, OÖLM; • 4♀, Sandanski, 1–30.vi.1969, leg. Kocourek, OÖLM; • 5♀, Slanĉev Brjag [Sunny Beach], 1–30.vi.1972, leg. Kocourek, • 1♀, 5–15.vi.1977, leg. Z. Pédr, • 1♀, 2.vii.1978, leg. Z. Pédr, • 1♀, 1–31.vii.1964, leg. V. Balthasar, OÖLM.

132. *Andrena* (*Micrandrena*) *proxima* (Kirby, 1802)

WARNCKE (1966; 1973); ATANÁSSOV (1972); SCHEUCHL & WILLNER (2016).

MATERIAL EXAMINED. BULGARIA: • 1♀, Charmanli [Harmanli], 18.v.1979, leg. Kocourek, OÖLM; • 1♀, Kresna, Javorov, 1–31.v.2010, leg. P. Pacholátko, OÖLM; • 1♀, Mostovo, 790–890 m, 12.v.2012, leg. P. Pacholátko, OÖLM; • 1♂, Plovdiv, 1.v.1996, leg. A. Zaykov, OÖLM; • 2♂, Rhodope, Galabovo, 10.vi.1997, leg. A. Zaykov, OÖLM; • 1♂, 2♀, Sinemorec, Veleka riv., 20.v.2012, leg. P. Pacholátko, OÖLM; • 1♂, Trakia, Voivodino, 18.v.1996, leg. A. Zaykov, OÖLM.

NOTE. SCHMID-EGGER (2005) separated members of the *A. proxima* complex, giving a general distribution for *A. proxima* sensu stricto from northern and central Europe to Italy and south-east through the Balkans to Greece. Though only listing material from Bulgaria for *A. alutacea* (see entry above), newly examined material demonstrates that both taxa are indeed present.

133. *Andrena* (*Ulandrena*) *resoluta* Warncke, 1973

WARNCKE (1973): Paratypes: Sandanski, Kresrensko [sic, presumably Kresna environs].

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

DISTRIBUTION. Italy, North Macedonia, Greece, Turkey, Lebanon, and Israel (GUSENLEITNER & SCHWARZ, 2002; PISANTY *et al*., 2018; WOOD *et al*., 2020a).

MATERIAL EXAMINED. BULGARIA: • 1♀, Sinemorec, Veleka riv., 20.v.2012, leg. P. Pacholátko, OÖLM; • 4♂, 2♀, Trakia, Plovdiv, 1.v.1996, leg. A. Zaykov, OÖLM; • 1♂, 1♀, Kresna, 5.v.2010, leg. P. Pacholátko, OÖLM; • 1♂, Kresna, 20 km N Sandanski, 27.iv.1997, leg. J. Bares, OÖLM; • 4♀, Sandanski, 28.v.1978, leg. Kocourek, OÖLM; • 1♀, Tylenovo, SE Sabla, 5.vi.2017, leg. M. Halada, OÖLM.

135. *Andrena* (*Micrandrena*) *rugulosa* Stoeckhert, 1935

SCHEUCHL & WILLNER (2016).

MATERIAL EXAMINED. BULGARIA: • 1♂, 1♀, 60 km NW Sofia, Glbovei env., 1.v.2012, leg. M. Snižek, OÖLM; • 1♀, Kresna, 5–9.v.2010, leg. P. Pacholátko, OÖLM; • 10♀, Mostovo, 790–890 m, 12.v.2012, leg. P. Pacholátko, OÖLM; • 1♀, Parvenec [Parvenets], 1.v.1997, leg. A. Zaykov, OÖLM; • 4♀, Plovdiv, 1.v.1996, leg. A. Zaykov, OÖLM; • 11♀, Rhodope, Momchilgrad, 400 m, leg. P. Pacholátko, OÖLM.

136. *Andrena* (*Micrandrena*) *sandanskia* Warncke, 1973

DISTRIBUTION. Bulgaria, Greece, North Macedonia* (GUSENLEITNER & SCHWARZ, 2002).

WARNCKE (1973): Holotype, • 1♂, Bulgaria, Sandanski, 1–8.vi.1967, leg. Kocourek, OÖLM.

MATERIAL EXAMINED. BULGARIA: • 2♀, 30 km SW Svilengrad, 550 m, 21.vi.2008, leg. M. & Z. Halada, OÖLM; • 1♀, Kresna, 14.v.1979, leg. Kocourek, OÖLM; • 5♂, 1♀, Parvenec [Parvenets], 25.v.1997; • 4♀, 12.vi.1996; all leg. A. Zaykov, OÖLM; • 1♀, Plovdiv, 15.vi.1997, leg. A. Zaykov, OÖLM; • 3♂, S of Sozopol, 40 m, 11.vi.2017, leg. B. Halada, OÖLM; • 2♂, Sandanski, v.1967; • 2♂, vii.1966, all leg. Kocourek, OÖLM; • 3♀, SE Lozenec, 16.vi.2008, leg. M. & Z. Halada, OÖLM; • 1♂, Stara Kresna, 20.vi.1987, leg. J. Halada, OÖLM; • 1♂, 1♀, Zidarevo [Zidaravo], S of Burgas, 12.vi.2017, leg. B. Halada, OÖLM; • 1♀, Kardzali, Balabanovo, 22.vi.2007, leg. M. & Z. Halada, TJWC.

NORTH MACEDONIA: • 1♀, National Park „Galichitsa“, 600–1500 m, 26.vi.2014, leg. J. Halada, OÖLM.

NOTE. This poorly studied species seems to be restricted to mountainous regions in the southern Balkans. The presence of the species in south-western Macedonia extend the range to the west. Interestingly, this specimen was collected at the same time and place as the type series of the recently described *Hoplitis galichicae* Müller, 2016, an oligolege of *Sedum* (Crassulaceae, MÜLLER, 2016). Analysis of pollen loads from two *A. sandanskia* from Bulgaria (SE Lozenec, 16.vi.2008; Kardzali, Balabanovo, 22.vi.2007) comprised pure *Sedum* pollen, suggesting that *A. sandanskia* may also be a specialist on this genus. Though *Sedum* oligolecty had not been previously documented in the European fauna before *H. galichicae*, several other recently described or elevated European bee species found in mountainous areas have either a confirmed or suspected specialisation on this genus, specifically *Flavipanurgus kastiliensis* (Warncke, 1987) and *Andrena omnilaevis* respectively (CROSS & WOOD, 2018; WOOD *et al*., 2020c). These results suggest that *A. sandanskia* may fit into this pattern, and that other bee forage plants should be investigated in mountainous areas as they may host other overlooked or understudied bee species.

137. *Andrena* (*Micrandrena*) *saxonica* Stoeckhert, 1935

WARNCKE (1966); ATANÁSSOV & VASILEVA (1990); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1967b; 1973); SCHEUCHL & WILLNER (2016).

139. *Andrena* (*Notandrena*) *schlettereri* Friese, 1896*

DISTRIBUTION. From Hungary south through the Balkans to Greece and Turkey (GUSENLEITNER & SCHWARZ, 2002).

MATERIAL EXAMINED. BULGARIA: • 1♂, 2♀, Plovdiv, 1.v.1996, leg. A. Zaykov, OÖLM; • 2♀, Rhodope, Galabovo, 10.vi.1997, leg. A. Zaykov, OÖLM.

140. *Andrena* (*Scitandrena*) *scita* Eversmann, 1853

WARNCKE (1966); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

141. *Andrena* (*Hoplandrena*) *scotica* Perkins, 1916

BANASZAK & DOCHKOVA (2014, as *A. jacobi* Perkins, 1921); SCHEUCHL & WILLNER (2016, as *A. carantonica* Pérez, 1902).

MATERIAL EXAMINED. BULGARIA: • 1♀, Kjustendil, Bobosevo [Boboshevo], 2.v.2012, leg. M. Snižek, OÖLM; • 1♂, 2♀, Kresna, 1–31.v.1967, leg. Kocourek, OÖLM; • 1♀, Mostovo, 790–890 m, 12.v.2012, leg. P. Pacholátko, OÖLM; • 1♀, Šípka mont [Shipka], 12.v.1994, leg. K. Deneš, OÖLM; • 1♂, Slanĉev Brjag [Sunny Beach], 18–30.v.1989, leg. J. Halada, OÖLM.

NOTE. There has been great nomenclatural confusion over this taxon that is currently in the process of being formally resolved (TJW, in prep). For clarity and simplicity, the name *A. scotica* is the earliest available name that can be applied to the most common European *Hoplandrena* which flies in a single generation in the spring, the male of which has a bidentate mandible.

142. *Andrena* (*Micrandrena*) *semilaevis* Pérez, 1903

BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

143. *Andrena* (*Poecilandrena*) *seminuda* Friese, 1896

ATANÁSSOV (1972); SCHEUCHL & WILLNER (2016).

144. *Andrena* (*Leucandrena*) *sericata* Imhoff, 1868

BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1973, as *A. ochreata* (Christ, 1791)); SCHEUCHL & WILLNER (2016).

146. *Andrena* (*Cnemidandrena*) *simillima* (Kirby, 1802)

ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

***Andrena* (*Cnemidandrena*) *simillima* ssp. *sischkai* Warncke, 1988**

WARNCKE (1988): • 1♂, 2♀, Paratypes: Popina-Luka/Pirin, 1300 m, 23–27.vii.1974, leg. A. Hoffer.

DISTRIBUTION. *Andrena simillima* is found across central and northern Europe eastwards to Russia. The subspecies *sischkai* is found in Bulgaria and Greece to the Russian Caucasus (Teberda, WARNCKE, 1988). This group requires revision as the subspecies (including *A. simillima bremensis* Alfken, 1900) are likely to represent good taxa given the elevation of *A. freygessneri* Alfken, 1904 (EBMER, 2001) in central Europe and the description of *A. niveofacies* Wood, 2020 from Morocco (WOOD *et al*., 2020b).

147. *Andrena* (*Micrandrena*) *simontornyella* Noskiewicz, 1939

WARNCKE (1966; 1967b); ATANÁSSOV & VASILEVA (1990); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

148. *Andrena* (*Poecilandrena*) *sphecodimorpha* Hedicke, 1942

HEDICKE (1942): Holotype: Bulgaria; WARNCKE (1966).

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

BANASZAK & DOCHKOVA (2014, as *A. spreta pusilla* Pérez, 1903).

DISTRIBUTION. Members of this complex are found throughout the West Palearctic (GUSENLEITNER & SCHWARZ, 2002) and represent many good species. The complex is currently under revision, and no further comment can be made at the present time.

MATERIAL EXAMINED. BULGARIA: • 1♀, Rhodopes, Pamporovo env., 1600 m, 23.vi.2016, leg. Barták & Kubik, OÖLM.

150. *Andrena* (*Micrandrena*) *subopaca* Nylander, 1848

WARNCKE (1966); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

151. *Andrena* (*Simandrena*) *susterai* Alfken, 1914

SCHEUCHL & WILLNER (2016).

MATERIAL EXAMINED. BULGARIA: • 1♀, 6 km S Pavel Banya, near river, SW, 1–30.vi.2018, leg. Barták & Kubik, OÖLM; • 1♀, Burgas, S Primorsko, Bach Oryaschka, 5–6.vi.2001, leg. H. & R. Rausch, OÖLM; • 12♂, Plovdiv, 1.v.1997, leg. A. Zaykov, OÖLM; • 1♀, Sinemorec, Veleka riv., 20.v.2012, leg. P. Pacholátko, OÖLM; • 1♀, Trakia, Proslav, 15.v.1996, leg. A. Zaykov, OÖLM.

152. *Andrena* (*Euandrena*) *symphyti* Schmiedeknecht, 1883

ATANÁSSOV (1972); SCHEUCHL & WILLNER (2016).

153. *Andrena* (*Chlorandrena*) *taraxaci* Giraud, 1861*

DISTRIBUTION. Central Europe with a western limit in Austria and Germany, eastwards to Russia and south to Greece and Turkey (SCHWENNINGER, 2015).

MATERIAL EXAMINED. BULGARIA: • 1♀, Charmanli [Harmanli], 16.v.1976, leg. Kocourek, OÖLM; • 2♂, 1♀, Kresna, v.1967, leg. Kocourek, OÖLM; • 2♀, 12–18.v.1979, leg. Kocourek, OÖLM; • 1♀, Kresna, Javorov, v.2010, leg. P. Pacholátko, OÖLM.

NOTE. *Andrena taraxaci* has been greatly confused because there are a large number of morphologically similar species around this taxon that are best separated by reference to the male genitalia and hidden sterna. Warncke treated many of these taxa as subspecies, and hence a very broad 'distribution' can be found for *A. taraxaci sensu* Warncke (see the distribution map presented in GUSENLEITNER & SCHWARZ, 2002). These taxa were most recently revised by SCHWENNINGER (2015), who listed *A. orientana* but not *A. taraxaci* for Bulgaria, in line with WARNCKE (1966). Though SCHEUCHL & WILLNER (2016) list *A. taraxaci* for Bulgaria, it is not clear which species concept they are using, or what species concept was used in the source data as this publication also lists *A. taraxaci* from countries like Israel that are ecologically extremely different to the upland habitats inhabited by *A. taraxaci sensu stricto*. The revision of Schwenninger is therefore followed as priority, and *A. taraxaci* is consequently listed as new for Bulgaria.

154. *Andrena* (*Tarsandrena*) *tarsata* Nylander, 1848

WARNCKE (1973); ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

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

DISTRIBUTION. Southern Europe from Spain, through the Balkans, and east to Turkey, the Caucasus, and Lebanon (GUSENLEITNER & SCHWARZ, 2002; WOOD *et al*., 2020a).

MATERIAL EXAMINED. BULGARIA: • 1♀, Rhodope, Galabovo, 1.vii.1997, leg. A. Zaykov, OÖLM.

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

WARNCKE (1966); ATANÁSSOV (1972); SCHEUCHL & WILLNER (2016).

157. *Andrena* (*Plastandrena*) *tibialis* (Kirby, 1802)

BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1973); SCHEUCHL & WILLNER (2016).

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

SCHEUCHL & WILLNER (2016).

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

WARNCKE (1973): Paratypes: Warna [Varna], Sandanski; BANASZAK & DOCHKOVA (2014).

161. *Andrena* (*Truncandrena*) *truncatilabris* Morawitz, 1878

WARNCKE (1966; 1967b; 1973); ATANÁSSOV (1972); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

162. *Andrena* (*Truncandrena*) *tscheki* Morawitz, 1872

ATANÁSSOV (1972); SCHEUCHL & WILLNER (2016).

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

WARNCKE (1966; 1967b; 1973).

MATERIAL EXAMINED. BULGARIA: • 1♂, Albena, 14.vii.1976, leg. O. Tkalců, OÖLM; • 1♂, Kaverna [Kavarna], 12.vii.1976, leg. O. Tkalců, OÖLM; • 1♂, Rhodope, Galabovo, 1.vii.1997, leg. A. Zaykov, OÖLM; • 1♂, Slanĉev Brjag [Sunny Beach], 26.vi.1968, leg. Kocourek, OÖLM.

164. *Andrena* (*Melandrena*) *vaga* Panzer, 1799*

DISTRIBUTION. Western and central Europe eastwards, scattered locations in south-eastern Europe (GUSENLEITNER & SCHWARZ, 2002).

MATERIAL EXAMINED. BULGARIA: • 2♀, Lebnice [Lebnitsa], 8.vii.1988, leg. Brokeš, OÖLM / TJWC.

NOTE. These specimens are unusual, because *A. vaga* is a well-known univoltine *Andrena* that flies in the spring. The collecting locality is in a mountainous area, and so these could represent a delayed emergence due to local climatic or weather conditions, as the species has never been reported as bivoltine. More study is required, as *A. vaga* has not been well recorded in the southern Balkans.

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

WARNCKE (1966; 1967b); ATANÁSSOV & VASILEVA (1990); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

166. *Andrena* (*Andrena*) *varians* (Kirby, 1802)

ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

167. *Andrena* (*Leucandrena*) *ventralis* Imhoff, 1832

SCHEUCHL & WILLNER (2016).

MATERIAL EXAMINED: BULGARIA: • 5♀, 6 km S Pavel Banya, near river, SW, 1–30.vi.2018, leg. Barták & Kubik, OÖLM.

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

WARNCKE (1966; 1967b; 1973); ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

169. *Andrena* (*Poecilandrena*) *viridescens* Viereck, 1916

BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

170. *Andrena* (*Euandrena*) *vulpecula* Kriechbaumer, 1873

ATANÁSSOV & VASILEVA (1990); SCHEUCHL & WILLNER (2016).

171. *Andrena* (*Holandrena*) *wilhelmi* Schuberth, 1995*

DISTRIBUTION. Italy, southern Balkans, Cyprus, Turkey, Caucasus, to Israel (SCHUBERTH 1995; PISANTY *et al*., 2018).

MATERIAL EXAMINED. BULGARIA: • 1♀, Parvenec [Parvenets], 12.vi.1996; • 1♂, 1.v.1997, both leg. A. Zaykov, OÖLM; • 1♂, Plovdiv, 1.vi.1996; • 1♂, 1.v.1997, both leg. A. Zaykov, OÖLM; • 2♂, Sandanski, 1–8.vi.1967, leg. Kocourek, OÖLM; • 1♂, Trakia, Proslav, 15.v.1997, leg. A. Zaykov, OÖLM.

NOTE. This taxon was separated from *A. forsterella* where it has been thought to be simply the spring flying generation; as is the situation in *A. decipiens* and *A. flavilabris*, both are distinct species.

172. *Andrena* (*Taeniandrena*) *wilkella* (Kirby, 1802)

ATANÁSSOV (1972); BANASZAK & DOCHKOVA (2014); SCHEUCHL & WILLNER (2016).

MATERIAL EXAMINED. BULGARIA: • 2♂, Melnik env., 30.v.1967, leg. Kocourek, OÖLM; • 1♂, Nessebar, 28.vi.1982, leg. Kocourek, OÖLM; • 1♂, Pirin-Begovica, 16.vi.1987, leg. J. Halada, OÖLM; • 1♀, Sandanski, 1–8.vi.1967, leg. Kocourek, OÖLM; • 4♂, Slanĉev Brjag [Sunny Beach], 1–30.vi.1972, leg. Kocourek, OÖLM.

Species excluded from the list

***Cubiandrena cubiceps* (Friese, 1914)**

ATANÁSSOV & VASILEVA (1990, as *Andrena cubiceps*).

NOTE. The former *Andrena* subgenus *Cubiandrena* should be treated as a good genus (DUBITZKY *et al*., 2010; PISANTY *et al*., 2021), and so this taxon is strictly not part of the *Andrena* fauna of Bulgaria, though it is present in the country.

***Andrena* (*Ulandrena*) *concinna* Smith, 1853**

WARNCKE (1966; 1973).

NOTE. There is a lack of clarity surrounding *A. concinna sensu stricto* because of the taxonomic concepts used by Warncke. He treated the many species allied around *A. concinna* as subspecies because of the difficulty in separating the females, for example describing *A. concinna resoluta* from North Macedonia and Bulgaria but then listing it simply under *A. concinna* in the faunal summary (WARNCKE, 1973). As true *A. concinna* was described from Albania (GUSENLEITNER & SCHWARZ, 2002) it is possible that it is present in Bulgaria. However, this must be demonstrated with male material as confident determination can only be made from inspection of the genital capsule.

***Andrena* (*Melandrena*) *flavipes* ssp. *puber* Erichson, 1835**

ATANÁSSOV (1972).

NOTE. This record is almost certainly a misidentification as the subspecies puber is restricted to North Africa and the Iberian Peninsula (GUSENLEITNER & SCHWARZ, 2002).

***Andrena* (*Calomelissa*) *tsukubana* Hirashima, 1957**

BANASZAK & DOCHKOVA (2014).

NOTE. This is almost certainly a misidentification, as *A. tsukubana* is found in the Russian Far East, Japan, and Korea (XU & TADAUCHI, 1995; ASCHER & PICKERING, 2021).

***Andrena* (*Notandrena*) *urdula* Warncke, 1965**

ASCHER & PICKERING (2021).

NOTE. The distribution of this species has been confused. The distribution map presented by GUSENLEITNER & SCHWARZ (2002) is actually the map of *A. ungeri*, this distribution map possibly being the underlying data source for ASCHER & PICKERING (2021). *Andrena urdula* has a more restricted distribution of Spain, Morocco, Greece, and Romania (KUHLMANN *et al*., 2021). The species may be present in Bulgaria, but without a primary source this must currently be considered doubtful.

Discussion

In total, this investigation of the *Andrena* fauna of Bulgaria identified 35 species newly recorded for the country, including two species new to science, and a further species new to science from North Macedonia. The presence of undescribed species in the mountains of the southern Balkans was unexpected given the work of Warncke on the fauna of this region (WARNCKE, 1965; 1966; 1967b; 1973; 1988). However, given the pattern of undescribed *Andrena* diversity in southern Europe (PRAZ *et al*., 2019; WOOD *et al*., 2020c), it is ultimately not surprising that species have been overlooked given the huge species richness of this genus.

In addition to the species thought to be endemic to Greece (predominantly on islands and in coastal areas), it seems that the mountains of the southern Balkans (Bulgaria, Greece, North Macedonia) may genuinely host an endemic montane fauna comprising *A. kocoureki*, *A. pelagonia*, *A. pirinia*, *A. resoluta*, and *A. sandanskia*. The species newly described here naturally require more study to identify their true range extents, but given the habitats in which they are found, it is considered unlikely that they will be present outside this region. From what little ecological data are available, they may have dietary niches focused on montane plants such as *Sedum*, as for other species found in southern European mountains (MÜLLER, 2016; WOOD *et al*., 2020c).

A major component of the *Andrena* diversity newly recorded for Bulgaria consists of species found largely in Greece and Turkey, not having been recorded far outside this region, most clearly seen for *A. astica*, *A. canohirta*, *A. gamskrucki*, *A. garrula*, *A. merula*, *A. neocypriaca*, *A. nucleola*, and *A. phoenicura*. Other major biogeographic affinities for species newly recorded include the Black Sea (*A. anatolica*, *A. athenensis*, *A. atrotegularis*), the wider Mediterranean basin (*A. cinerea*, *A. granulosa*, *A. nuptialis*, *A. thomsoni*), and broadly central and eastern Europe (*A. confinis*, *A. congruens*, *A. dorsalis*, *A. mitis*, *A. oralis*, *A. schlettereri*, *A. taraxaci*). The wide range of newly recorded species displaying these diverse climatic affinities illustrates the chronic lack of recording and subsequent study of the Bulgarian fauna. Substantial faunal richness increases at the country level within the genus *Andrena* after contemporary revisionary work are typical given the shortage of taxonomic workers for this genus in the post-Warncke period (e.g. Israel, PISANTY *et al*., 2018; Morocco, WOOD *et al*., 2020b). With more focused attention, it is likely that more undescribed *Andrena* species will be discovered in the Balkan fauna.

Acknowledgements

My thanks go to Christophe Praz (Neuchâtel) for ongoing collaboration and discussion on *Andrena* taxonomy, to Esther Ockermüller and Martin Schwarz for hospitality at Linz, to Frederique Bakker for access to the collection at Naturalis, and Stefanie Krause for access to

the collection at the Museum für Naturkunde in Berlin. I also thank two anonymous reviewers whose comments substantially improved the manuscript. This work is supported by an F.R.S.-FNRS fellowship "Chargé de recherches".

References

AMIET F., HERRMANN M., MÜLLER A. & NEUMEYER R., 2010. - Apidae 6: *Andrena*, *Melitturga*, *Panurginus*, *Panurgus*. Centre Suisse de Cartographie de la Faune (CSCF) / Schweizerische Entomologische Gesellschaft (SEG), Neuchâtel, 318 pp.

ARIANA A. TADAUCHI O. & SHEBL M., 2009. - A revision of the subgenus *Osychnyukandrena* of the genus *Andrena* (Hymenoptera: Andrenidae*). Esakia*, 49: 63–70.

ASCHER J.S. & PICKERING J., 2021. - Discover Life bee species guide and world checklist (Hymenoptera: Apoidea: Anthophila). Available from: http://www.discoverlife.org/mp/20q?guide=Apoidea_species [accessed 27 August 2021].

ATANÁSSOV N., 1972. - Arten Hymenoptera von West-Balkan-Gebirge: I. Teil. *Bulletin de l'Institut de Zoologie et Musée, Academie Bulgare des Sciences*, 35: 179–228.

ATANÁSSOV N. & VASILEVA E., 1990. - New Apian species (Hymenoptera, Apoidea) for the Bulgarian fauna. *Historia naturalis bulgarica*, 2: 12–18.

BANASZAK J. & DOCHKOVA B., 2014. - Bees (Hymenoptera, Apoidea, Apiformes) in the Agricultural Landscape of Bulgaria: Species Diversity. *Journal of Apicultural Science*, 58: 29–49.

CROSS I. & WOOD T.J., 2018. - New data on the Iberian endemic bee genus *Flavipanurgus* Warncke (Hymenoptera: Apoidea: Andrenidae): ecological and genomic data reveal a hidden species. *Zootaxa*, 452: 563–572.

DARDÓN M.J., TORRES F. & ORNOSA C., 2014. - The subgenus *Andrena* (*Micrandrena*) (Hymenoptera: Andrenidae) in the Iberian Peninsula. *Zootaxa*, 3872: 467–497.

DUBITZKY A., PLANT J. & SCHÖNITZER K., 2010. - Phylogeny of the bee genus *Andrena* Fabricius based on morphology (Hymenoptera: Andrenidae). *Mitteilungen der Münchner Entomologische Gesellschaft*, 100: 137–202.

EBMER A.W., 2001. - Hymenopterologische Notizen aus Österreich – 14 (Insecta: Hymenoptera: Apoidea). *Linzer biologische Beiträge*, 33: 435–460.

GHAHNAVIEH R.K. & MONFARED A., 2019. - A survey of the bees (Hymenoptera: Apoidea) from Isfahan Province, Iran. *Journal of Insect Biodiversity Systematics*, 5: 171–201.

GUSENLEITNER F. & SCHWARZ M., 2002. - Weltweite Checkliste der Bienengattung *Andrena* mit Bemerkungen und Ergänzungen zu paläarktischen Arten (Hymenoptera, Apidae, Andreninae, *Andrena*). *Entomofauna Supplement*, 10: 1–1280.

GUSENLEITNER F., SCHWARZ M., ASCHER J. & SCHEUCHL E., 2005. - Korrekturen und Nachträge zu GUSENLEITNER & SCHWARZ (2002): "Weltweite Checkliste der Bienengattung *Andrena* mit Bemerkungen und Ergänzungen zu paläarktischen Arten (Hymenoptera, Apidae, Andreninae, Andrena)". *Entomofauna*, 26: 437–472.

HAZIR C., KESKIN N. & SCHEUCHL E., 2014. - Faunistic, geographical and biological contributions to the bee genus *Andrena* (Hymenoptera, Andrenidae, Andreninae) from Turkey. *Journal of Hymenoptera Research*, 38: 59–133.

HEDICKE H., 1942. - Über paläarktische Apiden. (Hym.) III. *Mitteilungen der Deutschen Entomologischen Gesellschaft*, 11: 63–65.

KUHLMANN M. *et al.*, co-authors as listed in "Contributors", 2021. - Checklist of the Western Palaearctic Bees (Hymenoptera: Apoidea: Anthophila). http://westpalbees.myspecies.info [accessed 27 August 2021].

LHOMME P., MICHEZ D., CHRISTMANN S., SCHEUCHL E., EL ABDOUNI I., HAMROUD L., IHSANE O., SENTIL A., SMAILI M.C., SCHWARZ M., DATHE H.H., STRAKA J., PAULY A., SCHMID-EGGER C., PATINY S., TERZO M., MÜLLER A., PRAZ C., RISCH S., KASPAREK M., KUHLMANN M., WOOD T.J., BOGUSCH P., ASCHER J. & RASMONT P., 2020. - The wild bees (Hymenoptera: Apoidea) of Morocco. *Zootaxa*, 4892: 1–159.

MANDEREY K., KOSUCH J. & SCHUBERTH J., 2008. - Untersuchungsergebnisse zum Artstatus von *Andrena decipiens* Schenck, 1861, *Andrena flavilabris* Schenck, 1874, und ihrem gemeinsamen Brutparasiten *Nomada stigma* Fabricius, 1804 (Hymenoptera: Apidae). *Nachrichtenblatt der Bayerischen Entomologen*, 57: 30–41.

MICHENER C., 2007. - *The bees of the world*. 2nd edition. Johns Hopkins University Press, Baltimore, 992 pp.

MOTYKA E., WIŚNIOWSKI B., CELARY W. & SZCZEPKO K., 2018. - Contribution to the bee fauna (Hymenoptera: Anthophila) of Poland. VI. The genus *Andrena* Fabricius, 1775. Part 1. *Journal of Apicultural Science*, 62: 15–26.

MÜLLER A., 2016. - *Hoplitis* (*Hoplitis*) *galichicae* sp. nov., a new osmiine bee species from Macedonia with key to the European representatives of the *Hoplitis adunca* species group (Megachilidae, Osmiini). *Zootaxa*, 4111: 167–176.

MÜLLER A., 2018. - Pollen host selection by predominantly alpine bee species of the genera *Andrena*, *Panurginus*, *Dufourea*, *Megachile*, *Hoplitis* and *Osmia* (Hymenoptera, Apoidea). *Alpine Entomology*, 2: 101–113.

PISANTY G., SCHEUCHL E. & DORCHIN N., 2018. - Taxonomic review of the subgenus *Andrena* (*Poecilandrena*) (Hymenoptera: Andrenidae) in Israel and the Levant. *Zootaxa*, 4374: 151–188.

PISANTY G., RICHTER R., MARTIN T., DETTMAN J. & CARDINAL S., 2021. - Molecular phylogeny, historical biogeography and revised classification of andrenine bees (Hymenoptera: Andrenidae). *Molecular Phylogenetics and Evolution*, in press. https://doi.org/10.1016/j.ympev.2021.107151 [accessed 30 August 2021].

PITTIONI B. & STOECKHERT E., 1950. - Über einige neue und verkannte Andrena-Arten (Hymenoptera, Andrenidae). Beiträge zur Kenntnis paläarktischer Apiden III. *Annalen des Naturhistorischen Museums Wien*, 57: 284–295.

PRAZ C., MÜLLER A. & GENOUD D., 2019. - Hidden diversity in European bees: *Andrena amieti* sp. n., a new Alpine bee species related to *Andrena bicolor* (Fabricius, 1775) (Hymenoptera, Apoidea, Andrenidae). *Alpine Entomology*, 3: 11–38.

RADOSZKOWSKI O., 1867. - Matériaux pour servir à l'étude des insectes de la Russie. IV. Note sur quelques Hyménoptères de la tribu des Apides. *Horae Societatis Entomologicae Rossicae*, 5: 73–90.

SCHEUCHL E. & WILLNER W., 2016. - *Taschenlexikon der Wildbienen Mitteleuropas: alle Arten im Porträt*. Quelle et Meyer Verlag, Wiebelsheim, Germany, 920 pp.

SCHMID-EGGER C., 2005. - *Proxiandrena* subgen. nov. und Revision der west- und zentralpaläarktischen Arten der *Andrena proxima*-Gruppe (Hymenoptera, Apidae). *Revue Suisse de Zoologie*, 112, 1029–1044.

SCHMID-EGGER C. & DOCZKAL D., 1995. - Der taxonomische Status von *Andrena fulvicornis* Schenck, 1853 (Hymenoptera: Apidae). *Entomofauna*, 16: 1–12.

SCHMID–EGGER C. & SCHEUCHL E., 1997. - *Illustrierte Bestimmungstabellen der Wildbienen Deutschlands und Österreichs und Berücksichtigung der Arten der Schweiz. Band III Andrenidae*. Velden, Eigenverlag, 180 pp.

SCHÖNITZER K., GRÜNWALDT W., GUSENLEITNER F., OSYTSHNJUK A.Z. & SCHUBERTH J., 1995. - Klärung von *Andrena forsterella*, mit Hinweisen zu den anderen Arten der *Andrena labialis*-Gruppe (Hymenoptera: Apoidea: Andrenidae). *Linzer biologische Beiträge*, 27: 823–850.

SCHUBERTH J., 1995. - Eine als neu erkannte Sandbienenart aus Südosteuropa: *Andrena wilhemi* n. sp. (Hymenoptera, Apoidea, Andrenidae). *Linzer biologische Beiträge*, 27: 807–821.

SCHUBERTH J., GRÜNWALDT W. & SCHÖNITZER K., 2001. - Klärung und Neubeschreibung der Sandbiene *Andrena asiatica* Friese, 1921. *Beiträge zur Entomologie*, 51: 65–71.

SCHWENNINGER H.R., 2009. - Zum taxonomischen Status von *Andrena anthrisci* Blüthgen, 1925 (Hymenoptera, Andrenidae, *Andrena*, *Micrandrena*). *Linzer biologische Beiträge*, 41: 2025–2038.

SCHWENNINGER H.R., 2013. - Festlegung von Typen für *Andrena nitidiuscula* Schenck 1853 und *Andrena fulvicornis* Schenck 1861 sowie Erstnachweis von *Andrena curvana* Warncke 1965 für Deutschland (Hymenoptera, Andrenidae, *Andrena*, Subgenus *Notandrena*). *Linzer biologische Beiträge*, 45: 1945–1962.

SCHWENNINGER H.R., 2015. - Revision of the Western Palaearctic species of the *Andrena taraxaci*-group with description of four new species (Hymenoptera: Andrenidae). *Stuttgarter Beiträge zur Naturkunde. A, Neue Serie*, 8: 251–270.

TOMOZEI B., 2006. - First record of bee *Andrena anatolica* Alfken, 1935 (Hymenoptera: Apoidea: Andrenidae) in Romania. *Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa"*, 49: 319–321.

TOMOZII B., 2010. - The checklist of Andrenidae family (Hymenoptera: Apoidea: Apiformes) of Romania. *Complexul Muzeal de Ştiinţele Naturii "Ion Borcea" Bacău*, 23: 106–115.

VAN DER SMISSEN J., 2010. - Bilanz aus 20 Jahren entomologischer Aktivitäten (1987–2007) (Hymenoptera Aculeata). *Verhandlungen des Vereins für Naturwissenschaftliche Heimatforschung zu Hamburg e.V.*, 43: 1–426.

WARNCKE K., 1965. - Beitrag zur Kenntnis der Bienengattung *Andrena* Fabricius in Griechenland. *Beiträge zur Entomologie*, 15: 27–76.

WARNCKE K., 1966. - Ergebnisse der Albanien-Expedition 1961 des Deutschen Entomologischen Institutes. 50. Beitrag. Hymenoptera: Apidae II. (Genus *Andrena* Fabricius). *Beiträge zur Entomologie*, 16: 389–405.

WARNCKE K., 1967a. - Beitrag zur Klärung paläarktischer *Andrena*-Arten (Hym. Apidae). *Eos*, 43: 171–318.

WARNCKE K., 1967b. - Faunistische Bemerkungen über westpaläarktische Bienen der Gattung *Andrena* F. (Hymenoptera, Apoidea). *Bulletin des Recherches Agromomiques de Gembloux*, 2: 569–581.

WARNCKE K., 1969. - Bienen der Gattung *Andrena* F. aus der Türkei und dem Balkan (Hymenoptera, Apoidea, Andrenidae). *Bulletin des Recherches Agromomiques de Gembloux*, 4: 302–305.

WARNCKE K., 1973. - Beitrag zur Bienenfauna Mazedoniens (Colletidae, Andrenidae und Melittidae/Apoidea). *Mitteilungen aus dem Zoologischen Museum in Berlin*, 49: 13–36.

WARNCKE K., 1975. - Die Sandbienen der Türkei (Hymenoptera: Apoidea: *Andrena*). Teil B. *Mitteilungen der Münchner Entomologischen Gesellschaft*, 65: 29–102.

WARNCKE K., 1988. - Isolierte Bienenvorkommen auf dem Olymp in Griechenland. *Linzer biologische Beiträge*, 20: 83–117.

WIŚNIOWSKI B., MOTYKA E., CELARY W. & SZCZEPKO K., 2018. - Contribution to the bee fauna (Hymenoptera: Anthophila) of Poland. VI. The genus *Andrena* Fabricius, 1775. Part 2. *Journal of Apicultural Science*, 62: 233–246.

WOOD T.J., BOUSTANI M. & RASMONT P., 2020a. - A revision of the *Andrena* (Hymenoptera: Andrenidae) of Lebanon with the description of six new species. *Annales de la Société entomologique de France*, 56: 279–312.

WOOD T.J., MICHEZ D., CEJAS D., LHOMME P. & RASMONT P., 2020b. - An update and revision of the *Andrena* fauna of Morocco (Hymenoptera, Apoidea, Andrenidae) with the description of eleven new North African species. *Zookeys*, 974: 31–92.

WOOD T.J., CROSS I. & BALDOCK D.W., 2020c. - Updates to the bee fauna of Portugal with the description of three new Iberian *Andrena* species (Hymenoptera: Apoidea: *Anthophila*). *Zootaxa*, 4790: 201–228.

XU H-L. & TADAUCHI O., 1995. - A revision of the subgenus *Calomelissa* of the genus *Andrena* (Hymenoptera, Andrenidae) of Eastern Asia. *Japanese Journal of Entomology*, 63: 621–631.