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Belgian Journal of Entomology

A new *Andrena* species (Hymenoptera: Andrenidae) from the overlooked Doñana Protected Areas of southern Spain

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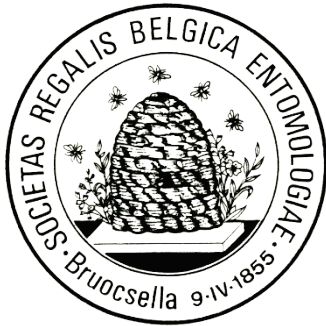


Published: Brussels, 26 January 2022

Citation: WOOD T.J. *et al.*, 2022. - A new *Andrena* species (Hymenoptera: Andrenidae) from the overlooked Doñana Protected Areas of southern Spain. *Belgian Journal of Entomology*, 126: 1–13.

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.

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- Zoological Record, Thomson Reuters, Publication Processing, 1500 Spring Garden Street, Fourth Floor, Philadelphia PA 19130, USA.

Publishing editors: Isabelle Coppée
Jurate De Prins

Front cover: *Andrena ramosa* sp. nov. female habitus in lateral view. © Thomas J. WOOD

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Abstract

Iberia has a species-rich bee fauna as a result of its predominantly Mediterranean climate and the diversity of habitats that can be found across the peninsula. One region that displays some of this habitat diversity are the Doñana natural areas in south-western Spain. Though it is known to host species with highly restricted Iberian or Atlantic distributions, many of these have only been discovered or described recently, suggesting that the area would benefit from more focused surveys. Targeted bee surveys of the Doñana Protected Areas detected 51 species of *Andrena*, including one new species for science, *Andrena* (?*Planiandrena*) *ramosa* **sp. nov.** Surprisingly, this taxon shows greatest affinity with a small group of species known from Central Asia rather than any known West Mediterranean taxa. These results illustrate the local faunal richness present in Doñana, as well as re-emphasising the need for additional targeted surveys in order to fully document bee diversity in southern Europe.

Keywords: Iberian endemic species, *Planiandrena*, solitary bees, taxonomy

Introduction

The bees of the genus *Andrena* Fabricius, 1775 constitute one of the most diverse and numerous bee taxa, with over 1,600 species worldwide (GUSENLEITNER & SCHWARZ, 2002; ASCHER & PICKERING, 2021, BOSSERT *et al.*, 2022, TJW *unpublished data*). However, the taxonomic complexity of the genus *Andrena*, its difficulty of identification and lack of published identification resources, and incomplete knowledge of local faunas for many areas such as southern Europe makes this a group poorly dealt with in local bee checklists. Though national checklists are often quite accurate (e.g. ORTIZ-SÁNCHEZ, 2020, there being at least 211 *Andrena* species known from the Iberobaleaeric area), this number will continue to increase as new taxa are described following revisions (WOOD *et al.*, 2021, TJW *unpublished data*). Furthermore, where revisions have been conducted, they are often at a sub-faunal level, and sometimes on subgenera that have subsequently been found to not include all appropriate taxa (e.g. DARDON *et al.*, 2014, see revisionary framework of PISANTY *et al.*, 2021).

The Mediterranean basin, with its characteristic Mediterranean climate, provides a huge number of ecological niches that helps explain the enormous wealth of *Andrena* species which have rapidly diversified to fill them (PISANTY *et al.*, 2016; 2021; OLLERTON, 2017; WOOD *et al.*, 2021). Despite this, there has been a lack of attention paid to the genus *Andrena* in the Iberian Peninsula; since Warncke's full faunal revision (WARNCKE, 1975; 1976) no new species were described until 2020 (WOOD *et al.*, 2020). Limited by what material was available, Warncke focused most of his studies in the central parts of Spain and Portugal, reviewing the important

collections of J.M. Dusmet y Alonso (mostly Spain) and M.A. Diniz (Portugal) and the broader collection in the National Museum of Natural Sciences of Madrid (MNCN) (WOOD *et al.*, 2021). As a result, the fauna of the southern part of the peninsula was comparatively neglected, as these collections contain comparatively little material from this region, a situation that persists to this day (Mercedes Paris, MNCN curator *pers. comm.*). Indeed, of the 20 currently valid *Andrena* species described from Iberia by Warncke (WARNCKE, 1967, 1975, 1976), just four have a *locus typicus* in southern Spain or Portugal, namely *A. abrupta* Warncke, 1967; *A. corax* Warncke, 1967; *A. nilotica* Warncke, 1967; and *A. hispania* Warncke, 1967.

Here we provide a list of *Andrena* species occurring in the Doñana Protected Areas. Doñana is a unique area for bee species diversity and conservation for multiple reasons. Located in the Mediterranean climatic region, it contains a great floral diversity due to the existence of a rich and varied mosaic of environments and habitats that have remained near-pristine due to historical protection. The major habitat types comprise pine forest and Mediterranean scrubland that are found on predominantly sandy soils, interspersed by vast marshes on clay soils that are subject to a highly seasonal water cycle. A detailed description of Doñana vegetation communities is given by RIVAS-MARTÍNEZ *et al.* (1980). The study area, covering 230,000 ha, is a natural area composed by the sum of the Doñana National Park, whose vital nucleus is the Doñana Biological Reserve, and the Natural Park that surrounds it (PINTOS, 2006). Due to its geographical location and lack of mountains, the Guadalquivir marshes have a sub-humid Mediterranean climate with Atlantic influence. Precipitation is strongly concentrated into certain months, producing two clear and characteristic seasons; one wet, from October to March, and another dry, from April to September. The rains are highly variable from one year to another, not even reaching 200 l/m² in very dry years, and exceeding 1,000 l/m² in wet and humid years. The annual average temperature is between 16 and 19°C, the average in summer being just below 25°C and the average in winter around 10°C. Sampling in this region in recent years has produced a total of 51 *Andrena* species, including the discovery of a new species of *Andrena* of uncertain phylogenetic placement but which can be placed closest to a poorly-studied group of species from Central Asia in the subgenus *Planiandrena* Osytsnjuk, 1983. This new species is described, and discussed in the light of recent developments in our understanding of *Andrena* classification and biogeography (PISANTY *et al.*, 2021).

Material and methods

Sampling and collection of wild bee specimens was conducted between 2015–2021 in the main protected areas of Doñana (Almonte, Aznalcázar, Bonares, Hinojos, Moguer, La Puebla del Río, and Villamanrique de la Condesa) following both standardised samplings protocols (MAGRACH *et al.*, 2021) and opportunistic collections. These collection areas cover the two major Doñana habitat types, specifically Mediterranean scrubland over sandy soils and the interface between this habitat type and areas of pine woodland, and marshlands over clay soils. All specimens are retained in the EBD-CSIC collection, Sevilla, Spain with the exception of the type specimen of the newly described taxon (see below).

Morphological terminology follows MICHENER (2007). *Andrena* subgeneric classification follows PISANTY *et al.* (2021). The abbreviations A and T are used for antennal segments and metasomal terga, respectively. Specimens were measured from the vertical plane of the front of the head to the tip of the metasoma. Photographs (© Thomas J. Wood) were taken using an Olympus E-M1 Mark II with a 60mm macro lens and were stacked using Zerene Stacker 1.04 (Zerene Systems, USA) and plates were prepared in GNU Image Manipulation Program (GIMP) 2.10. Post-processing of some images was made in Photoshop Elements (Adobe Systems, USA) in order to improve lighting to highlight specific characters.

Table 1. *Andrena* species recorded from Doñana Protected Areas, with their flight periods and recorded host plants.

Species	Female	Male	Host plants	Flight period	Localities
<i>A. abrupta</i> Warncke, 1967	1	5	<i>Echium vulgare</i> , <i>Lavandula pedunculata</i> , <i>Erodium cicutarium</i> , <i>Cistus crispus</i>	March, April	Aznalcázar, Almonte
<i>A. aerinifrons</i> Dours, 1873	3	4	<i>Glebionis coronaria</i> , <i>Cistus albidus</i> , <i>Teucrium fruticans</i>	February, March, April	Almonte, Hinojos
<i>A. alluaudi</i> Benoist, 1961	6	6	<i>Tolpis barbata</i> , <i>Taraxacum officinale</i> , <i>Tuberaria guttata</i>	April, May, June	Almonte, Bonares, La Rocina, Villamanrique de la Condesa
<i>A. assimilis</i> Radoszkowski, 1876	4	2	<i>Thapsia villosa</i> , <i>Arctotheca calendula</i> , <i>Pyrus bourgaeana</i>	March, June	Almonte, Hinojos
<i>A. bellidis</i> Pérez, 1895	1	2	<i>Teucrium fruticans</i> , <i>Lavandula stoechas</i>	March	Aznalcázar, Villamanrique de la Condesa
<i>A. bicolor</i> Fabricius, 1775	6	1	<i>Rosmarinus officinalis</i> , <i>Cistus crispus</i>	January, March, April	Almonte, Bonares
<i>A. bicolorata</i> (Rossi, 1790)		1	<i>Arctotheca calendula</i>	April	Almonte
<i>A. bimaculata</i> (Kirby, 1802)	2	3	<i>Pyrus bourgaeana</i> , <i>Echium vulgare</i> , <i>Teucrium fruticans</i>	March, April, May	Almonte, Aznalcázar, Bonares
<i>A. cinerea</i> Brullé, 1832	4	4	<i>Taraxacum officinale</i> , <i>Anemone palmata</i> , <i>Fumaria officinalis</i>	March, April	Aznalcázar
<i>A. cyanomicans</i> Pérez, 1895	2		<i>Arctotheca calendula</i> , <i>Tolpis barbata</i>	January, April	Moguer, La Puebla del Río.
<i>A. discors</i> Erichson, 1841	2	1	<i>Euphorbia helioscopia</i> , <i>Cistus ladanifer</i> , <i>Rosmarinus officinalis</i>	March	Hinojos, Moguer
<i>A. ferrugineicrus</i> Dours, 1872	4	2	<i>Echium vulgare</i> , <i>Glebionis coronaria</i> , <i>Anchusa calcarea</i> , <i>Sinapis arvensis</i>	March, April	Almonte, Aznalcázar, Moguer
<i>A. flavipes</i> Panzer, 1799	10	8	<i>Glebionis coronaria</i> , <i>Pyrus bourgaeana</i> , <i>Cistus albidus</i> , <i>Cistus salvifolius</i> , <i>Senecio vulgaris</i> , <i>Andryala ragusina</i> , <i>Arctotheca calendula</i>	January, March, April, May, June	Aznalcázar, Bonares, Hinojos Almonte
<i>A. florea</i> Fabricius, 1793	2		<i>Cistus ladanifer</i>	March	Villamanrique de la Condesa, Moguer
<i>A. florentina</i> Magretti, 1883	2		<i>Glebionis coronaria</i> , <i>Raphanus raphanistrum</i>	February, April	Almonte, Hinojos

<i>A. fulica</i> Warncke, 1974		1	<i>Raphanus raphanistrum</i>	March	Almonte
<i>A. fulvicornis</i> Schenck, 1853	3	3	<i>Cistus crispus</i> , <i>Linaria viscosa</i>	April, May	Aznalcázar, Almonte, Moguer
<i>A. granulosa</i> Pérez, 1902	1	1	<i>Cistus salvifolius</i> , <i>Raphanus raphanistrum</i>	March, April	Almonte, Aznalcázar
<i>A. hispania</i> Warncke, 1967	12	7	<i>Cistus crispus</i> , <i>Lavandula stoechas</i> , <i>Armeria gaditana</i>	March, April, May, June	Almonte, Bonares, Villamanrique de la Condesa, Hinojos, Moguer
<i>A. humilis</i> Imhoff, 1832		1	<i>Cistus salvifolius</i>	April	Villamanrique de la Condesa
<i>A. impressa</i> Warncke, 1967	2	1	<i>Cistus salvifolius</i> , <i>Convolvulus arvensis</i>	March, April	Aznalcázar, Bonares, Villamanrique de la Condesa
<i>A. labialis</i> (Kirby, 1802)		1	<i>Cistus crispus</i> , <i>Cistus salvifolius</i>	April, May	Aznalcázar, Villamanrique de la Condesa
<i>A. lagopus</i> Latreille, 1809		2	<i>Sinapis arvensis</i> , <i>Lavandula stoechas</i>	January, March	Aznalcázar
<i>A. langadensis albipila</i> Warncke, 1967	1	1	<i>Glebionis coronaria</i> , <i>Melilotus</i> spp	April	Almonte
<i>A. laurivora</i> Warncke, 1974	1		<i>Thapsia villosa</i> , <i>Arctotheca calendula</i> , <i>Pyrus bourgaeana</i>	May	Hinojos
<i>A. leucolippa</i> Pérez, 1895	6		<i>Echium vulgare</i>	May	Almonte, Aznalcázar
<i>A. limata</i> Smith, 1853	7	1	<i>Cistus albidus</i> , <i>Pyrus bourgaeana</i> , <i>Raphanus raphanistrum</i> , <i>Teucrium fruticans</i>	March, April, May	Aznalcázar, Bonares, Hinojos, Almonte
<i>A. livens</i> Pérez, 1895		4	<i>Oxalis pes-caprae</i> , <i>Cistus albidus</i> , <i>Rosmarinus officinalis</i>	March, April	Aznalcázar, Hinojos
<i>A. longibarbis</i> Pérez, 1895	2		<i>Sinapis arvensis</i>	February, March	Bonares
<i>A. macroptera</i> Warncke, 1974	1		<i>Glebionis coronaria</i>	March	Almonte
<i>A. minutula</i> (Kirby, 1802)	1		<i>Raphanus raphanistrum</i>	March	Hinojos
<i>A. morio</i> Brullé, 1832	1		<i>Raphanus raphanistrum</i>	March	Hinojos
<i>A. nigroaenea</i> (Kirby, 1802)	14	3	<i>Lotus creticus</i> , <i>Cistus crispus</i> , <i>Pyrus bourgaeana</i> , <i>Teucrium fruticans</i> , <i>Arctotheca calendula</i>	February, March, April, May, June	Almonte, Aznalcázar, Hinojos, Moguer, Villamanrique de la Condesa
<i>A. nigroolivacea</i> Dours, 1873	2		<i>Asphodelus ramosus</i>	February, March	Aznalcázar

<i>A. nigroviridula</i> Dours, 1873		1	<i>Echium plantagineum</i>	April	Villamanrique de la Condesa
<i>A. orana</i> Warncke, 1975	2	1	<i>Erodium cicutarium</i> , <i>Malcomia lacera</i> , <i>Raphanus raphanistrum</i>	February, March	Almonte, Hinojos
<i>A. orbitalis</i> Morawitz, 1871	1	5	<i>Cistus albidus</i> , <i>Echium vulgare</i> , <i>Raphanus raphanistrum</i> , <i>Cistus crispus</i> , <i>Tuberaria guttata</i>	March, April	Aznalcázar, Hinojos
<i>A. ovatula</i> (Kirby, 1802)	3		<i>Arctotheca calendula</i> , <i>Lysimachia arvensis</i>	February, March	Moguer, Villamanrique de la Condesa
<i>A. pilipes</i> Fabricius, 1781	15	4	<i>Raphanus raphanistrum</i> , <i>Teucrium fruticans</i> , <i>Glebionis coronaria</i> , <i>Pyrus bourgaeana</i> , <i>Rubus fruticosus</i> agg	March, April	Almonte, Aznalcázar
<i>A. propinqua</i> Schenck, 1853	6	2	<i>Raphanus raphanistrum</i> , <i>Pyrus bourgaeana</i>	March	Almonte, Hinojos
<i>A. ramosa</i> Wood, sp. nov.	1		<i>Asphodelus ramosus</i>	March	Aznalcázar
<i>A. rhyssonota</i> Pérez, 1895	13	10	<i>Lavandula pedunculata</i> , <i>Erodium cicutarium</i> , <i>Rosmarinus officinalis</i> , <i>Taraxacum officinale</i> , <i>Cistus salvifolius</i>	March, April, May	Almonte, Aznalcázar, Hinojos
<i>A. sardoa</i> Lepeletier, 1841	2		<i>Asphodelus ramosus</i>	March	Aznalcázar
<i>A. suerinensis</i> Friese, 1884	3	6	<i>Echium plantagineum</i> , <i>Sonchus tenerrimus</i> , <i>Lavandula pedunculata</i> , <i>Cistus ladanifer</i> , <i>Raphanus raphanistrum</i>	January, March, April	Almonte, Bonares
<i>A. tenuistriata</i> Pérez, 1895	4	4	<i>Teucrium fruticans</i> , <i>Rosmarinus officinalis</i> , <i>Cistus ladanifer</i> , <i>Cistus crispus</i> , <i>Convolvulus arvensis</i>	March, April, May	Almonte, Aznalcázar, Bonares, Hinojos, Villamanrique de la Condesa
<i>A. trimmerana</i> (Kirby, 1802)	3		<i>Pyrus bourgaeana</i> , <i>Cistus ladanifer</i>	March	Almonte, Bonares
<i>A. tunetana</i> Schmiedeknecht, 1900		2	<i>Cistus crispus</i> , <i>Anchusa calcarea</i>	January, May	Almonte, Bonares
<i>A. verticalis</i> Pérez, 1895	2	3	<i>Cistus salvifolius</i> , <i>Raphanus raphanistrum</i>	February, March	Almonte, Hinojos
<i>A. vetula</i> Lepeletier, 1841	2		<i>Raphanus raphanistrum</i>	January, April	Almonte, Bonares
<i>A. villipes</i> Pérez, 1895	3	5	<i>Echium vulgare</i> , <i>Rosmarinus officinalis</i> , <i>Lavandula pedunculata</i> , <i>Cistus ladanifer</i> , <i>Sinapis arvensis</i>	February, March, April	Almonte, Aznalcázar, Hinojos, Villamanrique de la Condesa
<i>A. vulpecula</i> Kriechbaumer, 1873		2	<i>Andryala integrifolia</i> , <i>Convolvulus arvensis</i>	April	Aznalcázar, Bonares

Results

Class Insecta Linnaeus, 1758
Order Hymenoptera Linnaeus, 1758
Family Andrenidae Latreille, 1802

Genus *Andrena* Fabricius, 1775

Surveys in the Doñana protected areas produced a total of 51 species of *Andrena*, including the six taxa recorded by HERERRA (1988), and also including a new species for science that is described below. Their flight periods encompassed January to June, with a peak in March and April. Overall, they utilize a wide diversity of floral resources, ranging from annual ruderal plants to long-lived shrubs (Table 1).

***Andrena* (?*Planiandrena*) *ramosa* Wood, sp. nov.**

(Figs 1–9)

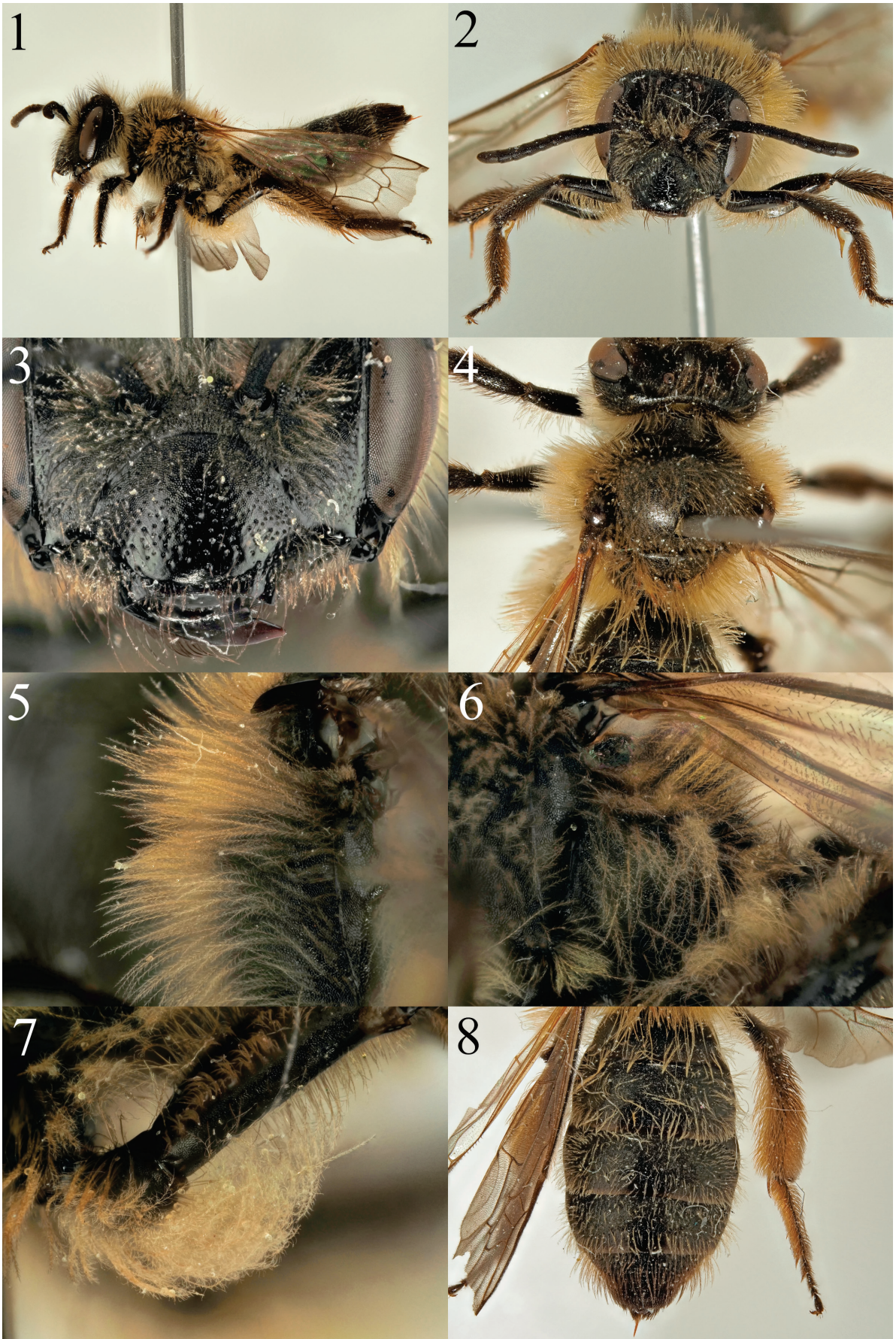
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HOLOTYPE. SPAIN: Seville Province, Aznalcázar, 37.262°N, -6.223°W, 10.iii.2020, 1♀, leg. F.P. Molina. Deposited in the Oberösterreichisches Landesmuseum, Linz, Austria.

DESCRIPTION. FEMALE. Body length 12 mm (Fig. 1).

Head: Dark, 1.1 times wider than long (Fig. 2). Clypeus domed and weakly flattened centrally, clearly protruding from face when viewed in profile (Fig. 1). Clypeus surface shagreened laterally and basally, dull, shagreen becoming weaker and almost disappearing centrally, clypeus here almost smooth and shining (Fig. 3). Entire clypeal surface covered with large, irregular punctures, these separated by 1–3 puncture diameters. Process of labrum broad, weakly trapezoidal, three times wider than long, glossy (Fig. 9). Gena broad, wider than width of compound eye, ocelloccipital distance moderate, equalling width of lateral ocellus. Fovea narrow, occupying slightly less than half distance between lateral ocellus and compound eye, slightly wider than width of flagellum, not separated from inner margin of compound eye. Gena with long light brown plumose hairs, these becoming mixed brown and black on vertex, longest hairs nearly equalling width of scape. Face and scape with shorter brown and black plumose hairs, brown hairs clustered around antennal insertions, predominantly black elsewhere. Antennae dark, A3 exceeding A4+5, slightly shorter than A4+5+6.

Mesosoma: Scutum and scutellum clearly but shallowly punctured, punctures separated by 1–3 puncture diameters, underlying surface finely microreticulate, dull laterally to weakly shining centrally (Fig. 4). Pronotum with extremely weak humeral angle, almost absent. Episternum and propodeum with fine granular reticulation, dull, with pattern of slightly raised reticulation that becomes stronger on propodeum. Propodeal triangle well differentiated, slightly depressed, internal surface with fine granular reticulation but without raised reticulation. Episternum with long light brown plumose hairs, these exceeding length of scape (Fig. 5). Propodeal corbicula complete, composed of long very strongly plumose light brown hairs (Fig. 6), internal surface with scattered plumose hairs. Legs uniformly dark, pubescence whitish to brownish. Flocculus dense, composed of strongly plumose whitish-light brownish hairs (Fig. 7). Femoral scopa dorsally with long plumose hairs, anterior fringe with hairs simple (Fig. 7). Tibial scopa with simple or only weakly branched hairs, these light brown ventrally, becoming dark brown apically, strongly so at the basitibial plate. Venation and stigma dark brown, nervulus interstitial.



Figs 1–8. *Andrena ramosa* sp. nov. female. 1, habitus in lateral view. 2, face. 3, clypeus detail. 4, scutum. 5, episternum, viewed from behind. 6, propodeal corbicula. 7, flocculus. 8, terga.

Metasoma: Terga dark, apical part of apical margins narrowly lightened dark brown (Fig. 8). Tergal integument finely reticulate, weakly shining, tergal discs with fine, obscure scattered punctures, punctures separated by 2–3 puncture diameters; tergal margins impunctate. Tergal discs with scattered light brown hairs, T5 and hairs flanking pygidial plate dark brown; pygidial plate with weak centrally raised longitudinal area, poorly differentiated from surrounding area.

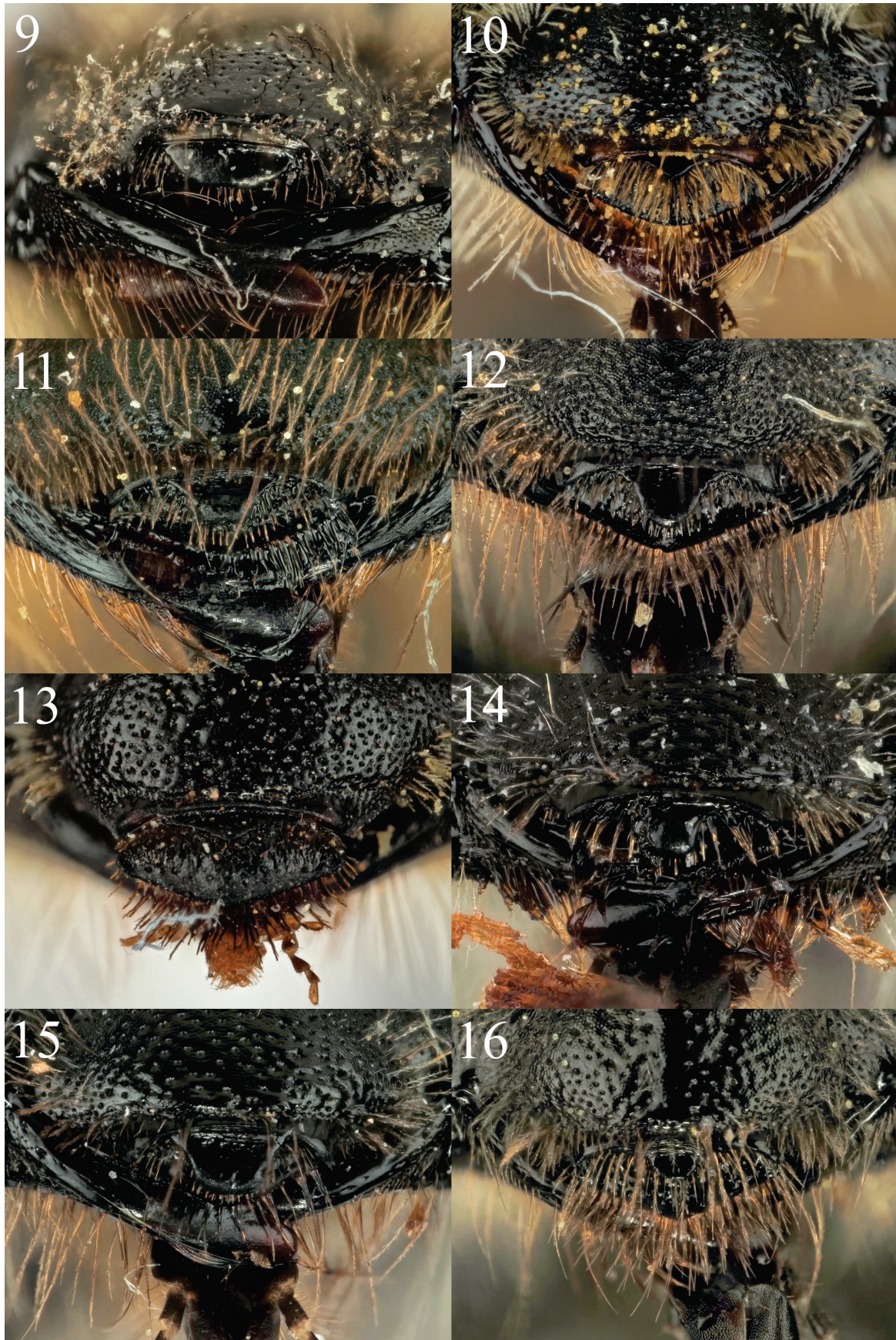
MALE. Unknown.

DIAGNOSIS. *Andrena ramosa* is difficult to place into a subgenus due to its unusual combination of characters, specifically the very broad process of the labrum, the pronotum without lateral furrow, the essentially smooth and unornamented propodeal triangle, unbroadened hind tibial spur, three submarginal cells, interstitial nervulus, hind femur without projecting teeth, simple and comparatively narrow fovea that do not narrow below, lack of squamous hairs, medium body size, lack of tergal hairbands, and domed clypeus. It therefore does not fit into existing West Palearctic concepts (WARNCKE, 1968) even following up-to-date revisions (PISANTY *et al.*, 2021).

However, it is similar to the subgenus *Planiandrena* which was described from Central Asia, with four species distributed across Kazakhstan, Uzbekistan, and Turkmenistan (OSYTSHNJUK, 1983). A further 3–4 species are known from Israel and Iran and are currently being described (T.J. WOOD & G. PISANTY, *in prep.*). The important original characters used to define the subgenus were the flattened or concave clypeus, very wide and short process of the labrum, narrow fovea occupying not more than half the distance between the lateral ocellus and the inner margin of the compound eye, hind tibial spur is widened, dorsal surface of propodeal triangle matt, with entirely granular shagreenation to shining, the triangle itself defined overall by having softer sculpturing than the lateral parts of the propodeum, and propodeal corbicula well defined. *Andrena ramosa* disagrees with some of these characters, specifically by its domed clypeus and unbroadened hind tibial spur. However, some of the Israeli and Iranian species also present these characters, and so a broader interpretation of this subgenus is taken in the interests of forming a hypothesised relationship. Because of the lack of male material, *A. ramosa* is not firmly placed in the *Planiandrena* at this point, though it is considered its possible future placement.

Because subgeneric placement is both highly technical and the nearest comparison species are found in the East Mediterranean, diagnosis is made also to superficially similar but unrelated Iberian taxa. Because of the strong propodeal corbicula composed of plumose hairs and the thick flocculus composed of long and strongly plumose hairs which contrast with the tibial scopa of simple or scarcely plumose hairs, *A. ramosa* could potentially be confused with members of the subgenus *Leucandrena* Hedicke, 1933 (recently reviewed in Iberia by FIDALGO *et al.*, 2021). *Andrena ramosa* can easily be separated from *Leucandrena* species by a combination of the broad labrum (Figs 9–16, triangular to rounded in *Leucandrena* species) and the comparatively narrow fovea (occupying less than half of the distance between the lateral ocellus and the compound eye, occupying at least half the distance in *Leucandrena* species), and very obviously by the extraordinary plumose hairs that extend onto the episternum where they are much more conspicuous than in other similar species (Fig. 5). Indeed, this final character allows separation from any Iberian *Andrena* species known to date.

ETYMOLOGY. The name derived from the Latin ‘*ramosus*’ meaning branched, in reference both to the strongly plumose hairs that make up its propodeal corbicula and flocculus, and which are present on the episternum, and also to refer to its observed host plant *Asphodelus ramosus* that is present on the sandy soils around Aznalcázar.



Figs 9–16. Process of the labrum of *Andrena ramosa* **sp. nov.** and *Andrena* (*L.*) females. 9, *A. ramosa* **sp. nov.** 10, *A. tunetana* Schmiedeknecht, 1900. 11, *A. leptopyga* Pérez, 1895. 12, *A. barbilabris* (Kirby, 1802). 13, *A. sericata* Imhoff, 1868. 14, *A. argentata* Smith, 1844. 15, *A. parviceps* Kriechbaumer, 1873. 16, *A. ventralis* Imhoff, 1832.

Discussion

The species-rich *Andrena* community recorded in the Doñana Protected Areas (approximately one quarter of Iberian taxa, ORTIZ-SÁNCHEZ, 2020), and the discovery of a previously undescribed *Andrena* taxon highlight the importance of this region for Iberian bee diversity. In addition to this new species for science, the Coto Doñana also hosts a fauna of wild bees that have highly restricted global ranges. This fauna contains species described from Morocco or Portugal that show a strongly Atlantic distribution and are not known from the Mediterranean basin, specifically *Dufourea lusitanica* Ebmer, 1999 (Spain and Portugal, EBMER, 1999, 2008; CROSS, 2021), *Flavipanurgus fuzetus* Patiny, 1999 (Spain and Portugal, PATINY, 1999; CROSS & WOOD, 2018), *Andrena macroptera* Warncke, 1974 (Morocco, Spain, and Portugal, WARNCKE, 1974; BALDOCK *et al.*, 2018), and *Andrena laurivora* Warncke, 1974 (Morocco and Spain, WARNCKE, 1974; WOOD *et al.*, 2021). In addition to *A. laurivora*, the surveys in Doñana also detected *A. abrupta*, *A. alluaudi* Benoist, 1961, *A. discors* Erichson, 1841 and *A. orana* Warncke, 1975 that have highly restricted distributions in Iberia, being predominantly found in North Africa. More broadly, the highly specialised *Flavipanurgus venustus* (Erichson, 1835) that is endemic to southern Spain (see BALDOCK *et al.*, 2018) can also be found most commonly in the Doñana area (GONZÁLEZ-VARO *et al.*, 2016), adding to the distinctive fauna of this region.

Against this context, the discovery of an undescribed bee species with a presumably highly restricted range is less surprising. However, what is surprising is that this taxon shows little similarities to the *Andrena* fauna of the West Mediterranean, an instead bears the strongest resemblance to a group of eastern taxa. Given the many outstanding issues with *Andrena* subgeneric classification despite many recent advances in our understanding of this huge genus (PISANTY *et al.*, 2021), many problems persist. Given the large numbers of species that continue to be described from poorly studied parts of the Mediterranean basin (PISANTY *et al.*, 2016; WOOD *et al.*, 2021; WOOD, 2021), new taxa may be discovered that join the apparent distributional gap between species tentatively placed in the subgenus *Planiandrena*. Alternatively, as cutting-edge genetic techniques become more available, phylogenetic studies will be able to more accurately place obscure, overlooked, and poorly-studied species (e.g. BOSSERT *et al.*, 2021).

Acknowledgements

We are very grateful to the Doñana Singular Scientific-Technical Infrastructure (ICTS-RBD) and the Doñana National Park. TJW is supported by an F.R.S.-FNRS fellowship “Chargé de recherches”.

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