

## DESCRIPTION OF THREE NEW *ANDRENA* FABRICIUS, 1775 SPECIES FROM UNDERSTUDIED PARTS OF IBERIA (HYMENOPTERA: ANDRENIDAE)

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**Abstract:** The Iberian Peninsula has one of the largest known *Andrena* faunas globally, with over 200 documented species. As a genus, *Andrena* show great phenological plasticity and ability to adapt to local conditions, leading to a high speciation rate. Consequently, fieldwork at unusual times of the year or in understudied regions continues to produce undescribed *Andrena* taxa. In preparation for a full faunal revision, three such taxa are described here: *Andrena* (*Avandrena*) *erodiorum* Wood & Ortiz-Sánchez **spec. nov.** from Spain, *Andrena* (*Suandrena*) *gades* Wood & Ortiz-Sánchez **spec. nov.** from Spain, and *Andrena* (*Taeniandrena*) *lusitania* Wood & Ortiz-Sánchez **spec. nov.** from Spain and Portugal. *Andrena* (*Avandrena*) *melacana* Warncke, 1967 is reported from both Spain and Europe for the first time. These findings underline the importance of the Iberian Peninsula as a global *Andrena* diversity hotspot.

**Key words:** Hymenoptera, Andrenidae, taxonomy, solitary bees, Iberian endemic species, phenology, oligolecty, Spain, Portugal.

### Descripción de tres especies nuevas de *Andrena* Fabricius, 1775 de zonas poco estudiadas de la península ibérica (Hymenoptera: Andrenidae)

**Resumen:** La península ibérica contiene una de las mayores faunas de *Andrena* conocidas a nivel mundial, con más de 200 especies documentadas. Como género, las *Andrena* exhiben una gran plasticidad fenológica, así como capacidad para adaptarse a las condiciones locales, lo que conduce a una alta tasa de especiación. Consecuentemente, el trabajo de campo en épocas del año inusuales o en regiones poco estudiadas continúa produciendo taxones de *Andrena* por describir. Como paso previo a la preparación de una revisión faunística completa, en este artículo se describen tres de esos taxones: *Andrena* (*Avandrena*) *erodiorum* Wood & Ortiz-Sánchez **spec. nov.** de España, *Andrena* (*Suandrena*) *gades* Wood & Ortiz-Sánchez **spec. nov.** de España, y *Andrena* (*Taeniandrena*) *lusitania* Wood & Ortiz-Sánchez **spec. nov.** de España y Portugal. Se cita *Andrena* (*Avandrena*) *melacana* Warncke, 1967 por primera vez tanto para España como para Europa. Estos hallazgos ponen de relieve la importancia de la península ibérica como un punto caliente de diversidad de *Andrena* a nivel mundial.

**Palabras clave:** Hymenoptera, Andrenidae, taxonomía, abejas solitarias, especies ibéricas endémicas, fenología, oligolectia, España, Portugal.

**Taxonomy / Taxonomía:** *Andrena* (*Avandrena*) *erodiorum* Wood & Ortiz-Sánchez **spec. nov.** ♀; *Andrena* (*Suandrena*) *gades* Wood & Ortiz-Sánchez **spec. nov.** ♀♂; *Andrena* (*Taeniandrena*) *lusitania* Wood & Ortiz-Sánchez **spec. nov.** ♀♂.

## Introduction

The genus *Andrena* is the second largest genus of bees with approximately 1,600 known species (Gusenleitner & Schwarz, 2002; TJW, unpublished data), and indeed one of the largest genera in the animal kingdom (Kelnarova *et al.*, 2018). Likely originating in the eastern part of the Mediterranean basin (Pisanty *et al.*, 2022), the genus speciates rapidly (Bossert *et al.*, 2022) and is most species-rich in Mediterranean and xeric environments. This high speciation rate may be as a result of the high phenological and ecological plasticity displayed by *Andrena* species, that allows them to colonise new temporal or dietary niches rapidly, allowing their activity throughout all months of the year and the use of few or many botanical families as a pollen source.

The Iberian Peninsula is one of the most important regions globally for *Andrena*, with a fauna of around 220 species following recent and ongoing revisions (Ortiz-Sánchez, 2020; Wood *et al.*, 2020a, 2021; TJW *in prep.*), making it the fourth largest fauna globally after the United States, Turkey, and Israel and the West Bank (TJW, unpublished data). Following the revisionary work of Klaus Warncke (1967, 1975, 1976), there was a long period without focused study of the Iberian *Andrena* fauna until recently, with the

description of nine new species for science (Wood *et al.*, 2020a, 2021, 2022; Wood, 2022). There has also been an improvement in our understanding of the distribution of Iberian *Andrena* species, including new species for the peninsula, confirmation of the presence of doubtfully listed species, and discoveries of populations of rare endemic species (Ortiz-Sánchez, 2020; Wood *et al.*, 2021; Álvarez Fidalgo *et al.*, 2021, 2022).

The combination of high speciation rate and phenological and ecological flexibility means that surveys in unusual or little-visited regions with unusual climatic affinities often produce new undescribed *Andrena* species. This is the case in hand, with collections over the past 20 years uncovering three new *Andrena* species from southern and western Iberia. These are described herein in preparation for an upcoming revision of the entire Iberian *Andrena* fauna.

## Methods

Morphological terminology follows Michener (2007). The abbreviations A, T and S are used for antennal segments, metasomal terga, and metasomal sterna respectively.

Subgeneric classification follows Pisanty *et al.* (2022). Specimens were measured from the vertical plane of the front of the head to the tip of the metasoma. Photographs were taken using an Olympus E-M1 Mark II with a 60 mm macro lens and were stacked using Helicon Focus software (HeliconSoft, Ukraine) and plates were prepared in GNU Image Manipulation Program (GIMP) ver. 2.10. Post-processing of some images was made in Photoshop Elements (Adobe Systems, USA) in order to improve lighting to highlight specific characters. All specimens were identified by TJW.

The geographical references were obtained by using GPS on the ground (WGS84 datum) and their subsequent transformation into their corresponding UTM coordinates.

### Abbreviations

FJOS = Francisco Javier Ortiz-Sánchez Collection, El Ejido (Almería), Spain.

RMNH = Naturalis Biodiversity Center, Leiden, the Netherlands.

OÖLM = Oberösterreichisches Landesmuseum, Linz, Austria.

TJWC = Thomas James Wood Collection, Mons, Belgium.

## Results

### *Andrena (Avandrena) erodiorum* Wood & Ortiz-Sánchez spec. nov.

HOLOTYPE: ALBACETE: Torre de Gorgojí, Reolid, MGRS: 30SWH3777, 870 m, 26.4.2008, ♀ [leg. Ortiz-Sánchez, OÖLM].

PARATYPES: ALBACETE: Torre de Gorgojí, Reolid, MGRS: 30SWH3777, 830 m, 29-30.4.2022, 6♀ [leg. Ortiz-Sánchez, FJOS/OÖLM/TJWC].

DIAGNOSIS: *Andrena erodiorum* can be recognised as belonging to the subgenus *Avandrena* Warncke, 1968 due to its moderate to small body size (9-10 mm), short and wide head (clearly wider than long, Figure 3), and short and wide foveae that are only slightly longer than wide. The hind femora lack a row of spines on their posterior margin, therefore separating them from *A. avara* Warncke, 1967 and *A. panurgina* De Stefani, 1889, the only two *Avandrena* previously known from Iberia, which both possess spined femora (Warncke, 1968, 1980).

It is closest to *A. melacana* Warncke, 1967, which also lacks spined femora, and which was previously known only from North Africa (Morocco, Algeria, Tunisia, Libya; Wood *et al.*, 2020b). However, it is herein reported as new for both Spain and Europe and can be found in sympatry with *A. erodiorum* (see below). The two taxa can be separated as follows (alternative character state in parentheses): *A. erodiorum* has pale hairs laterally on the mesepisternum (mesepisternum laterally with dark hairs, Figures 1-2), the clypeus is medially covered with dense white hairs that strongly contrast the dark hairs on the paraocular areas and frons (clypeus medially with sparse whitish-greyish hairs that do not strongly contrast the darker hairs of the paraocular areas and frons, Figures 3-4), the surface of the propodeum and mesepisternum has a strongly produced but also fine and dense network of raised rugosity (propodeum and mesepisternum without rugosity, without obvious sculpture, Figures 5-6), and the terga are covered with long erect white hairs that clearly visibly project from the surface of the terga in profile view, forming dense apical hairbands on T2-4 which obscure the underlying surface (terga with

sparse short pubescence, not visibly projecting in profile view, forming weak tergal hairbands that do not obscure the underlying surface, Figures 7-8). The presence of this unique network of raised rugosity on the mesepisternum and propodeum allows separation from all known *Avandrena* species.

DESCRIPTION: Female: Body length 9-10 mm (Figure 1).

Head: Black, 1.3 times wider than long (Figure 3). Clypeus weakly domed, covered with shallow, dense hair-bearing punctures, punctures separated by 0.5-1 puncture diameter; underlying surface shagreened, weakly shining. Process of labrum twice as broad as long, apical margin medially emarginate. Gena as broad as width of compound eye; ocellocapital distance equal to width of lateral ocellus. Foveae broad, occupying slightly over half of area between lateral ocellus and inner margin of compound eye, not narrowed below, just reaching level of antennal insertions, therefore more or less rectangular; filled with short black-brown hairs. Clypeus, antennal insertions, scape, lower gena, and vertex with predominantly white hairs, intermixed with predominantly black hairs on upper gena, frons, and paraocular areas, longest hairs not exceeding length of scape. Antennae dark, A5-12 lightened ventrally with grey cilia, A3 equals A4+5.

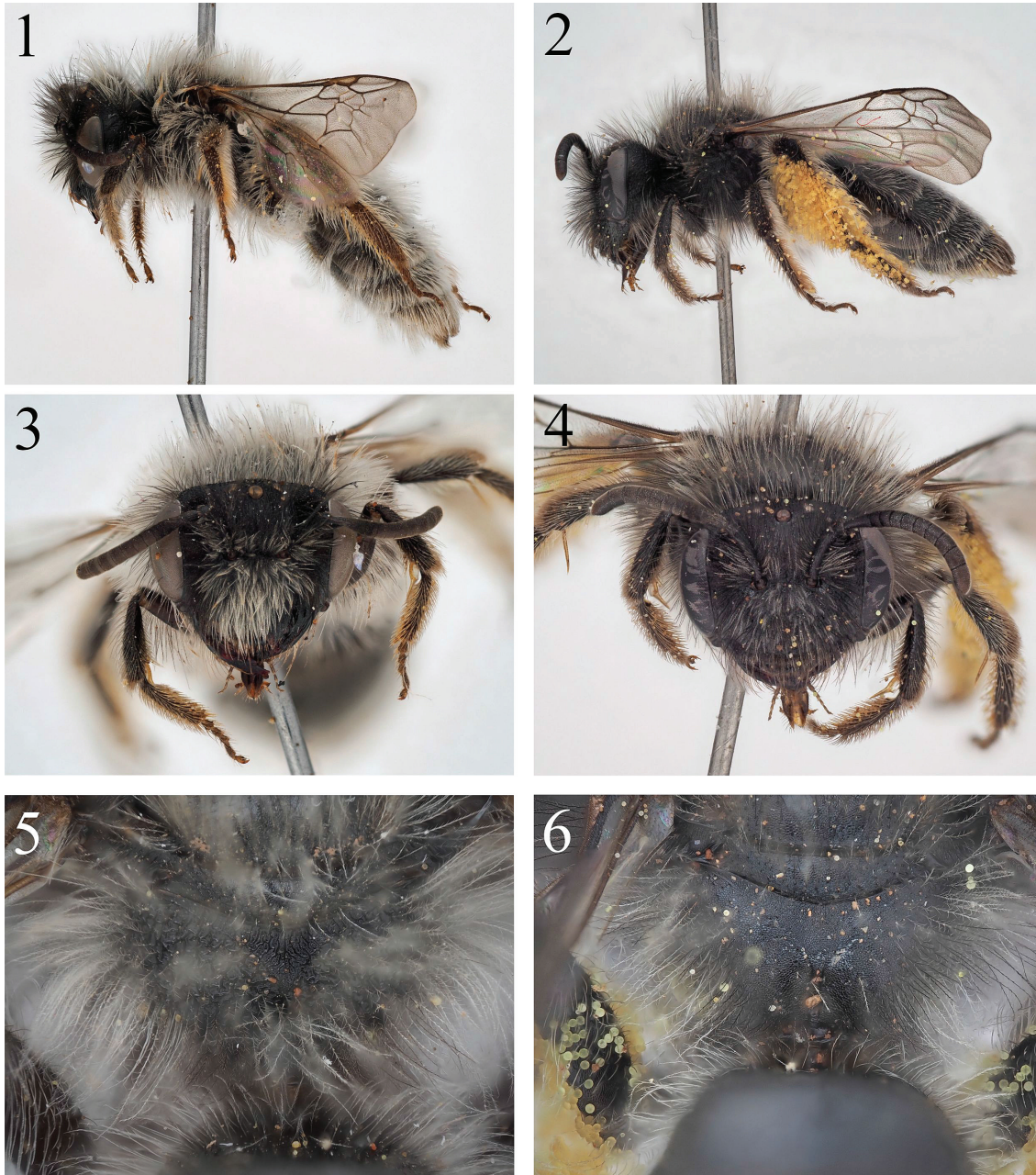
Mesosoma: Scutum and scutellum medially shallowly and obscurely punctate, punctures separated by 1-2 puncture diameters, punctures becoming coarser with raised rims anteriorly and laterally; underlying surface shagreened, dull laterally to weakly shining centrally. Pronotum without humeral angle. Mesepisternum and hind face of propodeum with strongly produced fine and dense network of raised rugosity; propodeal triangle laterally delineated with strong carinae, internal surface covered with fine but strong longitudinal rugae, contrasting irregular rugosity of propodeum (Figure 5). Mesepisternum and propodeum with long white, plumose hairs exceeding length of scape; propodeal corbicula weakly formed dorsally with long white plumose hairs, posterior face of propodeum with occasional intermixed black hairs. Scutum and scutellum with slightly shorter white plumose hairs, disc of scutum with occasional intermixed black hairs. Legs dark, tibiae and tarsi apically lightened dark orange-brown, pubescence whitish; tibial and femoral scopa whitish, predominantly composed of simple hairs occasionally with plumose hairs, floccus white, strongly plumose. Hind tarsal claws without inner teeth. Wings hyaline, stigma translucent yellow, venation orange to dark orange, nervulus interstitial.

Metasoma: Terga dark, apical margins narrowly lightened hyaline-yellow (Figure 7). Tergal discs with inconspicuous hair-bearing punctures, punctures separated by 1-2 puncture diameters, underlying surface shagreened, weakly shining. Terga covered with long white hairs, on T2-4 forming dense uninterrupted hairbands that obscure the underlying surface. Apical fringe of T5 and hairs flanking pygidial plate golden-brown; pygidial plate impunctate, medially with well-defined but weakly raised area, apically evenly rounded.

Male: Unknown.

ETYMOLOGY: Taken from the pollen host genus, *Erodium* (Geraniaceae). The new name is a noun, specifically the genitive plural of *Erodium*, therefore 'of the *Erodium*'.





**Fig. 1-6.** *Andrena (Avandrena) erodiorum* **spec. nov.**: 1) female, lateral view; 3) female face; 5) female propodeum; *Andrena melacana* Warncke, 1967: 2) female, lateral view; 4) female face; 6) female propodeum. / **Fig. 1-6.** *Andrena (Avandrena) erodiorum* **spec. nov.**: 1) hembra, vista lateral; 3) cara de la hembra; 5) propodeo de la hembra; *Andrena melacana* Warncke, 1967: 2) hembra, vista lateral; 4) cara de la hembra; 6) propodeo de la hembra.

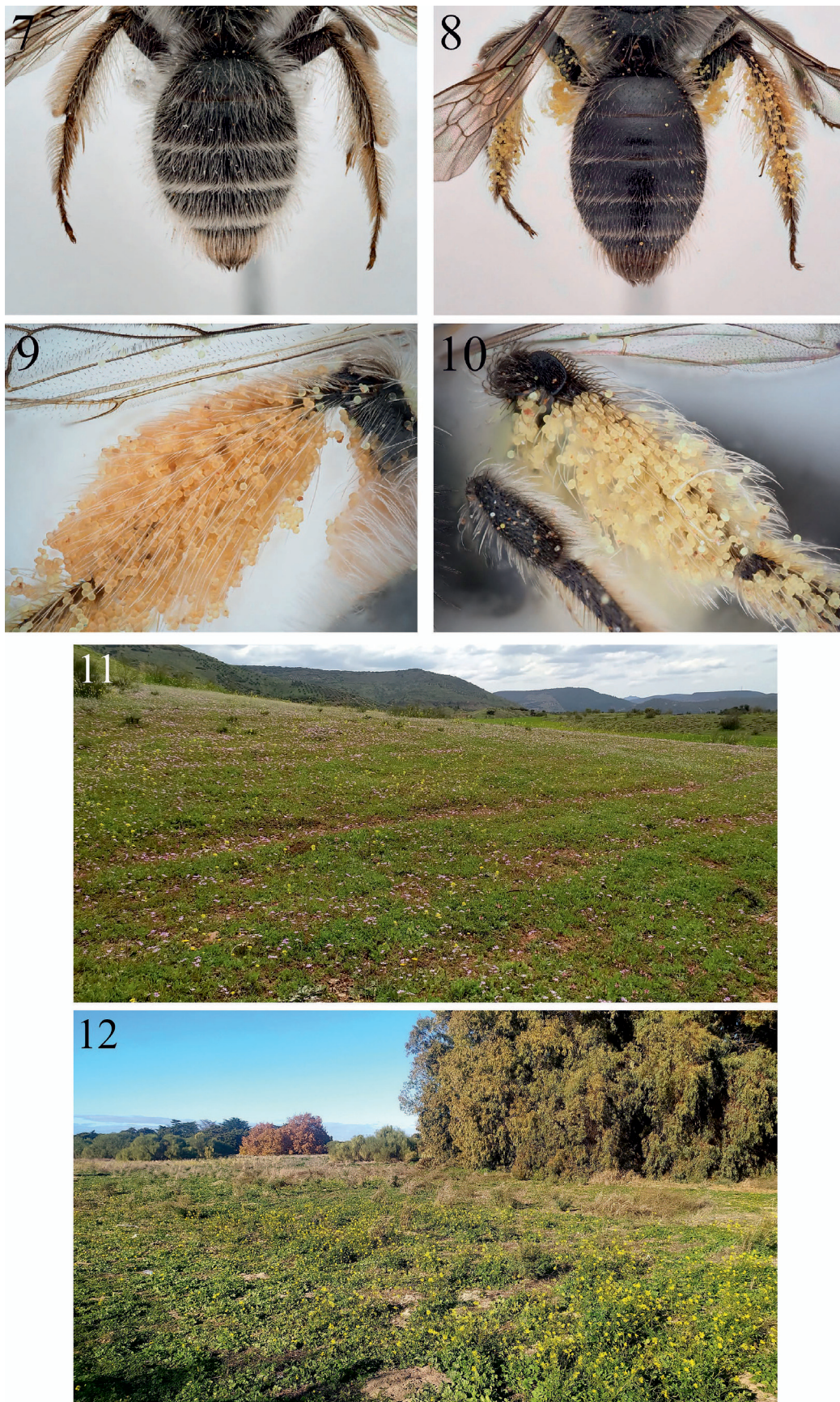
REMARKS: All four Iberian *Andrena (Avandrena)* appear to be strongly associated with *Erodium*, which was abundant at the collecting locality of *A. erodiorum* (Figure 11), with all collected pollen coming from this genus (TJW, unpublished data). At the Torre de Gorgojí site, both *A. erodiorum* and *A. melacana* were collected from *Erodium cicutarium*, and its distinctive large pollen grains can easily be observed in the scopae of these two species (Figures 9-10). All four taxa are highly likely to be oligolectic on this genus.

*Andrena (Avandrena)* are rare in collections, perhaps in part due to use of this uncommonly utilised pollen host, leading to them being overlooked by collectors. Though sparingly collected between 1980-2022, *A. melacana* appears to be widespread across southern Spain, from Cádiz to

Albacete. It is not possible to say whether it has colonised Spain since 1980, though to date it has not been found in older collections.

OTHER MATERIAL EXAMINED. *Andrena melacana*: SPAIN: ALBACETE: Torre de Gorgojí, Reolid, MGRS: 30SWH3777, 830 m, 29-30.4.2022, 1♂, 5♀ [leg. Ortiz-Sánchez, FJOS]. • CÁDIZ: Tarifa, 6.3.1990, 1♀ [leg. H. Teunissen, RMNH]. • GRANADA: Loja, Charco del Negro, Sierra de Loja. MGRS: 30SUG9508, 1440 m, 9.5.1989, 1♂, 1♀ [leg. A. Jiménez, FJOS/TJWC]. • MÁLAGA: 20 km NE Ronda, 30.4.2003, 1♀ [leg. J. Halada, coll. OÖLM]. • GRANADA: Güéjar Sierra, 19.4.1980, 1♂ [leg. S. Cardenete, FJOS].





**Fig. 7-12.** *Andrena (Avandrena) erodiorum* **spec. nov.**: **7)** female terga; **9)** female scopa showing *Erodium* pollen grains; *Andrena melacana* Warncke, 1967: **8)** female terga; **10)** female scopa showing *Erodium* pollen grains. **Fig. 11-12.** **11)** Habitat context at the Torre de Gorgojí site in Albacete, with abundant flowering *Erodium cicutarium*; **12)** *Andrena (Suandrena) gades* **spec. nov.** habitat context at the Punta Candor site in Cádiz, with abundant flowering *Diplotaxis virgata*. / **Fig. 7-12.** *Andrena (Avandrena) erodiorum* **spec. nov.**: **7)** terguitos de la hembra; **9)** escopa de la hembra mostrando granos de polen de *Erodium*; *Andrena melacana* Warncke, 1967: **8)** terguitos de la hembra; **10)** escopa de la hembra mostrando granos de polen de *Erodium*. **11)** Vista general del hábitat en el entorno de la Torre de Gorgojí (Albacete), con abundante floración de *Erodium cicutarium*; **12)** *Andrena (Suandrena) gades* **spec. nov.**, vista general del hábitat en el entorno de la Punta Candor (Cádiz), con abundante floración de *Diplotaxis virgata*.



***Andrena (Suandrena) gades* Wood & Ortiz-Sánchez  
spec. nov.**

HOLOTYPE: SPAIN: CÁDIZ: Rota, Punta Candor, MGRS: 29SQA3358, 7 m, 6.12.2021, 1♂ [leg. Ortiz-Sánchez, OÖLM].

PARATYPES: SPAIN: CÁDIZ: Rota, Punta Candor, MGRS: 29SQA3358, 7 m, 6.12.2021, 4♂, 5♀ [leg. Ortiz-Sánchez, FJOS/OÖLM/TJWC]. • Rota, La Albina, 29SQA3358, 2 m, 4.12.2011, 2♂, 1♀ [leg. L. Castro, FJOS].

DIAGNOSIS: Both sexes of *Andrena gades* are large bodied bees (>10 mm), presenting a finely defined and internally rugose propodeal triangle (Figure 15) and three submarginal cells in the forewing. Females can quickly be placed in the subgenus *Suandrena* Warncke, 1968 by the absence of spines on the hind femora, by a hind tibial spur that is strongly broadened at its base, and by the sculpture of the lateral faces of the propodeum, which has a fine shagreen and scattered punctures, without any ridges or creases. Males have a black clypeus and present the typical complex genitalia of *Suandrena*, with an inflated penis valve and gonostyli with a clear kink in their outer margin (Figure 20). Only two *Suandrena* species are currently known from Iberia – *A. cyanomicans* Pérez, 1895 s. str. (see Kratochwil, 2021) and *A. suerinensis* Friese, 1884.

Diagnosis is best made first with reference to the male, as for all *Suandrena*. The terga have metallic blue reflections, A3 lacks a ventral triangular extension (with a triangular extension in *A. suerinensis*), and the penis valve is strongly widened (only moderately widened in *A. cyanomicans*), placing it close to the North African/Levantine *A. planiventris* Dours, 1872, *A. hirticornis* Pérez, 1895, and *A. inaquosa* Wood, 2021. In *A. planiventris*, A3 is 1.7 times longer than A4, in *A. hirticornis* A3 is 1.4 times longer than A4 (see Dylewska, 1983), and in *A. inaquosa* A3 is 1.8 times longer than A4 whereas in *A. gades* A3 and A4 are subequal in length, with A3 slightly shorter than A4 (Figure 18). Moreover, the antennae are ventrally dark, whereas in *A. planiventris* and *A. inaquosa* the antennae are ventrally lightened orange. In *A. gades*, A4-8 have weak ventral tubercles, which are similar to the situation in *A. savignyi* Spinola, 1838, but the antennae are ventrally dark (not orange) and the penis valve is strongly broadened (only weakly broadened in *A. savignyi*).

For females, the combination of terga with metallic blue reflections, dark brown-black terminal fringe (the apical hairs of T5 and the hairs flanking the pygidial plate), T2-4 with uninterrupted (in fresh specimens) narrow brown hair bands (Figure 16; *A. suerinensis* lacks tergal hairbands) place it close to *A. cyanomicans* s. str. Separation can be made by the structure of the propodeal triangle, which in *A. gades* is much weaker and finer (Figure 15), lacking the strong internal rugosity present in both *A. cyanomicans* and also *A. suerinensis*. Additionally, in *A. gades* the nervulus is slightly antefurcal (interstitial in *A. cyanomicans*), though given the low number of *A. gades* and *A. cyanomicans* females examined, it is unclear to what extent this is a consistent character, and so diagnosis is best made with reference to the structure of the propodeal triangle.

DESCRIPTION: Female: Body length: 11-13 mm (Figure 13). Head: Black, 1.25 times wider than long (Figure 14). Clypeus domed, densely punctate, punctures separated by 0.5-1

puncture diameter of the majority of disc, becoming sparse apico-medially; underlying surface basally shagreened, dull, becoming shiny apically. Process of labrum weakly trapezoidal, twice as broad as long, corners more or less evenly rounded. Gena slightly wider than width of compound eye; ocelloccipital distance equal to width of lateral ocellus. Foveae occupying half of area between lateral ocellus and inner margin of compound eye, not narrowed below, extending below level of antennal insertions; filled with short dark brown hairs. Clypeus, gena, antennal insertions, and scape with light brown hairs, upper gena, vertex, and frons with black hairs, none exceeding length of scape. Antennae dark, A5-12 lightened dark orange ventrally, A3 equals A4+5+6.

Mesosoma: Scutum and scutellum shallowly punctate, punctures separated by 0.5-2 puncture diameters, underlying surface strongly shagreened, dull. Pronotum without humeral angle. Mesepisternum and propodeum finely microreticulate, dull, dorsolateral faces of propodeum with intermixed shallow punctures; propodeal triangle laterally delineated with fine carinae, internal surface finely rugosely areolate (Figure 15). Mesepisternum and propodeum with long brownish weakly plumose hairs exceeding length of scape; propodeal corbícula weakly formed dorsally with long whitish plumose hairs. Scutum and scutellum laterally with shorter dark brown plumose hairs, majority of disc with black plumose hairs. Legs dark, apically tarsal segments lightened dark orange, pubescence dark brownish to light brownish; tibial and femoral scopa and floccus dark orange to light brownish. Hind tarsal claws each with strong inner tooth. Hind tibial spur strongly broadened at base. Wings hyaline, stigma and venation dark orange, nervulus slightly antefurcal.

Metasoma: Terga dark apically to dull metallic blue-green basally, with faint metallic reflections, apical rims very narrowly lightened dark orange-brown (Figure 16). Tergal discs with shallow punctures, punctures separated by 1-2 puncture diameters, underlying surface shagreened, weakly shining. Marginal areas of T1 weakly, T2-4 strongly depressed. Disc of T1 with long light brownish hairs, T2 with short whitish hairs, T3-5 with short black hairs. Tergal margins with narrow hairbands, widely interrupted on T1, uninterrupted on T2-4. Apical fringe of T5 and hairs flanking pygidial plate dark brown to black; pygidial plate impunctate, featureless, apically evenly rounded.

Male: Body length: 12-14 mm (Figure 17).

Head: Black, 1.25 times wider than long (Figure 18). Clypeus, gena, and ocelloccipital distance structurally as in female. Clypeus, gena, antennal insertions, and scape with light brown hairs, upper gena, vertex, and frons with black hairs, though less extensive than in female; hairs often exceeding length of scape. Antennae dark, A4-13 lightened ventrally with grey cilia, A3 subequal to A4.

Mesosoma: Structurally as in female (Figure 19). Mesepisternum and propodeum with long light brown hairs, scutum and scutellum with predominantly long light brown hairs, with occasional black hairs intermixed. Wings hyaline, stigma and venation dark orange, nervulus strongly antefurcal.

Metasoma: Structurally as in female. S8 laterally compressed, forming a ventrally projecting keel, keel with ventro-laterally projecting tufts of dark brown-black hair, S8 apically compressed in horizontal plane, ventral face with





**Fig. 13-20.** *Andrena (Suandrena) gades spec. nov.*: **13**) female, lateral view; **14**) female face; **15**) female propodeum with propodeal triangle detail; **16**) female terga. **17**) male, lateral view; **18**) male face; **19**) male terga; **20**) male genital capsule. / **Fig. 13-20.** *Andrena (Suandrena) gades spec. nov.*: **13**) hembra, vista lateral; **14**) cara de la hembra; **15**) propodeo de la hembra con detalle del triángulo propodeal; **16**) terguitos de la hembra. **17**) macho, vista lateral; **18**) cara del macho; **19**) terguitos del macho; **20**) cápsula genital del macho.

apically projecting tuft of dark brown-black hair. Genital capsule compact, gonocoxae strongly diverging almost from their base, produced into apically projecting teeth (Figure 20). Gonostyli strongly curved, forming obtuse angle in their outer margin; blades of gonostyli lightened translucent

orange, outer surface covered in plumose hairs. Penis valves strongly broadened, outer margin with obtuse, near 90° angle, therefore with overall rhomboidal appearance, dorsal surface with weakly raised bumps medially.



ETYMOLOGY: From the ancient Latin name for the city of Cádiz, namely *Gādēs*, originally deriving from the Phoenician *Gadir* or *Agadir*. The new name takes the form of a noun in apposition.

REMARKS: The subgenus *Suandrena* has been taxonomically confused, and has undergone much revision in recent years that has meaningfully increased its species-specific diversity, particularly in the Western Mediterranean (Kratochwil *et al.*, 2014; Kratochwil, 2021). To date, all known members of this subgenus are specialists of Brassicaceae, with *A. gades* conforming to this pattern, with specimens observed collecting pollen from this family. Indeed, in early December, very little else is in flower in southwestern Iberia, and Brassicaceae was the dominant available resource at the 2021 collecting locality (Figure 12); in this case, all females were collected/observed on *Diplotaxis virgata* flowers. Against this context, the presence of a new *Suandrena* taxon that flies at an unusual time of the year is unsurprising. Continued searching outside of the ‘typical’ bee season in Iberia may well uncover additional overlooked bee taxa that exploit winter-flowering resources.

***Andrena (Taeniandrena) lusitania* Wood & Ortiz-Sánchez spec. nov.**

HOLOTYPE: PORTUGAL: CASTELO BRANCO: Fundão, Vale Praz, ASN.NET.E C373, 15.3.2021, 1♂ [*leg.* C. Siopa *et al.*, OÖLM].

PARATYPES: SPAIN: HUELVA: Peña de Arias Montano, Sierra de Aracena, Alájar, MGRS: 29SQB0596, 820 m, 13.4.2006, 1♀ [*leg.* Ortiz-Sánchez, OÖLM].

DIAGNOSIS: *Andrena lusitania* can be swiftly recognised as belonging to the subgenus *Taeniandrena* Hedicke, 1933 due to the strongly flattened clypeus in both sexes. The female has a unique character amongst Iberian *Taeniandrena* in that the face and the foveae are entirely black-haired (Figure 22). The terminal fringe is also dark (Figure 24) as in *A. ovatula* (Kirby, 1802) *s. str.* (golden in all other Iberian *Taeniandrena*), but the tergal discs have extremely weak and obscure punctures, whereas in *A. ovatula* they are clearly punctate. The obscurely punctate terga are similar to *A. russula* Lepeletier, 1841 (= *A. similis* Smith, 1849, see Praz *et al.*, 2022) and *A. lathyri* Alfken, 1899, but these both have a golden terminal fringe, and additionally *A. lathyri* has the pygidial plate deeply emarginate apically whereas it is evenly rounded in *A. lusitania*.

Males can be identified immediately by their genital capsule, which has a character that is highly unusual for *Taeniandrena*, namely that the gonostyli are extended into strong, apically projecting teeth (Figure 28). The only similar taxon is *A. lathyri*, which has weakly produced apical gonocoxal teeth. However, *A. lathyri* has strongly broadened penis valves, whereas in *A. lusitania* the penis valves are more or less parallel sided to slightly converging apically. The gonostyli of *A. lusitania* basally also have visible striations on their dorsal surface, and their apical blades are strongly flattened and spatulate. This unique character of strongly produced gonocoxal teeth, basally striate gonostyli, and strongly flattened spatulate gonostyli blades allows confident separation from all known West Palearctic *Taeniandrena* species.

DESCRIPTION: Female: Body length 12 mm (Figure 21).

Head: Black, 1.2 times wider than long (Figure 22). Clypeus dark, strongly flattened over its entire area, shallowly and irregularly punctate, punctures separated by 0.5-2 puncture diameters; underlying surface shagreened, dull, becoming weaker apically, apical margin weakly shining. Process of labrum weakly trapezoidal, three times wider than long, lateral corners rounded. Gena slightly broader than width of compound eye; ocelloccipital distance equal to width of lateral ocellus. Foveae broad, occupying three quarters of area between lateral ocellus and inner margin of compound eye, slightly narrowed below at level of antennal insertions; filled with short black-brown hairs. Face, gena, vertex, scape covered with black-brown hairs, none exceeding length of scape; vertex and antennal insertions with some intermixed light brown hairs. Antennae dark, A5-12 lightened ventrally with grey cilia, A3 exceeding A4+5, shorter than A4+5+6.

Mesosoma: Scutum and scutellum shallowly and obscurely punctate, punctures separated by 1-2 puncture diameters, underlying surface strongly shagreened, dull to weakly shining. Pronotum without humeral angle. Mesepisternum and propodeum finely microreticulate, weakly shining, dorsolateral faces of propodeum with intermixed shallow punctures. Propodeal triangle delineated laterally by fine carinae, internal surface microreticulate, with extremely fine network of weakly raised rugae. Mesepisternum covered with long dark brown weakly plumose hairs, becoming light brown dorsally; propodeum covered with shorter light brown hairs, propodeal corbicula weakly formed dorsally with light brown plumose hairs. Scutum and scutellum with shorter light brown hairs. Legs dark, with exception of orange hind tibiae and tarsi (Figure 21), pubescence dark brownish to light brownish. Tibial scopa golden, femoral scopa and floccus light brown, floccus composed of plumose hairs. Hind tarsal claws each with strong inner tooth. Wings hyaline, stigma and venation dark orange-brown, nervulus postfurcal.

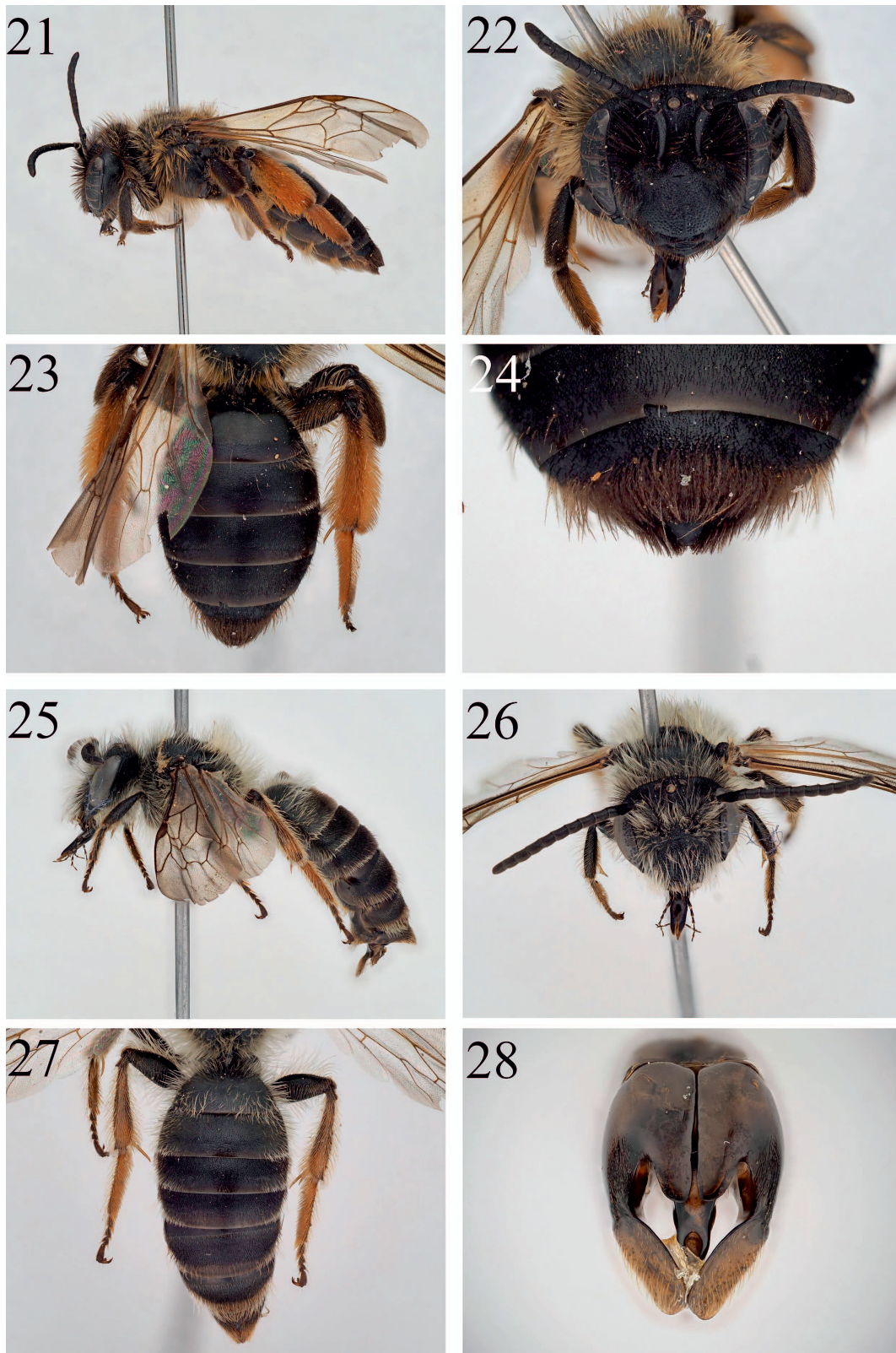
Metasoma: Terga dark, apical rims narrowly lightened hyaline-yellow (Figure 23). Tergal discs with dense but extremely shallow and obscure punctures, punctures separated by 0-5.1 puncture diameters, underlying surface shagreened, weakly shining. Terga with very short obscure hairs, T2-3 laterally with faint white hairbands. Apical fringe of T5 and hairs flanking pygidial plate uniformly dark brown (Figure 24); pygidial plate impunctate, medially with slight longitudinal linear bulge, apically evenly rounded.

Male: Body length 11 mm (Figure 25).

Head: Black, 1.1 times wider than long (Figure 26). Clypeus dark, strongly flattened over its entire area, densely punctate, punctures separated by 0.5 puncture diameters; underlying surface shagreened, dull basally to weakly shining medially and apically. Gena slightly broader than width of compound eye; ocelloccipital distance equal to width of lateral ocellus. Face, gena, vertex, scape covered with whitish hairs, longest exceeding length of scape; vertex and upper gena laterally with some intermixed black hairs. Antennae dark, A4-13 lightened ventrally with grey cilia, A3 1.25 times longer than A4.

Mesosoma: Structurally as in female. Mesepisternum, propodeum, scutum, and scutellum uniformly covered with long whitish-brown hairs, longest clearly exceeding length of scape.





**Fig. 21-28.** *Andrena (Taeniandrena) lusitania spec. nov.*: 21) female, lateral view; 22) female face; 23) female terga; 24) female terminal fringe. 25) male lateral view; 26) male face; 27) male terga; 28) male genital capsule. / **Fig. 21-28.** *Andrena (Taeniandrena) lusitania spec. nov.*: 21) hembra, vista lateral; 22) cara de la hembra; 23) terguitos de la hembra; 24) franja distal de pelos de la hembra. 25) macho, vista lateral; 26) cara del macho; 27) terguitos del macho; 28) cápsula genital del macho.

Metasoma: Terga dark, apical rims narrowly lightened hyaline-yellow (Figure 27). Tergal discs structurally as in female; T1 covered with sparse whitish hairs, surface of T2-6 covered with dense short black-brown hairs, T2-5 laterally with faint white hairbands. S8 columnar, apically broadened

like a fishtail, apically truncate, ventrally with spreading orange-brown hairs. Genital capsule with strongly produced gonocoxal teeth, gonostyli with apical blades strongly flattened, spatulate (Figure 28). Penis valves narrow, more or less parallel sided, weakly converging apically.

ETYMOLOGY: Named after ‘*Hispania Lusitania*’, the name for the ancient Iberian Roman province where this new species was discovered. The province now covers most of modern Portugal and parts of the community of Extremadura and the province of Salamanca; in turn, it took its name from the Lusitanians, pre-Roman peoples who put up strong resistance to the Roman invasion. The new name is a noun in apposition.

REMARKS: The subgenus *Taeniandrena* has recently been found to contain many cryptic taxa that are highly challenging to separate morphologically (Praz *et al.*, 2022). The Iberian Peninsula is particularly rich in *Taeniandrena* species, with the description of *A. lusitania* increasing the fauna to 12 species (Wood *et al.*, 2021; Praz *et al.*, 2022; Wood, 2022) from the seven listed by Ortiz-Sánchez (2020). Further collecting effort focused on Fabaceae (the dominant or exclusive pollen host of members of this subgenus) and genetic work is likely to increase this total further. Therefore, *A. lusitania* is highly likely to be oligolectic on Fabaceae, though this requires confirmation.

## Discussion

These findings continue to improve our understanding of the Iberian *Andrena* fauna and restate its importance as a global diversity hotspot for this genus. The presence of an additional undescribed *A. (Taeniandrena)* species in Iberia is not unexpected given the major revision to this subgenus that have been conducted in recent years (Wood *et al.*, 2021; Praz *et al.*, 2022; Wood, 2022). However, the discovery of undescribed *A. (Suandrena)* and *A. (Avandrena)* species with stronger affinities to the North African *Andrena* fauna is more notable.

Against this context, North African *Andrena* continue to be discovered in the southern Iberian fauna after *A. varia* Pérez, 1895 and *A. laurivora* Warncke, 1974 (Ortiz-Sánchez, 2020; Wood *et al.*, 2021), and *A. melacana* may well not be the last. Though Iberia as a whole is reasonably well-studied, such studies have not been evenly spread across the peninsula. The revisionary works of Warncke (1967, 1975, 1976) were largely focused on the material housed at the Museo Nacional de Ciencias Naturales in Madrid, particularly on the Dusmet Collection, and the Museu da Ciência da Universidade de Coimbra in Coimbra, particularly on the Diniz Collection. The majority of this material comes from central Spain or central Portugal, and hence southern Iberia is comparatively understudied, as noted by Warncke himself (Warncke, 1975). Continued collections in this region are likely to uncover further new species for science, for the peninsula, and for Europe.

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