



# *Andrena (Chlorandrena) diestelhorsti*, a new bee species from Crete, Greece (Hymenoptera: Anthophila, Andrenidae)

## *Andrena (Chlorandrena) diestelhorsti*, eine neue Bienenart aus Kreta, Griechenland (Hymenoptera: Anthophila, Andrenidae)

Hans Richard Schwenninger<sup>1</sup>

<sup>1</sup> Kompetenzzentrum Wildbienen, Erfurter Straße 7, 67433 Neustadt/Weinstraße, Germany, h.u.k.schwenninger@t-online.de

### Abstract

*Andrena (Chlorandrena) diestelhorsti* sp. nov. (Hymenoptera: Anthophila, Andrenidae), a new bee species from Crete (Greece), is described and illustrated. Characters to distinguish this new species from similar species are provided and integrated into the identification key for the *Andrena (Chlorandrena) taraxaci*-group. The first images documenting flower visitation and a description of the locus typicus provide information about the ecology of the new species.

### Zusammenfassung

*Andrena (Chlorandrena) diestelhorsti* sp. nov. (Hymenoptera: Anthophila, Andrenidae), eine neue Bienenart aus Kreta (Griechenland), wird beschrieben und abgebildet. Merkmale zur Unterscheidung dieser neuen Art von ähnlichen Arten werden aufgezeigt und in den Bestimmungsschlüssel für die *Andrena (Chlorandrena) taraxaci*-Gruppe integriert. Erste Abbildungen der Art beim Blütenbesuch und die Beschreibung des Fundorts geben einen Einblick in ihre Lebensweise.

### Introduction

The subgenus *Chlorandrena* contains 30 species in Europe (GHISBAIN et al. 2023) and is characterized by a row of spines on the back side of the hind femur, crater points on the terga, plumose (strongly branched) hairs on the corbicula and long foveae (extending to the base of the antennae) in females. The males have shovel-like excavations on the gonostyli and typical sterna 8. *Chlorandrena* is divided into the *taraxaci*-, *livens*- and *humilis*-group (WARNCKE 1968). While the *taraxaci*-group has been revised (SCHWENNINGER 2015), the other groups remain incompletely studied. Members of the subgenus *Chlorandrena* are usually oligolectic on Asteraceae of the subfamily Cichorioideae.

During an examination of *Chlorandrena* specimens in the Bavarian State Collection of Zoology (ZSM), two female specimens from Crete were discovered that had been designated by WARNCKE (1965) as paratypes of *Andrena*

*taraxaci orientana* (Fig. 1). Additionally, OLAF DIESTELHORST (Düsseldorf) provided the author with unidentified female *Andrena* specimens from Crete. Examination of these females revealed that they belong to a previously undescribed species. Based on precise locality data supplied by DIESTELHORST, the author investigated the corresponding habitats in Crete in March/April 2015. During this field trip, males were collected for the first time, providing important characters for the species description, as the genitalia and terminal sternites are of particularly diagnostic value in the *A. taraxaci*-group.

### Materials and methods

In this study, specimens of the *Andrena* subgenus *Chlorandrena* PÉREZ, 1890 from Crete were examined. The studied material is deposited in the Bavarian State Collection of Zoology, the collections of the Upper Austrian State Museum Linz, the State Museum of Natural

History Stuttgart, and in the private collections of OLAF DIESTELHORST, ERWIN SCHEUCHL, and of the author.

The macro photographs were created with an Olympus digital camera SC180 on an Olympus SZX16 stereomicroscope using the software Olympus cell for focus-stacking. All morphological measurements were conducted using the SZX16 stereomicroscope in combination with the software Olympus cell. Some images were post-processed using Photoshop CS5 (Adobe Systems, USA) to optimize lighting and enhance the visibility of diagnostic characters.

Morphological terminology and abbreviations mainly follow MICHENER (1944, 2007), with the exception that antennal segments are numbered A1–12(13), and the term “nervulus” is used instead of vein cu-v in the forewing.

### Abbreviations

A = antennal segment

coll. = collection

HL = head length

HT = Holotype

leg. = legit

Pd = puncture diameter

S = metasomal sternum

T = metasomal tergum

BL = body length

FL = flagellum

HW = head width

L, W = maximum length, respectively width

N, E = latitude respectively longitude

PT = Paratype

SC = scape

WL = length of forewing

DIOL = Private Collection of OLAF DIESTELHORST, Düsseldorf, Germany

OÖLM = Collection of the Upper Austrian State Museum Linz, Austria

SCER = Private Collection of ERWIN SCHEUCHL, Ergolding, Germany

SCWE = Private Collection of HANS SCHWENNINGER, Stuttgart, Germany

SMNS = State Museum of Natural History, Stuttgart, Germany

ZSM = Bavarian State Collection of Zoology, Munich, Germany

For morphometric analyses, the following characters were measured (abbreviations and used magnifications in brackets):

Body length (BL, 10x) from the antennal base to the tip of the pygidial plate; head length (HL, 16x) from the vertex to the lower margin of the clypeus excluding the process of the labrum; head width (HW, 20x); wing length of forewing (WL, 12.5x) without tegula; antennal segment length of flagellum and scape (A, 20x), measured on the ventral surface of the flagellomeres. The length of Sternum 8 (S8, 20x) was measured from base to apex.

Each studied specimen was labelled with a unique identification number and letter sequence (ID-No.) which is also recorded in the database of the author. Each data record includes, when available, information on locality, geographic coordinates, date of collection, collector, depository, identifier, and observations on flower visitation or nesting behavior.

### Results

All studied female specimens possess a row of spines on the back side of the hind femur, plumose (strongly branched) hairs on the corbicula and long foveae (extending to the base of the antennae), placing them in the subgenus *Chlorandrena* PÉREZ, 1890. WARNCKE (1968) divided this subgenus into three groups: the *humilis*-, *taraxaci*- and *livens*-group. The shape of the facial foveae is the main feature in females to separate the different species groups. The foveae of the studied Cretan specimens are long, but not square, they extend about half the length of the compound eye. Near the base of the scape, the foveae are narrowed and comma-shaped. The male genitalia have conspicuous tooth-like lateral dilatations on sternum 8, and the gonostyli are more or less slender without broad shovel-like excavations. Thus, they all exhibit the typical characteristics of the well-defined *Andrena taraxaci*-group (WARNCKE 1968, SCHWENNINGER 2015).

WARNCKE (1965: 38) described the subspecies *orientana* of *Andrena taraxaci* GIRAUD, 1861 from mainland Greece as well as from different Greek islands. As paratypes, he also designated specimens from Crete (labels see Fig. 1). GUSENLEITNER & SCHWARZ (2002) elevated this subspecies to species rank. Since this taxon was described, it has

been shown to occur in other Eastern European and Western Asian countries (SCHWENNINGER, 2015). However, comparison of the paratype specimens of *Andrena taraxaci orientana* WARNCKE, 1965 from Crete with specimens of *A. orientana* collected by the author in Greece and Cyprus, revealed clear differences. The most distinctive feature of *A. orientana* – the shiny disc with scattered punctation in the rear centre of the scutum – is missing in the Cretan paratype specimens. Instead, they have an entirely shagreened scutum (see Fig. 2A + B). Additionally, the coloration of the pubescence of the paratype is considerably browner than that of the lighter yellowish-brown haired typical *A. orientana*. Further examination of the Cretan specimens revealed that they are very similar to *Andrena taraxaci*, an extremely difficult group from a taxonomic perspective. WOOD (2021) points out that “*Andrena taraxaci* has been greatly confused because there are a large number of morphologically similar species around this taxon [...]”. 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 pre-

sented in GUSENLEITNER & SCHWARZ 2002). The examined material revealed a new species which will be described below.

**Material examined**

***Andrena orientana* WARNCKE, 1965**

**CYPRUS:** Limassol district, Paramythia Hills, 34.74530°N, 32.98158°E, 203 m, 30.III.2009 1 ♀, leg. SCHWENNINGER, SCWE (ID: 0901 031scwe082).

***Andrena pastellensis* SCHWENNINGER, 2015**

**SWITZERLAND:** Tessin, south Bellinzona Monte Ceneri, 46.136553°N, 8.910150°E, 549 m, 3.IV.2007 1 ♂, leg. SCHWENNINGER, SCWE (ID: 061212scwe0186).

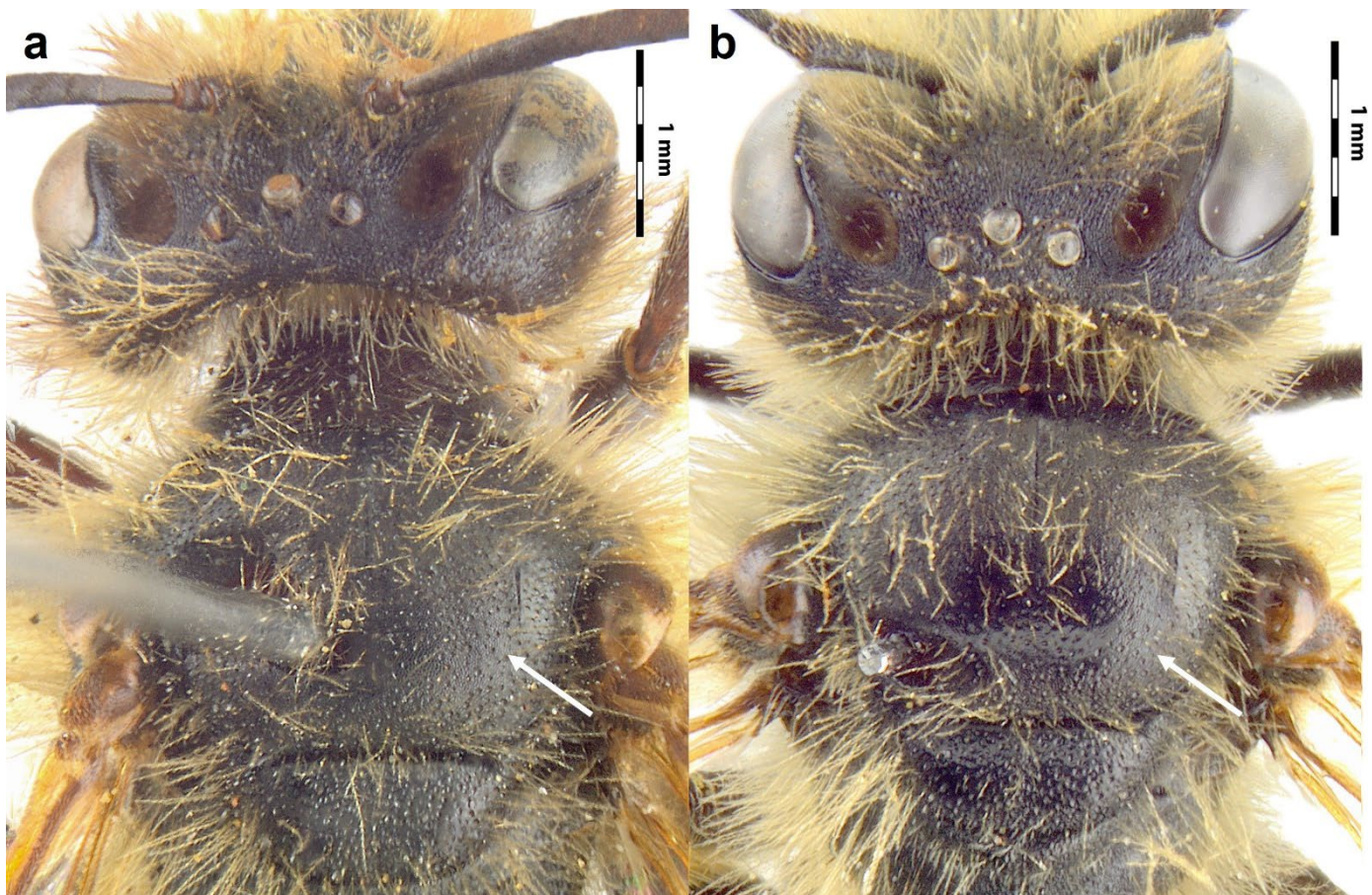
***Andrena taraxaci* GIRAUD, 1861**

**GERMANY:** Bavaria, Passau-Tiefenbach, Kiesgrube Hellersberg, 48.605859°N, 13.394909°E, 421 m, 9.IV.1996 1 ♀ (ID-No.: 250425scwe007);

**TURKEY:** Prov. Aydin, 4,5 km SE Sögütcuk, Çine Çayı, 37.468889°N, 28.159167°E, 221 m, 9.IV.1996 1 ♂ (ID-No.: 250425scwe007), all leg. SCHEUCHL, SCER.



Fig. 1 Labels of one the females, which WARNCKE (1965) had designated as paratypes of *Andrena taraxaci orientana*.



**Fig. 2** Head and Mesosoma of an *Andrena taraxaci orientana* paratype (a) from Crete (ID-No: 130126scwe039) and of *A. orientana* (b) from Cyprus (ID-No: 0901031scwe082). Scutum is partially polished with scattered punctures or all over shagreened (see arrows).

***Andrena stabiana* Morice, 1899**

**ITALY:** Sicily, Prov. Messina Giardini-Naxos, E 15.257777°, N 37.808077°, 6 m, 13.IV.2005, 1 ♀, leg. SCHWENNINGER, SCWE (ID: 051216scwe160).

**Description of a new species**

***Andrena (Chlorandrena) diestelhorsti* sp. nov.** (Figs 3-8)

Zoobank urn:lsid:zoobank.org:pub:7AA0860F-7263-48AB-A296-6FB8C1844B59

**Type material**

**Holotype** (ID: 130126scwe098): **GREECE:** Crete, Regional unit: Lassithi, Lassithi-plateau, (Tzermiado) Plati, 35.172384°N, 25.442832°E, 829 m, 30.III.2015, ♂, leg. SCHWENNINGER, OÖLM (intended).

**Paratypes:** **GREECE:** Crete, Lassithi, "Lassithi\*-plateau (Tzermiado) Plati", 35.172384°N, 25.442832°E, 829 m, 30.III.2015, 4 ♂ (ID-No.: 130126scwe036, 130126scwe037, 130126scwe041, 130126scwe043), 4 ♀ (ID-No.: 130126scwe027, 130126scwe 028, 130126scwe029, 130126scwe030), 31.III.2026, 1 ♂ (ID-No.: 130126scwe045), all

leg. SCHWENNINGER, SCWE; 1 ♀ (ID-No. 130126scwe031), leg. SCHWENNINGER, OÖLM (intended); "Lassithi-plateau; Tzermiado", 35.195467°N, 25.492189°E, 834 m, 30.III.2015, 1 ♂ (ID-No.: 130126scwe034), 4 ♀ (ID-No.: 130126scwe013, 130126scwe16, 130126scwe17, 130126scwe18), leg. SCHWENNINGER, SCWE, 1 ♀ (ID-No.: 130126scwe015), leg. SCHWENNINGER, SCER; "Lasithi Hochebene" (Tzermiado Plati), 35.172549°N, 25.441640°E, 829 m, 18.IV.2008, 1 ♀ (ID-No.: 130126scwe032), leg. DIESTELHORST, SCWE; 4 ♀ (ID-No.: 130126scwe051, 130126scwe052, 130126scwe053, 130126scwe 54), leg. DIESTELHORST, DIOL; "Lassithi-plateau: Ano Kera", 35.218391°N, 25.461111°E, 725 m, 4.IV.2015, 1 ♂ (ID-No.: 130126scwe035), leg. SCHWENNINGER, SCER, 1 ♀ (ID-No.: 130126scwe042), leg. SCHWENNINGER, SCWE; Iraklio, Chersonissos (Malia)-Krasí, 35.236932°N, 25.465644°E, 571 m, 30.III.2015, 2 ♀ (ID-No.: 130126scwe014, 130126scwe019); Iraklio, Chersonissos-Malia, 35.252653°N, 25.469963°E, 341 m, 30.III.2015, 1 ♀ (ID-No.: 130126scwe021); Iraklio, Chersonissos c/o Kera Kardiotissa,

35.223533°N, 25.461766°E, 631 m, 2.IV.2026, 1♀ (ID-No.: 130126scwe044), all leg. SCHWENNINGER, SCWE; Lasithi, “Mesa Mouliana”, 700 m, 25.III.1958, 2♀ (ID-No.: 130126scwe039, 130126scwe040), leg. KAHMANN, det. WARNCKE as Paratypes of *Andrena taraxaci orientana* (WARNCKE 1965: 38), ZSM.

\* *The unofficial spelling “Lassithi” was used on the labels.*

WARNCKE (1965:38) published records of *Andrena taraxaci orientana* from “Westkreta Sudha Bucht” (Western Crete, Souda Bay), 27.III.1925, 2♀, leg. Schulz. None of the listed specimens, which most likely belong to this new species, could be found during the examination of the collection.

### Etymology

The species name refers to the bee expert OLAF DIESTELHORST (Düsseldorf), who provided the author with specimens for identification and essential information about the type localities. This information enabled the author to collect males for the first time and subsequently describe the new species.

### Description

**Male** (Holotype, ID-Nr: 130126scwe098): BL: 9.5 mm, WL = 7.6 mm (Fig. 3, 4, 5, 9A).

**Coloration:** Integument black, except for the lower side of FL4-11 (reddish brown) and mandible teeth (reddish brown); tergal depressions only on hind margins narrowly brightened; apical fimbriae of sterna reddish yellow; hairs and bristles of tibiae and basitarsi reddish brown, tarsomeres and claws increasingly brightened, reddish brown; tibial spurs yellowish; wing membrane hyaline, veins and pterostigma reddish yellow, except for the radial vein (reddish brown); tegulae reddish brown.

**Pubescence:** Hairs plumose, yellowish except for the lower edge of the clypeus with white hairs and inner margin of compound eye with brown hairs, on sterna and hind metatarsus reddish yellow hairs; pubescence on head, meso- and metasoma long, moderately dense, on frons and clypeus very dense; hairs long (790-800 µm), on femur, tibia, and mesepisternum very long (1,100-1,200 µm) and conspicuous; on terga shorter 500-600 µm long; margins of sterna 2-5 with slightly protruding apical fimbriae (rows of hairs about 360 µm long).

**Head:** Transverse, HL (2.6 mm), HW (2.9 mm), HL/HW = 0.9 (Fig. 4). – Frons with face above antennal fossae with longitudinal rugulae, interrugal space with coarse punctures. – Malar space linear, small (72-115 µm). – Genal area with max. width 610 µm, as broad as width of compound eye (615 µm). – Clypeus domed, basally with scattered coarse punctation (Pd 1.5-2), towards the apex finer and denser (Pd less than 0.5). – Labrum with process rectangular-trapezoidal, four times wider than long, anterior margin truncate. – Antennae with scape (A1) 774 µm, pedicel (A2) 176 µm, A3 (414 µm) half as long as A4+5+6 (818 µm), from A6 transverse gradually longer, A8 longer than wide, towards the apex gradually longer, A13 sub-rectangular (A13: L = 329 µm, W = 203 µm) (see Fig. 5). Ocelloccipital distance equalling 1.7 times the diameter of lateral ocellus.

**Mesosoma:** Pronotum without humeral angle. – Scutum with surface shagreened, dull, with coarse and scattered punctation (interspaces 2-3 Pd). – Scutellum with anterior part weakly shagreened, with fine and dense punctation (interspaces 0.5-1 Pd). – Propodeum basally with fine, laterally decreasing wrinkles, propodeal enclosure indistinctly separated from the lateral area, lateral area next to the propodeal enclosure with fine honeycomb-like shagreen, laterally scattered dotted with coarse punctures (“crater-points”) (Pd 2-3). – Mesopleurae shagreened, punctation dense proximally (Pd 0.5), decreasing distally (Pd 2-3). – Wing with nervulus interstitial to weakly postfurcal, distance from basal vein usually 0.5 times the width of nervulus. – Legs with tarsal claws all bidentate.

**Metasoma:** Terga with discs smooth, shiny, T1 with scattered punctation (Pd 2-3) partly with crater points, other terga more densely punctate (Pd 1-2), depressions shagreened with fine punctation (Pd 1-2). Sterna finely shagreened, shiny, punctation more scattered proximally (Pd 1-2), denser distally (interspaces from 0.5-1 Pd), punctation on sterna 3-5 more imbricated, posterior margin of S6 arched, vertically protruding. – Terminalia: genitalia and associated sterna as illustrated in Fig. 8A, apex of gonostyli acute, gonocoxa elongated and acute, gonocoxa relatively long in comparison to other species of the *taraxaci*-group. Sternum 8 with bar-shaped process, posterior lateral teeth broad, anterior part narrowed towards the apex.



Fig. 3 Holotype ♂ of *Andrena diestelhorsti* sp. n. in dorsal view (ID-No.: 130126scwe098).



Fig. 4 Holotype ♂ of *Andrena diestelhorsti* sp. n. in lateral view (ID-No.: 130126scwe098).

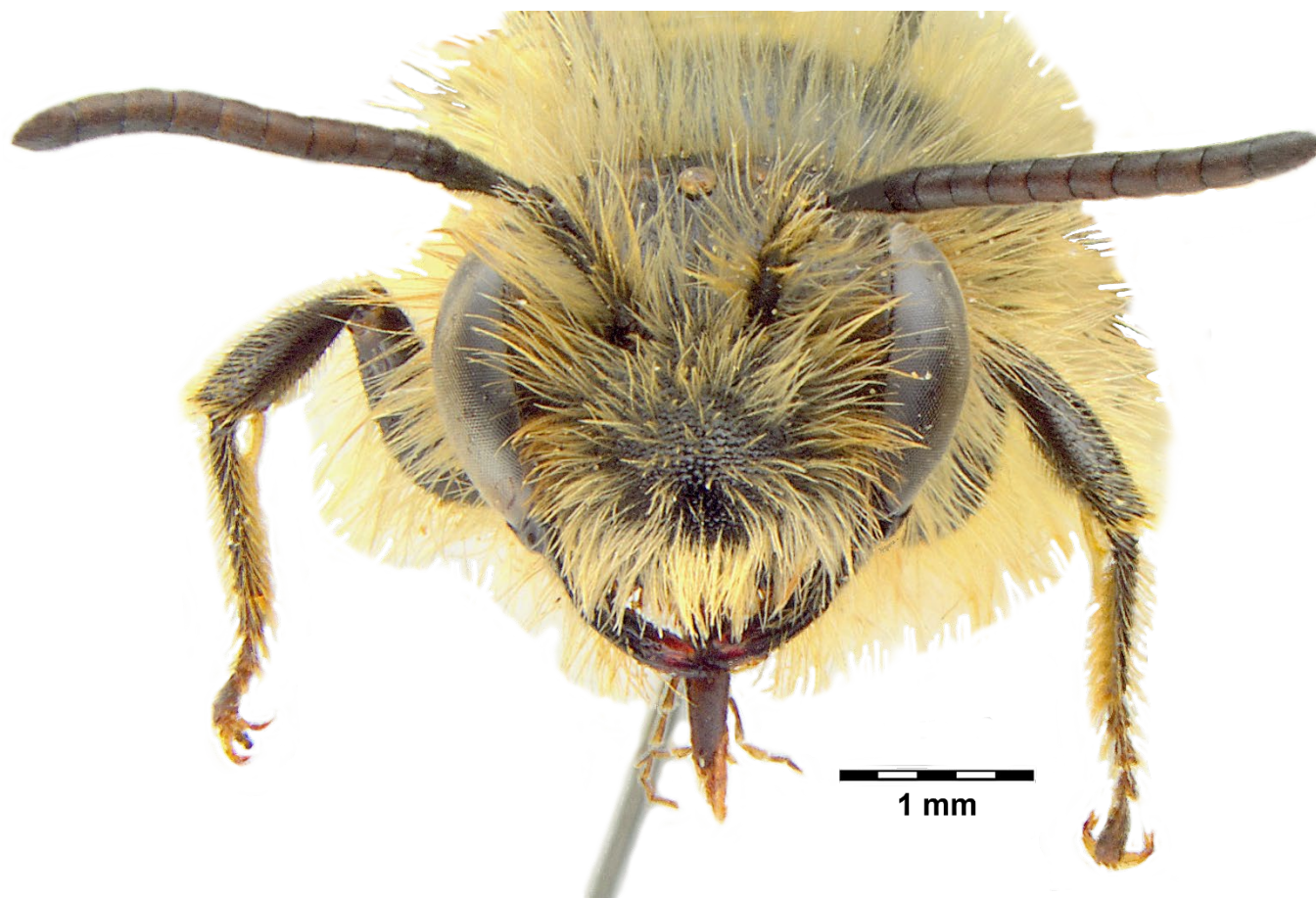


Fig. 5 Caput of Holotype ♂ of *Andrena diestelhorsti* sp. n. in frontal view (ID-No.: 130126scwe098).

**Female** (paratype, ID-No. 070915scwe005) BL = 12 mm, WL = 7 mm (fig. 6, 7).

**Coloration:** Integument black, except for the lower side of FL5-11 (reddish brown) and apex of mandible teeth, tegulae, and hind margins of sterna and to a lesser extent terga brightened reddish brown; tarsal claws and pygidium except for the margins reddish brown, tibial spurs yellowish; wing membrane hyaline, veins and pterostigma reddish yellow, except for the radial vein (reddish brown).

**Pubescence:** Hairs plumose, yellowish brown except for the inner margin and only very scattered on outer margin of compound eye with brown hairs; pubescence on head, meso- and metasoma moderately long (500-600  $\mu$ m), on frons and clypeus very dense, hairs shorter (200  $\mu$ m); on the femur, tibia especially inner side of corbiculae very long (up to 1,200  $\mu$ m), apical fimbria with very dense pubescence with a hair length about 800  $\mu$ m, margins of sterna 2-5 with slightly protruding apical fimbriae (rows of hairs about 400  $\mu$ m long).

**Head:** Transverse, HL = 2.3 mm, HW = 2.8 mm, HL/HW = 0.82. – Facial foveae with ellipsoid length 1.20 mm, dorsal width 310  $\mu$ m, basal width 90  $\mu$ m, dorsally deeply impressed, ventrally strongly narrowed to less than a third of the basal width (comma-shaped); fovea extending approximately to the insertion of the scape. – Foveae filled with dark brown hairs, foveae (W: 310  $\mu$ m) occupying almost half of the space between lateral ocellus and compound eye (W: 650  $\mu$ m), distance between fovea and lateral ocellus (185  $\mu$ m) slightly longer than the width of the ocellus (165  $\mu$ m) (space = 1.1 of the width) (see Fig. 3). – Occiput finely shagreened with moderately dense punctation (interspaces 1 Pd), upper side of fovea with more scattered punctation (interspaces Pd up to 2-3), ocelloccipital distance equalling (260  $\mu$ m) 1.6 times the diameter of lateral ocellus (160  $\mu$ m). – Frons with longitudinal rugulae, looking like longitudinal stripes, punctation very scattered (Pd 1.5-3). – Supraclypeal area with small longitudinal rugulae and fine dense punctation (Pd 0.5). – Clypeus domed, slightly convex, shagreened, with

coarse transverse punctures (Pd 2-3), towards the apex lateral punctation increasingly denser. – Labrum with process trapezoid (W 450  $\mu$ m), in the middle weakly emarginate, about half as wide as labrum (W 950  $\mu$ m), glossy. – Malar space linear. – Genal area (W: 650  $\mu$ m) slightly wider than compound eye (W: 615  $\mu$ m). – Antennae with A3 one-quarter longer than A4+5 (342  $\mu$ m), A4-A11 transverse gradually longer towards the apex, A12 weakly transverse [A1 (scape): L= 910  $\mu$ m, W = 180  $\mu$ m; A2 (pedicel): L= 134  $\mu$ m, W = 161  $\mu$ m; A3: L= 445  $\mu$ m, W = 150  $\mu$ m; A4: L= 165  $\mu$ m, W = 230  $\mu$ m; A5: L = 160  $\mu$ m, W = 228  $\mu$ m; A6 : L = 182  $\mu$ m, W = 228  $\mu$ m; A7: L = 195  $\mu$ m W =240  $\mu$ m; A8: L 208  $\mu$ m W 241  $\mu$ m; A9: L = 203  $\mu$ m, W = 231  $\mu$ m; A10: L = 217  $\mu$ m, W = 240  $\mu$ m; A11: L = 242  $\mu$ m, W = 252  $\mu$ m; A12: L = 286  $\mu$ m, W = 261  $\mu$ m].

**Mesosoma:** Pronotum with more or less scattered punctation (interspaces 1–2 Pd), surface shagreened. – Scutum with shallow and dense punctation (interspaces < 0.5 Pd), towards the posterior part punctation more scattered (interspaces 1–2 Pd) except at hind margin, surface shiny. – Scutellum shagreened, in the middle smooth, punc-

tation in the middle scattered (Pd 2-3), particularly dense on the front margin (Pd 0.5), and laterally fine and extremely dense (interspaces < 0.5 Pd). – Postscutellum shagreened with shallow and scattered punctation (Pd 1.5-2). – Propodeum: propodeal enclosure indicated by a fine boundary line, anterior margin with wrinkles; lateral area of propodeum with coarse imbricate punctation, interspaces about 1.5 Pd; laterally denser punctation (Pd 0.5). – Mesopleurae finely shagreened, proximally with coarse punctation (interspaces 1 to 2 Pd), distally punctation scattered (Pd 3) and fading. – Mesosterna shiny and moderately shagreened, scattered punctate (interspaces 2-5 Pd). – Wing with nervulus postfurcal, distance from basal vein usually 1 time the width of nervulus. – Legs: Hind femur with a row of 14 reddish brown spines, tarsal claws all bidentate.

**Metasoma:** Terga with T1 mostly polished and glossy, only weakly shagreened, especially on a stripe in the middle, in contrast, the depressions shagreened, T2–T5 shagreened throughout; T1 basally with very fine and more scattered punctation (interspaces > 4 Pd), T1 disc with scattered



Fig. 6 Paratype ♀ of *Andrena diestelhorsti* sp. n. in dorsal view (ID-No.: 130126scwe013).



Fig. 7 Paratype ♀ of *Andrena diestelhorsti* sp. n. in lateral view (ID-No.: 130126scwe013).

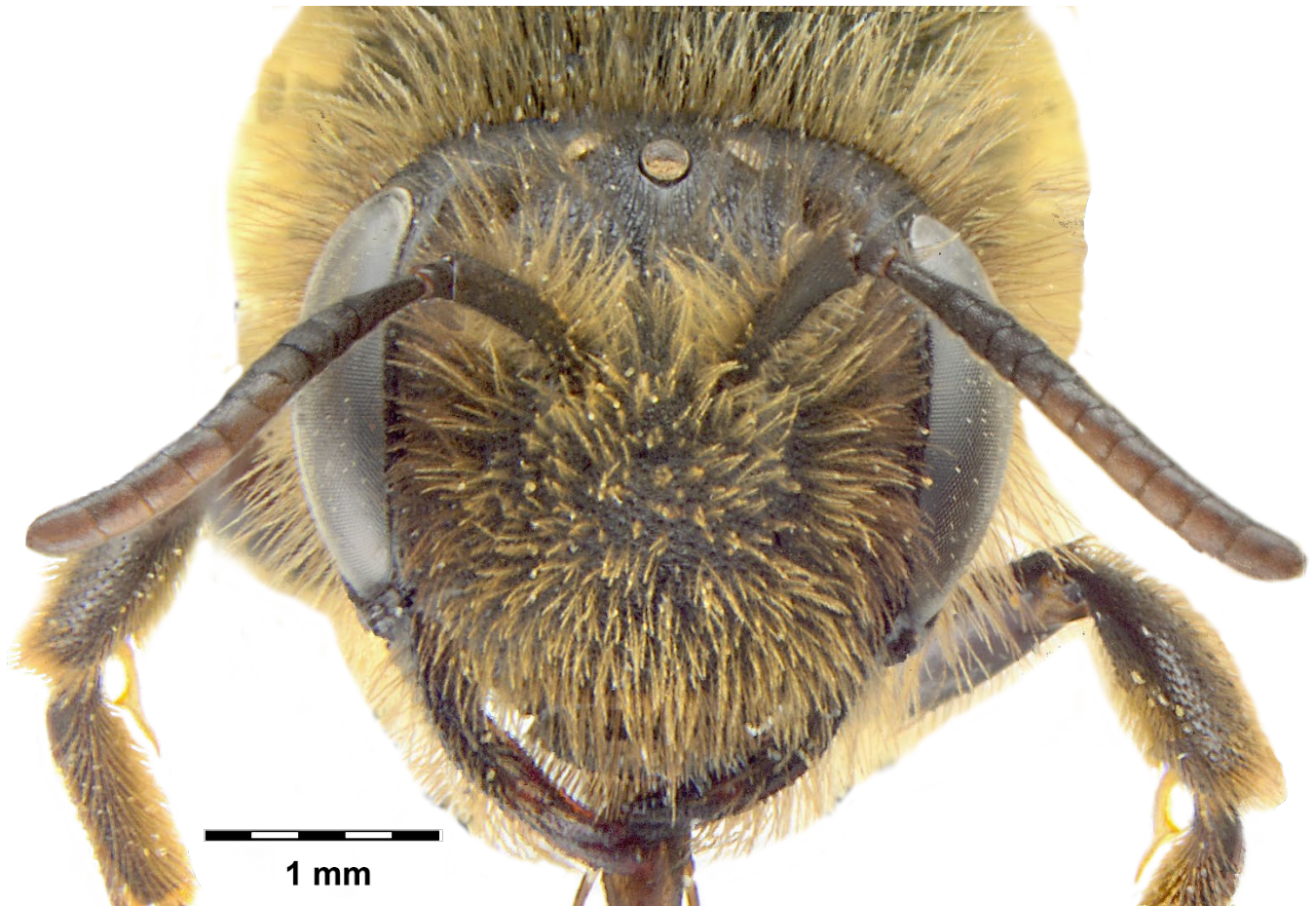


Fig. 8 Caput of Paratype ♀ of *Andrena diestelhorsti* sp. n. in frontal view (ID-No.: 130126scwe013).

and coarse punctation (caldera points) (interspaces 1.5-2 Pd), beginning from T2, punctation finer and increasingly denser (interspaces 2 to 1 Pd), depressions clearly separated from the discs at the sides; depressions only with extremely fine punctation (only visible with at least 40 x

magnification). – Sterna: shiny, very weakly shagreened, punctation imbricated dense, towards posterior margin increasingly denser (interspaces 1.5-1 Pd). – Pygidium with pygidial plate flat, densely microreticulated, laterally with weakly upward curved margin.

**Morphometrics**

The morphometric measurements of the males and the females are shown in table 1 and 2. The body length of the males ranges from 9.5 to 10.44 mm (on average about 10 mm), of the females from 10.5 to 11.3 mm (on average about 11 mm). The head is transverse in both sexes ( $\emptyset$ : ♂ = 0.82, ♀ = 0.84), the wing length is about 8 mm ( $\emptyset$ : ♂ = 7.64, ♀ = 8.22), and the antennal scape is about 0.8 mm long in males and in females about 0.9 mm long. The flagellum is on average about 2.9 mm (♂) or 2.4 mm (♀) long.

**Diagnosis males**

The new taxon is morphologically close to *Andrena taraxaci* and *A. pastellensis*. Ultimately, the best way to separate the species is the examination of their genitals and sternum 8. Following the key of SCHWENNINGER (2015), males of *A. diestelhorsti* would lead to couplet 14 as the apex of gonostyli between internal rim and outer margin are more or less parallel, ending in a point (Fig. 9).

**Table 1** Morphometric measurements of the body length (BL), head length/ width (HL/HW), wing length (WL), antennal flagellum (FL), scape (SC), sternum 8 (S) Aedeagus (AL) of the male type series of *Andrena diestelhorsti* sp. n. (in mm).

♂ Specimens ID-No.	BL	HL	HW	HL/HW	WL	FL	SC	S8	AL
130126scwe098 (HT)	9.50	2.30	2.81	0.82	7.36	2.92	0.77	1.34	1.98
130126scwe033 (PT)	10.08	2.57	3.19	0.81	8.10	3.00	0.87	-	-
130126scwe034 (PT)	9.86	2.41	2.90	0.83	7.56	2.80	0.71	-	-
130126scwe035 (PT)	9.82	2.30	2.76	0.83	7.44	2.78	0.75	1.30	1.98
130126scwe036 (PT)	10.44	2.40	3.05	0.79	7.87	2.95	0.81	1.44	1.95
130126scwe037 (PT)	10.22	2.39	2.83	0.84	7.63	2.90	0.77	1.28	1.81
130126scwe043 (PT)	10.17	2.39	2.88	0.83	7.55	2.81	0.78	1.37	1.98
$\emptyset$	<b>10.01</b>	<b>2.40</b>	<b>2.92</b>	<b>0.82</b>	<b>7.64</b>	<b>2.88</b>	<b>0.78</b>	<b>1.35</b>	<b>1.94</b>
<b>Range</b>	<b>9.5-10.4</b>	<b>2.3-2.6</b>	<b>2.8-3.2</b>	<b>0.8</b>	<b>7.4-8.1</b>	<b>2.8-3.0</b>	<b>0.7-0.9</b>	<b>1.3-1.4</b>	<b>1.8-2.0</b>

**Table 2** Morphometric measurements of the body length (BL), head length/ width (HL/HW), wing length (WL), antennal flagellum (FL), scape (SC) of the female type series of *Andrena diestelhorsti* sp. n. (in mm).

♀ Specimens ID-No.	BL	HL	HW	HL/HW	WL	FL	SC
130126scwe013 (PT)	10.2	2.6	3.1	0.88	8.3	2.4	0.9
130126scwe014 (PT)	11	2.54	3.25	0.78	8.13	2.5	0.9
130126scwe015 (PT)	10.32	2.53	3.0	0.84	8.2	2.36	0.9
130126scwe016 (PT)	10.7	2.73	3.2	0.85	8.27	2.55	0.99
130126scwe017 (PT)	11	2.59	3.17	0.82	8.2	2.45	0.88
130126scwe018 (PT)	10.97	2.7	3.25	0.83	8.25	2.5	0.89
130126scwe019 (PT)	10.95	2.63	3.2	0.82	8.2	2.5	0.92
130126scwe020 (PT)	10.9	2.7	3.16	0.85	8.1	2.56	0.88
130126scwe021 (PT)	10.95	2.79	3.23	0.86	8.19	2.45	0.92
130126scwe027 (PT)	11.3	2.7	3.22	0.84	8.35	2.44	0.94
130126scwe028 (PT)	10.48	2.6	3.1	0.84	8.2	2.41	0.85
130126scwe029 (PT)	10.54	2.68	3.15	0.85	8.2	2.45	0.94
130126scwe030 (PT)	10.94	2.7	3.22	0.84	8.3	2.52	0.87
130126scwe031(PT)	10.94	2.62	3.28	0.80	8.3	2.47	0.86
130126scwe032(PT)	10.46	2.63	3.28	0.80	8.2	2.4	0.91
130126scwe042 (PT)	10.82	2.64	3.08	0.86	8.42	2.49	0.88
$\emptyset$	<b>10.78</b>	<b>2.65</b>	<b>3.18</b>	<b>0.84</b>	<b>8.24</b>	<b>2.47</b>	<b>0.90</b>
<b>Range</b>	<b>10.2-11.3</b>	<b>2.5-2.8</b>	<b>3.0-3.3</b>	<b>0.8-0.9</b>	<b>8.1-8.4</b>	<b>2.4-2.6</b>	<b>0.8-0.9</b>

**14a** Genitalia: apex of gonostyli comparatively narrow and only weakly convex, gonobase adjacent to the gonocoxal lobes narrowest. Process of sternum 8: bar-shaped long, basally and between the teeth widest, progressively narrowing towards the apex (Fig. 9 A). (BL: 10 mm) .....

..... *A. diestelhorsti* sp. n.

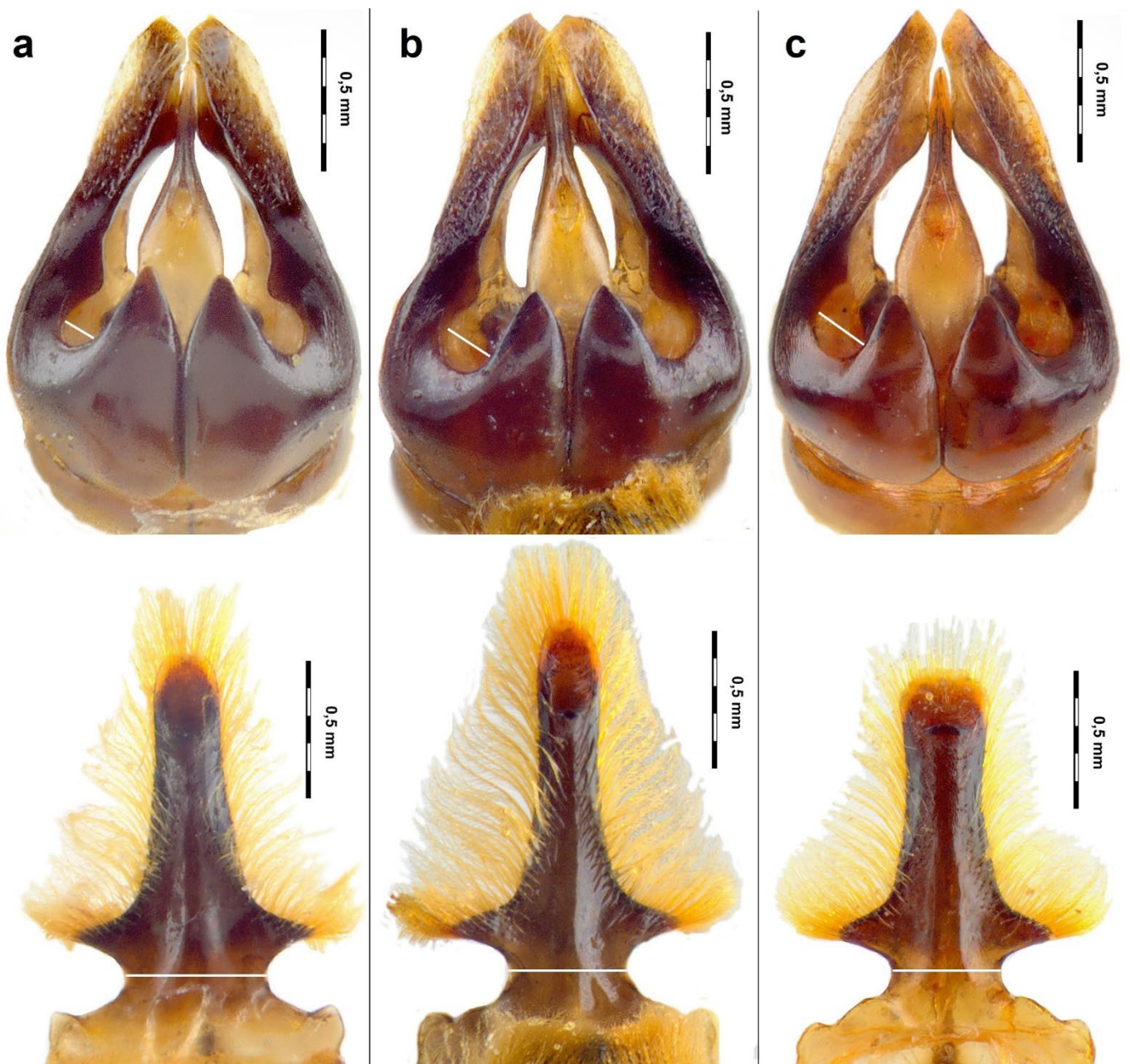
**14b** Genitalia: apex of gonostyli widest and outer margin bulged; gonobase adjacent to gonocoxal lobes broad. Process of sternum 8: bar-shaped long, above the teeth to the apex more or less parallel (Fig. 9 B). (BL: 11 mm)

..... *A. taraxaci* GIRAUD

**14c** Genitalia: apex of gonostyli narrowest, gonobase adjacent to gonocoxal lobes broad. Process of sternum 8: stockier, above the teeth to the apex parallel (Fig. 9 C). (BL:10.5 mm) .....

..... *A. pastellensis* SCHWENNINGER

*Andrena diestelhorsti* can also be distinguished from *A. taraxaci* by the scattered puncture of the scutum and scutellum. While the terga of *A. diestelhorsti* and *A. taraxaci* are polished and shiny, the terga of *A. pastellensis* are shagreened and duller.



**Fig. 9** Dorsal view of Aedeagus and ventral view of Sternum 8 of *Andrena diestelhorsti* sp. n., ID-No.: 130126scwe098 (a), *Andrena taraxaci*; ID-No.: 250425scwe012 (b) and *Andrena pastellensis*; ID-No.: 061212scwe0186 (c).

**Diagnosis females**

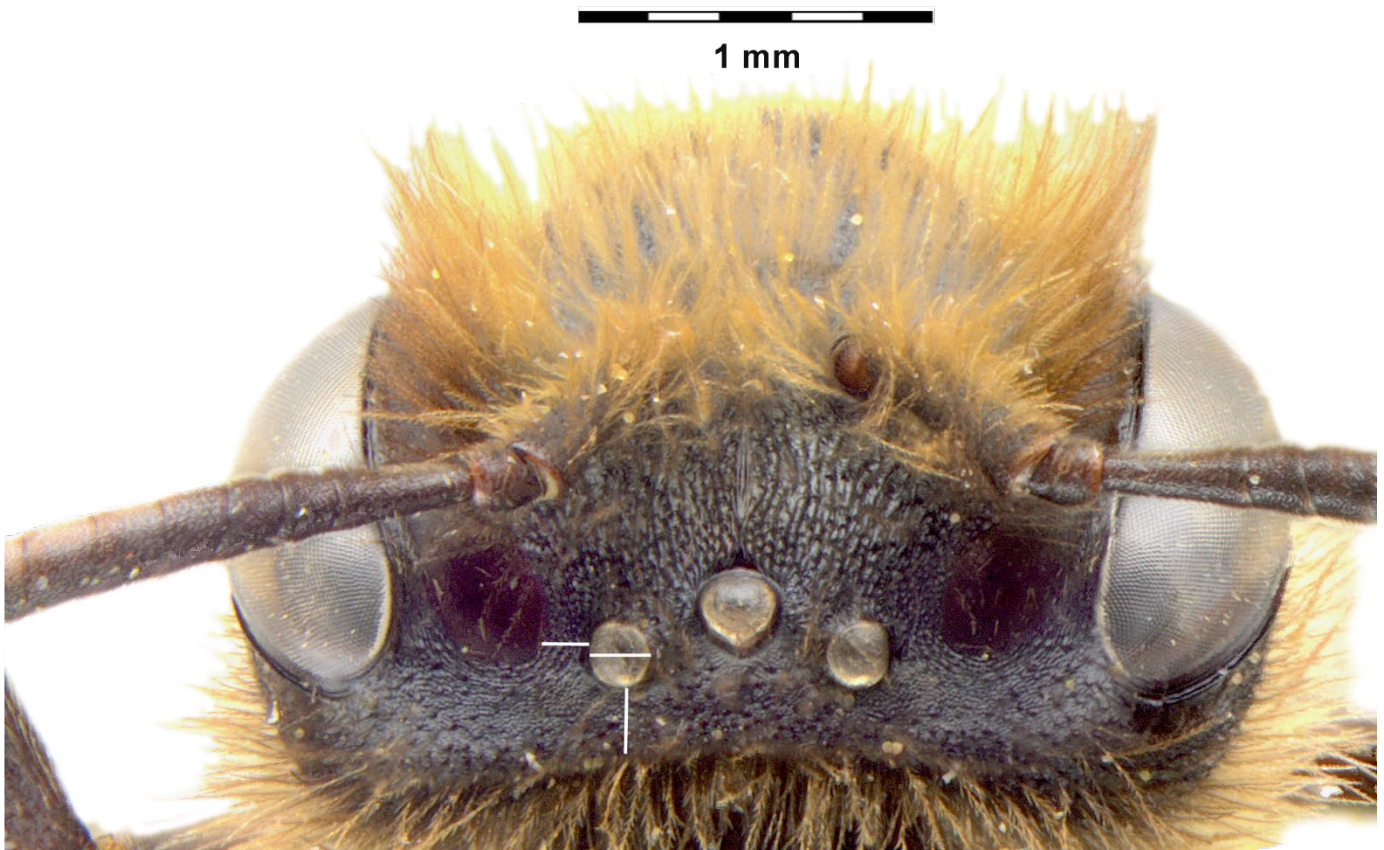
The females of *Andrena diestelhorsti* and *Andrena taraxaci* differ in the coloration of the pubescence of the head. Following the key of SCHWENNINGER (2015), females go to couplet 13 as the foveae are dark brown and the head is covered with well-visible brown hairs, at least around the compound eyes (Figs 10-12). Additionally, the scutum is intensively and uniformly shagreened, without polished or extremely weakly shagreened areas. The punctation of the scutum, at least in the posterior part, is deeply impressed. Mainly the scutellum is weakly shagreened, partly polished and shiny; the median part of the marginal area of the propodeum with pubescence and punctation.

**13a** Caput at the margin of the foveae with only a narrow row of brown hairs, about half as wide as the upper foveae (Fig. 10); nearest distance from foveae to the lateral ocellus smaller than the diameter of ocellus; ocelloccipital distance about 1.4 times the diameter of lateral ocellus. Scutum distinctly shagreened and mostly dull.

Scutellum sometimes more polished in the middle. Terga finer shagreened, faintly shiny. Punctures with exception of the crater-points on tergum 1 much more shallow; more scattered, on scutum and terga, interspaces of 2-3 Pd. (BL:11 mm) ..... *A. stabiana* MORICE

**13b** Caput with more extensive brown pubescence; nearest distance from foveae to the lateral ocellus at least as wide as the diameter of lateral ocellus. Scutellum and tergum 1 shiny and more polished; punctures much denser and coarser, interspaces of 1-2 Pd. .... **14**

**14a** Caput with the most extensive brown pubescence, at least wider as the upper foveae; nearest distance from foveae to the lateral ocellus as wide as the diameter of ocellus, ocelloccipital distance about 2 times diameter of lateral ocellus (Fig. 11). Scutum finely shagreened, scutellum polished and clearly shiny. Terga very finely shagreened and shiny, especially tergum 1 polished and clearly shiny. Punctures of scutum and scutellum coarse, more deeply impressed and with the densest punctation in comparison, interspaces on scutum 0.5-1 Pd and on terga 1-1.5 Pd. (BL:12,5 mm) ..... *A. taraxaci* GIRAUD



**Fig. 10** Dorsal view of the occiput of *Andrena stabiana* (ID-No.: 051216scwe160).



Fig. 11 Dorsal view of the occiput of *Andrena taraxaci* (ID-No.: 130126scwe007).

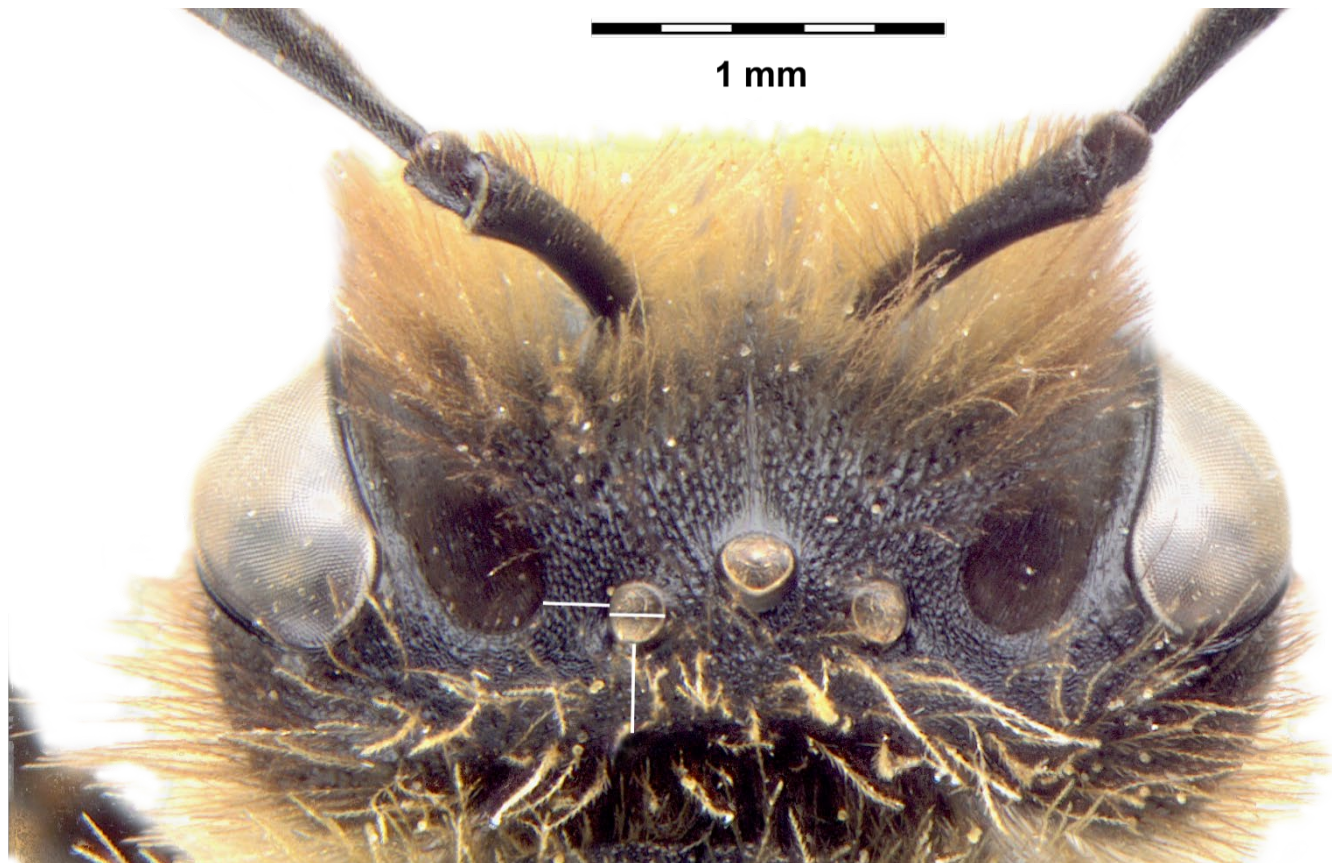


Fig. 12 Dorsal view of the occiput of *Andrena diestelhorsti* (ID-No.: 130126scwe013).

**14b** Caput with brown pubescence, at most as wide as the upper foveae; nearest distance from foveae to the lateral ocellus wider as the diameter of ocellus, ocellocipital distance equalling 1.6 times diameter of lateral ocellus (Fig. 12). Scutum shagreened, duller, scutellum on

distal part mostly polished. Terga with fine shagreen, faintly shiny, except tergum 1 apically polished and clearly shiny. Punctures of scutum with interspaces of 1-1.5 Pd and terga with interspaces of 1-2 Pd. (BL:11 mm) ..... *A. diestelhorsti* sp. n.



**Fig. 13** Locus typicus (a) of *Andrena diestelhorsti* on the Lasithi plateau with feeding habitat and presumable nesting sites (b) (Tzerimado-Plati, 02.04.2026)

**Description of the locus typicus**

*Andrena diestelhorsti* is yet known only from Crete, Greece. The type location of this species is the Lasithi Plateau – a high-altitude karstic plateau situated in the Dikti Mountains of eastern Crete, near the Mediterranean

coast. The Lasithi Plateau (Greek: Oropedio Lasithiou) lies at approximately 830 m a.s.l. (E 25.442832°, N 35.172384°). The climate is too cold for olives or carob trees. Therefore, grains and potatoes are usually grown in the fertile soil. Figure 13 shows foraging habitats and



**Fig. 14** Females of *Andrena diestelhorsti* collecting pollen on flowers of *Leontodon tuberosus* L.

presumably also nesting sites of *A. diestelhorsti* on the Lasithi plateau.

#### Observation of flower visits

*Andrena diestelhorsti* is a typical spring species. All previous records of males and females date back to the month of March and April. Females of *A. diestelhorsti* were observed collecting pollen on flowers of *Leontodon tuberosus* (see Fig. 14) and *Crepis cretica*. They also visited flowers of *Anthemis chia*, but no pollen collecting could be recorded. Like the other species of the *A. taraxaci*-group, *A. diestelhorsti* is probably oligolectic, as only pollen collecting on yellow Asteraceae of the Subfamily Cichorioideae has been observed so far. However,

it would be interesting to investigate, whether they also visit other composites for pollen collection.

#### Distribution of *Andrena diestelhorsti*

*Andrena diestelhorsti* is endemic to the island of Crete. The distribution map of *Andrena diestelhorsti* is displayed in Figure 15. Most records so far are from the Lasithi plateau. With the exception of published but unverifiable historical records from Souda Bay dating to 1925 (WARNCKE, 1965), all recent records come from elevations between 350 m and 830 m a.s.l. Since there are also few records from other localities on the island, it can be assumed that this species occurs throughout Crete, especially in montane regions.

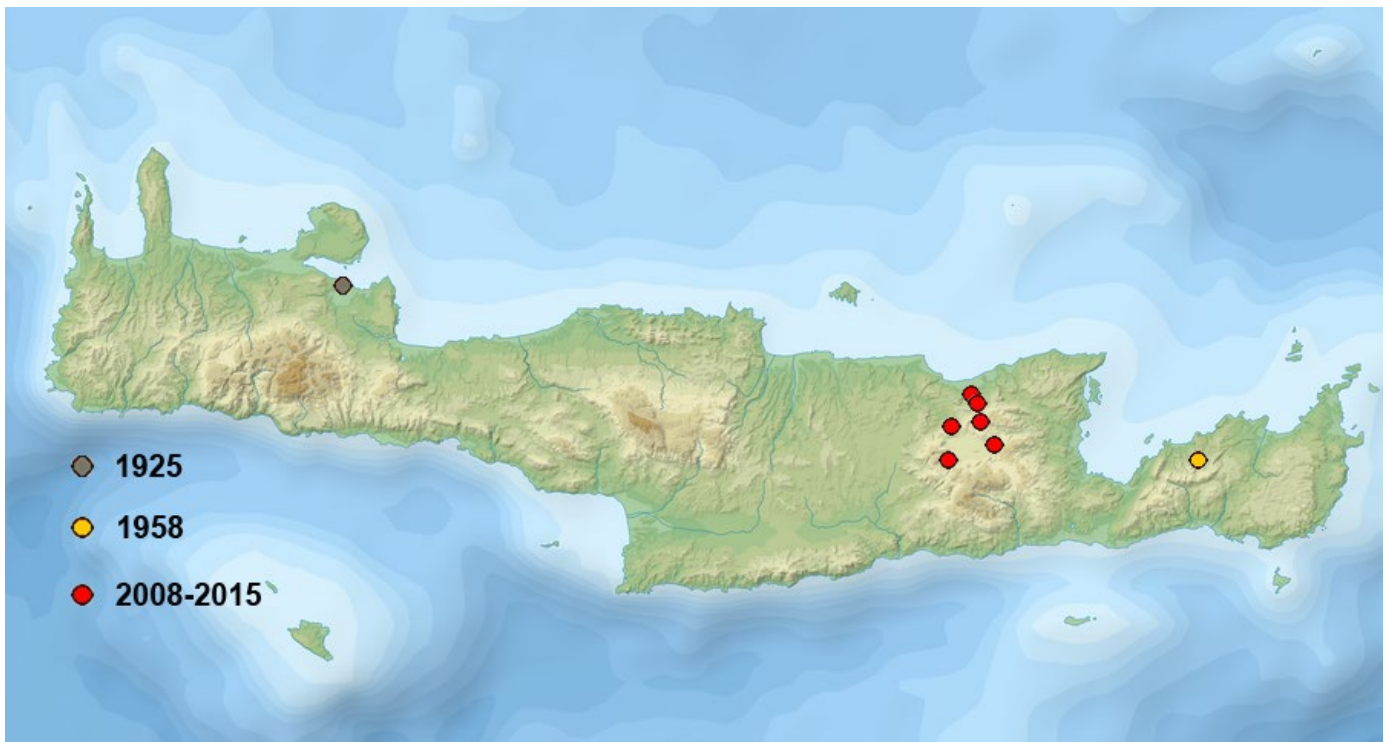


Fig. 15 Distribution map of *Andrena diestelhorsti* sp. n. on Crete.

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