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Description of a new *Andrena* species from Algeria (Hymenoptera: Apoidea: Andrenidae)

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Abstract

Andrena (Parandrenella) tebessana **nov.sp.** (Hymenoptera: Apoidea: Andrenidae) from Algeria is described as new. Important diagnostic characters are illustrated.

Zusammenfassung

Eine neue Sandbiene, *Andrena (Parandrenella) tebessana* **nov.sp.**, (Hymenoptera: Apoidea: Andrenidae) wird aus Algerien beschrieben. Wichtige diagnostische Merkmale werden bildlich dargestellt.

Introduction

The Andreninae are almost ubiquitous in the northern hemisphere, with maximum diversity in mediterranean climate areas (MICHENER 2007). LEPELETIER (1841), LUCAS (1849), DOURS (1872, 1873), PÉREZ (1895, 1903), and SAUNDERS (1908) have been the

first to study the wild bees of Algeria. ALFKEN (1914) worked in areas of Algiers and Medea (central Algeria) and he found 58 species of *Andrena*. SCHULTHESS (1924) lists the species especially of Tunisia and Morocco including the region of Tlemcen (west Algeria) and Annaba (East of Algeria). BENOIST (1961) mentioned 16 species. WARNCKE 1974 published a summary of the distribution of *Andrena* in North Africa according to current knowledge; he listed 199 species from this region, 147 of them are recorded from Algeria. In 1983, WARNCKE recorded 11 species collected in the southern region of Tamanrasset (Sahara).

Since the work of these authors, no taxonomic list was published until the work of LOUADI & DOUMANDJI (1998a, b) and LOUADI (1999) in the region of Constantine and LOUADI & al. (2008), who list 69 species of *Andrena* collected in the northeast region of Algeria. GUSENLEITNER & SCHWARZ (2002) gave the most complete list; they mentioned more than 215 valid species of *Andrena*, distributed in 45 subgenera.

The data on the genus *Andrena* are incomplete and imprecise as this work is patchy and limited to specific regions. That's why we felt it necessary to make a series of sampling in areas not addressed by the authors cited.

The discovery of *Andrena tebessana* expands the list of entomological features of Algeria.

Materials and Methods

Geographical context

Algeria occupies most of the Mediterranean coast between the Atlantic Ocean and the Gulf of Gabes. It extends south across the Sahara to the southern border (BENISTON 1984). Specimens of *Andrena tebessana* were caught in the wilaya (department) of Tebessa and Oum El Bouaghi, located in northeastern Algeria. Both wilaya (department) belong to the highlands constrained by parallel chains of the Tell Atlas in the north and the Saharan Atlas in the south. It is a steppe area characterized by semi-arid climate with cold and dry winters (<400-600 mm / year) and high temperatures in summers (30-36 °C) (BENCHERIF 2008).

Vegetation

The biotope of Tebessa and Oum El Bouaghi is typical of a semi-desert training grassland and shrub (LOUADI & al. 2008). Most wild plants in these regions grow and bloom in spring between March and May. There are a few plants that choose the warmer months to flower (BENISTON 1984).

Flora consists mainly of Asteraceae (*Centaurea pectinata* L., *Centaurea solstitialis* L., *Galactites tomentosa* MOENCH, *Calendula arvensis* L., *Calendula officinalis* L., *Scolymus hispanicus* L., *Echinops spinosus* L., *Picris hieracioides* L., *Sonchus oleraceus* L., *Sonchus arvensis* L., *Artemisia campestris* L., *Artemisia herba alba* ASSO), of Brassicaceae (*Alyssum granatense* BOISS. & REUT., *Arabidopsis thaliana* L., *Sinapis arvensis* L., *Raphanus raphanistrum* L., *Capsella bursapastoris* MOENCH, *Capsella*

burso MOENCH), Papilionaceae (*Medicago sativa* L., *Lathyrus aphaca* L.), Labiatae (*Rosmarinus officinalis* L., *Marrubium alysson* L., *Marrubium vulgare* L., *Thymus algeriensis* BOISS. & REUT.) Malvaceae (*Malva sylvestris* L., *Lavatera trimestris* L.), Salsolaceae (*Atriplex patula* L., *Suaeda fruticosa* FORSK, *Salicornia fruticosa* L.), Papaveraceae (*Papaver dubium* L., *Papaver roheas* L., *Glaucium corniculatum* L., *Roemeria hybrid* L.) and Convolvulaceae (*Convolvulus arvensis* L., *Convolvulus lineatus* L., *Convolvulus tricolor* L.). We also found a low formation of vegetation which covers a very important area in the region of Tebessa, it is the alfa (*Stipa tenacissima* L.) (Gramineae).

The forests are composed of associations of Aleppo pine (*Pinus halepensis* MILL.) (Apiaceae), Holm oak (*Quercus ilex* L.) (Fagaceae), the Phoenician juniper (*Juniperus phoenicea* L.) and the cade juniper (*Juniperus oxycedrus*) (Cupressaceae). There is also the Prickly pear (*Opuntia ficus-indica* L.) (Cactaceae) and on limestone terrains are encountered jujube (*Ziziphus zizyphus* MILL.) (Rhamnaceae).

Sampling and collection stations

Specimens of *Andrena tebessana* were captured in Doukkane station (35°22'05"N 08°04'09"E, 1032 m), University campus (35°23'N 08°05'E, 800 m), Ouenza (35°43'9"N 08°14'9"E, 728 m) and Bouchebka (35°13'06"N 08°19'06"E, 1224 m) in the wilaya (department) of Tebessa. In Oum El Bouaghi, it was captured in Meskiana Station (35°39'3"N 07°39'7"E, 855 m)

The captures took place in March 29, 2008 at Bouchebka, in April 3, 2008 at Meskiana, in April 15, 27, 2007, in April 11, 12, 17 and 20, 2008 and in June 3, 2009 at Doukkane and in March 24, 2009 at Ouenza. In Tebessa, species of *A. tebessana* were captured on *Sinapis arvensis*, *Rosmarinus officinalis* and *Reichardia picrioides*. The specimen of Meskiana was found on *Reseda alba*. The capture was performed by using the vacuum mouth and plastic tubes (5 cm and 3 cm in diameter) (LOUADI & al. 2008). We collected 16 individuals of *Andrena tebessana*: 15 specimens from the wilaya of Tebessa (9 at Doukkane, 4 at Ouenza, 1 at the University Campus and 1 at Bouchebka), but only one specimen from Meskiana (Wilaya Oum el Bouaghi).

Andrena (Parandrenella) tebessana nov.sp.

Description of the female

B o d y l e n g t h : 8.5-9 mm.

C o l o u r : Body black; apical depressions of tergites translucent reddish; ventral sides of flagellomeres 4-10 reddish yellow. Tarsomeres of fore, middle and hind legs and hind tibia brightly reddish yellow. Venation and stigma of the wings pallidly brownish, stigma without darker margin.

P u b e s c e n c e : Pubescence light brownish to whitish with brownish tinge. Mesonotum with ± sparse and very short hairs and a few longer bristles. Dorsal fringe of propodeal corbicula composed of dense and plumose hairs. Scopa whitish with yellow tinge. Caudal fimbria ferruginous. Flocculus short and sparse. Tergites without apical

hair bands or fringes, only with a loose row of bristle-like hairs arising from the base of the depression.

S t r u c t u r e : H e a d distinctly broader than long [fig. 2a]. Basal plate of labrum shortly trapezoidal [fig. 4a]. Clypeus regularly tessellate, only a narrow belt along the apical margin \pm smooth; lateral parts with dense and relatively coarse punctures (interspaces between punctures about 1 puncture diameter), central part with sparse to very sparse and moderately fine punctures (interspaces between punctures more than 2 puncture diameters); central part of clypeus broadly flattened. Foveae very narrow, groove-like [fig. 2a]. Distance between fovea and lateral ocellus three ocellar diameters, distance between lateral ocellus and vertex very close, about 0.1 ocellar diameters. Flagellomere 1 slightly longer than 2 and 3 together, flagellomere 2 quadratic, flagellomere 3 subquadratic. — **M e s o s o m a :** Scutum completely and superficially tessellate, shiny, with moderately dense punctures (interspaces between punctures predominantly 1-3 puncture diameters); scutellum similarly sculptured, but even more shinier. Propodeal enclosure finely rugulose, dull, adjacent areas tessellate and slightly shinier, with indistinct punctures. Mesepisternum completely tessellate, with indistinct crater-like punctures and weak rugulae \pm parallel to the body axis. Submarginal crossvein 1 meeting marginal cell very close to the stigma; recurrent vein 1 meeting submarginal cell 2 at the middle; nervulus \pm interstitial. All tarsal claws without any tooth. — **M e t a s o m a :** Tergite 1 with distinct lateral carinae, superficially tessellate, declivous basal part smooth, altogether \pm impunctate [fig. 1a]. Tergite 2 with narrow transversal basal depression and broad impunctate, widely tessellate apical depression, convex central part of the tergite with very indistinct, laterally with moderately dense to moderately sparse punctures [fig. 1a]. Tergites 3 and 4 similar, but with a narrow smooth belt before the basal margin of the apical depression, each with more distinct and coarser punctures than in tergite 2 [fig. 1a]. Tergite 5 without basal depression, completely narrowly tessellate, with moderately dense to moderately sparse punctures, apical depression narrow, covered by the hairs of the caudal fimbria. Pygidial plate narrowly triangular.

Description of the male

B o d y l e n g t h : 8-8.5 mm.

C o l o u r : Body black; apical depressions of tergites weakly translucent reddish; clypeus whitish with two tiny basal spots. Ventral sides of flagellomeres 3-11 reddish yellow. Tarsomeres of fore, middle and hind legs brightly reddish yellow. Venation and stigma of the wings pallidly brownish, stigma without darker margin.

P u b e s c e n c e : Pubescence whitish with brownish tinge. Tergites with loose apical fringes, composed of normal (not bristle-like) hairs.

S t r u c t u r e : H e a d distinctly broader than long [fig. 8a]. Clypeus superficially tessellate, apical half or third smooth; lateral parts with very dense punctures (interspaces between punctures about 0.5 puncture diameters), central part with distinctly sparser punctures (interspaces between punctures up to 3 puncture diameters). Distance between lateral ocellus and vertex very close, 0.2-0.5 ocellar diameters. Flagellomere 1 slightly longer than 2, flagellomere 2 as long as 3 [fig. 7a]. — **M e s o s o m a :** Scutum completely and superficially tessellate, shiny, with irregularly distributed, moderately fine

punctures (interspaces between punctures predominantly 0.1-3 puncture diameters); scutellum similarly sculptured, but punctures slightly finer. Propodeal enclosure rugulose, dull, adjacent areas similar, with \pm invisible punctures. Mesepisternum completely tessellate, with distinct crater-like punctures. Submarginal crossvein 1 meeting marginal cell very close to the stigma; recurrent vein 1 meeting submarginal cell 2 at the middle; nervulus interstitial to slightly antefurcal. Tarsal claws with tooth (contrary to female). — **M e t a s o m a**: Tergites narrowly tessellate to slightly coriaceous, weakly shiny, punctures sparse to moderately sparse, fine and rather indistinct, slightly denser laterobasally. Tergite 1 with apical part weakly depressed, tergites 2-4 with basal and distinct apical depressions. Apical part of sternite 3 with a weak elevation. Inner surface of sternite 8 hollowed, outer surface with a dense brush of hairs in the apical part, which is separated from the basal part by a circular plate [fig. 6a]. Lateral edges of sternite 8 conspicuously protruded [fig. 6a].

D i a g n o s i s: The submarginal crossvein 1 meeting the marginal cell very close to the stigma in combination with the lateral carinae of tergite 1, the very narrow, groove-like foveae, and the distinct transversal basal depression of tergites 2-4 in the female, respectively the yellowish or whitish clypeus, the strongly modified sternite 8 [figs 6a-c], and the large gonobase [figs 5a-c] in the male places this species unambiguously into the subgenus *Parandrenella* POPOV, 1958.

The subgenus *Parandrenella* contains following species: *A. atrata* FRIESE 1887, *A. crispata* WARNCKE 1975, *A. dentiventris* MORAWITZ 1873, *A. figurata* MORAWITZ 1866, *A. legata* NURSE 1904, *A. nisoria* WARNCKE 1969, *A. taxana* WARNCKE 1975, *A. tuberculiventris* MORAWITZ 1876¹) and *A. tebessana* nov.sp. We have not been able to examine *A. legata*, which is known only from the type series from Pakistan. So this species is disregarded in this paper.

The male of *A. tebessana* is most similar to *A. taxana*. Both, *A. tebessana* and *A. taxana*, have a uniformly brown flagellum (in *A. nisoria* it is tawney on the ventral side), and all hairs of sternite 8 are merged to a single hair brush [figs 6a, 6c]. The latter character is also present in *A. atrata* and *A. crispata*, but these two species differ from all other *Parandrenella* in having additional yellow markings beside the clypeus [fig. 8d], and in having a flat sternite 3 (without apical elevation). In the males of all other members of *Parandrenella*, the pubescence of sternite 8 is divided into several hair tufts and bristles [fig. 6b]. In distinction from *A. taxana* and *A. nisoria* the ventral side of the flagellomeres is \pm straight [fig. 7b] (distinctly convex in *A. taxana* and *A. nisoria*, [fig. 7a]), the scutum is shinier, the punctures of the scutum are less dense (interspaces between punctures predominantly 1-3 puncture diameters in *A. tebessana*, 0.5-2 in *A. taxana* and *A. nisoria*), and the punctures of the tergites are very shallow and indistinct

¹ GUSENLEITNER & SCHWARZ 2001 use the name *A. bicarinata* MORAWITZ 1876 for *A. tuberculiventris*, giving following reason: "Der Name *bicarinata* wird beibehalten, da er verschiedentlich in der Literatur auftaucht, dagegen der Name *tuberculiventris* nie verwendet wurde" (Translation: "The name *bicarinata* is maintained, as it appears variously in the literature, in contrast the name *tuberculiventris* has never been used"). Actually the name *A. bicarinata* appeared more often, but in most cases it was erroneously used for *A. atrata*. In his revision of the subgenus *Parandrenella* POPOV (1958) has synonymized *A. bicarinata* with *A. tuberculiventris*, and has chosen the latter name as valid. Thus, according to the International Code of Zoological Nomenclature, Article 24.2.2. (Determination of precedence of names or acts by the First Reviser) the precedence of *A. tuberculiventris* is fixed.

(distinct in *A. taxana* and *A. nisoria*). The sternite 8 of *A. tebessana* is unique among *Parandrenella* in having a circular plate on the ventral side [fig. 8a] (similar to *A. dorsalis* BRULLÉ 1832 or *A. florivaga* EVERS-MANN 1852, both members of the subgenus *Lepidandrena* HEDICKE, 1933), and strongly produced lateral edges [fig. 8a].

The female is very similar to *A. nisoria* concerning shape and sculpture of the abdomen: Tergite 1 with lateral carinae, tergites 2-4 with narrow transversal basal depression and broad apical depression (e.g. depression of tergite 3 occupying distinctly more than a half of the tergite length) [fig. 1a], whereas in *A. taxana*, *A. crispa*, *A. atrata*, and *A. tuberculiventris* the basal depressions of the tergites are lacking, and the apical depressions are narrower (e.g. depression of tergite 3 occupying distinctly less than a half of the tergite length) [fig. 1b]. In *A. dentiventris* and *A. figurata* the basal depression of the tergites are broader, and the tarsal claws have a tiny tooth, whereas in *A. tebessana* and in *A. nisoria* the basal depressions are narrow, and the tarsal claws are toothless. *A. tebessana* differs from *A. taxana* and *A. nisoria* in having the disc of the clypeus flat [fig. 3a] (slightly convex in *A. nisoria*, strongly convex in *A. taxana* [figs 3b, 3c]), in having all tarsomeres and hind tibia brightly reddish yellow (legs completely brown in *A. taxana* and *A. nisoria*), and in having the punctures of the scutum less dense, interspaces between punctures predominantly >2, only in lateral and apical parts partially about 1 (predominantly 1-2 in *A. taxana*, 0.5-2 in *A. nisoria*); the surface of the scutum and especially of the scutellum is distinctly shinier in *A. tebessana*. The head of *A. tebessana* is distinctly broader than long [fig. 2a] (as broad as long in *A. taxana* and *A. nisoria* [fig. 2b, 2c]).

Floral records: *Sinapis arvensis*, *Reseda alba*, *Rosmarinus officinalis*, *Reichardia picrioides*.

Etymology: The specific epithet refers to the Algerian province Tebessa, where most of the type specimens have been collected.

Material: Holotype: 1♀, "Algérie: Tébessa, Tébessa: Ouenza, 24. III. 2009, S/ *Sinapis arvensis*, Lég. Benarfa Noudjoud" - OLML. Paratypes: 2♀ 1♂ "Algérie: Tébessa, Tébessa: Ouenza, 35°43'N 8°14'E, 728m, 24. III. 2009, S/ *Sinapis arvensis*, Lég. Benarfa Noudjoud" - NB (2♀), ES (1♂); 1♂ "Algérie: Oum El-Bouaghi, Oum El-Bouaghi: Meskiana, 35°39'N 7°39'E, 855m, 03. IV. 2008, S/ *Reseda alba*, Lég. Benarfa Noudjoud" - ES (1♂); 1♀ "Algérie: Tébessa, Tébessa: Doukkane, 35°22'N 8°4'E, 1032m, 11. IV. 2008, S/ *Sinapis arvensis*, Lég. Benarfa Noudjoud" - NB (1♀); 1♀ "Algérie: Tébessa, Tébessa: Doukkane, 12. IV. 2008, S/ *Sinapis arvensis*, Lég. Benarfa Noudjoud" - ES (1♀); 1♀ "Algérie: Tébessa, Tébessa: Doukkane, 15. IV. 2007, S/ *Sinapis arvensis*" - NB (1♀); 2♀ "Algérie: Tébessa, Tébessa: Doukkane, 17. IV. 2008, S/ *Sinapis arvensis*, Lég. Benarfa Noudjoud" - NB (2♀); 1♀ "Algérie: Tébessa, Tébessa: Doukkane, 20. IV. 2008, S/ *Sinapis arvensis*, Lég. Benarfa Noudjoud" - NB (1♀); 1♂ "Algérie: Tébessa, Tébessa: Doukkane, 27. IV. 2007 S/ *Sinapis arvensis*" - NB (1♂); 1♂ 1♀ "Algérie: Tébessa, Tébessa: Doukkane, 3. VI. 2009, S/ *Reichardia picrioides*" - MUC (1♂ 1♀); 1♀ "Algérie: Tébessa, Tébessa: Campus universitaire, 35°23'N 8°5'E, 800m, 14. V. 2007, S/ *Reichardia picrioides*" - NB (1♀); 1♀ "Algérie: Tébessa, Tébessa: Bouchebka, 35°13'N 8°19'E, 1224m, 29. III. 2008, S/ *Rosmarinus officinalis*, Lég. Benarfa Noudjoud" - NB (1♀); 1♀ "TN - Thélepte, 34°59'12"N 8°35'27"E, 14. 4. 1998, W. Haas leg." - ES; 1♀ "SFAX" ('paratype' of *A. nisoria*) - OLML.

Type deposition: OLML = Oberösterreichisches Landesmuseum, Biologiezentrum, Linz (Austria) - MUC = Biosystematics and Ecology of Arthropodes Laboratory Mentouri University of Constantine (Algeria) - ES = Coll. E. Scheuchl, Velden/Vils (Germany) - NB = Coll. Benarfa, Tébessa (Algeria).

Remarks: WARNCKE (1969: 388, 407) described *A. nisoria* from 6 ♀♀ 5 ♂♂ collected in Israel, 2 ♀ collected on Cyprus, 3 ♀ collected in Turkey, and 1 ♀ collected in Tunisia. Referring to the latter specimen *A. nisoria* was cited as part of the Tunisian fauna by WARNCKE (1974: 16), MOUSTAFA (1986: 258), and GUSENLEITNER & SCHWARZ (2002: 1120 [distribution map]). One of us (E.S.) could examine the type series of *A. nisoria* in the Oberösterreichische Landesmuseum in Linz. The paratype of *A. nisoria* from Tunisia is labelled as follows: 1. green label (printed): "SFAX"; 2. red label (handwritten): "Paratype"; 3. white label (printed and handwritten): "*Andrena nisoria* WAR. det. Dr. WARNCKE "; 4. white label (printed): "Coll. K. WARNCKE O. Ö. Landesmuseum Linz/Austria-egg.93". It differs from all other female type specimens, and is conspecific with *A. tebessana*. Therefore *A. nisoria* has to be deleted from the fauna of Tunisia.

Distribution: The distribution area of *A. tebessana* seems to be restricted to a small region in Tunisia and northeastern Algeria. Along with *A. taxana*, which is only known from the type locality in central Spain, *A. tebessana* is the westernmost representative of the subgenus *Parandrenella*. We provide a map [fig. 9] with records of the species of *Parandrenella* (except *A. legata* [Pakistan]), obtained from literature and from specimens examined personally.

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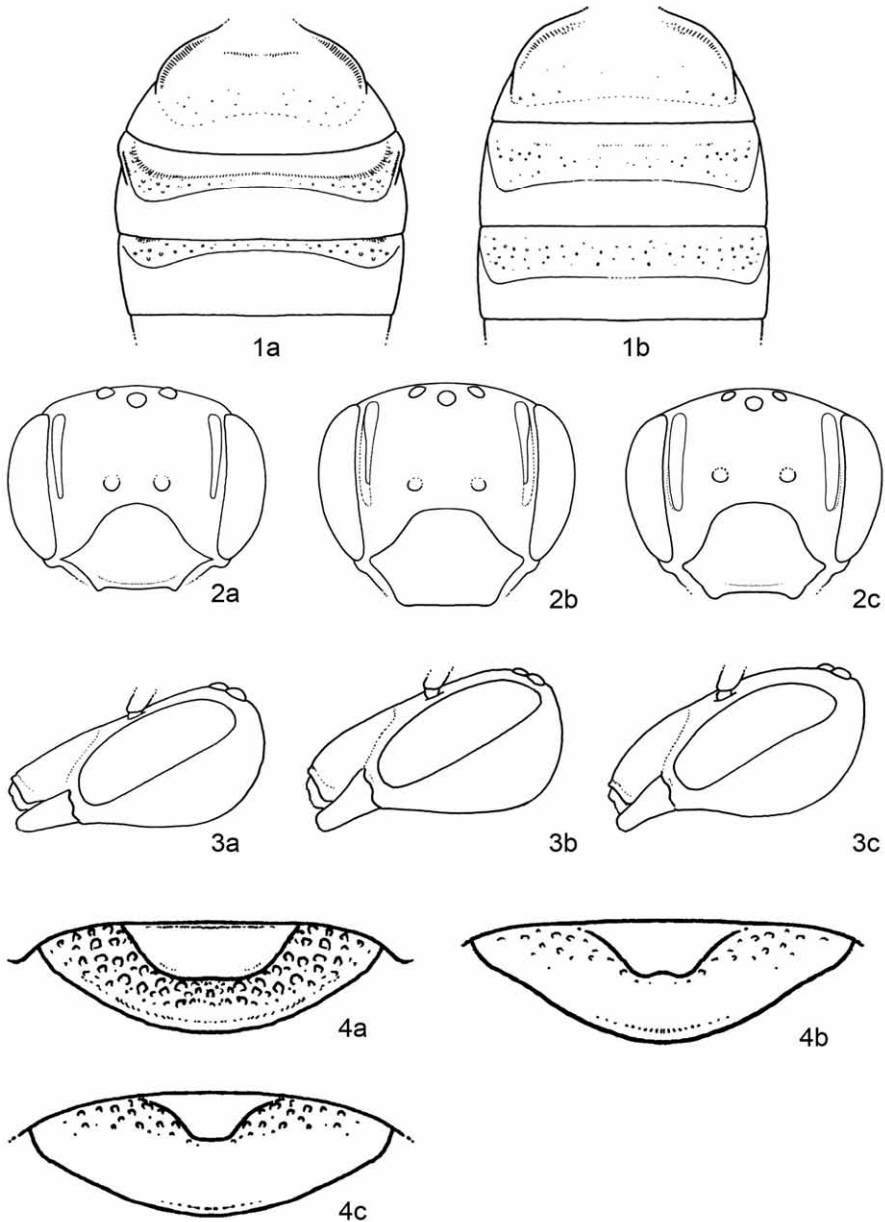


Fig. 1-4: (1) ♀ Tergites 1-3 of: (a) *A. tebessana* and *A. nisoria*; (b) *A. taxana*; (2) ♀ Head (frontal view) of: (a) *A. tebessana* nov.sp.; (b) *A. nisoria*; (c) *A. taxana*; (3) ♀ Head (lateral view) of: (a) *A. tebessana* nov.sp.; (b) *A. nisoria*; (c) *A. taxana*; (4) ♀ Labrum of: (a) *A. tebessana* nov.sp.; (b) *A. nisoria*; (c) *A. taxana*.

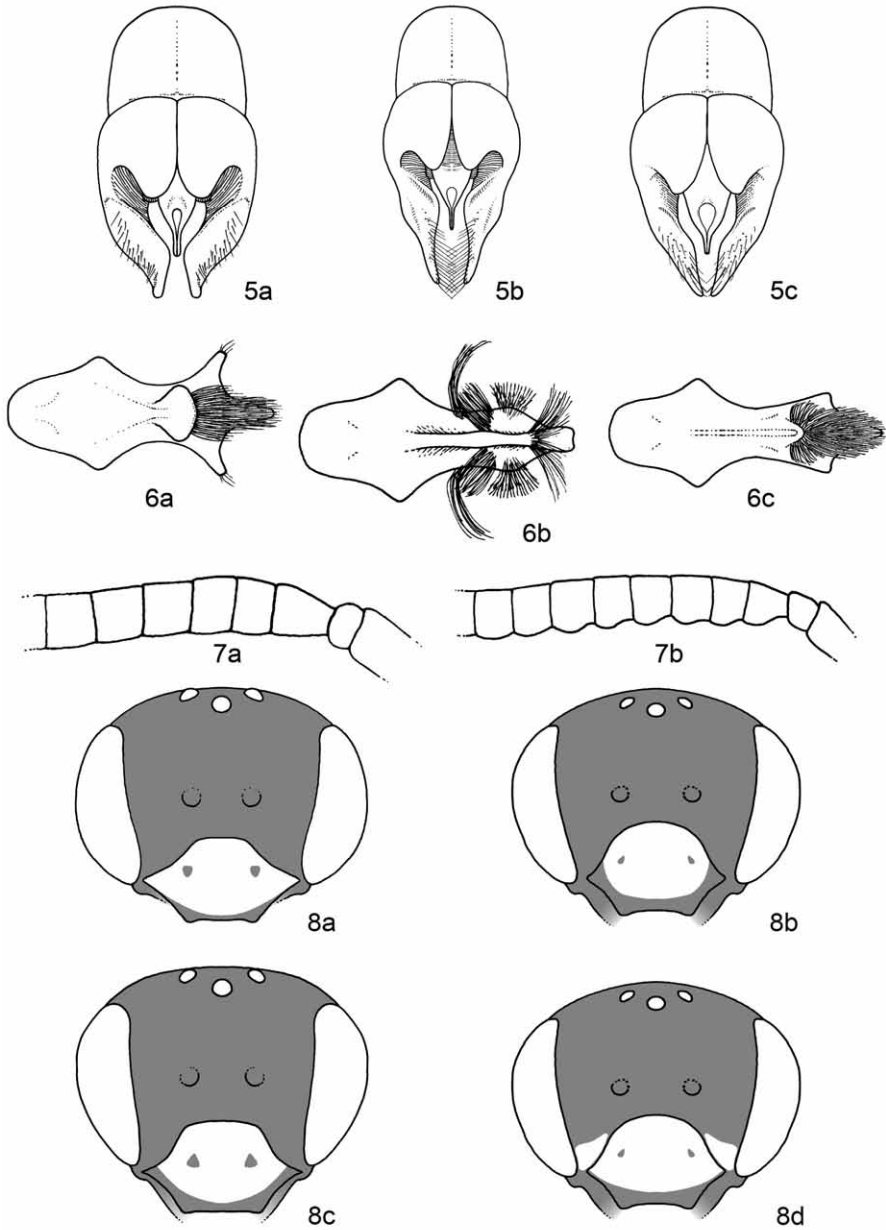


Fig. 5-8: (5) ♂ Genital of: (a) *A. tebossana* nov.sp.; (b) *A. nisoria*, (c) *A. taxana*; (6) ♂ Sternite 8 of: (a) *A. tebossana* nov.sp.; (b) *A. nisoria*; (c) *A. taxana*; (7) ♂ Basal flagellomeres of: (a) *A. tebossana* nov.sp.; (b) *A. nisoria* and *A. taxana*; (8) ♂ Head of: (a) *A. tebossana* nov.sp.; (b) *A. nisoria*; (c) *A. taxana*; (d) *A. crispa*.

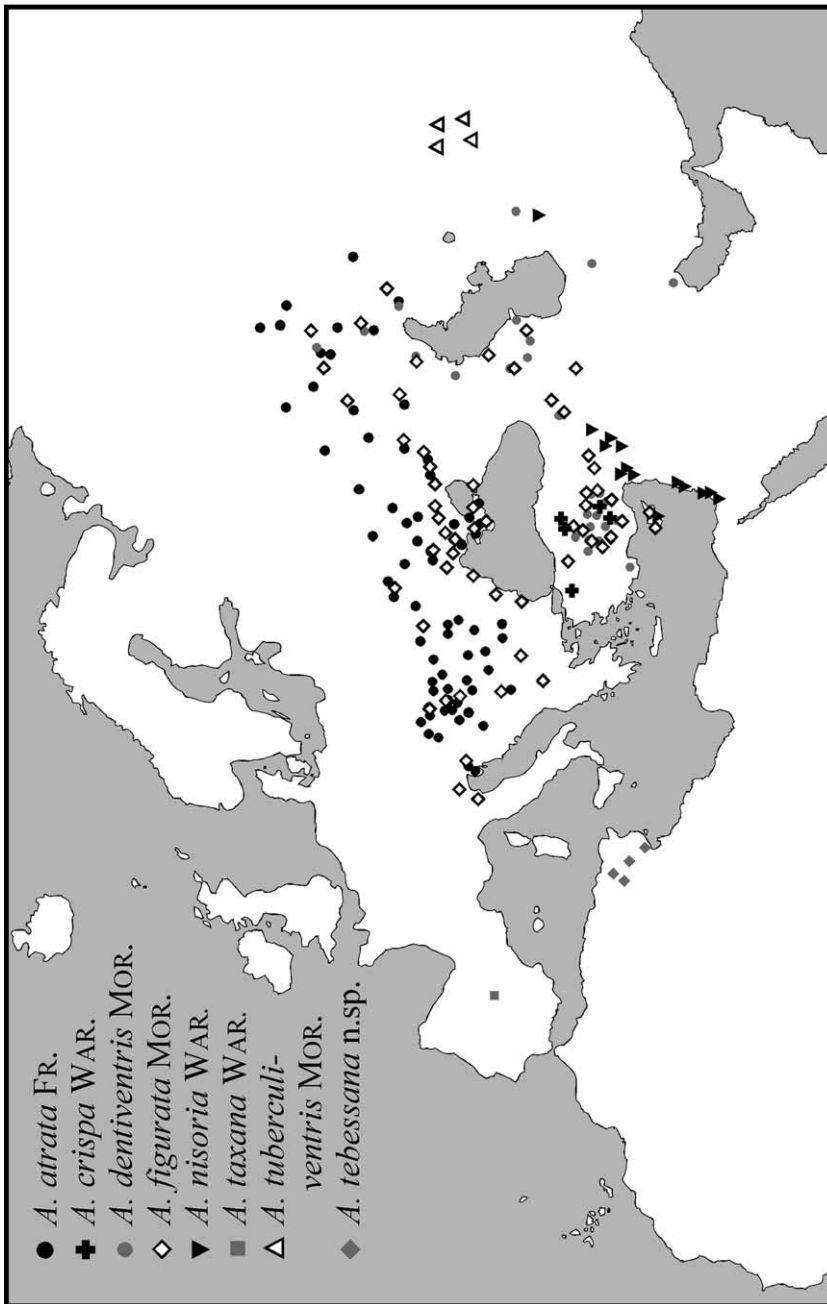


Fig. 9: Distribution map: Records of the species of *Parandrenella* (except *A. legata* NURSE)

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Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

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