



**THE IDENTITY OF *MEGACHILE DORSALIS* PÉREZ AND
MEGACHILE BURDIGALENSIS BENOIST, SP. REV.
(HYMENOPTERA: APOIDEA: MEGACHILIDAE)**

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Abstract - Based on the examination of the type material of *Megachile dorsalis* Pérez 1879 and field observations, *Megachile burdigalensis* Benoist 1940 is recognized as a distinct species and its lectotype is designated. A till now unknown female of this species is described and compared with its closest relative, *Megachile flabellipes* Pérez 1895. *M. burdigalensis* collects pollen from *Lotus tenuis* (Fabaceae). A redescription of a *Megachile dorsalis* female is given.

Izveček - IDENTITETA VRST *MEGACHILE DORSALIS* PÉREZ IN *MEGACHILE BURDIGALENSIS* BENOIST, SP. REV. (HYMENOPTERA: APOIDEA: MEGACHILIDAE)

Na podlagi pregleda tipskega materiala vrste *Megachile dorsalis* Pérez 1879 in opazovanj na terenu je ugotovljeno, da je *Megachile burdigalensis* Benoist 1940 svoja vrsta. Določen je njen lektotip. Opisana je še neznana samica te vrste in primerjana z najbližjim sorodnikom, vrsto *Megachile flabellipes* Pérez 1895. *M. burdigalensis* zbira pelod ozkolistne nokote (*Lotus tenuis*) (Fabaceae). Podan je ponovni opis samice vrste *Megachile dorsalis*.

Introduction

In 1879 J. Pérez described a new species of a leaf-cutter bee, *Megachile dorsalis* from France. The females were similar to *Megachile argentata*, a name used at that time for the species *Megachile leachella* Curtis. The males were, however, different, with dilated, pale front tarsi. In 1940 R. Benoist synonymized the females with "*M. argentata*" after examination of the types and observations in the field. He found only females, but no males that matched the description. On the basis of the only two male specimens from the Pérez collection, he described a new species: *Megachile burdigalensis*. This would be a replacement name by today's nomenclature standards and the revision was decisive for any later nomenclature changes that give different specific statuses to either sex, as described by Pérez.

The revision by R. Benoist has not been accepted by other entomologists who still recognize the Pérez species in the original way or as recognized by H. Friese in his work *Apidae Europaeae*, published in 1899. H. Friese had created much confusion by his key to the species, where he gave a description of *Megachile dorsalis* that in reality belonged to *M. flabellipes*. His mistake had been recognized by Alfken in 1924, although Alfken synonymized *M. flabellipes* with *M. rubrimana* Morawitz. But Friese's observation that "*M. dorsalis*" collects pollen from *Centaurea* flowers has been cited on and on to this day, even though it refers to a different species, *M. flabellipes* Pérez.

In 1967 O. Rebmann described a new subgenus, *Neoeutricharaea*, in which *Megachile dorsalis* was also placed. In 1996, G. van der Zanden synonymized Benoist's *Megachile burdigalensis* with *M. dorsalis* Pérez and accepted the lectotype of *M. dorsalis*, a female from Arcachon, designated by D.B. Baker in 1981.

During a study of the Slovenian bee fauna, I found several males that I identified as *Megachile dorsalis*, or *M. burdigalensis* by Benoist's key to the species, an identification that was confirmed by Gijs van der Zanden from Eindhoven. They were found in an area of abandoned salt-pans near Sečovlje at the Slovenian coast in Istria (UTM: UL93). They were active in July. To clear up the confusion concerning the females of *Megachile dorsalis*, I decided to observe the males and try to find the corresponding females.

Observations in the field

In 1997 I visited the Sečovlje salt-marsh on May 31, June 10 and 21, July 16, 22 and 30, August 12, and September 2. The males, identified as *Megachile dorsalis*, were found on July 16 and 30, always around the flowering *Lotus tenuis* plants. On July 30, they were found together with females which most probably belonged to the same species, although copulations were not observed. The females did not match the description of *Megachile dorsalis* females but were similar to *Megachile flabellipes*, which also occur in the area, but are larger and visit a different host plant. While *Megachile flabellipes* females visit exclusively the *Centaurea* flowers (Asteraceae), these females, like the males, visited *Lotus tenuis* (Fabaceae). Females of the same

species were also observed on August 12 when they collected pollen from the flowers of *Lotus tenuis*. The males were not found at this time.

The species in question has been found only in the Sečovlje salt-marsh, where a soft, sandy ground has been formed by the deposits of the Dragonja river and was not present higher up along the river or on the Karst plateau with rocky ground where its relative, *Megachile flabellipes*, is common.

Comparative material

To compare the material found in Sečovlje, I visited Mr. Maximilian Schwarz in Ansfelden near Linz (Austria). He showed me specimens identified as *Megachile dorsalis* in his collection. The material, collected in Kazakhstan by Popov, in both sexes was very similar to mine, only more hairy. It probably belongs to the same species.

To reach a conclusion the type material of *Megachile dorsalis* had to be examined: Dr. Janine Casevitz-Weulersse from the Paris museum kindly sent me all the existing type specimens from the Pérez collection.

The type specimens of *Megachile dorsalis* Pérez

Material examined:

Lectotype female, Arcach., Museum Paris coll. J. Pérez 1915, Lectotype ♀ *Megachile dorsalis* Pérez, 1879, det. (design.) D.B. Baker 1981.

Paralectotypes: 3 females Royan, Museum Paris coll. J. Pérez 1915, Paralectotype ♀ *Megachile dorsalis* Pérez, 1879, det. (design.) D.B. Baker 1981.

1 female Royan, Museum Paris coll. J. Pérez 1915, Paralectotypus *Megachile dorsalis* ♀ Pérez, design. Malisheva 1989.

1 female Cazaux, Museum Paris coll. J. Pérez 1915, Paralectotypus *Megachile dorsalis* ♀ Pérez, design. Malisheva 1989.

One must mention that the designations of the lecto- and paralectotypes by D.B. Baker and by Malisheva had not been published and the valid designation of the lectotype had not been done until the publication by G. van der Zanden in 1996, who accepted the Baker's lectotype. Malisheva had designated as paralectotypes only those specimens from the type series that were overlooked by Baker and did not designate her own lectotype.

Redescription of *Megachile dorsalis* Pérez

The females of *M. dorsalis* are similar to the females of *Megachile leachella* Curtis 1828. They do not have evident velvety spots at the sides of the second tergum typical of the subgenus *Neoeutricharaea* Rebmann 1967, to which the species is usually referred. In their places, elevated, finer and more closely punctured areas are present, overgrown with hairs. The scopa is white, except for the last sternum with black hairs. In some specimens dark hairs are present also on the apical edge of the fifth

sternum. The sixth tergum has two well separated white spots of scale-like hairs, as in *M. leachella*. The punctuation and microstructure of terga are, however, slightly different. The terga are shiny because the rugosity is shallower. In *M. leachella*, terga are dull. Punctuation is spaced out and is coarser, unevenly distributed. On terga 3-5 the shiny interspaces in some places exceed the diameter of a puncture. The clypeus of *M. dorsalis* is closely punctured to the apical edge except for the unpunctured mid-line. The supraclypeal area is unpunctured and shiny in the middle. The females are 8-9.5 mm long.

In the original description, Pérez (1879) gives the following criteria to distinguish the females of *M. dorsalis* from "*M. argentata*":

The hairs on the back (mesonotum) darker, brown or blackish, only rarely with some scale-like hairs between them which are typical for the comparative species. If scale-like hairs are present, they are scarce, finer and greyish brown.

- The punctuation of the abdomen (terga) coarser and spaced out, so that abdomen is more shiny, except for the second segment.

- Grey spots on the sixth segment (tergum) are round, small and well separated.

Some of these characters also distinguish the females of *M. leachella* (= *M. argentata* auct.) from the closely related *M. pilidens* Alfken 1924, which was not recognised yet at the time of Pérez's description of *M. dorsalis*. Only the punctuation of terga distinguish *M. dorsalis* from *M. leachella* and *M. pilidens*. The possible synonymy of *M. dorsalis* and *M. leachella*, as proposed by Benoist (1940), cannot be ruled out without knowledge of the males.

The females of *M. dorsalis* are not conspecific with males described as *M. dorsalis*. Pérez described two different species under the same name. He did not find them together, as his males are from Bordeaux and his females are from Arcachon, Royan, and Cazaux. While the true males of *M. dorsalis* are still unknown, the other species can now be described in both sexes with the name given to males by Benoist (1940).

***Megachile burdigalensis* Benoist 1940, sp. rev.**

Megachile dorsalis Pérez 1879: ♂ (nec ♀)

R. Benoist described *M. burdigalensis* on the basis of two males from Bordeaux in the Pérez collection. **Lectotype**, here designated, is the only surviving male specimen of the species from this collection preserved in the Muséum National d'Histoire Naturelle in Paris. It is damaged, with only its thorax with mid legs on the needle. The abdomen and head with front legs are in a plastic tube on the same needle. Only the right front tibia and tarsus are preserved. Labels on the lectotype are as follows: 1. MUSEUM PARIS, *dorsalis*, COLL. J. PÉREZ 1915; 2. A little round carmine red leaflet (=September); 3. *Megachile burdigalensis* ♂ Benoist. It has no labels mentioning the locality or its type status, but Benoist (1940) writes that only two male specimens of this species exist in the Pérez collection and with them he described *M. burdigalensis*. We can be quite sure that the selected specimen is one of them.

Benoist gives a drawing of the characteristic front tarsus in his description of *M. burdigalensis*, so the species identity is clear.

The males of *M. burdigalensis* are easily recognizable by a combination of characters:

- Size 7-8 mm.
- Sixth tergum largely covered with white scale-like hairs.
- Front femur more or less reddish-brown apically at the lower edge.
- Front tarsus dilated and reddish-brown, only metatarsus black at the base.
The shape of the metatarsus very characteristic, with curved front edge and triangular extension over the next segment (Fig. 2a), with a deep furrow on the inside.
- Last segments of the antennae flattened, but not dilated.
- Genitalia (Fig. 2b) typical for the subgenus *Neoeutricharaea* Rebmann.

Description of the females:

Very similar and closely related to *M. flabellipes* Pérez 1895, but smaller. Colour of the cuticle black, except for the apical segments of the front tarsi, which are reddish-brown. Second tergum with two velvety spots laterally (Fig. 3), typical for the subgenus *Neoeutricharaea* Rebmann. Sixth tergum with black hairs and only a few scattered scale-like white hairs, which are hardly recognizable and do not form any spots (Slovenian specimens). In the specimens from Kazakhstan, scale-like hairs are more numerous, forming a single white basal spot. Scopa white, black on the last two segments and laterally on some of the others. Clypeus densely punctured, except for the lower edge and a line along the middle that are shiny. Mandible with four triangular teeth. Hairs on the head and thorax light brown on the dorsal and white on the ventral side. Terga 1-5 with greyish apical hair-bands, expanded laterally (Figs. 1c, 3). Terga 1-2 very densely punctured; punctures on the terga 3-5 less dense, with interspaces measuring the diameter of a puncture.

The distinction characters between the **females** of *M. burdigalensis* and *M. flabellipes* are as follows:

M. burdigalensis Benoist

Smaller, about 7.5 mm long.

Supraclypeal area very densely punctured, without interspaces, mat.

Clypeus with a rudimental unpunctured line along the middle.

Punctuation of terga finer.

Second tergum very densely punctured in the middle, but shiny. The interspaces smaller than the diameter of a puncture.

The exposed area of the third tergum anterior to the gradulus much larger so that the gradulus lies almost in the middle of the exposed part of the tergum (Figs. 1c, 3). Pregradular area measured longitudinally in the middle of the tergum is 0.85 x as large as the postgradular area when the abdomen is not extended, contracted or bent.

Hairs on the underside of the hind trochanter and femur shorter and thinner.

M. flabellipes Pérez

Larger, about 8.5 mm long (exceptionally only 7.5 mm).

Supraclypeal area sparsely punctured in the middle, with wide, shiny interspaces.

Clypeus with a continuous unpunctured line along the middle.

Punctuation of terga coarser.

Second tergum usually dull in the middle, at least some interspaces equal to the diameter of a puncture.

Only a narrow area anterior to the gradulus of the third tergum is exposed. Pregradular area measured longitudinally in the middle of the tergum is 0.4 x as large as the postgradular area when the abdomen is not extended, contracted or bent.

Hairs on the underside of the hind trochanter and femur longer and thicker.

An important distinguishing character is behavioural: the females of *Megachile flabellipes* are oligolectic on *Centaurea* flowers (Asteraceae), while *M. burdigalensis* collects pollen from *Lotus* (Fabaceae).



Fig. 1: a) *Megachile dorsalis* female, paralectotype; b) Sečovlje salt-marsh with flowering *Lotus tenuis*, foodplant of *Megachile burdigalensis*; c) a pair of *Megachile burdigalensis* from Sečovlje, left female, right male.

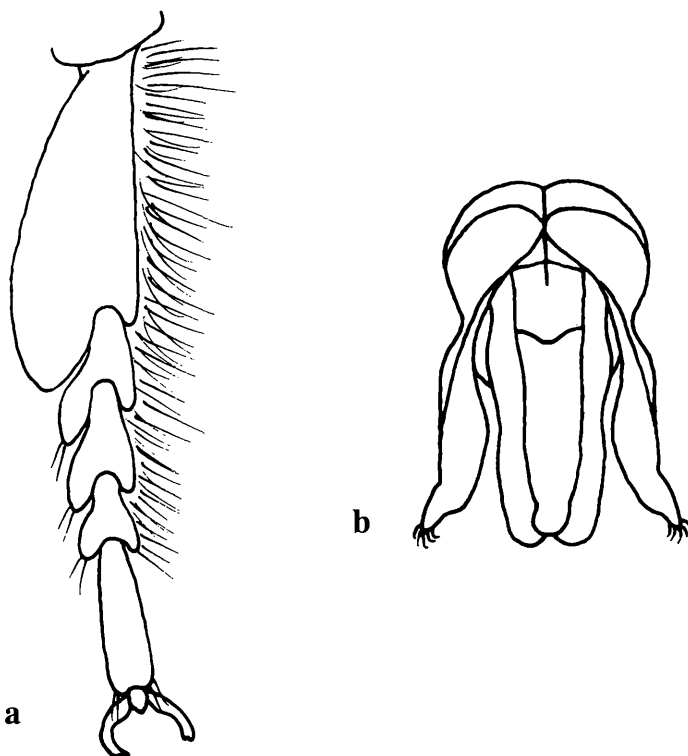


Fig. 2: *Megachile burdigalensis*, male (Sečovlje, Slovenia): a) front tarsus (from outside); b) genitalia.

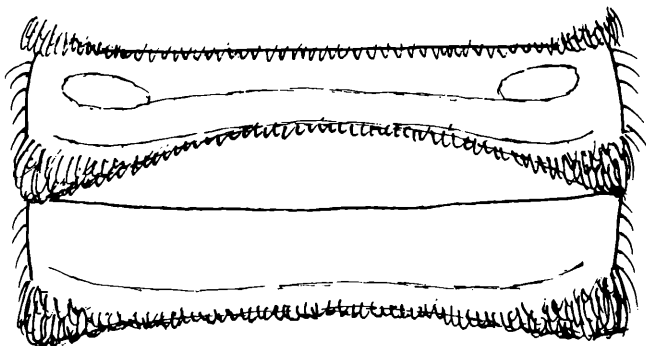


Fig. 3: *Megachile burdigalensis*, female (Sečovlje, Slovenia): terga 2 and 3 (punctuation not shown).

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