

## **Epeolus rozenburgensis nov. spec.** **(Apidae, Hym. aculeata)**

by

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In the years 1934—1938 I regularly found great numbers of *Colletes succincta* L. on "De Beer" (a nature reserve on the isle of Rozenburg, opposite to Hook of Holland, south of the New Waterway). They were much larger than the typical heath form and were also ecologically different as they mainly visited the flowers of *Aster tripolium* L., there being no *Calluna* on the island (van Lith, 1937, *De Levende Natuur*).

Later on, in 1943, Mr. P. M. F. Verhoeff, Den Dolder, described this larger form, of which also a small colony has been found at Pernis (situated on the southern bank of the New Waterway, about 20 km from the coast) and five old specimens from Zeeburg, near Amsterdam, 1909—1911, as a new subspecies: *Colletes succincta halophila*.

According to Mr. O. W. Richards (1937): "Mr. Spooner found large colonies at Scolt Head and Blakeney Point, E. Norfolk, in 1935, on maritime sand. Both sexes were visiting *Aster tripolium* in large numbers while a few were also found on *Limonium* sp. and on *Senecio Jacobaea*; no *Erica* or *Calluna* were present". As Mr. Spooner wrote me his specimens agree in the main with Verhoeff's description, including the rather large average size. Although both Mr. Verhoeff and I have sent specimens to various collectors abroad the only information which we have been able to obtain so far is that according to Mr. R. Hardouin, St. Cloud, this subspecies probably occurs near the French coast of the Straits of Dover, but I have not yet been able to examine these latter specimens.

Owing to the last war I lost contact with the colony on "De Beer". The small colony near Pernis, in clayish sand which had been deposited there through pipelines to raise the grounds for industrial purposes, has disappeared in the meantime. In 1946 and 1947 I could resume my study of the aculeates of "De Beer" but although I observed many specimens of *Colletes succincta halophila* on the flowers of *Aster tripolium*, which was blooming very abundantly in the hot summer of 1947, I did not succeed in finding their nesting site again, the scenery being much changed by the construction of a high dike.

In August 1948, however, I was so fortunate to rediscover the colony. It was situated in a nearly flat, sandy field, probably



somewhat more eastward than eleven years ago, but it had about the same extent, as far as I remember. Up to that time I had never been able to find any cuckoo bee, notwithstanding the fact that in former years I had reared a number of *halophila* from the egg. This year, however, when searching the flowers of *Cirsium* in the neighbourhood of the colony my eye was struck by a very big and black *Epeolus* ♂. A few days later I captured two females and when revisiting the colony together with Mr. Verhoeff on a practically sunless afternoon the latter also took a female, again on *Cirsium*.

There is no doubt that this *Epeolus* is the food parasite of *Colletes succincta halophila*, as there were no other *Colletes* species to be found on „De Beer” at that time of the year and moreover the isolated situation does not make it very likely that they had been carried there by the wind from somewhere else.

The peculiar shape of the frontal area of this bee made it at once clear that it was a representative of the *Epeolus tarsalis* group (see Bischoff, 1930). In 1945 Prof. Dr. B. Pittioni, Vienna, published his very interesting work on this group, containing a description of *praeustus* Pérez ♂ and of *tarsalis* Mor. ♀, which were unknown up to that time, and giving the following details on the distribution of the species belonging to this group:

*Epeolus tarsalis* Mor. (1873) — Mongolia, Transcaucasia, Southern Russia, Austria (host *Colletes collaris* Dours).

*E. praeustus* Pérez (1883) — Tyrol, Eaux-Bonnes (Pyrenees) (host *Colletes collaris* Dours = *frigidus* Pérez, according to Noskiewicz).

*E. sibiricus* Rad. (1887) — Vladivostock (host *Colletes collaris* Dours?).

Prof. Pittioni gave us every assistance and sent the following specimens for comparison:

♂ ♂ *Ep. tarsalis* Mor., Burgenland, Weiden, 1.IX.1935, det. Pittioni.

*Ep. tarsalis* Mor., N. Mongolia, Leder 29, det. Friese 1893, det. Pittioni.

*Ep. praeustus* Pér., allotype, Tyrol (Schlett.) 1887, det. Pittioni.

♀ ♀ *Ep. tarsalis* Mor., allotype, Bisamberg, Vienna, 30.VIII. 1936, det. Pittioni.

*Ep. tarsalis* Mor., N. Mongolia, Leder 29, det. Pittioni.

*Ep. praeustus* Pér., St. Pauls, Tyrol, det. Friese 1893, det. Pittioni.

Furthermore, Mr. Verhoeff sent his own *Epeolus* ♀ to Mr. R. Benoist, Fontainebleau, who kindly compared this specimen with the types of *praeustus* Pérez at Paris and who replied as follows: „J'ai comparé votre *Epeolus* avec le type de l'*Epeolus praeustus* de Pérez; ils concordent bien, sauf sur quelques points de détail: le type de Pérez est un peu plus petit, il mesure



8½ mm, les pattes sont rouges avec le dessous des fémurs un peu teinté de brun ; les taches abdominales sont légèrement teintées de roux, celles des 3e. et 4e. tergites sont un peu plus larges et accompagnées d'une très petite tache latérale (votre exemplaire sur le 3e. seulement) ; les tubercules huméraux sont d'un brun rougeâtre. — La structure est la même chez les 2 insectes, en particulier le „Stirnschildchen" ainsi que la ponctuation du 2e sternite abdominal et des fémurs postérieurs."

Although there is even more resemblance between the specimens from "De Beer" and those of *E. tarsalis* Mor., especially those from S.E. Europe, there are yet many, though slight differences which I expect will prove to be constant and there is such a marked difference in ecology — their parasitic relationship to *Colletes succincta halophila* for instance — that I feel entitled to consider the form from "De Beer" as a separate species, for which I propose the name of *Epeolus rozenburgensis* nov. spec. This opinion also agrees with that of Prof. Pittioni as set out in his work „Die Bienen des südöstlichen Niederdonau (Allgemeines zur Gattung *Epeolus*)", Niederdonau, Natur und Kultur, 1942, 19 : 61.

Anyhow, the four forms *tarsalis*, *praeustus*, *sibiricus* and *rozenburgensis* are very closely allied, though not as much as for instance *cruciger* Panz., *similis* Höppn. and *marginatus* Bisch. There may be authors who would prefer a subspecific separation, but to solve this problem definitely much more material of all the forms should be examined.

Unfortunately, there is only a very limited material of this group available for study so far, in all a few tens of specimens. I hope, therefore, that more attention will be given to this very interesting genus, not only to their morphological characters but also to their ecology. As far as I know *rozenburgensis* is the only species of which ♂ and ♀♀ as well as the host, have been found together.

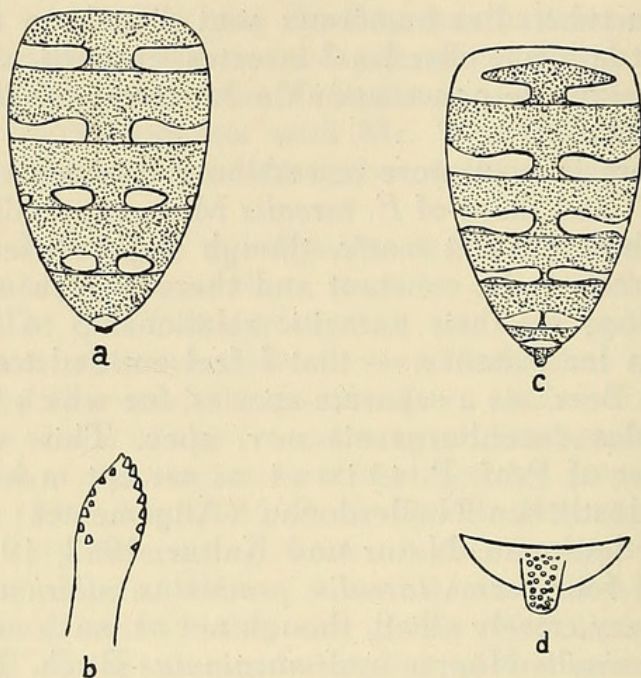
## DESCRIPTION.

### Female.

Length 8½—10 mm. Labrum closely and coarsely punctured, along the basis in the middle a narrow smooth and shining area, on the lower half two toothlike tubercles, which are not as long as in *tarsalis* and rather blunt, the distance from the anterior margin is about one third of the length of the labrum. Frontal area raised and enlarged on both sides, partly overhanging the implantation of the antennae (like in the other species of this group). Front and the area between the compound eyes and the ocelli rather coarsely punctured, interspaces at the utmost as broad as the punctures, vertex behind the ocelli about as coarsely but much more closely punctured. Clypeus very closely and finely punctured, mat, with a narrow smooth and shining anterior margin, on the line between the clypeus and this margin there are a few much larger punctures. Underside of the third joint of the antennae about 1½ times as long as broad at the apex, somewhat shorter than the fourth joint, the middle joints are somewhat longer than broad.



Mesonotum, scutellum and mesopleurae very closely and coarsely punctured. Metapleurae in the middle with a few rather shining



*Epeolus rozenburgensis* nov. spec.

a: Abdomen of female — b: Lateral process of sixth sternite of female — c: abdomen of male — d: Seventh tergite of male.

spaces between the punctures which somewhat exceed the size of the punctures. Metanotum smooth and shining, with large punctures in the upper angles. Area cordealis mat, very finely rugose.

Punctuation of the tergites very fine and close, finer and more regular than in the male, interspaces almost invisible through the black pubescence. Fifth tergite only slightly concave on the sides. Tergite 1—4 with a narrow smooth and shining posterior margin. Pygidial area truncated, triangular, rather rugosely punctured. Sternites finely and closely punctured, on the second and the third sternite the interspaces are about as broad as the punctures, in the middle of the second sternite the punctuation is more remote, the interspaces being much broader than the punctures; there are a few larger punctures intermixed. Sternites 4 and 5 more closely punctured. Foreside of the hind tibiae on the basal half coarsely and rather closely punctured, somewhat more closely than in *tarsalis* and much more closely than in *praeustus*, on the lower part the interspaces are narrower than the punctures, on the broadest part only there are a few larger smooth spaces. The outer half is finer and more closely punctured.

Colour black; the ends of the mandibles, a very indistinct spot on each side of the basis of the labrum, the tegulae, the two raised parts of the scutellum and the area connecting these, the ends of the



tibiae and femora, and the tarsi are red. The claws are darker than the tarsi.

Face covered with white pubescence round the implantation of the antennae only, the rest of the head is covered with short yellowish-brown erect hairs. Prothorax with a narrowly interrupted band of brownish-yellow pubescence. Mesonotum with two brownish-yellow longitudinal stripes which reach about as far as the foreside of the tegulae or somewhat further; before and behind the tegulae and under the implantation of the hind wings a tuft of long brownish hairs. In the upper angles of the metanotum a large spot of silvery pubescence. Margin of the tubercles with brownish-yellow pubescence. The remaining parts of thorax and scutellum with erect, very short and thick, black hairs. Sternites also covered with very short, dark hairs. The third and fourth sternite with an indistinct, mostly interrupted band of white pubescence.

Posterior margin of first and second tergite with an interrupted band of white pubescence with brownish tinge, foreside of the band of the second tergite emarginate on both sides. Posterior margin of the third tergite with an interrupted band in the middle and a white spot on both sides thereof, fourth tergite with an interrupted band in the middle only, no spots on the sides. On the first tergite the distance between the two parts of the band is about twice as large as the breadth of the band, on the following tergites that distance gradually diminishes, so that on the fourth tergite the distance is about equal to the breadth. End of the fifth tergite with a rather large, lozenge-shaped patch of silvery shining hairs which, however, are only visible when seen from a certain angle. The rest of tergite 1—5 is closely covered with dull black, broad hairs. On both sides of the upper part of the vertical part of the first segment a very vague spot consisting of a few reddish hairs. Pygidial area with long, erect, brown hairs.

Legs with short, yellowish-brown hairs, hind coxae covered with white pubescence. Back of the hind tibiae with a row of long, curved, brown hairs on the line between the densely punctured back and the smooth underside. Inside of the tarsi golden brown. Nerves of the wings black brown, basal parts paler, a broad border of the wings and the forepart of the marginal cell blackly clouded.

The structure of the sixth sternite very much resembles that of the *tarsalis* ♀ from Bisamberg as figured by Pittioni (1945, plate 6, fig. 1). On the lower end of the lateral processes of this sternite there are seven tubercles which are about equal in size, on the upper end a few tubercles of about the same size and 4 to 5 much smaller tubercles. Posterior margin of the sixth sternite fringed with mixed short and long hairs.

#### Male.

Length (abdomen somewhat pulled out by preparing genitalia) 10 mm. Structure of labrum, frontal area, vertex, mesonotum and metanotum as in female. Underside of third joint of antennae about



$1\frac{1}{2}$  times as long as broad at the apex, somewhat longer than the fourth joint, the middle joints are somewhat shorter than broad. Metapleurae closely punctured, interspaces mat, not as broad as the punctures. First and second tergite very closely punctured, with smooth interspaces, hardly visible through the black pubescence, on the sides the punctuation is somewhat coarser and irregular, posterior part somewhat finer, punctuation of the following tergites somewhat coarser and more irregular; tergite 1 to 6 with a narrow smooth and shining posterior margin. Seventh tergite with a pygidial area with nearly parallel sides and rounded posterior margin, on both sides of this pygidial area the seventh tergite is very concavely impressed. The pygidial area is very coarsely and irregularly punctured.

Sternites finely punctured, more remotely than the tergites, on the second sternite the interspaces of the central area are somewhat broader than the punctures.

Foreside of the hind tibiae closely punctured (more closely than in *tarsalis* and much more closely than in *praeustus*) — somewhat more closely punctured than in the female —, on the lower basal part the smooth and shining interspaces are somewhat broader, but not as broad as the punctures. The outer half is more finely and closely punctured. The underside of the hind tibiae is shining and without punctures.

Colour black, except the ends of the mandibles, which are red. The fore tarsi are dark red, the middle and hind tarsi are very dark. Margins of sternites reddish.

Face covered with a dense white pubescence which reaches higher than the implantation of the antennae. Rest of the head with short, whitish hairs. Prothorax with a band of yellowish-white pubescence which is very much narrowed in the middle. Are also covered with yellowish-white pubescence: anterior half of the mesonotum (but not very densely), with two rather vague longitudinal stripes which reach about as far as the tegulae, a narrow margin round the mesonotum and the tubercles. The posterior half of the mesonotum and the scutellum with short, thick, brown black erect hairs in the punctures. Mesopleurae, mesosternum, postscutellum and the upper angles of the metanotum with silvery white pubescence. Before the implantation of the hind wings a tuft of long brownish hairs. Outside of the legs with white hairs, coxae with white pubescence, inside of the tarsi golden brown. Back of the hind tibiae with a row of long hairs as in female. Underside of metatarsus 3 with long dark hairs.

Anterior margin of first tergite with a band of whitish pubescence, narrowed in the middle, posterior margin with an interrupted band of whitish pubescence, on the sides connected with the anterior band. The vertical part of the first segment is covered with a very fine and white pubescence. Second, third and fourth tergite with narrowly interrupted bands of whitish pubescence at the end, running to the sides of the tergite and slightly emarginate on both sides, especially those of the third and the fourth tergite. The band



of the fifth tergite is hardly interrupted, on the sixth tergite the band is vague. The pubescence of the posterior bands of the first four tergites is tinged somewhat yellowish-brown.

Sternite 1 to 4 with very short, erect, brown hairs; end of the second sternite with a band of white pubescence, also on the third and fourth sternite, but hairs somewhat longer, the third and the fourth sternite are slightly emarginate at the end, with a smooth and shining margin. Fifth sternite and, to a lesser degree also the sixth sternite, in the middle with a tuft of long and broad, brown black hairs, pointing backward, at the margin the hairs are thinner and paler.

The rest of the abdomen is covered with dull black pubescence. Wings as in female. Genitalia very much like those of *tarsalis* and *praeustus*, as figured by Pittioni (1945, plate 6, figs. 5—8), pale yellow.

Holotype : ♀, 5.IX.1948, "De Beer" (Rozenburg), leg. v. Lith, coll. Natuurhistorisch Museum, Rotterdam.

Allotype : ♂, 29.VIII.1948, "De Beer" (Rozenburg), leg. v. Lith, coll. Natuurhistorisch Museum, Rotterdam.

Paratypes : ♀, 5.IX.1948, "De Beer" (Rozenburg), coll. v. Lith  
♀, 11.IX.1948, "De Beer" (Rozenburg), coll. Verhoeff.

The ♂ differs from *tarsalis* Mor. (the Austrian specimen) in the larger size, the black colour of the antennae (also of the underside thereof) and of the abdomen, the black nervures and the dark clouded wings, the darker colour of the legs, the darker hairs of the underside of metatarsus 3 and of sternites 5 and 6, the more closely punctured second sternite and hind tibiae, probably also in the nearly parallel sides of the pygidial area of the 7th tergite (I have only been able to examine this area in the Mongolian specimen, where the sides were rather much convergent), the shorter tubercles of the labrum and the somewhat longer third joint of the antennae.

The *praeustus* Pérez ♂ (from Tyrol) is also smaller and paler, whilst the punctuation of the second sternite and of the foreside of the hind legs is still more remote. In this specimen also the punctuation of the front is much more remote.

The ♀ differs from *tarsalis* Mor., like the ♂, by the larger size, the darker colour (of the nervures, the border of the wings, the pygidial area and the sternites), the somewhat longer third joint of the antennae, the shorter tubercles of the labrum, the closer punctuation of the second sternite and of the foreside of the hind tibiae and further by the very indistinct patch on the margin of the fifth tergite and the absence of white spots on the sides of the fourth tergite. There are only a few pale-coloured hairs on the foreside of the first tergite.

In the *praeustus* Pérez ♀ (from St. Pauls) the punctuation of



the second sternite and of the foreside of the hind tibiae, also of the front, is still more remote, the white spots on the sides of the fourth tergite are very distinct and the distance between the two parts of the marginal bands is much greater. (The tubercles of the labrum are about as short as those of *rozenburgensis*; the scutellum is much darker).

Differs from the type of Pérez (according to Mr. Benoist) by the larger size (the ♀ of Pérez measures  $8\frac{1}{2}$  mm), the darker colour of the legs, the somewhat paler colour of the marginal bands, which are somewhat narrower on the third and fourth tergites and the absence of white points on the fourth tergite. The tubercles are darker than those of the type of Pérez. The punctuation of the second sternite and of the hind tibiae of *rozenburgensis* and of *praeustus* Pérez should be similar according to Mr. Benoist, but to be sure of this more specimens of *rozenburgensis* and all the types of *praeustus* (Pérez describes 3 ♀♀ taken at Eaux-Bonnes) should be compared.

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