

On the systematic position of *Huetheriella* Jeannel, with description of a new species from Anatolia (Coleoptera: Cholevidae, Bathysciinae)

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Abstract: The Anatolian genus *Huetheriella* Jeannel has so far been placed among the genera "incertae sedis". A series of *Huetheriella* specimens from Anatolian caves enables description and illustration of the male and female genitalia of this cavernicolous genus and to establish its systematic position in the "Theleomorphes" of the second division of Jeannel, near *Pisidiella* Jeannel, of the phyletic line of *Phaneropella* Jeannel.

Huetheriella notenboomi n. sp., described from the cave Sakal Tutan Düdeni in SW Anatolia, is close to *H. maximiliani* Jeannel. Differentiating characters of these two species are presented. Zoogeographical and ecological notes are given on *Huetheriella* and other hypogean Coleoptera of the western Taurus.

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Introduction

The genus *Huetheriella* and its type-species *maximiliani* were described by Jeannel (1934) on a series of 15 female specimens collected by L. Weirather in the Fersine (or "Ferzene") Mağarasi (cave) near Seydişehir (Western Taurus). The well known French specialist stressed the peculiar features and the great interest of the new taxon; however, lacking male specimens, he could not insert the new genus in his last taxonomic revision (Jeannel, 1924), mainly based on the morphology of the fore tarsi and of the male genitalia. The same problem was met by Laneyrie (1967) and Guéorguiev (1976), so that *Huetheriella* has so far been placed among the genera "incertae sedis".

A series of male and female specimens of Bathysciinae belonging to *Huetheriella* from two different caves, collected by Jos Notenboom and other members of the biospeleological group of "Speleo Nederland" during their investigations in Western Taurus, now gives us the opportunity to describe as new the second species of *Huetheriella*, to complete the diagnosis of the genus and to make clear its relationships.

Huetheriella Jeannel, 1934

Huetheriella Jeannel, 1934: 164.

Huetheriella Laneyrie, 1967: 635.

Huetheriella Guéorguiev, 1976: 119.

Huetheriella Casale & Giachino, 1985: 226.

Type-species: *Huetheriella maximiliani* Jeannel, 1934.

A genus of medium-sized cave-dwelling Bathysciinae with convex, elongate, pholeuonoid, densely punctate-pubescent body (figs. 1-2).

Head anophthalmous, not retractile, with weakly indicated, almost obsolete occipital carina; antennae reaching or passing the middle of the elytra, with joint 2 longer than 1. Mouth apparatus partially modified to take food by filtering: mandibles (fig. 10) large, irregularly bidentate, dorsally depressed, with a fringe of long setae on the inner side; labium finely ciliate, ligula and epipharynx with long filtering setae.

Pronotum relatively small, transverse, convex, wider than head, narrower than elytra; lateral sides narrowed anteriorly, weakly or almost not sinuate in the basal half; base gently arcuate, oblique near the basal angles, a little wider than the anterior side.

Metatergal apparatus with basal piece extremely reduced and middle apophysis very elongate and narrow.

Mesosternal carina low, a little prominent on metasternum, forming an obtuse angle, with ventral side almost truncate in *H. maximiliani*, hollowed in *H. notenboomi* n. sp. (figs. 4-5). No metasternal carina.

Elytra egg-shaped, very convex, strongly punctate-pubescent, fully covering the apical segments of abdomen; punctures deep, foveate, arranged in coarsely transverse rows in the basal half; sutural stria absent.

Legs relatively long and slender. Protibiae gently arcuate, thickened in the apical third, with inner and outer apical spurs, with neither outer comb of bristles nor apical fringe of setae. Meso and metatibiae with developed spurs on the outer side. Fore tarsi in the male with four undilated joints. Hind tarsi slender, with joint 1 as long as 2 and 3 taken together. Claws long, slender, normally arcuate.

Male genitalia (figs. 6-9): aedeagus large, slightly arcuate; penis wide and short in dorsal view; parameres shorter than the penis, strongly dilated, incavate and partially membranous at apex, each with three apical setae. Inner sac with a complex of basal and middle chitinized pieces and developed apical wands.

Female genitalia (figs. 11-12) strongly characterized: fore area of bursa copulatrix covered by spinulose scales, with a well chitinized structure at the insertion of the ductus spermatecae. This structure, similar to a small metatergal apparatus, could have the function to protect the bursa and ductus, the abdominal terga, except the apical two, being peculiarly reduced to a unsclerified membrane (fig. 3). Gonostyli each with one apical, three outer and one inner seta. Spermatheca elongate, bilobed, with a membranous annexed glandula; ductus very long and thin.

Huetheriella maximiliani Jeannel, 1934

Figs. 1, 4, 6, 8, 10

Material examined

1 ♀ paratype: "gr. de Fersine. Mt. Kybelon" "Taurus d'Ilsaurie. L. Weirather 33" "Type" "Museum Paris Coll. R. Jeannel 1931"; 13 (♂♂, ♀♀) and remains of 17 specimens:

Turkey, vil. Antalya, Sussuz, Güversin Taşı Deligi cave, F. Hovenkamp leg., August 12, 1986 (Zoölogisch Museum, Amsterdam, and Authors' coll.).

General description

The original description by Jeannel (1934), only on female specimens, is rather accurate and complete. The total length varies from 3.1 to 3.5 mm (not from 3.5 to 4.0, as indicated by Jeannel). The general characters are given above in the diagnosis of the genus. Teguments covered by extremely dense, serrate punctures; pubescence long, decumbent. Lateral sides of pronotum rounded, very weakly sinuate anteriorly to the basal angles; elytra with maximum width at about the middle.

Female genitalia as in the description of genus.

There is no evident sexual dimorphism: the shape of the body, the length of antennal joints, the width and number (four) of joints of fore tarsi are the same in both sexes.

Description of the male genitalia

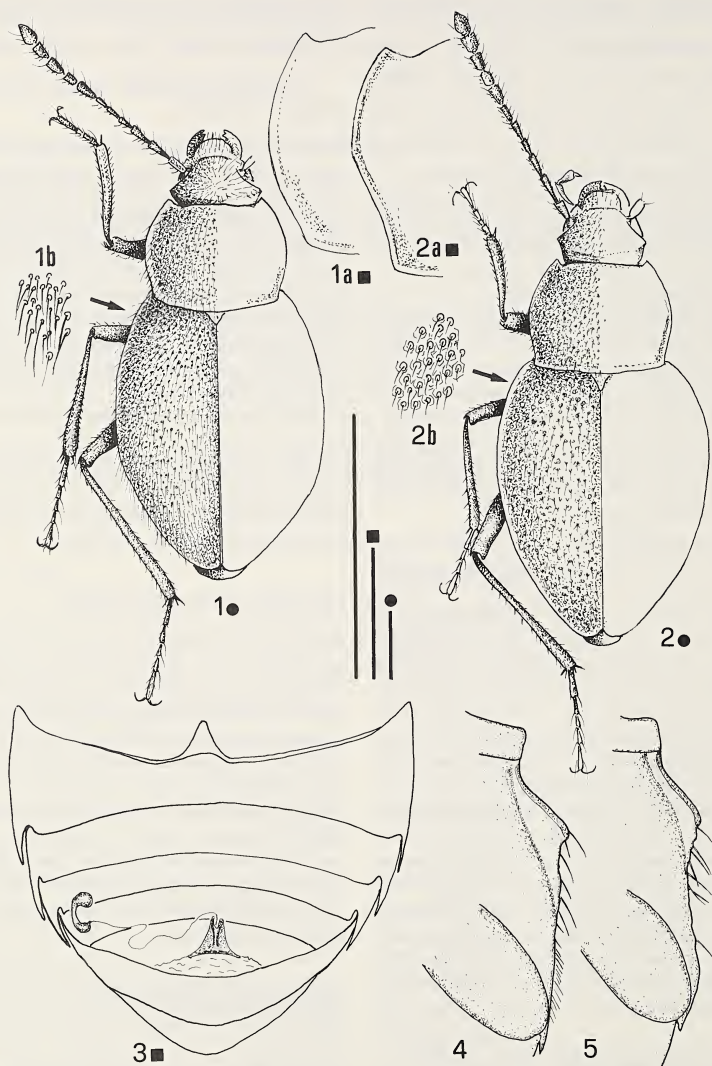
Aedeagus (fig. 6) large, weakly arcuate, with regularly rounded apex in dorsal view. Basal lamina of tegmen wide and rounded, well chitinized. Parameres not reaching the apex of aedeagus, gently sinuate in the basal third, dilated, spoon-shaped at the apex, which is partially membranous; each paramere has three roughly equal setae, two of which in an outer subapical and one in an inner subapical position. Inner sac with a large, scaly basal bulbus and complicated chitinized pieces; middle area with a shield-shaped piece; apical wands big but poorly chitinized.

Huetheriella notenboomi n. sp.

Figs. 2, 3, 5, 7, 9, 11, 12

Type material

Holotype ♂ "Turkey, vil. Antalya, 7 km NNE Süleymaniye, Sakal Tutan Düdeni (cave) [= Sakaltutan mağaraları] 1650 m, 13.VI.1987, J. Notenboom leg." (Zoölogisch Museum, Amsterdam); 2 ♂♂, 4 ♀♀ paratypes, same as holotype (Zoölogisch Museum, Amsterdam, and Authors' coll.).



Figs. 1-5. *Huetheriella* ssp., morphological characters. 1, *H. maximiliani* Jeannel, habitus; 1a, idem, particular of the pronotum; 1b, idem, particular of the elytron pubescence; 2, *H. notenboomi* n. sp., habitus; 2a, idem, particular of the pronotum; 2b, idem, particular of the elytron pubescence; 3, idem, abdomen, dorsal side with bursa copulatrix and spermatheca in natural position; 4, *H. maximiliani*, mesosternal carina; 5, *H. notenboomi* n. sp., mesosternal carina. (Scale: 0.5 mm).

Etymology

Dedicated to the biospeleologist Jos Notenboom from Haarlem (The Netherlands) who first discovered this new species.

Diagnosis

Similar to *H. maximiliani* in its general features (figs. 1-2), but easily distinguishable for the following characters: teguments with more regularly ranged, foveate and distanced punctures carrying much shorter pubescence (figs. 1b, 2b); sides of pronotum more evidently sinuate anteriorly to the basal angles (figs. 1a, 2a); elytra with their maximum width well before the middle; mesosternal carina with hollowed ventral side; and different structure of aedeagus (figs. 6-7), with subtruncate, not rounded, apex, parameres with a different position of apical setae, and inner sac with a different structure of the chitinized pieces.

Description

Total length 3.12-3.25 mm. Colour relatively dark reddish brown, with lighter, reddish yellow palpi, antennae and tarsi. Body very convex; teguments relatively opaque, uniformly covered by large, foveolate punctures coarsely transversally arranged on the elytra, carrying a yellow golden, erected, moderately long pubescence.

Head elongate, anophthalmous; mouth parts as in the description of the genus. Antennae long, reaching the middle of elytra; joints 7, 9 and 10 slightly thickened at apex; joint 11 regularly constricted at apex. Other joints subcylindrical, longer than wide; joint 1 longer than 2; 3 as long as 1; 4, 5, 6 of the same length, as long as 3/4 of 3; 7 as long as 3; 8 half as long as 7; 9 and 10 of the same length, as long as 4; 11 as long as 3.

Pronotum transverse (length/width ratio: 0.75-0.80), with the maximum width at about the middle; sides arcuate, slightly angulate in the middle, regularly and distinctly sinuate in the basal half. Basal side distinctly wider than the anterior side and narrower than elytra.

Elytra elongate ovoid, fully covering the abdomen, with their maximum width before the middle; sutural stria absent.

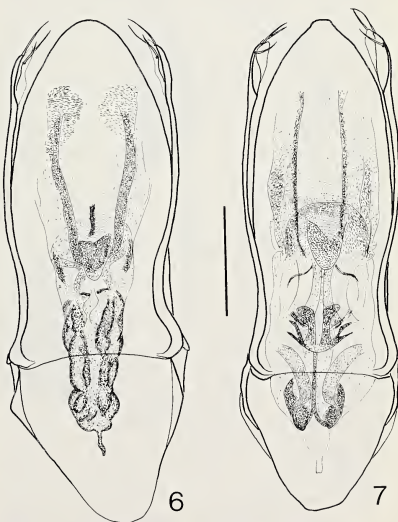
Mesosternal carina (fig. 5) low, a little prominent on the metasternum, forming an obtuse angle and with ventral side a little hollowed.

Legs as in the description of the genus.

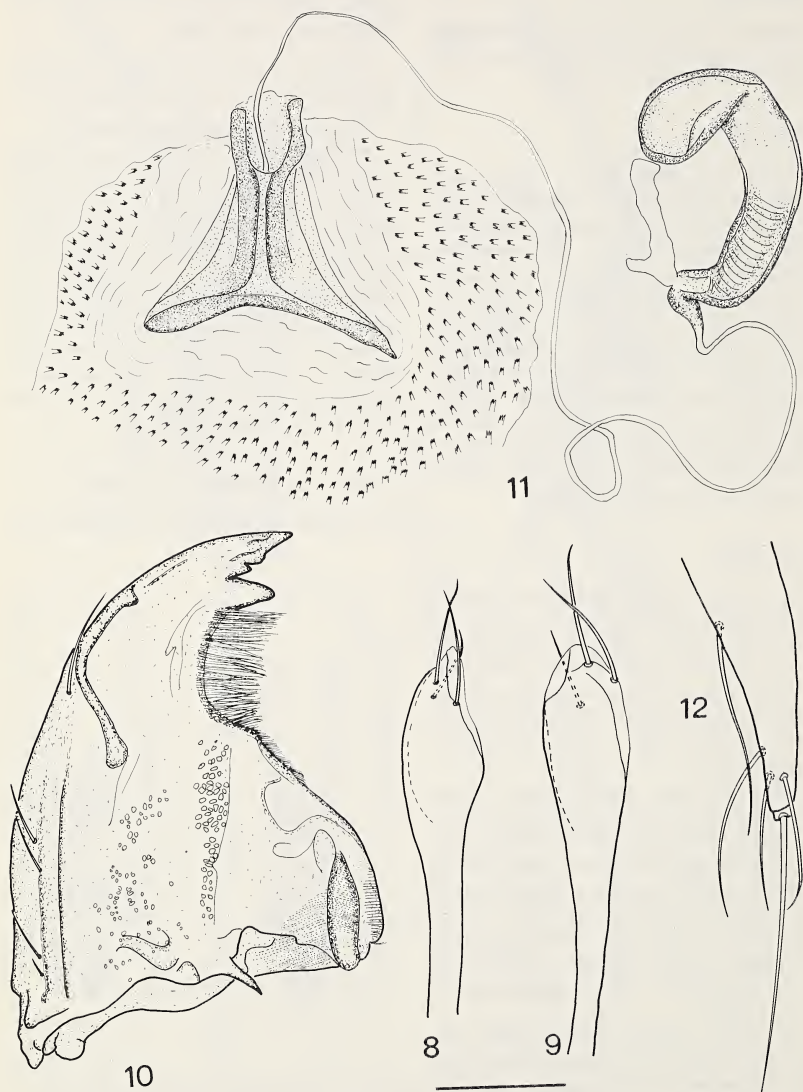
Aedeagus (fig. 7) large, short and weakly arcuate. Penis at the apex subtruncate in dorsal view; basal lamina of the tegmen wide and rounded, well chitinized. Parameres not reaching the apex of the penis, gently sinuate in their basal half, widened, spoon-shaped and partially membranous at apex, with three moderately long setae; two in a subapical outer position and one in a subapical inner position. Inner sac with large basal bulbous, well developed basal and middle pieces, very big and well chitinized apical wands.

Ecology and distribution of the genus

On account of its pholeuonoid shape, ante-



Figs. 6-7. *Huetheriella* spp., aedeagus, dorsal side. 6, *H. maximiliani* from the cave "Güversin Taşı Deligi"; 7, *H. notenboomi* n. sp., holotype. (Scale: 0.25 mm).



Figs. 8-12. *Huetheriella* spp., morphological characters. 8, *H. maximiliani*, right paramere, lateral side; 9, *H. notenboomi* n. sp., holotype, right paramere, lateral side; 10, *H. maximiliani*, left mandible, dorsal side; 11, *H. notenboomi*, female paratype, bursa copulatrix with spermatheca; 12, idem, left gonastylus, dorsal side. (Scale: 0,1 mm).

riorly narrowed body, globose elytra, long legs, *Huetheriella* presents the highest degree of specialized adaptation to the subterranean environment of all the Anatolian Bathysciinae, to the same extent as some European genera of other phyletic lines, such as *Leonhardia* Reiter, 1901, and *Setnikia* Breit, 1913, of the Bosnian caves.

On the other hand, the strongly pubescent teguments and the partially modified mouth parts suggest that the species of this genus are adapted to a particular way of life, perhaps to taking food in semi-liquid medium. This high degree of specialization to the subterranean environment seems demonstrated by the fact that *Huetheriella* specimens were found, till now, only in some large, oligotrophic, high altitude and relatively cold caves, some of them with streams, lakes and cascades.

Ferzene Mağarasi, at an altitude of 1,400 m 4 km south of Seydişehir, is a well known, 350 m long cave. It is well decorated but frequently visited and damaged by vandals.

Güversin Taşı Deliği is situated in a large doline within sight of Suğla Gölü. The cave has two entrances, with a small downstream and a more important upstream.

Sakal Tutan Düdeni (= Sakaltutan mağaraları) 7 km NNE of Süleymaniye, 28 km N of Akseki, at an altitude of 1,650 m, is a 292 m deep cave, with vertical entrance of -80 m. Deeper into the cave the amount of flowing water and the number of cascades increase. At about -300 m the meander reaches the river gallery. Water T = 3.8 °C; air T = 4.5 °C (informations by J. Notenboom).

The *Huetheriella* specimens in Güversin Taşı Deliği were collected by F. Hovenkamp at 400-500 m from the entrance, near excrement of unidentified bats. In Sakal Tutan Düdeni the beetles were found by J. Notenboom, assisted by W. Hovenkamp and A. Elderson, at different depths, dwelling on or nearby pieces of wood.

In any case, the distribution of the genus seems confined to the massifs of Küpe D. (Kybelon) - Gidengelmaz Dağları, which arise west of the Suğla Gölü lake, south of Seydişehir. The limestone unit in the area be-

longs to the autochthonous Mesozoic carbonate series; geological and speleological informations on this area were reported by Skuce et al. (1977).

H. maximiliani is known from two caves at the eastern side of Kupe Dagi; the new species, *H. notenboomi* here described, lives in a cave at the S.-W. side of the Gidengelmaz Dağları mountains.

Systematic and biogeographical remarks

The characters of the male (genitalia and fore tarsi) described in this paper support the original hypothesis of Jeannel (1934), later questioned by the same author (Jeannel, 1955: 5), that *Huetheriella* should be collocated systematically among the "Theleomorphes" of the "second division" of his Monograph (Jeannel, 1924), partly corresponding to the "Bathysciinae" sensu Guéorguiev (1976). In particular, on account of the morphology of the penis, inner sac and the peculiar parameres, the genus seems closely related to *Pisidiella* Jeannel, 1930, of which *Huetheriella* is a derived, more specialized southern line. The main phyletic characters of *Pisidiella*, which so far includes three species distributed in caves from the Beshsheir lake in the east to the Davras mountains in the west, are the same as those of *Huetheriella* (see Jeannel, 1947; 1955). However, in *Pisidiella* the bathyscioid body, with short and decumbent pubescence, the shorter legs and antennae with joint 1 about as long as 2, shows a less specialized degree of adaptation to the hypogean environment; on the other hand, in *Pisidiella* the structure of the inner sac of the penis is more plesiotypic and more similar to that of *Phaneropella* Jeannel, 1910, a more primitive genus of the phyletic line to which *Huetheriella* also belongs.

Thus, *Huetheriella* must be added to the "Southern Aegean" troglobitic elements (with *Phaneropella* and *Pisidiella* among the Bathysciinae, and *Duvalius* of the "*huetheri* group" among the Carabidae Trechinae), which coexist in Western Anatolian Taurus with the "supraflagellés" Bathysciinae of the other Northern phyletic lines, with pentamere fore tarsi in

the males, like *Coiffatiola* Jeannel, 1955, *Cavazzutiella* Casale & Giachino, 1985, or other "Northern Aegean" (Balkanian or Caucasian) elements among the Carabidae Trechinae, such as *Duvalius* (*Duvaliotes*) *bortesii* Casale & Vigna, 1984, and genera of the *Neotrechus* phyletic line.

These present-day results of primitive dispersal and subsequent evolution and local speciations, make this Mediterranean area one of the most highly interesting both from a bio-speleological and a biogeographic standpoint (Casale & Vigna Taglianti, 1984; Casale & Giachino, 1985).

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