

Studies on genus *Speluncarius*, with description of a new subgenus and notes on the systematic position of *S. (Hypogium) albanicus* (Coleoptera, Carabidae, Pterostichini)

Borislav V. Guéorguiev¹ & Roman Lohaj²

¹ Natural Museum of Natural History, 1 Blvd. Tzar Osvoboditel, 1000 Sofia, Bulgaria.
E-mail: bobivg@yahoo.com

² Institute of Forensic Sciences, Kuzmányho 8, SK-041 02 Košice, Slovakia.
E-mail: lohaj@minv.sk, rlohaj@gmail.com

SUMMARY

The examination of the holotypes of *Speluncarius ponticus* and *Platysma albanicus* demonstrates that the two taxa are members of separate phyletic lineages of the genus *Speluncarius*. On this ground the new subgenus *Pontotapinus* **subgen. nov.** is proposed, based on type species *Speluncarius ponticus* Casale & Giachino, 1991. On the other hand, the study suggests that *Hypogium* represents a well-isolated lineage probably with a basal position within the genus, and not belong to the “molopite complex”. The female genitalia of the type species of *Speluncarius* s. str., *Hypogium* and *Pontotapinus* **subgen. nov.** as well as parameres of the genus type are illustrated and described for the first time. Remarks on the systematics of the genus are made based on the present knowledge of the adult morphology. As a result of these monophyly or polyphyly of *Speluncarius* cannot be demonstrated at present while the monophyly of the complex “*Tapinopterus* – *Speluncarius*” is well-supported by three clear synapomorphies. Key to subgenera of *Speluncarius* is also provided.

Keywords: Carabidae, Pterostichini, *Speluncarius*, taxonomy, Eastern Mediterranean, Albania, Turkey

INTRODUCTION

Most species of microphthalmic and eyeless pterostichine beetles from the Western Palearctic region belong to the genus *Speluncarius* Reitter, 1886. Species from this genus are distributed from north-western Italy through Croatia, Bosnia and Herzegovina, Montenegro, Albania and Greece to the north-eastern Turkey. At present there are 25 valid species in the genus grouped in four subgenera (Bousquet, 2003). Eighteen described species inhabit Greece and Turkey and more than 60 new species from Greece await description (Giachino pers. com., 2007) which coincides with the center of the diversity of the genus *Tapinopterus* Schaum, 1858. Some authors expressed the view that *Speluncarius* may be polyphyletic with respect to *Tapinopterus* and that these two genera are closely related (Jeanne, 1982; Sciaky, 1982; Casale & Giachino, 1991; Casale et al., 1998; Guéorguiev & Guéorguiev, 1999). The presence of distinct transverse apophysis on the left paramere in the type species of the subgenera *Speluncarius* s. str., *Elasmopterus* Kraatz, 1886, *Hypogearius* Jeannel, 1953 as well as in *S. ponticus* Casale & Giachino, 1991 (Jeannel, 1953: 14, Fig. 11; Casale & Giachino, 1991: 218, Fig. 7; Sciaky & Persohn, 1994: 44, Fig. 3; current paper, Fig. 1) is evidence that the genus belongs to the “pterostichite complex” (cfr. Bousquet, 1999: 37). Only the systematic position of *Hypogium* Tschitschérine, 1900, which has been frequently discussed (Jeannel, 1950; Jeannel, 1953; Vigna Taglianti, 1973; Sciaky, 1982; Casale & Giachino, 1991), is not definitely settled since the male of *S. albanicus* is hitherto unknown. However, the study of several previously unconsidered morphological features contribute to the correct systematic position of this remarkable species.

Generally, the work aims to examine and describe new characters in the adults from some lineages of *Speluncarius*, as well as to specify the relationship between this genus and *Tapinopterus*. Comparison and a more detailed examination of *S. albanicus* and *S. ponticus* are provided as we assume that both belong to different phyletic lineages of the genus. Moreover, the former is a species which up to now has been known only from single specimen collected more than 100 years ago.

MATERIAL AND METHODS

The following material has been studied:

Speluncarius (*Speluncarius*) *anophthalmus* (Reitter, 1886)

3 specimens, including 1 syntype (MNHUB); 3 specimens (HNHM); 11 specimens (NMW); 1 male, “Herzegovina, Reitter” / “Zool. Inst. St. Petersburg” (ZISP); 1 female, “Herzegovina, Reitter” / “174” / “Zool. Inst. St. Petersburg” (ZISP); 1 female, “Pl. 4,3. 6.26 1200 m. Trubar Gau” / “*Speluncarius trubarensis*” (BMNH); 79 specimens, Herzegovina, Dikliči, Djediči, Žarbina jama, Jama pod Velikom Cbinom, Jakština pečina (NMP); 15 specimens, Herzegovina, Popovo polje (NMP); 3 specimens Montenegro, Golodražnica, route Risan – Kotor, “*Speluncarius anophthalmus golodraznicensis*”

(NMP); 2 specimens, Dalmatia, Kotor, "*Speluncarius anophthalmus kotorensis*" (NMP); 6 specimens, Bjelašnica, "*Speluncarius anophthalmus radošensis*" (NMP); 1 female, SW Herzegovina, Popovo polje, Zavala env., Orlica pečina Cave, 11.6.2000, R. Mlejnek leg. (cRL); 8 specimens, Herzegovina, Trebinje env., Matuličova pečina Cave, 16.9.2003, G. Dunay, R. Lohaj, J. Lakota and D. Čeplík leg. (cDC; cGD; cJL; cRL); 52 specimens, Herzegovina, Orjen Bjela Gora, Milanov Ocijek, ca 1000 m a.s.l., 1-4.6.2004, R. Lohaj, J. Lakota and D. Čeplík leg. (cDC; cJL; cRL); 1 female, "Hercegovina, Orjen Bjela Gora, Milanov Ocijek, 1 – 4.6.2004 R. Lohaj lgt." (NMNHS); 1 female Herzegovina, Trebinje env., Trebinska šuma (forest), Taleža jama, 16.4.2006, D. Čeplík leg. (cDC).

Speluncarius (Speluncarius) minutulus J. Müller, 1937

1 female (designated as paralectotype by P.M. Giachino), "Shkëlzën" / "Albania leg. Bischoff 1936" (MNHUB).

Speluncarius (Speluncarius) pesarinii Bucciarelli, 1979

1 male, 1 female, "M. Grappa (VI) campi solagna 28.VII.1987 R. Monguzzi" / "*Speluncarius pesarinii* Bucc. det. R. Monguzzi" (NMNHS; cRL); 1 male, 2 females (NMW).

Speluncarius (Speluncarius) setipennis (Apfelbeck, 1899)

2 females (including 1 syntype), 1 male (NMW); 4 specimens, Njeguš Mt., Orjen Mt. (NMP).

Speluncarius (Speluncarius) stefani (Jureček, 1910)

1 female (NMW); 2 females, Italy, "M. Lessini (VR) Malga Bagorno (Rovere) 3.10.90" / "*Speluncarius stefani* Jur. det. R. Monguzzi" (NMNHS); 1 male, Italy, Verona District, Monti Lessini, Tracchi, 1450 m, E. Ollivier leg. (cRL).

Speluncarius (Hypogearius) boluensis Schweiger, 1966

1 male (NMW).

Speluncarius (Elasmopterus) leonhardi leonhardi (Breit, 1914)

2 females, including 1 syntype (DEI); 1 male (NMW).

Speluncarius (Pontotapinus **subgen. nov.**) *ponticus* Casale & Giachino, 1991

male holotype, "Turchia vil. Kastamonu M. Yarılgöz m 1200 X.1988 R. Roma leg." / "Holotypus *Speluncarius (Hypogebium) ponticus* n.sp. A. Casale P.M. Giachino det. 1989" (cGI).

Speluncarius (Pontotapinus **subgen. nov.**) sp. cf. *ponticus* Casale & Giachino, 1991

1 female, "Turkey, 10.5.2001 Vil. Zonguldag, Ereğli, Koca Ali, Amaçlar cave entrance, R. Lohaj leg." (cRL).

Speluncarius (Hypogium) albanicus (Tschitschérine, 1900)

female holotype, "Albania" / "G.C.Champion Coll. B.M.1927-409" / "*Platysma (Hypogium) albanicum* m. typ. Tschitscherine det" / "syntype" [small round label with blue margin] (BMNH).

The studied material is housed in the following institutional and private collections:
 BMNH – Natural History Museum, London, United Kingdom (R. Booth; C. Gillett).
 DEI – Deutsches Entomologisches Institut, Deutschen Akademie der Landwirtschaftswissenschaften zu Berlin, Müncheberg, Germany (L. Zerche, M. Behne).
 HNHM – Hungarian Natural History Museum (Magyar Természettudományi Múzeum), Budapest, Hungary.

MNHUB – Museum für Naturkunde der Humboldt Universität zu Berlin, Bereich Zoologisches Museum, Berlin, Germany (M. Uhlig, B. Jaeger).

NMNHS – coll. National Museum of Natural History, Sofia (A. Popov).

NMP – National Museum Prague (Národní Museum Praha), Czech republic (J. Hájek).

NMW – Naturhistorisches Museum Wien, Vienna, Austria (H. Schönmann).

ZISP – Zoological Institute, Russian Academy of Sciences, St. Petersburg (B. Kataev).

cDC – coll. David Čeplík, Košice, Slovakia.

cGD – coll. Gejza Dunay, Kráľovce, Slovakia.

cGI – coll. Pier Mauro Giachino, Torino, Italy.

cJL – coll. Ján Lakota, Ružomberok, Slovakia.

cRL – coll. Roman Lohaj, Košice, Slovakia.

The systematics of Pterostichini follows Bousquet (1999), and the configuration of the female sterna and terga is in accordance with Deuve (1993) and Liebherr & Will (1998).

SYSTEMATICS

“*Tapinopterus - Speluncarius*” complex

Remarks. The adults of *Speluncarius* s.l. share three obvious synapomorphies with those of *Tapinopterus* s.l. – absence of basolateral setae of pronotum, subquadrate metaepisternae and presence of medial seta on hind coxae. This combination of apomorphies (Bousquet, 1999: 33, Table 3) is unique among the Palaearctic Pterostichini and supports close relationships and common origin of the species from this complex. Other characters have often been used (separately or together) to distinguish species of these two genera – 1/ presence (*Tapinopterus*) or absence (*Speluncarius*) of ventral setae on onychium, and 2/ presence (*Tapinopterus*) or reduction / absence (*Speluncarius*) of eyes. Both states in *Speluncarius* are hypothesized as probably reflecting the modifications due to the adaptation to hypogean way of life (Guéorguiev & Guéorguiev, 1999: 44). The polarities of both characters have been marked as apomorphic in supraspecific taxa of Nearctic Pterostichini (Bousquet, 1999: 33, Table 3) and in our opinion such assessment is also valid for the Holarctic representatives of the tribe. However, the level of eye reduction with a genus varies, while the absence of ventral seta on onychium occurs in five species from both subgenera of *Tapinopterus* – *Pterotapinus* Heyden, 1883 and *Molopsis* Schatzmayr, 1943 (excluding *T. machardi* Jeanne, 2005).

This complex includes approximately 80 described species, as well as some still undescribed species (P.M. Giachino, unpublished data; present authors, unpublished data).

Speluncarius Reitter, 1886 s.l.

Remarks. Sciaky (1982: 16) generalized at least five characters to distinguish adults of *Speluncarius* from adults of *Tapinopterus*, but in fact any of them is inadequate to

separate species of both genera: 1/ depigmented tegument of body (however, the colour of tegument in specimens of *S. anophthalmus* and *S. stefani* is dark brownish like in the most species of *Tapinopterus*, while specimens of several species from the latter genus have depigmented cuticle); 2/ eyes atrophied or absent (however, *Pontotapinus* **subgen. nov.** has minute and presumably still functioning eyes); 3/ absence of basolateral seta of pronotum (however, this character is shared by all species of *Tapinopterus* s.l., see above); 4/ apophysis of prosternum sulcate (however, this character also occurs *Tapinopterus*, e.g. species of the “*balcanicus*” group from Serbia and Macedonia and species of the “*laticornis*” group from the southern Turkey); 5/ absence of ventral seta on onychium (for this character see the comments above).

Besides, all species of the genus, except one belonging to the *Pontotapinus* **subgen. nov.**, share another feature – more or less projecting fore angles of the pronotum. The same characteristic occurs also in *Tapinopterus marani* V. B. Guéorguiev & B. V. Guéorguiev, 1998 (Guéorguiev & Guéorguiev, 1999: 42) and *T. (Elasmopterus) filigranus* Miller, 1862 (Giachino pers. com., 2007). Eight species of *Speluncarius* have distal part of antennomere 3 pubescent, while another seventeen have antennomere 3 glabrous. The same character occurs intraspecifically in the subgenus *Crisimus* Habelmann, 1885 of *Tapinopterus*. Six species of *Speluncarius* have two anterolateral setae on pronotum, but this is also found in species of the “*extensus*” group of *Tapinopterus*.

The question is whether *Speluncarius* is a genus separate from *Tapinopterus* or not? We studied critically all the characters, which have been used to divide *Speluncarius* and *Tapinopterus*. In reality, none seem constant or stable. The polarities of the selected characters occur in both genera, e.g. they are homoplasious and seemingly reflect morphological changes such as resulting from an adaptation to similar environments. Most probably *Speluncarius* represents a grade which arose from one, two or even more different lineages within *Tapinopterus*. We feel that the question above could be best addressed by phylogenetic study of species from the “*Tapinopterus* – *Speluncarius*” complex using a matrix of DNA sequence data and larval and adult morphology. The small amount of data available seems insufficient to answer the question. A reasonable and conservative approach is to follow the view of Casale & Vigna Taglianti (1999), combining all the subgenera of both genera into a single genus.

Speluncarius (Speluncarius) anophthalmus (Reitter, 1886)

(Figs 1, 2, 5, 8, 11, 12)

Legs. Hind trochanter round at apex, shorter than half length of hind femur. Hind coxa with posterolateral and medial setae. Onychium with pair of dorsolateral setae, dorsal setae absent.

Male genitalia. Median lobe of aedeagus as figured by Sciaky (1982: 22, Figs 2-3); left paramere with distinct transverse apophysis, right one long and thin (Fig. 1).

Female genitalia. Tergum VIII short, wide, with long “anterolateral apophyses” (Fig. 2). Both lobes of sternum VIII with fairly reduced internal membrane areas, “anterolateral

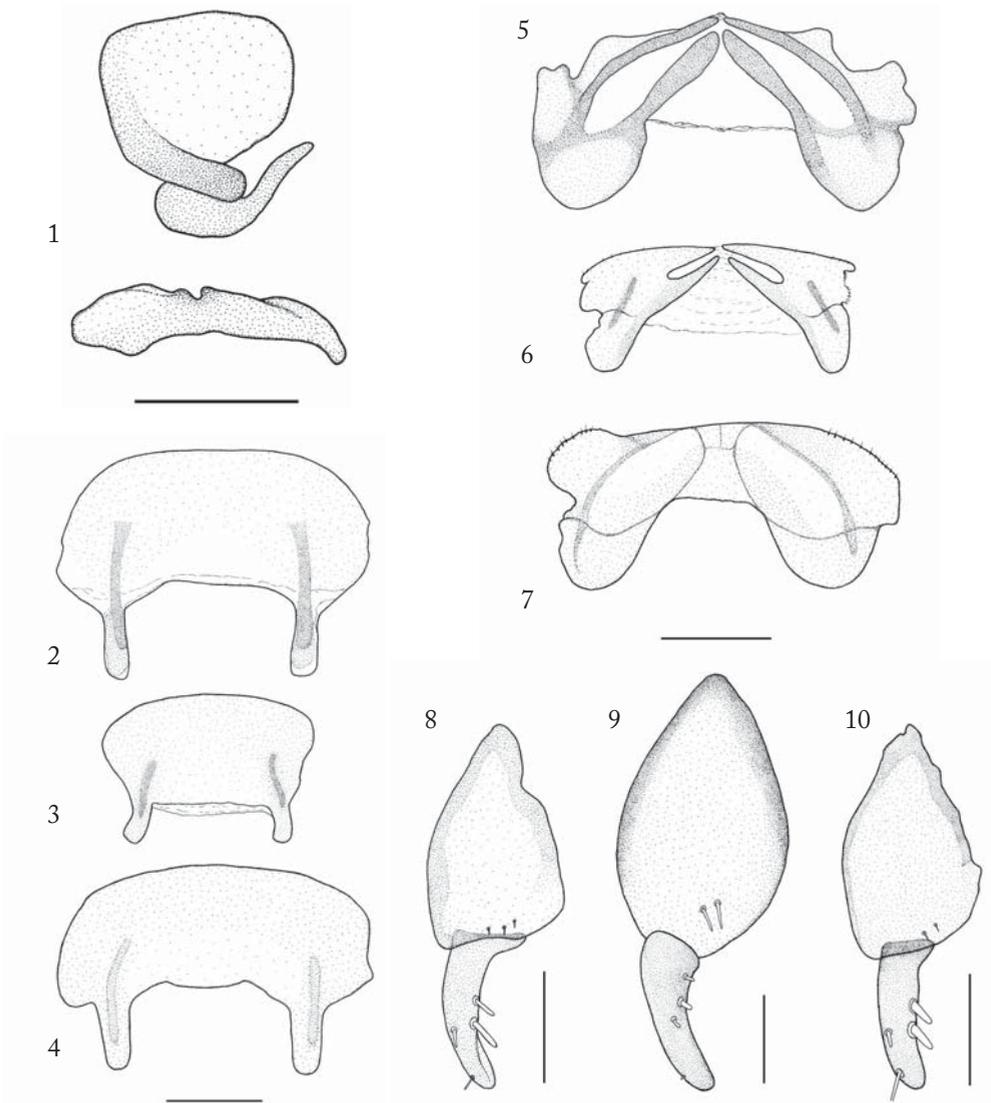


Fig. 1. Drawings of left and right parameres of *Speluncarius anophthalmus* (male from “Herzegovina, Reitter”). Scale line = 0.5 mm.

Figs 2-4. Drawings of tergum VIII. Fig. 2: *Speluncarius anophthalmus* (female from “Herzegovina, Reitter”); Fig. 3: *S. sp. cf. ponticus* (female from Amaçlar Cave); Fig. 4: *S. albanicus* (holotype). Scale line = 0.5 mm.

Figs 5-7. Drawings of sternum VIII. Fig. 5: *Speluncarius anophthalmus* (female from “Herzegovina, Reitter”); Fig. 6: *S. sp. cf. ponticus* (female from Amaçlar Cave); Fig. 7: *S. albanicus* (holotype). Scale line = 0.5 mm.

Figs 8-10. Drawings of stylus of ovipositor. Fig. 8: *Speluncarius anophthalmus* (female from Herzegovina); Fig. 9: *S. sp. cf. ponticus* (female from Amaçlar Cave); Fig. 10: *S. albanicus* (holotype). Scale line = 0.2 mm (Figs 7, 9); = 0.1 mm (Fig. 8).

apophyses" widely round (Fig. 5). Apical stylomere of left stylus of usual (for Pterostichini) size relative to basal stylomere (Fig. 8); dorsal ensiform seta dorsad, removed from distal dorsolateral ensiform seta at distance almost equal to distance between two dorsolateral setae; both dorsolateral ensiform setae long and thin, situated in medially in stylomere; nematiform setae long. Spermatheca with seminal canal and receptaculum differentiated (Figs 11-12); seminal canal long, slightly thinner than receptaculum; receptaculum elongate, sharply curved apically; spermathecal canal inserted proximally on receptaculum just before junction of seminal canal and receptaculum.

Speluncarius (*Pontotapinus* subgen. nov.)

Diagnosis. The new subgenus differs from all the other subgenera of *Speluncarius* in having minute eyes with clear and probably functioning ommatidia (vs. reduced spot-like eyes without ommatidia or eyes totally absent), sub-cordiform pronotum (vs. trapezium-shaped pronotum), and anterior angles of pronotum scarcely projecting (vs. anterior angles of pronotum clearly projecting). *Pontotapinus* **subgen. nov.** is distinguished from *Speluncarius* s. str. in having the distal half of third antennomeres pubescent (vs. distal half of third antennomeres glabrous) and the hind trochanter half the length of hind femur (vs. hind trochanter notably shorter than half the length of the hind femur). The new taxon is distinct from *Elasmopterus* Kraatz, 1886 in having the lateral border of pronotum with only single anterolateral seta (vs. lateral border of pronotum having two anterolateral setae). In addition, *Pontotapinus* **subgen. nov.** differs from *Hypogearius* Jeannel, 1953 in the distal half of third antennomeres pubescent (vs. distal half of third antennomeres glabrous). Finally, the new subgenus differs from the subgenus *Hypogium* Tschitschérine in three more characters: 1/ outer posterolateral seta on hind coxa present (vs. outer posterolateral seta on hind coxa absent); 2/ hind trochanter round at apex (vs. hind trochanter pointed at apex); 3/ onychium without dorsal setae and with single pair of dorsolateral setae (vs. onychium with dorsal setae and with two pairs of dorsolateral setae). A generalization and comparison of selected characters in the subgenera *Speluncarius* s. str., *Hypogium* and *Pontotapinus* **subgen. nov.** is given in Table 1.

Type species. *Speluncarius ponticus* Casale & Giachino, 1991

Etymology. The name of the new subgenus is combination from the Greek based on the name "Pontos", a sea deity worshipped by the ancient Greek (equivalent of the English word "sea") and the Greek adjective "tapeinos", tantamount to the English words "humble" and "meek".

Ecological remarks. The presumably functioning eyes, sub-cordiform pronotum without protruding fore angles, and sutural fusion of the elytra are presumed to be the result of partial adaptation to subterranean environment. Assuming that the edaphobite manner of living is ancestral and that the habitus of *S. ponticus* includes plesiomorphic features, we take this to indicate a somewhat hypogean way of life.

Table 1. Differing states of characters in *Speluncarius* s. str., *Hypogium* and *Pontotapinus* **subgen. nov.**

Character states and ratios	<i>Speluncarius</i> s. str.	<i>Hypogium</i>	<i>Pontotapinus</i>
Setation on second half of antennomere 3	Absent	Present	Present
Fore angles of pronotum	Projecting, more or less pointed	Projecting, more or less pointed	Neither projecting not pointed
Scutellar stria	Traceable	Absent	Absent
Posterolateral seta on hind coxa	Present	Absent	Present
Hind trochanter	Round at apex, shorter than half length of hind femur	Pointed at apex, as long as half length of hind femur	Round at apex, as long as half length of hind femur
Dorsolateral setae on onychia	One pair	Two pairs	One pair
Dorsal setae on onychia	Absent	Two pairs	Absent
Tergum VIII	Short and wide with long “anterolateral apophyses”	Short and wide with long “anterolateral apophyses”	Long and narrow with short “anterolateral apophyses”
Sternum VIII – reduction of internal membrane areas	Fairly reduced	Not reduced	Slightly reduced
Sternum VIII - “anterolateral apophyses”	Widely round	Widely round	Closely round
Dorsal ensiform seta of apical stylomere of stylus	Dorsal position, removed from distal dorsolateral seta	Dorsal position, removed from distal dorsolateral seta	Subdorsal position, close to distal dorsolateral seta
Dorsolateral ensiform setae of apical stylomere of stylus	Long and thin, both situated in medial part of stylomere	Long and thick, both situated in medial part of stylomere	Short, proximal seta situated in proximal part of stylomere
Nematiform setae of apical stylomere of stylus	Long (well developed)	Long (well developed)	Short (reduced)
Seminal canal of spermatheca	Long	Short	?
Receptaculum of spermatheca	Sharply curved apically	Gradually curved apically	?

***Speluncarius (Pontotapinus) ponticus* Casale & Giachino, 1991**
(Fig. 16)

References. *Speluncarius (Hypogeobium) ponticus*: Casale & Giachino, 1991: 215; Lorenz, 1998: 268. *Speluncarius (Hypogium) ponticus*: Bousquet, 2003: 516.

Remarks. This species was described from single male from the Yaraligözdag Mt. and was provisionally placed in the subgenus *Hypogium* Tschitschérine, 1900 (Casale & Giachino, 1991: 215-216). Lorenz (1998) and Bousquet (2003) also followed this placement. The study of the holotype of *S. ponticus* and the female from the region of Koca Ali Village showed that this species has significant differences in external and internal characters as compared to *S. albanicus*. For this reason these taxa are placed in separate supraspecific groups (see “Diagnosis” above and data in Table 2). The holotype is shown in Fig. 16.

Male genitalia. Median lobe of aedeagus, parameres, and urite figured and described by Casale & Giachino (1991: 218, Figs 4-8).

Legs. Hind trochanter round at apex, as long as half length of hind femur. Hind coxa with posterolateral and medial setae. Onychium with one pair of dorsolateral setae; dorsal setae absent.

***Speluncarius (Pontotapinus) sp. cf. ponticus* Casale & Giachino, 1991**

(Figs 3, 6, 9, 17)

Description of the locality. Amaçlar Cave is situated west of the Koca Ali Village, ca. 250 m elevation, 14 km southwest of the Ereğli Town, Zonguldag District, Northwestern Anatolia. The cave (known as Amaçlar Cave No. 1) was visited by Coiffait on 7th May 1954 (Coiffait, 1959: 444). In addition to the other fauna of the cave, one female Trechini was found by this author at the entrance of the cave which was subsequently described as *Anillidium coiffaiti* (Jeannel, 1955).

The entrance of the Amaçlar Cave is formed by a 6-7 metres long slope covered by humus, stones and vegetation, which at present is devastated by the local people and is used as dump for garbage. The unique specimen was found by the second author under a rusty piece of barrel fixed ca. 30 cm into the ground on 10th May 2001. In the same place he collected also the carabids *Nebria (Nebria) brevicollis* (Fabricius, 1792), *Porotachys bisulcatus* (Nicolai, 1822), *Bembidion (Sinechostictus) lederi anatolicum* (Korge, 1964), *Bembidion (Peryphanes) dalmatinum* (Dejean, 1831), *Bradycellus (Bradycellus) verbasci* (Duftschmid, 1812) and the scydmenid *Palaeostigus ruficornis schimitscheki* (Machulka, 1944) (P. Hlaváč det.). During the same visit, two specimens of *Trechus zonguldakensis* Donabauer (2004) were found. The cave was visited for the second time by one of us (RL) on the beginning of June 2003, but no other material of *Speluncarius* has been found. At this time, the slope before the cave was even more disturbed than earlier, with water conduit put ca 0,5 m deep into the soil to lead the water from the cave to the local people.

In the vicinity of Ereğli, *Speluncarius sp. cf. ponticus* live sympatrically with another hypogean congener – *S. (Hypogearius) heracleotes* Jeannel, 1950 (see also Jeannel, 1955: 9). The large massif of the Bolu Daglari is unique considering the occurrence of species from three phyletic lineages of *Speluncarius* and three phyletic lineages of *Tapinopterus* – *Speluncarius (Pontotapinus subgen. nov.)*, *S. (Speluncarius) minimus* Cerruti, 1977, *S.*

(*Hypogearius*) spp., *Tapinopterus* (*Hoplauchenium*) *minax* (Tschitschérine, 1900), *T.* (*Molopsis*) spp. and *T.* (*Percosteropus* Ganglbauer, 1896) spp. (Vigna Taglianti, 1973; 1980; present data; unpublished data) there.

Remarks. The taxonomic status of the population near Koca Ali Village is based only on female characters. Based on the clear overall similarity and shared details of the external morphology with the holotype of *S. ponticus* the female from Amaçlar Cave these are treated as conspecific. However, the microphthalmia, fused suture of the elytra, and distance between localities (ca. 190 km distance by airline), and several characters shown in Table 2 indicate the possibility of genetically isolated populations or even separate species.

The female examined has minute eyes, distal antennomere entirely exceeding base of pronotum and fast coalesced elytra. The specimen is shown in Fig. 17.

Table 2. Differences between the holotype of *Speluncarius ponticus* and female identified as *S.* sp. cf. *ponticus*.

Character states, measurements and ratios	<i>Speluncarius ponticus</i> (holotype)	<i>S.</i> sp. cf. <i>ponticus</i>
Length of body	7.8. mm	6.5 mm
Maximal width of body	2.3 mm	2 mm
Side of pronotum in basal fifth (before angles)	Slightly sinuate	Right
Hind angles of pronotum	Almost rectangular	Obtuse
HL / HW	1.36	1.28
HL / PL	1.05	0.94
HW / PW	0.72	0.69
PW / PL	1.06	1.07
PW / PA	1.25	1.26
PW / PB	1.5	1.49
PA / PB	1.2	1.18
EW / PW	1.16	1.21
EL / EW	1.7	1.73

Symbols: HL - length of head; HW - maximal width of head; PL - length of pronotum; PW - maximal width of pronotum; PA - width of apical border of pronotum; PB - width of basal border of pronotum; EL - length of elytra; EW - maximal width of elytra.

Female genitalia. Tergum VIII long, narrow, with short “anterolateral apophyses” (Fig. 3). Both lobes of sternum VIII with slightly reduced internal membrane areas, “anterolateral apophyses” closely round (Fig. 6). Apical stylomere of left stylus smaller relative to basal stylomere than usual (for Pterostichini) (Fig. 9); dorsal ensiform seta close to distal ensiform dorsolateral seta (as distance between them smaller than distance between both dorsolateral seta); both dorsolateral ensiform setae minute, distal seta situated medially in stylomere, proximal one situated proximally on stylomere; nematiform setae very short, hardly visible. Spermatheca not studied.

***Speluncarius (Hypogium) Tschitschérine, 1900* [= *Hypogeobium* Tschitschérine, 1903]**

Diagnosis. The adults of this subgenus differ from the adults of all the other subgenera of the genus by the presence of the following three characters: 1) outer posterolateral seta on hind coxa absent (Fig. 14); 2) hind trochanter pointed at apex (Fig. 14); 3) onychium with two pairs of dorsal (first one situated in distal half, second one situated in proximal half of article) and two pairs of dorsolateral setae (Fig. 15).

Type species. *Platysma albanicum* Tschitschérine, 1900

Remarks. Varying opinions have been published as to the systematic position of *S. albanicus* (Jeannel, 1950; Jeannel, 1953; Vigna Taglianti, 1973; Sciaky, 1982; Casale & Giachino, 1991). Some have agreed that it belongs to *Speluncarius* rather than to the genera related to *Molops* Bonelli, 1810 (Vigna Taglianti, 1973; Sciaky, 1982; Casale & Giachino, 1991). Müller (1937: 134) proposed a synonymy between *Elasmopterus* and *Hypogeobium* (replacement name for *Hypogium*), and Jeanne (1982) did not include the latter within *Speluncarius*. No doubt, the main reason for these conflicting placements was the lack study material, especially the important male specimens.

We believe that the two morphological features previously deemed important for the distinction of this species from the other taxa of *Speluncarius*, apical half of antennomere 3 paddle-like and presence of small tubercle at the posterior supraorbital pore, are overestimated (Apfelbeck, 1904: 236; Mařan, 1932: 36; Straneo, 1935: 85; Schatzmayr, 1942: 51; Schatzmayr, 1943: 130) and are not useful at the specific or supraspecific level. This is based on the lack distinctive states for these features in the specimen at hand. We think also that the absence of the outer posterolateral seta on the hind coxa is certainly autapomorphy in *Hypogium* relative to other phyletic lineages of “*Tapinopterus* – *Speluncarius*”. The attenuation of the apex of hind trochanter is found in other lineages of this complex, like *Hoplauchenium* Tschitschérine, 1900 and *Hoplodactylella* Strand, 1936, and probably represents an adaptive character to subterranean life. In some pterostichines from the New World this feature is sexually dimorphic (Will, 2004). The additional pubescence on the dorsal part of onychium in *S. albanicus* is unique in the complex “*Tapinopterus*–*Speluncarius*” but it is not clear if this is a plesiomorphic or apomorphic state.

***Speluncarius (Hypogium) albanicus* (Tschitschérine, 1900)**

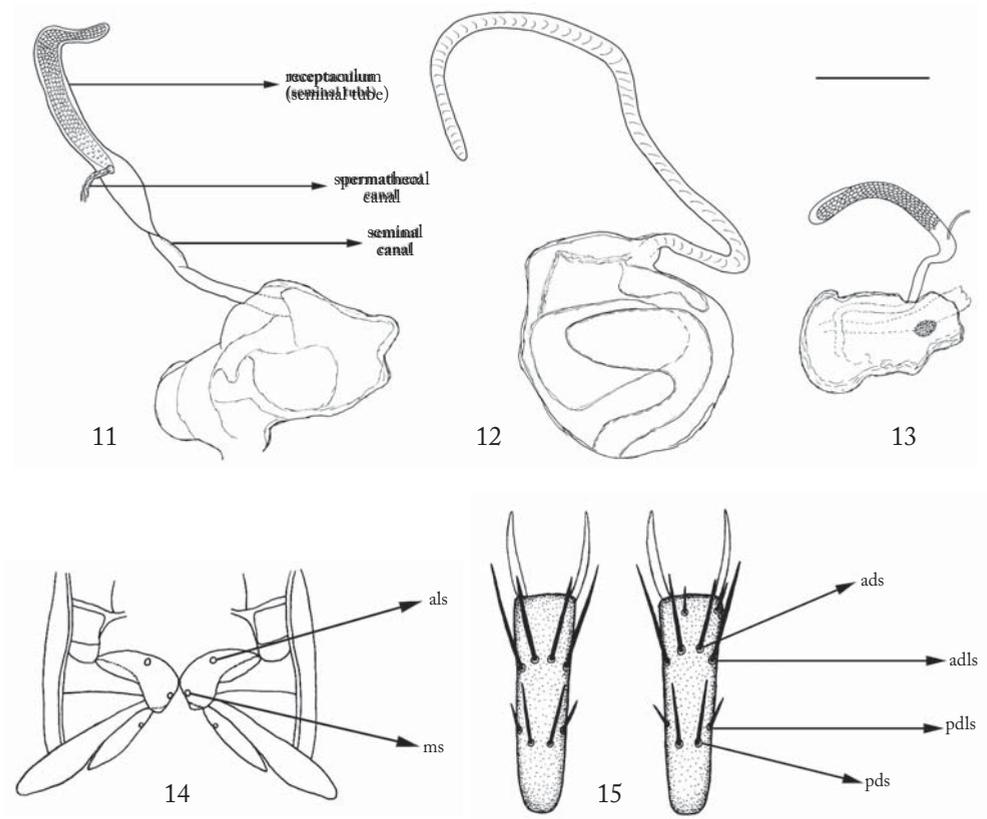
(Figs 4, 7, 10, 13, 14, 15, 18)

References. *Platysma (Hypogium) albanicum*: Tschitschérine, 1900: 49–50 (“Albanie”, loc. typ.). *Pterostichus (Hypogium) albanicus*: Apfelbeck, 1904: 236–237; Heyden et al., 1906: colum 82. *Platysma (Hypogeobium) albanicum*: Jakobson, 1907: 353. *Speluncarius (Hypogeobium) albanicum*!: Reitter, 1914: 262. *Platysma albanicus*: Lutshnik, 1922: 78. *Pterostichus (Hypogeobium) albanicus*: Winkler, 1924: 175; Schatzmayr, 1930: 329. *Tapinopterus (Hypogeobium) albanicus*: Mařan, 1932: 36; Müller, 1937: 134; Schatzmayr, 1942:

51; Schatzmayr, 1943: 131. *Hypogeobium albanicum*: Jeannel, 1950: 160-161; Jeannel, 1953: 11; Mateo, 1955: 299; Negre, 1977: 140; Vigna Taglianti, 1973: 356. *Tapinopterus albanicus*: Turin, 1981: 127. *Speluncarius (Hypogeobium) albanicus*: Sciaky, 1982: 28; Casale & Giachino, 1991: 215-216; Lorenz, 1998: 268. *Speluncarius (Hypogium) albanicus*: Bousquet, 2003: 516; Vigna Taglianti, 2004.

Remarks. The type locality is not specified, but this species is remarkable for its chetotaxy. The holotype is shown in Fig. 18.

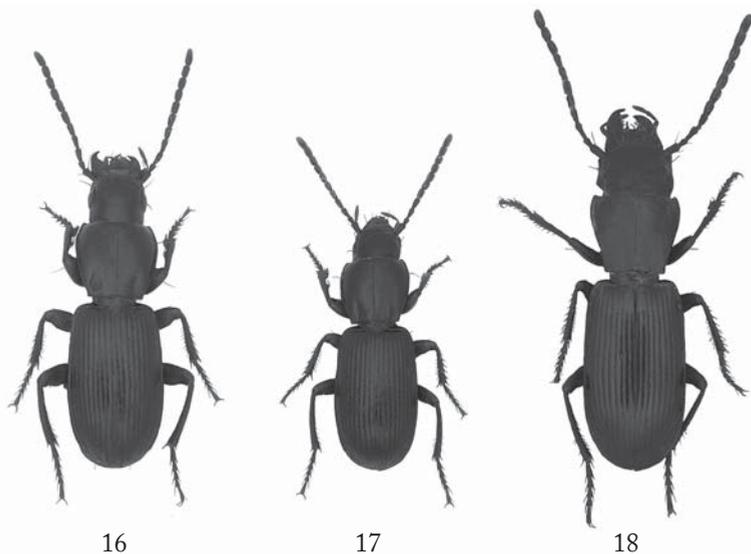
Legs. Hind trochanter pointed at apex, as long as half length of hind femur (Fig. 14). Hind coxa with medial seta, posterolateral seta absent (Fig. 14). Onychium with



Figs 11-13. Drawings of spermatheca. Fig. 11: *Speluncarius anophthalmus* (female from Herzegovina, Orjen Mt., Bjela Gora, Milanov Ocijek, ventral view); Fig. 12: *Speluncarius anophthalmus* (female from "Herzegovina, Reitter", dorsal view, spermathecal canal not shown); Fig. 13: *S. albanicus* (holotype, ventral view). Scale line = 0.5 mm.

Fig. 14. Sketch of metasternum, part of hind legs and setation of hind coxae, *Speluncarius albanicus* (holotype, ventral view), als – anterolateral seta, ms – medial seta.

Fig. 15. Sketch of left and right hind onychia, *Speluncarius albanicus* (holotype, dorsal view), ads – anterior dorsal seta, adls – anterior dorsolateral seta, pds – posterior dorsal seta, pdls – posterior dorsolateral seta.



Figs 16-18. Photos of habitus. Fig. 15: *Speluncarius ponticus* (holotype); Fig. 16: *S. sp. cf. ponticus* (female from Amaçlar Cave); Fig. 17: *S. albanicus* (holotype).

two pairs of lateral and two pairs of dorsal setae as well as with a few additional dorsal setae (Fig. 15).

Female genitalia. Tergum VIII short, wide, with relatively long “anterolateral apophyses” (Fig. 4). Sternum VIII asymmetrical, both lobes with complete internal membrane areas, “anterolateral apophyses” widely round (Fig. 7). Apical stylomere of left stylus of usual (for Pterostichini) size with relation to basal stylomere (Fig. 10); dorsal ensiform seta dorsad, removed from distal dorsolateral ensiform seta at distance longer than distance between two dorsolateral setae; both dorsolateral ensiform setae long and thick, situated in paramedial part of stylomere; nematiform setae long. Spermatheca with seminal canal and receptaculum differentiated (Fig. 13); seminal canal short, thinner than receptaculum; receptaculum elongate, gradually curved apically; spermathecal canal inserted on proximal part of receptaculum just before junction of seminal canal and receptaculum.

Key for identification of the subgenera of *Speluncarius* Reitter, 1886

- 1(6) Distal part of antennomere 3 pubescent
- 2(3) Pronotum with two anterolateral setiferous punctures. Greece *Elasmopterus*
- 3(2) Pronotum with single anterolateral setiferous puncture
- 4(5) Fore angles of pronotum slightly projecting. Posterolateral seta on hind coxa present. Hind trochanter round at apex. Dorsal setae of onychium absent. Northwest Anatolia *Pontotapinus* subgen. nov.

- 5(4) Fore angles of pronotum fairly projecting. Posterolateral seta on hind coxa absent. Hind trochanter pointed at apex. Dorsal setae of onychium present. Albania.....
*Hypogium*
- 6(1) Distal part of antennomere 3 glabrous
- 7(8) Lateral border of pronotum sinuate or rectilinear in apical part, not or hardly sinuate in basal part. Aedeagus strongly flattened laterally. Distal half of elytra with single setiferous puncture at interval 3. Northwest Anatolia*Hypogearius*
- 8(7) Lateral border of pronotum more or less convex in apical part, sinuate in basal part. Aedeagus not flattened laterally. Distal half of elytra with one or more setiferous punctures at interval 3. Italy, Balkan Peninsula (Herzegovina, Montenegro, Albania, Greece, Crete), North Anatolia *Speluncarius s. str.*

CONCLUSIONS

We arrive at several conclusions based on the study of selected characters (in particular the setation of the legs and the female genitalia) and on the present knowledge of the morphology of adults. The examination of the holotypes of *Speluncarius ponticus* and *Platysma albanicus* demonstrates that the two taxa are members of separate phyletic lineages of the genus *Speluncarius*. On this basis the new subgenus *Pontotapinus* **subgen. nov.** is proposed, based on type species *Speluncarius ponticus* Casale & Giachino, 1991. The study of the female collected near Amaçlar Cave shows that probably it is conspecific with *Speluncarius ponticus* Casale & Giachino, 1991 despite the presence of several differences. On the other hand, the study suggests that *Hypogium* Tschitschérine, 1900 represents well-isolated lineage with probably basal position within the genus, and not belong to the “molopite complex”. For the time being, monophyly or polyphyly of *Speluncarius* cannot be demonstrated, while the monophyly of the “*Tapinopterus* – *Speluncarius*” complex is well-supported by three clear synapomorphies. Excluding the nominotypical subgenus, the monophyly of the subgenera of *Speluncarius* seems obvious. *Speluncarius* s. str. may include at least three separate phyletic lineages – the “*anophthalmus*” group, the “*pasquini*” group, and the “*breuningi*” group (cfr. Jeanne, 1982).

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