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Advances in the studies of the fauna of the Balkan Peninsula
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Catalogue of the troglobitic Pselaphinae (Coleoptera, Staphylinidae) of the Balkan Peninsula, with a key to genera

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Summary. All obligate troglobitic Pselaphinae currently known from Balkan caves and pits are listed together with all their known localities. A key to all known genera is provided. A short history of exploration for cavernicolous Pselaphinae fauna of Balkan Peninsula is also discussed.

Key words. Coleoptera, Staphylinidae, cavernicolous Pselaphinae, Balkan Peninsula.

1 – Introduction

The cave-dwelling way of life is one of the living organism's most interesting adaptations for a special, unusual habitat. It is no surprise that one of the most successful groups in using this strategy is the insect. The majority of insects living in caves and pits are members of the order Coleoptera: Carabidae Trechinae and Leiodidae Leptodirini in particular which have developed a very successful strategy and they are dominant among the cavernicolous Coleoptera. Although Staphylinidae is one of the most wide-spread and numerous families of Coleoptera in the world, only a few species are successfully adapted to subterranean habitats (Hlaváč, Oromi & Bordoni, 2006). One of the reasons can be that they cannot compete in feeding strategy as predators against Trechinae. A very special exception is the subfamily Pselaphinae which, probably due to their small size, precavernicolous character and specialization on different preys are relatively common in caves. In numbers of species they occupy the third place amongst cave-dwelling Coleoptera.

There are about 150 species of cavernicolous Pselaphinae in the world (Poggi & *al.*, 1998), making up about 1.6 % of the sub-family, and only about 100 species can be considered as true troglobitic species. In addition many species also live near caves or in organic matter in cave entrances or sink holes; these are not included in this study. In this work we treat only real cavernicolous, troglobitic species, i.e. eyesless, de-pigmented species adapted to the dark enviroment living exclusively in caves and pits. There are currently 55 species belonging to 17 genera of troglobitic Pselaphinae known from Balkan Peninsula; this is more than half of all the known cavernicolous Pselaphinae fauna of the world. The world's highest cave dwelling biodiversity, and not only for Pselaphinae, occurs

in the Dinaric Mountains. Almost 80 % of all known cavernicolous Pselaphinae of the Balkan Peninsula live here.

2 – Abbreviations and acknowledgements

Abbreviations used in the text and table: DIN – Dinarides; N – North; M – Mid; S – South; HEL – Hellenides; STP – Stara Planina; CAR – Carpathians; I – Italy; SLO – Slovenia; HR – Croatia; BiH – Bosnia & Hercegovina; CG – Montenegro; SRB – Serbia; MK – Macedonia; AL – Albania; BG – Bulgaria; RO – Romania; GR – Greece.

Cave – a horizontal type of cave

Pit – a vertical type of cave also know as "pot holes" or "alpine cave".

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3 – History of research of cavernicolous Pselaphinae in the Balkan Peninsula

Cavernicolous Pselaphinae have attracted the attention of many entomologists since the first cavernicolous Pselaphinae, *Machaerites spelaeus* L. Miller, was described in 1855. There have been three main periods in the research of cavernicolous Pselaphinae since that date.

The first period <1855 – 1950> covers almost 100 years during which time 19 [34.5 %] species in 9 genera were described. This is a period of three main contributors, Josef Müller (6 species), Edmund Reitter (3 species) and Albert Winkler (3 species). Two species were described by Vilmos Székessy, and one each by Ludwig Miller, Victor Motschulsky, René Jeannel and Stjepan Svirčev. Ludwig Schaufuss (1863) prepared the first revision of the genus *Machaerites* which also included a few species which are today regarded as members of other genera of Bythinini. Amauropini were studied by Winkler (1925), Müller (1944) and Jeannel (1948). The bulk of all species discovered in this period are from former Yugoslavia with on1y one from Italy and one from Romania.

The second period <1950 – 1990> of 40 years contributed only 9 [16.4 %] new species and only one new genus. René Jeannel (1954) revised troglobitic Bythinini of Slovenia and Zora Karaman (1961) published a revisional study of Amauropini of Balkans. The main contributor of that period was Claude Besuchet from Geneva who described 4 species and one new genus (*Antrobythus*). He also published a complete key to the genus *Seracamaurops* (Besuchet, 1986) and described the first species from Greece (Besuchet, 1985). Giorgio Agazzi (1961) described the first species from Albania and one subspecies of *Bryaxis crepsensis* Müller. Zora Karaman (1969) described the first species from Bulgaria. This period also saw three important works on cavernicolous fauna of the Balkans published. Vasil Guéorguiev (1977) published an exhaustive study covering the whole region. Unfortunately he ignored many already-described species of Pselaphinae and mentioned only 11 species of the 20 species known at that time. Egon Pretner, the leading authority on cavernicolous studies of Coleoptera of the former Yugoslavia,

published survey of the coleopteran fauna of Croatia and Montenegro (Pretner, 1973; 1977) but also omitted much of the data concerning the knowledge of Pselaphinae.

Thus, 135 years after the first troglobitic species of Pselaphinae was described a further 28 species were discovered, representing 50.9 % of fauna known today (see below).

The third period <1990 – to date> saw a great renaissance in the exploration of cavernicolous fauna, mainly in the Dinaric range in Italy, Croatia, Bosnia & Herzegovina and Montenegro. In this period a further 27 [49.1 %] species have been described so far. The period begins with studies of Roberto Poggi (1992) who revised all troglobitic Bythini of the northern Dinaric range, redescribed all known species and described one new genus *Gasparobythus*. He is also responsible for two Pselaphidological events, first the discovery and description of *Decumarelus sarbui* Poggi, the first troglobitic representative of the tribe Tyrini, and secondly and more importantly the description of a new tribe of Batrisitae, Thaumastocephalini Poggi & *al*. In the 21st century a new epoch began. It was led by Guido Nonveiller† and Dragan Pavićević from Belgrade. Claude Besuchet continues his studies and first contributions have been published by Peter Hlaváč from Košice. Many new species and even new genera (*Pauperobythus*, *Nonveilleria*) have been described. All these discoveries were possible due to the collecting efforts of many enthusiastic biospeleologists, namely Siniša Ognjenović and Momčilo Popović from Belgrade, Serbia; Radek Udržal, Martin Švarc and Roman Mlejnek from Czech Republic, Jan Lakota and David Čeplík from Slovakia, Roman Ozimec, Branko Jalžić, Tomica Rubinić, Gordan Polić, Hrvoje Cvitanović, Tonči Rađa and other members of the Croatian Biospeleological Society.

During the last 13 years the number of new species of Pselaphinae described the same as the total for the initial 135 years since the discovery of *Machaerites spelaeus*. There is no doubt that further exploration of cave habitats of the Balkan Peninsula will bring other new species, and most probably also some new genera. The Dinaric region, Stara Planina and the Carpathian mountains are the best studied regions while the Hellenids, especially in Albania and Macedonia, are still very poorly known and need further exploration.

4 – Biospeleological subdivision of the Balkan Peninsula

We use here the biospeleologic subdivision of the Balkan Peninsula according to Guéorguiev (1977), but with corrected borders for south Dinarides. He divided the Balkans into five main regions: the Dinaric range, the Hellenids range, the Rhodos range, the Stara Planina with the Dobrudja and the Carpathian range. The Rhodos range does not support any cavernicolous Pselaphinae so far.

4-1 – The Dinaric region (fig. 1)

For the Balkans, as well as for the whole world's cave-dwelling Pselaphinae fauna, one of the most important regions are the Dinarides. The Dinaric region is a centre of development and survival of some phyletic lines of Pselaphinae from the Eocene and Miocene periods (Mršić, 1997). The Dinarides occupy the territory near the Adriatic sea from the Gulf of Trieste to the river Crni Drin in northwest Albania. Inland the Dinarides are bordered by the Alps, the Panonian basin, the Carpathians, the Rhodops and the Hellenids. The geotectonic belts of the Dinarides, according to Herak (1991), are: the Adriaticum – Adriatic carbonate platform, near the Adriatic

sea, covering Istria and a narrow coastal belt which includes the Croatian islands as far as the end of the Pelješac peninsula, including west Hercegovina; the Dinaricum – a deep karst limestone belt covering Slovenia, inland Croatia, southern Bosnia, east Hercegovina, Montenegro and part of northwestern Albania approximately to the tectonic line between Škodra-Peć or the Drin river; finally, the Supradinaricum – or the inner Dinarides, are very heterogeneous in structure, it covers eastern Slovenia, northwestern Croatia, middle, northern and eastern Bosnia and western Serbia. A specific ecological division which exists in the Dinarides, results in a thermopile fauna in caves under Mediterranean climatic influence on the Adriatic coast and islands as well as cryophilic fauna in cold caves at higher altitudes in the mountainous Dinaric region (Ozimec, 2005). Biogeographically, the cave-dwelling fauna of the Dinaric region can be divided according to three well-defined bio-geographical subregions, the northern, middle and southern Dinaric regions. They are historically named Krain, Dalmatian and Dubrovnik-Hercegovina-Montenegreen fauna (Ozimec, 2005).

The Dinarides have in total 12 genera and 45 species which have been described so far, which represents almost 81.8 % of cave dwelling Pselaphinae of the Balkan Peninsula.

4-2 – Subregion of northern Dinarides (= Krain fauna)

It runs from Trieste to the Una tectonic fracture (line Una-Zrmanja), which is the same as the line of the mountain chain Velebit-Poštak-Dinara-Osječenica-Grmeč. The region occupies north-eastern Italy (Venezia Giulia), Slovenia and part of Croatia: Istra, Hrvatsko primorje (Croatian coast) with the islands of Cres, Krk, Rab and Pag, Gorski kotar, Lika, the Velebit Mountains, Kordun, Pokuplje, Žumberak and the Supradinaric belt through to Medvednica Mountains near Zagreb, also part of north-western Bosnia.

18 species [32.7 %]: *Bryaxis argus* Kraatz, *Bryaxis crepsensis crepsensis* Müller, *Bryaxis crepsensis histrus* Agazzi, *Bythoxenus subterraneus* Motschulsky, *Gasparobythus tergestinus tergestinus* Poggi & *al.*, 11 species of *Machaerites* L. Miller, *Pauperobythus globuliventris* Nonveiller, Pavićević & Ozimec, *Tychobythinus croaticus* Z. Karaman.

The genera: *Bythoxenus* Motschulsky, *Machaerites* L. Miller, *Gasparobythus* Poggi and *Pauperobythus* Nonveiller, Pavićević & Ozimec are endemic to this subregion.

4-3 – Subregion of middle Dinarides (= Dalmatian fauna)

This is a region between the Una and Neretva river tectonic fractures, or from Zadar city till Ploče city. It includes the historical Dalmatian region in Croatia which goes north from the Dalmatian islands of Dugi otok, Šolta, Brač, Hvar and Vis to the Bosnian Dinaric border defined by the Sava river. However, the Population drift between Krain and Dalmatian fauna in northern Dalmatia between Zrmanja and Krka River has been noted (Mršić, 1987). Although this subregion is perhaps the best studied, the low number of cave-dwelling Pselaphinae so far recorded indicates high potential for new discoveries; the finding of the genus *Thaumastocephalus*, which represents a new tribe, proves this fact.

Six species [10.9 %]: *Thaumastocephalus folliculipalpus* Poggi & *al.* (a further two new species will be described soon, Besuchet, pers. comm.), *Bryaxis argus* Kraatz, *Bryaxis issensis* Müller and *Tychobythinus neumanni* Müller.

Only the genus *Thaumastocephalus* Poggi & *al.* is endemic to this subregion.

4-4 – Subregion of southern Dinarides (= Dubrovnik-Hercegovina-Montenegrian fauna)

This subregion includes territory from the Neretva river tectonic line, through to the south eastern border of the Dinarides defined by Drim river, the tectonic line Škodra-Peć. The region is located in southern Croatia, including the Pelješac peninsula, the islands of Lastovo, Korčula, Mljet, Elaphites and the region of Dubrovnik, also eastern Hercegovina, Montenegro and north western part of Albania.

22 species [40.0 %]: *Protamaurops montenegrinus* Székessy, *Pseudamaurops calcaratus* Nonveiller & Pavićević, all 10 species of *Seracamaurops* (s. str.) Winkler, *Seracamaurops* (subg. *Cordiamaurops* Nonveiller & Pavićević) with 2 species, *Troglamaurops* with 3 species, *Bryaxis argus* Kraatz, *Bryaxis tuberculiceps* Nonveiller, Pavićević & Besuchet, *Nonveilleria* Pavićević & Besuchet with 2 species and *Tychobythinus neumanni* Müller.

Three genera, *Seracamaurops* Winkler, *Troglamaurops* Ganglbauer and *Nonveilleria* Pavićević & Besuchet are endemic to this subregion.

4-5 – Aegean region = Hellenides range

This is the region from the valley of Drin, or the tectonic line Škodra-Peć up to the island of Crete. The region is in Albania, Macedonia and the whole of Greece.

Nine species [16.4 %]: *Namunia cavernicola* Besuchet, *Zoufalia corcyrea* (Reitter), *Antrobythus perplexus* Besuchet, *Bryaxis ossaeus* Besuchet, *Bryaxis blacensis* Karaman, *Bryaxis troglophilus* Agazzi, *Bythinus hauseri* Besuchet, *Tychobythinus brachati* Besuchet, *Tychobythinus naxius* Besuchet. *Spelaeobythus regulis* Löbl from Greek Macedonia is not a troglobitic species (Besuchet, 1993).

Three genera, *Zoufalia* Reitter, *Antrobythus* Besuchet and *Speleobythus* Löbl are endemic to this region.

4-6 – Stara Planina & Dobroudja region

A region comprising: Stara Planina and Prebalkan, part of the Carpathians south of the Danube, north of the tectonic line Stalać-Sokobanja-Knjaževac and west of Timok, the plain of the Danube and Dobroudja. This region can be divided in to three subregions: the Western Stara Planina, the Eastern Stara Planina and Dobroudja.

Two species [3.6 %]: *Decumarellus sarbui* Poggi, *Bryaxis beroni* Karaman and only the genus *Decumarellus* Poggi are endemic to this region.

4-7 – Carpathian range

This region includes the whole of the Carpathians north of the Danube.

One species [1.8 %]: *Bryaxis splendidus goliath* (Jeannel) is endemic.

5 – Key to genera of cavernicolous Pselaphinae of the Balkan Peninsula

The Pselaphinae is one of the largest subfamilies of the Staphylinidae with about 9,150 species described world-wide (Newton, pers. comm.). They are common in decaying plant debris, especially in tropical forests, but they often inhabit very special habitats like ant and termite nests or caves and pits. The Pselaphinae are divided in to 6 supertribes: Faronitae, Euplectitae, Batrisitae, Goniaceritae, Clavigeritae and Pselaphitae. Four of them are present in caves and pits of the Balkan Peninsula.

1 – Mesofemora distant from mesocoxae, dorsal margin of mesotrochanters longer than trochanter width (**Pselaphitae Tyrini**) . . . . . ***Decumarelus*** Poggi

– Mesofemora close to mesocoxae, dorsal margin of mesotrochanters very short **2**

2 – Antennal scape distinctly notched at dorsal apex (**Batrisitae**) **3**

– Antennal scape usually with dorsal apical margin straight **9**

3 – Pedunculate gular process present, second and third segments of maxillary palpi with a thin filament ending in a spherical appendix at the exterior side (**Thaumastocephalini**, monogeneric tribe) . . . ***Thaumastocephalus*** Poggi, Nonveiller, Colla, Pavićević & Rađa

– Pedunculate gular process absent, maxillary palpi normally developed (**Amauropini**) **4**

4 – External stria of the first abdominal tergite oblique, remote from the margin toward the base and approaching it apically **5**

– External stria of the first abdominal tergite parallel to the margin **6**

5 – First abdominal tergite without median basal carinae, foveae at the base replaced by large excavation covering the space between lateral carinae, elytra without sutural groove . . . . . ***Zoufalia*** Reitter

– First abdominal tergite with deep fovea between two prominent medium basal carinae at the base . . . . . ***Pseudamaurops*** Jeannel

6 – Eyes or ocular spines absent, legs long and slender, cavernicolous species **7**

– Eyes or ocular spines well defined and prominent, legs not so long, endogeous species, elytra with two prolonged, deep basal foveae . . . . . ***Protamaurops*** Müller

7 – Claws of all legs short, scape only a little longer than pedicel, pedicel strongly narrowed from apex to base, smaller species about 2.5 mm length, ocular spine completely absent, last segment of maxillary palpi robust, less than 4 times as long as wide . . . . . ***Troglamaurops*** Ganglbauer

– Claws of all legs very long, scape distinctly longer than pedicel, pedicel more and less parallel, never strongly narrowed from apex to base, bigger species, more than 3 mm long **8**

8 – Base of the first visible tergite normal, with distinct lateral margin . . . . . ***Seracamaurops*** (s. str.) Winkler

– Base of the first visible tergite strongly constricted, covered dense yellow setae . . . . . ***Seracamaurops (Cordiamaurops)*** Nonveiller & Pavićević

9 – Metacoxae contiguous, strongly projecting at point of articulation with metatrochanters (**Euplectitae**); antebasal sulcus of pronotum usually distinct, at least near median antebasal foveae (**Trichonychini**) . . . . . ***Namunia*** Reitter

– Metacoxae moderately to widely separated, relatively flat and only slightly projecting at point of articulation with metatrochanter (**Goniaceritae**); frontal rostrum prominent, basal fovea of pronotum always connected by a transverse sulcus (**Bythinini**) **10**

10 – Scape stout, extended from apex to base, external side without tubercles or carinae in males . . . . . ***Nonveilleria*** Pavićević & Besuchet

– Scape long and slender, always extended from base to apex, similar for both sexes, external side without tubercles or carinae in males **11**

– Scape generally short and stout, always subparallel in females **16**

11 – Pubescence of dorsum long, two antebasal fovea connected by antebasal sulcus present, elytra with two basal foveae and complete sutural stria . . . ***Tychobythinus*** Ganglbauer

– Pubescence of dorsal side short, set-off of pronotom and elytra not as above **12**

12 – Sutural striae atrophied **13**

– Sutural striae well developed **14**

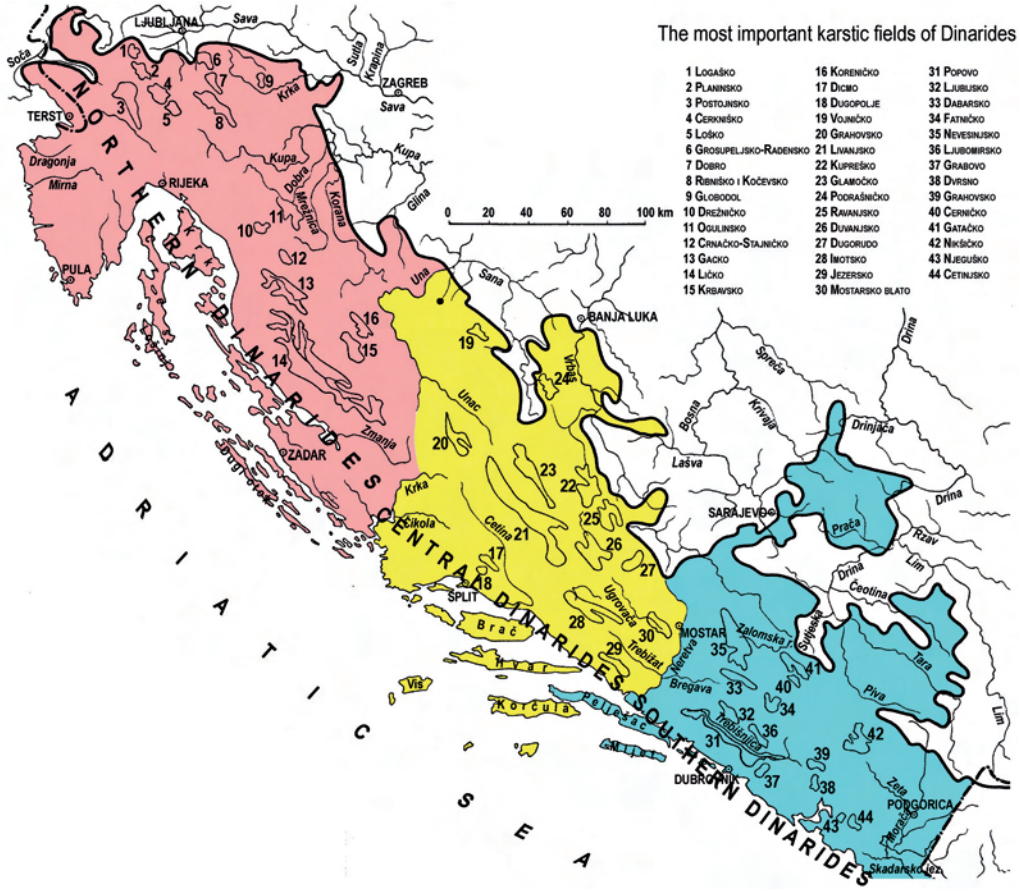

Figure 1: the dinaric subregions

13 – Pronotum without antebasal sulcus, sutural sulcus complete through the whole length of elytra, vertexal median carina absent . . . . . ***Machaerites*** L. Miller

– Pronotum with antebasal sulcus, sutural sulcus evanescent in apical fourth of elytra, vertexal median carina present . . . . . ***Bythoxenus*** Motschulsky

14 – Scape more than 5 times as long as wide **15**

– Scape less than 5 times as long as wide . . . . . ***Gasparobythus*** Poggi

15 – Base of pronotum with four small but well defined foveae, frontal depression large and deep, scape about 6 times as long as wide . . . . . ***Antrobythus*** Besuchet

– Base of pronotum lacking antebasal foveae, frontal depression absent, scape about 10 times as long as wide . . . . . ***Pauperobythus*** Nonveiller, Pavićević & Ozimec

16 – Last segment of maxillary palpi on dorsal side with spherical protuberance, first antennal segment short and simple in both sexes . . . . . ***Bythinus*** Leach

– Last segment of maxillary palpi simple, first antenal segment often modified . . . . . ***Bryaxis*** Kugelan

6 – Catalogue of troglobitic Pselaphinae of the Balkan Peninsula

Supertribe **EUPLECTITAE** Streubel, 1839

Tribe **Trichonychini** Reitter, 1882

Namunia Reitter, 1882b: 211, type species *Namunia myrmecophila* Reitter, 1884.
cavernicola Besuchet, 1978b: 131.
* Cave Kako Perato: GR, island Samos, vicinity of Kosmadhei, Tzitzir Tripa

Supertribe **BATRISITAE** Reitter, 1882

Tribe **Amauropini** Jeannel, 1948

Protamaurops J. Müller, 1944: 84, type species *Amaurops macrophthalma* J. Müller, 1944.
montenegrinus Székessy, 1943: 159. (*Amaurops*)
* Unknown cave: SCG, Montenegro, Bijele Rudine, 12 km west Nikšić

Pseudamaurops Jeannel, 1948a: 7, type species *Bergrothiella albanica* Apfelbeck, 1907.
calcaratus Nonveiller & Pavićević, 2002: 435. (fig. 2)
* Golublja špilja: SCG, Montenegro, vicinity of Virpazar

Seracamaurops Winkler, 1925: 147, type species *Amaurops frieseni* Winkler, 1925.
fodori Székessy, 1943: 160. (*Amaurops* subg. *Seracamaurops*) (fig. 3)
* Riđanska pećina [**type locality**]: SCG, Montenegro, vicinity of Banići, village between Nikšić and Podgorica
* Velja peć: SCG, Montenegro, Lisac Mt., vicinity of Carev most
frieseni Winkler, 1925: 147. (*Amaurops*)
* Pećina u Mravinjac [**type locality**]: BiH, Herzegovina, NW Trebinje, Truba vrh, Bjelašnica Mt. vicinity of Dolovi
* Djavolja (Vragina) jama: BiH, Hercegovina, Bjelašnica planina, W of village Dolovi
* Unknown cave: BiH, Herzegovina, NW Trebinje, Bjelašnica, vicinity of Tukalska Bjelina
grabowskii Müller, 1926: 17. (*Amaurops*)
* Jama Borje III: BiH, south Bosnia, vicinity of Kalinovik
grandis Winkler, 1925: 147. (*Amaurops*)
* Deep pit on W slopes of Orjen [**type locality**]: BiH, Herzegovina, Orjen, vicinity of Grab
* Bukova rupa: BiH, Herzegovina, Orjen, vicinity of Gubar Mt
* Jezero špilja: HR, South Dalmatia, Konavle, Sniježnica Mt., vicinity of Kuna Konavoska
mlejneki Pavićević, Hlaváč & Lakota, 2008: 272.
* Jama Bravenik: BiH, Hercegovina, Orjen Mts., vicinity of Grab
novaki Svirčev, 1936: 34. (*Amaurops* subg. *Seracamaurops*)
* Dvogrla jama: BiH, Herzegovina, Bjelasnica Planina, vicinity of Vučija bara (Gacko)
weiratheri Reitter, 1913: 157 (*Troglamaurops*)
* Vodena pećina [**type locality**]: BiH: Herzegovina, NW of Bileća
* Jama Zagradište: BiH, Bileća, Zvjerina, village Granica

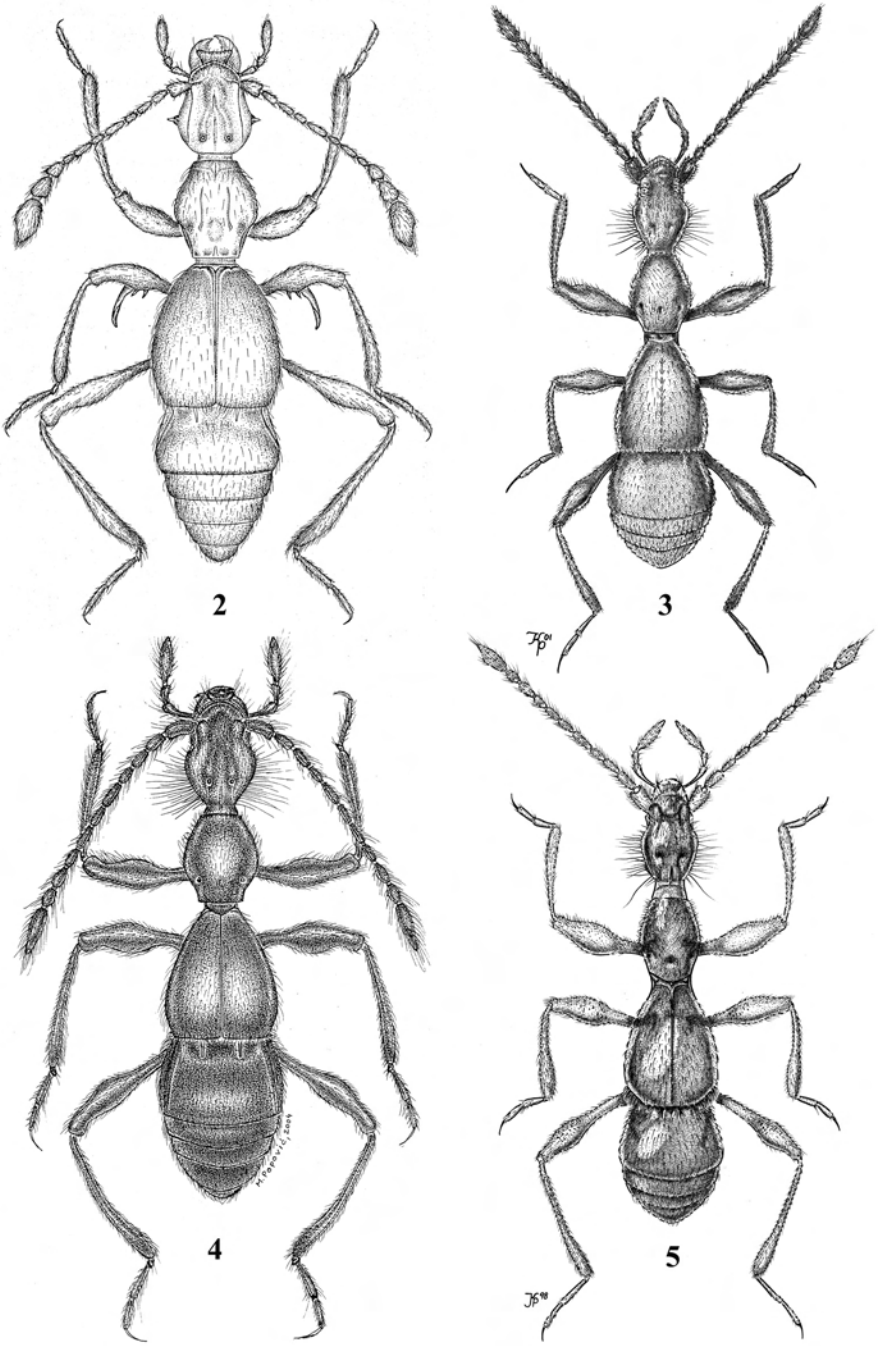

Figure 2: *Pseudamaurops calcaratus* Nonveiller & Pavićević (Popović). Fig. 3: *Seracamaurops (Seracamaurops) fodori* Székessy (Krásenský). Fig. 4. *Seracamaurops (Seracamaurops) ognjenovici* Pavićević, Hlaváč & Lakota (Popović). Fig. 5: *Seracamaurops (Cordiamaurops) fritschi* Besuchet (Krásenský).

ognjenovici Pavićević, Hlaváč & Lakota, 2008: 276.
* Unknown cave designated as "Manja pećina sa vodom na Troglavu kod Bajova Dola" (Pretner, 1977) [**type locality**]: SCG, Montenegro, Bijele Rudine, about 3 km from Podbožur
* Brankova jama: SCG, Montenegro, Bjele Rudine, about 2,5 km south of Podbožur

nonveilleri Pavićević, Hlaváč & Lakota, 2008: 274.
* pećina Đatlo [**type locality**]: BiH, Hercegovina, Kobilja Glava Mts., vicinity of Korita
* jama Golubinka: BiH, Hercegovina, Kobilja Glava Mts., vicinity of Korita
* Bezimena jama: BiH, Hercegovina, Kobilja Glava Mts., vicinity of Korita

popovici Pavićević, Hlaváč & Lakota, 2008: 270.
* pećina Golubinka [**type locality**]: BiH, Hercegovina, Dabarsko polje
* pećina Lepirnica: BiH, Hercegovina, Fatničko polje, vicinity of Fatnica

Seracamaurops (Cordiamaurops) Nonveiller & Pavićević, 2008: 251.

perreaui Nonveiller & Pavićević, 2008: 252. (fig. 7)
* Bukavička pećina [**type locality**]: SCG: Montenegro, Krivošije Mt., vicinity of Risan
* Ericova jama: SCG, Montenegro, Krivošije Mt., Crkvice

fritschi Besuchet, 1986: 451. (*Seracamaurops*) (fig. 5)
* Jama Bojanovića [**type locality**]: SCG, Montenegro, Lovćen Mt., vicinity of Njeguši – Rajčevići
* Cetinjska pećina: SCG, Montenegro, Cetinje, cave near Manastir
* Bezdan jama: SCG, Montenegro, Lovćen Mt., Vršanj, Njeguši
* Unknown pit: SCG, Montenegro, vicinity of Njeguši – Rajčevići village, 250 m SW from Boljanovića jama
* Unknown cave between Njeguši – Rajčevići village and Boljanovića jama: SCG, Montenegro, Lovćen Mt., vicinity of Njeguši – Rajčevići
* Stephan von Sarkotič Höhle (Jama u Dubokom dolu): SCG, Montenegro, Njeguši, Petrova Ljut, Duboki do

Troglamaurops Ganglbauer, 1903: 178, type species *Amaurops leptoderina* Reitter, 1901.

ganglbaueri Winkler, 1925: 148. (*Amaurops*) (fig. 6)
* Unknown cave [**type locality**]: HR, South Dalmatia, Mala Žaba Mt., vicinity of Metković
* Vjetrenica špilja: BiH, Hercegovina, Popovo polje, vicinity of Zavala
* Žira pećina, BiH, Hercegovina, Popovo polje, vicinity of Zavala
* Grabrovica pećina: BiH, Hercegovina, vicinity of Grebci

leptoderina Reitter, 1901: 22. (*Amaurops*)
* Gorska jama [**type locality**]: HR, South Dalmatia, Pelješac, vicinity of Janjina

scheibeli Müller, 1944: 100. (*Amaurops*)
* Đurovića jama: HR, south Dalmacija, Konavle, vicinity of Đurovići, Močići, Ćilipi

Zoufalia Reitter, 1918c: 201, type species *Amaurops corcyrea* Reitter, 1884.

corcyrea Reitter, 1884: 106. (*Amaurops*)
* Cave Grava tou Phossa: GR, Corfu

Tribe **Thaumastocephalini** Poggi, Nonveiller, Colla, Pavićević & Rađa, 2001

Thaumastocephalus Poggi, Nonveiller, Colla, Pavićević & Rađa, 2001: 3, type species *Thaumastocephalus folliculipalpus* Poggi, Nonveiller, Colla, Pavićević & Rađa.

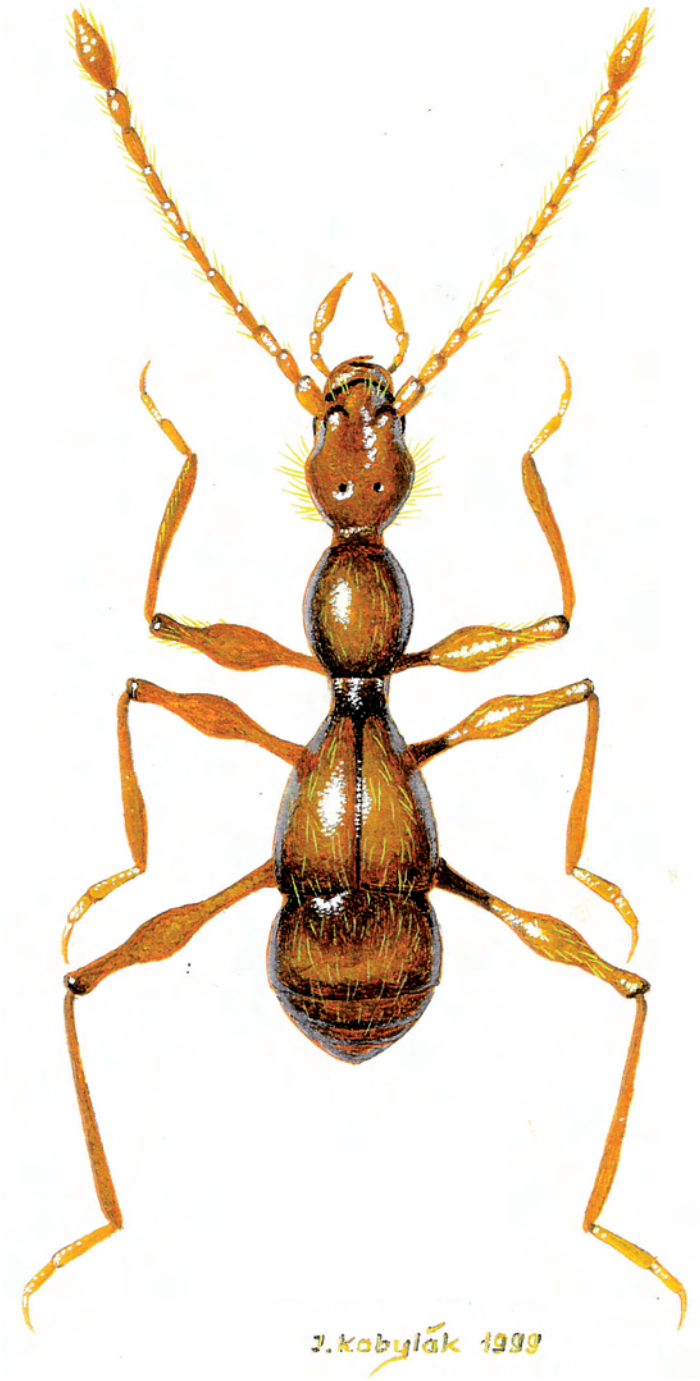

Figure 6: *Troglamaurops ganglbaueri* Winkler

folliculipalpus Poggi, Nonveiller, Colla, Pavićević & Rađa, 2001: 5. (*Thaumastocephalus*) (fig. 8)
* Jama Mala Birnjača [**type locality**]: HR, central Dalmacija, Kozjak Mt., Malačka
* Vranjača špilja: HR, Mosor Mt., Dugopolje, vicinity of Kotlenice

Supertribe **GONIACERITAE** Reitter, 1882

Tribe **BYTHININI** Raffray, 1890

Antrobythus Besuchet, 1985a: 511, type species *Antrobythus leclerci* Besuchet, 1985.
perplexus Besuchet, 1993: 223. (*Antrobythus*)
* Unknown cave: GR, Cyclades, island Iraklia, Aghios Ioannis

Bryaxis Kugelann, 1794: 580, type species *Pselaphus bulbifer* Reichenbach, 1816.
argus Kraatz, 1863: 124. (*Machaerites*) (from PRETNER, 1977 & unpublished data)
* Unknown cave [**type locality**]: I, region Carnila
* Grotta Nuova di Vilanova: I, Friuli-Venezia Giulia, Lusevera
* Grotta di Monteprato: I, Friuli-Venezia Giulia, Nimis
* Groticella presso la Grotta di Monteprato: I, Friuli-Venezia Giulia, Nimis
* Grotta di S. Giovanni di Landro (o d'Antro): I, Friuli-Venezia Giulia, Stregna vicinity of Cividale, Pulfero
* Caverna preistorica (Velika jama): I, vicinity of Tercimonte, Udine
* Grotta di Visogliano (Grotta dei cacciatori, Grotta Leghissa): I, Duino, Aurisina
* Grotta presso il viadotto ferroviario di Aurisina (Svenska jama): I, Duino Aurisina
* Grotta presso Samatorza (Spelonco del Ferro, Pećina na doleč, Moserova jama): I, Duino Aurisina
* Grotta Azzurra di Samatorza (Caverna presso Samatorza, Pećina na Leskovcah): I, Duino Aurisina
* Grotta Dante: I, vicinity of Tolmino
* Grotta Ercole (Grotta di Gabrovitza, Velika pećina): I, Sgonico, Gabrovizza, vicinity of Prosecco
* Grotta dell'Orso: I, Sgonico
* Grotta Gigante: I, Sgonico
* Grotta del Monte Gurca: I, between Opicina and Prosecco
* Grotta del Frasino: I, Monrupino
* Grotta del Sterpi: I, Monrupino
* Grotta delle Tre Querce: I, Monrupino
* Sercetova jama: I, Trieste
* Grotta Fulvio: I, Trieste
* Grotta Clementina: I, vicinity of Opicina, Carso di Opicina, Trieste
* Grotta sopra Longera: I, Trieste
* Grotta delle Gallerie: I, S. Dorligo delle Valle
* Caverna in Val Rosandra: I, S. Dorligo delle Valle
* Grotta della Radici: I, Friuli-Venezia Giulia, VG 256, Duino-Aurisina
* Grotta Romana: I, Friuli-Venezia Giulia, VG 850, Monrupino
* Grotta vicinity of Orle: I, Friuli-Venezia Giulia, VG 390, Trieste
* Gipsova jama: SLO, vicinity of Škofja Loka
* Migutovo brezno (Grotta Brezno): SLO, Škofja Loka
* Romualdova špilja: HR, Istra, vicinity of Limska Draga, vicinity of Rovinj
* Tenčić špilja (Caverna di Vines): HR, Istra, Labin, Krapan
* Močiljska špilja: HR, south Dalmacija, Osojnik, vicinity of Dubrovnik

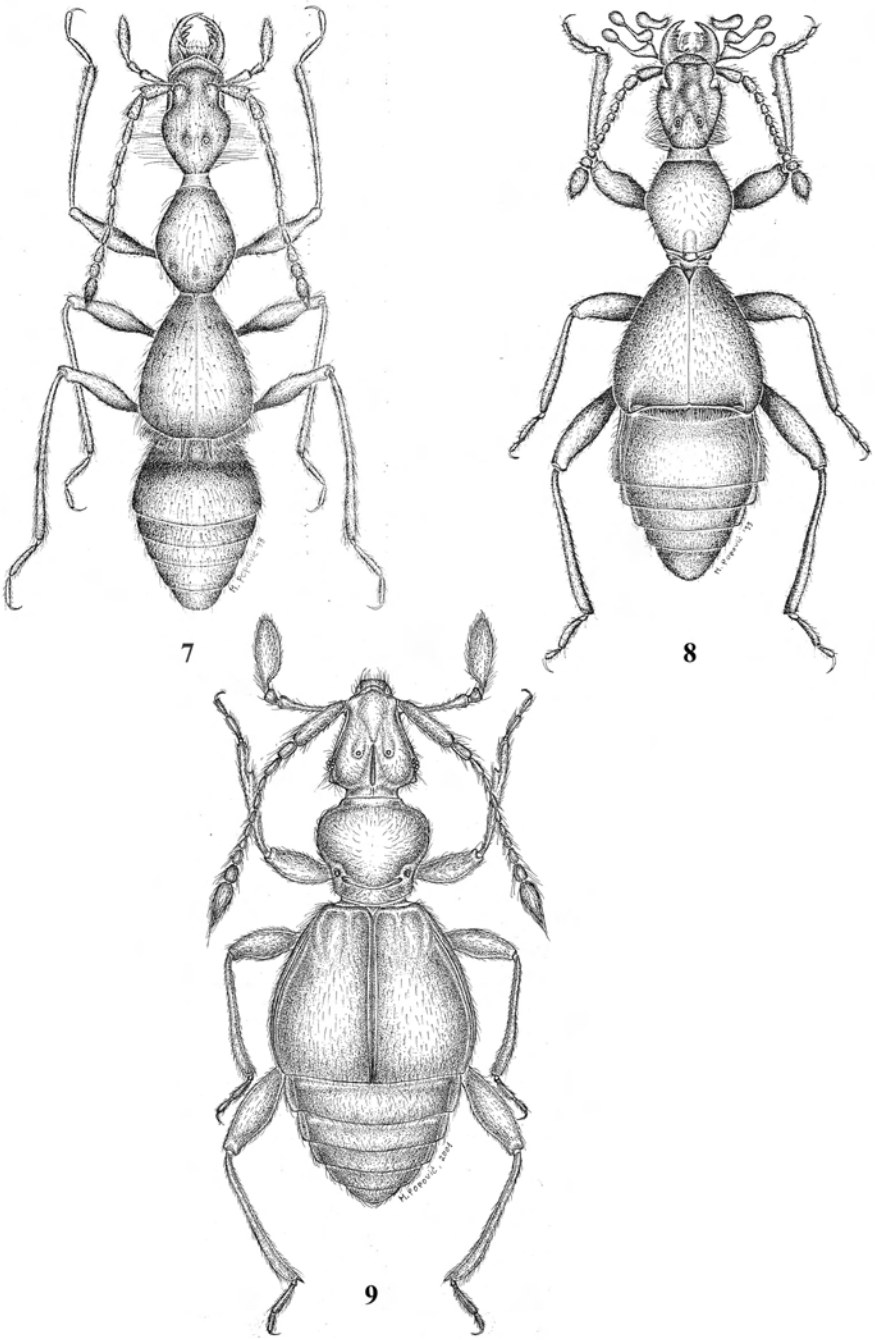

Figure 7: *Seracamaurops (Cordiamaurops) perreaui* Nonveiller & Pavićević (Popović). Fig. 8: *Thaumastocephalus folliculipalpus* Poggi, Nonveiller, Colla, Pavićević & Rađa (Popović). Fig. 9: *Bryaxis tuberculiceps* Nonveiller, Pavićević & Besuchet (Popović).

Note: most probably not strictly cavernicolous species, distributed in whole dinaric range from northern Italy, Slovenia, Croatia up to BiH.

beroni Karaman, 1969: 61. (*Bryaxis*)
* Metcha dupka (Lisitcha dupka) [**type locality**]: BG, Kjustendil, vicinity of Stradalovo
* Jame 2: BG, Vidin, vicinity of Targovište
* Medzhak dupka: BG, Vidin, vicinity of Repljana
* Prekonoška pećina: SCG, Serbia, Svrljig, Mt. Svrljiške planine, vicinity of Prekonoge
* Ravna peć: SCG, Serbia, Svrljig, Mt. Svrljiške planine, vicinity of Prekonoge
* Popšički pešter: SCG, Serbia, Svrljig, Mt. Svrljiške planine, vicinity of Popšica

blacensis Karaman, 1954a: 82. (*Arcopagus* subg. *Erichobythus*)
* Pećina Blace [**type locality**]: MK, vicinity of Skopje
* Kovačevića pećina: SCG, Serbia, Krupanj, village Cerova, hamlet Kovačevići

crepsensis crepsensis Müller, 1947: 141. (*Bythinus*)
* Campari jama: HR, Kvarner, island Cres, vicinity of Petričevi

crepsensis histrus Agazzi, 1961: 51. (*Bryaxis*)
* Romualdova špilja [**type locality**]: HR, Istra, Limska Draga, vicinity of Rovinj
* Tenčić špilja: HR, Istra, Labin, near Krapan

issensis Müller, 1909: 279. (*Bythinus*)
* Kraljičina špila: HR, Central Dalmacija, island Vis, vicinity of Oključna

ossaeus Besuchet, 2008: 245. (*Bryaxis*)
* Cave Tsari Tripa: GR, Thessalia, Mt. Psylodendron, ros Ossa, vicinity of Spiliá

splendidus goliath Jeannel, 1922: 233. (*Megalobythus*)
* Peştera Corobana Mîndruţului: RO: Scărişoara, Turda Aries, Mt. Bihor

troglophilus Agazzi, 1961: 52. (*Bryaxis*)
* Unknown pit: AL, Cukale Mt. Sphella Luga. Cen, Vukáj

tuberculiceps Nonveiller, Pavićević & Besuchet, 2003: 287. (*Bryaxis*) (fig. 9)
* Maksina jama: SCG, Montenegro, Krivošije Mts., Kameno more, village Knezlaz

Bythinus Leach, 1817: 82, type species *Pselaphus securiger* Reichenbach, 1816.

hauseri Besuchet, 1978a: 263. (*Bythinus*)
* cave Garzeniko: GR, Peloponesos, vicinity of Kandila, island Samos, vicinity of Kosmadhei

Bythoxenus Motschulsky, 1859a: 132, type species *Bythoxenus subterraneus* Motschulsky, 1859.

subterraneus Motschulsky, 1859: 132. (*Bythoxenus*)
= *plicatulus* Schaufuss, 1863: 1245. (*Machaerites*)
* Velika Pasica jama [**type locality**]: SLO, Dolenjsko region, Krim Mt., Ljubljana, vicinity of Gornji Ig
* Volčja jama: SLO, Nanos Mt., vicinity of Postojna
* Žegnana jama (Nussdorfer Grotte): SLO, Postojna, vicinity of Orehek
* Migutovo brezno: SLO, region of Gorenjsko, vicinity of Škofja Loka
* Matjaževa jama (Grotte am Grossgallenberg): SLO, Šmarna gora Mt., vicinity of Zavrh
* Jama Tacerca: SLO, Dobrepolje, vicinity of Cretež
* Velika jama pri Trebnjem: SLO, Dolenjska region, vicinity of Trebnje
* Jama pod Jamskim gradom: SLO, Postojna, vicinity of Predjama
* Jeralovo brezno: SLO, Rovnik, Kranj, vicinity of Besnica
* Gipsova jama: SLO, region of Gorenjsko, vicinity of Škofja Loka

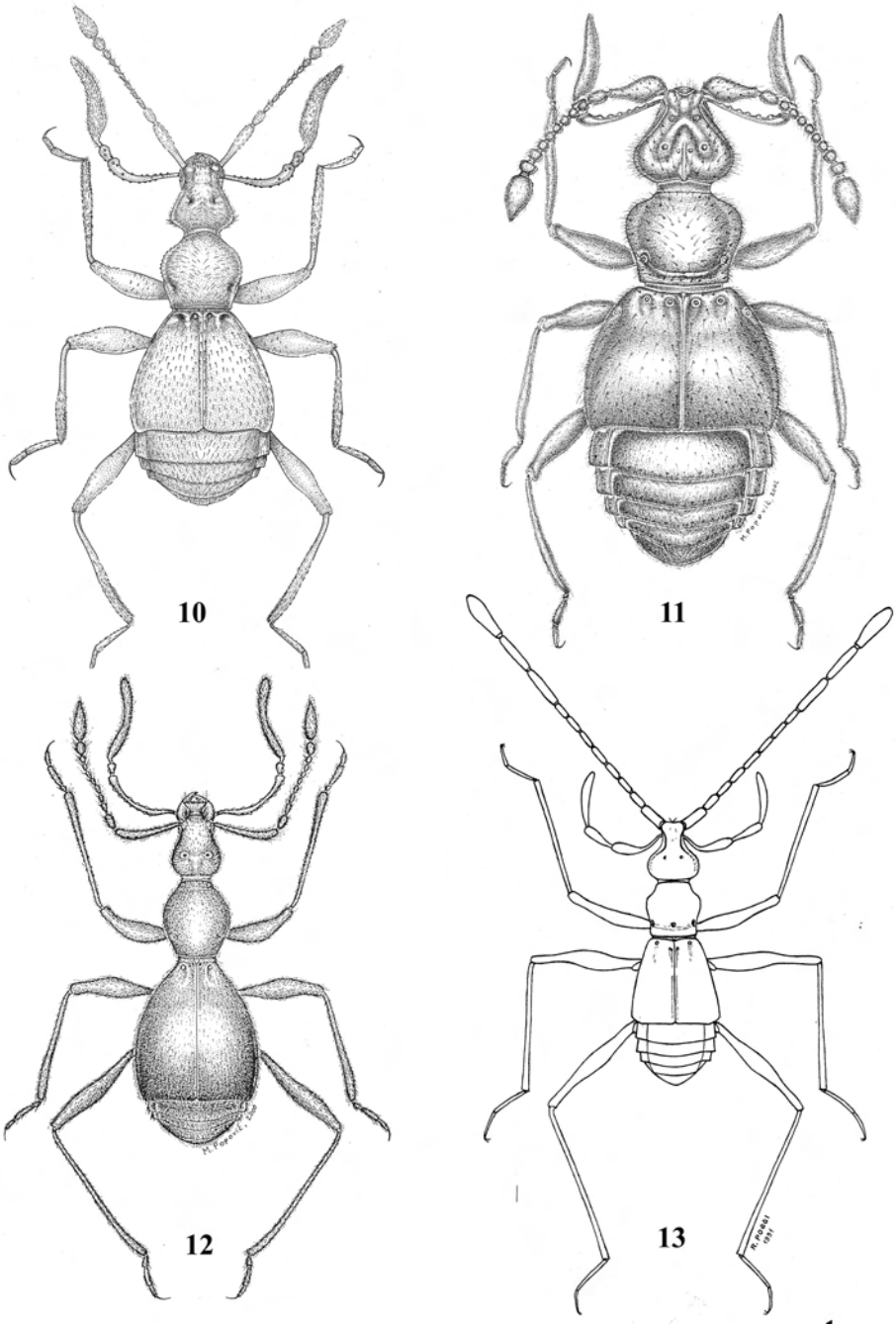

Figure 10: *Machaerites udrzali* Hlaváč & Lakota (Krásenský). Fig. 11: *Nonveilleria lepida* Pavićević & Besuchet (Popović). Fig. 12: *Pauperobythus globuliventris* Nonveiller, Pavićević & Ozimec (Popović). Fig. 13: *Decumarellus sarbui* Poggi (Poggi)

Gasparobythus Poggi, 1992: 207, type species *Gasparobythus tergestinus* Poggi, 1992.
tergestinus tergestinus Poggi, 1992: 208. (*Gasparobythus*)
* Grotta Moser [**type locality**]: I, Friuli – Venezia Giulia, VG 1096, Duino-Aurisina
* Grotta Cosmini: I, Friuli – Venezia Giulia, VG 561, Duino-Aurisina

Machaerites L. Miller, 1855: 509, type species *Machaerites spelaeus* L. Miller, 1855.
cognatus Nonveiller & Pavićević, 2001: 329. (*Machaerites*)
* Špilja Vrelo: HR, Gorski Kotar, vicinity of Fužine
croaticus Nonveiller & Pavićević, 2001: 320. (*Machaerites*)
* Špilja Đutno: HR, Pokuplje region, Zdihovo, vicinity of Liplje
curvistylus Nonveiller & Pavićević, 2001: 325. (*Machaerites*)
* Špilja Drobovnik [**type locality**]: HR, Žumberak region, Radatovići, vicinity of Kunčani
* Špilja Izvor, HR, Žumberak region, vicinity of Malinci
* Špilja Provala, HR, Žumberak region, vicinity of Bučari
* Jamina, HR, Žumberak region, vicinity of Donji Oštrc
* Ponor Vrulje, HR, Žumberak region, vicinity of Cerovica
intermedius Nonveiller & Pavićević, 2001: 327. (*Machaerites*)
* Špilja Kod Stare Sušice: HR, Gorski Kotar, Ravna Gora, vicinity of Stara Sušica
jurinaci Pavićević & Ozimec, 2008: 282. (*Machaerites*)
* Zagorska peć [**type locality**]: HR, Kordun region, Ogulin, Velika Kapela Mt., vicinity of Zagorje Ogulinsko
kastavensis Pavićević & Ozimec, 2008: 284. (*Machaerites*)
* Jama S8 [**type locality**]: HR, Istra, Ćićarija Mt., vicinity of Mune
* Jama S9: HR, Istra, Ćićarija Mt., vicinity of Mune
mekotiensis Nonveiller & Pavićević, 2001: 328. (*Machaerites*)
* Špilja u Mekoti: HR, Kordun region, Ogulin, vicinity of Košare
nehaji Pavićević & Ozimec, 2008: 286. (*Machaerites*)
* Špilja Orlovac [**type locality**]: HR, Hrvatsko primorje, Senjsko bilo, Majorija, Senjska draga, vicinity of Senj
novissimus Nonveiller & Pavićević, 2001: 330. (*Machaerites*)
* Polina Pećina: SLO, Istra, Podgrad, vicinity of Poljane pri Podgradu
ravasinii Müller, 1922: 32. (*Bythinus*)
* Postojna jama [**type locality**]: SLO: Postojna
* Grotta delle Tori di Slivia: I, Duino-Aurisina
* Grotta Azzurra di Samatorza (Caverna presso Samatorza; Pećina na Leskovcah): I, Duino-Aurisina
* Grotta C. Doria: I, Sgonico
* Grotta del Bufalo: I, Duino-Aurisina
* Draga jama pri Ponikvah: SLO, Tržič, Štanjel
* Jama v Lašci: SLO, Tržič
* Jama pri Slivnem: SLO, Slivno
* Mačkovica jama: SLO, Postojna, vicinity of Laze
* Križna jama: SLO, Postojna, vicinity of Logarček
* Lagarček jama: SLO, Postojna, vicinity of Logarček
spelaeus spelaeus Miller, 1855: 509. (*Machaerites*)
* Jama Tacerca [**type locality**]: SLO, Dolenjsko region, Dobrepolje, vicinity of Cretež
* Velika jama nad Trebnjem: SLO, Dolenjsko region, vicinity of Trebnje
* Jama treh bratov: SLO, W of Kočevje, vicinity of Mestni Vrh

* Eleonorina jama: SLO: W of Kočevje, vicinity of Mestni Vrh
* Vrlovka špilja: HR, Pokuplje, Ozalj, vicinity of Kamanje

spelaeus orientalis Nonveiller & Pavićević, 2001: 323. (*Machaerites*)
* Lukova jama: SLO, Pokuplje region, vicinity of Zdihovo

udrzali Hlaváč & Lakota, 2004: 139. (*Machaerites*) (fig. 10)
* Rodićeva pećina: HR, Lika region, Plitvice, Rodićeve Kuće

Nonveilleria Pavićević & Besuchet, 2003: 279, type species *Nonveillera lepida* Pavićević & Besuchet.

lepida Pavićević & Besuchet, 2003: 280. (*Nonveillera*) (fig. 11)
* unknown cave: SCG, Montenegro, Nikšić, vicinity of Budoš, small cave above Velja pećina

romani Pavićević & Besuchet, 2003: 282. (*Nonveillera*)
* Samograd špilja: HR, South Dalmacija, island of Korčula, vicinity of Račišće

Pauperobythus Nonveiller, Pavićević & Ozimec, 2002: 13, type species *Pauperobythus globuliventris* Nonveiller, Pavićević & Ozimec.

globuliventris Nonveiller, Pavićević & Ozimec, 2002: 14. (*Pauperobythus*) (fig. 12)
* Markova jama: HR, Istria, vicinity of Tar

Tychobythinus Ganglbauer, 1896: 170, type species *Bythinus ottonis* Ganglbauer, 1896.

brachati Besuchet, 2008: 246. (*Tychobythinus*)
* Cave Panaghia Kaloperato: GR, island of Samos, vicinity of Kosmadei

croaticus Z. Karaman, 1954: 175. (*Collartia*)
* Zagorska peć: HR, Kordun region, Ogulin, vicinity of Zagorje Ogulinsko

naxius Besuchet, 1993: 225. (*Tychobythinus*)
* cave Zeus: GR, Cyclades, island of Naxos, vicinity of Filoti

neumanni Müller, 1909: 117. (from Pretner, 1977 & unpublished data)
* Šipun špilja [**type locality**]: HR, South Dalmacija, Konavle, vicinity of Cavtat
* Špilja u Bastu: HR, Middle Dalmacija, Biokovo Mt., Bast, vicinity of Baška voda
* Špilja u Vrdolje: HR, Middle Dalmacia, Island Brač, vicinity of Škrip
* Pružina špilja: HR, Middle Dalmacija, Zabiokovlje, Ogradice, vicinity of Zagvozd
* Špilja Podrum: HR, Middle Dalmacija, Biokovo Mt., vicinity of Podgora
* Samogorska špilja: HR, Middle Dalmacija, Biokovo Mt., vicinity of Župa
* Jama Bobaj 2: HR, South Dalmacija, Neretva region, Kula Norinska, vicinity of Metković
* Špilja za Gromačkom vlakom: HR, South Dalmacija, Gromača, vicinity of Dubrovnik
* Močiljska špilja: HR, South Dalmacija, Osojnik, vicinity of Dubrovnik
* Unknown cave above Splavište: SCG, Montenegro, Durmitor Mt., canyon of the river Tara, Đurdevića Tara
* Unknown cave in Rajčevići: SCG, Montenegro, Lovćen Mt.

Supertribe **PSELAPHITAE** Latreille, 1802

Tribe **Tyrini** Reitter, 1882

Decumarellus Poggi, 1994: 221, type species *Decumarellus sarbui* Poggi, 1994.

sarbui Poggi, 1994: 222. (*Decumarellus*) (fig. 13)
* Peştera de la Movile: RO, Dobrogea meridionale, vicinity of Mangalia

7 – Table summarizing the distribution of cavernicolous Pselaphinae in the Balkan Peninsula

		DIN	N DIN	M DIN	S DIN	HEL	STP	CAR	I	SLO	HR	BiH	CG	SRB	MK	AL	BG	RO	GR
	Euplectitae: Trichonychini (1 gen/1 sp)																		
	Namunia																		
1	*N. cavernicola*					x													x
	Batrisitae: Amauropini (5 gen/18 sp)																		
	Protamaurops																		
2	*P. montenegrinus*	x			x								x						
	Pseudamaurops																		
3	*P. calcaratus*	x			x								x						
	Seracamaurops																		
	S. *(**Cordiamaurops**)*																		
4	*S. (C.) perreaui*	x			x							x							
5	*S. (C.) fritschi*	x			x							x							
	S. *(**Seracamaurops**)*																		
6	*S. (S.) fodori*	x			x								x						
7	*S. (S.) frieseni*	x			x							x							
8	*S. (S.) grabowskii*	x			x							x							
9	*S. (S.) grandis*	x			x						x	x							
10	*S. (S.) popovici*	x			x								x						
11	*S. (S.) mlejneki*	x			x							x							
12	*S. (S.) nonveilleri*	x			x							x							
13	*S. (S.) novaki*	x			x							x							
14	*S. (S.) ognjenovici*	x			x							x							
15	*S. (S.) weiratheri*	x			x							x							
	Troglamaurops																		
16	*T. ganglbaueri*	x			x						x	x							
17	*T. leptoderina*	x			x						x								
18	*T. scheibeli*	x			x						x								
	Troglamaurops																		
19	*Z. corcyrea*					x													x
	Batrisitae: Thaumastocephalini (1 gen/3 sp)																		
	Thaumastocephalus																		
20	*T. folliculipalpus*	x		x							x								
	Goniaceritae: Bythinini (9 gen/33 sp)																		
	Antrobythus																		
21	*A. perplexus*					x													x
	Bryaxis																		
22	*B. argus*	x	x	x	x				x	x	x		x						
23	*B. beroni*						x							x			x		
24	*B. blacensis*					x									x				

		DIN	N DIN	M DIN	S DIN	HEL	STP	CAR	I	SLO	HR	BiH	CG	SRB	MK	AL	BG	RO	GR
25	*B. crepsensis s. str.*	x	x								x								
26	*B. crepsensis histrus*	x	x								x								
27	*B. issensis*	x		x							x								
28	*B. ossaeus*					x													x
29	*B. splendidus goliath*							x										x	
30	*B. troglophilus*					x										x			
31	*B. tuberculiceps*	x			x								x						
	Bythinus																		
32	*B. hauseri*					x													x
	Bythoxenus																		
33	*B. subterraneus*	x	x							x									
	Gasparobythus																		
34	*G. tergestinus*	x	x						x										
	Machaerites																		
35	*M. cognatus*	x	x								x								
36	*M. croaticus*	x	x								x								
37	*M. curvistylus*	x	x								x								
38	*M. intermedius*	x	x								x								
39	*M. jurinaci*	x	x								x								
40	*M. kastavensis*	x	x								x								
41	*M. mekotiensis*	x	x								x								
42	*M. nehaji*	x	x								x								
43	*M. novissimus*	x	x							x									
44	*M. ravasinii*	x	x						x	x									
45	*M. spelaeus orientalis*	x	x							x									
46	*M. spelaeus spelaeus*	x	x							x	x								
47	*M. udrzali*	x	x								x								
	Nonveilleria																		
48	*N. lepida*	x			x								x						
49	*N. romani*	x			x						x								
	Pauperobythus																		
50	*P. globuliventris*	x	x								x								
	Tychobythinus																		
51	*T. brachati*					x													x
52	*T. croaticus*	x	x								x								
53	*T. naxius*					x													x
54	*T. neumanni*	x		x	x						x								
	Pselaphitae: Tyrini (1 gen/1 sp)																		
	Decumarellus																		
55	*D. sarbui*						x											x	
	Total 17 gen / 55 sp	43	20	4	22	9	2	1	3	6	23	11	7	1	1	1	1	2	7
		78.2	36.4	7.3	40.0	16.4	3.6	1.8	5.5	10.9	41.8	20.0	12.7	1.8	1.8	1.8	1.8	3.6	12.7

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