

ENDOGEAN AND CAVERNICOLOUS
COLEOPTERA OF THE BALKANS. XXII.
TWO NEW SPECIES OF *PARAMAUROPS*
JEANNEL, 1948 (COLEOPTERA, STAPHYLINIDAE,
PSELAPHINAE) FROM CROATIA

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Two new species of the subterranean and anophthalmous genus *Paramaurops* Jeannel, 1948 are described and illustrated: *P. alenkirini* sp. n. and *P. struyoei* sp. n. from Croatia. The distribution of all Croatian records of the genus is given in the map.

Key words: Amauropini, taxonomy, biospeleology, subterranean beetles, Dinarides.

Hlaváč, P., Bregović, P. & Jalžić, B.: Endogejski i špiljski Coleoptera Balkana. XXII. Dvije nove vrste roda *Paramaurops* Jeannel, 1948 (Coleoptera, Staphylinidae, Pselaphinae) iz Hrvatske. *Nat. Croat.*, Vol. 29, No. 1, 1-8, 2020, Zagreb.

U radu su opisane dvije nove vrste podzemnih i slijepih kornjaša roda *Paramaurops* Jeannel, 1948: *P. alenkirini* sp. n. i *P. struyoei* sp. n. iz Hrvatske. Ilustrirani su muški kopulturni organi obje vrste. Distribucija svih zapisa ovog roda u Hrvatskoj prikazana je na karti.

Ključne riječi: Amauropini, taksonomija, biospeleologija, podzemni kornjaši, Dinaridi

INTRODUCTION

The genus *Paramaurops* Jeannel, 1948 with 51 described species plus 9 subspecies is the largest genus of the subterranean tribe Amauropini Jeannel, 1948 (SCHÜLKE & SMETANA, 2015). The majority of species are distributed in France and Italy with 8 species known from the Balkan peninsula. Two species were previously known from Croatia, *P. apfelbecki* Ganglbauer, 1896 and *P. kaufmanni* Ganglbauer, 1895. The aim of this paper is to describe two new species, both of which can be considered endogean, even though one was found in the entrance part of a cave. The description of at least three more species, actually known only from one specimen each, is waiting until more material is available.

MATERIAL AND METHODS

Specimens prepared for morphological study were examined using a Leica S8APO stereoscopic microscope with diffuse lighting at magnifications of up to 128×. Habitus images were taken with a Canon EOS 90D in combination with a Canon MP-E65 1-5x macro lens.

The aedeagus was studied using a Zeiss transmitted-light microscope at magnifications of up to 500X. The aedeagus was dissected and preserved in Euparal on a plastic card pinned together with the specimen. All drawings were made using a drawing tube and digitized using CorelDRAW X7.

The head length was measured from the occipital constriction to the anterior margin of the labrum; elytral length was measured along the suture; width always refers to the maximum width of a given structure, e.g. head (excluding ocular spines), pronotum, elytra, abdomen. The body length is the combined length of the head, pronotum, elytra, and abdomen.

Label data are cited verbatim. All labels of the studied material are printed. All type specimens were provided with the following red printed label: HOLOTYPE or PARATYPE, generic and specific name of the taxon, P. Hlaváč det., 2020.

The material is deposited in the following collections: Croatian Natural History Museum, Zagreb (CNHM) and the private collection of Peter Hlaváč (PCPH, Prague, The Czech Republic).

Paramaurops alenkirini sp. n.

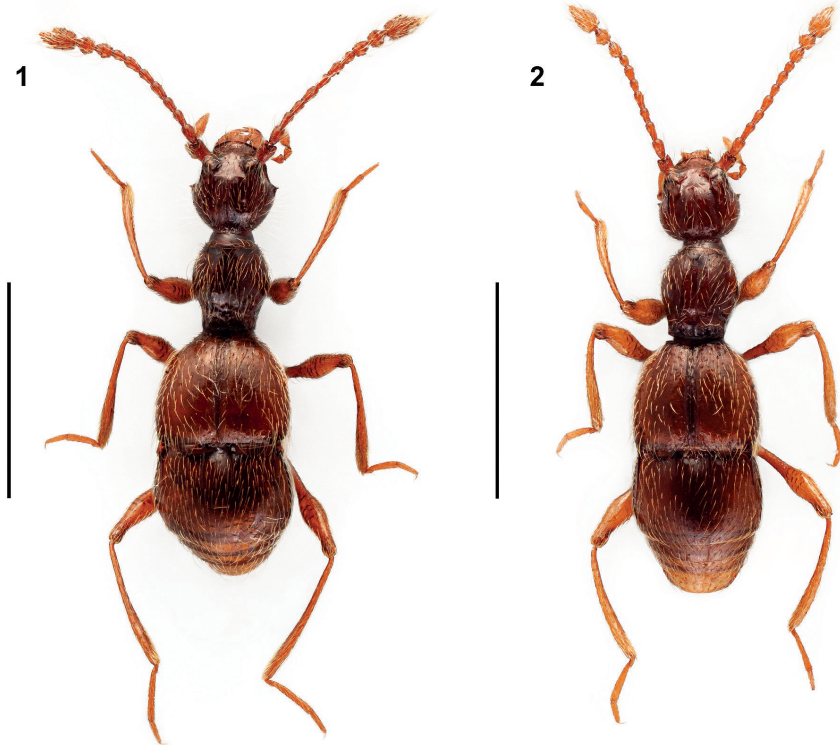
(Figs 1, 3-5, 12)

Material studied. Holotype, ♂: (p) CROATIA: Mihovil, Vrgorac, Zavojane, Baletići, Golubinka u gaju, 30.IV.2018, A. Kirin lgt. CNHM. Paratypes: 3♂, 12♀: the same data as holotype. CNHM, PCPH.

Description. Body shiny (Fig. 1), reddish-brown, sparsely pubescent, covered with medium length golden setae; legs, antennae, and maxillary palpi slightly lighter. Length 1.95–2.05 mm; maximum width of elytra 0.62–0.64 mm.

Head slightly longer than wide, eyes completely atrophied, each replaced by short, acute ocular spine; labrum large, rounded, bearing few long, golden setae; frons with well-defined semi-quadratic excavation between prominent supra-antennal tubercles, disc and vertex slightly convex, with well-defined median carina; median carina remote from posterior margin of frontal excavation and reaching posterior margin of head and continuing on neck region, lateral carinae absent, vertexal foveae separated, distance from median carina slightly inferior to distance to lateral margin of head; surface of disc and vertex with few long setae, smooth.

Antennae short and slender, about 0.67 mm long, all antennomeres elongate, scape cylindrical, about 1.25 x longer than wide and about 1.3 x as long as pedicel, pedicel longer than wide, 1.20 x as long as antennomere III, and as long as V and VII, antennomere V 1.20 x as long as IV and VI and 1.50 x as long as VIII, antennomeres IX and X, symmetrical, both about 1.20 x as long as wide, lacking modifications, terminal antennomere symmetrical, about 1.85 x as long as wide.



Figs. 1-2. Habitus of *Paramaurops* species. (1) *Paramaurops alenkirini* sp. n.; (2) *Paramaurops struyeyi* sp. n. (photo courtesy of T. Delić).

Pronotum about 1.15-1.20 x as long as wide, and about as long as head, with wide, shallow median sulcus between two parallel carinae; median antebasal and lateral foveae well-defined, transversal sulcus connecting foveae well-defined.

Elytra simple, lacking foveae and striae, about 1.18-1.25 x as wide as long and about 1.20-1.30 x as long as pronotum.

Abdomen slightly wider than elytra, first visible tergite (IV) large, slightly expanded posteriad, lateral parallel carinae weakly defined, located closely to lateral margin and short, reaching one third of tergal length, slightly shorter than median carinae; median carinae slightly divergent posteriad, long about 0.40 of tergal length, their basal distance about 0.19 of the basal tergal width, with three basal depressions, lateral depressions deeper than median shallow one. Visible sternite 7 as in Fig. 5. Legs long and slender, lacking any modification.

Aedeagus 0.35 mm long (Figs 3, 4).

Sexual dimorphism. Not apparent.

Differential diagnosis. *P. alenkirini* is separated from its congeners by short antennae, about 0.67 mm long, but mainly by the shape of the aedeagus.

Etymology. Named after our colleague and friend, the speleologist Alen Kirin (Croatian Biospeleological Society, Croatia), the collector of the type series.

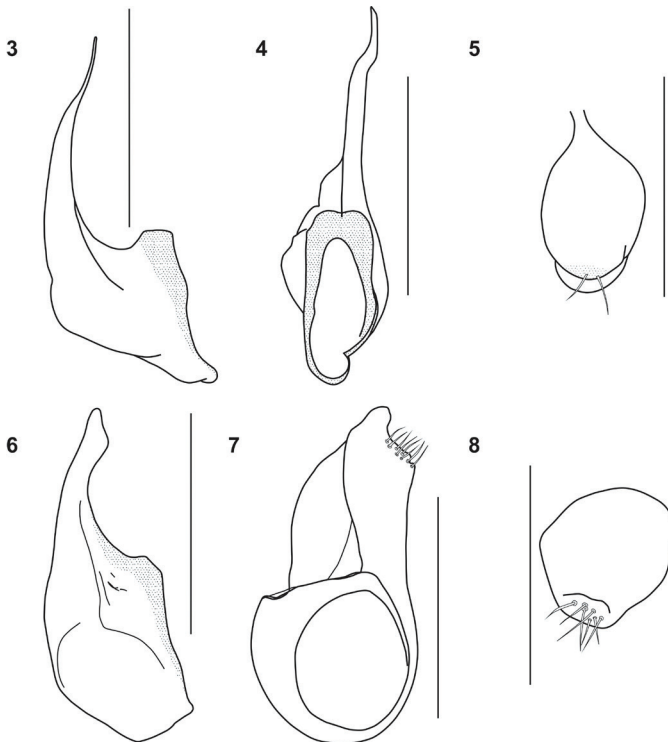
Distribution and habitat. *P. alenkirini* is known only from the cave Golubinka u gaju (Figs 9-11), situated at 740 m a.s.l. on the slopes of Mihovil Mountain (with highest

peak of 1245 m a.s.l.), near the village Baletići in the municipality of Vrgorac (Fig. 12, blue circle). The cave has only one chamber, and is 29 m long, and 5.7 m deep (Čuček et al., 2018). Because of the large entrance, measuring 10.6 m x 4.6 m, the daylight penetrates to all parts of the chamber. The cave has a simple morphology, and the bottom of the cave is covered with lumps of stone of various dimensions. The air temperature measured in the cave on 30th April 2018 was 8.0 °C, the soil temperature was 7.1 °C, and the relative humidity was 77%. Specimens of *Paramaurops* were found in entrance part of the cave, under a large piece of stone block where there was also plenty of humus. The following fauna is also recorded from the cave: Araneae – *Harpactea* sp. (det. M. Pavlek); Diplopoda – *Brachydesmus subterraneus* Heller, 1858, *Metonomastus* sp. nov.?, *Macrochaetosoma* sp. (det. T. Dražina) as noted by Čuček et al. (2018); Coleoptera – *Laneyriella staudacheri* (Müller, 1934) (det P. Bregović), *Speonesiotes* sp. (det. B. Jalžić).

Paramaurops struyvei sp. n.

(Figs 2, 6-8, 12)

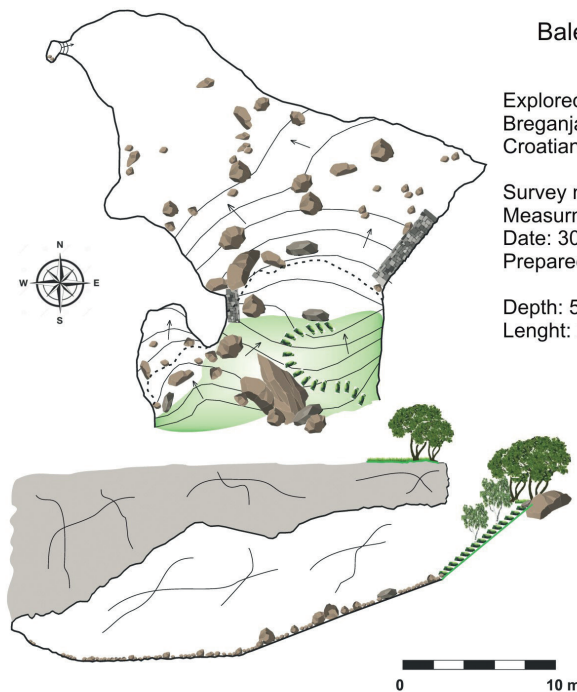
Material studied. Holotype, ♂: (p) CROATIA (soil washing), Učka, Sučići, 3.10.2017, 45.247°N 14.237°E, T. Struyve lgt. CNHM. Paratype, 1♀: (p) CROATIA (soil washing), Rijeka, Trnovica, 3.10.2017, 45.390°N 14.423°E, T. Struyve lgt. PCPH.



Figs. 3-8. *Paramaurops alenkirini* sp. n. (3-5), (3) aedeagus, dorsal view; (4) aedeagus, lateral view; (5) visible sternite 7 (IX); *Paramaurops struyvei* sp. n. (6-8), (6) aedeagus, dorsal view; (7) aedeagus, lateral view; (8) visible sternite 7 (IX). Scale: 0.2 mm.



11



Golubinka u gaju

Baletići, Zavojane, Vrgorac

Explored by:  
Breganja
Croatian Biospeleological Society

Survey made by: Dolores Hribar
Measurements: Tin Rožman, Nina Hećej
Date: 30.04.2018.
Prepared by: Dolores Hribar

Depth: 5,7 m
Length: 29,0 m

Figs. 9-11. Golubinka u gaju (cave), type locality (9-11), (9) entrance (photo F. Belak); (10) interior of the first part of the cave where *Paramaurops alenkirini* sp. n. was found (photo A. Čukušić), (11) topographical map.

Description. Body slightly shiny (Fig. 2), reddish-brown, sparsely pubescent, covered with medium length golden setae; legs, antennae, and maxillary palpi slightly lighter. Length 2.10–2.15 mm; maximum width of elytra 0.59–0.61 mm.

Head about as wide as long or slightly longer than wide, eyes completely atrophied, each replaced by short, acute ocular spine; labrum large, rounded, bearing few long, golden setae; frons with well-defined semi-quadratic excavation between prominent supra-antennal tubercles, disc and vertex slightly convex, with well-defined median

carina; median carina remote from posterior margin of frontal excavation and reaching posterior margin of head, lateral carinae absent, vertexal foveae separated, distance from median carina subequal to lateral margin of head; surface of disc and vertex with few long setae, smooth.

Antennae long and slender, about 0.90 mm long, scape cylindrical, about 1.65 x longer than wide and 1.1x longer than pedicel, pedicel longer than wide, about as long as III, antennomere III–IX elongate, IX and X hexagonal, symmetrical, X as long as wide, lacking modifications, terminal antennomere symmetrical, about 1.65 x as long as wide.

Pronotum slightly longer than wide, and slightly longer than head, with wide, shallow median sulcus between two parallel carinae, median antebasal and lateral foveae well-defined, transversal sulcus connecting foveae well-defined.

Elytra simple, lacking foveae and striae, about 1.20 x as wide as long and about 1.15–1.20 x as long as pronotum.

Abdomen slightly wider than elytra, first visible tergite (IV) large, slightly expanded posteriad, lateral parallel carinae located closely to lateral margin, reaching 2/3 of tergal length; median carinae short, slightly extending basal fourth of tergal length, their basal distance about 0.32 of basal tergal width, with three basal shallow depressions. Visible sternite 7 as in Fig. 8. Legs long and slender, lacking any modification.

Aedeagus 0.31 mm long (Figs 6, 7).

Sexual dimorphism. Not apparent.

Differential diagnosis. *P. struyvei* is separated from its congeners by the quadrate head, long antennae, about 0.90 mm long, but mainly by the shape of the aedeagus.

Etymology. Named after our colleague and friend Tim Struyve (Brussels, Belgium), the collector of the type series.

Distribution. Croatia, Učka (peninsula Istria) and near Rijeka.

Other records of *Paramaurops* from Croatia:

(Fig. 12)

Paramaurops apfelbecki: 1♂, 1♀: Croatia, Lastovo, Jama na Lastovu (cave), VII. 1997, T. Rađa lgt. *Paramaurops* sp. n. 01: 1♂, 1♀: Croatia, Mljet, Strmica, Blato, Kozarica, Jama na Strmici (cave), 20.10.2015, A. Kirin. *Paramaurops* sp. n. 02: 1♂: Croatia, Ograde, Ste-nine, Metković, Mandina jama (cave), 22.10.2016, A. Kirin lgt. *Paramaurops* sp. n. 03: 1♂: Croatia, Krivići, Uble, Bunarina (cave), 20.2.2010, B. Jalžić lgt. *Paramaurops* sp.: 1♀: Croatia: Biokovo Mts., Tučepi env., Vladići vill., sifting beneath rocky wall, P. Hlaváč. All specimens are tentatively deposited in PCPH.

DISCUSSION

Previously, two species of the genus *Paramaurops* were known from Croatia: *P. apfelbecki* Ganglbauer, 1896 distributed in central Dalmatia and *P. kaufmanni* Ganglbauer, 1895 from south Dalmatia (see red and green circle on Fig. 12). All the specimens of these two species have been collected in the soil or under the rocks, so the species can be considered to be endogean. *P. apfelbecki* is known from the mountain Svilaja, collected by Winkler in the forest under rocks, at 1200–1400 m a.s.l. (MÜLLER, 1944; PRET-

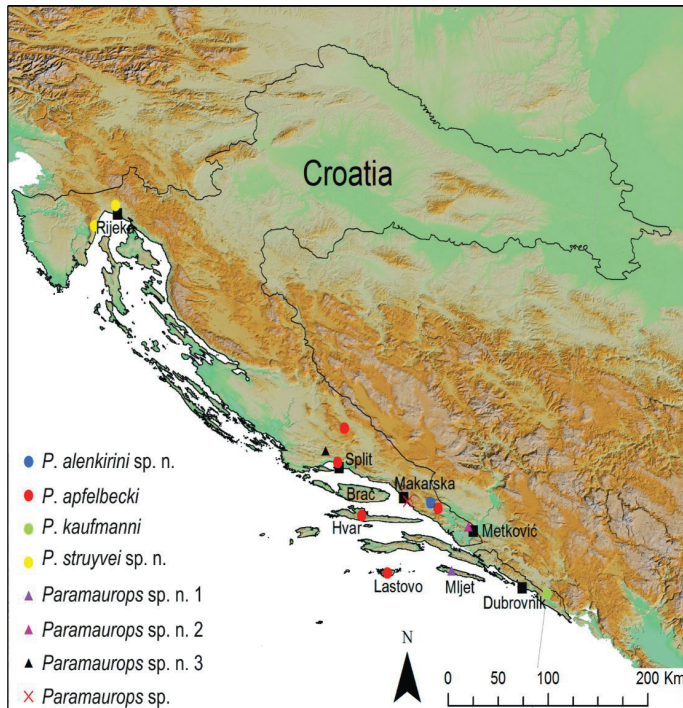


Fig. 12. Distribution map of the species of the genus *Paramaurops* mentioned in this work.

NER, 1973). Another specimen was collected by Novak near Kaštel Sućurac in the soil under olive trees (NOVAK, 1952; PRETNER, 1973). The species was also found on three islands: the island of Hvar, near Vrbanj, collected by Novak (NOVAK, 1952; PRETNER, 1973), Mljet Island, collected by Gobanz (GANGLBAUER, 1904; PRETNER, 1973) and on the island of Lastovo in two caves - Jama na Prčino žaj and Jama na Lastovu, collected by T. Rađa (deposited in PCPH). One specimen of *P. apfelbecki* was also collected on the mountain Matokit, with a highest peak of 1063 m a.s.l. (PRETNER, 2011). This mountain is a part of the mountain ridge called Vrgorsko gorje, along with Mt Mihovil (the finding place of *P. alenkirini* n. sp.) and Mt Veliki Šibenik. Vrgorsko gorje, situated in the hinterland of Biokovo mountain in Dalmatia, both being the part of the biogeographical region of Central Dinarides (HLAVÁČ *et al.*, 2008; 2017) which has had a low number of Pselaphinae recorded so far. Only 12 species of Pselaphinae are recorded from the Central Dinarides, compared to 27 species from the Northern and 37 species from the Southern Dinarides (HLAVÁČ pers. database, see also HLAVÁČ *et al.*, 2017; HLAVÁČ *et al.*, 2019). As the Mt Matokit finding place of *P. apfelbecki* is very near the type locality of *P. alenkirini* n. sp., this record should be considered carefully and additional material from Mt Matokit should be collected to confirm its identity. *P. kaufmanni* was collected by Weirather near Udor by Stravča, Dubrovnik under a rock (PRETNER, 1973; WINKLER, 1925). Records of *P. struyvei* n. sp. were made in the Northern Dinarides (see yellow circle in Fig. 12), on the slopes of Mt Učka and near Rijeka. As only 8 species of the genus *Paramaurops* were known till now from the Balkan peninsula, a world hotspot of subterranean beetle diversity (HLAVÁČ *et al.*, 2017), the two new species from the

Central Dinarides are not surprising. Also, research has shown that at least three more species (see purple, pink and black triangle on Fig. 12) are waiting to be described, but additional material is required.

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REFERENCES

- ČUČEK, M., BELAK, F., PAVLEK, M. & DRAŽINA, T., 2018: Mali Šibenik - Veliko bogatstvo podzemlja. *Subterranea Croatica* **25**, 25-35.
- GANGLBAUER, L., 1904: Verzeichnis der auf der dalmatinischen Insel Meleda vorkommenden Koleopteren nach dem Sammelergebnissen des Herrn Alois Gobanz. *Verhandlungen der kaiserlich-königlichen Zoologisch-Botanischen Gesellschaft in Wien* **54**, 645-660.
- HLAVÁČ, P., BREGOVIĆ, P. & JALŽIĆ, B., 2019: Endogean and cavernicolous Coleoptera of the Balkans. XVI-II. Strong radiation in caves of the Central Dinarides: seven new species of *Thaumastocephalus* Poggio et al., 2001 (Staphylinidae: Pselaphinae). *Zootaxa* **4559** (1), 090-110.
- HLAVÁČ, P., OZIMEC, R. & PAVIČEVIĆ, D., 2008: Catalogue of the troglitic Pselaphinae (Coleoptera, Staphylinidae) of the Balkan. In: PAVIČEVIĆ, D. & PERREAU, M. (eds.), *Advances in the Studies of the Fauna of the Balkan Peninsula - Papers Dedicated to the Memory of Guido Nonveiller*. Institute for Nature Conservation of Serbia, Belgrade, p. 307-328.
- HLAVÁČ, P., PERREAU, M. & ČEPLÍK, D., 2017: The subterranean beetles of Balkan Peninsula. *Czech University of Life Sciences, Faculty of Forestry and Wood Sciences, Department of Forest Protection and Entomology, Praha*, 267 pp.
- MÜLLER, G., 1944: Die Amaurops-Arten der Balkanhalbinsel. *Mitteilungen des Münchener entomologischen Vereins* **34**, 82-103.
- NOVAK, P., 1952: Kornjaši jadranskog primorja (Coleoptera). *Jugoslavenska akademija znanosti i umjetnosti*, 521 pp.
- PRETNER, E., 1973: Koleopterološka fauna pećina i jama Hrvatske. *Krš Jugoslavije* **8**, 101-239.
- PRETNER, E., 2011: Die Verdienste von Leo Weirather um die Biospeläologie, insbesondere Jugoslawiens, sein Höhlenkataster und seine Sammelplätze. *Berichte des naturwissenschaftlich-medizinischen Vereins in Innsbruck* **97**, 85-234.
- SCHÜLKE, M. & SMETANA, A., 2015: Staphylinidae. In: LÖBL, I. & LÖBL, D. (eds.), *Catalogue of Palaearctic Coleoptera. Hydrophiloidea-Staphylinoidea*. Vols. 2/1 & 2/2. Revised and updated Edition. Brill Books, Leiden and Boston, p. 304-1134.
- WINKLER, A., 1925: Ergebnisse von Exkursionen auf Blindkäfer in der südlichen Herzegowina. (1. Beitrag zur Kenntnis der Blindkäferfauna). *Koleopterologische Rundschau* **2**, 137-148.