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CEUTHONECTES PETKOVSKII, A NEW SPECIES OF HARPACTICOID COPEPOD FROM MONTENEGRO (CRUSTACEA, CANTHOCAMPTIDAE)

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ABSTRACT

A new species of the genus *Ceuthonectes* Chappuis, 1924 (Harpacticoida, Canthocamptidae) is described from three subterranean localities in Montenegro. With the addition of the new species, this genus now includes nine species from Europe and Caucasus.

RÉSUMÉ

Une nouvelle espèce du genre *Ceuthonectes* Chappuis, 1924 (Harpacticoida, Canthocamptidae) est décrite des trois localités souterraines du Monténégro. Avec l'espèce nouvelle ce genre comprend neuf espèces de la Europe et de la Caucasic.

INTRODUCTION

Chappuis (1924) established the genus *Ceuthonectes* based on two males of *C. serbicus* found in two different localities in Serbia. Females of that species were described later from Romania, together with the description of a new species, *C. gallicus*, from France (Chappuis, 1928). Borutzky (1930) described a new species from Georgia (Caucasus), for which he created a new genus: *Moraroides colchidana*. As Chappuis (1933, 1936, 1936a) and Lang (1948) already showed, this species belongs to the genus *Ceuthonectes*. Borutzky (1952, 1972) accepted this opinion, and even synonymized *C. colchidanus* with *C. serbicus*. Later on analyses showed that they are two distinct species (Rouch, 1980; Petkovski, 1984). Ponyi (1958) described *C. hungaricus* after one male from Hungary, and Rouch (1980) redescribed *C. gallicus*, and described two new species (all from Pyrenées): *C. vievillae* and *C. chapuisi*. The seventh species, *C. rouchi*, is described by Petkovski (1984) Slovenia after one male; the female of this species was described by Brancelj (1991), also from

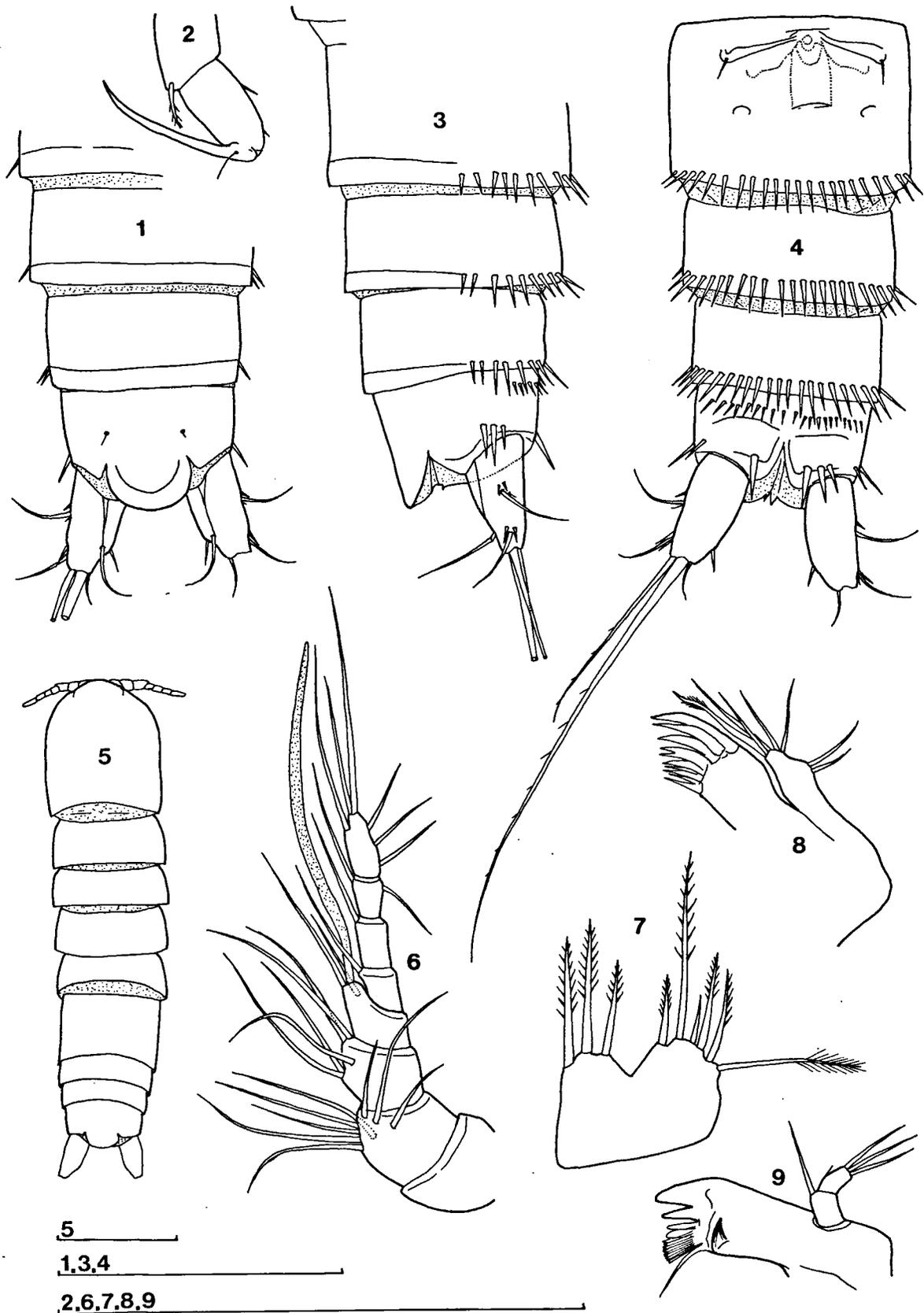
Slovenia. Cottarelli & Saporito (1985) described *C. pescei* from Sardinia, and rediscovered it very near the type locality (Cottarelli & Bruno, 1993).

All known species are endemic, except *Ceuthonectes serbicus* Chappuis, 1924, which is found in Italy, Slovenia, Serbia, Macedonia, Romania, and in Georgia (Borutzky & Mihailova-Neikova, 1970; Chappuis, 1924, 1928, 1933, 1936, 1936a, Petkovski, 1959).

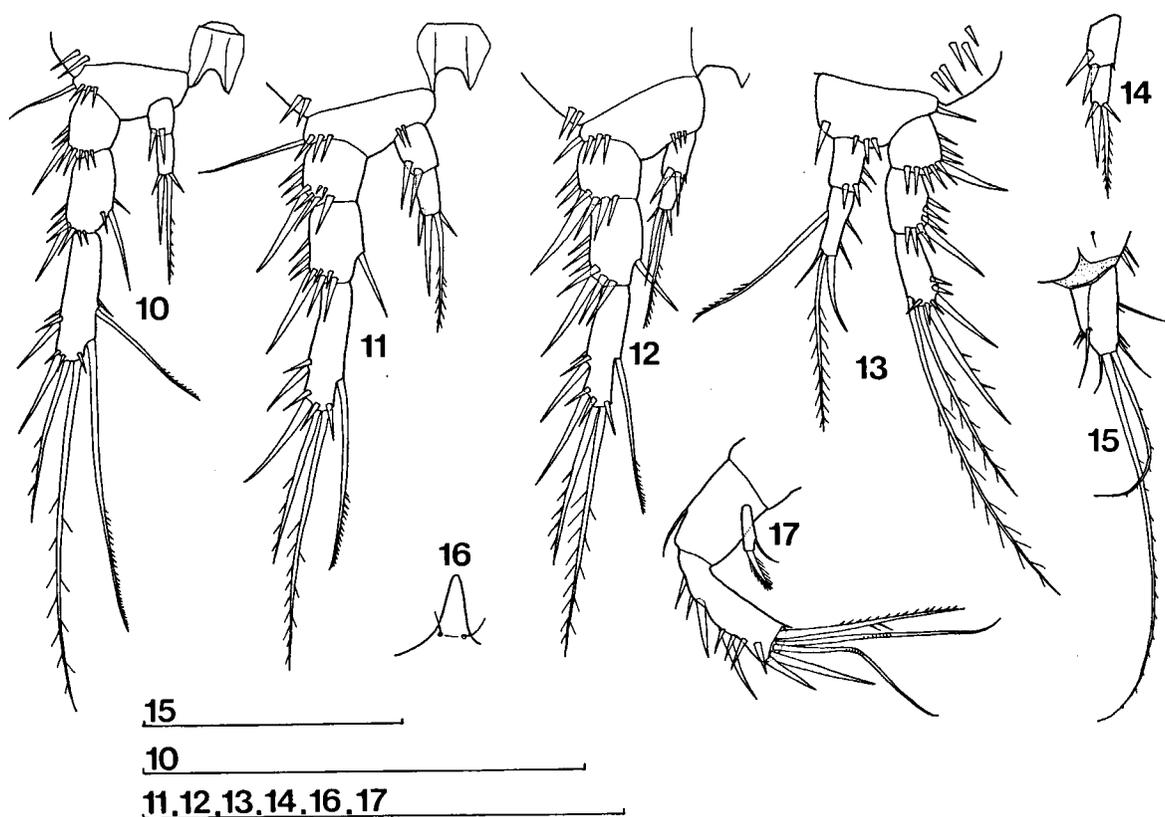
During an investigation of the copepod fauna in Montenegro, we found one new species of the genus *Ceuthonectes*, which is the first representative of this genus found in Montenegro.

METHODS

Samples were collected in three small caves that are situated close to each other with the Karaman-Chappuis method and with different types of hand-nets and little rubber pumps. The material was preserved by adding several drops of 36% formaldehyde. Specimens were dissected in a mixture of equal parts of distilled water and glycerol.



Figs. 1-9. *Ceuthonectes petkovskii* n. sp., holotype (female 0.418 mm): 1 - abdomen dorsally; 2 - Mxp; 3 - abdomen laterally; 4 - abdomen ventrally; 5 - dorsal view; 6 - A1; 7 - P5; 8 - Mxl; 9 - Md. Scales = 0.1 mm.



Figs. 10-17. *Ceuthonectes petkovskii* n. sp., 10-13, 16 and 17, holotype (female, 0.418 mm); 14 and 15, cave Ivanina Spilja (female 0.446 mm); 10 - P4; 11 - P3; 12 - P2; 13 - P1; 14 - EnpP2; 15 - Fu; 16 - Ro; 17 - A2. Scales = 0.1 mm.

All drawings have been prepared using a drawing attachment on a Leica DMLS brightfield microscope with C-PLAN achromat objectives. Dissected appendages were preserved in Faure's medium.

Abbreviations used in the text and figures are: GS - genital somite; Fu - Furca; Ro - rostrum; A1 - antennula; A2 - antenna; Md - mandible; Mxl - maxillula; Mx - maxilla; Mxp - maxillipede; P1 - first leg; P2 - second leg; ...; P6 - sixth leg; Enp - endopodite; Exp - exopodite; Enp2P3 - second article of the third leg.

DESCRIPTIVE PART

Ceuthonectes petkovskii n.sp.

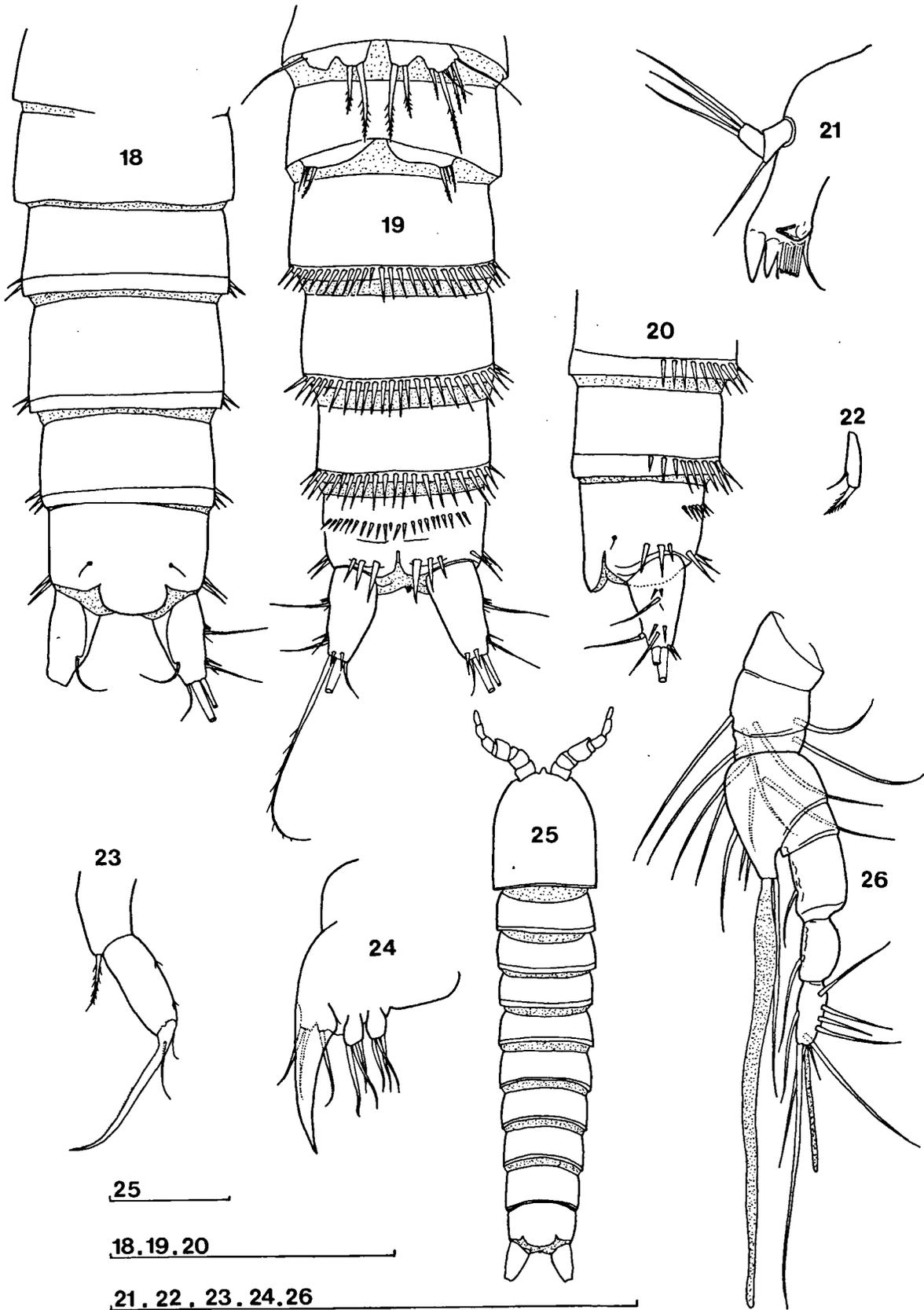
Material examined

- Holotype (female 0.418 mm), and one paratype (female 0.454 mm) from the cave Goluspa (type locality) near the village Donja Seoca on the mountain Rumija, South Montenegro, 8 February 1997, collected by T. Karanovic.
- One female (0.446 mm) from the cave Ivanina Spilja near the village Donja Seoca, 4 February 1997, collected by T. Karanovic.
- One male (0.43 mm) from the cave Vilina Spilja near the village Donja Seoca, 8 February 1997, collected by T. Karanovic.

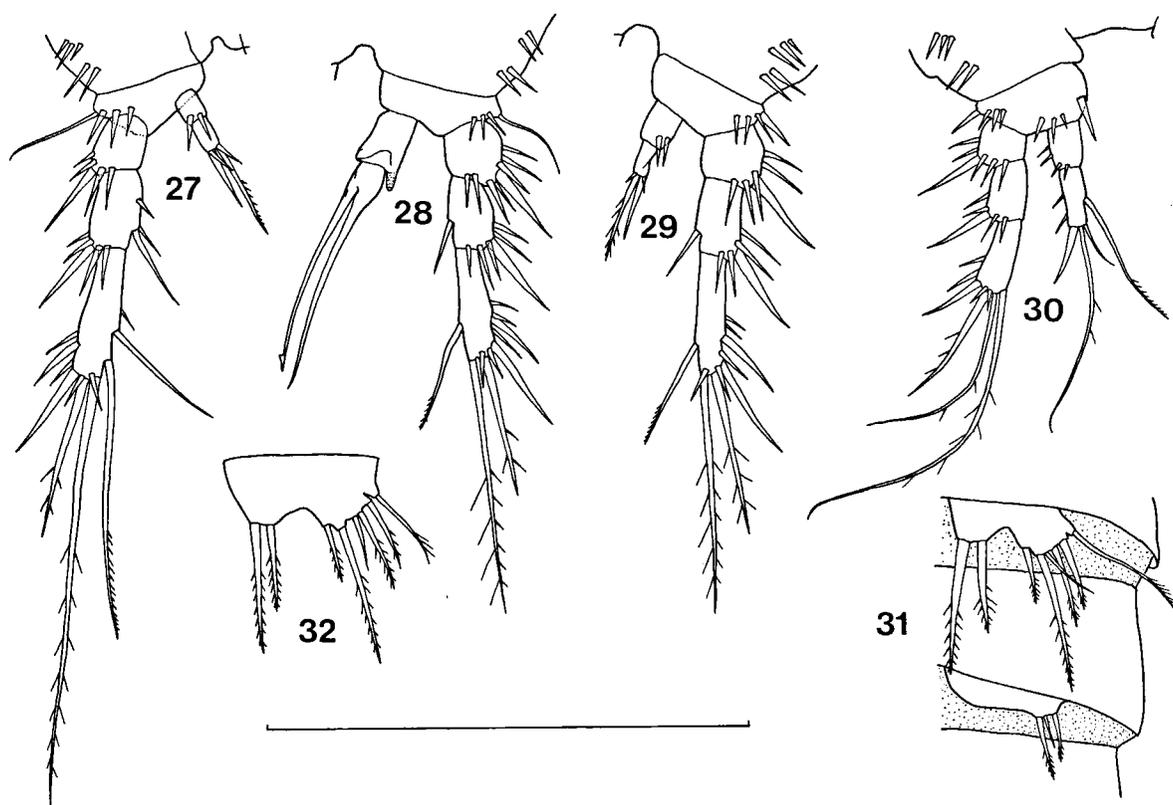
All specimens are dissected and mounted on slides in Faure's medium. Except for the paratype, the other specimens are deposited in the author's collection in Kotor, Montenegro.

Description

Female (holotype). - Body length, including furcal rami (excluded furcal setae) is 0.418 mm. Body cylindrical and colourless (Fig. 5). Nauplius eye absent. Rostrum small and triangular (Fig. 16). Hind margins of cephalothorax and thoracic somites are smooth, as well as hind margins of abdominal segments. GS is about 1.4 times wider than long; its hind margin armed with a transverse row of spines ventrally and laterally. Genital field with characteristic pattern (Fig. 4). Second and third abdominal somites also with transverse rows of spines ventrally and laterally (Figs. 3 and 4). Anal somite armed with a transverse row of small spines ventrally, at the first third, and with 3 big spines at the base of the furcal rami ventrally (on the right side only one), and laterally. Anal operculum concave, smooth, and slightly reaching beyond distal margin of anal somite (Fig. 1). Caudal rami divergent, subcylindrical, about twice longer than wide. They bear two lateral, three apical, and one dorsal setae, as well as one spine on the inner margins (Fig. 1). Dorsal seta is attached at distal third of furcal length, behind chitinous ridge. Distal lateral seta with two spinules at the base, while proximal one has two spinules and hair (Fig. 3). Inner apical seta very short (about 2.5 times shorter than caudal ramus). Middle and outer setae well-developed (Fig. 4). A1 is 8-segmented, with very long



Figs. 18-26. *Ceuthonectes petkovskii* n. sp., cave Vilina Spilja (male 0.43 mm): 18 - abdomen dorsally; 19 - abdomen ventrally; 20 - abdomen laterally; 21 - Md; 22 - ExpA2; 23 - Mxp; 24 - Mx; 25 - dorsal view; 26 - A1. Scales = 0.1 mm.



Figs. 27-32. *Ceuthonectes petkovskii* n. sp., 27-31, cave Vilina Spilja (male 0.43 mm); 32, cave Ivanina Spilja (female 0.446 mm): 27 - P4; 28 - P3; 29 - P2; 30 - P1; 31 - P5 & P6; 32 - P5. Scale = 0.1 mm.

aesthetasc on fourth segment (Fig. 6) Exopodite of A2 is 1-segmented, with one very strong and plumose seta apically, and one smooth seta at distal third of exopodite length (Fig. 17). Md palp is 2-segmented, armed with one subapical seta on the first segment, and three apical setae and one lateral hair on the second segment (Fig. 9). Basipodite of Mxl with three distal and four lateral setae (Fig. 8). Syncoxa of Mx with two endites bearing three apical setae; basipodite with one seta; endopodite reduced to a tubercle with two apical setae. Basipodite of Mxp with one plumose seta on distal-inner corner; first endopodite segment with two hairs on the outer margin; second segment with a strong, recurved thorn and one smooth seta (Fig. 2). All swimming legs with 3-segmented exopodites and 2-segmented endopodites (Figs. 10, 11, 12, and 13). Spine and setal formula on exo- and endopodites P1-P4 (legend: inner/outer spine or seta; inner/terminal/outer):

segments	Exp			Enp	
	1	2	3	1	2
P1	0/1	0/1	0/2/2	0/0	1/3/0
P2	0/1	1/1	1/2/2	0/0	0/2/0
P3	0/1	1/1	1/2/2	0/0	0/2/0
P4	0/1	1/1	2/2/2	0/0	0/2/0

Cuticular spinules are very well developed on all swimming legs, especially on their outer margins of exopodites. Endopodites P2-P4 bear two cuticular spinules on each

segment apically or subapically (Figs. 10, 11, and 12). P5 with completely fused basipodite, exo- and endopodite (Fig. 7), but with well developed lobes. Outer basipodite lobe bearing one long seta; endopodite lobe with 3, while exopodite lobe bearing 5 strong setae.

Male. - Body length is 0.43 mm. Body similar to female in general appearance. GS unarmed. Second, third, and fourth abdominal somites with transverse rows of spines ventrally and laterally (Figs. 19 and 20). Anal somite and Fu similar to that of female (Figs. 18 and 19), just there are additional two spines on the base of apical setae ventrally, and spine on inner margin of the caudal ramus is absent. A1 prehensile, 8-segmented, and with very long aesthetasc on fourth segment (Fig. 26). A2, Mxl, Mx (Fig. 24), P1 (Fig. 30), and P4 (Fig. 27) are very similar to those of the female. Md palp without hair on the lateral margin of the second article (Fig. 21). Mxp bears one seta and one hair on second endopodite segment (Fig. 23). Exopodites P2 and P3 similar to female's. Endopodite P2 2-segmented; second segment as long as first, but twice narrower (Fig. 29). EnpP3 characteristically modified; its first segment unarmed, but with one tubercle on outer-distal corner (Fig. 28). Second segment with two very strong and long spines, of which the inner one is slightly shorter and with spear-like tip. P5 with two strong setae on endopodite lobe, while exopodite lobe bearing 5 setae (Fig. 31) P6

consisting of a chitinous lamella, which bears 3 setae (Fig. 31).

Variability

Four specimens (one male and three females) of *Ceuthonectes petkovskii* n.sp., from three localities were found and examined. Body length of females ranges from 0.418 mm (holotype) to 0.454 mm (paratype). Female from cave Ivanina Spilja has endopodite lobe of P5 with two setae (Fig. 32), while the opposite leg normally build. Same female shows some minor differences, compared with the holotype, in its Enp P2 (shorter setae), and Fu (presence of two spines on inner margin) (Figs. 14 and 15).

Distribution

At present, *C. petkovskii* is found only in three localities on the mountain Rumija, which is the south-west range of Skadar Lake. We suppose that it inhabits a wide area of Skadar Lake Valley (SE Montenegro, and NW Albania).

Etymology

The specific name is dedicated to Dr. Trajan K. Petkovski, as a friendly acknowledgment for his the great help in copepod taxonomy.

RELATIONSHIPS

By the shape of P1 (inner seta on the second article only) *Ceuthonectes petkovskii* n.sp. is similar to *C. vievilleae* Rouch, 1980, and *C. rouchi* Petkovski, 1984. From both species *C. petkovskii* is clearly distinguishable by the shape of P5 (5 instead of 4 setae on exopodite lobe), and anal operculum (without spinules on posterior margin) in both sexes. *C. petkovskii* also clearly differs from *C. rouchi* by the appearance of Fu, A1, male's EnpP2 and EnpP3, as well as armature on abdominal somites. All other species have inner setae on both articles of EnpP1, except *C. colchidanus* Borutzky, 1930, which is without any inner setae on EnpP1. Additional differences between *C. petkovskii* and *C. colchidanus* are found in shape of P5 and anal operculum. The new species is also similar to *C. gallicus* Chappuis, 1928 and *C. hungaricus* Panyi, 1958, by the appearance of Fu, anal operculum, and other de-tails, but clearly differs by the appearance of P1, P5, and male's ExpP2 and ExpP3. *C. serbicus* Chappuis, 1924, *C. pescei*

Cottarelli & Saporito, 1985 and *C. chappuisi* Rouch, 1980, are clearly distinguishable from the new species in many features, such as P1, P5, anal operculum, male's EnpP2, etc.

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