Biologia Serbica
2013, Vol. 35 No. 1-2 31-42

Discovery of a new subterranean member of the family Niphargidae from Serbia, *Niphargus luka* sp. n. (Contribution to our knowledge of the Amphipoda 267)

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Recieved for Review: 27 March 2013 / Accepted: 24 June 2013.

Summary. A new subterranean species of the family Niphargidae (Crustacea, Amphipoda, Gammaridea), *Niphargus luka* sp. n., which was discovered in Ranney collector wells near Čačak (Serbia), is described and its taxonomic status within the genus *Niphargus* Schiödte, 1849, is discussed. This species has some characters which are similar to those of the subgenus *Orniphargus* (elongated extremities, telson, dactylus of pereopods, gnathopods, uropods 1-2, etc.) and subgenus *Jovaniphargus* (dactylus of pereopods, telson, etc.), but with some different characteristics (elongated uropod 3 with spinose second article, metasomal segments without marginal spines, etc.).

Keywords: Amphipoda, new species, Niphargidae, *Niphargus luka*, Serbia, subterranean, taxonomy.

INTRODUCTION

The taxonomy of the genus *Niphargus* Schiödte, 1849 (family Niphargidae) is rather complicated, because approximately 300 taxa of this genus are known from Europe and the Near East (up to Iraq) (Karaman G 2012a).

The members of the family Niphargidae, or more closely, of the genus *Niphargus* Schiödte, 1849 (sensu auctorum) settle various subterranean waters, springs (limnocrenes, rheocrenes, hygropetric springs, rheopsammocrenes, rheohelocrenes and rheocrenes), as well as subterranean waters in caves (small ponds, deep lakes, subterranean waters with strong currents etc.). Some species settle deep lakes with clean cold water, where no light reaches the bottom (Lake Ohrid, Lake Geneva), or clean cold water mountain lakes, where *Niphargus* specimens come through coastal springs (Lake Golemo Jezero on Mt. Pelister, Macedonia).

Members of the genus *Niphargus* can be found in subterranean streams toward the seacoast with very broad salinity (but never in pure salt water), supporting the possible marine origin of this family. Additionally, of the very large number of known *Niphargus* taxa in Europe and the Near East, not a single species has been identified with partially or completely developed eyes, again supporting a marine origin. Members of genus *Niphargus* are the most important animals in the fauna of subterranean clean waters, analogous to insects on land.

Extremely variable ecological conditions and settlements in subterranean waters have facilitated the isolation of various populations, leading to the creation of distinct species. However, the similar conditions found in some subterranean waters have stimulated already distinct species to develop similar morphological characters. Because of this, today it is rather difficult to recognize the limits of variability for many species and subspecies through morphological differences alone (Lis JA and Lis B 2011). Although further molecular studies and DNA analysis can partially resolve the recognition of some taxonomic categories (as has been reported by some authors), these methods are associated with significant problems (Fišer et al. 2006, 2009; Cruickshank 2011; Mitchel 2011; etc.).

Various studies of Amphipoda from the subterranean waters of Serbia, and the relatively recent discovery of various new species in this region, demonstrate the remarkable richness of this fauna in Serbia (Karaman G 2011). Dr. Ivo Karaman provided me with a sample of *Niphargus* collected from Ranney Collector wells near Čačak (Serbia), which is described here as a new species, *Niphargus luka* sp. n.

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MATERIAL AND METHODS

The collected *Niphargus* material was sent to me preserved in 70% ethanol. Specimens were dissected using a WILD M20 microscope and drawn using camera lucida attachment. All appendages were temporarily submersed in a mixture of glycerin and water (50:50) for study and drawing. Later, all appendages were permanently transferred into Liquid of Faure. Body-lengths of the examined specimens were measured by tracing individual mid-trunk lengths (from the tip of the head to the end of the telson) using the camera lucida. All illustrations were inked manually. Letters were used to indicate taxonomically important spines and setae. Terminology used for major spines and setae on propodus of gnathopods 1-2 is sensu Karaman G (1969; 1993; 2012b).

RESULTS

Niphargus luka sp. n.

(Figs 1-6)

Material examined

Serbia: S-4624: Čačak, vicinity, Ranney collector wells, Prijevor, April 1990, 2 exp. (leg. Branko Miljanović). Holotype and paratype are deposited in KARAMAN`s Collection in Podgorica, Crna Gora (Montenegro) under No. S-4624.

Diagnosis

Body with elongated antenna 1, antenna 2, pereopods 5-7 and uropod 3. Epimeral plates 1-3 quadrate, with well-marked ventroposterior corner; epimeral plate 3 with nearly transverse posterior margin, slightly inclined in the proximal part. Coxae relatively short. Pleopods 1-3 with 2 retinacula, peduncle of pleopods scarcely setose. Inner plate of maxilla 1 with 2-3 setae, outer plate with 7 spines bearing mostly one lateral tooth each. Inner plate of maxilliped with 2 pointed distal spines. Mandible palpus article 3 longer than article 2, with several bunches of B-setae.

Gnathopods 1-2 with article 5 shorter than 6; propodus longer than broad, with palm inclined nearly one-half of the propodus-length, and L-spines are attached laterally of the main S-spine; dactylus along the outer margin with a row of several strong setae. Pereopods 3-4 with strong short dactylus bearing along the inner margin one strong spine, nail very short and strong. Pereopods 5-7 progressively longer, with all articles elongated; article 2 narrow, much longer than broad, without a distinct ventroposterior lobe; dactylus with one spine along the inner margin, nail much shorter than pedestal.

Uropods 1-2 short and strong. Peduncle of uropod 1 with a dorsoexternal and dorsointernal row of strong spines; outer ramus of uropod 1 in males is barely longer than the inner ramus; in females they are of equal length. Inner ramus of uropod 2 in males and females is slightly longer than the outer one. Uropod 3 elongated, second article of outer ramus in uropod 3 somewhat shorter than the first article, but with spines along both margins.

Telson very short, nearly as long as broad (males) or broader than long (females), distally broadly excavated slightly over half (females) or one third (males) of the telson-length, lobes with long distal spines, lateral and facial spines absent.

Description

Female 6.8 mm, with setose oostegites (Holotype): Body moderately slender, metasomal segments 1-3 with 4-5 dorsoposterior short marginal setae each (Fig. 1J). Urosome segment 1 on each dorsolateral side with one seta (Fig. 1K). Urosome segment 2 on each dorsolateral side with 3 spines (Fig. 1K). Urosome segment 3 naked. Urosomite 1 near the base of uropod 1, with one strong ventroposterior spine (Fig. 1K).

Epimeral plates 1-3 quadrate, plates 1-2 with marked ventroposterior corner and spine-like seta, and with slightly convex posterior margin bearing several setae each (Fig. 1J). Epimeral plate 3 with a well-marked ventroposterior corner and almost transverse posterior margin bearing 2-3 marginal setae (Fig. 1J). Epimeral plates 2-3 with one subventral spine each (Fig. 1J).

Head with short rostrum and broadly subrounded lateral cephalic lobes and ventroanterior sinus (Fig. 1A), eyes absent.

Antenna 1 long, slightly shorter than the body (ratio 62:68), peduncle articles 1-3 progressively shorter (ratio 63:55:22), all articles sparsely covered with short setae (Fig. 1B). Main flagellum consisting of 36 articles (most with one short aesthetasc); accessory flagellum 2-articulate, slightly shorter than the last peduncle article (ratio 16:22) (Fig. 1B).

Antenna 2 relatively slender, peduncle articles 3-5 slender, unequally long (ratio 20:62:63); peduncle article 3 short, with several distal setae (Fig. 1C); peduncle article 4 along the ventral margin with 3 transverse bunches of setae (Fig. 1C) and along the dorsal margin with several short setae; article 5 along the ventral margin with 4 bunches of setae as long as or slightly longer than the diameter of the article itself (Fig. 1C), along the dorsal margin with a single short setae. Flagellum slender, much longer than the last peduncle article (ratio 63:120), consisting of 16 slightly setose articles (Fig. 1C). Antennal gland cone short (Fig. 1C).

Mouthparts basic. Labrum much broader than long, with slightly concave lateral margins and tip (Fig. 1D). Labium broader than long, inner lobes well-developed, but short (Fig. 1E); outer lobes subrounded distally (Fig. 1E).

Mandible with triturative molar. Left mandible: incisor with 5 teeth, lacinia mobilis with 4 teeth (Fig. 1F). Right mandible: incisor with 4 teeth, lacinia mobilis bifurcate, ser-

rate (Fig. 1G). Mandible palpus 3-articulate, articles progressively longer (ratio 40:68:83); first article short, naked (Fig. 1H); second article with 12 strong setae (Fig. 1H). Article 3 falciform, along the ventral margin with a row of nearly 23 marginal D-setae and 6 long distal E-setae (Fig. 1H). On the outer face of article 3 one bunch of 6 A-setae is attached (Fig. 1 I), on the inner face 4 bunches of B-setae (2-3-3-2); C-setae absent (Fig. 1H).

Maxilla 1: inner plate with 2-3 setae (Fig. 2A, B), outer plate with 7 spines (6 spines with one lateral tooth, one spine with 3 small lateral teeth). Palpus 2-articulated: first article naked; second article narrow, short, not reaching the tip of the spines of the outer plate and bearing 4 distal setae (Fig. 2A).

Maxilla 2: both plates with only marginal setae (Fig. 4A).

Maxilliped: inner plate short, with only 2 pointed distal spines, accompanied by several setae (Fig. 4B, C). Outer plate reaching half of the second palpus article, bearing along the inner margin a row of pointed spines (Fig. 4B); palpus article 3 along the outer margin with one median and one distal bunch of setae (Fig. 4B); palpus article 4 along the outer margin with one median plumose seta, along the inner margin with 2 unequal setae near the base of the nail (Fig. 4B).

Coxae relatively short. Coxa 1 broader than long (ratio 45:31), with a subrounded ventroanterior corner and with several marginal setae (Fig. 2C). Coxa 2 slightly broader than long (ratio 50:46) (Fig. 2F). Coxa 3 slightly broader than long (ratio 56:50), with a slightly concave posterior margin and with several marginal setae (Fig. 3A). Coxa 4 markedly broader than long (ratio 54:45), with a slightly concave posterior margin and bearing several marginal setae (Fig. 3C).

Coxae 5-7 short, progressively shorter toward coxa 7. Coxa 5 bilobed, with a broadly subrounded anterior lobe provided with several short setae (Fig. 3E). Coxa 6 with a narrow anterior lobe and a posterior lobe with one posterior strong seta (Fig. 3F). Coxa 7 intact, with a convex ventral margin, and one strong posterior spine-like seta (Fig. 3G).

Gnathopods 1-2 with only slightly unequal propodus (Fig. 2D, G), the propodus of both gnathopods is larger than the corresponding coxae (Fig. 2C, F). Gnathopod 1: article 2 along the anterior and posterior margin with numerous long setae; articles 3 and 4 along the posterior margin with one distal bunch of setae (Fig. 2C). Article 5 slightly shorter than article 6 (ratio 43:50), along the anterior margin with one anterodistal bunch of setae. Article 6 (propodus) large, longer than broad (ratio 100:86), along the posterior margin with 5 transverse rows of setae (Fig. 2D). Palm slightly convex, inclined nearly half of the propodus-length, defined on the outer face by one strong corner S-spine accompanied laterally by 2 slender serrate L-spines and 3-4 facial M-setae (Fig. 2E), along the inner margin with one short subcorner R-spine. Dactylus reaching the posterior margin of the propodus, along the inner margin with several marginal setae, along the outer margin with 5 strong setae (Fig. 2D).

Gnathopod 2: article 2 along the anterior and posterior margin with numerous long setae (Fig. 2F); articles 3-4 along the posterior margin with one bunch of setae each (Fig. 2F). Article 5 (carpus) slightly shorter than propodus (ratio 48:52). Propodus (article 6) similar to that of gnathopod 1 but slightly larger, longer than broad (ratio 100:92), along the posterior margin with 7 transverse rows of setae (Fig. 2G). Palm inclined slightly over half of the propodus-length, defined on the outer face by one strong corner S-spine accompanied laterally by 2 serrate L-spines and facial 4 M-setae; and on the inner face by one short subcorner R-spine. Dactylus reaching the posterior margin of propodus, with several setae along the inner margin and with a row of 5 strong setae along the outer margin (Fig. 2G).

Pereopods 3-4 are similar to each other, moderately strong, but pereopod 4 is slightly smaller than 3 (Fig. 3A, C). Pereopod 3: article 2 along the posterior margin with numerous long setae, along the anterior margin setae are shorter (Fig. 3A); articles 4-6 of unequal size (ratio 60:35:46). Article 4 along both margins with strong setae shorter than the diameter of the articles themselves; article 5 along the posterior margin with 3 single spines accompanied by a single short setae (Fig. 3A). Article 6 along the posterior margin with 4 groups of short spines. Dactylus short and stout, along the inner margin with a strong spine near the base of the nail (Fig. 3B), along the outer margin with one median plumose seta; nail markedly shorter than the pedestal (ratio 17:23), poorly recurved (Fig. 3B).

Pereopod 4: article 2 along the anterior margin with several shorter setae, along the posterior margin with several long setae (Fig. 3C). Articles 4-6 of unequal length (ratio 48:35:41) (measured along the anterior margin) (Fig. 3C). The posterior margin of article 4 with several short setae and a single spine; posterior margin of articles 5 and 6 with 3-4 groups of short spines and a single short setae. Dactylus short and stout, with one strong spine at the inner margin near the nail (Fig. 3D) and with one median plumose seta along the outer margin; nail shorter than pedestal (ratio 13:22), poorly recurved (Fig. 3D).

Pereopods 5 and 6 are missing. Pereopod 7 is very long and strong, only slightly shorter than the body (ratio 53:68) (Fig. 3G, H); basipodite narrow, much longer than broad (ratio: 94:52), along the anterior margin with 6 strong spine-like setae, along the posterior straight margin with a row of short setae, ventroposterior lobe absent (Fig. 3G). Article 3 short; articles 4-6 elongated, progressively longer (ratio 74:103:152) (Fig. 3G, H); article 4 along the anterior margin with 4 groups of spines, along the posterior margin with 3 groups of spines. Article 5 along the anterior margin with a single strong setae and spines, along the posterior margin with 3 groups of spines. Article 6 along the anterior and posterior margin with several groups of spines and with a distal posterior group of long setae (Fig. 3H). Dactylus relatively short and strong, along the inner margin with one strong spine near the base of the nail, along the outer margin with

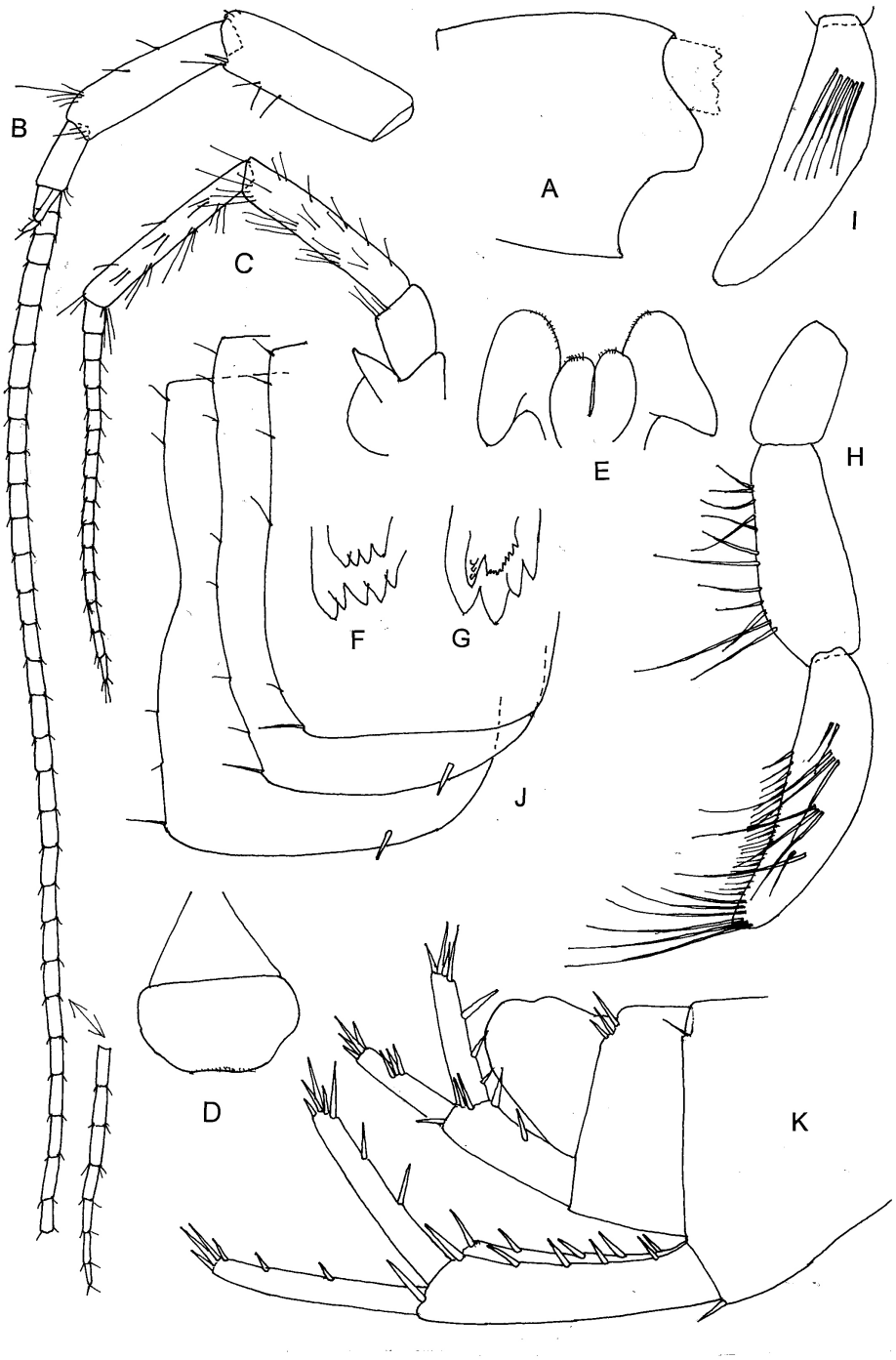

Figure 1. *Niphargus luka* sp. n., Čačak, vicinity, female 6.8 mm (holotype): **A**, head; **B**, antenna 1; **C**, antenna 2; **D**, labrum; **E**, labium; **F**, left incisor and lacinia mobilis; **G**, right incisor and lacinia mobilis; **H**, mandible palpus, inner face; **I**, tip of mandible palpus, outer face; **J**, epimeral plates 1-3; **K**, urosome with uropods 1-2.

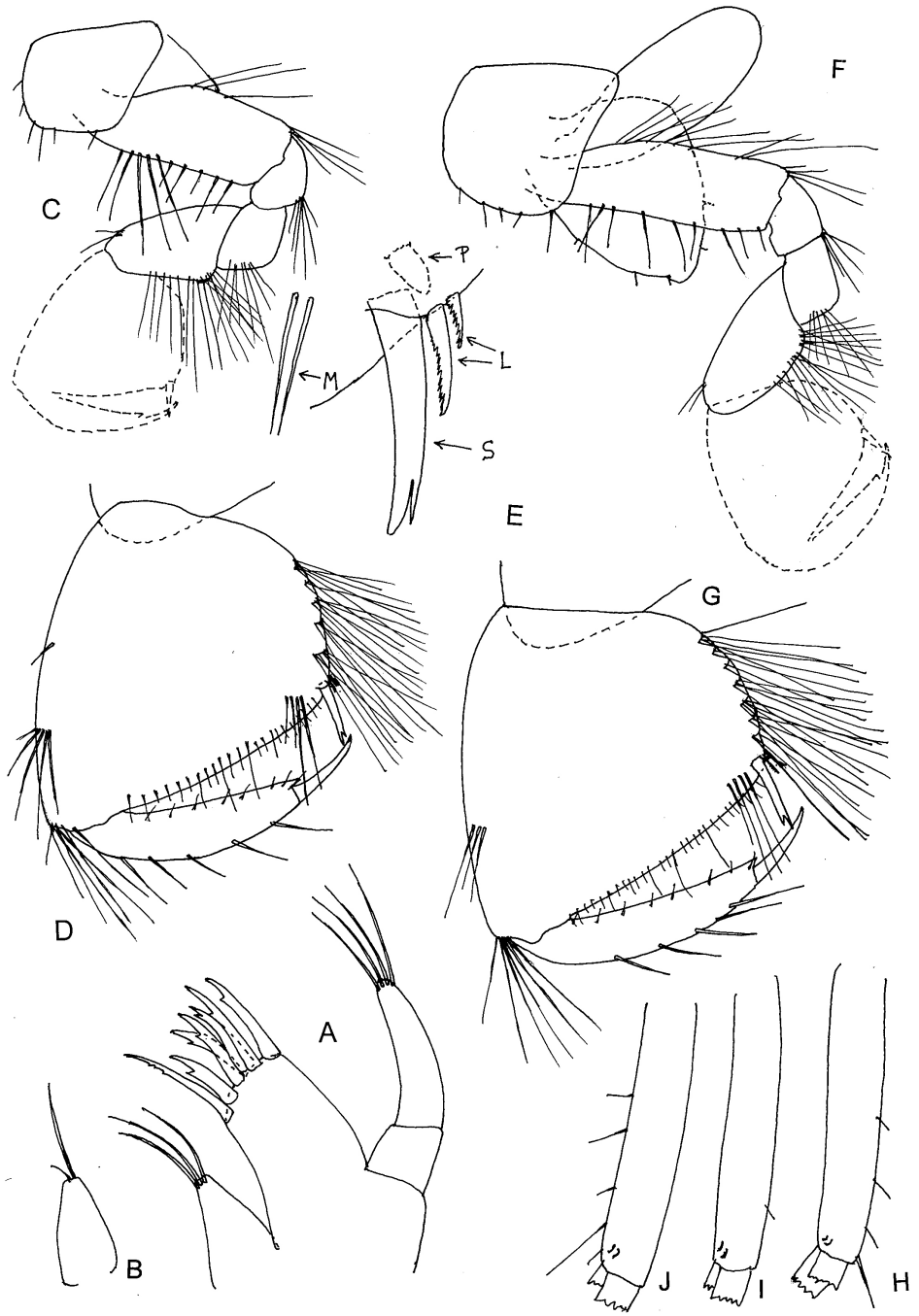

Figure 2. *Niphargus luka* sp. n., Čačak, vicinity, female 6.8 mm (holotype): **A**, right maxilla 1; **B**, left inner plate of maxilla 1; **C-D**, gnathopod 1; **E**, disto-posterior corner of gnathopod 1 propodus, outer face; **F-G**, gnathopod 2; **H-J**, peduncle of pleopods 1-3.

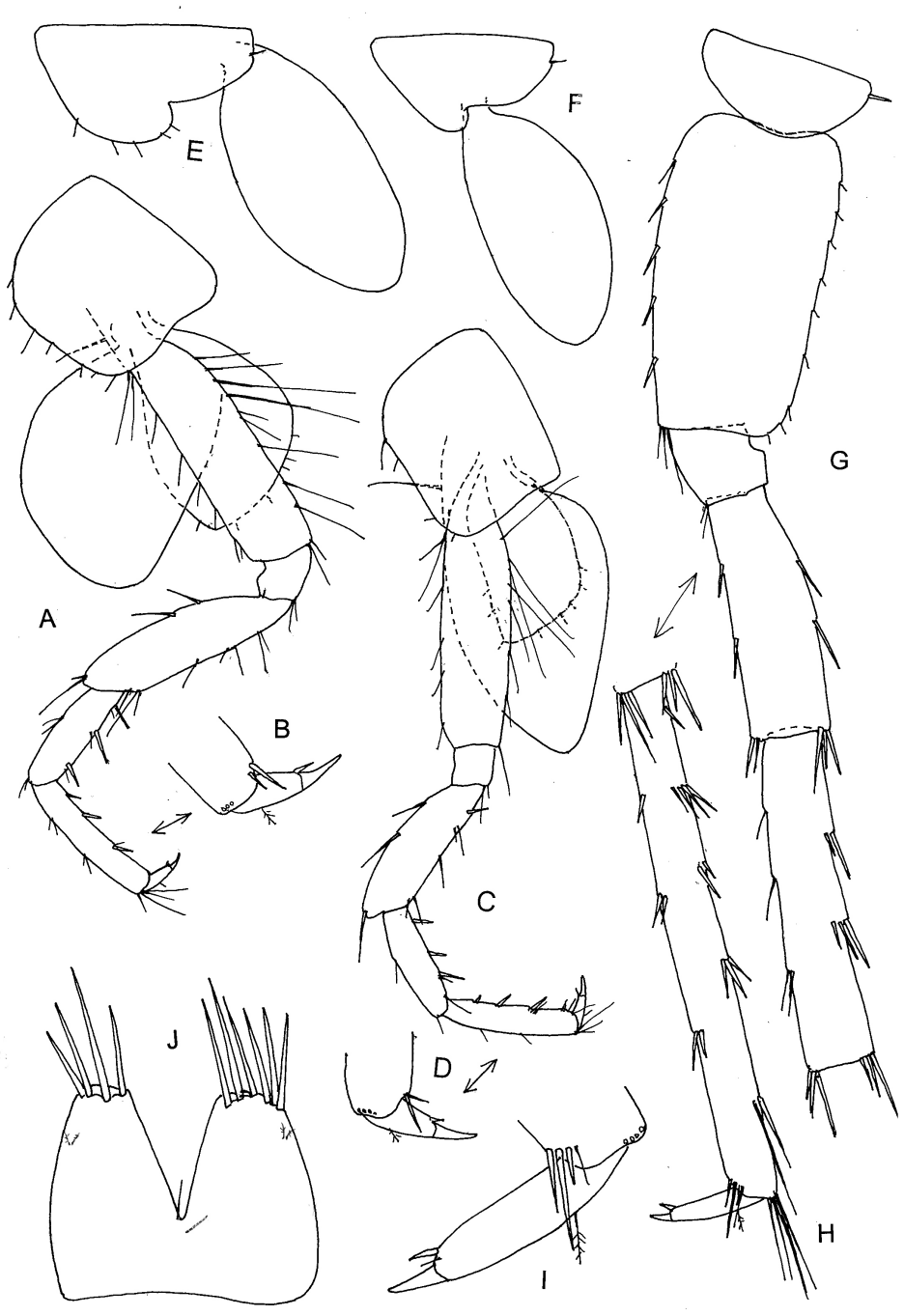

Figure 3. *Niphargus luka* sp. n., Čačak, vicinity, female 6.8 mm (holotype): **A-B**, pereopod 3; **C-D**, pereopod 4; **E**, coxa 5; **F**, coxa 6; **G-I**, pereopod 7; **J**, telson.

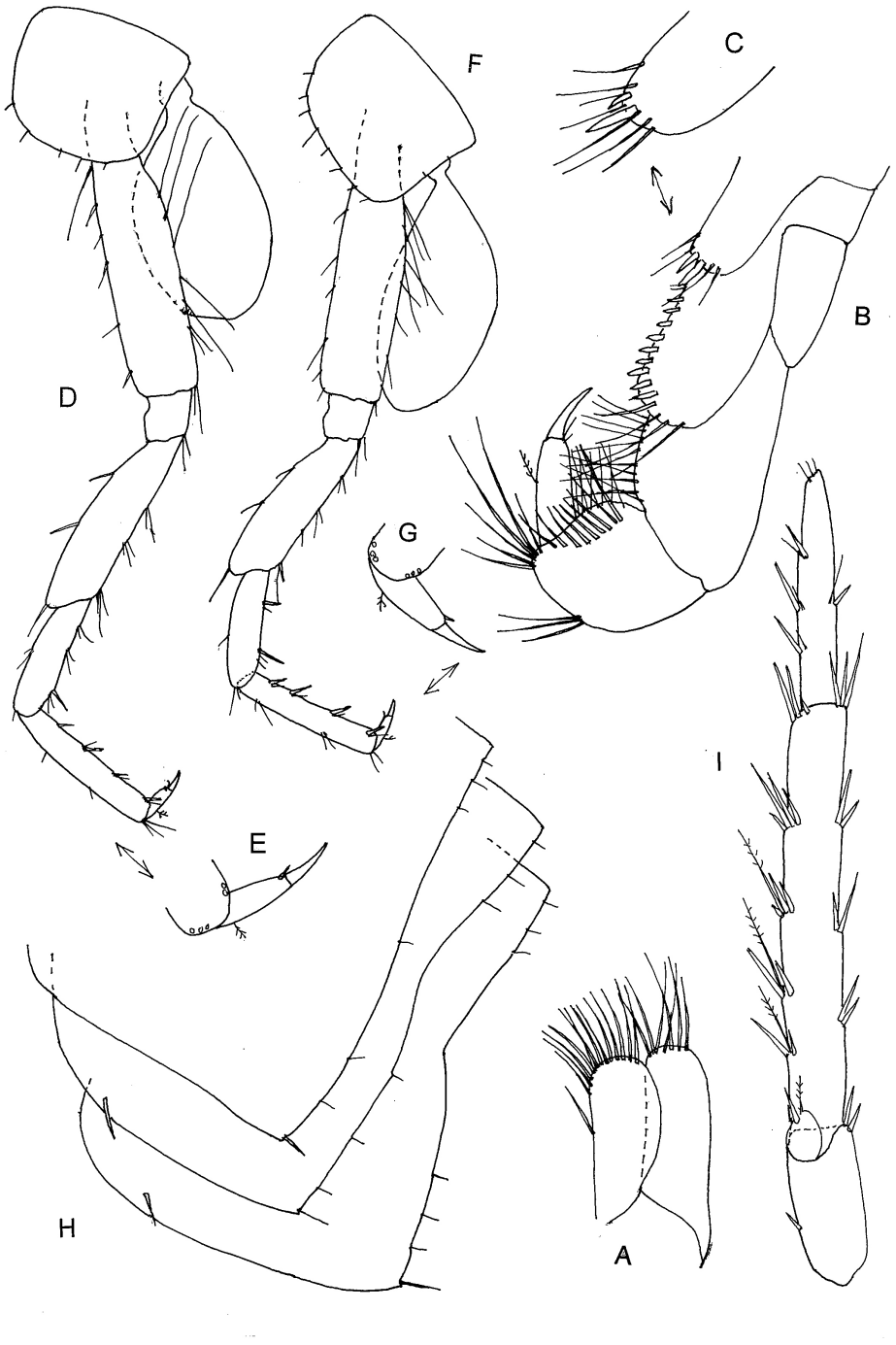

Figure 4. *Niphargus luka* sp. n., Čačak, vicinity, female 6.8 mm (holotype): **A**, maxilla 2; **B-C**, maxilliped. Male 7.2 mm (paratype): **D-E**, pereopod 3; **F-G**, pereopod 4; **H**, epimeral plates 1-3; **I**, uropod 3.

one median plumose seta (Fig. 3 I); nail is very short and is almost not recurved, much shorter than the pedestal (ratio 17:70) (Fig. 3I).

Pleopods 1-3 with 2 retinacula each. Peduncle of pleopod 1 along the anterior margin with one strong distal and 3 median setae (Fig. 2H); peduncle of pleopod 2 with one median short seta along the anterior margin (Fig. 2I); Peduncle of pleopod 3 along the posterior margin with 4-5 setae (Fig. 2J).

Uropod 1: peduncle strong, with a dorsoexternal and dorsointernal row of strong spines (Fig. 1K); inner and outer ramus of the same length, both rami with lateral and distal strong spines (Fig. 1K).

Uropod 2: peduncle with dorsal spines; the outer ramus is slightly shorter than the inner ramus, both rami with strong lateral and distal spines (Fig. 1K).

Uropod 3 missing.

Telson short, broader than long (ratio 82:65), incised slightly over half of the telson-length (Fig. 3J); each lobe with 4-6 long distal spines, lateral and facial spines absent; a pair of short plumose setae appears in the upper part of the outer margin in each lobe (Fig. 3J).

Coxal gills relatively large: gill on gnathopod 2 narrow, almost reaching the ventral tip of article 2 (Fig. 2F), gill on pereopod 3 is large and ovoid, reaching the ventral tip of article 2 (Fig. 3A). Gill on pereopod 4 is large but narrow ventrally, reaching the ventral tip of article 2 (Fig. 3C). Gills on pereopods 5 and 6 are shorter but ovoid (Fig. 3E, F).

Oostegites on gnathopod 2 broad, nearly reaching the ventral tip of article 2 and provided with short marginal setae (Fig. 2F). Oostegites on pereopods 3 and 4 are smaller than the coxae (Fig. 3A, C).

Male 7.1 mm (Paratype): Body moderately slender, metasomal segments 1-3 with 5-6 dorsoposterior marginal setae each (Fig. 4H). Urosome segment 1 along both dorsolateral sides with 1 spine (Fig. 5G); urosome segment 2 on each dorsolateral side with 2 spines (Fig. 5G); urosome segment 3 naked. Urosome segment 1 on each side with one strong ventroposterior spine near the base of uropod 1 peduncle (Fig. 5G).

Epimeral plates 1-3 quadrate (Fig. 4H), with a clearly visible ventroposterior corner defined by one strong spine-like seta. Posterior margin of epimeral plates 1-3 almost straight, inclined in the proximal part and provided with 3-4 setae each along the posterior margin (Fig. 4H). The ventral margin of epimeral plates 2-3 is slightly convex, and of epimeral plate 1 is slightly concave in the middle. Epimeral plates 2-3 with 1 subventral spine each (Fig. 4H).

Head similar to females. Antenna 1 long, slightly shorter than the body (ratio 66:71); peduncle articles 1-3 progressively shorter (ratio 64:53:21); peduncle article 1 along the ventral margin with 1 median spine and several short setae (Fig. 5A); peduncle article 2 along the dorsal margin with several setae; peduncle article 3 along the ventral margin with one median and distal seta; main flagellum consisting of 38 articles. Accessory flagellum short, 2-articulate, slightly shorter than the last peduncle article (ratio 17:20) (Fig. 5A).

Antenna 2 relatively long, peduncle article 3 short, with a distal bunch of longer setae; peduncle articles 4 and 5 nearly of equal length, both with several bunches of long setae along the ventral margin and somewhat shorter setae along the dorsal margin (Fig. 5B). Flagellum slender, much longer than the last peduncle article (ratio 107:62), barely setose (Fig. 5B); antennal gland cone short.

Mouthparts mainly like those in females, including the labrum, labium and maxilliped. Mandible palpus article 3 on the outer face by one row of 5 A-setae, on the inner face by 4 groups of B-setae (3-2-2-2).

Maxilla 1: inner plate with 3 setae, outer plate with 7 spines like those found in females; palpus with 5 distal setae.

Coxae 1-4 relatively short, with several marginal setae each. Coxa 1 broader than long (ratio 42:32), with a subrounded ventroanterior corner (Fig. 5C). Coxa 2 only slightly broader than long (high) (ratio 45:42) (Fig. 5E). Coxa 3 significantly broader than long (ratio 50:43) (Fig. 4D). Coxa 4 shallow, broader than long (ratio 50:40), with a slightly concave posterior margin (Fig. 4F).

Gnathopods 1-2 with propodus slightly larger than the corresponding coxae (Fig. 5C, E). Gnathopod 1: article 2 along the posterior margin with long setae, along the anterior margin with shorter setae (Fig. 5C); article 3 with one bunch of setae along the posterior margin. Article 5 slightly shorter than article 6 (ratio 42:50), along the anterior margin with a distal bunch of setae (Fig. 5C). Propodus (article 6) longer than broad (ratio 105:83), along the posterior margin with 6 transverse rows of setae (Fig. 5D). Palm slightly convex, inclined nearly half of the propodus-length, defined on the outer face by one corner S-spine accompanied laterally by 2 slender L-spines and 3 facial M-setae; on the inner face by one short subcorner R-spine. Dactylus reaching the posterior margin of the propodus, with a row of short setae along the inner margin and a row of 4 strong setae along the outer margin (Fig. 5D).

Gnathopod 2: articles 2-3 like those found in females; article 5 slightly shorter than article 6 (ratio 40:48) (Fig. 5E). Article 6 (propodus) only very slightly larger than that of gnathopod 1, longer than broad (ratio 97:85), with 8 transverse rows of setae along the posterior margin (Fig. 5F). Palm slightly convex, inclined half the length of the propodus, defined on the outer face by 1 S-spine, 2 L-spines, 3 facial M- setae; on the inner face by one subcorner R-spine. Dactylus reaching the posterior margin of the propodus, with a row of short setae along the inner margin and a row of 5 strong setae along the outer margin (Fig. 5F).

Pereopods 3-4 moderately stout, barely setose. Pereopod 3: article 2 along the posterior margin with long setae; articles 4-6 of unequal length (ratio 58:34:50) (Fig. 4D). Ar-

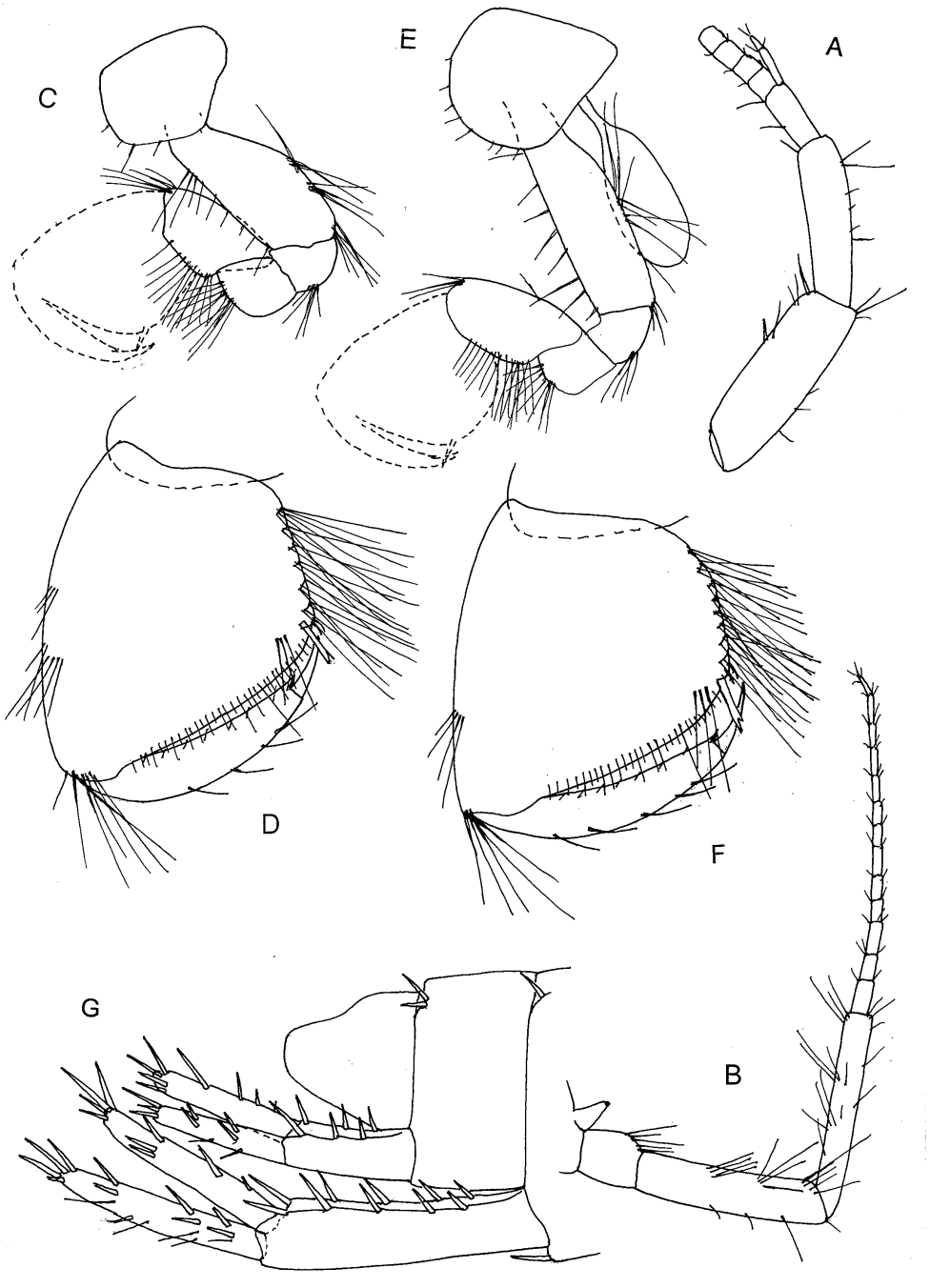

Figure 5. *Niphargus luka* sp. n., Čačak, vicinity, male 7.2 mm (paratype): **A**, proximal part of antenna 1; **B**, antenna 2; **C-D**, gnathopod 1; **E-F**, gnathopod 2; **G**, urosome with uropods 1-2.

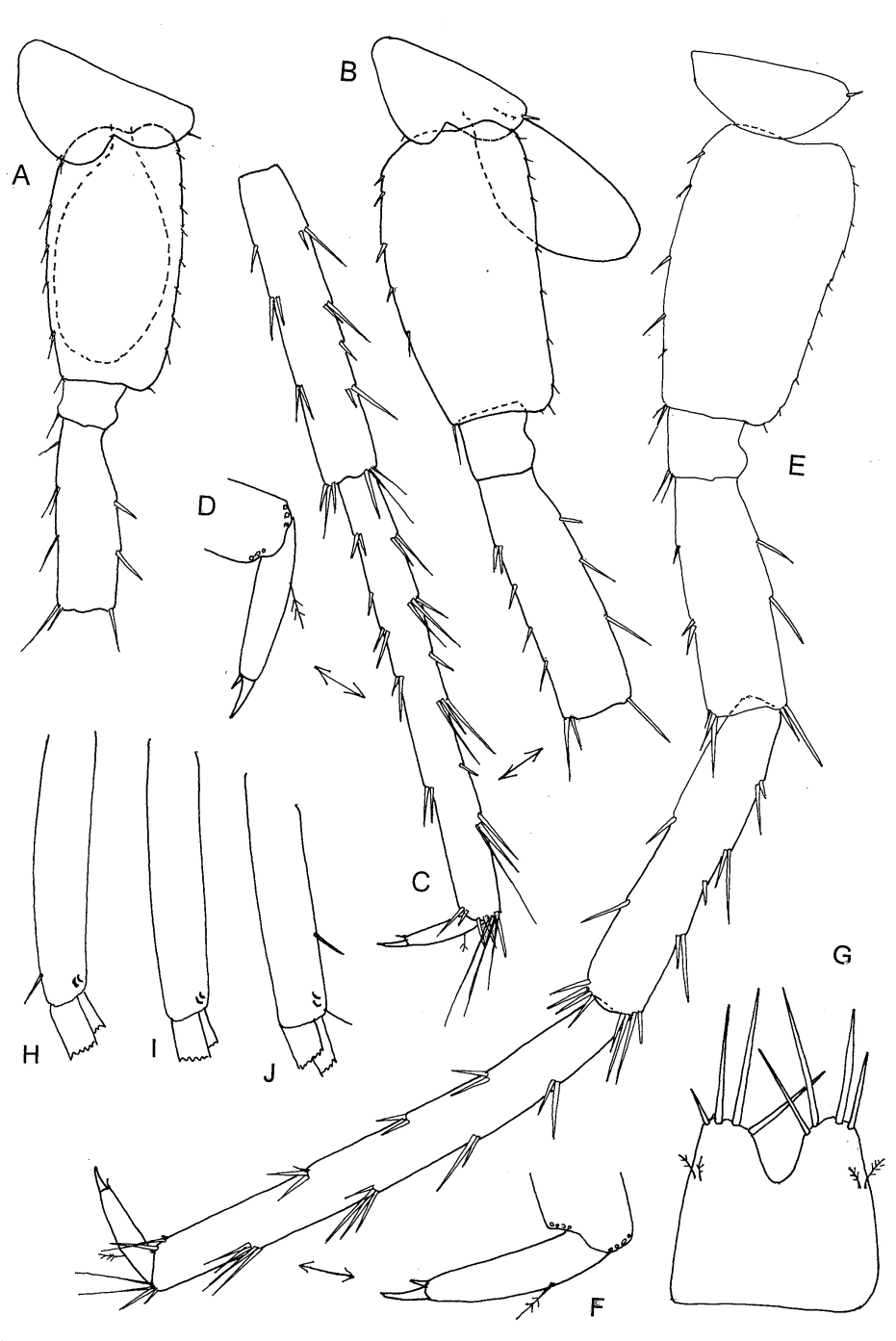

Figure 6. *Niphargus luka* sp. n., Čačak, vicinity, male 7.2 mm (paratype): **A**, pereopod 5; **B-D**, pereopod 6; **E-F**, pereopod 7; **G**, telson; **H-J**, peduncle of pleopods 1-3.

ticle 4 along the posterior margin with 3-4 bunches of short setae, along the anterior margin with 3 slender spines (Fig. 4D). Posterior margin of articles 5 and 6 with slender spines and short setae. Dactylus short and stout, with one spine at the inner margin near the base of the nail, and with one median plumose seta at the outer margin; nail shorter than the pedestal (ratio 17:25) (Fig. 4E).

Pereopod 4 like pereopod 3, but slightly smaller and less setose (Fig. 4F). Articles 2-3 like those in pereopod 3. Articles 4-6 of unequal length (ratio 50:35:45). Article 4 along the posterior margin with setae shorter than those in pereopod 3 (Fig. 4F); article 6 along the posterior margin with 4 groups of spines and short setae. Dactylus short and stout, with one spine at the inner margin and one plumose seta at the outer margin; nail shorter than the pedestal (ratio 16:28) (Fig. 4G).

Pereopods 5-7 elongated, progressively longer towards pereopod 7, with a narrowed article 2. Pereopod 5: article 2 with nearly parallel lateral margins, narrow, much longer than broad (ratio 81:41), along the anterior margin with a row of strong setae, along the posterior margin with a row of short setae (Fig. 6A). Article 4 along the anterior margin with 4 groups of setae and a distal spine, along the posterior margin with 3 single spines (Fig. 6A); articles 5-7 missing.

Pereopod 6: article 2 elongated, slightly tapering ventrally, with slightly visible ventroposterior lobe and a straight posterior margin bearing a row of short setae; anterior margin slightly convex, with a row of strong spine-like setae (Fig. 6B). Articles 4-6 progressively longer (ratio 79:98:140), along both margins with lateral and distal spines. Article 6 along the posterior margin with long spines and one long lateral and several distal long setae (Fig. 6B, C). Dactylus relatively short and strong (Fig. 6D), along the inner margin with one strong spine near the base of the nail, along the outer margin with one median plumose seta (Fig. 6D); nail short, poorly recurved, much shorter than pedestal (ratio 13:51).

Pereopod 7: article 2 narrow, much longer than broad (ratio 90:51), slightly tapering ventrally, without a distinct ventroposterior lobe and with a barely concave posterior margin bearing a row of short setae (Fig. 6E), along the anterior, a slightly convex margin, with several strong spine-like setae (Fig. 6E). Articles 4-6 elongated, progressively longer towards article 6 (ratio 74:102:164), all articles along both margins with strong lateral and distal spines (Fig. 6E). Dactylus relatively short and strong, along the inner margin with one strong spine near the base of the nail, along the outer margin with one median plumose seta (Fig. 6F); nail much shorter than pedestal (ratio 14:57).

Pleopods 1-3 with 2 retinacula each. Peduncle of pleopod 1 with one strong distoanterior seta (Fig. 6H); peduncle of pleopod 2 naked (Fig. 6 I); peduncle of pleopod 3 along the posterior margin with 2 strong setae (Fig. 6J).

Uropod 1: peduncle strong, with a dorsoexternal and dorsointernal row of strong spines (Fig. 5G); outer ramus slightly longer than the inner ramus, both rami with lateral and distal strong spines; 3-4 simple setae are attached along the outer ramus.

Uropod 2: peduncle with 2 rows of dorsal spines (Fig. 5G); the inner ramus is slightly longer than the outer ramus, both rami with strong lateral and distal spines (Fig. 5G).

Uropod 3 on the male was missing, but in the vial containing holotype and paratype, one torn apart uropod 3 was found; we suppose that it belongs to the male (Fig. 4 I). Peduncle of uropod 3 two times longer than broad, with one lateral and several distal spines (Fig. 4 I). Inner ramus scale-like, with a distal spine and one plumose seta. Outer ramus 2-articulate, elongated: first article along both margins with bunches of strong spines (Fig. 4 I), and along the inner margin several long plumose setae are attached. The second article of the outer ramus is elongated, but markedly shorter than the first article (ratio 69:129), along the inner margin with 3 strong spines accompanied by one short simple seta each, along the outer margin with one median spine and simple seta; 3 short setae are present on the tip of the second article (Fig. 4 I).

Telson short, as long as broad, incised broadly nearly 1/3 of telson-length (Fig. 6G); each lobe with 4 distal long spines (Fig. 6G); lateral and facial spines were absent; a pair of short plumose setae are present in upper half of telson.

Coxal gills on gnathopod 2 are narrow, not reaching the ventral tip of article 2 (Fig. 5E). Gills on pereopods 3-4 are broad, of unequal size (Fig. 4D, F). Gills on pereopods 5-6 large, ovoid, but not reaching the ventral tip of article 2 (Fig. 6A, B).

Variability

Unknown.

Derivatio nominis

Niphargus luka sp. n. is dedicated to the memory of my grandfather **Prof. Luka Karaman**, biologist and botanist (1855-1930), who studied nature in Bosnia & Herzegovina and Dalmatia. The name is nominative (gender masculine).

DISCUSSION

The new species *N. luka*, displays some similarity to the *Niphargus orcinus*-group of species, but with some specific, distinctly different characters. *Niphargus luka* differs significantly from most known species from Serbia because of several elongated body parts (antenna 1, flagellum of antenna 2, pereopods 5-7), and because of the presence of a dorsointernal row of spines on the peduncle of uropod 1. These characters are present in some species of the *Orniphargus*-group, namely *N. dolichopus* Fišer, Trontelj & Sket, 2006 (loc. typ.: Suvaja pećina Cave, Lušci Polje, Sanski Most, Bosnia & Herzegovina) and *N. dabarensis* Fišer, Trontelj &

Sket, 2006 (loc. typ.: Dabarska pećina-Cave, Bosnia & Herzegovina). In particular, both species are provided with numerous dorsoposterior spines on their metasomal segments, while gnathopods 1-2 are very large, and the shape of their gnathopods and uropods is different, etc.

Although the shallow distal telson excavation in males is also present in *N. croaticus* Jurinac, 1887 and *N. dolichopus*; both of these differ distinctly from *N. luka* by numerous characters (such as the shape of gnathopods, pereopods and coxae, etc.).

The second article of the outer ramus in uropod 3 is usually very short in males and females of the *Niphargus orcinus*-group from the western Balkans. However (for example in Macedonia) there are species of this group with a slightly elongated second article in the outer ramus of uropod 3, but with only a single short setae (*N. macedonicus* S. Karaman, 1929 [loc. typ.: Rašće springs near Skopje, Macedonia]). *Niphargus luka* differs from all of these species by the presence of a significantly elongated second article in uropod 3, which is provided with strong lateral spines.

Although the presence of extremely elongated last pereopods and nearly oval propodus in gnathopods 1-2 were also found to occur in various members of the *Jovaniphargus*-group of species: *N. jovanovici* S. Karaman, 1931 (loc. typ.: wells in Skopje, Macedonia); *N. serbicus* S. Karaman, 1960 (loc. typ.: Ćuprija, Serbia), *N. luka* differs from these by the presence of several setae along the outer margin in gnathopods' dactylus and pilosity of telson, etc.

While a short nail on the dactylus of the pereopods is present in various species, probably in connection with their ecology (for example *N. jovanovici*, *N. macedonicus*, etc.); these species differ significantly from *N. luka* with respect to gnathopods, telson and uropods, etc.

The presence of a dorsointernal row of spines on the peduncle of uropod 1 is present in numerous species of the *Orniphargus*-group: *N. hercegovinensis* S. Karaman, 1950 (loc. typ.: Zavala, Herzegovina); *N. arbiter* G. Karaman, 1984 (loc. typ.: Pećina Selo, Lika, Croatia), *N. podgoricensis* S. Karaman, 1934 (loc. typ.: spring of Ribnica river, Podgorica), etc. But, some species not belonging to *Orniphargus*-group also have a dorsointernal row of spines: *N. catalogus* G. Karaman, 1995 (loc. typ.: Merula, Andora, Italy), etc.; these species display markedly differently shaped gnathopods, telson, pereopods and antennae 1-2.

ACKNOWLEDGEMENTS

This work was supported by the Montenegrin Academy of Sciences and Arts. I am thankful to Prof. Dr. Ivo M. Karaman, zoologist and biospeleologist, from the Faculty of Sciences, University of Novi Sad, Serbia, who sent me the material used in this study.

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