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FURTHER STUDIES OF GENUS *NIPHARGUS* SCHIÖDTE, 1849 (FAM. NIPHARGIDAE) FROM WESTERN BALKAN PENINSULA (CONTRIBUTION TO THE KNOWLEDGE OF THE AMPHIPODA 274)

SUMMARY

The new data of some species of the family Niphargidae (Crustacea Amphipoda Gammaroidea) from Balkan are presented. The species *Niphargus borkanus* S. Karaman, 1960, known and poorly described from springs in Boračko jezero Lake (Borke) only (Bosnia and Herzegovina), is redescribed and figured based on material from new locality, spring of torrent Pješčar, NW from Konjic (Bosnia and Herzegovina) and its taxonomical position is discussed.

Niphargus salonitanus S. Karaman, 1950, known from Dalmatia and Herzegovina, is cited from Vilina pećina Cave near source of Ombla River by Dubrovnik, Croatia, and some taxonomical characters of this species are given.

Niphargus abavus G. Karaman, 2011, known from Markov Rt in Boka Kotorska is discovered in new locality of Boka Kotorska, Crna Gora (Montenegro). *Niphargus valachicus* Dobreanu & Manolache, 1933, known from Pontocaspian basin till Iran, is cited at the first time for Bosnia and Herzegovina.

Key words: taxonomy, Amphipoda, *Niphargus, borkanus*, *abavus*, *salonitanus*, *valachicus*, western Balkan peninsula

INTRODUCTION

The Tertiary genus *Niphargus* Schiödte, 1849 (Amphipoda: Niphargidae) settles the subterranean waters over Europe till Iran and Iraq with almost 300 different taxa. Various members of this genus settled subterranean waters in various waves through different periods, and by this way the present fauna of *Niphargus* is composed of species of various ages. On the other hands, the most of the known populations of genus *Niphargus* is still in process of differentiation and we can found the populations with transitive taxonomical characters between existing established taxa.

The large variability of many taxonomical characters within various populations of the same species, or within the specimens of the same population, made the recognition of various species and subspecies very difficult.

The genetic and molecular investigations of various populations of *Niphargus*, provided recently by many scientists: (Fišer et al., 2006; Fišer et al., 2008; Trontelj et al., 2009; Esmaeili-Rineh et al., 2013, etc.) showed sometimes similar or dissimilar genetical or evolutionary conclusions regarding the former

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already existing taxonomical positions of various taxa. The further detailed morphological studies on one side, and genetic and molecular investigations on the other side, combined, will help us to understand the taxonomical position of each population or taxon within genus *Niphargus*, and show the limits of possible segregation of various taxa. Without any doubt, the problem of recognition of cryptic (Fišer & Zagmajster, 2009) and pseudocryptic species will not facilitate to resolve this problem. In this light, our studies are based on morphological and ecological investigations of collected populations.

MATERIAL AND METHODS

The collected material was preserved in the 70% ethanol. The specimens were dissected using a WILD M20 microscope and drawn using camera lucida attachment. All appendages were temporarily submersed in the mixture of glycerin and water (50: 50) for study and drawing. Later all appendages have been transferred to Liquid of Faure on permanent slides. The body-length of examined specimens were measured by tracing individual's mid-trunk lengths (from tip of head to end of telson) using camera lucida. All illustrations were inked manually. Some morphological terminology and seta formulae follows Karaman`s terminology (Karaman, G. 1969; 1970; 2012c).

Our studies were provided based on morphological and ecological investigations and data.

TAXONOMICAL PART

Family Niphargidae

NIPHARGUS BORKANUS S. Karaman, 1960
Figs. 1-5

Niphargus boskovici borkanus S. Karaman, 1960: 81, figs. 16-19; G. Karaman, 1972: 5;.G. Karaman, 1973a: 279; G. Karaman, 1974: 16; Barnard & Barnard, 1983: 690; G. Karaman & Ruffo, 1986: 523;
Niphargus borkanus G. Karaman, 2010: 22.

MATERIAL EXAMINED: BOSNIA AND HERZEGOVINA:
Sp. 307= Spring in Boračko jezero (Borke) Lake, nearly 22 km SE from Konjic, Neretva River drainage system, 20.12.1953, several paratypes and holotype;
S-7211= Spring of torrent Pješčar, village Kostajnica, 15 km NW from Konjic [Neretva River drainage system], 28.12.2013 (leg. J. Mulaomerović]; one specimen.

DESCRIPTION (Spring of torrent Pješčar), FEMALE 8.1 mm with oostegites: Body moderately slender, metasomal segments along posterior

margin with 4-6 short setae (fig. 2F); urosome segment 1 on each dorsolateral side with 1 seta; urosome segment 2 on each dorsolateral side with 2 spines (fig. 4F); urosome segment 3 naked.

Urosome segment 1 on each side with one ventroposterior spine near basis of uropod 1 (fig. 4F).

Epimeral plates 1-2 angular, with well marked ventroposterior corner (fig. 2F); epimeral plate 3 slightly acute, with straight posterior margin bearing several setae (fig. 2F). Epimeral plate 2 with 2 subventral spines, epimeral plate 3 with 4 subventral spines.

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

Antenna 1 reaching nearly half of body-length; peduncular articles 1-3 progressively shorter (ratio: 49: 35: 17), scarcely setose (fig. 1B); main flagellum consisting of 24 articles [most of them with one aesthetasc]; accessory flagellum short, 2-articulated (fig. 1B).

Antenna 2 much shorter than antenna 1, peduncular articles 3-5 of unequal length (ratio: 23: 61: 57); ventral margin of these articles with bunches of long straight setae [most of them longer than diameter of articles themselves); along dorsal margin of articles 3-5 are implanted bunches of short setae (fig. 1C); flagellum slender, longer than last peduncular article and provided with short setae (fig. 1C); antennal gland cone short.

Mouthparts well developed. Labrum much broader than long, with entire convex anterior margin (fig. 2A). Labium with well developed inner lobes and broad, entire outer lobes (fig. 2B).

Mandible: molar triturative. Left mandible: incisor with 5 teeth, lacinia mobilis with 4 teeth accompanied by 9 rakers. Right mandible: incisor with 4 teeth, lacinia mobilis bifurcate, with several unequal teeth accompanied by 4 rakers (fig. 2C). Palpus mandible consisting of 3 articles: first article short, second article with 11-13 strong setae (fig. 2D); palpus article 3 falciform, poorly longer than article 2 (ratio: 70: 65), along margin with nearly 24 D- setae and 6-7 E- setae; on inner face appear 4 long B-setae in 3 groups (2-1-1), on outer face is attached one row of 5 A- setae (fig. 2E).

Maxilla 1: inner plate with 3 setae; outer plate with 7 spines bearing one lateral tooth each (fig. 1D); palpus short, 2-articulated, not reaching tip of spines on outer plate and provided with 8 setae (fig. 1D).

Maxilla 2: both plates with lateral setae only (fig. 4A).

Maxilliped: inner plate short, not reaching outer tip of first palpus article and provided with 2-3 distal spines (fig. 1E); outer plate nearly reaching half of second palpus article and bearing a row of distal and lateral smooth spines (fig. 1E); palpus article 3 along outer margin with one median and one distal bunch of setae; palpus article 4 at inner margin with one long seta near basis of the nail (fig. 1E).

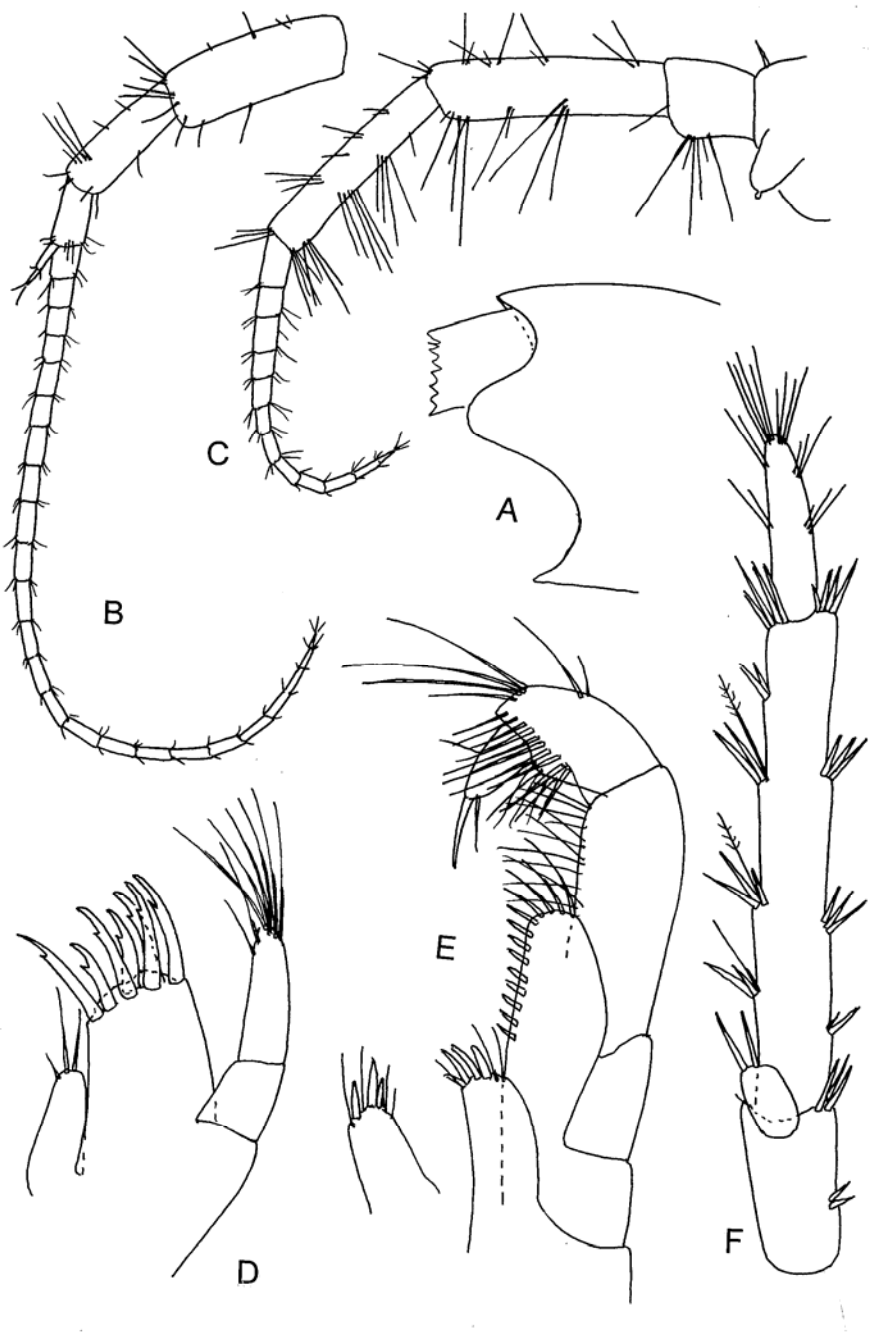

Fig. 1. *Niphargus borkanus* S. Karaman, 1960, female 8.1 mm, Pješčanik: A= head; B= antenna 1; C= antenna 2; D= maxilla 1; E= maxilliped; F= uropod 3.

Coxae 1-4 relatively short, with several longer setae along margins. Coxa 1 broader than long (ratio: 50: 38), with subrounded ventroanterior corner (fig. 3A).

Coxa 2 hardly broader than long (ratio: 50: 48) (fig. 3D); coxa 3 nearly as long as broad (fig. 4B); coxa 4 broader than long (ratio: 55: 50) (fig. 4D).

Coxae 5-7 progressively shorter, coxae 5 and 6 with subrounded anterior lobe. Coxa 5 much broader than long (ratio: 66: 42) (fig. 5A); coxa 6 smaller than coxa 5, broader than long (ratio: 55: 35) (fig. 5C); coxa 7 entire, with convex ventral margin, much broader than long (ratio: 45: 22) (fig. 5E).

Gnathopods 1-2 relatively small, with propodus nearly as large as corresponding coxa. Gnathopod 1: article 2 along both margins with long setae (fig. 3A) article 3 along posterior margin with one bunch of setae; article 5 shorter than article 6 (ratio: 33: 43), along anterior margin with one bunch of setae (fig. 3A). Article 6 trapezoid, slightly longer than broad (ratio: 87: 74), along posterior margin with 5 transverse rows of setae (fig. 3B); palm slightly convex, inclined almost half of propodus- length, defined on outer face by one strong S- spine accompanied laterally by 2 serrate L- spines and 4 facial M-setae, along inner face by one subcorner R- spine (fig. 3C); dactylus reaching posterior margin of article 6, along outer margin with row of 6 median strong setae (fig. 3B), along inner margin with row of short setae.

Gnathopod 2 is slightly larger than gnathopod 1, its article 2 along both margins with long setae (fig. 3D); article 3 along posterior margin with one bunch of setae; article 5 slightly shorter than article 6 (ratio: 40: 43), along anterior margin with 2 bunches of setae. Article 6 (propodus) almost quadrate, (ratio: 87: 83), along posterior margin with 7 transverse groups of setae (fig. 3E); palm slightly convex, defined on outer face by one corner S- spine accompanied laterally by 2 serrate L- spines and 2 facial long M- setae (fig. 3E), on inner face by one subcorner R- spine (fig. 3F); dactylus reaching posterior margin of propodus, along outer margin with row of 6 strong median setae (fig. 3E), along inner margin with row of short setae.

Pereopods 3 and 4 similar to each other, rather stout. Pereopod 3: article 2 along posterior margin with row of long simple setae, along anterior margin with long setae in proximal part and with short setae in distal part (fig. 4B); articles 3-5 along posterior margin with long setae (the longest setae exceeding the diameter of articles themselves; articles 4-6 of unequal length (ratio: 48: 35: 42); posterior margin of article 6 with 5 groups of short spines and single short seta (fig. 4B); dactylus stout, much shorter than article 6 (19: 42), along inner margin with one strong spine near basis of the nail, along outer margin with one median short seta; nail as long as pedestal (fig. 4C).

Pereopod 4: setae on articles 3-5 are hardly shorter than these in pereopod 3; articles 4-6 of unequal length (ratio: 40: 30: 42) (fig. 4D); dactylus like that of pereopod 3, with one strong spine at inner margin near basis of the nail, and with one median plumose seta at outer margin; nail hardly longer than pedestal (ratio: 34: 30) (fig. 4E).

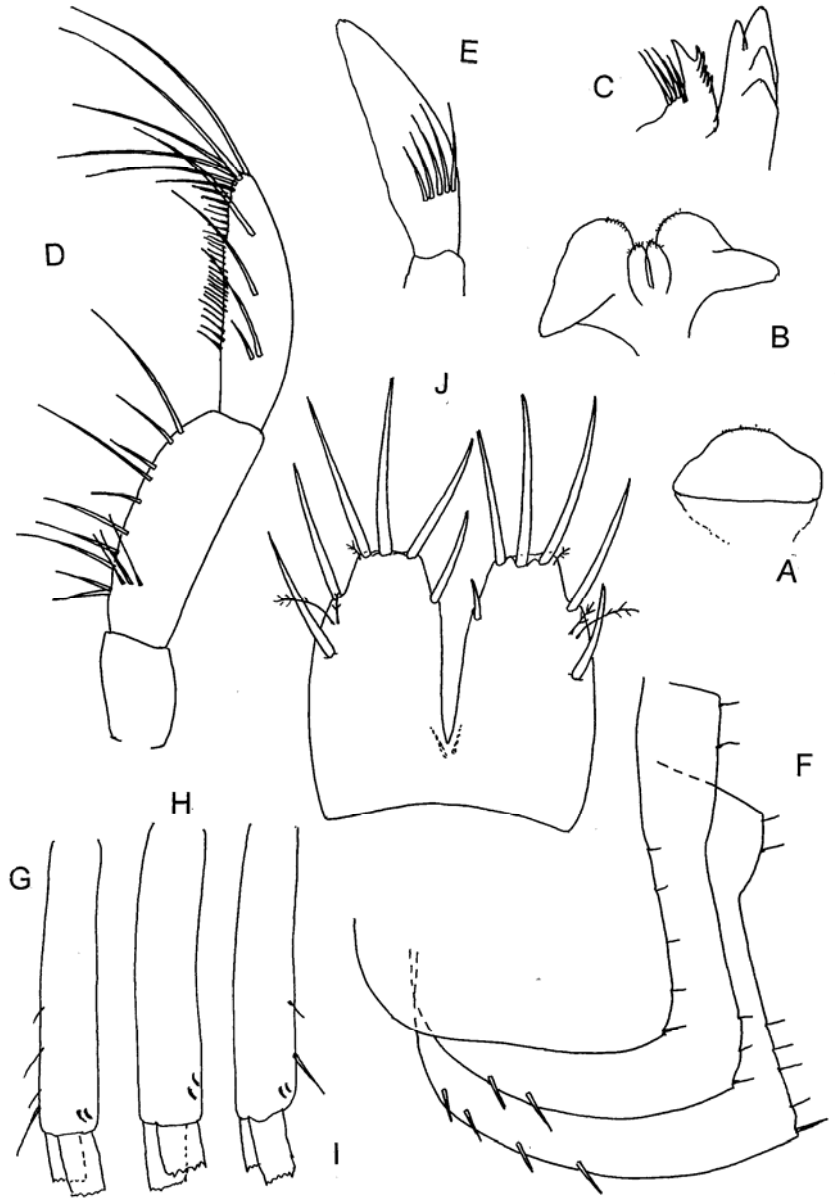

Fig. 2. *Niphargus borkanus* S. Karaman, 1960, female 8.1 mm, Pješčanik: A= labrum; B= labium; C= right incisor and lacinia mobilis; D= mandible palpus, inner face; E= tip of mandible palpus, outer face, A- setae; F= epimeral plates 1-3; G-I= peduncle of pleopods 1-3. J= telson.

Pereopods 5-7 rather stout. Pereopod 5 is remarkably shorter than pereopods 6 and 7 (fig. 5A), article 2 longer than broad (ratio: 68: 42), with almost parallel lateral margins and without distinct ventroposterior lobe (fig. 5A); along anterior margin of article 2 are attached several strong spine-like setae, along posterior margin appear nearly 8 short setae; articles 3 with 2 long distoanterior marginal setae; articles 4-6 of unequal length (ratio: 38: 45: 50), along both margins with strong spines and single setae; dactylus short and strong, much shorter than article 6 (ratio: 20: 51), along inner margin with one strong spine near basis of the nail, along outer margin with one median plumose seta (fig. 5B);nail slightly shorter than pedestal (ratio: 23: 32).

Pereopod 6: article 2 much longer than broad (ratio: 85: 48), along anterior margin with row of strong spine-like setae, along posterior margin with nearly 11 short setae (fig. 5C), ventroposterior lobe not developed; articles 4-6 of unequal length (ratio: 53: 63: 80), along both margins with strong spines intermixed with single setae; dactylus strong, much shorter than article 6 (ratio: 24: 80), along inner margin with one strong spine, along outer margin with one median plumose seta; nail shorter than pedestal (ratio: 23: 46) (fig. 5D).

Pereopod 7: article 2 without distinct ventroposterior lobe, along anterior margin with 6 strong spine-like setae, along posterior margin with nearly 12 short setae (fig. 5E); articles 4-6 with unequal length (ratio: 47: 63: 87), along both margins with bunches of strong spines; dactylus strong, much shorter than article 6 (ratio: 30: 88), along inner margin with one strong spine near basis of the nail, along outer margin with one median plumose seta (fig. 5F), nail shorter than pedestal (ratio:28: 54).

Pleopods 1-3 with 2 retinacula each. Peduncle of pleopod 1 along anterior margin with 3-4 setae (fig. 2G); peduncle of pleopod 2 naked (fig. 2H); peduncle of pleopod 3 along posterior margin with 2 setae (fig. 2 I).

Uropods relatively stout. Uropod 1: peduncle longer than rami, bearing dorsoexternal and dorsointernal row of strong spines (fig. 4F); both rami of equal length, bearing lateral and distal strong spines (fig. 4F); two bunches of long simple setae are attached in the external middle of outer ramus, and two long simple setae at margin of inner ramus (fig. 4F).

Uropod 2: peduncle and both rami with strong spines; rami of equal length, bearing lateral and distal strong spines (fig. 4F).

Uropod 3: peduncle short, slightly longer than broad; inner ramus short, scale like, with 2 distal spines (fig. 1F); outer ramus 2- articulated: first article along both margins with 4-5 bunches of strong spines, along inner margin accompanied by single plumose setae; second article of outer ramus slightly elongated, but shorter than first article (ratio: 49: 130), along both margins and tip with bunches of simple setae (fig. 1F).

Telson as long as broad, deeply incised (fig. 2J); each lobe with 3 long distal spines, one spine is attached along outer and inner margin on each lobe; one long spine is attached on the face of each lobe (fig. 2J).

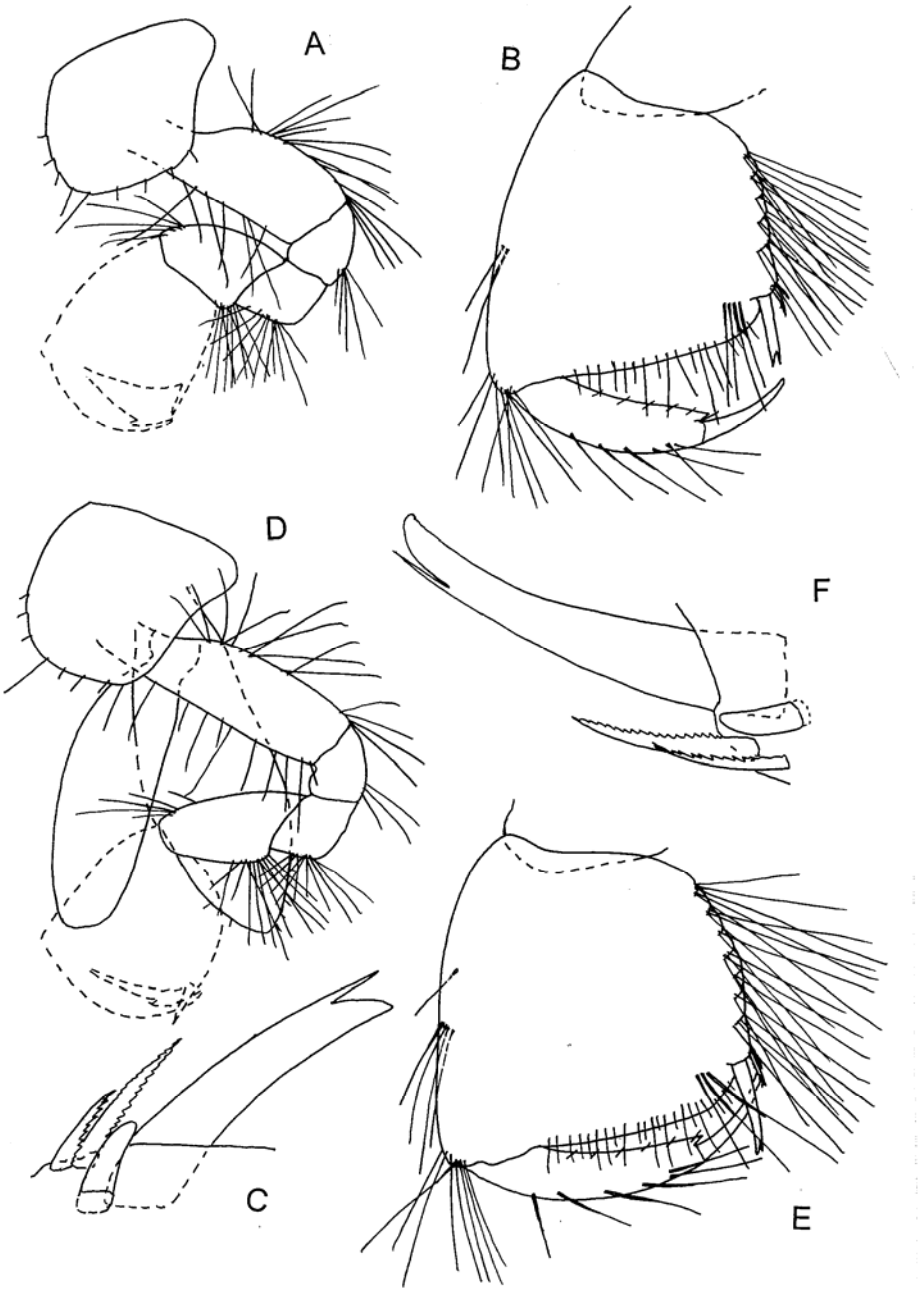

Fig. 3. *Niphargus borkanus* S. Karaman, 1960, female 8.1 mm, Pješčanik: A-B= gnathopod 1; C= distal tip of gnathopod 1 propodus, inner face; D-E= gnathopod 2; F= distal tip of gnathopod 2 propodus, inner face.

A pair of short plumose setae is attached in upper half of each lobe (plumose seta towards outer margin of lobe is longer than seta attached towards the middle of each lobe).

Coxal gills on gnathopod 2 (fig. 3D) and pereopods 3 (fig. 4B) and pereopod 4 (fig. 4D) are very large, exceeding ventral tip of corresponding article 2; coxal gills on pereopods 6 and 7 are shorter (fig. 5C).

Oostegites very large, with short marginal setae (figs. 3D, 4B, D).

MALE. We have not the males from Pješčar torrent, but the elongated second article of outer ramus in uropod 3 in female suggests that outer ramus of uropod 3 in males should be like that in female or with longer second article, as mentioned S. Karaman also (1960).

S. Karaman (1960) mentioned male of 7.5 mm with characters like these in female. S. Karaman mentioned that second article of uropod 3 reaching nearly half of first article, he figured distinctly acute epimeral plates, and telson with long spines: each lobe is with 3 long distal spines, one long spine is attached at outer margin and one small spine is attached at inner margin; one lobe is provided with one short facial spine.

Maxilla 1 inner plate is with 3 distal setae, uropods 1-2 with subequal rami, outer plate and palpus like that in female of Pješčar.

VARIABILITY. Stanko Karaman (1960) figured telson of female of 10 mm with lobes bearing 4 long distal spines, the number and position of other spines like these in female from Pješčar.

As the known male from type locality is not of adult size, and no males were collected from Pješčar, more detailed differences between males and females and between *N. borkanus* and some other species is not possible to establish without new material.

DISTRIBUTION: Bosnia and Herzegovina, endemic species.

REMARKS AND AFFINITIES

Stanko Karaman described (1960) this species as subspecies of *N. boskovici* S. Karaman, 1952, species known from Vjetrenica Cave in Herzegovina, based on various taxonomic differences (stouter body, shorter uropod 3, presence of lateral and facial spines on telson, gnathopods, etc), and this subspecific status of *borkanus* was mentioned later by many authors (see synonymy). Unfortunately, Stanko Karaman died before his paper was printed. We cited later *borkanus* as a distinct species (2010).

N. borkanus was very scarcely described and figured, with undescribed many taxonomical characters and details, making very difficult recognition of taxonomic position of this taxon. By this way, we decided to redescribe this species based on specimen from second locality, Pješčar, nearly 25 km far from the type locality. The comparison of specimens from type-locality with that from Pješčar show no significant differences.

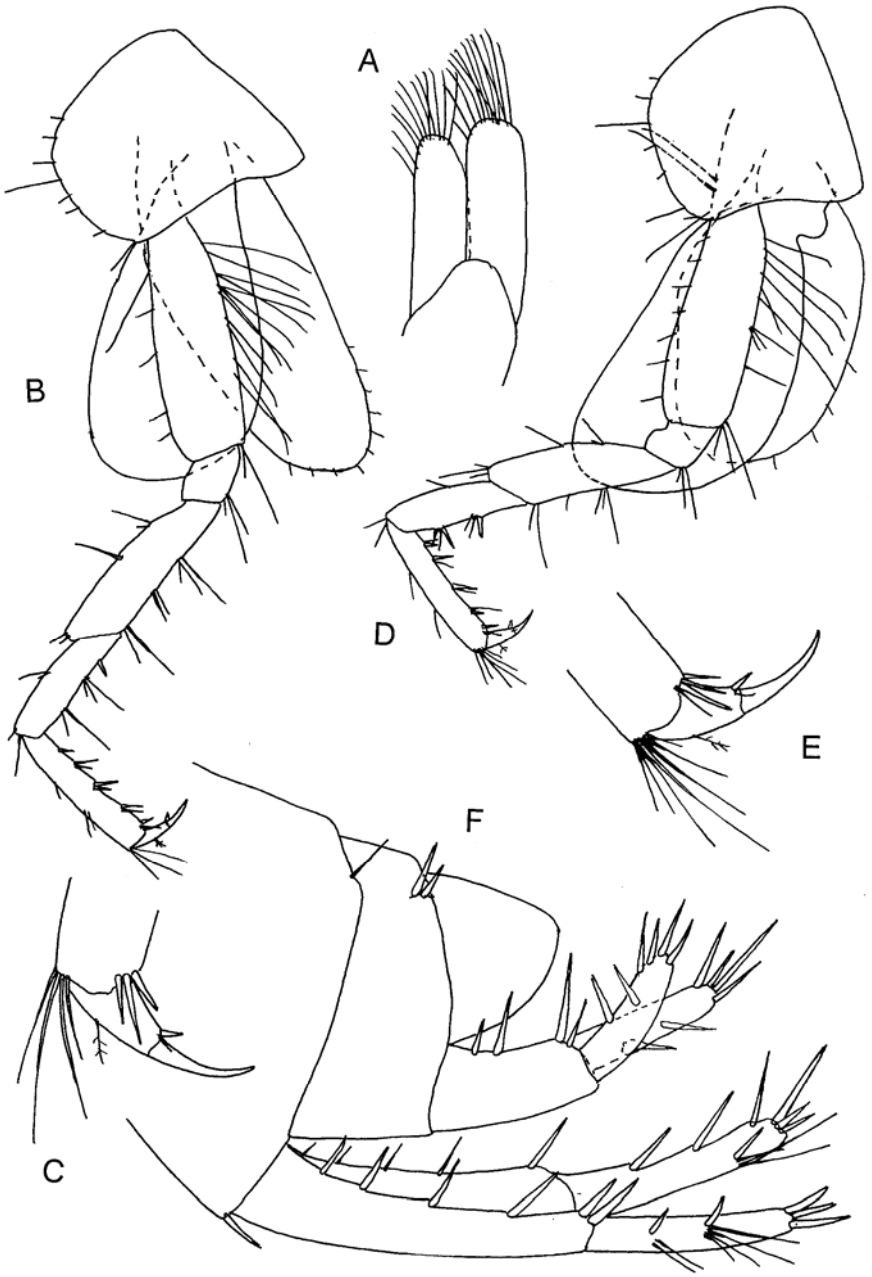

Fig. 4. *Niphargus borkanus* S. Karaman, 1960, female 8.1 mm, Pješčanik: A= maxilla 2; B-C= pereopod 3; D-E= pereopod 4; F= urosome with uropods 1-2.

N. borkanus belong to a group of small different species known from western Balkan, often still partially descried, and consequently, very difficult for detailed comparison (*N. rucneri* G. Kar., 1962, *N. alatus* G. Kar., 1973, *N. boskovici* S. Kar., 1952, *N. zavalanus* S. Kar., 1950, *N. cvijici* S. Kar., 1950, etc.), and more detailed redescription of these taxa is necessary.

Niphargus rucneri G. Karaman, 1962 [loc. typ.: Glibovita Draga, Plitvice Lakes, Croatia) is rather similar to *N. borkanus* by shape of gnathopods 1-2, long spines on telson, epimeral plates, urosome segment 2, etc., but *N. rucneri* differs by lower number of setae on inner plate of maxilla 1, by unequal rami of uropods 1 and 2, by short second article of outer ramus in uropod 3 of female, etc.

N. zavalanus S. Karaman, 1950c [loc. typ.: spring of torrent Lukavac near Vjetrenica cave, Herzegovina] differs from *N. borkanus* by presence of additional spines on some pereopods, by elevated number of dorsolateral spines on urosome segments 1 and 2, short uropod 3, absence of lateral and facial spines on telson, etc.

Niphargus cvijici S. Karaman, 1950c [loc. typ.: spring near Vjetrenica cave in Popovo Polje, Herzegovina] differs from our species by subrounded epimeral plates 1-3, by distally tapering telson bearing short spines, etc.

N. alatus G. Karaman, 1973a [loc. typ.: spring on Veruša, Prokletije Mt.] is rather similar to *B. borkanus* by shape of epimeral plates, uropods 1-2, urosomal segments 1-2, but differs from *N. borkanus* by more inclined propodus of gnathopods 1-2, by absence of lateral and facial spines on telson, etc.

NIPHARGUS VALACHICUS Dobreanu & Manolache, 1933

Niphargus tatrensis valachicus Dobreanu & Manolache, 1933: 104, figs. 2-4;
Niphargus (*Supraniphargus*) *valachicus valachicus* S. Karaman, 1950b: 68, figs. 35-37; Sket, 1981: 90;
Niphargus valachicus S. Karaman, 1050a: 11, figs. 1-10; G. Karaman, 1973b: 150, fig. IV; G. Karaman, 1998: 10, figs. I-IV.

LOCUS TYPICUS: Bucharest, Romania.

MATERIAL EXAMINED:

S-7199. Balatun, Gromželj, lowland peat, 13.11.2008, 1 exp. (leg. M. Stanković (1 ovig. female).

REMARKS

The specimen from Balatun (ovig. female 11.5 mm) agree with description and figures of this species mentioned by various authors from Serbia (Karaman, S., 1950a), Bulgaria (G. Karaman, 1973b), Slovenia and Croatia (Sket, 1981), Iran (G. Karaman, 1998), etc.

Urosome segment 1 on each dorsolateral side with 1 spine, Urosome segment 2 on each dorsolateral side with 1 spine.

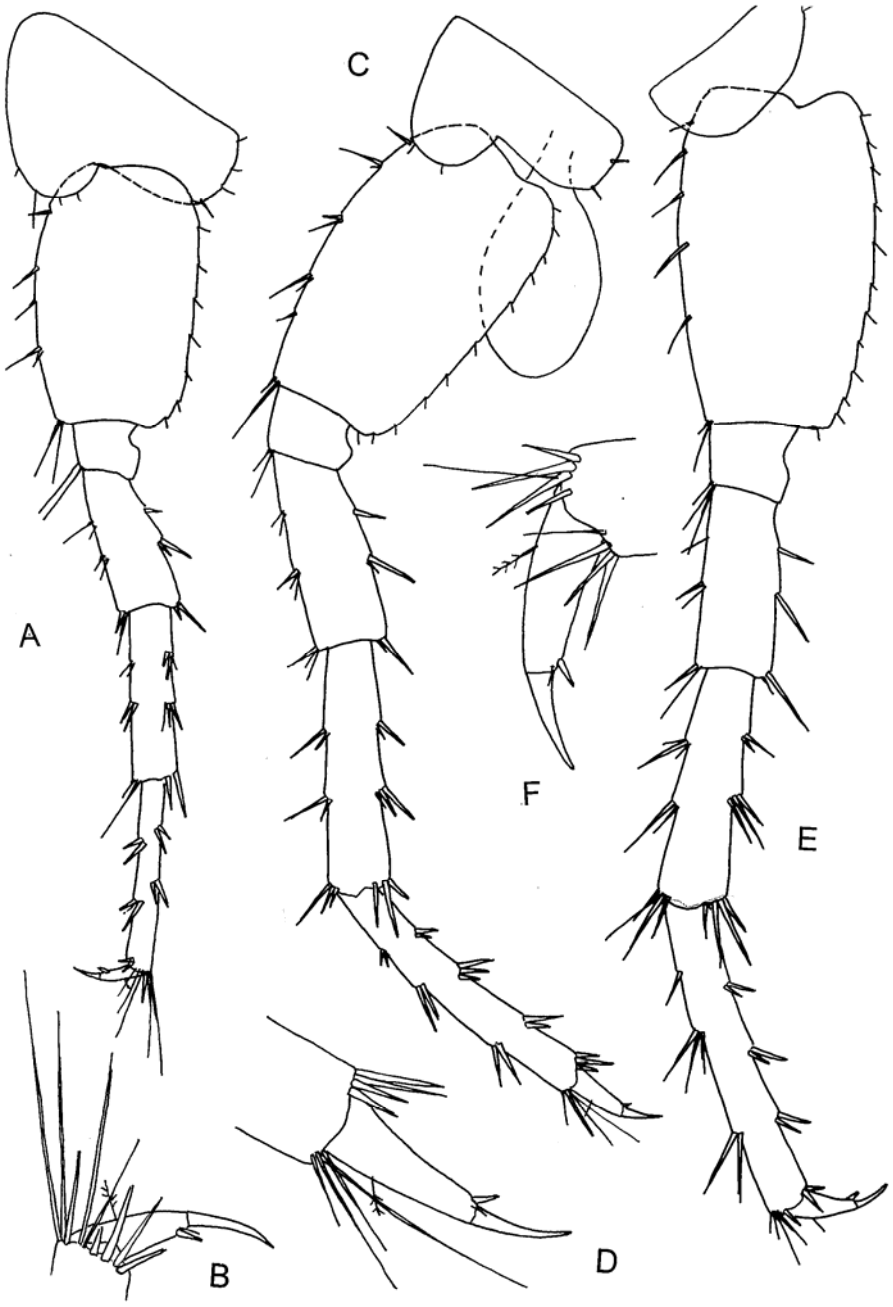

Fig. 5. *Niphargus borkanus* S. Karaman, 1960, female 8.1 mm, Pješčanik: A-B= pereopod 5; C-D= pereopod 6; E-F= pereopod 7.

Dactylus of pereopods 3-7 long, bearing along inner margin several spines each [5 spines on pereopod 5 dactylus, 7 spines on pereopod 7 dactylus, etc.].

Uropod 3 second article of outer ramus much shorter than first article (ratio: 10: 70) (female 11.5 mm), reaching half of peduncle length.

DISTRIBUTION: SE Europe till Iran. New for the fauna of Bosnia and Herzegovina. Pontocaspian element.

NIPHARGUS SALONITANUS S. Karaman, 1950

Niphargus (*Orniphargus) salonitanus* S. Karaman, 1950e: 137, figs. 62-72; S. Karaman, 1953: 143, figs. 3, 4; S. Karaman, 1955: 223, 241;
Niphargus salonitanus G. Karaman, 1974: 24; Barnard & Barnard, 1983: 695; G. Karaman, 1984: 22, figs. VII, 7-9; VIII, IX; G. Karaman, 2012b: 25, 33.

MATERIAL EXAMINED:
Vilina pećina Cave, in Duboko jezero Lake [vicinity of source of Ombla River (=Rijeka Dubrovačka)], Croatia], 6.5.2012, 1 specimen accompanied by *Hadzia fragilis* S. Kar. (leg. Jana Bedek & Predrag Rade);
Vilina pećina Cave, siphon on western caverna, 16.6.2012, 2 specimens intermixed with *Hadzia fragilis* S. Kar.1932 (leg. Petra Kovač-Konrad);
Vilina pećina Cave, caverna behind the door, 18.6.2012, one specimen intermixed with *Niphargus steueri kolombatovici* S. Kar., 1950 (leg. Alen Kirin).

LOCUS TYPICUS: subterranean waters in Solin near Split, Croatia.

REMARKS

This species belongs to the group of taxa with specific taxonomical characters, removed by S. Karaman (1950d) into a distinct subgenus *Orniphargus* S. Kar. 1950 [typus subgeneris: *Niphargus orcinus Joseph, 1867]*.

In my paper published 2012 (Karaman, G., 2012b) erroneously it was omitted this species except the name in abstract and conclusions, and by this way, I cited data here. *N. salonitanus* was known from central Dalmatia near Split (S. Karaman, 1950d), and later it was mentioned also for Popovo Polje field in Herzegovina to Cavtat (S. Karaman, 1953) and in the valley of Neretva River (G. Karaman, 1984).

Recently I obtained specimens of this species from Vilina pećina Cave. The subterranean waters of this large cave are connected directly with the subterranean waters of Popovo Polje valley in Herzegovina (Vjetrenica Cave system).

The specimens in hands, up to 11 mm long (females), from Vilina pećina Cave

mainly agree with these from type locality.

Metasomal segment 3 along posterior margin with numerous short setae intermixed with short spines. Epimeral plates 1-3 distinctly slightly acute, epimeral plate 2 with 2 subventral spines, epimeral plate 3 with 3 subventral spines.

Urosomite 1 on each dorsolateral side with 3 spines; urosomite 2 on each dorsolateral side with 4 spines, urosomite 3 naked.

Antenna 1 slightly exceeding half of body-length (64: 110), main flagellum with 33 articles. Flagellum of antenna 2 as long as or longer than last peduncular article, consisting of 9 slender articles.

Propodus of gnathopods 1-2 larger than corresponding coxae, with rather variable shape having remarkably inclined palm; corner S- spine is rather longer; L- spines on gnathopod 1 propodus are implanted laterally of S- spine; on propodus of gnathopod 2 L-spines are implanted behind the S- spine.

Pereopods 5-7 with lobed basipodit; dactylus of pereopods 3-7 slightly more slender than figured in literature (Karaman, G., 1984).

Pleopods 1-3 with 2 retinacula each; peduncle of pleopods 1-3 scarcely setose.

Uropod 1: peduncle with row of dorsoexternal and dorsointernal row of spines, rami nearly of equal length, bearing lateral and distal spines, plumose setae on rami absent.

Uropod 2: inner ramus remarkably longer than outer one, outer ramus often slightly recurved upwards, plumose setae absent. Uropod 3 strongly spinose, second article of outer ramus very short, similar to other members of *Orniphargus* group.

Telson longer than broad, each lobe with 3 distal spines and one spine along outer margin; a pair of longer plumose setae is attached near the middle of each lobe.

DISTRIBUTION: Croatia, Bosnia and Herzegovina, endemic species.

NIPHARGUS ABAVUS G. Karaman, 2011

Niphargus abavus G. Karaman, 2011: 199, figs. 1-7; G. Karaman, 2012a: 54.

LOCUS TYPICUS: springs on Markov Rt near Prčanj, Boka Kotorska, Crna Gora (Montenegro).

MATERIAL EXAMINED:
S-7178= Opatovo near Lepetane, temporary spring, Boka Kotorska, 6.6.2013, 7 exp. (leg. G. Karaman).

REMARKS

This species was known from type locality only. We collected it in the small temporary spring dried in the summer period, nearly 7 km far from the type locality. The taxonomic characters of these specimens agree completely with these from type locality.

DISTRIBUTION: Crna Gora. *N. abavus* settled the subterranean waters of the Vrmac Mt in Boka Kotorska; endemic species.

CONCLUSIONS

New data of some species of the family Niphargidae (Crustacea Amphipoda Gammaroidea) from Bosnia and Herzegovina, Croatia and Montenegro (Crna Gora) are given. New taxonomical characters of poorly known species *Niphargus borkanus* S. Karaman, 1960 from Pješčanik in Bosnia and Herzegovina are presented and figured. New localities of *Niphargus croaticus* S. Karaman, 1950, *N. valachicus* Dobr. & Manolache, 1933 and *N. abavus* G. Karaman, 2011 from western Balkan are presented. Recent studies on genetic and molecular biology of various *Niphargus* species provided by various scientists showed the necessity to combine the results of these studies with morphological, ecological and zoogeographical studies to resolve the recognition of various taxonomical taxa and its evolutive connections.

ACKNOWLEDGEMENTS

During recent large scientific expeditions (2012) to the Ombla river source- Vilina pećina-cave complex near Dubrovnik (Croatia), provided by several scientists, speleologists and cave-divers from Croatian Biospeleological Society (CBSS), among other very interesting material, several subterranean species of Amphipoda were collected. Thanks to the Mr. sc. biol. Roman Ozimec from Zagreb, leader to this expedition, I obtained the collected material of Amphipoda at disposition for study, and some results of this investigation are presented in this work.

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DALJNE STUDIJE RODA *NIPHARGUS* SCHIŐDTE, 1849 (FAM. NIPHARGIDAE) IZ ZAPADNOG BALKANA (274. Prilog poznavanju Amphipoda)

U radu su presentirani novi podaci o nekim vrstama iz familije Niphargidae (Crustacea Amphipoda Gammaroidea) sa Balkana. Vrsta *Niphargus borkanus* S. Karaman, 1960, poznata i oskudno opisana samo iz izvora na Boračkom jezeru (Borke) (Bosna & Hercegovina), detaljno je opisana iz novog lokaliteta, kod sela Kostajnica u Bosni i Hercegovini i njen taksonomski položaj je razmatran.

Niphargus salonitanus S. Karaman, 1950, poznat iz Dalmacije i Hercegovine, citiran je iz Viline špilje kod izvora rijeke Omble kod Dubrovnika i neke taksonomske odlike te vrste su prezentirane.

Niphargus abavus G. Karaman, 2011, poznat do sada sa Markovog Rta u Boki Kotorskoj, nadjen je na novom lokalitetu u Boki Kotorskoj (Crna Gora). *Niphargus valachicus* Dobreanu & Manolache, 1933, poznat iz Pontokaspijskog bazena sve do Irana, citiran je po prvi put za Bosnu & Hercegovinu.

Ključne riječi: taksonomija, Amphipoda, *Niphargus*, *borkanus*, *abavus*, *salonitnus*, *valachicus*, zapadni Balkan