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NIPHARGUS CYMBALUS, NEW SPECIES AND *N. JOVANOVICI* S. KAR. 1931 IN GREECE (CONTRIBUTION TO THE KNOWLEDGE OF THE AMPHIPODA 298)

SUMMARY

Two members of the family Niphargidae (Amphipoda, Gammaridea) from Greece are treated in this study: From the subterranean waters in Epirus is described and figured new species *Niphargus cymbalus*, sp. n. [type locality: wells in Glikorizo, Epirus, Greece] and its taxonomic position regarding other members of this genus are discussed. *Niphargus jovanovici* S. Karaman, 1931 [loc. typ.: Skoplje, Macedonia] is established at the first time from two localities of Greece [Viotica in Attica and Amarinthos on Euboea island] and taxonomical characteristics of these populations regarding these from Macedonia are analyzed.

Keywords: Amphipoda, taxonomy, new species, *Niphargus cymbalus*, jovanovici, Greece, subterranean waters.

INTRODUCTION

The subterranean fauna of Amphipoda in Greece is very rich but only partially investigated, presented by several families and genera with various number of species. Among the family Niphargidae, genus *Niphargus* Schiödte 1849, was presented by nearly 16+ species known from continental Greece and Greek islands (G. Karaman, 2017). During our recent studies of *Niphargus* samples collected by Italian scientists in Greece, we established one new species from the subterranean waters in Epirus region, *Niphargus cymbalus*, sp. n. and presence of *Niphargus jovanovici* S. Karaman 1931 known from Macedonia, in two localities in Greece.

MATERIAL AND METHODS

The studies 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 glycerine and water for study and drawing. Later, all appendages have been transferred into 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.

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Note: The authors declare that they have no conflicts of interest. Authorship Form signed online.

Some morphological terminology and setae formulae follow G. Karaman's terminology (Karaman, G. 1969; 2012) regarding the last mandibular palpus article [A= setae on outer face; B= setae on inner face; C= additional setae on outer face; D= lateral marginal setae; E= distal long setae] and propodus of gnathopods 1 and 2 [S= corner S-spine on outer face; L= lateral slender serrate L-spines; M= facial M-setae; R= subcorner R-spine on inner face]. Terms "setae" and "spines" are used based on its shape, not origin. The study was realizes based on morphological, ecological and zoogeographical research.

TAXONOMICAL PART

Family NIPHARGIDAE

NIPHARGUS CYMBALUS, sp. n.
Figures 1-4, 5A-H

MATERAL EXAMINED: GREECE:

G-17= Epirus, Glikorizo, Arta, 10 m a.s.l., freshwater well, water temperature. 11.5oC, pH 7, 24.2.1976, one exp. accompanied by *Niphargus* sp. (leg. Argano, Pesce & Bianco).

DIAGNOSIS (males only):

Body moderately stout, rostrum short, peduncular article 3 of antenna 1 short; accessory flagellum 2-articulated; urosomal segments 1-2 with spines on each dorsolateral side, urosomal segment 3 naked. Epimeral plates acute. Coxa 4 with ventroposterior lobe, coxa 5 shorter than 4; mandibular palpus article 1 naked. Maxilla 1 outer plate spines with several teeth each, palpus short. Maxilliped unknown.

Gnathopods 1-2 relatively small, article 3 with one posterior bunch of setae; propodus trapezoid, as large as coxae, with L-setae sitting laterally of S-spine and with dactylus bearing a row of setae along outer margin. Dactylus of pereopods 3-7 moderately strong, with one slender spine at inner margin. Basipodit of pereopods 5-7 large, ovoid, lobed. Pleopods 1-3 with 2 retinacula and peduncles scarcely setose. Uropod 1 peduncle with dorsointernal and dorsoexternal row of spines, rami of equal length. Uropod 2 with equal rami, spines are short. Uropod 3 unknown. Telson is relatively short, deeply incised, with 3 distal spines on each lobe.

DESCRIPTION

Male 6.1 mm (holotype): Body moderately stout. Head with short rostrum and subrounded lateral cephalic lobes, ventroanterior excavation developed (fig. 1A), eyes absent. Metasomal segments 1-3 with 2-4 dorsoposterior marginal setae each (fig. 3E). Last mesosomal segment at ventral margin with 2 median sexual tubercles (fig. 5D); urosomal segment 1 and urosomal segment 2 on each dorsolateral side are provided with 2 strong spines (fig. 5H); urosomal segment 3

naked. Urosomal segment 1 near basis of uropod 1 peduncle are with one strong spine (fig. 5H).

Epimeral plates 1-3 are sharply acute, with inclined posterior margin bearing several short setae each (fig. 3E). Epimeral plate 1 naked, provided with slightly concave ventral margin; epimeral plates 2 and 3 are with slightly convex ventral margin bearing 2-3 subventral spines each (fig. 3E).

Antenna 1 hardly shorter than half of body-length; peduncular articles 1-3 progressively shorter (ratio: 55:36:24), very scarcely setose (fig. 1B); last peduncular article is not elongated. Main flagellum is consisting of 16 articles (most of them with one short aesthetasc (fig. 1C).

Accessory flagellum 2-articulated, exceeding half of last peduncular article (fig. 1D).

Antenna 2 moderately slender, peduncular article 4 slightly longer than article 5 (ratio: 65:58), bearing several bunches of setae (the longest setae slightly exceeding the diameter of article itself); article 5 along ventral margin with 3 bunches of setae (the longest setae longer than diameter of article itself); flagellum moderately slender, scarcely setose, consisting of 9 articles (fig. 1E); antennal gland cone is short (fig. 1E).

Mouthparts well developed (maxilliped missing). Labrum is broader than long. with poorly concave distal margin (fig. 5A).

Labium is with well developed inner lobes, outer lobes entire, distally subrounded (fig. 5B).

Mandible: molar triturative. Right mandible: incisor with 4 teeth, lacinia mobilis bifurcate, accompanied by 8 rakers (fig. 1F). Left mandible: incisor with 5 teeth, lacinia mobilis with 4 teeth accompanied by 7 rakers. Palpus consisting of 3 articles: first article is short, naked; second article is provided with 7 setae (fig. 1G); third article is subfalciform, with nearly 16 D-setae and 6 E-setae, on outer face is attached group of 3 A-setae (fig. 1H), on inner face of third article are attached 4 single B-setae (fig. 1G).

Maxilla 1: inner plate is narrow, with 1-2 distal setae; outer margin with 7 spines bearing 5-6 lateral teeth each (fig. 1 I); palpus 2-articulated, not reaching distal tip of outer plate- spines, consisting of 2 articles and provided with 5 distal setae.

Maxilla 2 is with well developed lobes bearing numerous distal marginal setae each, facial setae absent (fig. 5C).

Maxilliped unknown (missing).

Coxae are of moderate size. Coxa 1 is as long as broad, with subrounded ventroanterior corner and bearing 5-6 marginal short setae (fig. 2A). Coxa 2 is poorly longer than broad (ratio: 60:59), with subrounded ventral margin bearing nearly 7 short setae (fig. 2D). Coxa 3 is remarkably longer than broad (ratio: 85:55), with convex anteroventral margin, bearing nearly 6 short marginal setae (fig. 3A). Coxa 4 is longer than broad (ratio: 87:78), with convex ventral margin bearing nearly 7 short setae and with developed ventroposterior lobe (fig. 3C).

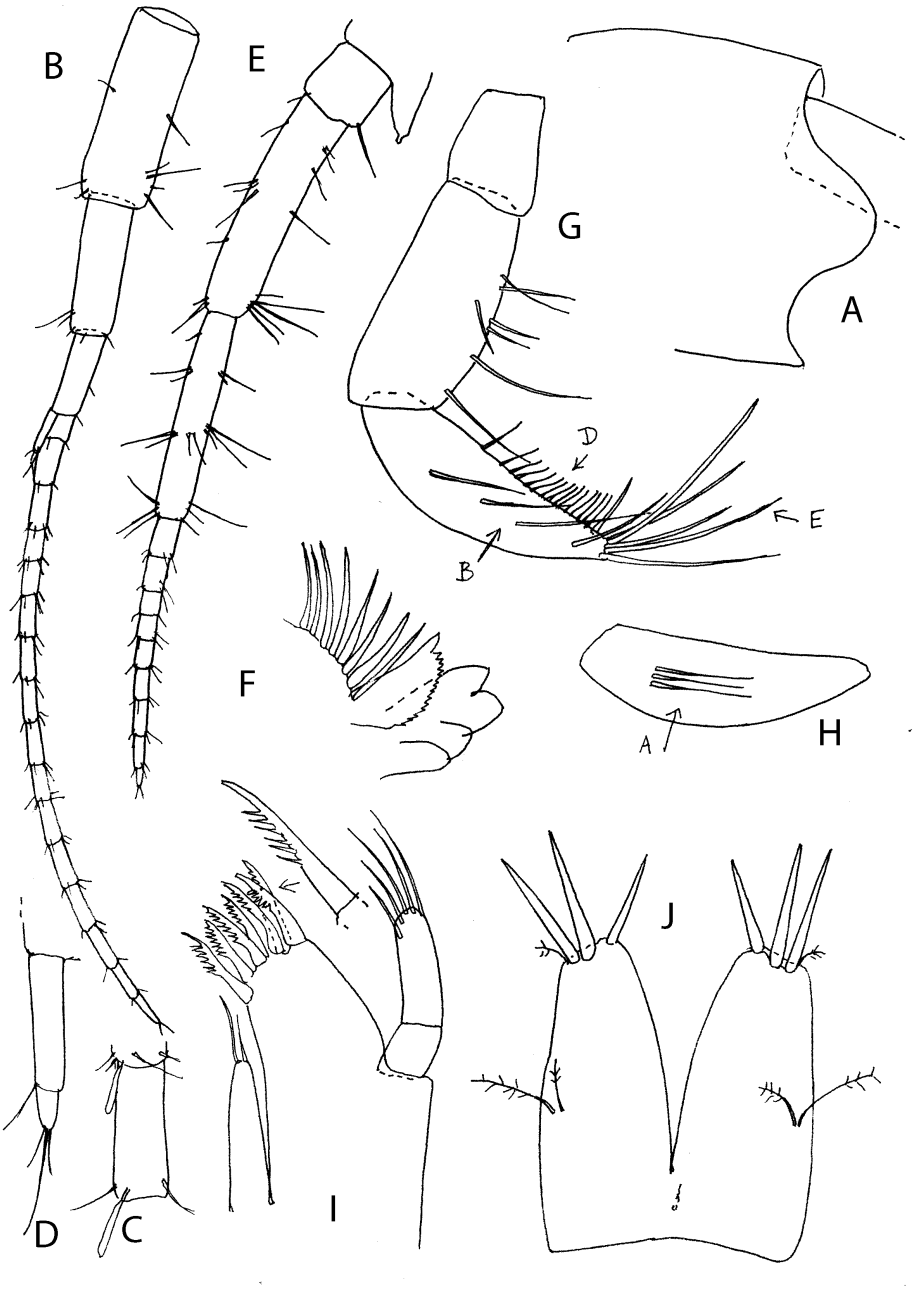

Figure 1. *Niphargus cymbalus*, sp. n., Glikorizo, Arta, Epirus, male 6.1 mm (holotype): A= head; B= antenna 1; C= aesthetasc; D= accessory flagellum; E= antenna 2; F= left mandible incisor and lacinia mobilis; G= mandibular palpus, inner face (B= B-setae, D= D-setae; E= E-setae); H= third article of mandibular palpus, outer face with A-setae; I= maxilla 1; J= telson.

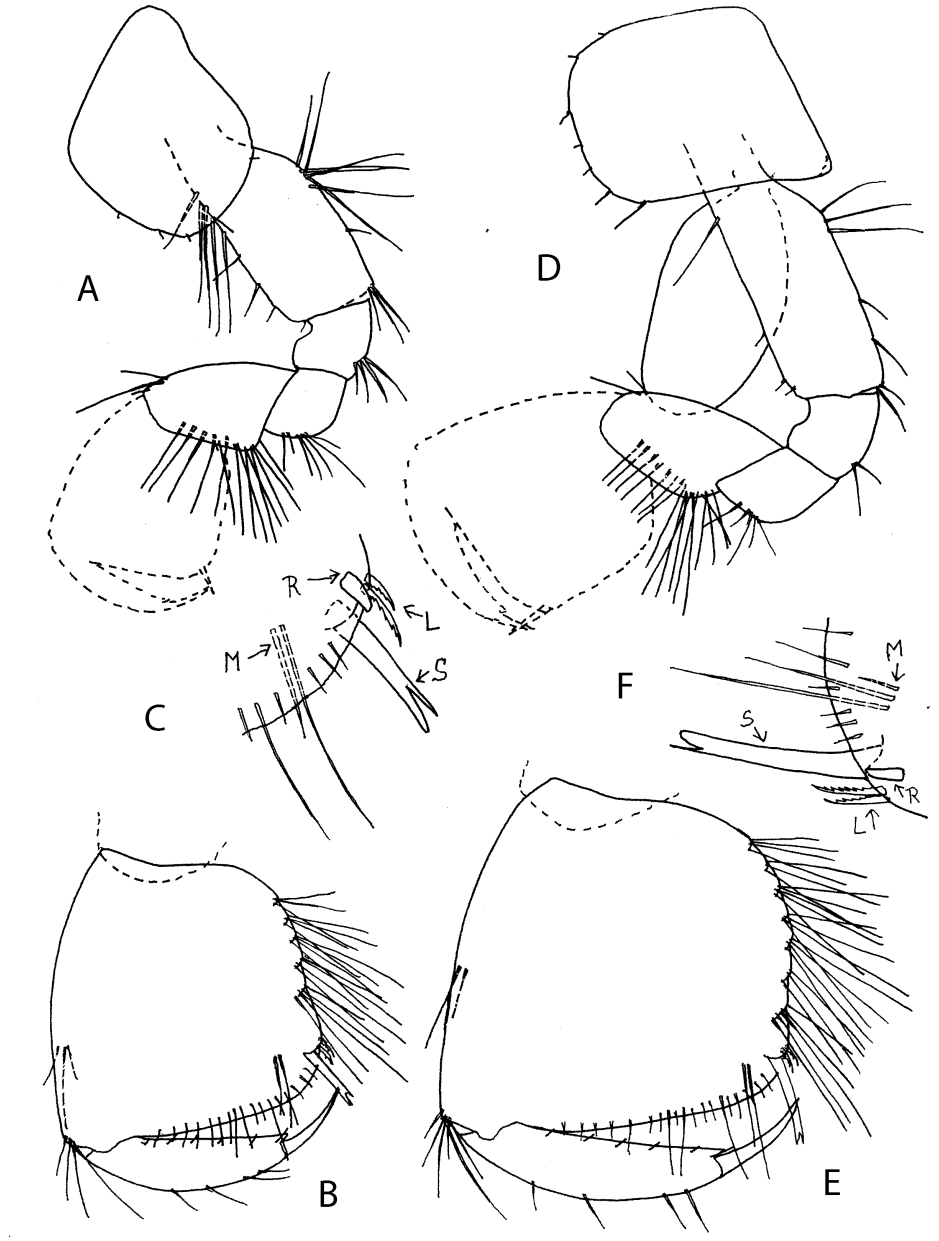

Figure 2. *Niphargus cymbalus*, sp. n., Glikorizo, Arta, Epirus, male 6.1 mm (holotype): A-B= gnathopod 1, outer face; C= distal corner of gnathopod 1 propodus (S= corner S-spine; L= lateral L-spines; M= facial M-setae); D-E= gnathopod 2, outer face; F= distal corner of gnathopod 2 propodus, inner face (S= corner S-spine; L= lateral L-spines; M= facial M-setae; R= subcorner R-spine).

Coxae 5-7 are short. Coxa 5 is broader than long (ratio: 64:43), remarkably shorter than coxa 4, anterior lobe relatively short (fig. 4A).

Coxa 6 is broader than long (ratio: 54:32), remarkably shorter than coxa 5 (fig. 4C).

Coxa 7 is entire, broader than long (ratio: 57:25) (fig. 4E).

Gnathopods 1 and 2 are relatively small, nearly as large as corresponding coxa (fig. 2A, D). Gnathopod 1: article 2 along proximal part of anterior and posterior margin, with rows of long setae, in distal part is with shorter setae (fig. 2A); article 3 at posterior margin with one bunch of setae; article 5 is slightly shorter than propodus (ratio: 42:49), along anterior margin with distal bunch of setae, along posterior margin with numerous long setae. Propodus trapezoid, slightly longer than broad (ratio: 83:75), along posterior slightly inclined margin appear 5 transverse rows of setae (fig. 2B); palm is slightly convex, inclined rather less than half of propodus-length, defined on outer face by one corner S-spine accompanied laterally by 2 serrate L-spines and with 2 facial M-setae, on inner face appear one subcorner R-spine (fig. 2C). Dactylus reaching posterior margin of propodus, along outer margin are attaches 4 single median setae (fig. 2B), at inner margin appear several short setae.

Gnathopod 2 is distinctly larger than gnathopod 1 (fig. 2D). Article 2 is in proximal part with long setae and in distal part with shorter setae; article 3 at posterior margin with one bunch of 2 median setae; article 5 is slightly shorter than propodus (ratio: 48:60), along anterior margin with one bunch of distal setae, along posterior margin with numerous setae. Propodus is trapezoid, poorly longer than broad (ratio: 100:94), along posterior margin with 7 transverse rows of setae (fig. 2E); palm slightly convex, inclined nearly 1/3 of propodus-length, defined on outer face by one corner S-spine accompanied laterally by 2 L-spines and 2 long facial M-setae, on inner face by one subcorner R-spine (fig. 2F). Dactylus reaching posterior margin of propodus, along outer margin are attached 4 single median setae, along inner margin appear several short setae.

Pereopods 3 and 4 are relatively slender. Pereopod 3: along anterior slightly concave margin of article 2 appear 2 long setae in proximal part and 2-3 short setae in distal part, along posterior margin are attached 2 proximal long setae and several short setae (fig. 3A). Articles 4-6 are of different length (ratio: 60:40:50), articles 4 and 5 along both margins with single spine-like setae; article 6 along posterior margin with 4 single short spines, at tip with one long and 2 short setae. Dactylus is much shorter than article 6 (ratio: 24:50), at inner margin with one weak spine, at outer margin with one median plumose seta; nail is shorter than pedestal (ratio: 30:45) (fig. 3B).

Pereopod 4: article 2 with long setae in proximal part and short setae in distal part; articles 4-6 of different length (ratio: 54:40:47); articles 4-5 along both margins with short setae and spine-like setae; article 6 at posterior margin with 4 groups of single short spines and setae (fig. 3C). Dactylus is much shorter than article 6 (ratio: 21:47), at inner margin with one slender spine near basis of the nail, along outer margin with one median plumose seta; nail is shorter than pedestal (ratio: 30:36) (fig. 3D).

Pereopods 5-7 are relatively short, with large article 2. Pereopod 5 is distinctly smaller than pereopods 6 and 7 (fig. 4A, C, E), article 2 ovoid, slightly

broader than long (ratio: 90:68), anterior margin remarkably convex but without lobe, provided with row of 10 short spine-like setae (fig. 4A), along posterior strongly ovoid margin appear nearly 8 short setae, ventroposterior lobe shallow. Articles 4-6 relatively slender, of different length (ratio: 40:45:52), along both margin with short and long slender spines (the longest spines exceeding the diameter of articles themselves). Article 6 with 2 long distal setae. Article 2 is remarkably longer than article 6 (ratio: 90:52). Dactylus is moderately slender, much shorter than article 6 (ratio: 23: 52), at inner margin with one slender spine near basis of the nail, at outer margin with one median plumose seta (fig. 4B); nail is shorter than pedestal (ratio: 27:46).

Pereopod 6 is ovoid, longer than broad (ratio: 100:75), along anterior convex margin appear a row of 5 median single spine-like setae and bunch of distal short spines; posterior strongly convex margin is provided with nearly 11 short setae, ventroposterior lobe well developed (fig. 4C). Articles 4-6 moderately strong, of different length (ratio: 54:60:75), along both margins with short and long spines (the longest spines exceeding the diameter of articles themselves); article 6 with 3 distal setae. Article 2 is longer than article 6 (ratio: 100:75). Dactylus is moderately strong, much shorter than article 6 (ratio: 27:75), along inner margin with one slender spine, at outer margin with one median plumose seta (fig. 4D); nail is shorter than pedestal (ratio: 32:57).

Pereopod 7: article 2 is ovoid, longer than broad (ratio: 90:73), with convex anterior margin bearing medially nearly 5 spine-like setae, anterior lobe is not developed; posterior convex margin is provided with nearly 11 short setae, ventroposterior lobe well developed (fig. 4E). Articles 4-6 are moderately strong, of different length (ratio: 46:57:82), along both margins with strong spines. Article 2 is longer than article 6 (ratio: 90:82). Dactylus is moderately strong, much shorter than article 6 (ratio: 27:82), at inner margin with one slender spine near basis of the nail, at outer margin with one median plumose seta (fig. 4F); nail is shorter than pedestal (ratio: 35:63).

Pleopods 1-3 with 2 retinacula each. Peduncle of pleopod 1 along anterior margin with 3 short setae (fig. 5E); peduncle of pleopod 2 with one median short seta at anterior margin (fig. 5F); peduncle of pleopod 3 along posterior margin with 4 single setae (fig. 5G).

Uropod 1: peduncle with dorsoexternal and dorsointernal row of strong spines (fig. 5H); inner and outer ramus are of equal length; inner ramus is with 4 lateral and 3-4 distal strong short spines; outer ramus is with nearly 6 lateral short spines and distal bunch of 4 short spines.

Uropod 2: peduncle is with 2 distal strong spines; outer and inner ramus are of equal length; outer ramus is poorly curved upwards, bearing one lateral and 4 distal short spines; inner ramus is straight, bearing 2 lateral and 4 distal short spines (fig 5H).

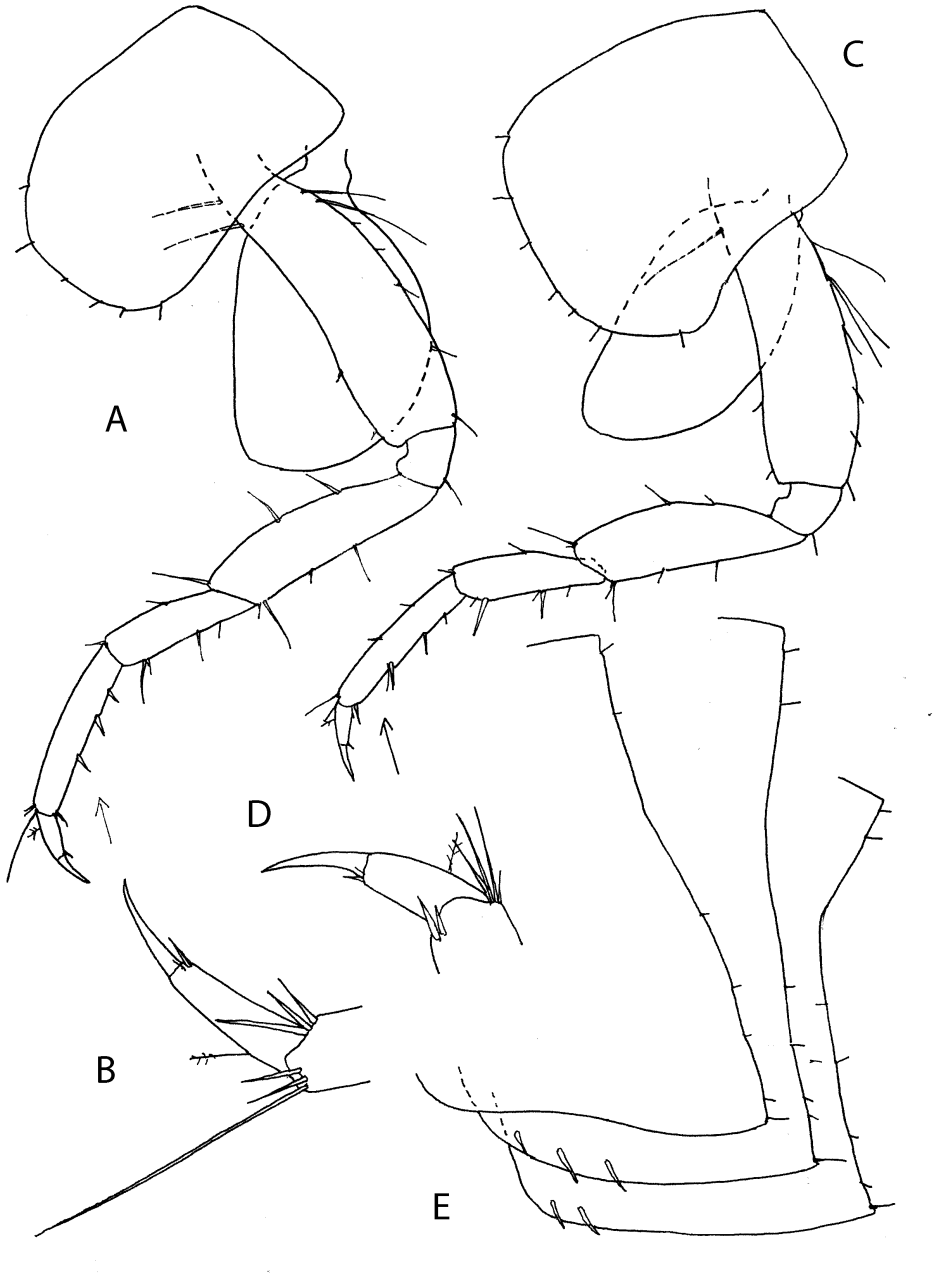

Figure 3. *Niphargus cymbalus*, sp. n., Glikorizo, Arta, Epirus, male 6.1 mm (holotype): A-B= pereopod 3; C-D= pereopod 4; E= epimeral plates 1-3.

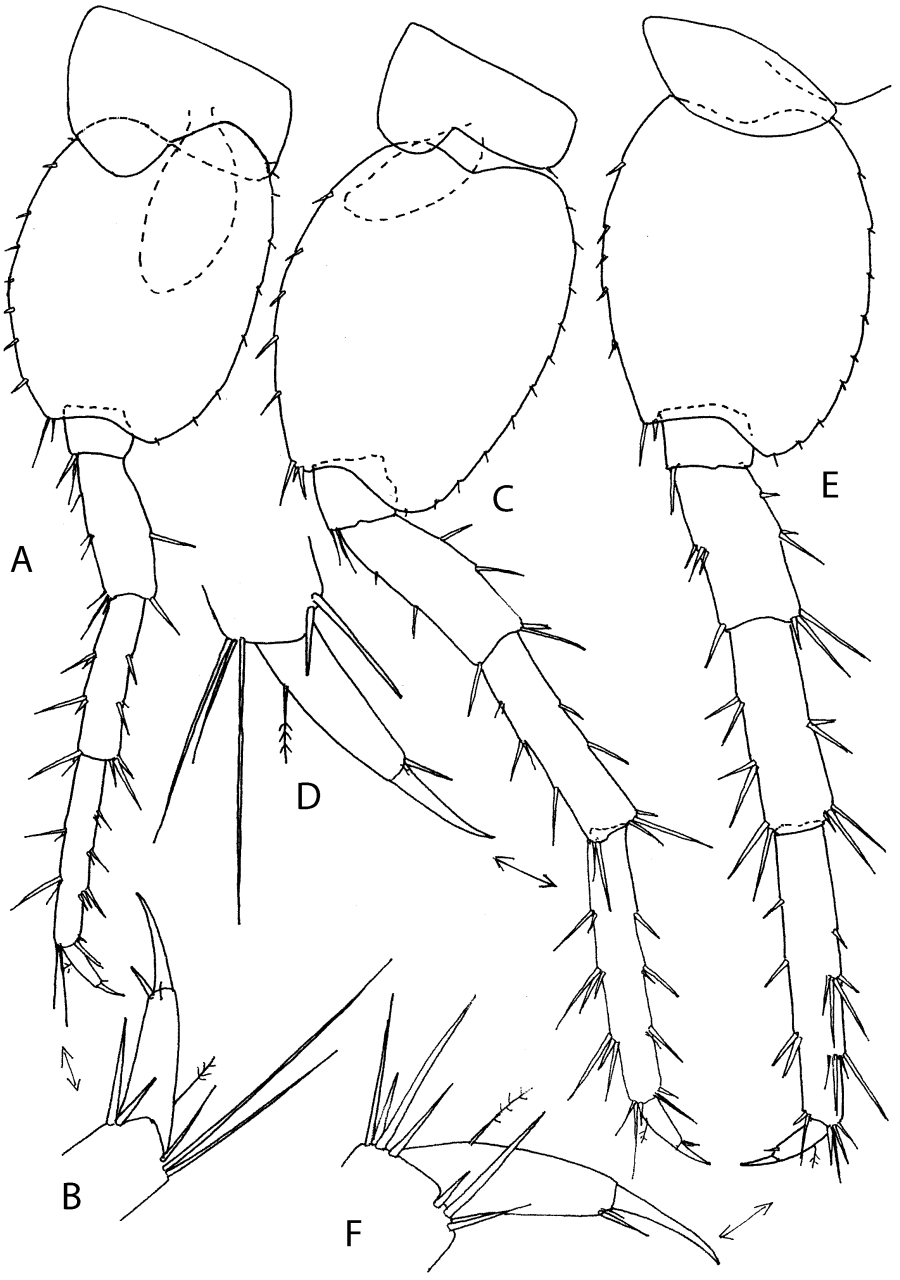

Figure 4. *Niphargus cymbalus*, sp. n., Glikorizo, Arta, Epirus, male 6.1 mm (holotype): A-B= pereopod 5; C-D= pereopod 6; E-F= pereopod 7.

Uropod 3 unknown [based on the taxonomic characteristics of the body, we suppose that uropod 3 should be short and strong, with short distal article of outer ramus].

Telson is not elongated, slightly longer than broad (ratio: 85:74), incised over ¾ of telson-length; each lobe is provided with 3 distal spines (the longest spine reaching half of telson-length), lateral and facial spines are absent; one short plumose seta is attached at external distal tip of each lobe (fig. 1J). One pair of 2 unequally long plumose setae is attached along outer margin nearly the middle of each lobe.

Coxal gills are ovoid, on gnathopod 2 and pereopods 3-4 nearly reaching ventral tip of corresponding article 2 (fig. 2D). Coxal gills on pereopods 5-6 are short, on pereopod 6 coxal gill is shorter than that of pereopod 5 (fig. 4A, C).

Females are unknown, probably similar to the males.

VARIABILITY: unknown.

HOLOTYPE: male 6.1 mm (slides G17/1, G17/2, G17/3) are temporarily deposited in KARAMAN`s Collection in Podgorica, Montenegro.

REMARKS AND AFFINITIES

Niphargus cymbalus differs from all known species of genus *Niphargus* known from Greece by very large ovoid basipodit of pereopods 5-7, but this character is present in various other species from adjacent regions.

At the first glance, *N. cymbalus* is rather similar to *Niphargus lourensis* Fišer et al. 2006, described from Greece (loc. typ.: spring of Louros River) by short uropod 3, absence of lateral and facial spines on telson, shape of gnathopods), but *N. lourensis* differs by much more narrowed basipodit of pereopods 5-7, higher number of setae on maxilla 1 inner plate, etc.

By the shape of basipodit of pereopods 5-7, lobate coxa 4, acute epimeral plates and almost pectinate outer plate spines of maxilla 1, *N. cymbalus* is rather similar to *Niphargus skopljensis* S. Karaman, 1929, known from Macedonia [loc. typ. subterranean waters in Skoplje], but *N. skopljensis* differs remarkably from *N. cymbalus* by presence of only one median seta on dactyls of gnathopods 1 and 2, by fully pectinate outer plate spines of maxilla 1, by different shape of propodus of gnathopods 1 and 2, etc.

Another species with very large ovoid lobed basipodit of gnathopods 1-2 is *Niphargus factor* Karaman & Sket, 1990 known from Bosnia and Herzegovina [loc. typ.: Vjetrenica cave near Trebinje], but this species differs from N. *cymbalus* by very long and slender dactylus of all pereopods, long and narrow telson, narrow propodus of gnathopods 1-2, etc.

Niphargus numerus Karaman & Sket, 1990 from Croatia [loc typ.: Čavlinska pećina-Cave near Obrovac, Croatia] is provided also with very large basipodit of pereopods 5-7, acute epimeral plates and telson with distal spines only, differing remarkably from *N. cymbalus* by "*kochianus*" type of gnathopods

1-2, by long slender dactylus of all pereopods, less serrate maxilla 1outer plate spines, short stout uropods 1-2, etc.

Niphargus melticensis Dancau & Andreev, 1973 from Bulgaria [loc. typ.: well in Sokolovo, Lowech district] is provided with large lobate basipodit of pereopods 5-7, but it differs from *N cymbalus* by presence of only one median seta on dactylus of gnathopods 1-2, elongated article 5 of gnathopods 1-2, etc.

Niphargus asper G. Karaman, 1972 known from Montenegro (Crna Gora) [loc. typ.: wells in Podgorica (= Titograd)] is provided also with large ovoid basipodit of pereopods 5-7, with several setae along outer margin of dactylus in gnathopods 1-2, acute epimeral plates, like these in *N. cymbalus*, but this species differs remarkably from *N. cymbalus* by different shape of gnathopods 1-2, long telson, presence of one lateral tooth on spines of maxilla 1 outer plate, etc.

In Italy appear also taxa similar to *N. cymbalus*, provided with large ovoid basipodit of pereopods 5-7, pectinate or multispinose spines of outer plate in maxilla 1, short palpus of maxilla 1, presence of several setae on outer margin of gnathopods 1 and 2 dactylus: *N. stefanellii* Ruffo & Vigna Taglianti 1968 [loc. typ.: Roma, Italy] and *N. ictus* G. Karaman 1986 [loc. typ. Grotta di Fiume-Cave, Marche, Italy], but these species differ distinctly from *N. cymbalus* by more spinose telson and combination of other characters [pectinate maxilla 1, elongated peduncular article 3 of antenna 1, etc.].

To this group belongs also *Niphargus hebereri* Schellenberg 1933 described from Croatia [loc. typ.: wells in Rovinj, Istra], species very similar to *N. cymbalus* by various characters (epimeral plates, pereopods, maxilla 1), but this species differs from later by different shape of propodus in gnathopods 1-2, by longer and narrow telson, unequal rami of uropod 2, etc.

DERIVATIO NOMINIS. The name *cymbalus* regards the association of broad pereopods of this species with the musical percussion instrument cymbal.

NIPHARGUS JOVANOVICI S. Karaman, 1931
Figures: 5 I, J, 6

Niphargus jovanovici S. Karaman 1931: 93, figs. 1-2; S. Karaman 1932: 220, 226; G. Karaman 1980: 17; Pesce & Maggi 1983: 58; G. Karaman & Ruffo 1986: 526;

Niphargus jovanovici (part.) Carausu, Dobreanu & Manolache 1955: 262, figs. 243-245;

Niphargus jovanovici jovanovici S. Karaman 1943, pl. III, figs. 43-62; Sket 1972: 10, fig. 107; Barnard J.L. & Barnard, C.M. 1983: 692;

Niphargus (*Jovaniphargus*) *jovanovici jovanovici* S. Karaman 1960: 86, fig. 5;

nec *Niphargus jovanovici jovanovici* Dobreanu, Manolache & Puscariu 1951: 579, figs. 1-2 (= *serbicus*).

MATERIAL EXAMINED:

GREECE:

G-84 Attica, Viotia, main road Thebes-Lamia, Levadia, freshwater well, water temperature 16°C, pH 6.9, NO_2 1 mg/l; one exp., 10.5.1977 (leg. Pesce, Maggi & Miranda);

G-201 (=S-7336) = Euboea island, Amarinthos, road Chalchis-Aliverion, on km 2.500, 2 wells, water temperature 15.1°C, pH 7.1; 30.6.1980, one ovigerous female (leg. G. Pesce).

MACEDONIA:

Nr.-57= Spring near Kumanovska reka-River (near Kumanovo), 2.6.1955 (leg. Kiro Bogoevski), one exp. mixed with *Niphargus skopljensis* S. Karaman, 1929;

M-16= Skopje Andja well, 1929, many exp. mixed with *Niphargus skopljensis* (leg. S. Karaman).

REMARKS.

Niphargus jovanovici has been discovered and described by S. Karaman in 1929 from the wells in Skoplje, and later was mentioned by some authors from various other localities in Macedonia only. Pesce & Maggi (1983) generally mentioned *N. jovanovici* for Ionian islands and northern Greece, but without any locality or description.

Among the studied samples of *Niphargus* collected by various samplers from Greece, we established the presence of *N. jovanovici* in samples from Amarinthos and Levadia. Taxonomic characters of these specimens agree mainly with these from Macedonia.

Ovigerous female 8.2 mm from Amarinthos: Head with short rostrum and subrounded lateral cephalic lobes. Metasomal segments along dorsoposterior margin with 4 short dorsoposterior marginal short setae each (fig. 6E). Epimeral plates 1-3 acute, with posterior margin bearing scarce number of setae (fig. 6B); epimeral plates 2 and 3 with one subventral spine each.

Urosomal segment 1 on each dorsolateral side with 1 seta, urosomal segment 2 on each dorsolateral side with one slender spine, urosomal segment 3 naked.

Antenna 1 rather shorter than body length, peduncular articles 1-3 are progressively shorter, main flagellum consisting of 20 articles. Flagellum of antenna 2 consisting of 10 articles. Mandibular palpus article 1 naked, article 2 with 9 setae; article 3 falciform, with one bunch of 3 A-setae, 4 single B-setae, nearly 18 D-setae and 4 E-setae.

Maxilla 1 inner plate with one seta, outer plate with 7 spines (6 spines with 1-2 teeth, inner spine with 3 teeth), palpus 2-articulated, short, with 3 distal spines.

Maxilliped inner plate short, with 2 distal spines and single setae, outer plate short, with 6 distolateral (mesial) pointed spines, palpus article 4 with one seta at inner margin near basis of the nail.

Propodus of gnathopods 1 and 2 is ovoid, that of gnathopod 1 is hardly longer than propodus of gnathopod 2 (fig. 5 I, J). Palm of gnathopod 1 propodus is with convex margin bearing on outer face one corner S-spine accompanied by

one lateral L-spine and 3 facial M-setae, on inner face appear one longer R-spine. Palm of gnathopod 2 propodus is on outer face with one S spine accompanied laterally by one L-spine and 2 facial M-setae, on inner face by one longer R-spine (fig. 6A). Dactylus of gnathopods 1-2 is with 2-3 short outer marginal median setae (fig. 5 I, J).

Pereopods 3-7 like specimen figured by Stanko Karaman (1943) from Skoplje.

Pereopods 5-6 like these figured by S. Karaman (1943).

Pereopod 7 is long, much exceeding posterior tip of the body; article 2 is linear, much longer than broad (ratio: 77:36), with concave posterior margin bearing proximal small lobe, along posterior margin are attached nearly 7 short setae (fig. 6C); articles 4-6 are of different length (ratio: 60:87:107), along anterior and posterior margin with numerous slender spines. Article 2 is shorter than article 6 (ratio: 77:107). Dactylus is slender, much shorter than article 6 (ratio: 40:107), at inner margin with one slender spine, at outer margin with one median plumose seta (fig. 6D); nail is much shorter than pedestal (ratio: 10:30).

Pleopods 1-3 are with 2 retinacula. Peduncle of pleopod 1 is with 3 median short setae along anterior margin; peduncle of pleopod 2 naked; peduncle of pleopod 3 is provided with 2 short median setae along posterior margin.

Uropod 1 peduncle is provided with dorsointernal and dorsoexternal row of spines. Rami of uropod 1 are of equal length, with several lateral spines and long distal spines (fig. 6E).

Uropod 2 is with equal rami bearing long distal spines (the longest spines are almost as long as rami themselves) (fig. 6F).

Uropod 3 is relatively short, with inner ramus scale-like bearing distal spine and plumose seta; outer ramus 2-articulated: first article along outer margin with 4 bunches of spines, along inner (mesial) margin with 4 bunches of longer slender spines mixed with single plumose setae (fig. 6G); second auricle is short, without plumose setae or spines.

Telson is slightly longer than broad (ratio: 54:45), incised only slightly over half of telson-length; each lobe is provided with 2 slender distal spines and one short plumose seta, accompanied laterally by 3 very long plumose setae (fig. 6H).

Specimen from Viotia (juv. 5.5 mm) agree with specimen from Amarynthos, but propodus of gnathopod 1 is hardly more narrow than that of gnathopod 2, with dactylus bearing 1-2 short median setae along outer margin. Distal spines on rami of uropods 1 and 2 are rather longer than these in specimen from Amarinthos.

VARIABILITY

Dactylus of gnathopods 1-2 in specimens of *N. jovanovici* from Macedonia is provided usually with one median seta only, but the specimen from spring near Kumanovska reka-River is provided with 1-2 median setae along outer margin. Evidently, this character is rather variable within *N. jovanovici*.

The length of distal spines on rami on uropods 1 and 2 is also rather variable within specimens from various localities in Macedonia and Greece.

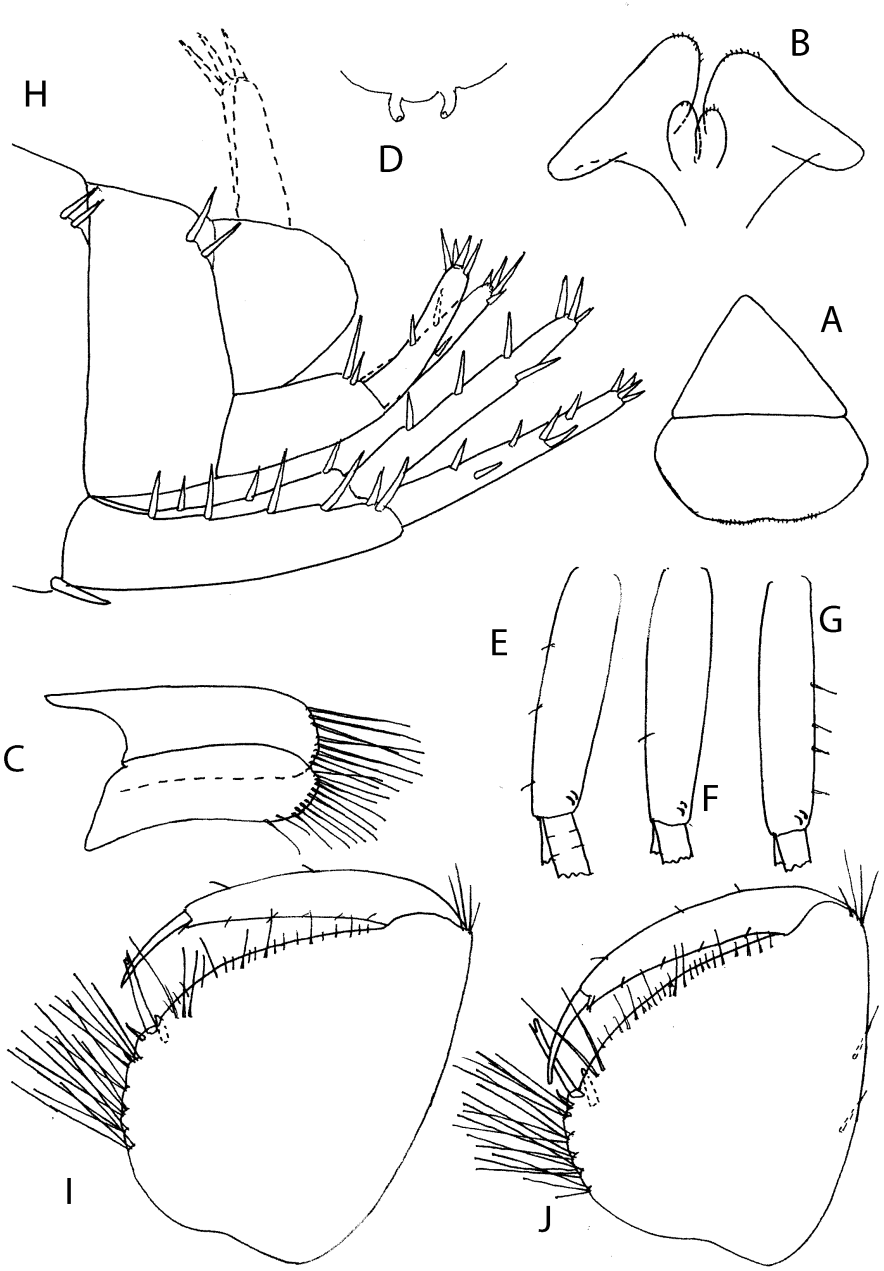

Figure 5. *Niphargus cymbalus*, sp. n., Glikorizo, Arta, Epirus, male 6.1 mm (holotype): A= labrum; B= labium; C= maxilla 2; D= sexual papillae on ventral side of last mesosomal segment; E-F-G= peduncle of pleopods 1-2-3; H= urosome with uropods 1-2. *Niphargus jovanovici* S. Karaman, 1931, Amarinthos, female 8.2 mm: I= gnathopod 1 propodus; J= gnathopod 2 propodus.

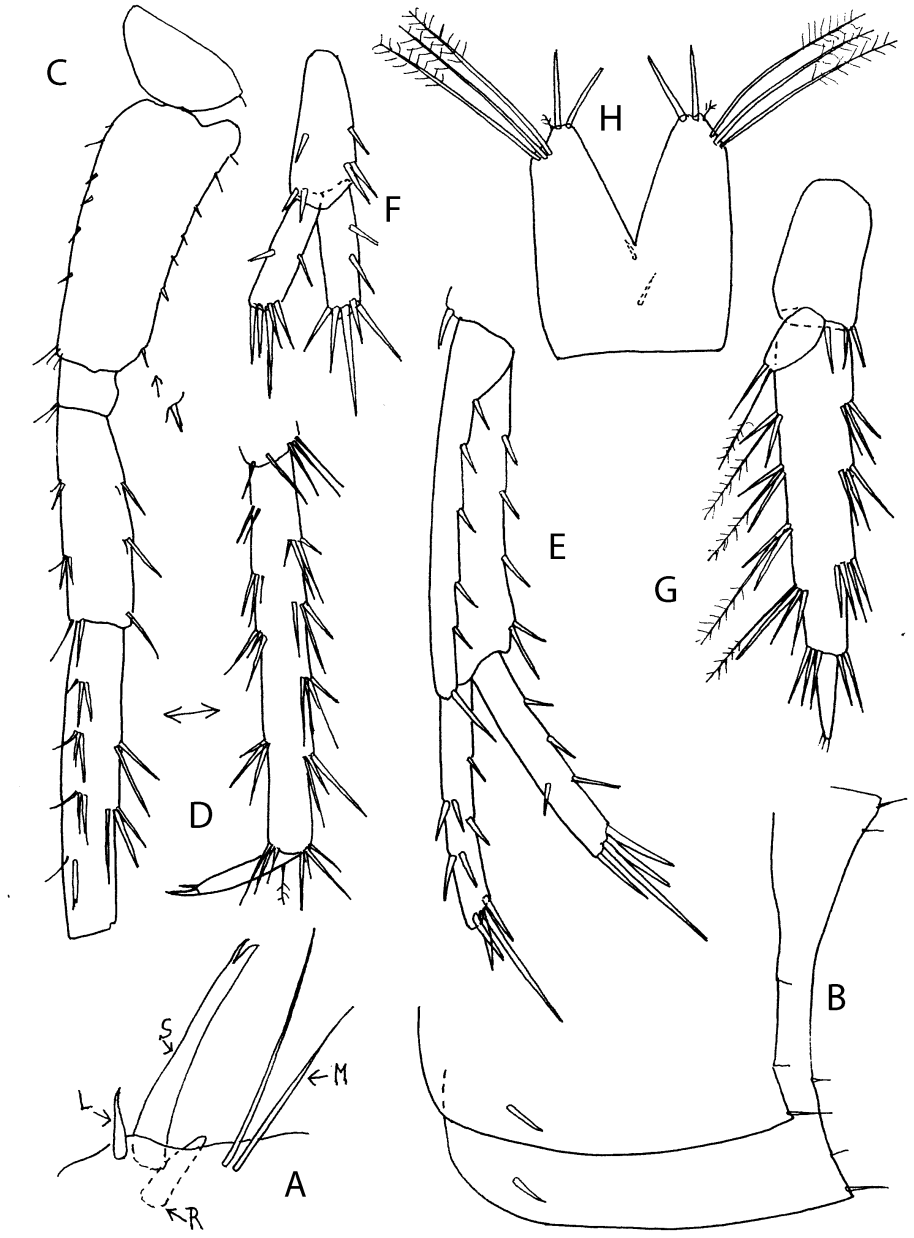

Figure 6. *Niphargus jovanovici* S. Karaman, 1931, Amarinthos, female 8.2 mm: A= distal corner of gnathopod 2 propodus, outer face (S= corner S-spine; L= lateral L-spine; M= facial M-setae; R= subcorner R-spine); B= epimeral plates 2-3; C-D= pereopod 7; E= uropod 1; F= uropod 2; G= uropod 3; H= telson.

CONCLUSIONS

Based on present research, the number of known species of genus *Niphargus* is elevated to 17+ species.

Stanko Karaman established subgenus ***Niphargus (Jovaniphargus)*** n. sbg. with typus generis *Niphargus jovanovici* S. Kar. 1931, including in it all species with long plumose setae on telson, large ovoid propodus of gnathopods 1-2, narrowed basipodit of pereopods 5-7, etc. [*N. serbicus* S. Karaman, 1960), *N. multipennatus* Sket 1956, *N. grandii* Ruffo 1937, *N. kieferi* Schellenberg 1936, *N. gallicus* Schellenberg 1935, *N. bajuvaricus* Schellenberg 1932, *N. microcerberus* Sket, 1972, *N. aberrans* Sket 1972, etc.].

It was very useful attempt to divide large amount of *Niphargus* species (now over 300 taxa) into smaller entities based on certain morphological characters. The further study of these taxa based also on other characters, will clear taxonomical position of all these species to each other and within genus *Niphargus*.

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