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Gordan S. KARAMAN¹

FURTHER DISCOVERIES OF THE SUBTERRANEAN GENUS NIPHARGUS SCHIÖDTE, 1849) (FAM. NIPHARGIDAE) IN GREECE (CONTRIBUTION TO THE KNOWLEDGE OF THE AMPHIPODA 331)

SUMMARY

The new member of the subterranean family Niphargidae (Crustacea: Amphipoda: Senticaudata) is discovered and described from the Maronia Cave, near Maronia town, Rhodopi district, NE Greece, *Niphargus beroni*, spec. nov., and its relation to some other members of genus *Niphargus* from adjacent regions of Balkan is discussed. By this way, the number of known members of the family Niphargidae in Greece is elevated to nearly 25 distinct taxa (genera, species and subspecies).

Keywords: Amphipoda, taxonomy, description, new species, *Niphargus beroni*, Greece, Balkan

INTRODUCTION

The fauna of the family Niphargidae (Crustacea: Amphipoda: Senticaudata) is relatively very rich in the subterranean waters of Greece (caves, springs, sulfuric springs, torrents, etc.). Thanks to study of this family by numerous scientists, speleologists and other investigators, the fauna of family Niphargidae in Greece reaching nearly 25 different taxa (genera, subgenera, species and subspecies) (G. Karaman, 2020). Exact number is not possible to establish, because various scientists used different criteria in recognition and delimitation of individual taxonomical categories, genera, subgenera, species and subspecies, or not accept some of these taxonomical categories. The similar observations appear also in using the terms “Group of taxa”, “*Niphargus* Complex”, “*Niphargus* aggregate”, etc., instead of the names genera, subgenera, tribes, etc.

The existing taxonomy was based on morphological characters to facilitate recognition and place of each taxon within certain taxonomical hierarchy. The discovery of every genetic molecular difference between various populations is

¹Gordan S. Karaman (corresponding author: karaman@t-com.me), Montenegrin Academy of Sciences and Arts, Podgorica, MONTENEGRO.

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not automatically evidence to establish a new taxon for each of them, what lead up to nominate numerous new taxa not or almost not differing to each other. That produce great problem in discovery and recognition of new taxa, because some newly established taxa are not clearly delimited to each other or to other similar taxa [delimitation can be negative or positive, but must exists], as the investigators can recognize which previously described species is similar, identic or not identic morphologically and/ or genetically to new taxon they intend to describe. The molecular/genetic taxonomy as well as morphological/ ecological taxonomy must recognize the level of differences necessary to recognize a different taxon, because in taxonomie it is possible to create numerous different new taxa based on the various limit of established differences. The use of combination of all methods is the best way in recognition of different taxa.

Recent attempt of fusing together some morphologically well defined genera of Niphargidae {*Pontoniphargus*, *Niphargus*, etc.) into one genus (Borko *et al.*, 2019) based on only limited criteria is one example of these attempts to create a new taxonomy, where already some authors suggested that morphological description of new taxa is not necessary, etc. The establishing of all taxa above species is more or less conditional for recognition of distinct taxonomical hierarchy, and it can be made in numerous different ways (based on cytology, physiology, neurology, embryology, etc.). At the moment various genera, subgenera, species and subspecies are described in fauna of Niphargidae in Greece, but I will not analyze it here.

During our intensive research of Niphargidae family in Greece, we found one sample of genus *Niphargus* from cave near Maronia, collected in 1983 by P. Beron and V. Beshkov.

The speleologist and investigator Dr. Petar Beron, in his scientific work "Faune cavernicole de la Grece" (2016: 12) mentioned: "En Septembre 1983 j'ai visité (accompagné de V. Beshkov) les grottes à Kamari (Santorin) – Zoodochos I et II, la grotte de Maronia, la grotte d'Alistrati et un gouffre à Folegandros, avec de très bon résultat", mentioning on page 22 the collecting of "?*Niphargus* sp.-nouv.: Grotte de Maronia (TW2)."

Evidently this famous Cave has been visited by various scientists many times and numerous new subterranean animals were collected and described from it. Beron explained (2016: 153): "Maronia – le mont Ismaros (678 m) près du littoral de la mer Egée représente un promontoire méridional des Rhodopes. A présent la grotte de Maronia semble avoir une position isolée. Sa riche faune cavernicole est une indication que cette grotte est restée à sec pendant les fluctuations du littoral au Quaternaire."

In this light, new species *Niphargus beroni* show some specific characters (mandible) but also some characters similar to some other *Niphargus* species from Serbia, Northern Macedonia and Bulgaria (uropods, etc.).

MATERIAL AND METHODS

The studied material was preserved by collectors in the 70% ethanol. The studied specimens were dissected using a WILD M20 microscope and drawn using camera lucida attachment. Dissected body-parts were temporarily submersed in the mixture of glycerin and water for study. All illustrations were inked manually. After the study, these body-parts are submersed in Liquid of Faure on slides and covered by thin cover glass making definitive microscopic slides.

Some morphological terminology and setal formulae follow G. Karaman's terminology (Karaman, G., 1969) regarding the distal mandibular palpus article [A=A-setae on outer face; B=B-setae on inner face; D=lateral marginal D-setae; E=distal long E-setae], and later (2012b) regarding propodus of gnathopods 1 and 2 [S=corner S-spine; L=lateral slender serrate L-spines; M=facial corner M-setae; R=subcorner R-spine on inner face].

Terms "setae" and "spines" are used based on its shape, not origin. Our studies are based on the morphological, ecological and zoogeographical investigations.

In the REFERENCES we cited also the number of figures in each cited paper, because it is important to see in which of cited papers appear the figures important for determination.

TAXONOMICAL PART

AMPHIPODA SENTICAUDATA

FAMILY NIPHARGIDAE

NIPHARGUS BERONI, sp. nov.

Figures 1-7

MATERIAL EXAMINED: Greece:

Bu-7= Vil. Maronia, district Rhodopi, Maronia Cave, 1.10.1983, 5 exp. males, females (leg. P. Beron & V. Beshkov).

DIAGNOSIS OF SPECIES

Body slender, coxae shallow, coxa 4 unlobed, urosomal segments 1-2 with one dorsolateral seta. Epimoric plates 1-3 subrounded; pleopods 1-3 with elevated number of retinacula and peduncles scarcely setose. Maxilla 1: inner plate with one seta, outer plate with 7 spines (most of them with one lateral tooth, palpus reaching tip of outer plate-spines. Mandibular palpus with 3 distal setae on first article.

Gnathopods 1-2 small, with propodus not larger than corresponding coxa and dactylus with one median seta at outer margin. Dactylus of pereopods 3-7 short, with one spine or spine-like seta at inner margin. Article 2 of pereopods 5-7 longer than broad, ventroposterior lobe not distinctly developed.

Uropod 1 peduncle with dorsointernal row of setae; rami of uropod 1 in males paddle-shaped, in females normal. Uropod 3 in males long, with long distal article, in females distal article of outer ramus shorter. Telson in males deeply incised, lobes with row of distolateral slender spine-like setae and 1-2 facial mesial spine-like setae; in females lobe with 3-4 distal spines or spine-like setae, facial spines absent. Coxal gills recurved on gnathopod 2 and pereopod 4.

DESCRIPTION

MALE 7.2 mm (holotype): Body moderately slender, mesosomal segments naked, metasomal segments 1-3 with 3-4 dorsolateral short marginal setae (fig. 3E); urosomal segments 1-2 on each dorsolateral side with one seta, urosomal segment 3 naked (fig. 4F). Urosomal segment 1 at ventroposterior corner with one seta near basis of uropod 1 peduncle (fig. 4F).

Epimeral plates 1-3 subrounded, with several posterior marginal setae each (fig. 3E); epimeral plate 2 with 3 subventral spines, epimeral plate 3 with 5 subventral spines (fig. 3E).

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

Antenna 1 not reaching half of body-length; peduncular articles 1-3 progressively shorter (ratio: 63:40:18), scarcely setose (fig. 1A); main flagellum consisting of 12+ articles (distal part of flagellum missing), some of articles with one short aesthetasc poorly visible. Accessory flagellum 2-articulated, short (fig. 1B).

Antenna 2 moderately slender, peduncular article 3 with distoventral seta; peduncular article 4 rather longer than article 5 (ratio: 48:40), both articles with several shorter setae each (fig. 1A). Flagellum slender, 7-articulated, longer than last peduncular article, bearing several short setae. Antennal gland cone short (fig. 1A).

Mouthparts well developed. Labrum broader than long, with poorly convex distal margin (fig. 4A). Labium with entire outer lobes, inner lobes shorter but well developed (fig. 4B).

Mandibles with tritirative molar. Right mandible: incisor with 4 teeth, lacinia mobilis serrate, accompanied by 7-8 rakers (fig. 4D). Left mandible: incisor with 5 teeth, lacinia mobilis with 4 teeth, accompanied by 8 rakers. Mandibular palpus well developed, 3-articulated: first article with 3 distal strong setae (fig. 4D); second article with 7 strong lateral setae; third article subfalciform, scarcely longer than second article, with nearly 10 lateral D-setae and 4 distal long E-setae, on outer (external) face by 2 A-setae, on inner (internal) face with 2 B-setae (fig. 4E).

Maxilla 1: inner plate with one seta, outer plate with 7 spines (6 spines with one lateral tooth, inner spine finely serrate; palpus 2-articulated: first article naked, second article reaching tip of outer plate spines, bearing 6 setae (fig. 1C).

Maxilla 2: both plates narrowed, bearing distal setae only (fig. 4C).

Maxilliped: inner plate short, with 2 distal spines mixed with several setae (fig. 5A); outer plate exceeding half of second palpus article, along mesial margin with nearly 12-13 marginal spines and several distal setae; palpus article 4 at inner margin with one long seta near basis of the nail (fig. 5A).

Coxae relatively short. Coxa 1 broader than long (ratio: 60:32), with subrounded ventroanterior corner bearing several short setae (fig. 2A). Coxa 2 broader than long (ratio: 66:42), with several marginal setae (fig. 2D).

Coxa 3 broader than long (ratio: 55:43), with 4-5 marginal short setae (fig. 1D). Coxa 4 much broader than long (ratio: 62:36), ventroposterior lobe absent (fig. 1E).

Coxae 5-7 short, not longer than coxae 1-4. Coxa 5 broader than long (ratio: 67:38), anterior lobe subrounded (fig. 3A). Coxa 6 smaller than coxa 5, bilobed, broader than long (ratio: 55:30) (fig. 3B). Coxa 7 entire, broader than long (ratio: 55:25) (fig. 3C).

Gnathopods 1-2 relatively small, smaller than corresponding coxae. Gnathopod 1: article 2 with long setae along both margins; article 3 with distoposterior bunch of setae (fig. 2A). Article 5 rather shorter than propodus (ratio: 60:71), at anterior margin with distal bunch of setae, at posterior margin with numerous setae (fig. 2B). Propodus nearly quadrate, longer than broad (ratio: 71:64), along posterior margin with 4 transverse rows of setae (fig. 2B). Palm slightly convex, inclined nearly half of propodus-length, defined on outer face by corner S-spine accompanied laterally by 2 serrate L-spines and 3 corner facial M-setae (fig. 2C); on inner face by one short subcorner R-spine. Dactylus reaching posterior margin of propodus, with one median seta at outer margin and several short setae at inner margin (fig. 2B).

Gnathopod 2 poorly larger than gnathopod 1, article 2 with long setae at posterior margin and shorter setae along anterior margin; article 3 with distoposterior bunch of setae (fig. 2D). Article 5 triangular, rather shorter than propodus (ratio: 65:73), with 2 bunches of setae along anterior margin and numerous setae at posterior margin (fig. 2E). Propodus quadrate, poorly longer than broad (ratio: 73:68), along posterior margin with 6 transverse rows of setae (fig. 2E). Palm slightly convex, inclined rather less than half of propodus-length, defined on outer face by corner S-spine accompanied laterally by one serrate L-spine and 2 corner facial M-setae, on inner face by one short subcorner R-spine (fig. 2F). Dactylus reaching posterior margin of propodus, with one median seta at outer margin and several short setae at inner margin (fig. 2E).

Pereopods 3-4 moderately slender. Pereopod 3: article 2 with short anterior marginal setae and posterior longer setae (fig. 1D), articles 4-6 of different length (ratio: 52:31:38), bearing short setae and spines at both margins. Dactylus short and strong, much shorter than article 6 (ratio: 13:38), one slender spine at inner margin near basis of the nail and one short median seta at outer margin (fig. 1D).

Pereopod 4 rather shorter than 3, with hairiness like that of pereopod 3. Articles 4-6 of different length (ratio: 50:30:36); dactylus much shorter than article 6 (ratio: 16:36) (fig. 1E), inner margin with one slender spine near basis of

the nail, outer margin with one median plumose seta; nail almost as long as pedestal (fig. 1F).

Pereopods 5-7 relatively short, progressively longer towards pereopod 7; pereopod 7 not reaching posterior end of the body.

Pereopod 5: article 2 longer than broad (ratio: 65:44), anterior margin slightly convex, posterior margin almost straight, bearing 7-8 marginal setae, ventroposterior lobe not distinctly developed (fig. 3A). Articles 4-6 of different length (ratio: 39:35:37), bearing scarce number of short spines and setae (fig. 3A); article 2 remarkably longer than article 6 (ratio: 65:37). Dactylus much shorter than article 6 (ratio: 13:37), with one spine-like seta at inner margin near basis of the nail, outer margin with one short median plumose seta (fig. 3A).

Pereopod 6 distinctly longer than 5, article 2 elongated, remarkably longer than broad (ratio: 80:44), with almost parallel lateral margins poorly convex, posterior margin with 8-9 short setae, anterior poorly convex margin with several stronger setae; ventroposterior lobe not distinctly developed (fig. 3B). Articles 4-6 of different length (ratio: 47:54:58), both margins with scarce number of short spines and setae. Article 2 distinctly longer than article 6 (ratio: 80:58). Dactylus much shorter than article 6 (ratio: 18:58), inner margin with one spine-like seta near basis of the nail, outer margin with one median seta (fig. 3B).

Pereopod 7: article 2 elongated, much longer than broad (ratio: 92:46), with almost parallel lateral margins, posterior margin with 11-12 short setae, anterior margin with 5-6 stronger setae; ventroposterior lobe not distinctly developed (fig. 3C). Articles 4-6 of different length (ratio: 50:60:73), both margins with scarce number of short spines and setae. Article 2 remarkably longer than article 6 (ratio: 92:73). Dactylus much shorter than article 6 (ratio: 23:73), with one spine at inner margin near basis of the nail, outer margin with one median plumose seta (fig. 3D), nail shorter than pedestal.

Pleopods 1-3 with 3-4 retinacula each. Peduncles scarcely setose, peduncle of pleopod 1 with 3 anterior marginal setae (fig. 3F); peduncle of pleopod 2 naked (fig. 3G); peduncle of pleopod 3 with 1-2 setae at anterior margin (fig. 3H).

Uropod 1: peduncle with dorsointernal row of setae (fig. 4G). Rami dilated, paddle-shaped, nearly of equal length, with 4-5 distal short spines (fig. 4G).

Uropod 2 not dilated, rami with 4-5 distal short spines (fig. 4H).

Uropod 3 long, peduncle longer than broad, with some lateral and distal spine-like setae; inner ramus short, scale-like, with distal spine; outer ramus long, 2-articulated, linear, both articles with single short simple setae or spine-like setae; second article almost as long as first one (fig. 5B).

Telson deeply incised, nearly as long as broad; each lobe with one stronger spine and several long distolateral spine-like setae; on face of each lobe appear 1-2 spine-like setae (fig. 5C). A pair of short plumose setae is attached near the outer median margin of each lobe. Coxal gills on gnathopod 2 and pereopods 3-6 narrow, of different shape (fig. 1D, E, 3A, 3B).

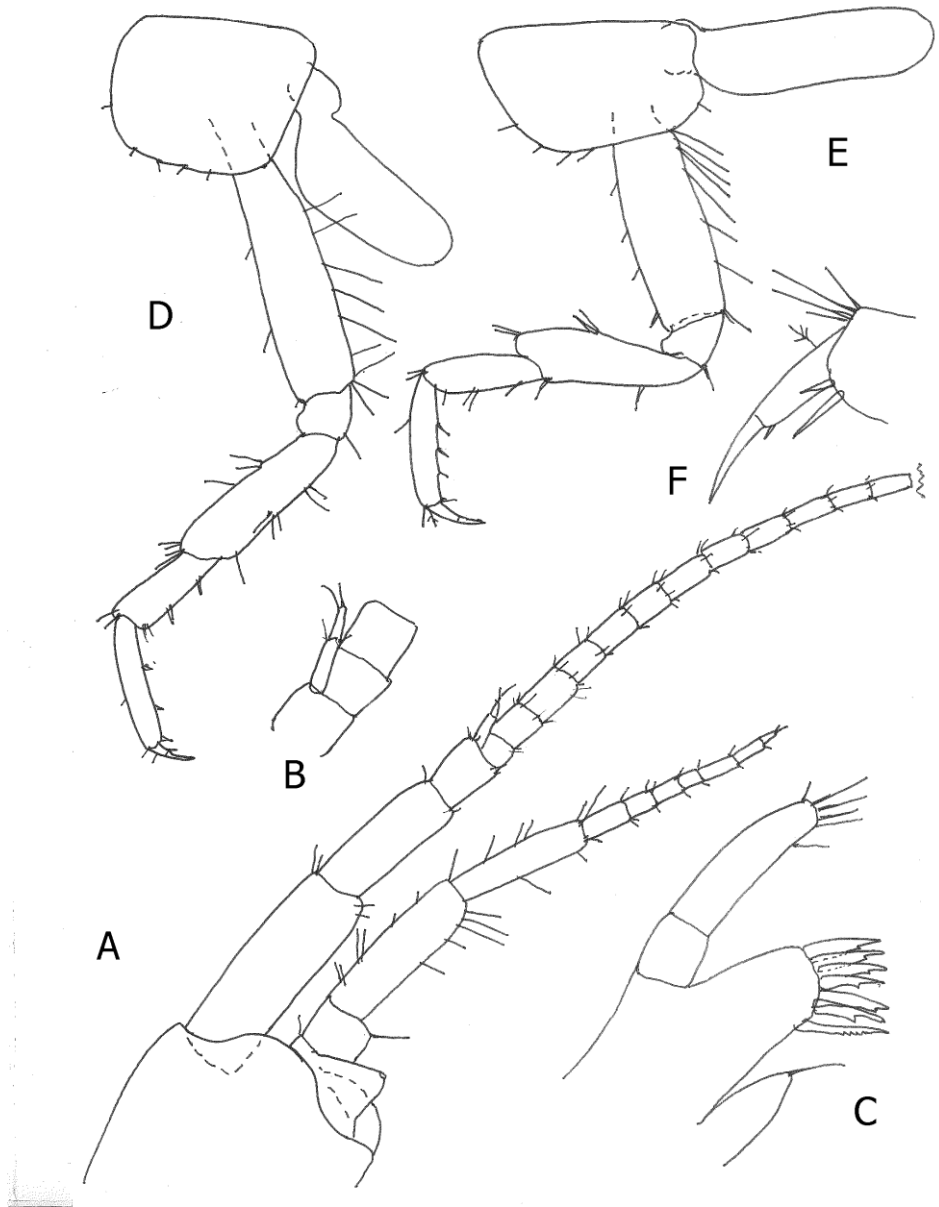


Fig. 1. *Niphargus beroni*, sp. nov., Maronia Cave, Maronia, Greece, male 7.2 mm (holotype): A= head with antennae 1-2; B= accessory flagellum; C= maxilla 1; D= pereopod 3; E-F= pereopod 4.

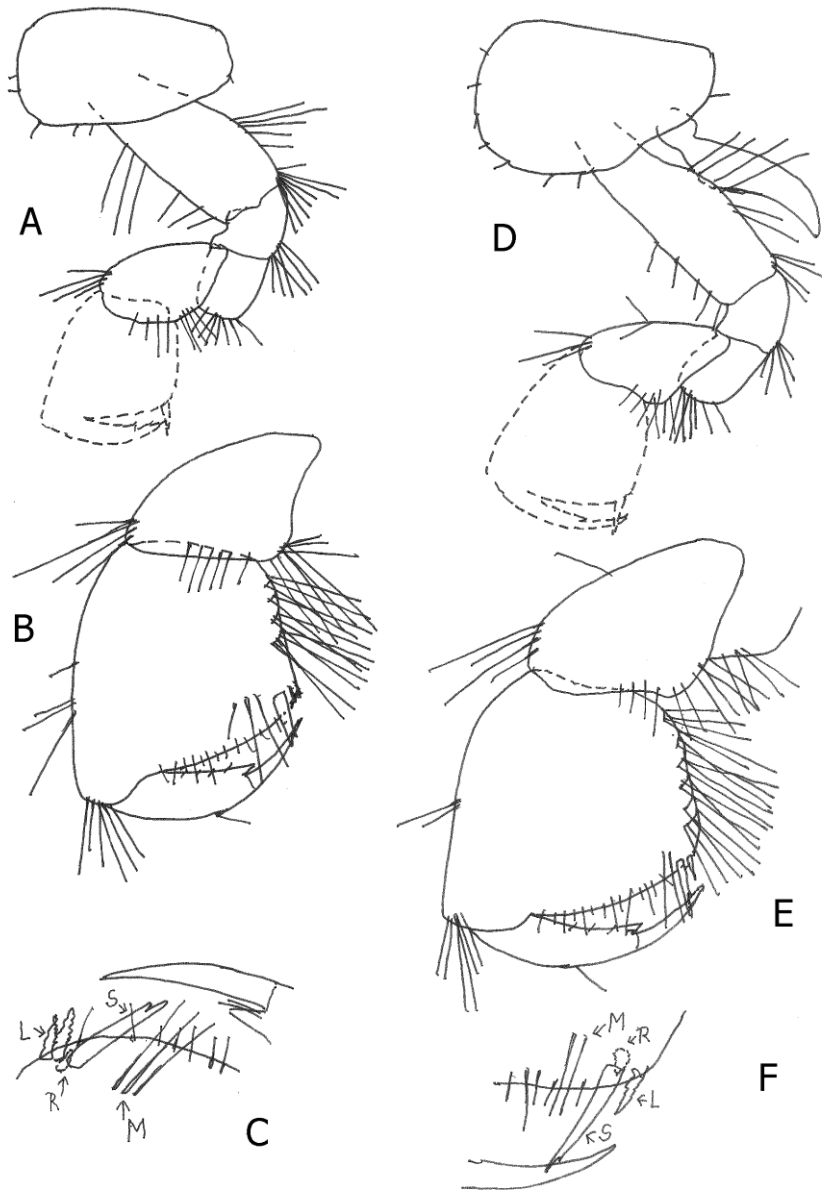


Fig. 2. *Niphargus beroni*, sp. nov., Maronia Cave, Maronia, Greece, male 7.2 mm (holotype): A-B= gnathopod 1; C= distal corner of gnathopod 1-propodus, outer face [S=- corner S-spine; L= lateral L-spines; M= corner facial M-setae; R= subcorner spine on inner face]; D-E= gnathopod 2; F= distal corner of gnathopod 2-propodus, outer face [S=- corner S-spine; L= lateral L-spines; M= corner facial M-setae; R= subcorner spine on inner face].

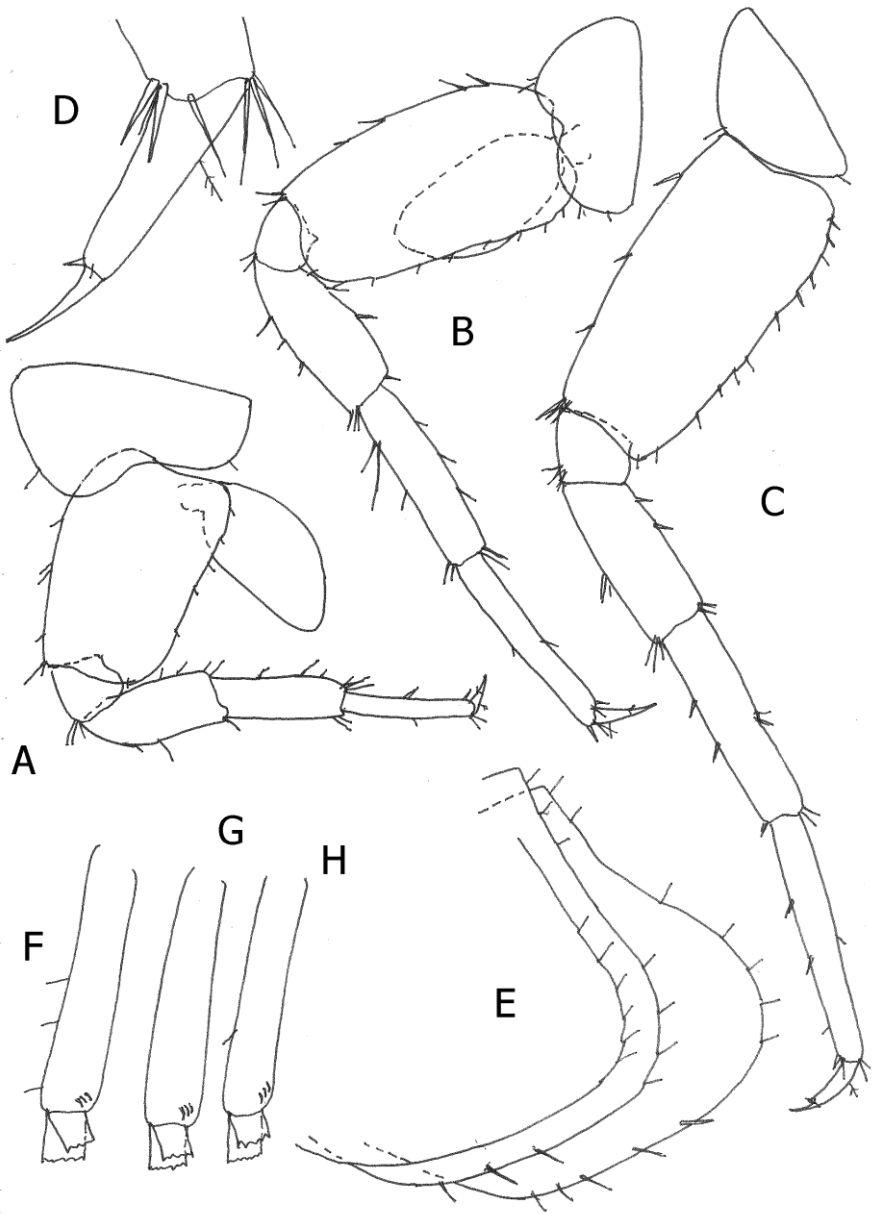


Fig. 3. *Niphargus beroni*, sp. nov., Maronia Cave, Maronia, Greece, male 7.2 mm (holotype): A= pereopod 5; B= pereopod 6; C-D= pereopod 7; E= epimeral plates 1-3; F-G-H= peduncle of pleopods 1-2-3.

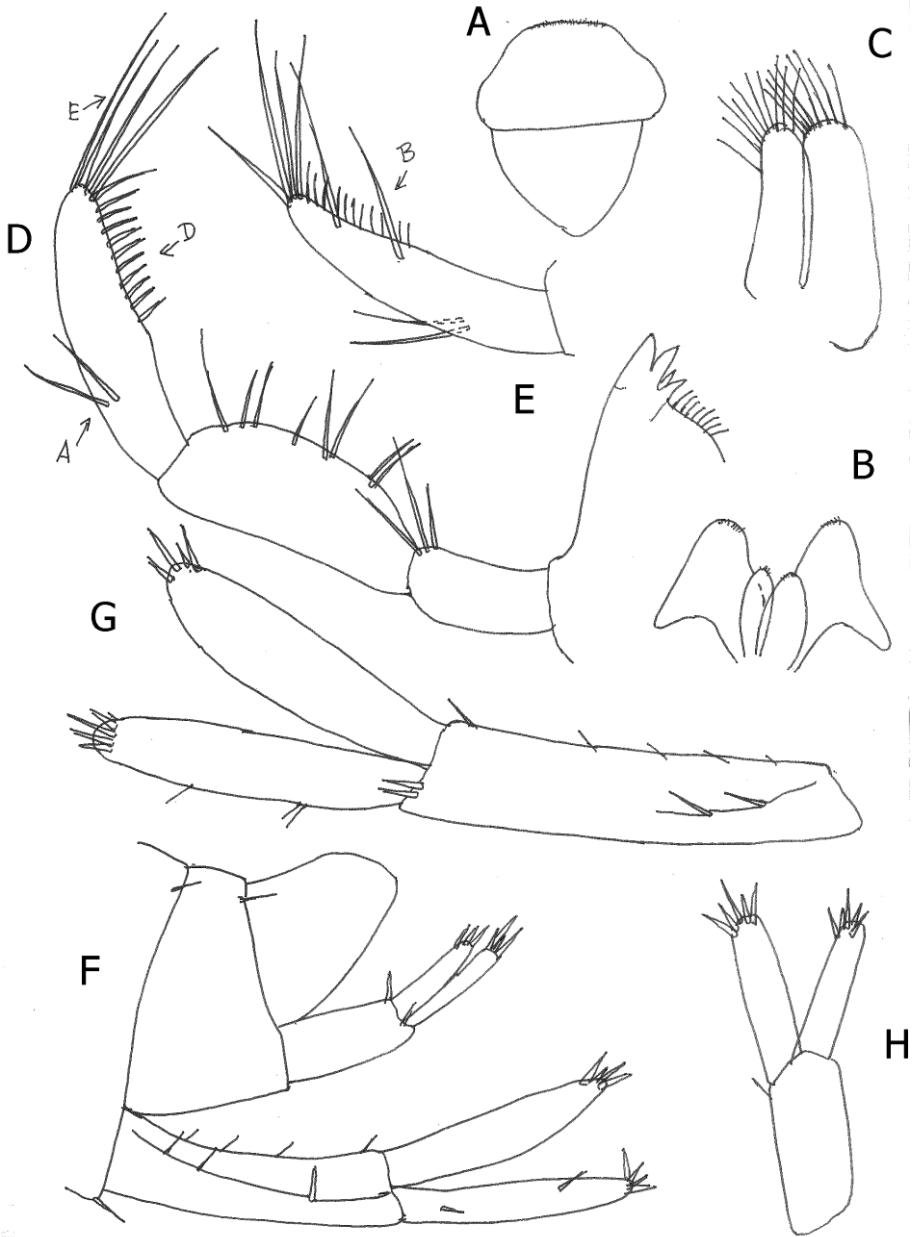


Fig. 4. *Niphargus beroni*, sp. nov., Maronia Cave, Maronia, Greece, male 7.2 mm (holotype): A=labrum; B=labium; C=maxilla 2; D=mandibular palpus, outer face [A=outer facial A-setae; B=inner facial B-setae; D=marginal D-setae; E=distal E-setae]; E=last palpus article, inner face [B=facial B-setae]; F=urosome with uropods 1-2; G= uropod 1; H= uropod 2.

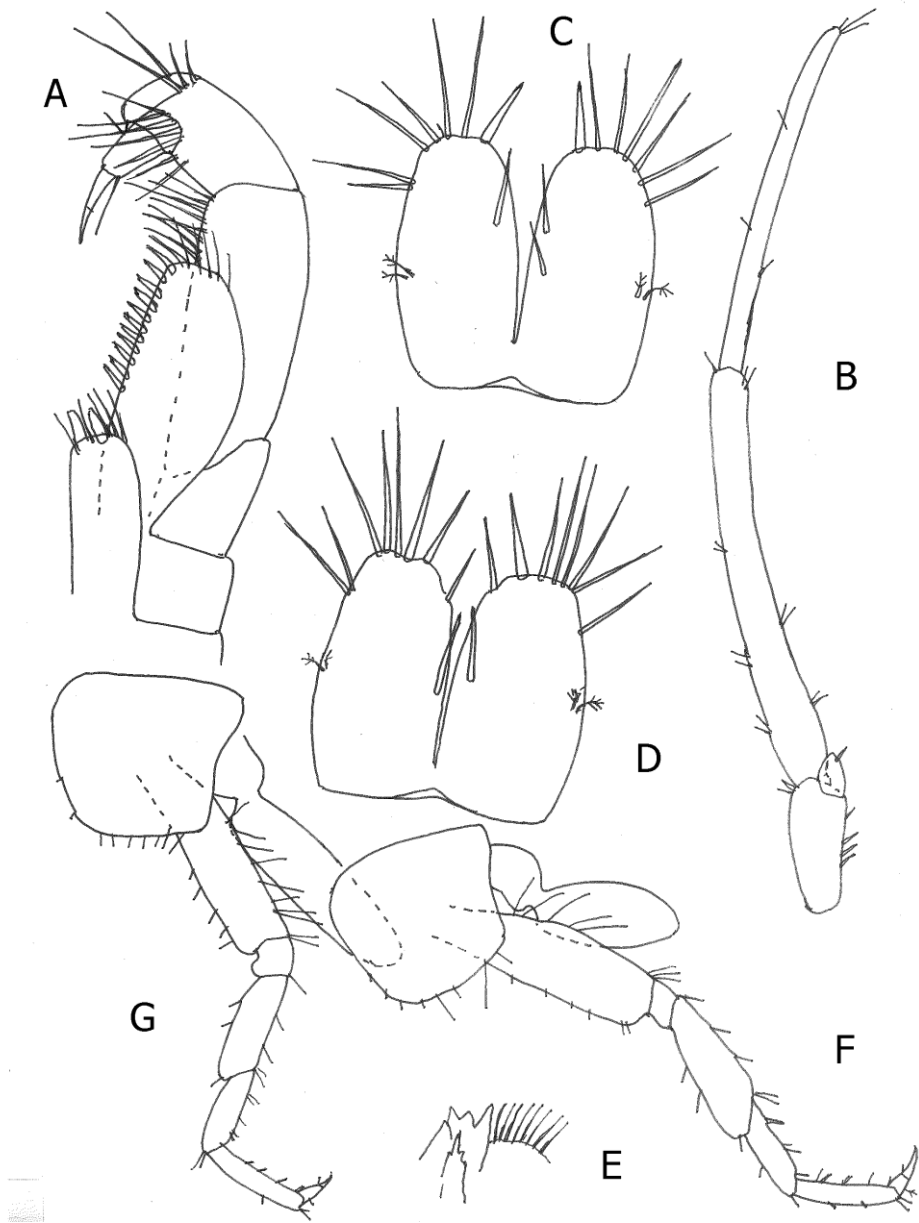


Fig. 5. *Niphargus beroni*, sp. nov., Maronia Cave, Maronia, Greece, male 7.2 mm (holotype): A= maxilliped; B= uropod 3; C= telson; D= telson, male 7.1 mm; E= tip of left mandible. **Female 5.4 mm (paratype):** F= pereopod 3; G= pereopod 4.

FEMALE 5.4 mm with setose oostegites (paratype): Head like that in male, metasomal segments with 2 dorsolateral posterior marginal setae each (fig. 7F); urosomal segments 1-2 with one dorsolateral seta on each side, urosomal segment 3 naked; Urosomal segment 1 with one ventroposterior seta near basis of uropod 1-peduncle.

Epimeral plates 1-3 subrounded, like these in male; epimeral plate 2 with 2 subventral spines, epimeral plate 3 with 3 subventral spines (fig. 7F).

Antenna 1 like that in male, almost reaching half of body-length, peduncular articles 1-3 progressively shorter; main flagellum consisting of 15-16 articles scarcely setose (some of them with one short, poorly visible aesthetasc); accessory flagellum 2-articulated, short. Antenna 2 like that in male, scarcely setose, peduncular article 4 poorly longer than article 5; flagellum longer than last peduncular article, consisting of 8 articles; antennal gland cone short.

Mouthparts like these in male (fig. 5E). Mandibular palpus article 1 with 3 distal setae (fig. 7A); article 2 rather shorter than article 3, with 10 lateral setae; article 3 subfalciform, with nearly 12 lateral D-setae and 4-5 distal E-setae, on outer face with 2 A-setae, on inner face with 2 B-setae (fig. 7A).

Labrum, labium, maxillae 1-2 and maxilliped like these in male. Maxilla 1 inner plate with one seta, outer plate with 7 spines (5-6 spines with one lateral tooth, 1 spine with 1-2 lateral teeth, inner spine serrate; palpus 2-articulated, reaching tip of outer plate-spines, with 6 distal setae.

Coxae relatively short. Coxa 1 broader than long (ratio: 50:29), with subrounded ventroanterior corner (fig. 7B). Coxa 2 rather broader than long (ratio: 48:41), with several short marginal setae (fig. 7D). Coxa 3 rather broader than long (ratio: 50:43), with 7-8 marginal setae (fig. 5F). Coxa 4 broader than long (ratio: 53:45), with 8-9 marginal short setae, ventroposterior lobe absent (fig. 5G). Coxa 5 broader than long (ratio: 70:48), bilobed (fig. 6A). Coxa 6 smaller than 5, bilobed, broader than long (ratio: 60:40) (fig. 6B). Coxa 7 entire, broader than long (ratio: 55:31) (fig. 6C).

Gnathopods 1-2 relatively small, with propodus smaller than corresponding coxa. Gnathopod 1 poorly smaller than gnathopod 2; article 2 with long setae at both margins (fig. 7B), article 3 with distoposterior bunch of setae. Article 5 almost as long as propodus, anterior margin with 2 groups of setae (fig. 7C), and numerous setae at posterior margin. Propodus poorly trapezoid, longer than broad (ratio: 71:63), along posterior margin with 3 transverse rows of setae (fig. 7C). Palm convex, inclined half of propodus-length, defined on outer face by corner S-spine accompanied laterally by 2 L-spines and corner facial 2 M-setae (fig. 7C), on inner face by one short subcorner R-spine. Dactylus reaching posterior margin of propodus, with one median seta at outer margin and several short setae at inner margin (fig. 7C). Gnathopod 2: article 2 with row of shorter setae at anterior margin and row of long setae at posterior margin, article 3 with distoposterior bunch of setae (fig. 7D). Article 5 as long as propodus, with 2 groups of setae at anterior margin and numerous setae at posterior margin (fig. 7E). Propodus rather trapezoid, nearly as long as broad, with 5 transverse rows of setae at posterior

margin (fig. 7E). Palm convex, inclined nearly half of propodus-length, defined on outer margin by corner S-spine accompanied laterally by 2 slender L-spines and 3 corner facial M-setae, on inner face by one subcorner R-spine (fig. 7E). Dactylus reaching posterior margin of propodus, with one median seta on outer margin and several short setae at inner margin (fig. 7E).

Pereopods 3-4 moderately short. Pereopod 3 with long setae at posterior margin; article 3 with distoposterior bunch of setae. Articles 4-6 of different length (ratio: 40:25:31), scarcely setose (fig. 5F). Dactylus much shorter than article 6 (ratio: 14:30), at inner margin with one slender spine-like seta near basis of the nail, on outer margin with one median plumose seta (fig. 5F).

Pereopod 4 poorly shorter than pereopod 3, article 2 anterior margin with shorter setae, posterior margin with longer setae; article 3 with distoposterior bunch of setae (fig. 5G). Articles 4-6 of different length (ratio: 32:24:30), articles scarcely setose, setae short. Dactylus much shorter than article 6 (ratio: 13:30), with one spine-like seta at inner margin near basis of the nail, outer margin with one median seta (fig. 5G).

Pereopods 5-7 progressively longer towards pereopod 7. Pereopod 5: article 2 slightly longer than broad (ratio: 63:45), along posterior margin with 8-9 setae, anterior margin with 6-7 spine-like setae, ventroposterior lobe not developed (fig. 6A). Articles 4-6 of different length (ratio: 40:35:38), both margins with short spines and setae. Article 2 longer than article 6 (ratio: 63:38). Dactylus shorter than article 6 (ratio: 23:38), at inner margin with one spine-like seta near basis of the nail, outer margin with one median plumose seta, nail shorter than pedestal (fig. 6A).

Pereopod 6: article 2 distinctly longer than broad (ratio: 79:51), posterior poorly convex margin with 9-10 short setae, anterior margin with 6 setae, ventroposterior lobe not distinctly developed (fig. 6B). Articles 4-6 of different length (ratio: 49:55:65), with short spines and single short setae along both margins. Article 2 longer than article 6 (ratio: 79:65). Dactylus shorter than article 6 (ratio: 25:65), at inner margin with one spine-like seta near basis of the nail, outer margin with one median plumose seta (fig. 6B).

Pereopod 7: article 2 longer than broad (ratio: 90:55), posterior poorly convex margin with nearly 16 short setae, anterior margin with 4-7 setae, ventroposterior lobe not distinctly developed (fig. 6C). Articles 4-6 of different length (ratio: 48:63:79), along both margins with single short spines and setae. Article 2 longer than article 6 (ratio: 90:79). Dactylus shorter than article 6 (ratio: 32:79), at inner margin with one slender spine near basis of the nail, outer margin with one median plumose seta (fig. 6C), nail shorter than pedestal. Pleopods 1-3 with 4 retinacula each. Peduncle of pleopods 1-3 scarcely setose, like these in male.

Uropod 1: peduncle with distal spines. Rami narrowed, normal, of subequal length, not paddle-shaped, both with 4-5 short distal spines (fig. 6D).

Uropod 2: rami narrowed, nearly of subequal length, with 3-4 distal spines (fig. 6E).

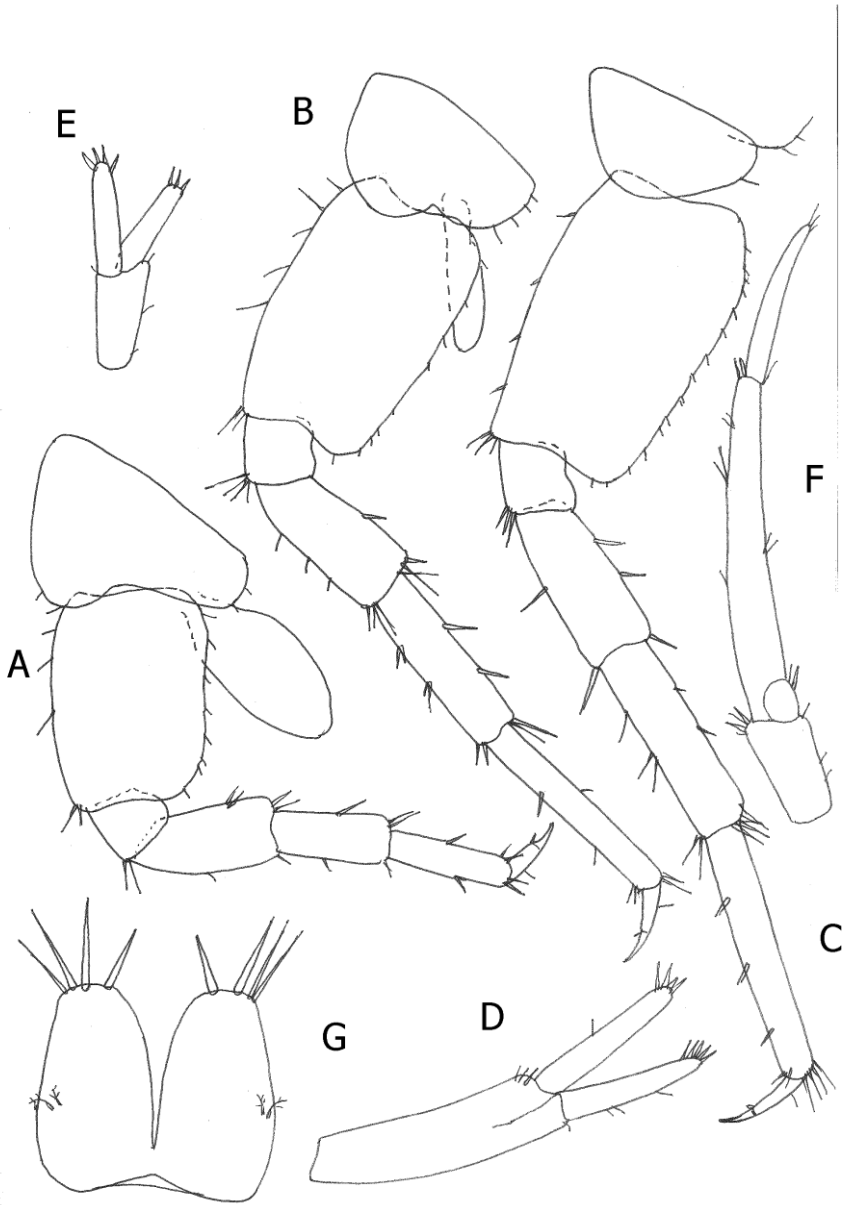


Fig. 6. *Niphargus beroni*, sp. nov., Maronia Cave, Maronia, Greece, female 5.4 mm (paratype): A= pereopod 5; B= pereopod 6; C= pereopod 7; D= uropod 1; E= uropod 2; F= uropod 3; G= telson.

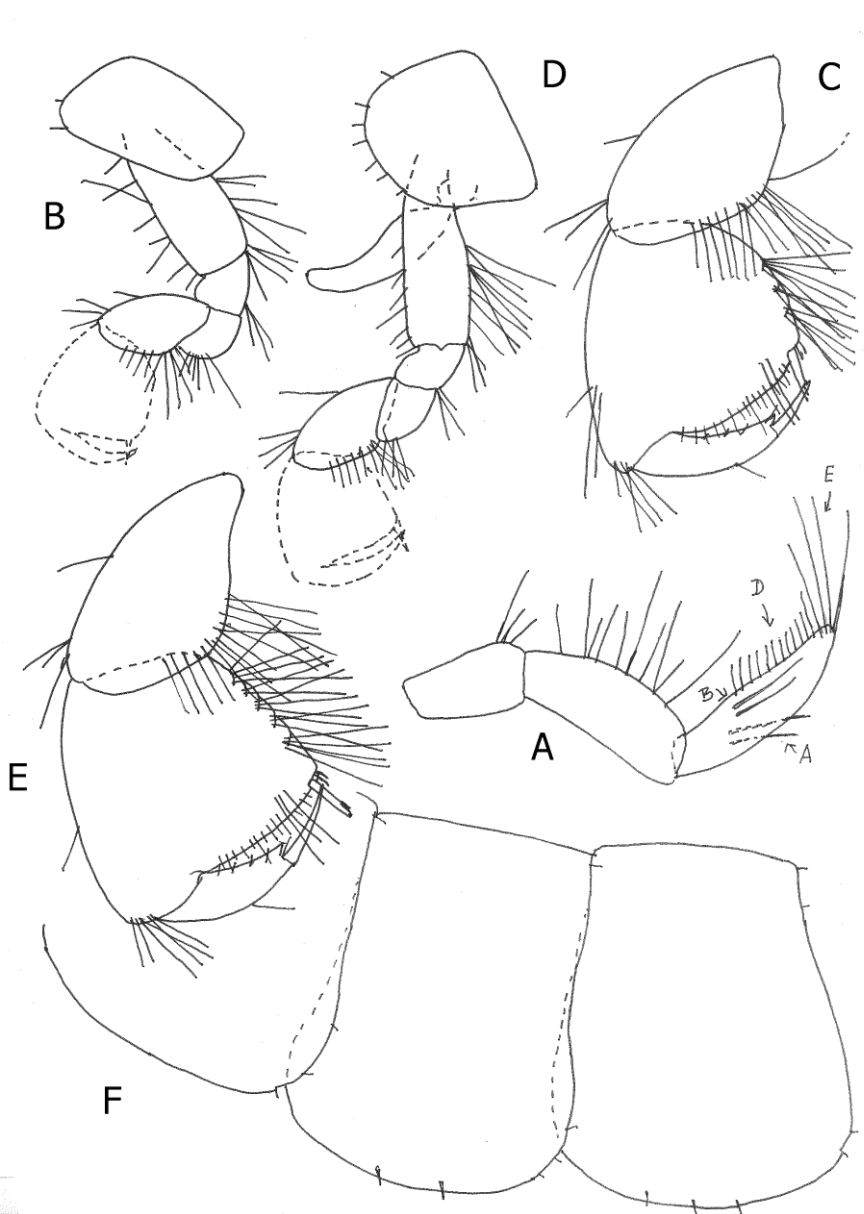


Fig. 7. *Niphargus beroni*, sp. nov., Maronia Cave, Maronia, Greece, female 5.4 mm (paratype): A=mandibular palp, inner face [B=inner facial B-setae; A=outer facial A-setae]; B-C= gnathopod 1; D-E= gnathopod 2; F=epimeral plates 1-3.

Uropod 3 slender, but shorter than that in male. Peduncle longer than broad, with several short distal spines; inner ramus short, scale-like, with distal spine and seta (fig. 6F); outer ramus 2-articulated: first article long, along both margins with single short simple setae or single small spine; second article nearly half as long as first one, with 3 distal short simple setae.

Telson relatively short, deeply incised, broader than long (ratio: 70:63), each lobe with 4 distal spine-like setae of various size; lateral and facial spines or setae absent; a pair of short plumose setae is attached near the median outer margin of each lobe (fig. 6G).

Coxal gills like these in male (figs. 5F, G.; 6A, B; 7D). Oostegites broad, with long marginal setae.

VARIABILITY. Main flagellum of antenna 1 in male and female not reaching half of body-length, consisting of 14-15 articles. Epimeral plates 2 and 3 with 2-5 subventral spines. Gnathopod 2 propodus with 1-2 L- spines. Maxilliped: inner plate with 2-3 distal spines, palpus article 4 with 1-2 unequal setae near basis of the nail.

Lobes of telson in males with 2-3 facial setae in mesial part of each lobe (fig. 5C, D); lobes of telson in female with 4 distal spine-like setae only, facial spines or setae absent.

HOLOTYPE (male 7.2 mm) and **PARATYPE** (female 5.4 mm with setose oostegites) are deposited in Karaman's Collection in Podgorica (Crna Gora, Montenegro), under the No. BU-7.

REMARKS AND AFFINITIES.

Schellenberg (1933) described a new subspecies *Niphargus aquilex tauri*, sp. nov. from cave in Taurus Mts., Turkey, Asia Minor.

Karaman, G. (1973) in his redescription of lectotype of *Niphargus tauri* Schell. [Cave in Taurus Mts., Asia Minor, Turkey] figured and mentioned: "Die Äste der I. Uropoden sind schmal und sehr schwach dorsoventral abgeplattet, aber nicht schaufelförmig verbreitert, auch bei sehr alten Exemplaren".

Karaman, S. (1943) described specimens from Kragujevac (Serbia) as *Niphargus aquilex tauri* Schellenberg, 1933. Observing later that these specimens are not identical with specimens of *N. aquilex tauri* Schell., he nominated it (S. Karaman, 1950: 90) as a new subspecies *N. tauri kragujevensis*, ssp. nov. [loc. typ.: Kragujevac, Serbia].

In the same publication S. Karaman described 2 other similar different taxa: *Niphargus tauri jurinaci*, ssp. nov. [loc. typ.: Crni Lug, Croatia] and *Niphargus tauri medvednicae*, ssp. nov. [loc. typ.: Zagrebačka gora Mts. near Zagreb, Croatia]. Both these taxa are with normal developed rami of uropod 1 in males.

S. Karaman described (1959) a new subspecies *Niphargus tauri osogovensis*, ssp. nov. [loc. typ.: Osogovo Mts., eastern part of North Macedonia] with normal developed rami of uropod 1 in males.

Karaman, S. & Karaman, G. (1959) described a new subspecies *Niphargus tauri pecarensis* [loc. typ.: Pečara dupka Cave, Bulgaria], discovered later in Serbia also (G. Karaman, 1999).

Karaman, G. (1992) redescribed *N. kragujevensis kragujevensis* S. Kar. 1950 from type-locality, and described new subspecies *N. kragujevensis remus*, ssp. nov. [loc. typ.: Prekonoga, Svrlijig, eastern Serbia]; both of them with dilated rami of uropod 1 in males.

Karaman, G. (1998) redescribed *Niphargus pecarensis* S. & G. Karaman, 1959 and described a new subspecies *N. p. occultus*, ssp. nov. [loc. typ.: Matinee, spring, Montenegro, Crna Gora]. Later he discovered *N. pecarensis* in Serbia (G. Karaman, 1999) and Romania (G. Karaman, 2022).

Kenderov, Lj. & Andreev, S. (2015) described a new species *Niphargus cvetkovi* sp. nov. [loc. typ.: source “Cheshma Gorgoritza” near the village Novi Han, east of Sofia, Bulgaria], with dilated rami of uropod 1 in males.

But all these mentioned species are without setae on first palpus article of mandible, despite the fact that some of these species are with normal or more or less inflated paddle shaped rami of uropod 1 in males, or are with densely or scarce hairiness of peduncle in pleopods 1-3.

The new species *Niphargus beroni*, in spite of similarity to the species mentioned above, differs from all of them by presence of setae on first article of mandibular palpus. Otherwise, this character is present in only a few known *Niphargus* species: *Niphargus timavi* S. Karaman, 1954 [loc. typ.: subterranean waters of Timavo River on Italian/ Slovenian border] (G. Karaman, 1985), *Niphargus religiosus* G. Karaman, 2012a [loc. typ.: Uragavaz Gecidi, Ballidag (Kastamonu), Turkey], etc., but all these species differ remarkably from *N. beroni* by various morphological characters.

DERIVATIO NOMINIS. The new species *Niphargus beroni* is dedicated to Prof. Dr. Petar Beron from Sofia (Bulgaria), scientist, speleologist and investigators of the subterranean fauna of Balkan and other parts of the World, who collected sample of this new species together with prof. Beshkov.

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