Karaman, G. (2022): Research of two species of genus Niphargus Schiödte 1849 (fam. Niphargidae)(contribution to the knowledge of the Amphipoda 325). Agriculture and Forestry, 68 (1): 41-70. doi:10.17707/AgricultForest.68.1.03

DOI: 10.17707/AgricultForest.68.1.03

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RESEARCH OF TWO SPECIES OF GENUS *NIPHARGUS* SCHIÖDTE 1849 (FAM. NIPHARGIDAE) (CONTRIBUTION TO THE KNOWLEDGE OF THE AMPHIPODA 325)

SUMMARY

Two subterranean species of genus *Niphargus* Schiödte, 1849 (Amphipoda, fam. Niphargidae) are studied: *Niphargus angelieri* Ruffo 1954 known from SW France [locus typicus: Le Boulou, Pyrenees Orientales, France] is mentioned, and new subspecies, *Niphargus angelieri ariegei*, ssp. nov. from Cave Tuc d`Audoubert, near Montesquieu-Avantes, (Dept. Ariege, Pyrenee-Orientales, France) is discovered and described.

The species *Niphargus* (*Niphargus*) *podpecanus* S. Karaman 1952, known from several localities in Slovenia [locus typicus: Podpeška Jama cave, Slovenia] is mentioned. The specimens from Źeljnske jame Cave, Źeljne, Kočevje (Slovenia), separated from *N. podpecanus* as a new species by Delić et al. (2017) based on the molecular/genetic data only, *Niphargus gottscheeanensis* Delić et al. 2017, are here morphologically described and drawn. Taxonomical and morphological characters and value of these taxa are discussed.

INTRODUCTION

Genus *Niphargus* Schiödte, 1849-Complex (fam. Niphargidae) settled subterranean waters from N. Spain and England till Iran and Caucasus with over 300 different known and numerous still undiscovered new taxa. The great diversity of morphological characters of *Niphargus*-Complex indicated that settlements of subterranean waters by *Niphargus*- Complex occur several times from Tertiary till today, followed by very successful morphological and other modification and adaptation to the various subterranean environments, from primitive forms with ability to bent the body into a ball (*K. parapupetta* Karaman G. 1984) till slender forms with ability to pass between grains of sand (*N. kragujevensis* Karaman S. 1950). This process is still active today, observed by high morphological diversity and morphological variations within specimens of one locality, as well as between various populations of one species and presence

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Notes: The author declares that he has no conflicts of interest. Authorship Form signed online.
Recieved:22/11/2021 *Accepted:14/01/2022*

of transitive populations between different populations still in process of reproductive isolation.

For this reason there are wide discordance about validity and delimitation of various taxa, recognition of subspecies or transitive population based of morphological and molecular-genetic research. We tried to show here some of these dilemma, where only multiple approaches to this problem are needed.

MATERIAL AND METHODS

The studied material was preserved in the 70% ethanol. The specimens were dissected using a WILD M20 microscope and drawn using camera lucida attachment. Body-parts were temporarily submersed in the mixture of glycerin and water for study and drawing by camera lucida; later transferred to Liquid of Faure as permanent slides. All illustrations were inked manually.

Some morphological terminology and setal formulae follow G. Karaman`s terminology (Karaman, G. 1969; 2012) for the last mandibular palpus article [A= A-setae on outer face; B= B-setae on inner face; C= additional C-setae on outer face; D= lateral marginal D-setae; E= distal long E-setae], and for 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 shape, not origin. Our studies were based on the external morphology, ecology and zoogeography.

TAXONOMICAL PART

Family NIPHARGIDAE

NIPHARGUS ANGELIERI ANGELIERI Ruffo 1954

Niphargus skopljensis angelieri Ruffo 1954: 673, figs. II and III; ; Balazuc 1957: 76; Barnard & Barnard 1983: 695;

Niphargus angelieri G. Karaman & Ruffo 1986: 522; Ginet 1995/6: 53, figs. II-III; Ferreira et al. 2007: 589 (no localities); Bréhier & Jaume 2009: 18.

LOCUS TYPICUS: Le Boulou, Pyrenees Orientales, France.

LOCALITIES CITED:

Ruffo 1954: cited this species for 4 localities of Pyrenees orientales in France: Le Boulou; Pont de Boulou; Baillaurie, Banyuls-sur Mer; La Raillere, Amelie-les-Bains;

Ginet 1996: Pyrenee Orientales;

Bréhier & Jaume 2009: French Mediterranean coast: cave, "Grotte des Fées de Leucate".

DISTRIBUTION:
Western part of Pyrenees orientales near Mediterranean coast (France), in interstitial waters and caves.

REMARKS.
N. angelieri angelieri, although mentioned by various authors, remains only partially described, and some important taxonomical characters are unknown. The specimens from Cave Tuc d`Audoubert, locality nearly 170 km W of the Mediterranean Sea coast, differing from typical *N. angelieri* by several characters, is described and figured here as a new subspecies, *N. angelieri ariegei*, ssp. nov.

NIPHARGUS ANGELIERI ARIEGEI, ssp. nov.
Figures 1-5

MATERIAL EXAMINED:
S-7413= Cave Tuc d`Audoubert, near Montesquieu- Avantes (Dept. Ariége, Pyrenee-Orientales, France), nearly 10 exp (leg. G.M.).

DIAGNOSIS (based on female):
Adult females up to 3 mm, urosomal segment 1 with seta, urosomal segment 2 with spines. Coxae short, coxa 1 with subrounded ventroanterior corner, coxa 4 unlobed; epimeral plates 2-3 angular, with subventral spines. Antenna 1 slender, peduncular articles 1-3 progressively shorter, accessory flagellum 2-articulate, almost as long as peduncular article 3; antenna 2 slender, flagellum longer than last peduncular article. Mandibular palpus article 3 with partially reduced number of D and A-setae, B-setae absent.

Maxilla 1 inner plate with 2 setae, 6 spines of outer plate with 3-5 teeth each, one spine (inner) spine with 7 lateral teeth, palpus not reaching tip of outer plate spines, with 3-4 distal setae. Maxilliped inner plate exceeding outer tip of palpus article 1, provided with 3 spines; outer plate not exceeding tip of palpus article 2, nail of palpus article 4 only slightly shorter than pedestal.

Gnathopods 1-2 relatively small, article 5 rather elongated; propodus trapezoid, inclined, with convex corner, L-spines sitting laterally of S-spine, one corner facial M-seta, dactylus with one median seta at outer margin. Dactylus of pereopods 3-7 with one slender spine-like seta at inner margin. Pereopods 5-7 progressively longer and stronger, article 2 dilated, with ventroposterior lobe. Pleopods almost naked, with 2 retinacula. Uropod 1 peduncle with dorsointernal and dorsoexternal row of spines, inner ramus of both uropods with longer inner ramus than outer one, distal spines short. Uropod 3 short and strong, distal article of outer ramus short, first article along both margins with bunches of spines, at mesial margin mixed with single plumose setae. Telson incised nearly 2/3 of telson-length, lobes with distomesial narrowed tip and distal 2 short spines sitting at distolateral side; pair of short plumose setae attaches on each lobe lateromedially.

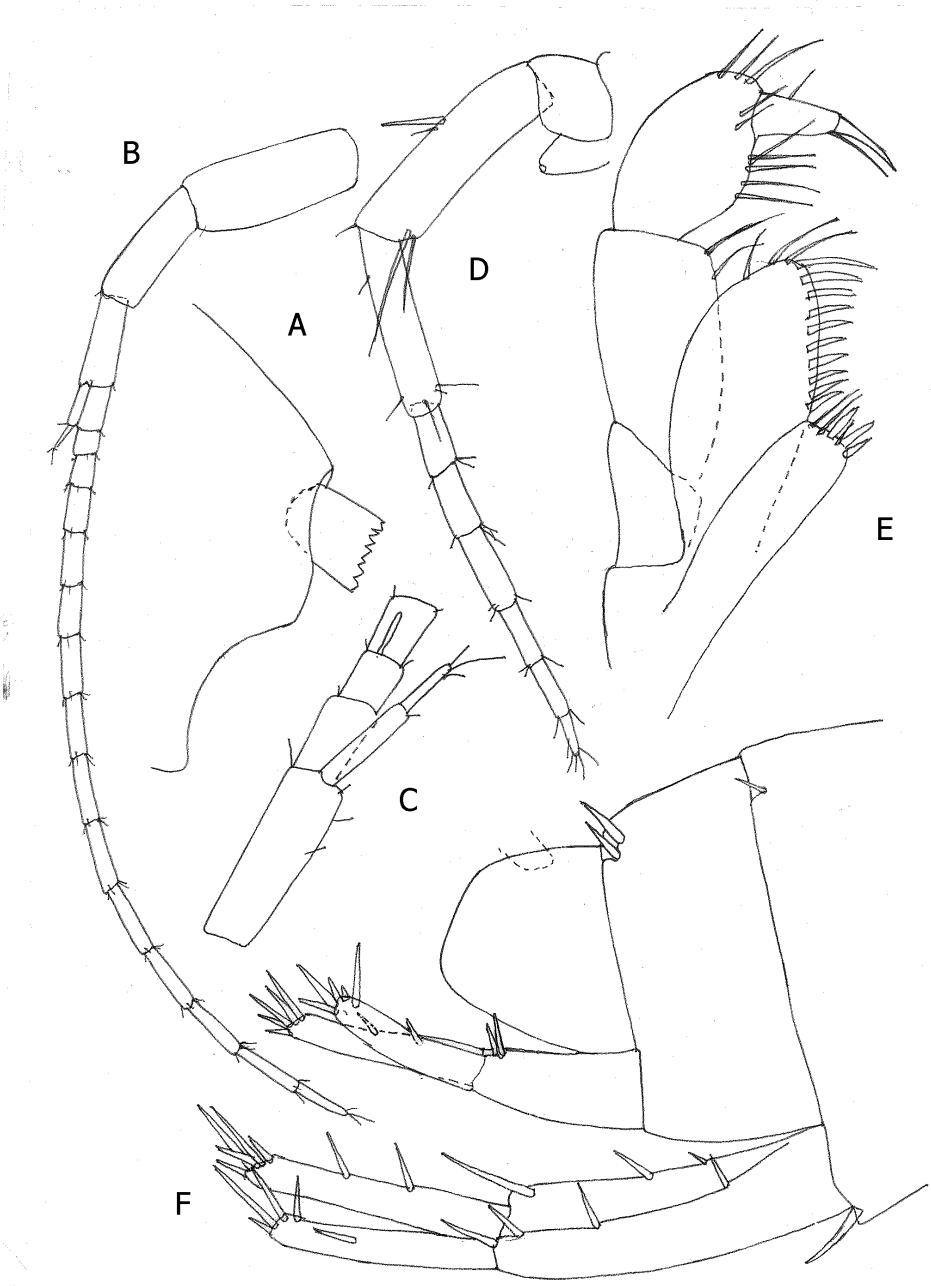

Fig. 1. *Niphargus angelieri ariegei*, ssp. nov., Cave Tuc d`Audoubert, near Montesquieu-Avantes, female 3.0 mm: A= head; B= antenna 1; C= accessory flagellum; D= antenna 2; E= maxilliped; F= urosome with uropods 1-2.

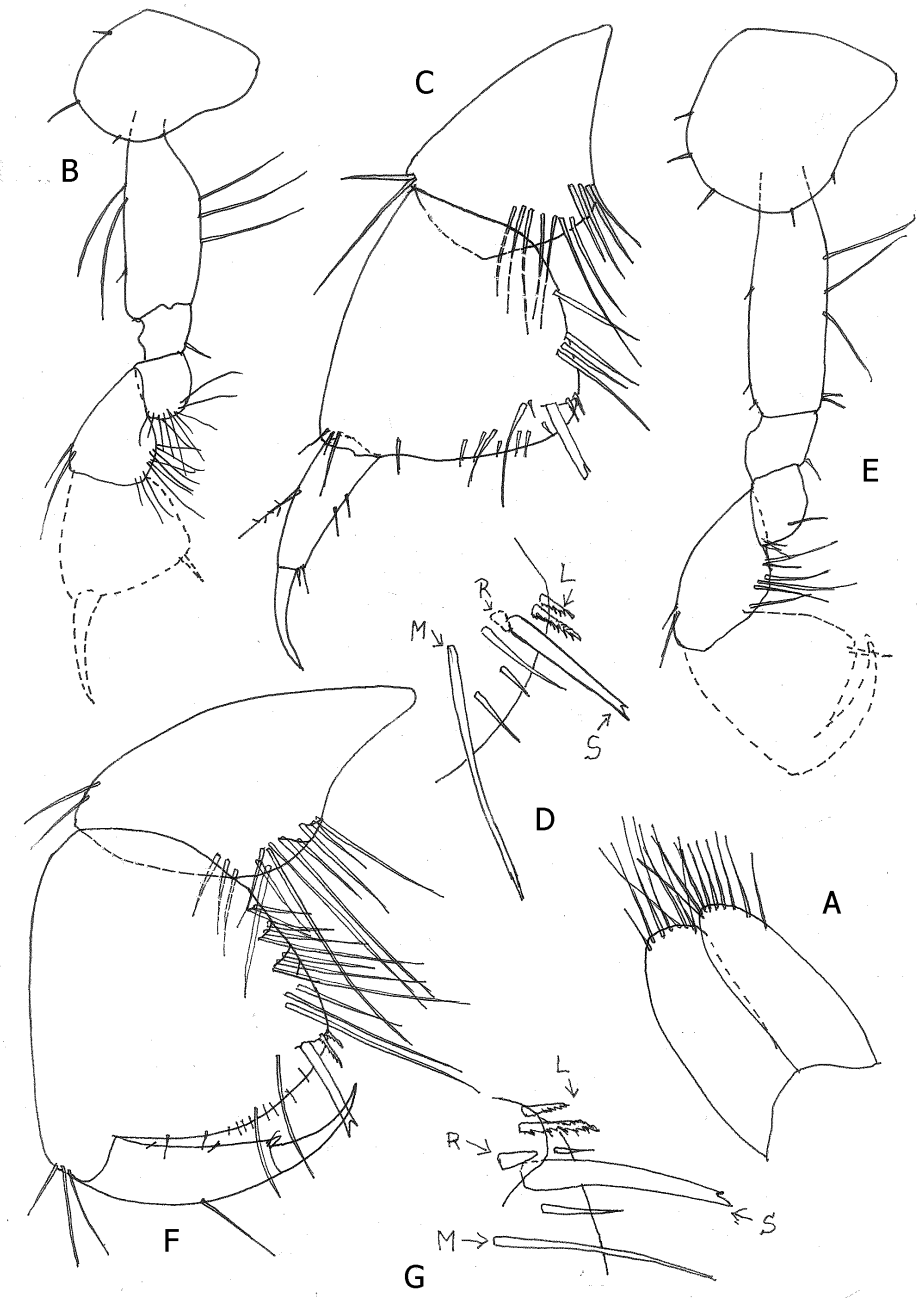

Fig. 2. *Niphargus angelieri ariegei*, ssp. nov., Cave Tuc d`Audoubert, near Montesquieu-Avantes, female 3.0 mm: A= maxilla 2; B-C= gnathopod 1, outer face; D= distal corner of gnathopod 1-propodus, outer face [S= corner S-spine; L= lateral L-spines; M= corner facial M-seta; R= subcorner R-spine, inner face]; E-F= gnathopod 2, outer face; G= distal corner of gnathopod 2-propodus, outer face [S= corner S-spine; L= lateral L-spines; M= corner facial M-seta; R= subcorner R-spine, inner face].

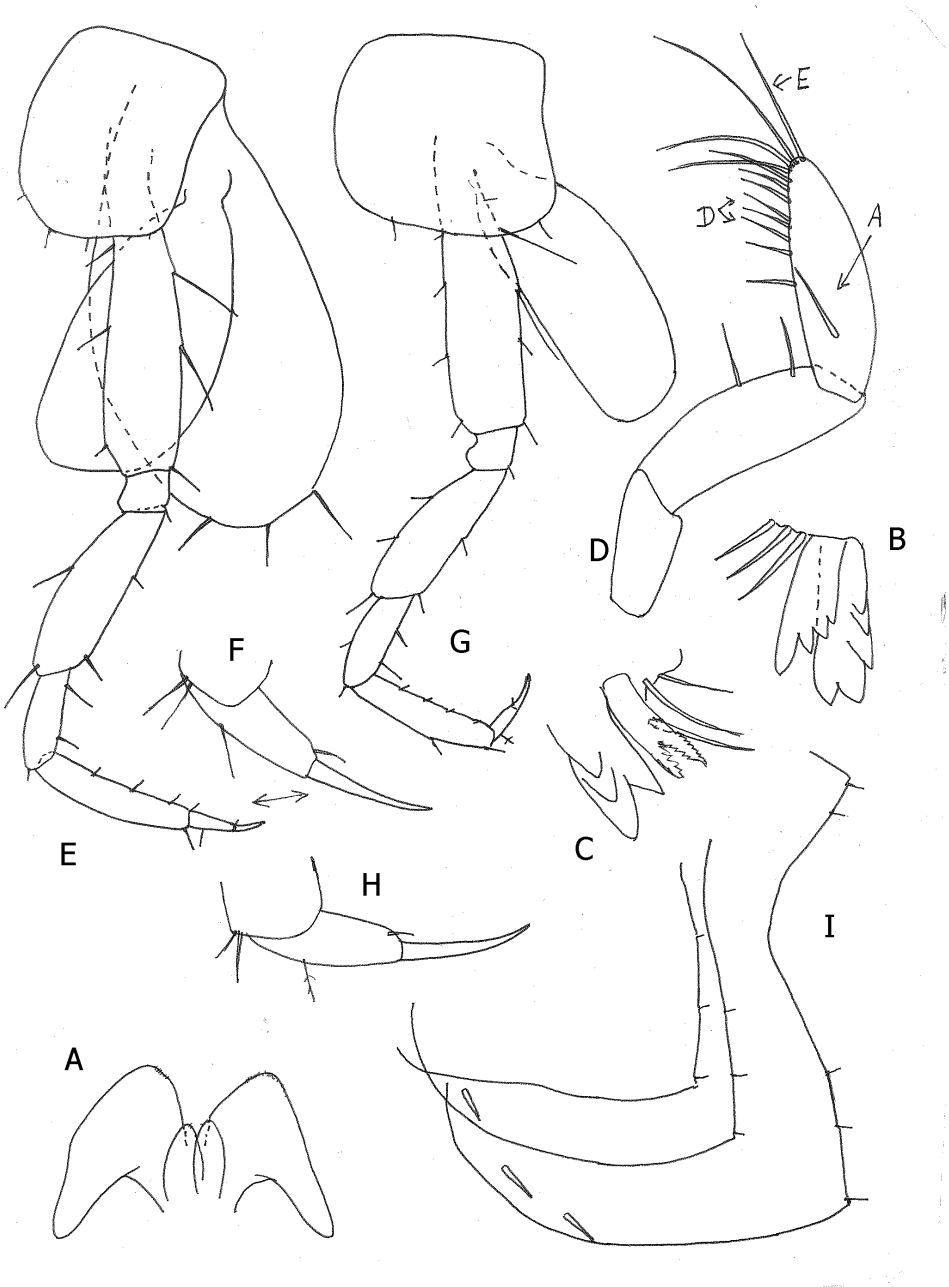

Fig. 3. *Niphargus angelieri ariegei*, ssp. nov., Cave Tuc d`Audoubert, near Montesquieu-Avantes, female 3.0 mm: A= labium; B= left incisor with lacinia mobilis and rakers; C= right incisor with lacinia mobilis and rakers; D= mandibular palpus, outer face [D= marginal D-setae; E= distal E-setae; A= facial A-seta]; E-F= pereopod 3; G-H= pereopod 4; I= epimeral plates 1-3.

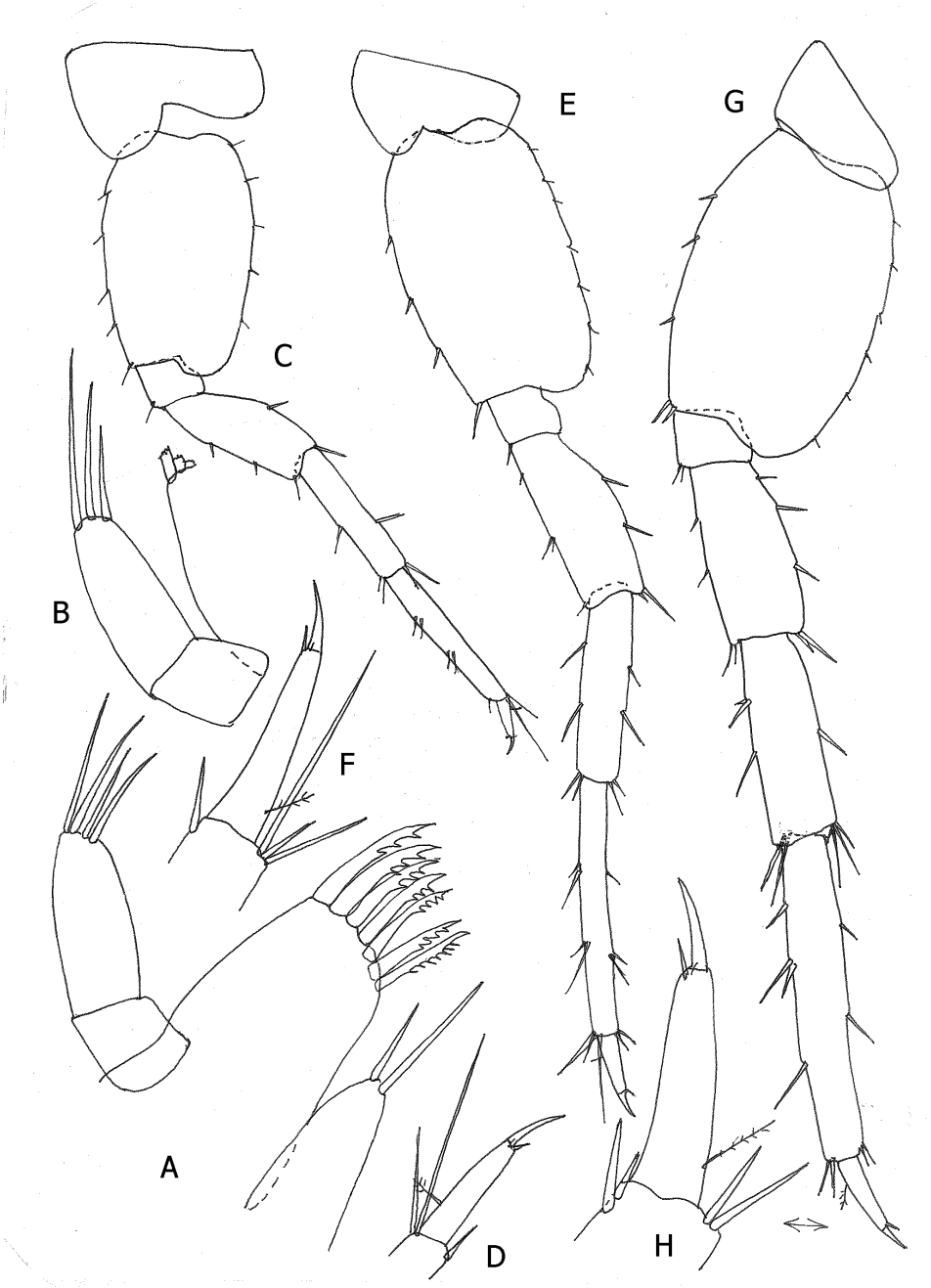

Fig. 4. *Niphargus angelieri ariegei*, ssp. nov., Cave Tuc d`Audoubert, near Montesquieu-Avantes, female 3.0 mm: A-B= maxilla 1; C-D= pereopod 5; E-F= pereopod 6; G-H= pereopod 7

DESCRIPTION.

Female ovig. 3.0 mm with setose oostegites: Body moderately slender, metasomal segments 1-3 with 3-4 dorsoposterior short marginal setae (fig. 3 I); urosomal segment 1 with one dorsolateral seta on each side; urosomal segment 2 on each dorsolateral side with 2 spines; urosomal segment 3 naked (fig. 1F). Epimeral plates distinctly angular: epimeral plate 1 with vestigial ventroposterior tooth and posterior convex margin bearing 2 setae, ventral margin naked, slightly concave in the middle. Epimeral plate 2 with distinct ventroposterior corner and poorly convex posterior margin almost straight in distal part and provided with 1-2 short setae, ventral margin convex, with one submarginal spine (fig. 3 I); epimeral plate 3 with marked ventroposterior tooth, convex posterior margin bearing 3 setae, ventral margin convex, with 2 subventral spines.

Head with very short rostrum, lateral cephalic lobes shallow, obtuse, ventroanterior excavation developed, eyes absent (fig. 1A).

Antenna 1 slightly exceeding half of body; peduncle relatively slender, with 3 articles (ratio: 48:35:25) almost naked (fig. 1B); main flagellum 15 slender scarcely setose articles (most of them with one aesthetasc exceeding half of article itself (fig. 1C). Accessory flagellum 2-articulated, almost as long as last peduncular article (ratio: 46:50), distal article elongated (fig. 1C).

Antenna 2 relatively slender, peduncular article 3 short; article 4 at dorsal margin with one median spine and short seta, distoventral tip with 2 long setae, dorsal distal tip with one short seta (fig. 1D); article 5 more slender and shorter than article 4 (ratio: 54:65), with single short marginal and distal setae. Flagellum longer than last peduncular article, consisting of 6 stronger articles provided with several short distal setae each. Antennal gland cone short (fig. 1D).

Mouthparts basic. Labrum slightly broader than long, convex distally (fig. 5A). Labium broader than long, outer lobes subrounded distally, inner lobes small but well developed (fig. 3A).

Mandible with triturative molar. Left mandible: incisor with 5 teeth, lacinia mobilis with 4 teeth and 3 rakers (fig. 3B). Right mandible: incisor with 4 teeth, lacinia mobilis bifurcate and serrate, accompanied by 3 rakers (fig. 3C). Palpus mandibulae with 3 articles: first article short, naked; second article with 2 setae; third article poorly subfalciform, with 7 D-setae and 5 distal E-setae, on outer face with one facial A-seta, B-setae on inner face absent (fig. 3D).

Maxilla 1: inner plate narrowed, with 2 distal setae; outer plate with 7 spines [5 spines with 3-5 teeth, inner spine with up to 7 teeth (fig. 4A)]; palpus short, 2-articulated, not reaching distal tip of outer plate spines, bearing 3-4 unequal setae (figs. 4A, B).

Maxilla 2 longer than broad, inner plate poorly smaller than outer one, both plates with distal setae only (fig. 2A).

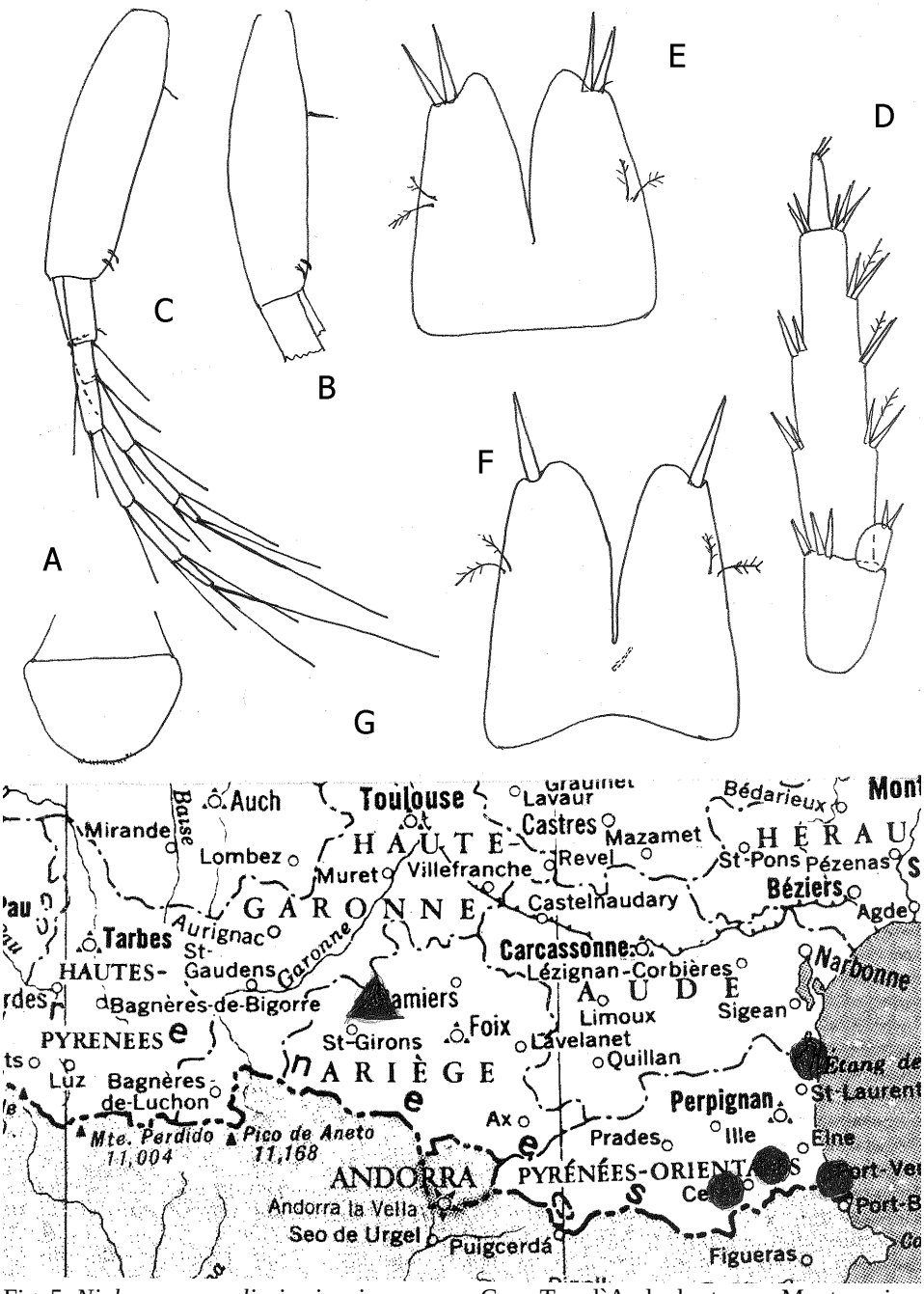

Fig. 5. *Niphargus angelieri ariegei*, ssp. nov., Cave Tuc d`Audoubert, near Montesquieu--Avantes, female 3.0 mm: A= labrum; B= pleopod 1-peduncle; C= pleopod 3-peduncle; D= uropod 3; E= telson; F= telson, female 2.9 mm; G= Distribution of *Niphargus angelieri* in France: dots= *N. angelieri angelieri*; triangle= *N. angelieri ariegei*

Maxilliped: inner plate slightly exceeding outer tip of palpus article 1, with 3 distal spines and 3-4 setae; outer plate long, reaching tip of palpus article 2 only, along inner (mesial) margin with nearly 9 strong spines and 3 long distal setae (fig. 1E); palpus article 2 at inner (mesial) margin with row of setae; article 3 with 3 distal and 3-4 distolateral setae, at inner (mesial) margin with 5 setae; article 4 nail slightly shorter than pedestal, outer margin with median seta, inner margin with one seta near basis of the nail (fig. 1E).

Coxae relatively short. Coxa 1 broader than long (ratio: 44:37), broadly subrounded ventroanterior corner, bearing 3 marginal setae (fig. 2B). Coxa 2 nearly as long as broad, convex ventral margin with 4 setae (fig. 2E). Coxa 3 longer than broad (ratio: 58:48), with 3-4 marginal setae (fig. 3E). Coxa 4 broader than long (ratio: 59:55), with 2 ventral setae and without ventroposterior lobe (fig. 3G).

Coxae 5-7 shallow. Coxa 5 is shorter than coxa 4, broader than long (ratio: 55:33), ventroanterior lobe subrounded, not produced (fig. 4C). Coxa 6 smaller than 5, broader than long (ratio: 48:28) (fig. 4E). Coxa 7 shorter than 6, entire, broader than long (ratio: 44:23), tapering posteriorly (fig. 4G).

Gnathopods 1-2 relatively small, propodus not larger than corresponding coxa. Gnathopod 1 slightly smaller than 2, article 2 with 2 long median setae at anterior margin and 3 long median setae at posterior margin (fig. 2B); article 3 with one posterior seta; article 4 with posterior bunch of setae; article 5 nearly as long as propodus, with 2 distoanterior longer setae, at posterior margin with 2 rows of setae. Propodus trapezoid, hardly longer than broad (ratio: 74:69), posterior margin with 2 transverse rows of long setae, anterior margin with 3 distal setae (fig. 2C). Palm convex, inclined nearly 2/5 of propodus-length, defined on outer face by corner S-spine accompanied laterally by 2 serrate L-spines and one corner facial M-seta (fig. 2D), on inner face by one small subcorner R-spine. Dactylus reaching posterior margin of propodus, one median seta at outer margin and 3 shorter setae along inner margin (fig. 2C).

Gnathopod 2: article 2 with 3-4 short anterior marginal setae, posterior margin with 3 long median setae and bunch of distoposterior short setae (fig. 2E); article 3 with one distoposterior seta; article 4 with several posterior marginal short setae. Article 5 nearly as long as propodus, with 2 distoanterior setae, posterior margin with numerous long setae (fig. 2E). Propodus trapezoid, longer than broad (ratio: 94:81), with 3 distoanterior setae, posterior margin with 4 transverse rows of long setae (fig. 2F). Palm convex, inclined nearly 1/3 of propodus-length, defined on outer face by corner S-spine accompanied laterally by 2 serrate L-spines and one corner facial M-seta (fig. 2G), on inner face by one subcorner S-spine. Dactylus reaching posterior margin of propodus, one median seta at outer margin and 4 short setae at inner margin (fig. 2F).

Pereopods 3-4 moderately slender. Pereopod 3 rather longer than 4, article 2 with 3 shorter anterior marginal setae, 2 long median and one short distal seta at posterior margin (fig. 3E); article 3 with short distoposterior seta. Articles 4-5 of different length (ratio: 53:28:44), along both margins with scarce number of short

setae or spine-like setae; article 6 at posterior margin with row of 4 short setae. Dactylus remarkably shorter than article 6 (ratio: 22:44), inner margin with one longer strong seta, outer margin with one median plumose seta (fig. 3F); nail rather shorter than pedestal (ratio: 43:57).

Pereopod 4: article 2 anterior margin with 4 short setae, posterior margin with 2 median long setae and 3 short setae; article 3 with distoposterior short seta. Articles 4-6 of different length (ratio: 45:27:40): articles 4-5 with several single short setae at both margins; article 6 at posterior margin with 5 short setae (fig. 3G). Dactylus shorter than article 6 (ratio: 21:40), one stronger seta at inner margin (fig. 3H), outer margin with one median plumose seta; nail shorter than pedestal (ratio: 37:45).

Pereopods 5-7 moderately slender. Pereopod 5 remarkably shorter than pereopods 6 and 7, article 2 dilated, longer than broad (ratio: 68:43), slightly tapering ventrally, anterior convex margin with 6 strong setae, posterior convex margin with 4-5 short setae, ventroposterior lobe developed (fig. 4C). Articles 4-6 of different length (ratio: 40:42:48); articles 4-5 with single short setae or spine-like setae at both margins; article 6 anterior margin with 3 groups of short setae and distal seta longer than dactylus. Article 2 longer than article 6 (68:48). Dactylus much shorter than article 6 (ratio: 15:48), one stronger seta at inner margin and one median plumose seta at outer margin (fig. 4D); nail shorter than pedestal (ratio: 19:34).

Pereopod 6: article 2 larger than that of pereopod 5, almost not tapering ventrally, longer than broad (ratio: 80:48), anterior convex margin with 4 spine-like setae, posterior margin almost straight medially, bearing 7-8 short setae, ventroposterior lobe shallow (fig. 4E). Articles 4-6 of different length (ratio: 51:55:72); both margins with single or paired spine-like setae or slender spines. Article 2 longer than article 6 (ratio: 80:72). Dactylus shorter than article 6 (ratio: 19:72), strong seta at inner margin and median plumose seta at outer margin; nail shorter than pedestal (ratio: 20:56) (fig. 4F).

Pereopod 7 longer than pereopod 6, article 2 hardly ovoid, longer than broad (ratio: 87:57), anterior convex margin with 4-5 slender spines, posterior convex margin with 6 short setae, ventroposterior lobe developed (fig. 4G). Articles 4-6 of different length (ratio: 51:59:92), both margins with single or paired slender spines up to as long as diameter of articles themselves. Article 2 shorter than article 6 (ratio: 87:92). Dactylus remarkably shorter than article 6 (ratio: 30:92), one slender spine-like seta at inner margin and one median plumose seta at outer margin (fig. 4H); nail shorter than pedestal (ratio: 31:65).

Pleopods with 2 retinacula, external rami with 6 articles, internal rami with 5 articles. Peduncle of pleopod 2 naked, that of pleopods 1 and 3 with one proximal posterior seta (fig. 5B, C).

Uropods 1-3 stout, with relatively short spines. Uropod 1 with dorsoexternal and dorsointernal row of spines (fig. 1F). Inner ramus (without distal spines) shorter than peduncle, bearing 2 lateral and 5 strong, relatively short

distal spines; outer ramus rather shorter than inner one, with one lateral and 4 distal strong spines (fig. 1F).

Uropod 2 peduncle with distal spines; inner ramus with 2 lateral and 5 distal spines; outer ramus remarkably shorter than inner one, with 5 distal spines (fig. 1F).

Uropod 3 short, peduncle rather longer than broad, with 3-4 distal spines; inner ramus scale-like, shorter than peduncle, bearing 2 distal spines. Outer ramus 2-articulated: first article along outer margin with 3 groups of spines, along inner (mesial) margin with 4 groups of strong spines accompanied by one short plumose seta (fig. 5D); second article short, not exceeding diameter of first article, bearing 3 short distolateral simple setae.

Telson short, nearly as long as broad, incised nearly 2/3 of telson-length (fig. 5E); tapering distally; each lobe with distomesial subrounded tip, and 2 distal spines sitting at distolateral margin; the longest spines reaching 2/5 of telson-length only. A pair of short plumose setae attached medially at outer margin of each lobe.

Gills moderately large, not exceeding distal margin of corresponding article 2 (fig. 3E, G).

Oostegites large, with marginal setae (fig. 3E).

MALE unknown; we suppose that it will be similar to females.

VARIABILITY.

All ovigerous females up to 3 mm are with setose oostegites (fig. 3E). Telson always with distolateral position of 1-2 distal short spines (fig. 5E, F), lateral and facial spines absent; a pair of median plumose setae short; inner plate of maxilliped with 2-3 distal spines and single setae. Maxilla 1 palpus not reaching distal tip of outer plate spines, bearing 3-4 distal setae (fig. 4A, B).

The juvenile specimens of 2.0 mm show the same main taxonomical characters as adult females (uropod 3, shape of telson, maxilliped, maxilla 1, etc.).

REMARKS AND AFFINITIES.

Our specimens from Tuc d` Audoubert are very similar to *Niphargus angelieri* Ruffo 1954 known from several localities of Pyrenees Orientale, in the subterranean waters [Le Boulou; Pont du Boulou; Baillaurie (Banyuls sur Mer); La Raillere (Amelie-les- Bains] and cave (Grotte des Fées de Leucate)] and we suspected that our taxon can be identical with *N. angelieri*. Unfortunately, there are no further taxonomical data of specimens of *N. angelieri* cited from other localities, except those quoted by Ruffo from locus typicus.

One more detailed analyze of known taxonomic characters, suggested that, based on present knowledge of *N. angelieri*, specimens from Tuc d`Audoubert are not identical with ssp. *angelieri*, but represent a distinct new taxon, *N. angelieri ariegei*, ssp. new.

The subspecies *N. angelieri ariegei* differs from ssp. *angelieri* (based of figures and description of Ruffo) by:

- Maxilla 1 palpus 3-4 setae (3 in *angelieri*); Maxilliped inner plate not reaching half of second palpus article 2 (distinctly reaching second palpus article in *angelieri*); outer plate not exceeding tip of palpus article 2 (distinctly exceeding in *angelieri*); nail of article 4 almost reaching pedestal, with long seta at inner margin near basis of the nail (shorter in *angelieri*);
- Coxa 3 is not broader than long (broader than long in *angelieri*);
- Pereopod 7 article 2 more elongated and with longer nail of dactylus;
- Epimeral plates 2-3 with distinctly pointed ventroposterior corner and provided with subventral spines (obtuse, without spines in *angelieri*);
- Pleopods with 2 retinacula (undescribed in *angelieri*);
- Uropods 1-2: both rami with short distal spines (very long in *angelieri*); Uropod 3: outer margin of outer ramus with 3 bunches of short spines (single simple setae only in *angelieri*);
- Telson: lobes with distal finger and 1-2 short distolateral spines reaching 2/5 of telson length (lobes subrounded distally, with 3 slender distal spines (the longer spines reaching almost half of telson-length in *angelieri*); Pair of lateral plumose setae of telson-lobes short (one of these plumose setae very long in *angelieri*);

The sex of described *N. angelieri* is not mentioned.

Although some taxonomic differences we can theoretically attributed to the size or different sex, the most of them are more stable (mouthparts, telson, geographical distance). But we cannot exclude the possibility that our specimens can be within the unknown limits of morphological variety of still poorly known *N. angelieri*.

NIPHARGUS (NIPHARGUS) PODPECANUS S. Karaman 1952

Niphargus (Stygoniphargus) stygius podpecanus S. Karaman 1952: 12, pl. VI, figs. 24-28;

Niphargus stygius podpecanus G. Karaman 1972: 6; G. Karaman 1974: 26; G. Karaman & Ruffo 1986: 532.

Niphargus podpecanus Delić et al. 2017: 6; Primate et al. 2021: 3;

LOCUS TYPICUS: Podpeška Jama cave, Slovenia.

LOCALITIES CITED: SLOVENIA:

S. Karaman, 1952: Podpeška Jama Cave; "Wasserloch"(=swamp) near Kočevje; well in Kočevje;

G. Karaman 1974: loc. typ.; Kočevje;

Delić et al. 2017: Podpeška jama Cave, Podpeč, Dobrepolje; Slugova jama Cave, Golobinjek, Dolenjske toplice; spring near Venska vas village, Kočevje; spring near Obrh, Mirtoviči, Osilnica; Krška jama Cave, Gradiček, Krška vas

village; Željnske jame Cave, Željne, Kočevje; Črničkova jama Cave, Stavča vas village, Žužemberk; Lučka jama Cave, Luče, Grosuplje; Jama v Peklu Cave, Rajndol, Kočevje; spring near Obrh, Mirtoviči, Osilnica.

Premate et al. 2021: Podpeška jama Cave, with *N. longiflagellum* S. Karaman 1950 and *N. pachytelson* Sket 1960.

REMARKS.

Niphargus (Niphargus) podpecanus belongs to *N. stygius*-Complex. *N. podpecanus* from type-locality (Podpeška jama Cave, Slovenia) is rather similar to *N. stygius* (Schiödte 1847) [loc. typ. Postojna Cave, Slovenia] but differs from later by various morphological characters (presence of facial spines on telson, presence of plumose setae on peduncle of pleopods, gnathopods 1-2, uropod 1 in males, etc).S. Karaman (1952) cited this species from several localities: Podpeška jama Cave; well in Kočevje; "Wasserloch" (= swamp} near Kočevje. He mentioned (1952: 14) that specimens from one of four his samples from Podpeška jama Cave were slightly different (more inclined palm of gnathopods, rather shorter inner ramus of uropod 1, rather shorter distal article of uropod 3 outer ramus, slightly more angular epimeral plates, and with weak facial spine on telson or absence of this spine), considering that this sample can be maybe rather different form between *valvasor*i and *podpecanus*. S. Karaman proposed the possibility that in different parts of the same subterranean water can develop or preserve different forms morphologically different.Delić et al. (2017) have split *Niphargus podpecanus* sensu S. Karaman into 3 different species based on partially genetic/molecular analyze, without detailed morphological data of taxonomical characters and differences. One of them, *Niphargus gottscheeanensis* Delić et al. 2017 [locus typicus: Źeljnske jame Cave] was cited also for Podpeška jama Cave, mentioning that there are not morphological differences between *podpecanus* and *gottscheeanensis*. Unfortunately they have not redescribed and drawn neither specimens from Podpeška jama nor these from Źeljnske jame Caves, to support this conclusion.

1. There are no doubt that within the same subterranean waters (cave system), the ecological, physical, chemical and other conditions can be rather different, what can cause some morphological or partially known genetic/molecular differences (or both of them).

2. Evidently not every established molecular/genetic difference of specimens presented in one sample, represent automatically a new species, especially when both nominated new species have identical morphological characters.

The similar problem I established in epigean populations of amphipod *Gammarus balcanicus*- Complex in several torrents and rivers (G. Karaman, 1977: 51), but neither attention nor reaction to this problem was later made.

Within one water stream in the source zone, some morphological characters of *G. balcanicus* s. l. are different that these in specimens some

kilometers far downstreams (in males and females), what will be enough to consider the presence of two different species, because there are no transitive specimens in contact zone. But, detailed morphological analyze of specimens further downstreams show presence of specimens with transitive morphological characters between both forms, indicating that they are not species but only different forms of the same species (G. Karaman 1977: 51). In some torrents we found also 3 different populations of the same species (*G. balcanicus* s. l.) and always with transitive specimens in transitive zone.

I suppose that the similar situation is within some subterranean populations of single *Niphargus* species also. The recent oversplitting of single known species into several distinct "cryptic" new species each, based on molecular/genetic differences only, although with identical morphological characters, must be reexamined and confirmed through further detailed study of other genetic/molecular and morphological data. There are probability that some of these "cryptic species" can be various varieties and different forms of one species. Are there all numerous new cryptic species reproductively isolated? Absence of cited subspecies or transitive populations among so many "nominated cryptic species" indicated necessity of reexamination of all these split taxa.

As *N. podpecanus* s. str. is only partially described and figured, and split taxon *N. gottscheeanensis* was not described morphologically and figured, we described and figured *N. gottscheeanensis*, to help further study of its taxonomical status regarding *N. podpecanus* and entire *N. stygius*-Complex.

NIPHARGUS (NIPHARGUS) GOTTSCHEEANENSIS Delić et al. 2017
Figures 6-12

?Niphargus (Stygoniphargus) stygius podpecanus S. Karaman 1952 (part.).
Niphargus gottscheeanensis Delić et al. 2017: 3, map 1.

MATERIAL EXAMINED: SLOVENIA

AMD/00337- Źeljnske jame Cave (S. 12), Źeljne, Kočevje, 11.5. 1993, 6 exp. intermixed with *Synurella ambulans ambulans* (F. Müller 1846) and *Niphargus longiflagellum* S. Kar. 1950 (leg. F. Gasparo);

AMD/00477- Kompoljska jama Cave (S. 25), Kompolje, Videm, 11.7.1993, several exp. (leg. J. Broder, F. Gasparo, F. Stoch).

LOCUS TYPICUS: Źeljnske jame Cave, Źeljne, Kočevje.

DIAGNOSIS

Large species, up to 21 mm long, metasomal segments with several dorsomarginal setae only; urosomal segment 1 with dorsolateral setae, urosomal segment 2 with dorsolateral spines; urosomal segment 3 naked; epimeral plates quadrate, with weakly angular ventroposterior corner and straight or slightly

convex posterior margin. Head with short lateral cephalic lobes, antennae 1-2 slender, antenna 1 peduncular articles 1-3 progressively shorter, flagellum long, accessory flagellum 2-articulate. Antenna 2 slender, peduncular article 5 shorter than 4, flagellum much longer than last peduncular article.

Mandibular palpus article 1 naked, article 2 with numerous setae, article 3 as long as 2, with numerous D, E, A and B setae. Maxilla 1 inner plate with several setae, outer plate with mainly one-toothed distal spines, palpus relatively short. Maxilliped inner and outer plate short, inner plate with 4 spines. Coxae short, coxa 1 subrounded ventroanterior corner; coxa 4 without distinct ventroposterior lobe. Gnathopods 1-2 nearly as large as corresponding coxae, with trapezoid propodus remarkably inclined, L-spines sitting laterally of S-spine, inner face with one R-spine; dactylus with numerous outer marginal setae.

Pereopods 3-7 dactylus with one spine at inner margin, article 2 of pereopods 5-7 narrowed, without ventroposterior lobe. Pleopods with 2 retinacula, peduncles with additional plumose setae. Uropod 1 peduncle with dorsointernal row of setae, inner ramus in males remarkably longer than outer one. Uropod 3 elongated in males, second article long. Telson gaping, with distal, lateral and facial spines. Sexual dimorphic characters present (uropod 1, uropod 3).

DESCRIPTION (Źeljnske jame Cave). MALE 20.0 mm.

Body moderately slender, metasomal segments 1-3 with 4-5 dorsoposterior marginal setae each (fig. 9B); urosomal segment 1 with one seta on each dorsolateral side; urosomal segment 2 on each dorsolateral side with 2 spines and 1 seta, urosomal segment 3 naked (fig. 9D). Urosomal segment 1 near basis of uropod 1-peduncle with one bunch of 2 ventroposterior spine-like setae (fig. 9D).

Epimeral plates 1-3 quadrate, with marked ventroposterior corner and with convex posterior margin; plates 2-3 with 2-4 subventral spines.(fig. 9B).

Head: dorsal margin poorly convex in lateral projection, lateral cephalic lobes short and subrounded, eyes absent.

Antenna 1 reaching almost half of the body; peduncular articles 1-3 progressively shorter (ratio: 84:61:27), article 3 not reaching half of article 2; main flagellum consisting of 32 articles (most of them with one short aesthetasc) (fig. 6B); accessory flagellum short, 2-articulated (fig. 6B).

Antenna 2 moderately slender, peduncular article 5 distinctly shorter than 4 (ratio: 60:70), both articles with 4 ventral bunches of setae shorter or longer than diameter of articles themselves; flagellum slender, poorly setose, consisting of 17 articles; antennal gland cone short (fig. 6C).

Mouthparts: Labrum broader than long, convex distally (fig. 6A); labium broader than long, inner lobes short, outer lobes subrounded (fig. 10A).

Left mandible: incisor with 5 teeth, lacinia mobilis with 4 teeth, accompanied by 16 rakers (fig. 10B). Right mandible: incisor with 4 teeth, lacinia mobilis bifurcate, serrate, accompanied by 10 rakers (fig. 10C). Palpus mandibulae article 1 naked; article 2 as long as article 3, bearing 15+3 setae;

article 3 with 33 D and 8 E setae (fig. 10D), on outer face with one group of 13 A-setae (fig. 10E), on inner face 4 groups of B setae (4-3-2-1) (fig. 10D); C-setae absent.

Maxilla 1: inner plate with 4 setae, outer plate with 7 spines (6 spines with 1 tooth, one spine with 3 teeth) (fig. 10F), palpus 2-articulated, short, not reaching tip of outer plate-spines, provided with 13-14 setae (fig. 10F, G).

Maxilla 2 inner plate slightly shorter than outer one, both with distal setae only (fig. 10H). Maxilliped: inner plate short, not reaching outer tip of first palpus article provided with 3-4 spines, outer plate nearly reaching half of second palpus article, with row of nearly 12 mesial pointed spines (fig. 9A), palpus article 3 with 2 outer marginal bunches of setae; article 4 at outer margin with 2 median setae, at inner margin with one seta near basis of the nail, nail shorter than pedestal.

Coxa 1 broader than long (ratio: 43:35), with narrowly subrounded ventroanterior corner (fig. 7A), bearing nearly 13 short marginal setae; coxa 2 hardly longer than broad (ratio: 45:42), with nearly 15 short marginal setae (fig. 7D); coxa 3 hardly longer than broad (ratio: 48:45), with nearly 12 short marginal setae (fig. 6D). Coxa 4 nearly as long as broad, with 12 short marginal setae (fig. 6F); ventroposterior lobe absent. Coxa 5 shorter than coxa 4, much shorter than broad (ratio: 54:33), with single marginal short setae, anterior lobe subrounded, short (fig. 8A); coxa 6 much broader than long (ratio: 45:30), with single short marginal setae (fig. 8C). Coxa 7 entire, broader than long (ratio: 42:20), with one short marginal seta (fig. 8E).

Gnathopods 1-2 moderately large, with propodus not larger than corresponding coxa (fig. 7A, D). Gnathopod 1 slightly smaller than 2, article 2 with numerous long setae along anterior and posterior margin; article 3 with distoposterior bunch of setae; article 5 shorter than propodus (ratio: 30:40), with 2 distoanterior bunches of setae and numerous posterior marginal setae (fig. 7A). Propodus trapezoid, slightly longer than broad (ratio: 90:81), with 10 transverse rows of posterior setae (fig. 7B); palm inclined slightly over half of posterior length, defined on outer face by one corner S-spine accompanied laterally by 3-4 slender toothed L-spines and 7 facial corner M-setae, on inner face by 1 short subcorner R-spine (fig. 7C); dactylus with row of setae along outer margin (1-2-2-1-1-1-1-1-1-2-1-2-1 or 1-1-2-1-1-1-1-1-1-2-1-1-2-1) and short setae at inner margin (fig. 7B).

Gnathopod 2: article 2 with row of numerous long setae at anterior and posterior margin; article 3 with distoposterior bunch of setae; article 5 nearly as long as propodus, with 2 distoanterior bunches of setae and numerous posterior marginal setae (fig. 7D). Propodus trapezoid, broader than long (ratio: 95:90), at posterior margin with 14 transverse rows of setae (fig. 7E); palm slightly convex, inclined hardly over half of propodus-length, defined on outer face by corner S-spine accompanied laterally by 3 slender L-spines and 6-7 corner facial M-setae (fig. 7F). Dactylus reaching posterior margin of propodus, along outer margin

with row of setae (1-2-1-1-1-1-2-2-1-2-1-1-1-2, or 2-1-1-2-3-3-2-2-2-1-3), and very short setae at inner margin (fig. 7E).

Pereopods 3-4 moderately slender. Pereopod 3 article 2 with proximoanterior and proximoposterior marginal long setae, distoanterior and distoposterior marginal setae are shorter (fig. 6D). Articles 4-6 of different length (ratio: 50:32:39); article 4 with 4 bunches of posterior marginal setae (the longest setae slightly exceeding width of article itself) and 4 groups of short anterior marginal setae; article 5 with 5 groups of short spines and single short setae; article 6 along posterior margin with 5 bunches of short spines or setae. Dactylus much shorter than article 6 (ratio: 17:39), at inner margin with one short spine, at outer margin with one median seta; nail nearly as long as pedestal (fig. 6E).

Pereopod 4 rather similar to pereopod 3 but hardly shorter, and hardly shorter setae (fig. 6F). Articles 4-6 of different length (ratio: 45:32:36); dactylus much shorter than article 6 (ratio: 16:37), at inner margin with one short spine, at outer margin with one median seta; nail nearly as long as pedestal (fig. 6G).

Pereopods 5-7 moderately slender, scarcely spinose. Pereopod 5 remarkably shorter than pereopods 6 and 7; article 2 longer than broad (ratio: 58:33), anterior slightly convex margin with 5-6 groups of short spine-like setae, posterior margin hardly concave in the middle, provided with nearly 14 short setae, ventroposterior lobe absent (fig. 8A). Articles 4-6 of different length (ratio: 38:42:42), at both margins with short spines and setae. Article 2 longer than article 6 (ratio: 58:38). Dactylus much shorter than article 6 (ratio: 13:42), at inner margin with one small spine (fig. 8B), at outer margin with one median seta; nail as long as pedestal.

Pereopod 6: article 2 remarkably longer than broad (ratio: 77:37), anterior slightly convex margin with 8 groups of short setae, posterior margin straight in the middle, bearing nearly 17 short setae, ventroposterior lobe not developed (fig. 8C). Articles 4-6 of different length (ratio: 49:61:68); articles 4 anterior margin with several single or pairs of short setae and distal short spine, posterior margin with 4 groups of short spines; articles 5-6 at both margins with groups of spines and setae much shorter than width of articles themselves. Article 6 slightly shorter than article 2 (ratio: 68:77). Dactylus much shorter than article 6 (ratio: 21:68), with one short spine at inner margin and one median seta at outer margin (fig. 8D); nail shorter than pedestal (ratio: 37:48).

Pereopod 7: article 2 much longer than broad (ratio: 76:39), anterior margin almost straight, with 7 groups of short spine-like setae, posterior almost straight margin with nearly 14 short setae replaced with several short spines (fig. 8E), ventroposterior lobe absent. Articles 4-6 of different length (ratio: 55:57:61) at both margins with groups of short spins and /or short setae (fig. 8E). Article 6 shorter than article 2 (ratio: 61;76), dactylus much shorter than article 6 (ratio: 18:61), with one short spine at inner margin and 2 median plumose setae at outer margin (fig. 8F), nail shorter than pedestal (ratio: 38:47) [my impression is that figured pereopod 7 is with partially regenerated some distal articles].

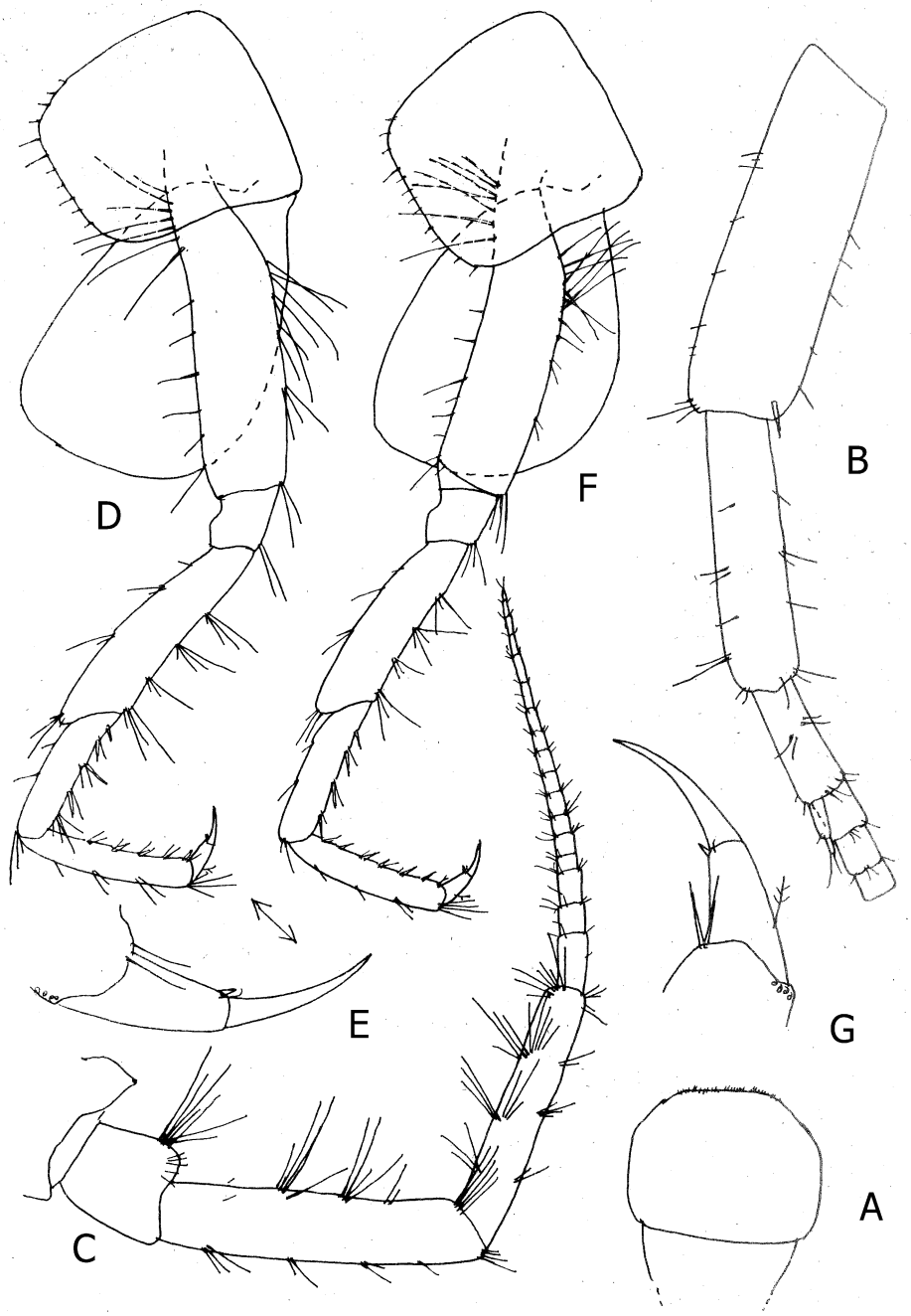

Fig. 6. *Niphargus* (*Niphargus*) *gottscheeanensis* Delić et al. 2017, Željnske jame Cave, Kočevje, male 20.0 mm: A= labrum; B= antenna 1; C= antenna 2; D-E= pereopod 3; F-G= pereopod 4.

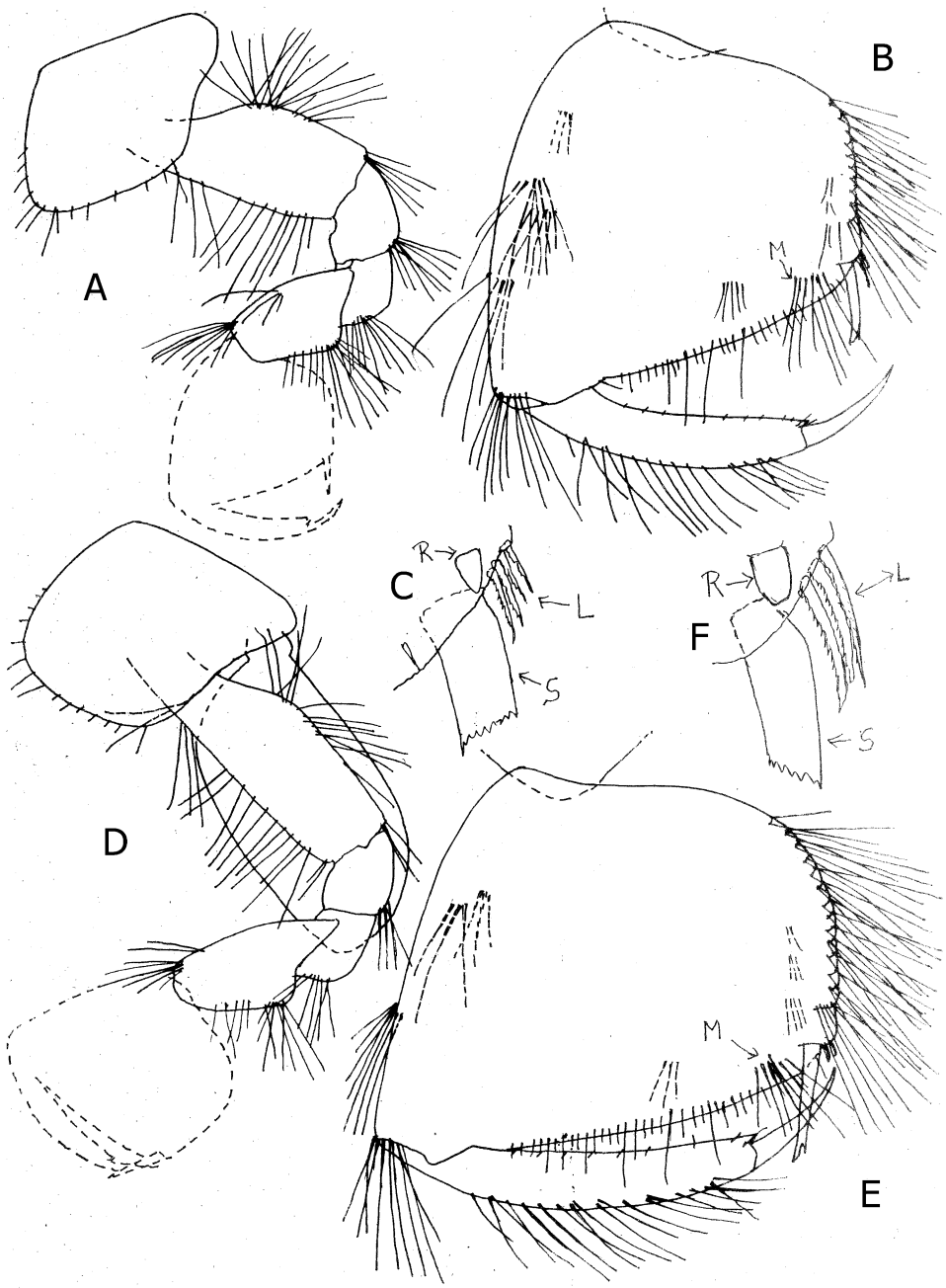

Fig. 7. *Niphargus* (*Niphargus*) *gottscheeanensis* Delić et al. 2017, Željnske jame Cave, Kočevje, male 20.0 mm: A-B= gnathopod 1; outer face; C= distal corner of gnathopod 1-propodus, inner face [S= corner S-spine; L= lateral L-spines; M= corner facial M-seta; R= subcorner R-spine, inner face]; D-E= gnathopod 2; outer face; F= distal corner of gnathopod 2-propodus, inner face [S= corner S-spine; L= lateral L-spines; M= corner facial M-seta; R= subcorner R-spine, inner face].

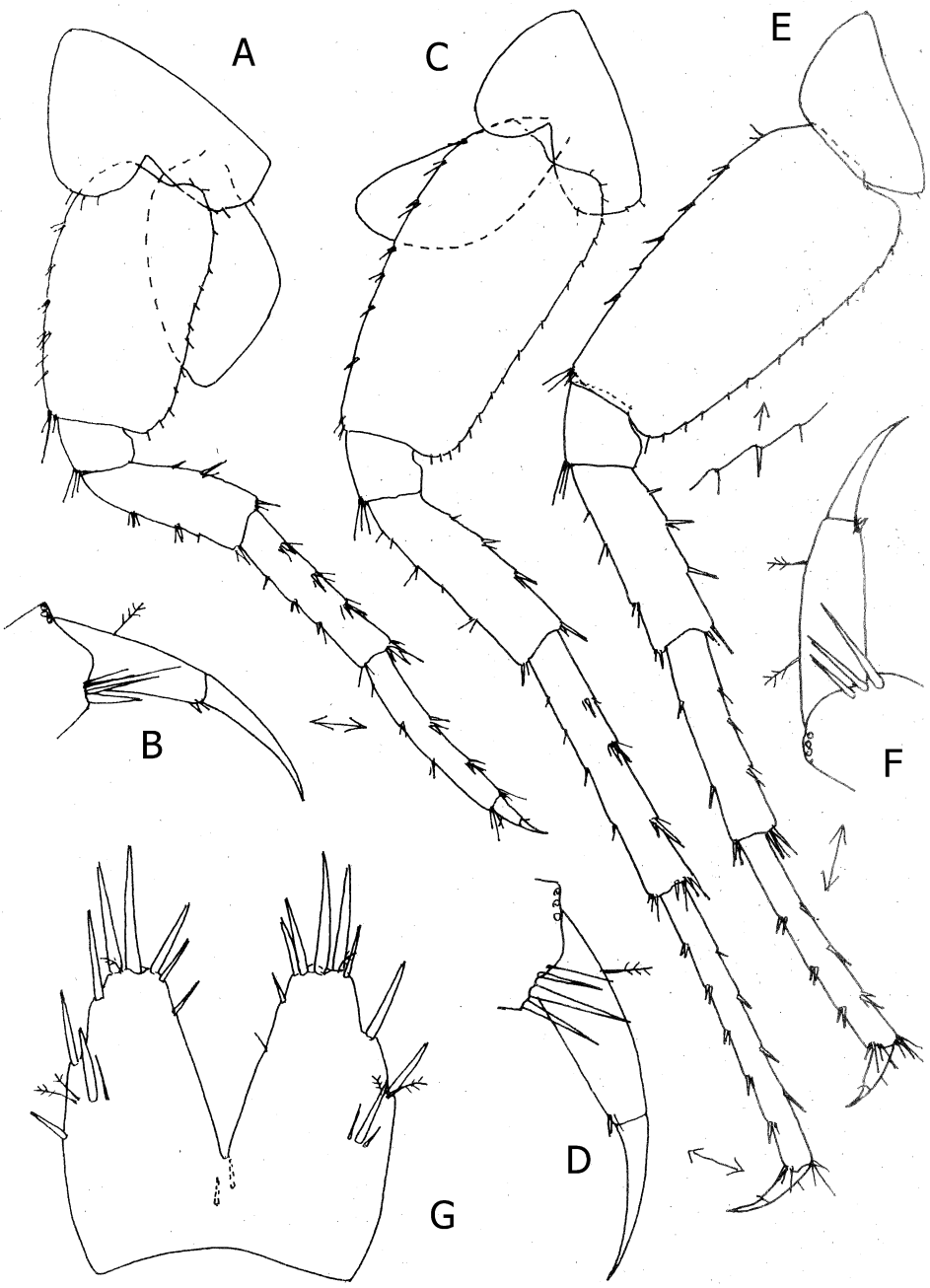

Fig. 8. *Niphargus* (*Niphargus*)"*gottscheeanensis* Delić et al. 2017, Željnske jame Cave, Kočevje, male 20.0 mm: A-B= pereopod 5; C-D= pereopod 6; E-F= pereopod 7; G= telson.

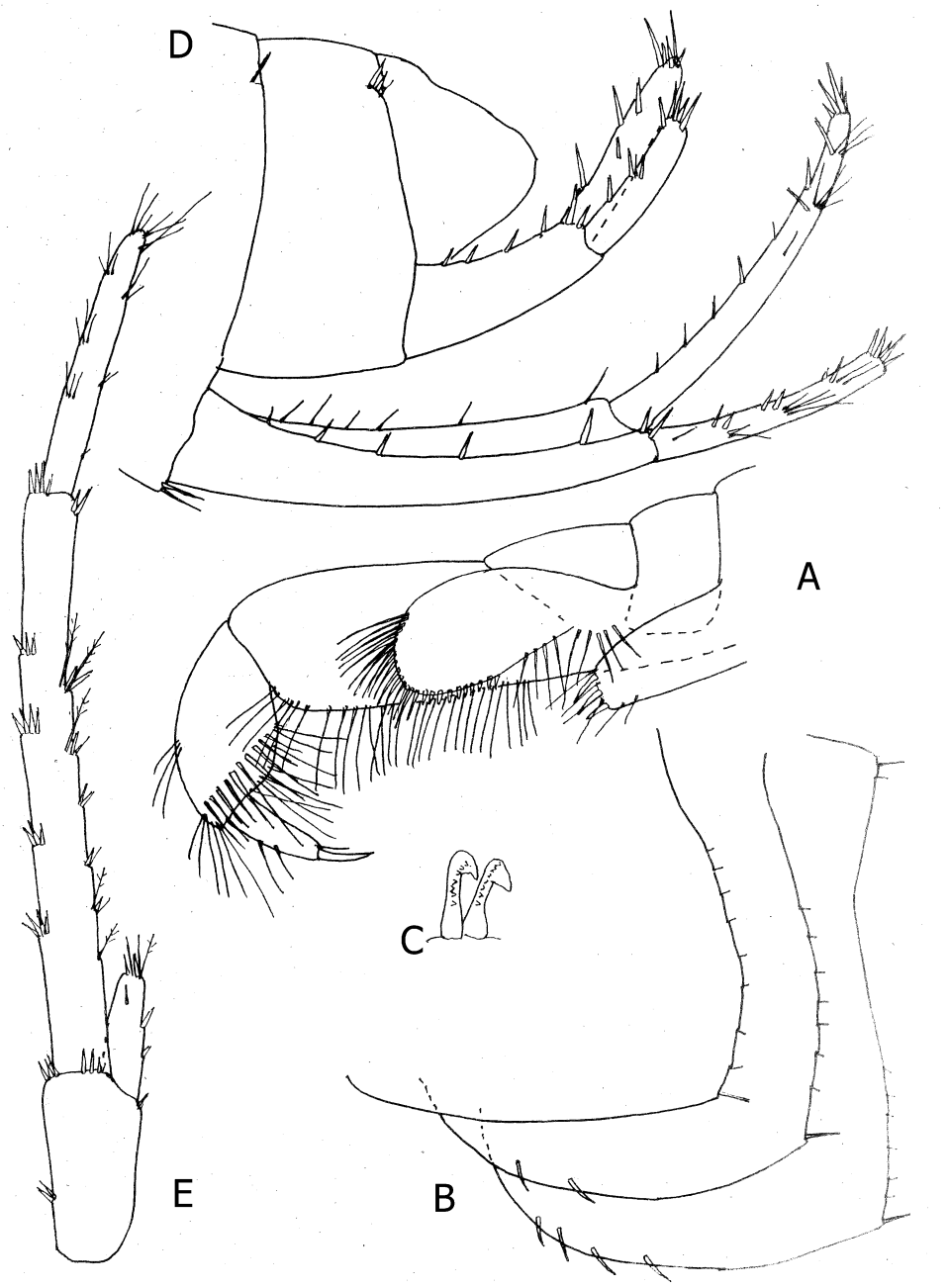

Fig. 9. *Niphargus* (*Niphargus*) *gottscheeanensis* Delić et al. 2017, Źeljnske jame Cave, Kočevje, male 20.0 mm: A= maxilliped. B= epimeral plates 1-3; C= retinacula; D= urosome with uropods 1-2; E= uropod 3.

Pleopods with 2 retinacula. Peduncle of pleopod 1 with 5 anterior simple setae sitting in the middle of anterior face of peduncle (fig. 9 I). Peduncle of pleopod 2 with 1 distoanterior median simple seta and 4 outer facial plumose setae (fig. 10J). Peduncle of pleopod 3 at posterior margin with 4-5 simple setae and 9-11 outer facial plumose setae (fig. 10K).

Uropod 1: peduncle relatively long, with dorsoexternal row of spines and dorsointernal row of setae; inner ramus elongated but shorter than peduncle, outer (dorsal) margin with row of several slender short spines and distal bunch of 5 short spines, as well as with 2-3 subdistal groups of short simple setae (fig. 9D); outer ramus exceeding half of inner ramus, with several lateral and 5 distal short spines as well as with 3-4 groups of short simple setae.

Uropod 2: peduncle with dorsal row of spines; inner ramus distinctly longer than outer one, both rami with short lateral and 5 distal short spines.(fig. 9D).

Uropod 3 long; peduncle longer than broad; with lateral and distal short spines; inner ramus shorter than peduncle, with single lateral and distal spines; outer ramus long, 2-articulated, first article at outer margin with 5 bunches of short spines (fig. 9E), at inner (mesial) margin with several groups of short spines mixed with single plumose setae; second article shorter than first one (ratio: 62:130), with bunches of short simple setae at margins and tip. Telson slightly broader than long, gaping; each lobe with row of 5 distal and outer and inner marginal spines, as well as with one facial spine accompanied by 1-2 short setae; a pair of short plumose setae appears near the outer middle of each lobe (fig. 8G).

Coxal gills on gnathopod 2 and pereopods 3-4 large (figs. 6D,E; 7D), these of pereopods 5-6 smaller (fig. 8A, C).

FEMALE 18 mm with setose oostegites: Mainly likes the male; metasomal segments 1-3 with 4 dorsoposterior marginal setae each (fig. 11E). Urosomal segment 1 with one seta on each dorsolateral side; urosomal segment 2 with 3 spines and one seta on each dorsolateral side, urosomal segment 3 naked (fig. 12G). Urosomal segment 1 with one group of 3 ventroposterior spine-like setae near basis of peduncle of uropod 1 (fig. 12G).

Epimeral plates 1-2 quadrate, with slightly convex posterior margin bearing nearly 5 short setae and poorly marked ventroposterior corner (fig. 11E). Epimeral plate 3 quadrate, with almost straight inclined posterior margin with nearly 10 short setae and well marked ventroposterior corner; epimeral plate 2 with 3, and epimeral plate 3 with 4 subventral spines. Antenna 1 poorly exceeding half of body, main flagellum with 29 articles; flagellum of antenna 2 with 12 articles.

Mouthparts like these in male. Mandibular palpus article 2 with 15 setae, article 3 with nearly 30 D-setae, 10 A setae, 10 B setae (2-3-3-1-1) and 7 E setae.

Maxilla 1 inner plate with 5 setae, outer plate with 7 spines [6 spins with one tooth, 1 spine with 3 teeth), palpus short, with 11 setae. Maxilliped like that in male.

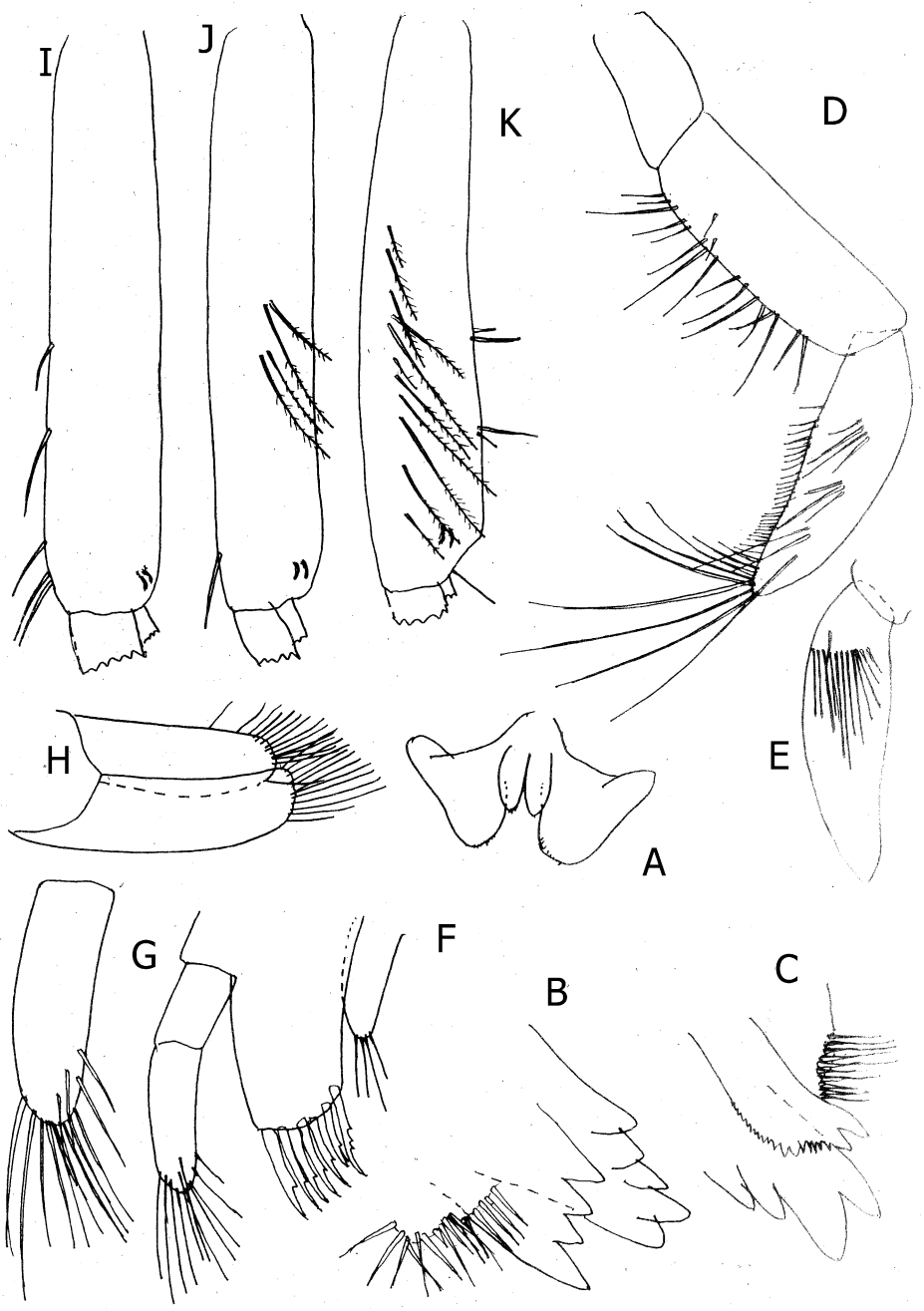

Fig. 10. *Niphargus* (Niphargus) *gottscheeanensis* Delić et al. 2017, Željnske jame Cave, Kočevje, male 20.0 mm: A= labium; B= left incisor with lacinia mobilis and rakers; C= right incisor with lacinia mobilis and rakers; D= mandibular palpus inner face; E= distal article of mandibular palpus, outer face; F-G= maxilla 1; H= maxilla 2; I= pleopod 1-peduncle; J= pleopod 2-peduncle; K= pleopod 3-peduncle.

Coxae 1-4 are slightly longer than these in males. Coxa 1 hardly longer than broad (ratio: 37:35), with narrowly subrounded ventroanterior corner and provided with nearly 17 short setae (fig. 11A); coxa 2 slightly longer than broad (ratio: 47:40), with nearly 15 marginal setae (fig. 11B); coxa 3 longer than broad (ratio: 52:40), with nearly 12 marginal setae (fig. 11C); coxa 4 longer than broad (ratio: 50:45), with nearly 11 marginal setae, ventroposterior lobe absent (fig. 11D).

Coxae 5-7 like these in male. Coxa 7 with one posterior marginal seta (fig. 12A). Gnathopod 1 articles 2-5 like these in male. Propodus trapezoid, slightly longer than broad (ratio: 80:72), at posterior margin with 8 transverse rows of setae, at anterior margin with 2 lateral and one distal bunch of setae (fig. 11F); palm slightly convex, inclined rather over half of propodus-length, defined on outer face by corner S-spine accompanied laterally by 4 L-spines and 7 corner facial M-setae; on inner face by one subcorner R-spine (fig. 11G). Dactylus reaching posterior margin of propodus, at outer margin with row of single or paired setae (1-2-1-2-1-1-2-1-1-1-2), at inner margin with row of very short setae (fig. 11F).

Gnathopod 2: articles 2-5 like these in male. Propodus trapezoid, less inclined than that in male, rather broader than long (ratio: 95:82), along posterior margin with 12 transverse rows of setae, at anterior margin with 2 lateral and one distal bunch of setae (fig. 11H). Palm slightly convex, inclined nearly half of propodus-length, defined on outer face by corner S-spine accompanied laterally by 3 slender L-spines and corner facial 6 M-setae, on inner face by one subcorner R-spine. Dactylus reaching posterior margin of propodus, at outer margin with row of setae (1-1-3-2-2-3-2-2-1-1-2), at inner margin with row of very short setae (fig. 11H).

Pereopods 3-4 like these in male. Pereopod 3 article 2 with numerous long anterior and posterior marginal setae (the longest setae exceeding diameter of article itself); article 3 with distoposterior bunch of setae exceeding length of article 3. Articles 4-6 of different length (ratio: 50:30:40), with pilosity like that in these of male. Dactylus much shorter than propodus (ratio: 22:42), with small spine at inner margin and one median plumose seta at outer margin, nail almost as long as pedestal.

Pereopod 4 like pereopod 3 with scarcely shorter various setae.

Pereopods 5-6 like these in male. Pereopod 7 as long as pereopod 6, with article 2 longer than broad (ratio: 88:43), anterior poorly convex margin with row of short spines mixed with single short setae, posterior slightly convex margin with nearly 15 short setae (some setae are replaced with short spines (fig. 12A), ventroposterior lobe absent. Articles 4-6 of different length (ratio: 43:65:80), along both margins with several bunches of short spines mixed often with single short setae (fig. 12B). Article 2 is longer than article 6 (ratio: 88:80). Dactylus much shorter than article 5 (ratio: 25:80), at inner margin with one weak spine near basis of the nail, at outer margin with 2 single plumose setae (fig. 12C), nail slightly shorter than pedestal (ratio: 33:45).

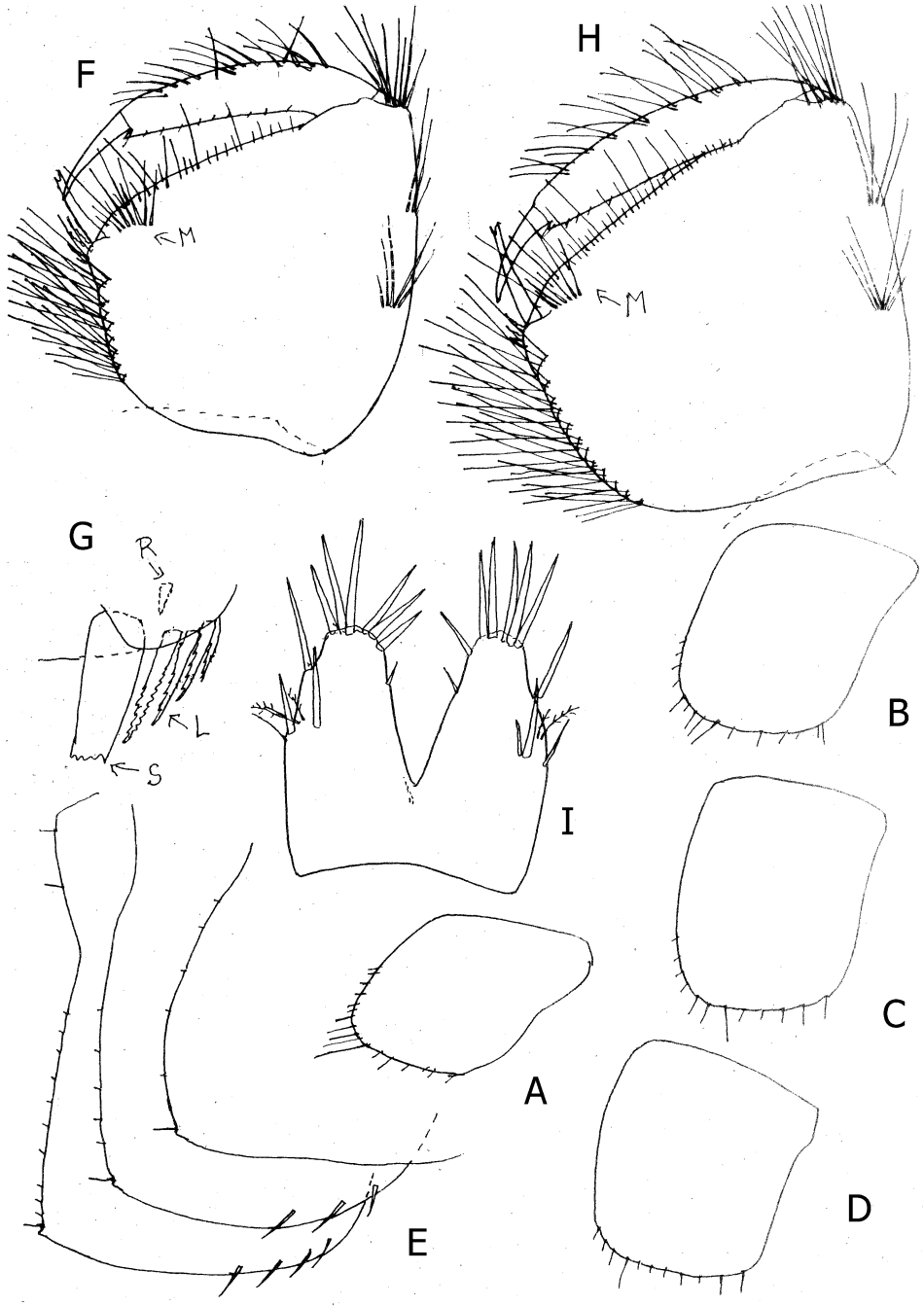

Fig. 11. *Niphargus* (*Niphargus*) *gottscheeanensis* Delić et al. 2017, Željnske jame Cave, Kočevje, female 18.0 mm: A= coxa 1; B= coxa 2; C= coxa 3; D= coxa 4; E= epimeral plates 1-3; F= gnathopod 1-propodus, outer face; G= distal corner of gnathopod 1-propodus, outer face [S= corner S-spine; L= lateral L-spines; R= subcorner R-spine, inner face]; H= gnathopod 2-propodus, outer face..

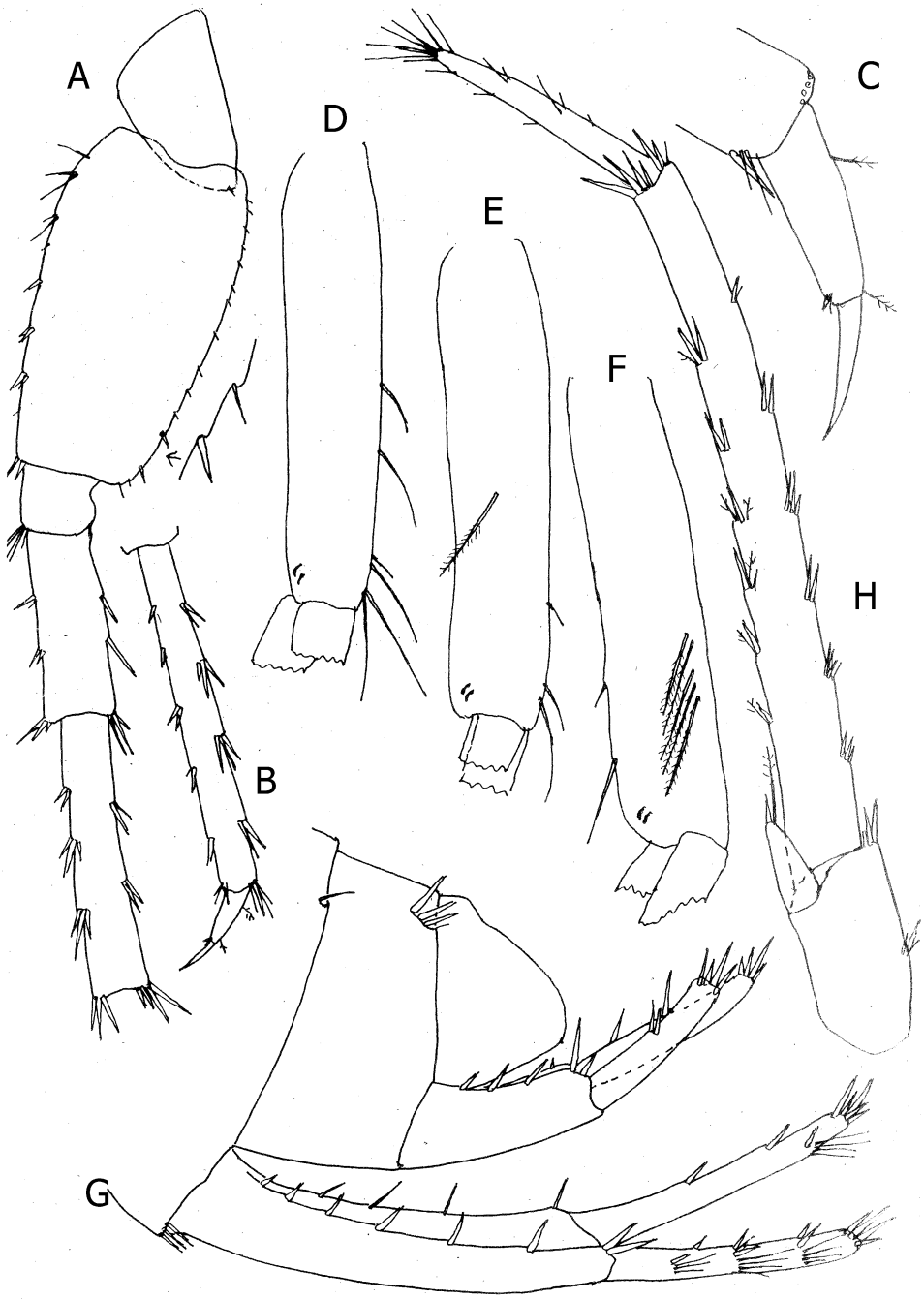

Fig. 12. *Niphargus* (*Niphargus*) *gottscheeanensis* Delić et al. 2017, Źeljnske jame Cave, Kočevje, female 18.0 mm: A-B-C== pereopod 7; D= pleopod 1-peduncle; E= pleopod 2-peduncle; F= pleopod 3-peduncle; G= urosome with uropods 1-2; H= uropod 3.

Pleopods 1-3 with 2 retinacula. Peduncle of pleopod 1 with 6 simple setae in the middle of anterior face of peduncle (fig. 12D); peduncle of pleopod 2 with 3 anterior simple setae and one outer facial plumose seta (fig. 12E). Peduncle of pleopod 3 with 2 4 posterior marginal simple setae and with 5-6 outer facial plumose setae.(fig. 12F).

Uropod 1: peduncle with dorsoexternal row of spines and dorsointernal row of setae (fig. 12G); inner ramus shorter than peduncle, with single lateral and 5 distal short spines, as well as with one bunch of short subdistal simple setae; outer ramus only slightly shorter than inner one, with 3 lateral spines and distal bunch of 4 spines, as well as with 3 lateral bunches of simple setae

Uropod 2: inner ramus slightly longer than outer one, both rami with lateral and distal short spines (fig. 12G).

Uropod 3: peduncle longer than broad, with one lateral and 2-3 distal spines; inner ramus scale-like, much shorter than peduncle with distal spine and plumose seta; outer ramus 2-articulated, elongated, first article along inner and outer margin with row of nearly 7 groups of short spines, at inner margin mixed with single very short plumose setae (fig. 12H); second article shorter than first one (ratio: 57:160), with short lateral single setae and distal bunch of rather longer simple setae.

Telson slightly broader than long, gaping; incised almost 2/3 of telson-length; each lobe with 5-6 distal and 1-2 outer and inner marginal spines, as well as 1-2 facial spines; a pair of short plumose setae attached medially at outer lateral margin of each lobe (fig. 11 I).

Coxal gills like these in male. Oostegites broad, occur on mesosomal segments 2-5.

VARIABILITY.

Number of outer marginal setae on dactylus in gnathopods 1-2 rather variable; inner plate of maxilla 1 with 4-5 setae, palpus with 11-14 setae. Dactylus of pereopod 7 with 1-2 median setae at outer margin; article 6 of pereopod 7 usually as long as that in pereopod 6, seldom shorter (regeneration?). Urosomal segment 1 at ventroposterior corner usually with one spine, seldom replaced with 2-3 spine-like setae. Telson always with distal, lateral and facial spines. The number of plumose setae on peduncle of pleopods is rather variable but present.

KOMPOLJSKA jama Cave (male 15 mm, female 20 mm: mainly agree with specimens of Źeljnske jame Cave, but also with these of Podpeška jama Cave: narrowed article 2 of pereopods 5-7 with posterior marginal setae sometimes replaced by single small spine; peduncle of pleopod 1 with 3-5 anterior setae, that of pleopod 2 with 1-4 anterior seta; peduncle of pleopod 3 with 3 posterior simple setae and 3-5 facial plumose setae.

Maxilla 1 inner plate 3-4 setae, palpus short, with 11-13 setae, gnathopods 1-2 propodus with one S-spine, 3 slender L- spines, 5-6 facial M-setae and one

subcorner R-spine. In males uropod 1 outer ramus reaching 2/3 of inner one (male 15 mm); uropod 2 inner ramus only slightly longer than outer one; one ventroposterior spine on urosomal segment 1 near basis of uropod 1-peduncle.

In females uropod 1 outer ramus reaching 5/6 of inner ramus, uropod 2 outer ramus reaching 4/5 of inner one. Uropod 3 in male of 15 mm outer ramus second article reaching 3/5 of first one, in females reaching 1/2 to 1/4 of first article.

Epimeral plate 3 angular or hardly acute; epimeral plates 1-2 with less convex posterior margin. Dactylus of pereopods 5-7 strong, with one slender spine at inner margin. Telson lobes with one facial spine, 3-4 distal and 0-2 inner and/or outer marginal spines.

LOCALITIES CITED : SLOVENIA:

Delić et al. 2017: Podpeška jama Cave, Podpeč, Dobrepolje; Spring SW from Sušje, Ribnica; Cave in quarry, Vinica, Črnomelj; Židovske kuće, Budinjak, Žumberak; Željnske jame Cave, Željne, Kočevje; springs NW of Kočevska reka River; Kočevska reka near Kočevje; spring near Obvrh, Mirtoviči, Osilnica;

?Kompoljska jama Cave, Slovenia (new).

REMAKS AND AFFINITIES.

The splitting *N. podpecanus* into three different species, (but without analyze of its morphological characters), the absence of different known morphological characters between *N. podpecanus* and *N. gottscheeanensis* and finding both taxa in the same locality (Podpeška jama Cave; Źeljnske jame Cave; spring near Obrh); request further studies and confirmation of its taxonomical status.

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