

ЦРНОГОРСКА АКАДЕМИЈА НАУКА И УМЈЕТНОСТИ  
ГЛАСНИК ОДЈЕЉЕЊА ПРИРОДНИХ НАУКА, 25, 2022.

ЧЕРНОГОРСКАЯ АКАДЕМИЯ НАУК И ИСКУССТВ  
ГЛАСНИК ОТДЕЛЕНИЯ ЕСТЕСТВЕННЫХ НАУК, 25, 2022

THE MONTENEGRIN ACADEMY OF SCIENCES AND ARTS  
PROCEEDINGS OF THE SECTION OF NATURAL SCIENCES, 25, 2022

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UDK 565.3(449.45)

*Gordan S. Karaman\**

**ON THE SUBTERRANEAN GENUS *NIPHARGUS* SCHIÖDTE  
1849 (FAM. NIPHARGIDAE) OF CORSICA ISLAND, FRANCE  
(CONTRIBUTION TO THE KNOWLEDGE OF THE  
AMPHIPODA 322)**

*Abstract*

The fauna of genus *Niphargus* Schiödte, 1849 (Crustacea, Amphipoda, fam. Niphargidae) in the subterranean waters of island Corsica in the Mediterranean Sea (France) was investigated. The single confirmed species in Corsica, *Niphargus corsicanus*, has been discovered and briefly described by Schellenberg (1950) from spring Vornaccia, Solaro reg., Ordinaccio Mt., Corsica Island. Later this species was cited by some authors in other localities of Corsica. New unknown localities of this species from Corsica are cited and redescription of this species based on specimens of new localities is presented. The variability of taxonomical characters of this species is discussed and citations of species *Niphargus* aff. *tatrensis* Wrzes. 1890 for Corsica are mentioned.

*Keywords:* taxonomy, Amphipoda, subterranean waters, *Niphargus corsicanus*, description, Corsica Island, France

**INTRODUCTION**

Fauna of genus *Niphargus* Schiödte, 1849 in France is very rich, containing over 35 known taxa, discovered from various types of subterranean waters (caves, springs, wells, interstitial waters, lakes, etc.). Despite this, fauna of Amphipoda, and especially of genus *Niphargus*, in France is still only partially known and various new taxa are waiting to be discovered.

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\* Gordan S. Karaman, Montenegrin Academy of Sciences and Arts, Podgorica, Montenegro.  
e-mail: [karaman@t-com.me](mailto:karaman@t-com.me)

Among so many known taxa, only one species is known and confirmed from the subterranean waters of Corsica Island in the Mediterranean Sea, *Niphargus corsicanus*, discovered and briefly described by Schellenberg in 1950. Beron (1972) during his investigations of caves in Corsica Island, collected specimens of genus *Niphargus* in one cave and mentioned that these specimens are not identical with these of known *Niphargus corsicanus* Schell. But he has never published his discovery more in detail, and this remains unsolved.

In the same year (1972) Stock published his investigations of genus *Niphargus* from many localities in Corsica. He collected *N. corsicanus* in numerous localities and made redescription of this species under the name *Niphargus longicaudatus corsicanus*. Among so many samples, he mentioned to find in 2 localities specimens of genus *Niphargus* different than these of *N. corsicanus*. He figured and described these specimens under the name *Niphargus* aff. *tatrensis* Wrzesniowski 1890.

Later Hovenkamp et al. (1984) studied specimens of *N. corsicanus* from numerous localities in Corsica, including specimens of *Niphargus* aff. *tatrensis* of Stock, based on cluster analysis, and they concluded “On account of our results we consider the form *N. aff. tatrensis* identical with *N. longicaudatus corsicanus*” (p. 134).

During our investigations of *Niphargus* species from France, we established 3 new localities of *Niphargus corsicanus* from Corsica Island, and results of these investigations are presented here.

## MATERIAL AND METHODS

The studied material was preserved in 70% ethanol. The specimens were dissected using a WILD M20 microscope and drawn using a camera lucida attachment. All dissected appendages were submersed in the mixture of glycerin and water for study and drawing. The body-length of examined specimens was measured from the tip of head to the end of telson using camera lucida. All illustrations were inked manually. After the end of the study, dissected body parts are submerged in Liquid of Faure and covered by thin cover glass forming permanent slides. Some morphological terminology and setae's formulae follow Karaman's terminology (Karaman, G. 1969; 2012) for setae of last 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 for setae and spines on propodus of gnathopods 1 and 2 [S = corner S-spine; L = lateral slender serrate L-spines; M = facial M-setae; R = subcorner R-spine on inner face].

Term “setae” and “spines” are used based on its shape, not origin. The work is based on morphological and ecological investigations and data.

**TAXONOMICAL PART**

**Family NIPHARGIDAE**

**Genus *NIPHARGUS* Schiödte, 1849**

***NIPHARGUS CORSICANUS* Schellenberg, 1950**

**Figures 1-8**

*Niphargus corsicanus* Schellenberg, 1950: 325, fig. 1; Ruffo, 1960: 170; Straškraba, 1972: 87; Morand-Chevat, 1972: 26; Vigna-Taglianti, 1972: 14; Barnard, J.L. & Barnard, C.M. 1983: 690; Ferreira et al., 2007: 589 (no localities);

*Niphargus longicaudatus corsicanus* Stock, 1972: 204, figs. 2-7; G. Karaman & Ruffo 1986: 527; Ginet, 1991: 18K; Ginet, 1995/96: 161, figs. 2, 7, pls. 1-4;

? *Niphargus* aff *tatrensis* Stock, 1972: 206, figs. 7-11; Hovenkamp et al., 1984: 154.

**MATERIAL EXAMINED:**

AMD/00392= spring near Mandriole, Santa Maria di Lotta, Corsica, France, 22.4.1992, 10 exp. (leg. B. Bodon);

AMD/00393= spring in Fontanone, Casamozza, Corsica, France, 16.4.1992, 5 exp.;

AMD/00403= springs in Salgi, on road towards Poggio, Corsica, 20.4.1992, 4 exp. (leg. M. Bodon).

**DIAGNOSIS.** Moderately slender body, adult specimens 4-13 mm, metasomal segments with scarce number of dorsoposterior marginal setae, epimeral plates obtusely angular to slightly pointed (female). Coxae short, coxa 4 unlobed. Antenna 1 peduncular article 3 short, accessory flagellum 2-articulated, shorter than last peduncular article.

Maxilla 1 inner plate 2-3 setae, outer plate 7 spines (6 with one lateral tooth), palpus short, with several distal setae. Maxilliped inner plate with 3-4 distal spines.

Gnathopods 1-2: trapezoid propodus, nearly as large as corresponding coxae, palm inclined, L-spines attached laterally of S-spine, dactylus outer margin with row of single or pairs of setae. Dactylus of all pereopods strong, with one strong spine at inner margin (occasionally some additional spines on some of dactyls). Article 2 of pereopods 5-7 longer than broad, unlobed. Pleopods with 2 retinacula. Uropod 1 in males and females with equal rami or inner ramus slightly longer. Uropod 3 long in males, shorter in females. Telson as long as

or longer than broad, deeply incised, with 3-4 short distal spines, 0-2 marginal spines, and 0-1 facial spine.

DESCRIPTION (AMD/ 00392= spring near Mandriole, Santa Maria di Lotta):

**MALE 9.2 mm.** Body moderately slender, metasomal segments with 2-4 short dorsoposterior marginal setae each (fig. 4A). Urosomal segment 1 on each dorsolateral side with 1 seta, urosomal segment 2 on each dorsolateral side with 2 spines and one strong seta; urosomal segment 3 smooth. Urosomal segment 1 ventroposterior corner with one spine near basis of uropod 1-peduncle (fig. 3F). Sexual palpi on ventral side of last mesosomal segment well developed (fig. 1L).

Epimeral plates 1-3 with strongly angular ventroposterior corner and nearly straight posterior margin bearing 6-7 setae, corner seta strong. Epimeral plate 2 with 2 subventral spines, epimeral plate 3 with 3 subventral spines (fig. 4A).

Head with short rostrum, short subrounded lateral cephalic lobes, ventroanterior excavation well developed (fig. 1A), eyes absent.

Antenna 1 nearly half of body-length; peduncular articles 1-3 progressively shorter (ratio: 52:36:15), scarcely setose (fig. 1B); main flagellum 26 articles scarcely setose, many of them with one short aesthetasc. Accessory flagellum short, 2-articulated, only slightly shorter than last peduncular article (fig. 1C).

Antenna 2 relatively slender; peduncular article 3 short, with bunch of dis-  
toventral setae; peduncular article 4 slightly longer than article 5 (ratio: 54:45), with several groups of setae mainly not exceeding diameter of article itself, distal bunch of setae exceeding diameter of article; article 5 with 4 lateral and 2 distal bunches of setae (the longest setae exceeding diameter of article itself (fig. 1D), flagellum longer than last peduncular article, with 11 articles bearing short setae. Antennal gland cone short (fig. 1D).

Labrum broader than long, with slightly concave distal margin (fig. 1E). Labium broader than long, outer lobes with subrounded distal part, inner lobes well developed, small (fig. 1F).

Mandibular molar triturative. Left mandible: incisor 5 teeth, lacinia mobilis 4 teeth, accompanied by 6 rakers. Right mandible: incisor 4 teeth, lacinia mobilis serrate, accompanied by 8 rakers (fig. 1G). Palpus mandibulae 3-articulate: first article bald; second article shorter than third one (ratio: 62:80), bearing 11 strong setae (fig. 1H); third article subfalciform, ventral margin with nearly 21 D-setae and 6-7 distal E-setae; on inner face 4 groups of B-setae (2-2-1-2) (fig. 1H), on outer face one transverse row of 5 A-setae (fig. 1 I).

Maxilla 1: inner plate with 2-3 setae, outer plate with 7 spines [6 spines with one lateral tooth, one spine with 2-3 teeth], palpus 2-articulated, short, not reaching distal tip of outer plate-spines (fig. 3A), bearing 7 distal setae.

Maxilla 2 inner plate slightly smaller than outer one, both plates with numerous distal setae only (fig. 1J).

Maxilliped: inner plate short, not reaching outer tip of palpus article 1, with 3 distal spines and several setae longer than spines (fig. 2A); outer plate nearly half of palpus article 2, along mesial margin with nearly 9 pointed spines and row of distomarginal setae. Palpus 4-articulated, article 3 along outer margin with median and distal bunch of setae; article 4 (dactylus) with one median seta at outer margin and one seta at inner margin near basis of nail (fig. 2A).

Coxae relatively short. Coxa 1 broader than long (ratio: 45:24), subrounded ventroanterior part bearing nearly 7 unequally long setae (fig. 2B). Coxa 2 broader than long (ratio: 48:37), strongly subrounded ventroanterior margin bearing nearly 9 setae (fig. 2E). Coxa 3 broader than long (ratio: 42:38), convex margin with nearly 8 setae (fig. 3B). Coxa 4 distinctly broader than long (ratio: 48:36), with nearly 8 marginal setae, ventroposterior lobe not developed (fig. 3D).

Coxae 5-7 shallow. Coxa 5 broader than long (ratio: 58:31), anterior lobe broadly subrounded, bearing 5-6 short setae (fig. 4B), posterior margin with one strong and one small seta.

Coxa 6 rather smaller than 5, broader than long (ratio: 47:29), anterior lobe subrounded, bearing 2-3 short setae, posterior part with one marginal seta (fig. 4D).

Coxa 7 entire, convex, broader than long (ratio: 43:23) with one posterior marginal seta (fig. 4E).

Gnathopods 1-2 moderately large, of unequal size. Gnathopod 1: article 2 anterior margin with 5 setae, posterior margin with 2 median and 4-5 distal setae; article 3 with posterodistal bunch of setae (fig. 2B). Article 5 rather shorter than propodus (ratio: 29:40), anterior margin with distal bunch of setae, inner face with row of distal single setae. Propodus trapezoid, slightly longer than broad (ratio 84:78), posterior margin with 7 transverse rows of setae, anterior margin with one median and one distal group of setae (fig. 2C). Palm slightly convex, inclined nearly half of propodus-length, defined on outer face by one corner S-spine accompanied laterally by 2 serrate L-spines and 5 facial M-setae, on inner face by one strong short R-spine (fig. 2D). Dactylus reaching posterior margin of propodus, outer margin with 6 median setae (1-2-1-1-1), inner margin with row of several short single setae (fig. 2C).

Gnathopod 2: article 2 anterior margin with 6 setae, posterior margin with 4 median and 4 distal setae; article 3 with distoposterior bunch of setae (fig. 2E). Article 5 slightly shorter than propodus (article 6) (ratio: 35:48), anterior margin with distal group of setae, inner face with distal row of single setae. Propodus remarkably larger than that of gnathopod 1, broadly trapezoid, nearly as long as broad, posterior margin with 7 transverse rows of setae (fig. 2F). Palm slightly convex, inclined nearly 3/5 of propodus-length, defined on outer face by

one corner S-spine; 2 L-spines sitting laterally of S-spine, longer L-spine partially behind S-spine; 4 M-setae appear in distoposterior corner of outer face; on inner face one subcorner strong R-spine (fig. 2G). Dactylus reaching posterior margin of propodus, outer margin with row of 6 setae (2-1-1-2), inner margin with row of short single setae (fig. 2F).

Pereopods 3-4 moderately strong, almost of the same size. Pereopod 3: article 2 anterior margin with 2 proximal long and 4-5 short setae, posterior margin with 3-4 proximal long setae and 3-4 shorter distal setae. Articles 4-6 of different length (ratio: 45:28:35), article 4 with short spines at anterior margin, posterior margin with setae (the longest setae nearly reaching diameter of article itself); article 5 posterior margin with 3 bunches of short spines; article 6 posterior margin with 5 groups of short spines, anterior margin with single short setae (fig. 3B). Dactylus strong, much shorter than article 6 (ratio: 15:35), inner margin with strong spine near basis of nail, outer margin with one median plumose seta (fig. 3C); nail shorter than pedestal (ratio: 29:38).

Pereopod 4: pilosity scarcely shorter than that in pereopod 3. Article 2 with 2 distoanterior and 3 distoposterior long setae; 4 marginal short setae at distal anterior margin and 2 median spines in distal posterior margin. Articles 4-6 of different length (ratio: 39:27:33); article 4 at anterior margin with 3 single spines, posterior margin with 4 groups of shorter setae; articles 5 and 6 anterior margin with single setae, posterior margin with 2-3 groups of short spines mixed often with single short seta (fig. 3D). Dactylus much shorter than article 6 (ratio: 19:33), strong, inner margin with one strong spine near basis of nail, outer margin with one median plumose seta; nail shorter than pedestal (ratio: 28:35) (fig. 3E).

Pereopod 5 remarkably shorter than pereopod 7, article 2 longer than broad (63:40), anterior poorly convex margin with 4 single marginal spines and distal group of setae, posterior margin nearly straight in the middle, bearing 11 short setae, ventroposterior dilatation unlobed; articles 4-6 of different length (ratio: 35:38:45); bearing groups of short spines or short setae at both margins (fig. 4B). Article 2 longer than article 6 (ratio: 63:45). Dactylus much shorter than article 6 (ratio: 15:45), strong, inner margin with strong spine near basis of nail, outer margin one median plumose seta (fig. 4C); nail nearly as long as pedestal.

Pereopod 6 missing.

Pereopod 7: article 2 much longer than broad (ratio: 80:45), anterior almost straight margin with 5 spines, posterior poorly convex margin nearly straight in distal part, with 14 short setae, ventroposterior dilatation unlobed. Articles 4-6 of different length (ratio: 50:56:86); article 4 anterior margin with 2 groups of setae, posterior margin 2 single strong spines (fig. 4E); article 5 anterior margin 3 groups of spines and single setae, posterior margin 2 spines and distal group of spines. Article 6 anterior margin with 4 groups of strong short spines, posterior

margin 4 groups of spines, distal setae longer than spines. Article 2 shorter than article 6 (ratio: 80:86). Dactylus much shorter than article 6 (ratio: 30:86), inner margin with strong spine near basis of nail, outer margin with one median plumose seta (fig. 4F), nail shorter than pedestal (ratio: 40:115).

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

Uropod 1: peduncle with dorsoexternal row of spines and dorsointernal row of setae (except distal spine); rami distinctly of equal length, shorter than peduncle; outer ramus with 2 lateral single spines and 4-5 short distal spines (fig. 3F); inner ramus 2 lateral spines and bunch of 3 short simple subdistal setae, at tip 4 short spines.

Uropod 2: inner ramus slightly longer than outer one, both rami with one lateral and 4 distal short spines (fig. 3F).

Uropod 3 very long and slender: peduncle much longer than broad (ratio: 51:16), with 2 lateral and 2-3 distal slender short spines. Inner ramus very short, scale-like, with 2 distolateral setae. Outer ramus 2-articulated: first article with 4 groups of small spines and simple short setae at outer margin, at inner (mesial) margin 4 groups of 1-2 simple setae [plumose setae not observed]; second article slightly longer than first one (ratio: 145:139), both margins with several short simple setae, at tip with group of short simple setae (fig. 3G).

Telson slightly longer than broad (ratio: 80:72), incised slightly over 2/3 of telson-length; each lobe with 3-4 distal short spines, one spine along outer margin and 1-2 spines along inner (mesial) margin (fig. 1K); one short slender spine attached in the middle of dorsal face in both lobes; a pair of short plumose setae attached near middle of external part of lobes.

Coxal gills on gnathopod 2 and pereopods 3-6 ovoid, not reaching ventral tip of corresponding article 2; on gnathopod 2 and pereopods 5 and 6 short (figs. 2E, 4B. D). Coxal gills on pereopod 4 more elongated (fig. 3D), on pereopod 3 shorter and more ovoid (fig. 3B).

**FEMALE 7.2 with oostegites:** Body slightly broader; metasomal segments 1-3 with 2-4 dorsoposterior marginal short setae (fig. 5E). Epimeral plate 1 angular, slightly convex posterior margin with stronger corner spine and 3 short marginal setae (fig. 5E).

Epimeral plate 2 slightly pointed, along posterior rather concave margin 4-5 lateral short setae and one corner strong spine-like seta. Epimeral plate 3 distinctly pointed, posterior concave margin 4-5 short setae and stronger corner spine-like seta; epimeral plates 2 and 3 with 3 subventral spines each (fig. 5E).

Urosomal segment 1 on each dorsolateral side with one seta; urosomal segment 2 on each side with 2 spines and 2 short setae (fig. 8A); urosomal segment 3 naked. Ventroposterior corner of urosomal segment 1 with one spine near basis of uropod 1-peduncle (fig. 8B).

Antenna 1 reaching nearly half of body, peduncular articles progressively smaller (ratio: 63:35:15), scarcely setose (fig. 5A), main flagellum with 21 articles (some of them with one short aesthetasc). Accessory flagellum 2-articulate, almost as long as last peduncular article (fig. 5A).

Antenna 2: peduncular article 3 with distoventral group of longer setae; peduncular article 4 slightly longer than 5, ventral margin with 2 groups of long setae (the longest setae exceeding diameter of article (fig. 5B), dorsal margin 4 groups of short setae; article 5 ventral margin 3 groups of long setae, dorsal margin 3 groups of shorter setae. Flagellum relatively slender, slightly shorter than peduncular articles 4 and 5 combined, with 10 articles bearing setae longer at ventral margin; antennal gland cone short (fig. 5B).

Coxae slightly longer than these in male. Coxa 1 broader than long (ratio: 50:39), ventroanterior corner subrounded, with 6 marginal setae (fig. 6A); coxa 2 nearly as long as broad, ventral subrounded margin with 9 unequal setae (fig. 6D); coxa 3 scarcely longer than broad (ratio: 60:58), convex margin with 7 unequal setae (fig. 5C). Coxa 4 nearly as long as broad, with 7 setae at ventral margin, ventroposterior lobe not developed (fig. 5D).

Coxae 5-7 shallow. Coxa 5 broader than long (ratio: 55:40), bilobed, anterior lobe subrounded, 6-7 marginal setae, posterior lobe with corner spine-like seta and 2 posterior marginal setae (fig. 7A). Coxa 6 rather smaller than 5, broader than long (ratio: 50:33), anterior lobe subrounded, with 3 marginal setae, posterior lobe with strong ventroposterior seta and 1-2 strong marginal setae (fig. 7B). Coxa 7 entire, broader than long (ratio: 46:22), with one strong posterior spine-like seta (fig. 7C).

Head and mouthparts similar to these in male. Palpus mandibulae article 3 with nearly 19 D-setae, 5 distal E-setae, 4-5 A-setae and 6-7 B-setae.

Maxilla 1 inner plate with 2-3 setae, outer plate 7 spines (6 spines with one lateral tooth, one spine 2 lateral teeth), palpus with 5-6 setae, not reaching tip of outer plate spines. Maxilliped inner plate with 3 distal spines, palpus (article 4) at inner margin one seta near basis of nail.

Gnathopods 1-2 propodus nearly as large as corresponding coxae. Gnathopod 1 distinctly smaller than 2, article 2 with 6 anterior longer setae and nearly 4 posterior marginal setae. Article 3 with one distoposterior bunch of setae (fig. 6A); article 5 shorter than propodus (ratio: 35:50), with distoanterior bunch of setae, inner face with distal row of setae. Propodus trapezoid, slightly longer than broad (ratio: 80:69), posterior margin with 6 transverse rows of setae (fig. 6B);

palm slightly convex, inclined almost to the half of propodus-length, defined on outer face by corner S-spine accompanied laterally by 2 serrate L-spines (longer L spine sitting laterally or partially behind S-spine) (fig. 5C) and 5 corner facial M-setae; on inner face by one strong R-spine. Dactylus reaching posterior margin of propodus, outer margin with 6 median setae (2-2-1-2), inner margin with row of short setae (fig. 6B).

Gnathopod 2: article 2 anterior margin with 6 long single setae, posterior margin with 2 lateral and 2 distal long setae; article 3 with distoposterior bunch of setae. Article 5 shorter than propodus (ratio: 43:51), anterior margin with distal bunch of setae, inner face with distal row of setae (fig. 6D). Propodus trapezoid, nearly as long as broad, posterior margin with 8 transverse rows of setae (fig. 6E). Palm slightly convex, inclined nearly half of propodus-length, defined on outer face by corner S-spine accompanied laterally by 2 L-spines (longer L-spine sitting close to the S-spine or slightly behind it) and 5 facial corner M-setae (fig. 6F). Dactylus reaching posterior margin of propodus, outer margin with 7 setae (2-1-2-2), inner margin with row of short setae (fig. 6E).

Pereopods 3-4 moderately stout. Pereopod 3: article 2 anterior margin with 5 shorter setae in distal part and 3 long proximal setae, posterior margin with long setae in proximal part and 5 short setae in distal part. Article 3 with distoposterior bunch of setae (fig. 5C). Articles 4-6 of different length (ratio: 50:29:40). Article 4 posterior margin with 4 groups of setae (the longest setae exceeding diameter of article itself); article 5 posterior margin with 2-3 single spines mixed with single short seta; article 6 posterior margin with 5 groups of single short spines and setae. Dactylus remarkably shorter than article 6 (ratio: 17:40), inner margin with one strong spine near basis of nail, outer margin with one median plumose seta.

Pereopod 4 poorly shorter than pereopod 3, pilosity almost as that in pereopod 3. Article 2 with long setae in proximal part and short setae in distal part (fig. 5D). Articles 4-6 of different length (ratio: 43:27:36), article 4 posterior margin with 3-4 bunches of setae usually not exceeding diameter of article itself; articles 5 and 6 posterior margin with bunches of short spines mixed with single short setae. Dactylus short and strong, much shorter than article 6 (ratio: 17:36), inner margin with spine near basis of nail, outer margin with one median plumose seta.

Pereopod 5 shorter than pereopods 6 and 7. Pereopod 5: article 2 dilated, longer than broad (ratio: 61:40), anterior margin with row of nearly 6 spine-like setae, posterior poorly convex margin with 9 short setae and spine-like setae, ventroposterior dilatation not fully developed into lobe (fig. 7A). Articles 4-6 of different length (ratio: 31:37:41). Article 4 anterior margin with 4 setae, posterior margin 2 spines and setae. Both margins of articles 5-6 with 3 groups

of short spines, tip of article 6 with several longer setae and short spines. Article 2 longer than article 6 (ratio: 61: 41). Dactylus much shorter than article 6 (ratio: 15:41), inner margin with one spine near basis of nail, outer margin with one median plumose seta.

Pereopod 6: article 2 dilated, longer than broad (ratio: 79:46), tapering distally, along anterior slightly convex margin with row of 7 slender spines (distal spine is longest one), along posterior margin with 11 short setae and single short spines (fig. 7B), ventroposterior dilatation is not fully developed into lobe. Articles 4-6 of different length (ratio: 50:60:70); article 4 anterior margin with 2 groups of setae and distal spine and seta, posterior margin with 2 single spines; articles 5-6 along both margins with groups of spines. Article 2 longer than article 6 (ratio: 79:70). Dactylus much shorter than article 6 (ratio: 21:70), inner margin with one strong spine near basis of nail, outer margin with one median plumose seta.

Pereopod 7: article 2 longer than broad (ratio: 80:49), ventroposterior dilatation without distinct lobe, anterior poorly convex margin provided with 7 single spines, posterior convex margin with 10 single very short spines (fig. 7C). Articles 4-6 of different length (ratio: 44:56:77), article 4 anterior margin with 2 groups of setae and distal spine, posterior margin with 2 single spines mixed with one short seta. Articles 5-6 at both margins with several bunches of spines and single short seta. Article 2 longer than article 6 (ratio: 80:77). Dactylus much shorter than article 6 (ratio: 27:77), inner margin with one strong spine and short seta near basis of nail, outer margin with one median plumose seta (fig. 7D); nail shorter than pedestal (ratio: 25:45).

Pleopods with 2 retinacula. Peduncle of pleopod 1 with one distoanterior seta, peduncle of pleopod 2 naked, that of pleopod 3 with one distoanterior seta and 3 distoposterior short setae.

Uropod 1: peduncle with dorsoexternal row of spines and dorsointernal row of setae (except distal spine). Rami distinctly of equal length, shorter than peduncle (fig. 8B); outer ramus with 2 lateral and 4 distal spines and one bunch of 2 subdistal simple short setae; inner ramus with one lateral and 5 distal short spines, and 2 subdistal simple setae.

Uropod 2: peduncle with lateral and distal spines; outer ramus with 2 lateral and 4 distal short spines (fig. 8C), inner ramus slightly longer than outer one, with 2 lateral and 5 distal spines.

Uropod 3 elongated; peduncle twice as long as broad, with distal spines; inner ramus scale-like, much smaller than peduncle, with 2 distal spines. Outer ramus 2-articulated, rather broader and shorter than that in male; first article inner margin with 5 groups of spines (4 groups mixed with one longer plumose seta

(fig. D); outer margin with 4 bunches of spines. Distal article remarkably shorter than first one (ratio: 50:121), both margins and tip with single simple setae.

Telson longer than broad (ratio: 77:60), incised  $\frac{3}{4}$  of telson-length; each lobe with 3 longer distal spines, one outer marginal spine and one facial spine; a pair of short plumose setae attached rather over half of external part of lobes (fig. 6G).

Coxal gills on gnathopod 2, pereopods 5 and 6 short, ovoid (figs. 6D, 7A, B), these of pereopod 3 large, ovoid (fig. 5C); gills on pereopod 4 long and narrowed, nearly reaching ventral tip of article 2 (fig. 5D).

Oostegites broad, with short marginal setae (figs. 5C, D), probably not in period of reproduction or not fully developed.

#### VARIABILITY.

**The specimens from Mandriole** agree mainly with original short description of *N. corsicanus* of Schellenberg 1950 from Vornaccia, except uropod 1 and spines on dactylus of all pereopods.

Antenna 1 peduncular article 3 more or less very short (figs. 1C, 5A, 8E), accessory flagellum almost as long as or slightly shorter than peduncular article 3. Uropod 1 in all our specimens, males and females, with equal rami. Dactylus of pereopods 3-7 always with one strong spine at inner margin.

**Male 7.0 mm:** Uropod 3 distal article of outer ramus longer than first one; telson with 4 distal and one outer marginal spine; Article 2 of pereopods 6-7 mainly with posterior marginal setae, small spines only in scarce number.

**Female 6.9 mm:** telson lobes with 3 distal and one outer marginal spine, facial spine absent (fig. 7E). Females usually with epimeral plates slightly more angular or pointed than these in male, basipodit of pereopods 7 and partially pereopod 6 with posterior marginal spines (in males usually with short setae).

The three specimens of *Niphargus* aff. *tatrensis* Wrzes. 1890, described and figured by Stock from two localities (Figarella; Marine de Nero) are very similar to these of *N. corsicanus*, and its mentioned morphological different characters are within the variability of *N. corsicanus* (maxilla 1 inner plate with 3 setae; maxilliped inner plate with 4+1 distal spines; size of posteroventral corner spine on epimeral plates; shape of pereopod 5 article 2 (basipodit)).

#### **The specimens from AMD/00393= spring in Fontanone, Casamozza:**

**Female 6 mm** with long setae on oostegites: uropod 1 inner ramus poorly longer than outer one, epimeral plate 3 angular. Metasomal segments with 4 dorsoposterior marginal setae; telson with 3-4 distal spines and one outer marginal spine, 0-1 inner marginal spine, facial spine absent; article 2 of pereopod 7 with small spines and setae along posterior margin. Dactylus of all pereopods with one spine.

**The specimens from AMD/00403= springs in Salgi, on road towards Poggio:**

**Female ovig. 4.0 mm:** urosomal segment 1 with dorsolateral seta, urosomal segment 2 with one dorsolateral spine; uropod 1 outer ramus almost as long as inner one, epimeral plate 3 obtusely pointed; with posterior margin convex; dactylus of all pereopods with one strong spine; posterior margin of pereopod 7 basipodit with more or less strong short setae only. Telson lobes with 3 distal and 0-1 outer marginal spine

**Male 5.0 mm:** left uropod 1 with equal rami, right uropod 1 inner ramus slightly longer than outer one; telson with 3 distal spines only; pereopod 7 article 2 with posterior marginal setae only; dactylus of pereopods 3-7 with one spine. Epimeral plates and urosomal segments like these in female.

Schellenberg described *N. corsicanus* based mainly on **female 4.5 mm** with setose oostegites (adult): He mentioned uropod 1 and uropod 2 inner ramus only slightly longer than outer one; uropod 3 outer ramus articles 1:2= 5:2; dactylus of pereopods 3-6 with one spine at inner margin; (female 5.5 mm pereopod 6 dactylus with 2 spines at inner margin); dactylus of pereopod 7 with 2 spines at inner margin.

His adult **male of 7.5 mm** was with missing uropod 1. His **male 5.0 mm:** pereopod 7 dactylus with 3 spines at inner margin; uropod 1 inner ramus longer than outer one (ratio 3:2); uropod 3 outer ramus with first article longer than second one (ratio 5:3).

Stock (1972) redescribed *N. corsicanus* based on 12 new localities; He mentioned male of 12-13 mm, and figured male uropod 1 inner ramus distinctly longer than outer one (ratio: 3:2), similar that mentioned by Schellenberg. Dactylus of pereopods 3-7 usually with one spine at inner margin, but sometimes one of dactyls with 2 spines (he figured it on pereopod 4); dactyl of pereopod 7 in one male with 2 spines (male from Fountain of village Solaro); maxilla 1 palpus with 4 setae; maxilliped inner plate with 4-5 spines; gnathopod 2 propodus in male broader than long; dactylus of pereopod 5 sometimes with 2 spines at inner margin; pereopod 7 dactylus rarely with 2 spines at inner margin. He suppose that these additional spines are accidental only.

He also shortly described from 2 localities (only 3 specimens) specimens very similar to *corsicanus* sub name *Niphargus* aff. *tatrensis* Wrzes. 1890: males 11.5 mm with uropod 1 inner ramus slightly longer than outer one (locality Figarella) or barely longer than outer one (locality Marine de Nero); dactylus of pereopods 3-7 in all 3 specimens with 1 spine at inner margin; telson without facial spines.

Hovenkamp et al (1984) studied material of 560 specimens from various localities of Corsica, presented map of Corsica with marked localities, but without the names of localities themselves. They used numerical and cluster analyses, but for us unknown morphological data regarding uropods, pereopods and other taxonomical data. They discussed also validity of *Niphargus longicaudatus corsicanus* and *Niphargus* aff. *tatrensis* cited by Stock. They concluded "On account of our results we consider the form *N.* aff. *tatrensis* identical with *N. longicaudatus corsicanus*" (p. 134).

Ginet (1995/96) besides already published figures of precedent authors, added some new figures of *N. corsicanus* from st. 31 (?Fountain in Chiaravalle). with more subrounded epimeral plates, uropod 1 with remarkably longer inner ramus, dactylus of pereopods with one spine at inner margin.

All these data, sometimes rather contradictory, show the large variability of morphological characters in various populations as well as in specimens within the same population of *Niphargus* in Corsica. The serious problem here is the taxonomic character "length of uropod 1 rami in males and females". Numerous known species within genus *Niphargus* have equal rami or distinctly unequal rami of uropod 1 as important stable taxonomic character (*N. valvasori* S. Karaman 1952, *N. elegans* Garbini 1894, *N. gineti* Bou 1965, etc.), but in some species length of rami in uropod 1 in males can be more or less variable [*N. stygius* (Schiödte 1847)]. Within the Corsica populations we have large variety of uropod 1 rami-size, what suggest the necessity to reexamine all population using molecular/genetic methods..

The presence of additional spines on dactylus sometimes is valid stable character (*Niphargus illidzensis* Schâferna 1922, *N. valachicus* Dobreanu & Manolache 1933, etc), but sometimes also very variable or accidental [*Niphargus longicaudatus* (Costa 1851), *N. navotinus* G. Karaman 2014, etc.].

At the moment, among mentioned specimens of *Niphargus* from Corsica, only a few of them are mentioned with additional spines on some of dactyls. It can be partially attributed as occasional, but probably some of populations have more incline to developed this character than others.

Evidently in Corsica exist various populations in the process of diversification, with already some partially distinct characters, but not yet fully isolated to each other to prevent breeding between them. The further genetic and molecular analyses will put some more light on it, but not every genetic variety is automatic a distinct species, because various population are in different way towards reproductive isolation, i.e. to the species-rank. For this reason we have not tried to split populations from Corsica into distinct taxa based on morphological characters only.

LOC. TYP.: Vornaccia springs, reg. Solaro, Ordinacio Mt., on 250 m asl., Corsica island, France.

DISTRIBUTION: Endemic species, known from Corsica only.

Schellenberg: Vornaccia springs, Solaro, Ordinacio Mt., Corsica island, France (locus typicus).

Stock (1972): Cave near left bank of river Bevinco, (Defile de Lacone); Fountain d'Aqua Freddola (NE of Rutali); Fountain 3 km NE of Piedicroce; Fountain in San Nicolao (N. of Cervione); Small source on right bank of river Tavignano (10 km ESE of Corte); Source 2 km ESE of Saparelle; Fountain in village Solaro; Souce 3 km E of Gurgazzo; Fountain in Chiaravalle (19 km N. of Partinello); Source nearly 6 km from St. Florent; Fountain of Porraghia (St. Florent region); Source near Olmeta-di-Tuda.

Stock (1972) mentioned this species under name *Niphargus* aff. *tatrensis* Wrzesniowski 1890 from spring 1 km from Figarella (station 9), and spring near Marine de Nero (station 39).

**The new localities:** spring near Mandriole, Santa Maria di Lotta; spring in Fontanone, Casamozza; springs in Salgi on road towards Poggio.

## REMARKS.

The species *Niphargus corsicanus* s. lato is rather similar to the *Niphargus stygius*-Complex, especially to the species of northern Italy, where various species differ to each other morphologically by minor but distinct differences.

The phylogenetic position of this valid species is still uncertain. Straškraba (1972), Moran-Chevat (1972) and Vigna-Taglianti (1972) considered this species as member of *N. longicaudatus*-Group. Ferreira et al (2007) mentioned it as "obligate species of France (Corsica)".

The further genetic-molecular analyses of various samples of *N. corsicanus* will show its real phylogenetical relations with other species of France and Italy.

## ACKNOWLEDGEMENTS

I am indebted to Dr Fabio Stoch from Italy for the loan of Corsica samples used in this study.

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*Gordan S. Karaman*

**O podzemnom rodu *Niphargus* Schiödte 1849  
(Fam. Niphargidae) Korzike, Francuska  
(322. Prilog poznavanju Amphipoda)**

*Sažetak*

Prezentirana je fauna roda *Niphargus* Schiödte, 1849 (Crustacea, Amphipoda, fam. Niphargidae) u podzemnim vodama otoka Korzike u Sredozemnom moru (Francuska). Jedina do sada sigurno potvrđena vrsta roda *Niphargus* otoka Korzika je *Niphargus corsicanus* Schellenberg 1950, svojevremeno otkriven i kratko opisan iz izvora Vornaccia, Solaro regiona, Ordinaccio brda na Korzici. Kasnije je ta vrsta citirana od drugih autora za pojedine druge lokalitete na Korzici. Dati su novi lokaliteti vrste *N. corsicanus* i detaljni opis te vrste na osnovu tih lokaliteta. Razmatrani su varijabilitet pojedinih taksonomskih karaktera ove vrste kao i citiranje vrste *Niphargus* aff. *tatrensis* za Korziku.

*Ključne riječi:* taksonomija, Amphipoda, podzemne vode, *Niphargus corsicanus*, opis, otok Korzika, Francuska

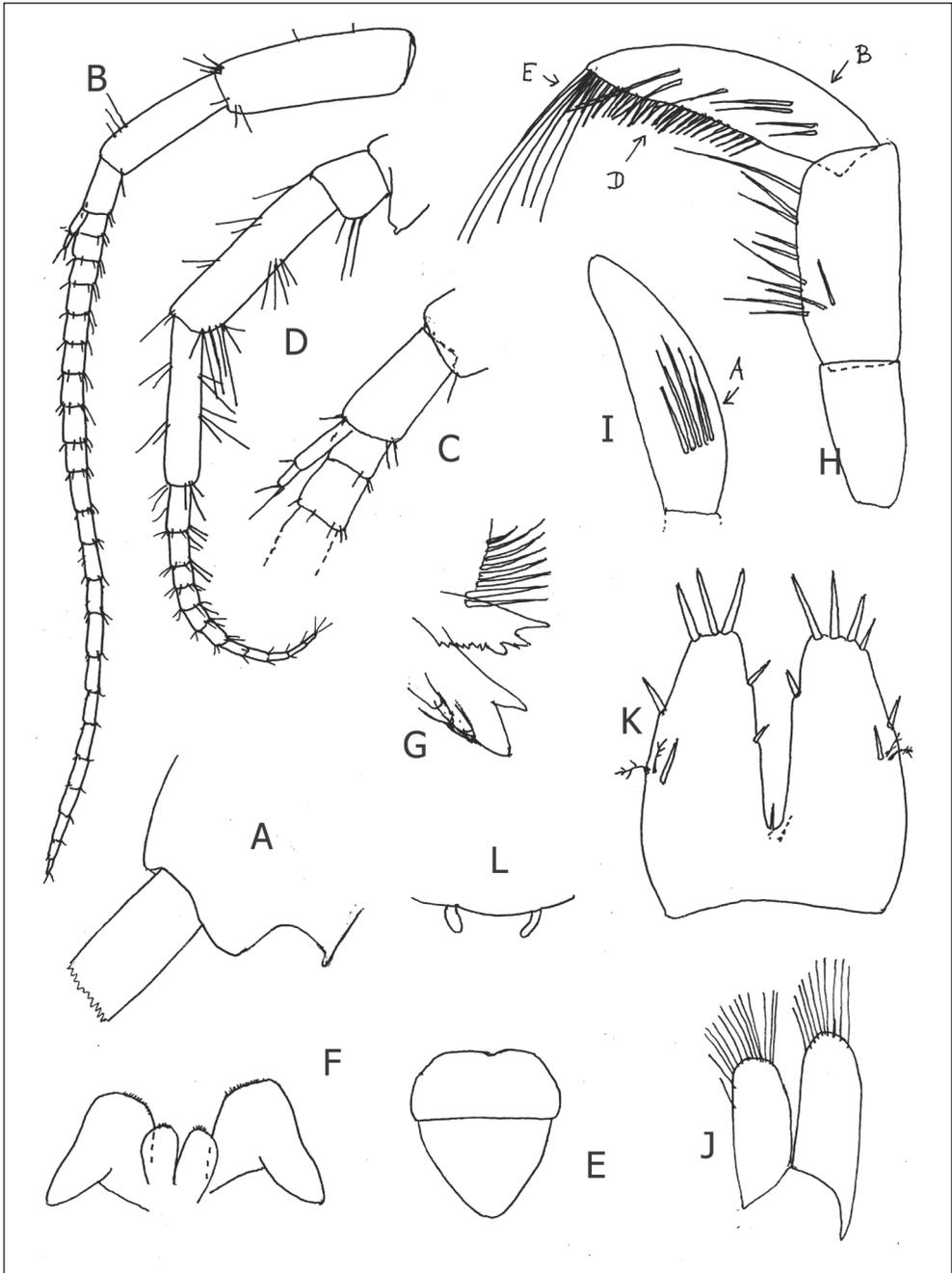


Fig. 1. *Niphargus corsicanus* Schellenberg 1950, springs near Mandriole, Corsica Island, male 9.2 mm: A= head; B= antenna 1; C= accessory flagellum; D= antenna 2; E= labrum; F= labium; G= right mandible, distal part; H= mandibular palpus inner face [B= inner facial B-setae; D= marginal D-setae; E= distal E-setae]; I= mandibular palpus article 3, outer face [A= facial A-setae]; J= maxilla 2; K= telson; L= sexual palpi on mesosomal segment 7.

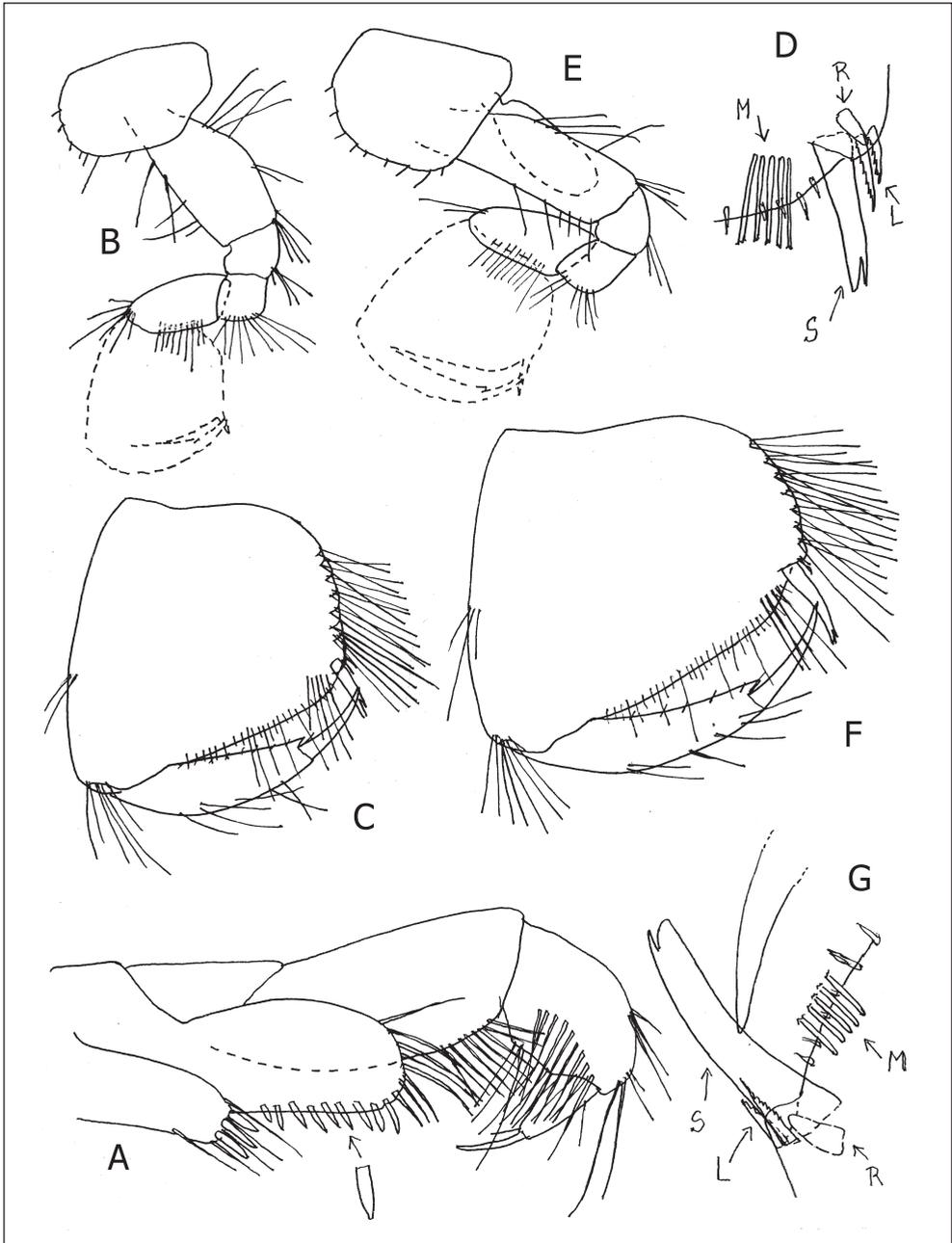


Fig. 2. *Niphargus Niphargus corsicanus* Schellenberg 1950, springs near Mandriole, Corsica Island, male 9.2 mm: A= maxilliped; B-C= gnathopod 1, outer face; D= corner of gnathopod 1 propodus, outer face [S=corner S-spine; L= lateral L-spines; R= subcorner R-spine; M= corner facial M-setae]; E-F= gnathopod 2, outer face; G= corner of gnathopod 2 propodus, outer face [S=corner S-spine; L= lateral L-spines; R= subcorner R-spine; M= corner facial M-setae].

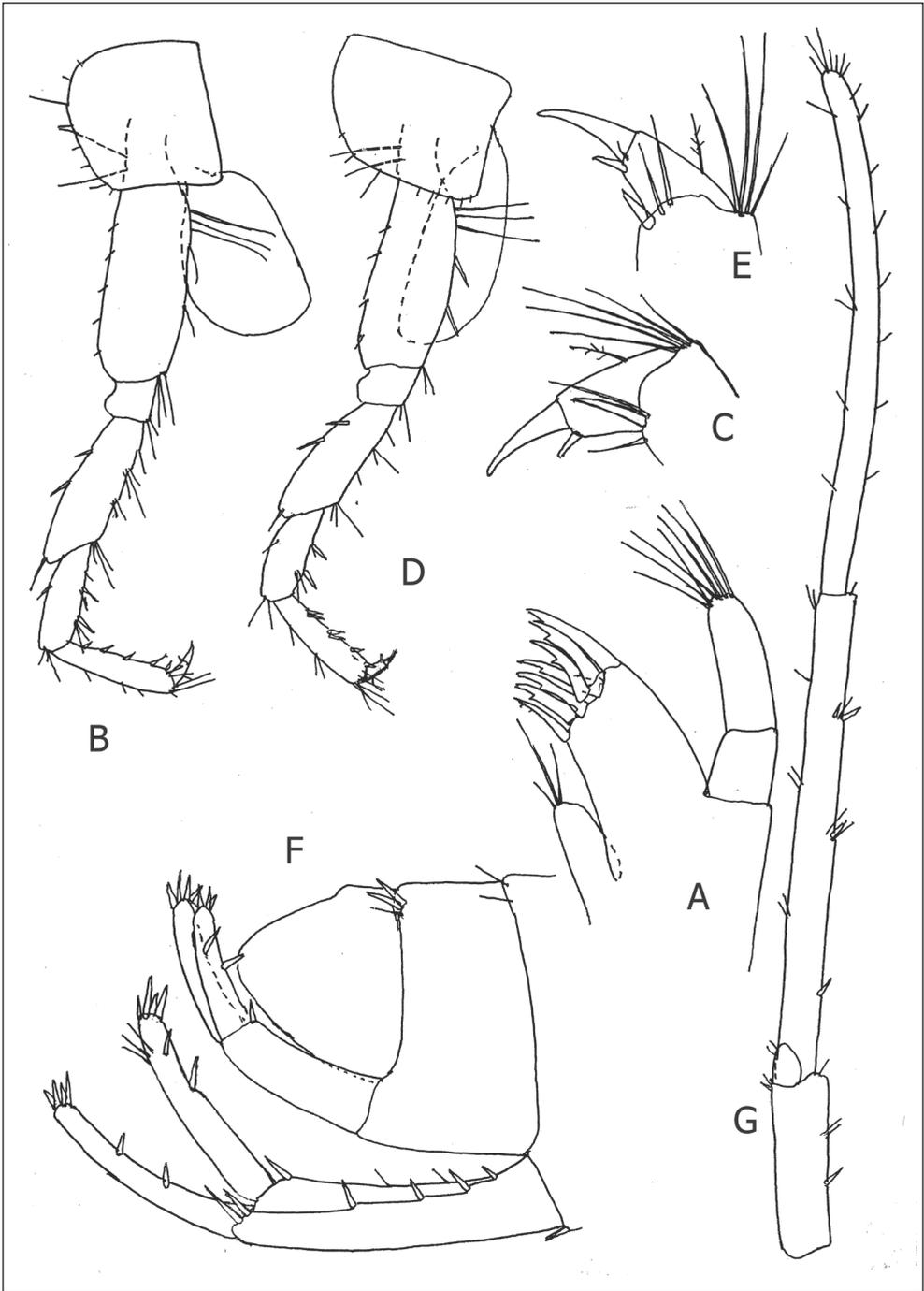


Fig. 3. *Niphargus corsicanus* Schellenberg 1950, springs near Mandriole, Corsica Island, male 9.2 mm: A= maxilla 1' B-C= pereopod 3; D-E= pereopod 4; F= urosome with uropods 1-2; G= uropod 3.

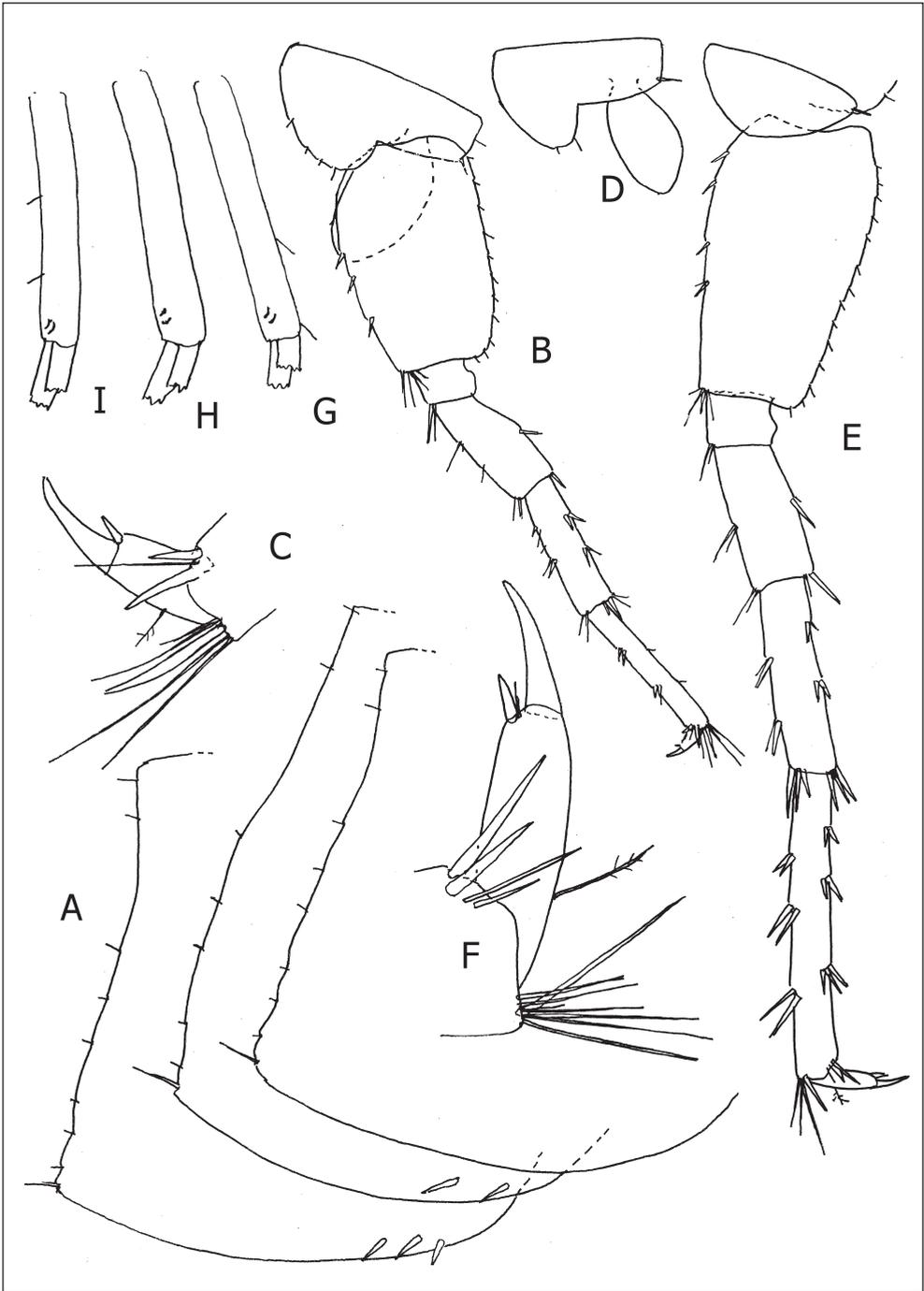


Fig. 4. *Niphargus corsicanus* Schellenberg 1950, springs near Mandriole, Corsica Island, male 9.2 mm: A= epimeral plates 1-3; B-C= pereopod 5; D= coxa of pereopod 6; E-F= pereopod 7; G= pleopod 1 peduncle; H= pleopod 2 peduncle; I= pleopod 3 peduncle.

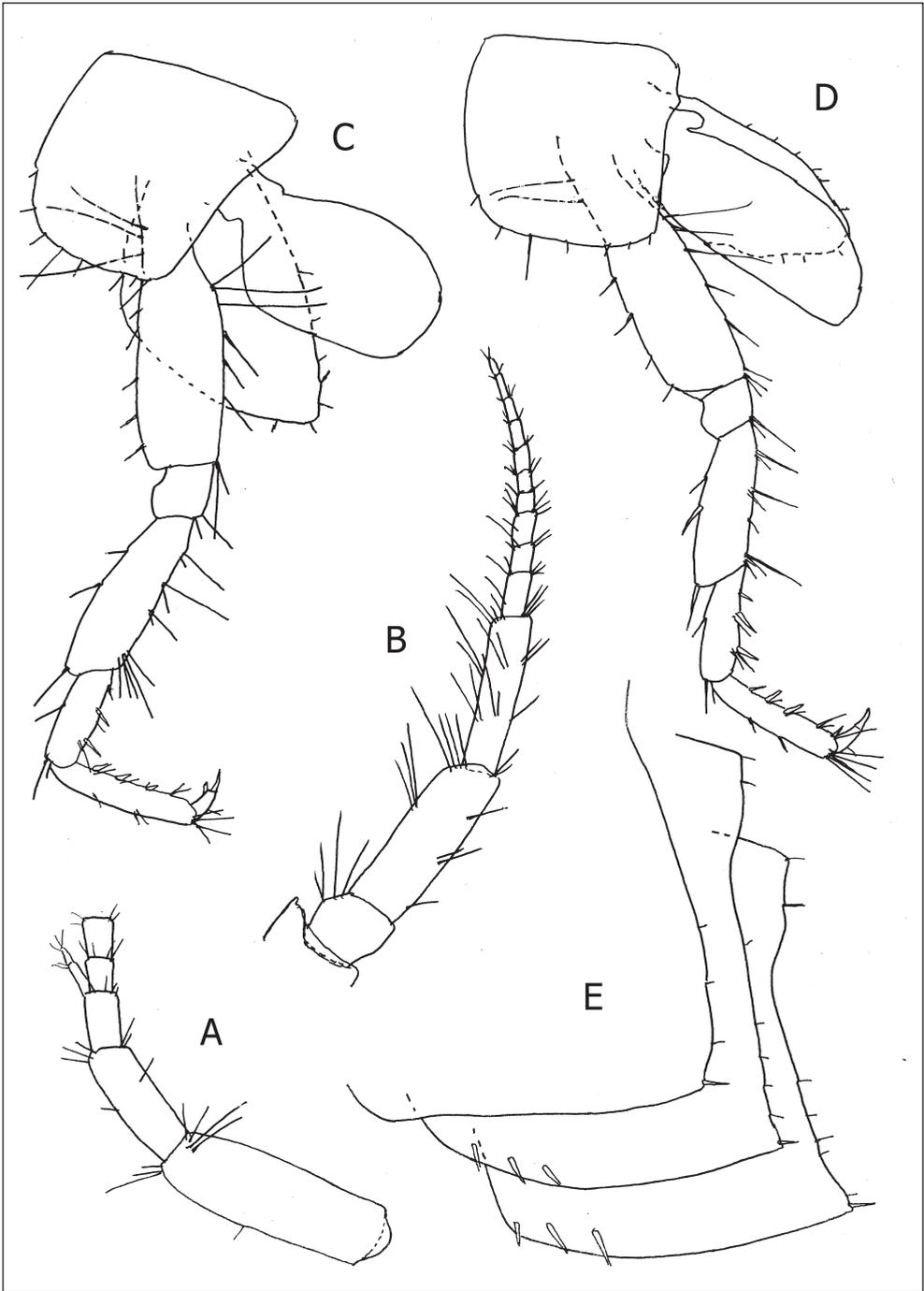


Fig. 5. *Niphargus corsicanus* Schellenberg 1950, springs near Mandriole, Corsica Island, female 7.0 mm: A= antenna 1; B= antenna 2; C= pereopod 3; D= pereopod 4; E= epimeral plates 1-3.

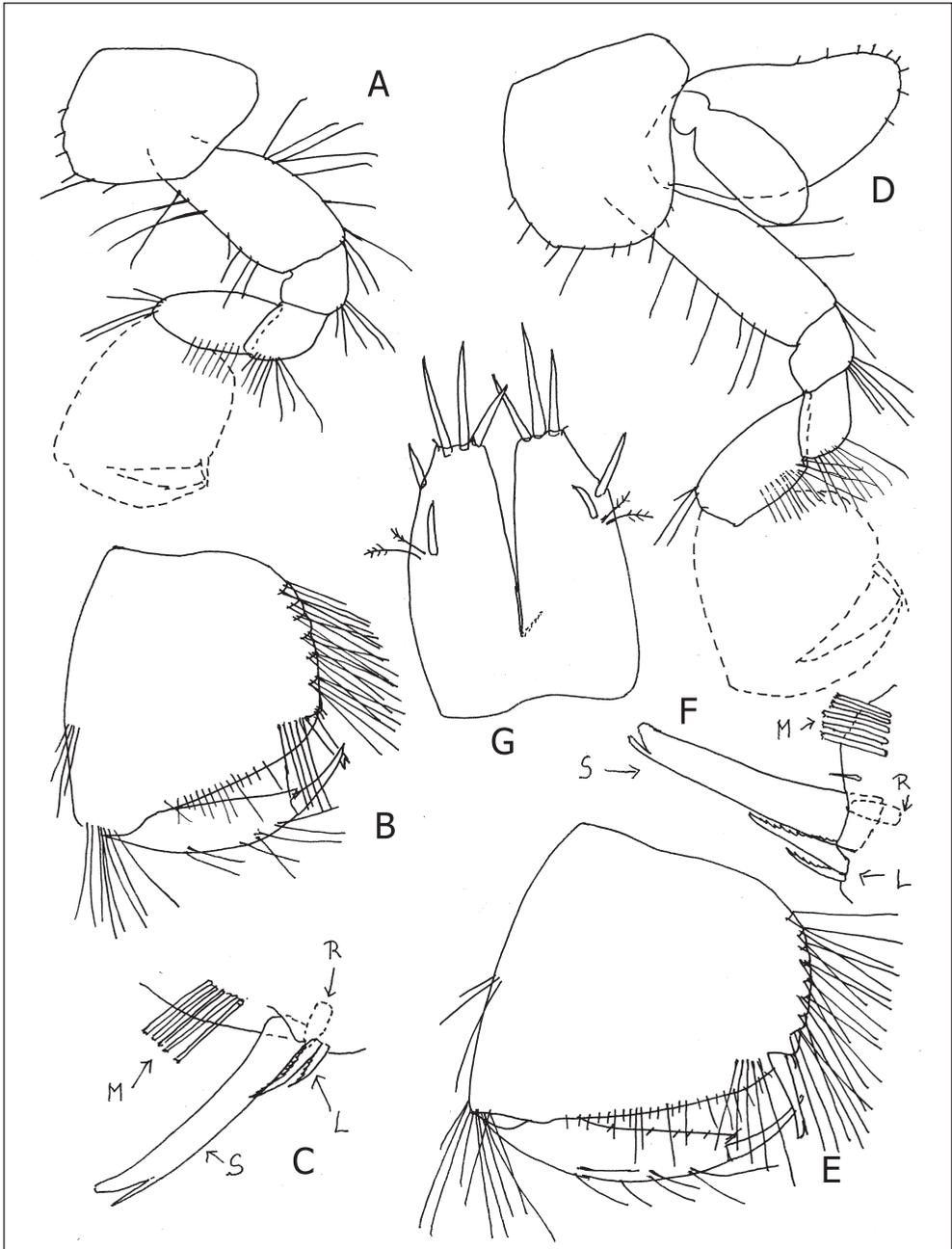


Fig. 6. *Niphargus corsicanus* Schellenberg 1950. springs near Mandriole, Corsica Island, female 7.0 mm: A-B= gnathopod 1, outer face; C= corner of gnathopod 1 propodus, outer face [S=corner S-spine; L= lateral L-spines; R= subcorner R-spine; M= corner facial M-setae]; D-E= gnathopod 2, outer face; F= corner of gnathopod 2 propodus, outer face [S=corner S-spine; L= lateral L-spines; R= subcorner R-spine; M= corner facial M-setae]; G= telson.

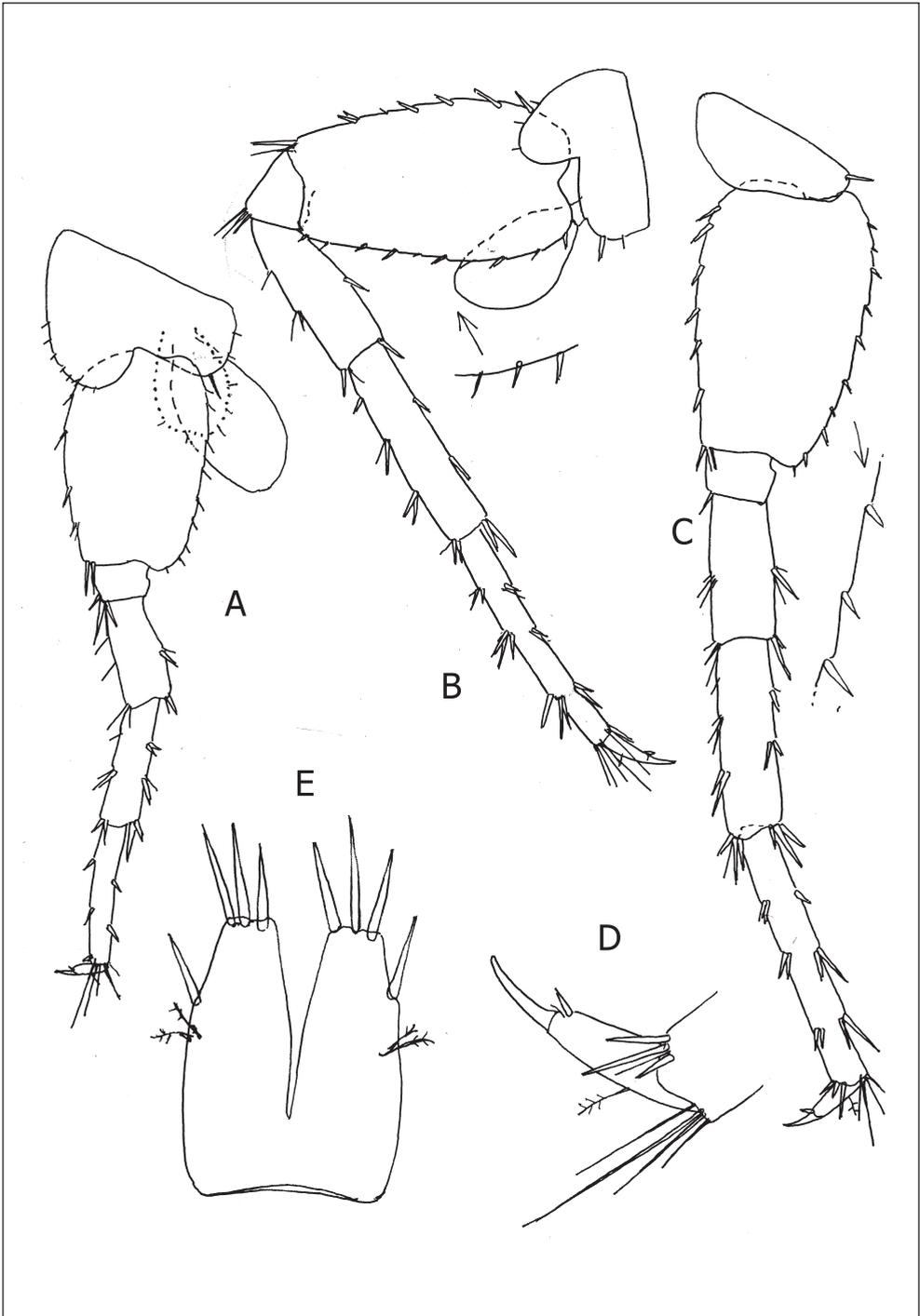


Fig. 7. *Niphargus corsicanus* Schellenberg 1950, springs near Mandriole, Corsica Island, female 7.0 mm: A= pereopod 5; B= pereopod 6; C-D= pereopod 7; E= telson, female 6.9 mm.

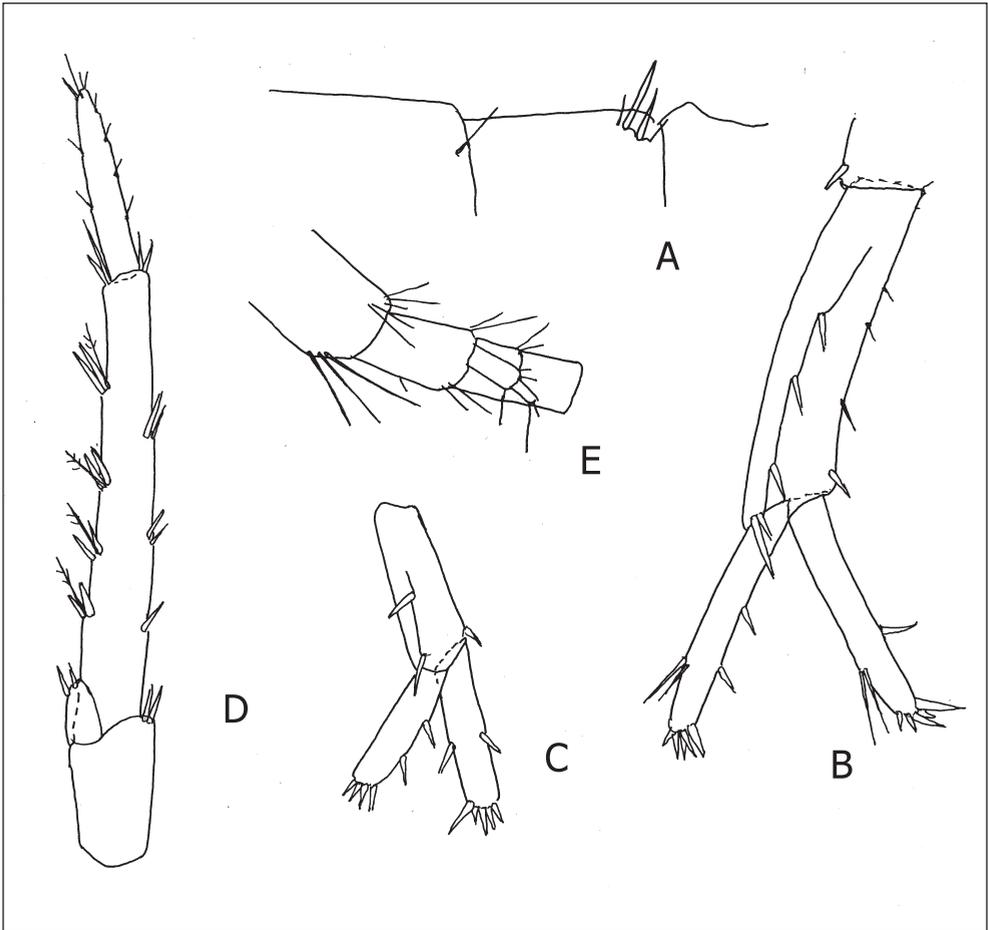


Fig. 8. *Niphargus corsicanus* Schellenberg 1950, springs near Mandriole, Corsica Island, female 7.0 mm.; A= dorsal face of urosomal segments 1-3; B= uropod 1; C= uropod 2; D= uropod 3. E= accessory flagellum of female 6.9 mm.