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FURTHER STUDY OF POORLY KNOWN CRUSTACEA AMPHIPODA FROM TURKEY: *NIPHARGUS ANATOLICUS* S. KARAMAN, 1950 (CONTRIBUTION TO THE KNOWLEDGE OF THE AMPHIPODA 333)

Abstract

The subterranean species of the family Niphargidae (Amphipoda: Senticaudata), *Niphargus anatolicus* S. Karaman, 1950b, discovered and described from the subterranean waters of Emirgan near coasts of Marmara See (Turkey) is partially redescribed based on existing holotype and paratypes. The taxonomic relation of this species regarding some other *Niphargus* species of Turkey and adjacent regions of Balkan is discussed, and key to the known *Niphargus* species in Turkey is composed.

Keywords: Amphipoda, Niphargidae, *Niphargus anatolicus*, taxonomy, key, Turkey

INRODUCTION

The subterranean fauna of the family Niphargidae in Turkey is only partially known, and 12 species of the genus *Niphargus* Schiődte, 1849, in this region are known, but other species in Turkey will be probably discovered during the further studies of this genus in this region.

The first species of genus *Niphargus* from Turkey was described by Schellenberg in 1933 as *Niphargus aquilex tauri* ssp. n., from the cave in Taurus Mountain, later erected on the species level by Schellenberg (1935). Stanko Karaman (1950b) described 2 new species, *N. anatolicus*, sp. n. and *N. illidzensis orientalis*, ssp. n. (erected later on the species level). Fišer et al. (2009) described two other new species, *N. kirgizi*, sp. n. and *N. sertaci*, sp. n. Gordan Karaman described (2012) *N. religious*, sp. n. and *N. tauri afioni*, ssp. n. Andreev and Kenderov (2012) described *N. turcicus*, sp. n. Bat et al. (2001) and G. Karaman (2003) cited *N. valachicus* from vicinity of Sidon, species later mentioned by other authors also.

We reexamined type-material of *N. anatolicus* S. Karaman, 1950b from Karaman`s Collection (holotype and paratypes) in attempt to complete the description of this species

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regarding paratype female, to better understanding taxonomical position of this species. The review and key to the *Niphargus* species known from Turkey is composed.

MATERIAL AND METHODS

The sample of *Niphargus* preserved in 70% ethanol, were dissected and examined in the mixture of glycerin and water for study, using a Wild M 20 stereomicroscope. The dissected studied body-parts were transferred later in Faure liquid for final preservation as permanent slides. The advantage of Faure liquid is the possibility to dissolve the liquid on slides using normal water, and remove the dissected pieces again for additional studies. The body parts of examined specimens are drawing using a camera lucida attachment and inked manually.

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

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

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

TAXONOMICAL PART

Order AMPHIPODA Latreille, 1816
Suborder SENTICAUDATA Lowry & Myers, 2013
Family NIPHARGIDAE Bousfield, 1977
Genus NIPHARGUS Schiödte, 1849

NIPHARGUS ANATOLICUS S. Karaman, 1950b

Figures 1-6

Niphargus anatolicus S. Karaman, 1950b: 36, figs. 9-18; Karaman, G., 1972: 7; Barnard, J. L. & Barnard, C. M., 1983: 689; Karaman, G. & Ruffo, 1986: 522; Bat et al., 2001: 235; Ozbek, M. & Ustaoglu, M.R., 2006: 231; Karaman, G., 2012d: 69 (key); Fišer et al., 2009: 138, fig. 1; Esmaeili-Rineh et al., 2015: 425 (key).

LOCUS TYPICUS: Emirgan, (N. off Istanbul, European part of Turkey, Western Anatolia).

MATERIAL EXAMINED:

-590= Emirgan, eastern? side of Marmara Sea, N of Istanbul, 1938, 5 exp. (leg. C. Kosswig) (holotype and paratypes).

DESCRIPTION

Stanko Karaman described and figured *N. anatolicus* mainly based on adult male (8.0 mm, holotype), mentioning only some taxonomical characters of females. In attempt to have a more complete description of this species, we described in detail the adult female 6.5 mm (paratype) from the same sample.

FEMALE 6.5 mm (paratype): Body moderately slender; mesosomal segments smooth, metasomal segments 1-3 with 3-5 short dorsoposterior marginal setae (fig. 1E); urosomal segment 1 with one seta, urosomal segment 2 with 2 spines on each dorsolateral side; urosomal segment 3 naked (fig. 5G). Urosomal segment 1 with one ventroposterior spine on each side near basis of uropod 1-peduncle (fig. 5G).

Epimeral plates 1-3 nearly subrounded, with convex posterior margin bearing several setae each, and with stronger ventroposterior marginal spine-like seta (fig. 1E). Epimeral plate 2 with one subventral spine, epimeral plate 3 with 2 subventral spines.

Head with short rostrum and moderately subrounded lateral cephalic lobes, ventroanterior excavation present, eyes absent (fig. 1A).

Antenna 1 reaching nearly half of body; peduncular articles 1-3 progressively shorter (ratio: 73:43:21), article 1 with several distal short setae, article 2 with 2 lateral and 2 distal groups of short setae; article 3 with one lateral and distal short seta; slender flagellum remarkably longer than peduncle, consisting of 21 articles scarcely setose (fig. 1B), single aesthetascs short. Accessory flagellum short, 2-articulated, rather exceeding half of peduncular article 3 (fig. 1C).

Antenna 2 relatively slender, much shorter than antenna 1; peduncular article 3 short, with several setae at ventral margin; article 4 with 4 groups of short setae along dorsal margin and several groups of long setae along ventral margin (the longest setae remarkably exceeding diameter of article itself). Article 5 only slightly shorter than article 4 (ratio: 52:60), along dorsal margin with 4 groups of setae (the longest setae exceeding diameter of article itself), along ventral margin with 3-4 groups of long setae. Flagellum slender, remarkably longer than last peduncular article, consisting of 13 scarcely setose articles (fig. 1D), antennal gland cone short (fig. 1D).

Mouthparts well developed. Labrum broader than long, with slightly concave distal margin medially (fig. 6A).

Labium distinctly broader than long, outer lobes subrounded distally, inner lobes well developed (fig. 6B).

Mandible with triturative molar (fig. 5A). Left mandible: incisor with 5 teeth, lacinia mobilis with 4 teeth and nearly 7 rakers. Right mandible: incisor with 4 teeth, lacinia mobilis bifurcate, serrate, accompanied by 8 rakers (fig. 5A). Palpus 3-articulated: first article short, naked; second article with 12 setae; third article nearly as long as second one, subfalciform, with nearly 17 lateral D-setae and 4-5 distal E-setae; on outer face with one group of 4 A-setae (fig. 5B), on inner face with 2 longer B-setae (fig. 5C).

Maxilla 1: inner plate with 2 strong setae, outer plate with 7 spines: 6 spines with one lateral tooth, one spine with several teeth (fig. 6C). Palpus 2-articulated, almost reaching tip of outer plate spines and provided with 4 distal setae.

Maxilla 2: both plates longer than broad, each with distal bunch of setae, inner plate with one distolateral seta also (fig. 6D).

Maxilliped: inner plate short, not reaching external tip of first palpus article. bearing 3-4 distal spines and several setae, outer plate reaching nearly half of palpus article 2, bearing along mesial margin nearly 10 short spines, along distal margin several setae (fig. 1F); palpus 4-

articulated, article 2 with numerous setae at mesial margin; article 3 with numerous distal and marginal longer setae; article 4 (dactylus) with one median seta at outer margin and one long seta at inner margin near basis of the nail (fig. 1F).

Coxae are relatively short. Coxa 1 broader than long (ratio: 55:44), with subrounded ventroanterior part and bearing 5-6 marginal setae (fig. 2A).

Coxa 2 rather broader than long (ratio: 65:60) with nearly 7 marginal setae (fig. 2D). Coxa 3 rather longer than broad (ratio: 68:65), with nearly 8 marginal setae (fig. 3A).

Coxa 4 nearly as long as broad, with 10 short marginal setae, ventroposterior lobe absent (fig. 3C).

Coxa 5 bilobed, only slightly shorter than coxa 4, much broader than long (ratio: 68:40), anterior lobe subrounded, with several ventral short setae (fig. 4A).

Coxa 6 bilobed, shorter than coxa 5, broader than long (ratio: 55:36) (fig. 4B). Coxa 7 entire, broader than long (ratio: 42:25) (fig. 4D).

Gnathopod 1-2 moderately small, with propodus nearly as large as corresponding coxa (fig. 2A, D). Gnathopod 1: article 2 moderately broad, with row of long setae along anterior and posterior margin (fig. 2A); article 3 short, with one distoposterior bunch of setae; article 5 rather shorter than propodus (article 6), with row of posterior marginal setae, anterior margin with distal group of setae. Propodus (article 6) trapezoid, rather longer than broad (ratio: 86:72), along posterior margin with 4 transverse rows of setae. Palm slightly convex, inclined almost to the half of propodus-length (fig. 2B), defined by 1 corner S-spine accompanied laterally by 3 toothed L-spines and 4 corner facial M-setae (not figured) (fig. 2C), on inner face by one subcorner R-spine. Dactylus reaching posterior margin of propodus, along outer margin with 7 median setae, at inner (mesial) margin with several short submarginal setae (fig. 2B).

Gnathopod 2 rather larger than gnathopod 1: article 2 with long setae along anterior and posterior margin; article 3 with one distoposterior bunch of marginal setae; article 5 nearly as long as propodus, with numerous setae along posterior margin, along anterior margin with one median seta and distal bunch of setae (fig. 2D). Propodus only slightly longer than broad (ratio: 90:85), trapezoid, along posterior margin with 6 transverse rows of setae (fig. 2E); palm slightly convex, inclined almost to the half of propodus-length, defined by corner S-spine accompanied laterally by 2 serrate L-spines and corner facial 4 M-setae, on inner face by one subcorner S-spine (fig. 2F). Dactylus reaching posterior margin of propodus, with 6 median setae along outer margin and with several short submarginal setae at inner margin (fig. 2E).

Pereopods 3-4 moderately slender. Pereopod 3 rather longer than pereopod 4, article 2 with short setae at anterior margin and longer setae at posterior margin; articles 4-7 of different length (ratio: 52:34:43:21); posterior margin of article 4 and article 5 with 3 groups of long setae (the longest setae exceeding diameter of articles themselves), along anterior margin with single long setae also (fig. 3A). Article 6 with short setae along anterior margin and 4 spines along posterior margin. Dactylus along inner margin with one spine near basis of the nail (fig. 3B), nail as long as pedestal (fig. 3B).

Pereopod 4: article 2 with long setae at posterior margin and short setae at anterior margin (fig. 3C). Articles 4-7 of different length (ratio: 50:30:42:20), pilosity similar to that in pereopod 3; dactylus with one spine at inner margin near basis of the nail, and one median seta at outer margin.

Pereopods 5-7 progressively longer. Pereopod 5: article 2 longer than broad (ratio: 69:41), anterior slightly convex margin with nearly 8 longer spine-like setae, posterior slightly convex margin with nearly 9 short setae, ventroposterior lobe not fully developed (fig. 4A).

Article 3 with 2 distoanterior spine-like setae exceeding tip of article itself. Articles 4-7 of different length (ratio: 40:37:45:16), articles 4-5 along anterior margin with longer strong setae, along posterior margin with shorter spines; article 6 at anterior margin with 4 groups of short spines. Article 2 longer than article 6 (ratio: 69: 45). Dactylus with one spine at inner margin near basis of the nail, and one short median seta at outer margin.

Pereopod 6: article 2 longer than broad (ratio: 80:46), along anterior slightly convex margin with nearly 8 strong setae, along posterior less convex margin with 10 short setae, ventroposterior lobe not fully developed. Articles 4-7 of different length (ratio: 50:59:73:23); articles 4-5 along anterior margin with strong setae or spine-like setae, along posterior margin with slender spines; article 6 at anterior margin with 4 groups of short spines (fig. 4B). Article 2 longer than article 6 (ratio: 80:73). Dactylus with one spine at inner margin near basis of the nail, and with one median short seta outer margin (fig. 4C), nail rather shorter than pedestal.

Pereopod 7: article 2 longer than broad (ratio: 83:52), along anterior margin with 5-6 shorter setae and distal spine, along posterior more convex margin with 11 short setae, ventroposterior lobe not distinctly developed (fig. 4D). Articles 4-7 of different length (ratio: 50:59:80:23); article 4 with shorter setae along anterior margin and 4 groups of spines at posterior margin; articles 5-6 with groups of spines along both margins. Article 2 poorly longer than article 6 (ratio: 83:80). Dactylus with one spine at inner margin near basis of the nail and one median seta at outer margin, nail rather shorter than pedestal (fig. 4E).

Pleopods 1-3 with 2 retinacula. Peduncle of pleopod 1 with 3 setae at distoanterior margin (fig. 5D). Peduncle of pleopod 2 naked (fig. 5E), inner ramus rather longer than outer one (fig. 6E); peduncle of pleopod 3 with one seta at distoposterior margin (fig. 5F).

Uropod 1: peduncle longer than rami, with dorsoexternal row of spines and dorsointernal row of setae (fig. 5H). Inner ramus with 2 lateral and 5 distal spines, as well as with one subdistal seta; outer ramus distinctly shorter than inner one, with 2 lateral and 4 distal spines, as well as with bunch of 3 subdistal setae.

Uropod 2: inner ramus slightly longer than outer one, with 2-3 lateral and 5 distal spines; outer ramus with 2 lateral and 4 distal spines (fig. 5 I).

Uropod 3 not elongated; peduncle rather longer than broad, with 2 lateral and several distal spines; inner ramus scale-like, with distal spine; outer ramus 2-articulated: first article along both margins and tip with bunches of spines (fig. 3D); distal article much shorter than first one (ratio: 37:100), pointed distally, bearing 5 strong setae (fig. 3E).

Telson nearly as long as broad, incised over half of telson-length; each lobe with 3 distal spines (the longest spines rather exceeding half of telson-length) and one spine at outer margin, accompanied by a pair of short plumose setae (fig. 3F).

Coxal gills relatively short, ovoid, appear on pereopods 2-6 (figs. 2D, 4A, B; not figured on pereopods 3-4).

Oostegites broad, appear on pereopods 2-5, with long marginal setae (fig. 2D).

MALE 8.0 mm (holotype): Stanko Karaman (1950) well described and figured male, and I will mentioned some additional characters only.

The most characters mentioned here for female, are similar with these of male: shape of epimeral plates, urosomal segments, telson with distal and lateral spines (facial spines absent); shape and pilosity of gnathopods, pereopods, pleopods and uropods 1-2.

Epimeral plate 2 with 2, epimeral plate 3 with 3 submarginal ventral spines. Antenna 1 main flagellum with 17 articles, usually bearing 1 short aesthetasc. Peduncle of antenna 2 with long posterior setae (fig. 6F), flagellum with 11 articles.

Maxilla 1 palpus with 6 distal setae. Maxilliped inner plate with 3 distal spines.

Pereopods 3-4 with long posterior marginal setae (fig. 6G), dactylus of all pereopods with one spine at inner margin near basis of the nail (fig. 6H).

Pereopod 7 article 2 more narrow, with almost straight posterior margin and not developed ventroposterior lobe.

Uropod 1 inner ramus nearly twice as long as outer one.

Uropod 3 elongated, second article of outer ramus as long as first one, inner ramus slightly longer than that in female.

REMARKS

Within known *Niphargus* species from Turkey, *N. anatolicus* is well defined by combination of morphological characters :subrounded epimeral plates, several setae along outer margin in gnathopods 1-2 dactylus, dactylus of pereopods with one spine at inner margin, long uropod 3 in males, only 2 retinacula on pleopods, naked first mandibular palpus article (see key).

Within adjacent regions of Turkey, *N. anatolicus* seems to be rather close to *Niphargus vlkanovi* S. Karaman & G. Karaman, 1959, known from Bulgaria [locus typicus: Cave near Živata voda, Sofia region (nearly 500 km W. of Emirgan] (subrounded epimeral plates, several setae on outer margin of gnathopod dactylus, 2 retinacula, elongated uropod 3 in males, etc.), but *N. anatolicus* differs by shorter gills, more inclined palm of gnathopods 1-2 propodus, lobes of telson in male with spines at inner (mesial) margin, maxilla 1, etc.

As both species were described from type-locality only and on scarce material, further new samples of both taxa are necessary to establish variability of its morphological characters and understand its real taxonomical relation and position within genus *Niphargus*.

Niphargus versluysi S. Karaman, 1950e [locus typicus: Spring Skophos on Zakynthos Island, Greece], is also close to *N. anatolicus* (several setae on dactylus of gnathopods 1-2, elongated uropod 3 in males, 2 retinacula, one spine on dactylus of pereopods 3-7, subrounded epimeral plates in males, etc.) but differing by presence of facial spines on telson, subangular epimeral plate 3 in female, etc.).

Recent discovery of numerous new *Niphargus* species from Iran and other adjacent region of Turkey by various authors will give new data for recognition, distribution and zoogeographical understanding of genus *Niphargus* distribution inhabiting subterranean waters from Iraq to Spain, including Turkey.

LIST OF KNOWN *NIPHARGUS* SPECIES IN TURKEY

NIPHARGUS ANATOLICUS S. Karaman, 1950b

See above

NIPHARGUS IMITATOR G. Karaman, 2012b

Niphargus imitator G. Karaman, 2012b: 36, figs. 1-7; Esmaeili-Rineh et al., 2015: 425 (key).

LOCUS TYPICUS: Antalya village, Dosemealti-Yagca, Mustanini Cave, Turkey
LOCALITIES CITED: loc. typ. only.
REMARKS: endemic, Turkey.

NIPHARGUS INCUS G. Karaman, 2012c

Niphargus incus G. Karaman, 2012c: 55, figs. 1-8; Esmaeili et al., 2015: 425 (key);

LOCUS TYPICUS: Turkey: Zonguldak, Eregli Oglan, Kis Magara.
DISTRIBUTION: Known from type-locality only.
REMARKS: endemic, Turkey.

NIPHARGUS KIRGIZI Fišer et al., 2009

Niphargus kirgizi Fišer, C.¸ Camur-Elipek, B. & Ozbek, M., 2009: 139, 140, figs. 2-7; Esmaeili-Rineh et al., 2015: 425 (key).

LOCUS TYPICUS: A reservoir of drinking water in Katransekisi (Burucek pasture) at the 1200 m above sea level, Pozantı (Adana/ Turkey); coordinates: 3712502800N, 3415001700E.[on p.140: Pozantı (Burucek, Katransekisi), Turkey].
LOCALITIES CITED: Locus typicus only (West Anatolia].
REMARKS: endemic, Turkey.

NIPHARGUS ORIENTALIS S. Karaman, 1950b

Niphargus ilidzensis orientalis S. Karaman, 1950b: 34, 43, figs. 1-8; Karaman, G. & Ruffo, 1986: 522; Fišer et al., 2009: 140; Bat et al., 2001: 235; Ozbek & Ustaoglu, 2006: 231;
Niphargus orientalis Fišer et al., 2009: 140; Esmaeili-Rineh et al., 2015: 425 (key).

LOCUS TYPICUS: Gőksu, E side of Dardanelles, Turkey.
LOCALITIES CITED: Locus typicus only (Western Anatolia].
REMARKS: endemic, Turkey.

NIPHARGUS RELIGIOSUS G. Karaman, 2012a

Niphargus religiosus G. Karaman, 2012a: 50, figs. 1-6.

LOCUS TYPICUS: Uragavaz-Gecidi, Ballidag (Kastamonu), 1350 m. a.s.l., Turkey.
LOCALITIES CITED: Locus typicus only.
REMARKS: endemic, Turkey.

NIPHARGUS SERTACI Fišer et al., 2009

Niphargus sertaci Fišer, C.¸ Camur-Elipek, B. & Ozbek, M. 2009: 140, 144, figs. 9-15; Esmaeili-Rineh et al., 2015: 425 (key).

LOCUS TYPICUS: A well in Izmir; coordinates 38128001.7200N, 27113033.7000E, Turkey.
LOCALITIES CITED: Locus typicus only [Western Anatolia].
REMARKS: endemic, Turkey.

?NIPHARGUS SPOECKERI Schellenberg, 1933a

Niphargus puteanus spoeckeri Schellenberg, 1933a: 32, fig. 1; Schellenberg, 1936: 20, figs.10, 11; Barnard, J. L. & Barnard, C. M., 1983: 694; Karaman, G. & Ruffo, 1986: 530; Bat et al., 2001: 235; Ozbek & Ustaoglu, 2006: 231; Fišer et al., 2009: 138.
Niphargus spoeckeri spoeckeri G. Karaman, 1993: 249, fig. 121.
Niphargus (Supraniphargus) spoeckeri S. Karaman, 1950c: 68.

LOCUS TYPICUS: Krainer Grotte [= Crna Jama – cave near Postojna Cave, Slovenia].
LOCALITIES CITED:
Schellenberg, 1933a: 32: Krainer Grotte, Slovenia.
Karaman, G. & Ruffo, 1986: caves and springs in Slovenia, Yugoslavia
Bat et al., 2001: Turkey.
Ozbek & Ustaoglu, 2006: Europe [refers on the European part of Turkey].
Fišer et al., 2009: Western Anatolia, Turkey. They cited also ‘‘Between Erkmenek and Mut’,’Turkey, fide Barnard & Barnard 1983”.

REMARKS. Probably the citation of *N. spoeckeri* in southern Turkey refers to some other taxa.

NIPHARGUS TAURI TAURI Schellenberg, 1933b

Niphargus aquilex tauri Schellenberg, 1933b: 32-33, fig. 6.
Niphargus tauri Schellenberg, 1935: 207; G. Karaman, 1973: 275, figs. 1-4; Barnard, J. L. & Barnard, C. M., 1983: 694; Ipek, 2009: 53, 8 figs.; Ipek & Sirin, 2009: 244, fig. 3; Trontelj et al., 2009: 734; Fišer et al., 2009: 140; Akbulut et al., 2001: 235;
Niphargus tauri tauri S. Karaman, 1950d: 98; Ozbek, M. & Ustaoglu, M.R., 2006: 231; Esmaeili-Rineh et al., 2015: 425 (key).

LOCUS TYPICUS: Cave in Taurus- Mts., Asia Minor, Turkey.
LOCALITIES CITED:
Schellenberg, 1933b: Cave in Taurus Mts., Turkey.
G. Karaman, 1973: locus typicus.
Abduluk et al., 2001: Turkey.
Ipek 2009: Eskisehir, Turkey.
Ipek & Sirin, 2009: Zemzemiye Village Fountain 39°51’ N 30°16’ E 913 m, Bilecik, Turkey
Trontelj et al., 2009: Eskişehir, Yesiltepe district, Turkey.
REMARKS: endemic Turkey.

NIPHARGUS TAURI AFIONI G. Karaman, 1912d

Niphargus tauri afioni G. Karaman, 2012d: 50, figs. 1-5; Esmaeili-Rineh et al., 2015: 425 (key).

LOCUS TYPICUS: subterranean waters, 4 km. from Afion (Province of Afion), Turkey
LOCALITIES CITED: Locus typicus only.
REMARKS: endemic, Turkey.

NIPHARGUS TURCICUS Andreev & Kenderov, 2012

Niphargus turcicus Andreev & Kenderov, 2012: 48, figs 1-5; Esmaeili-Rineh et al., 2015: 425 (key);

LOCUS TYPICUS: Kastamonu Prov., Pinarbaşi, Distr. Milli park Kűre Dağlari, Eşeçukuru Cave 2, Turkey.
LOCALITIES CITED:
Andreev & Kenderov, 2012: Locus typicus; Kastamonu Prov. Pinarbaşi, Corma Tepl. Cave 2, Turkey.
REMARKS: endemic, Turkey

NIPHARGUS VALACHICUS Dobreanu & Manolache, 1933
(reduced synonymy)

Niphargus tatrensis valachicus Dobreanu & Manolache, 1933: 104, figs. 2-4;
Niphargus valachicus Sket, 1981*:* 96; G. Karaman, 1998: 10, figs. 1-4; Akbulut et al., 2001: 236, figs. 1-2; (!)Bat et al., 2001: 236, figs. 1-2; G. Karaman, 2003: 31; Fišer et al., 2009: 139, fig. 1; G. Karaman, 2014: 213; Copilaș-Ciocianu, Fišer, Borza, Balázs, Angyal & Petrusek, 2017: 4, tab. 1;
Niphargus valachicus valachicus Motas et al., 1962: 222;
Niphargus (*Supraniphargus*) *valachicus valachicus* S. Karaman, 1950c: 68, figs. 35-37; Sket, 1958: 67;
Niphargus (*Phaenogammarus*) *valachicus* S. Karaman, 1960: 83; Dedju, 1967: 63.

LOCUS TYPICUS; Bucuresti, Romania.
LOCALITIS CITED FOR TURKEY:
Akbulut et al., 2001: Sirakaraagaçlar Stream flowing into the Black Sea Akliman (Sinop)-Turkey;
(!)Bat et al., 2001: Sirakaraagaclar torrent, Akliman (Sinop) (Black Sea affluent);
G. Karaman, 2003: Sinop (Black Sea coast region) (were mixed with *Synurella ambulans ambulans*),
Fišer et al., 2009: Pirinci Stream (Istanbul vicinity); Hamam stream (Kirklareli vicinity); Hamam Lake (Kirklareli vicinity); Sirakaraagaclar stream, Turkey;
Copilaș-Ciocianu et al., 2017: Abali, coordinates N42.0386 E35.0191, Turkey;
GENERAL DISTRIBUTION: Slovenia, Croatia, Bosnia & Herzegovina, Serbia, Hungary, Czechoslovakia, Romania, Bulgaria, Turkey, Iran, Georgia, Ukraine.

NIPHARGUS SP.

Niphargus sp. Fišer et al., 2009: 140; Özbek, et al., 2017: 496.

LOCALIIES CITED:
Fišer et al., 2009 and Ozbek, et al., 2017, cited various localities from Turkey as *Niphargus* sp.

KEY TO THE *NIPHARGUS* SPECIES IN TURKEY

1. Dactylus of gnathopods 1-2 with one median seta at dorsal margin……..…….2
--- Dactylus of gnathopods 1-2 with several setae along dorsal margin……;….……4
2. Article 2 of pereopods 5-7 more than twice longer than broad, tapering ventrally; epimeral plates 1-3 sharply pointed; telson incised usually less than half of its length
N. IMITATOR G. Karaman, 2012b
--- Article 2 of pereopods 5-7 less than twice longer than broad, not tapering ventrally; epimeral plates 1-3 subrounded or angular; telson incised over half of its length……..…;;……3
3. Maxilla 1 inner plate with 2 setae; palpus not reaching tip of outer plate spines; lobes of telson not tapering distally; distal mandibular palpus article with elevated number of D-setae, pereopods 5-7 with shorter article 6 and broader article 2
N. TAURI AFIONI G Karaman, 2012d
--- Maxilla 1 inner plate with 1 seta; palpus reaching or exceeding tip of outer plate spines; lobes of telson tapering distally, distal mandibular palpus article with lower number of D-setae, pereopods 5-7 with longer article 6 and narrower article 2
N. TAURI TAURI Schellenberg, 1933b
4. Pleopods 1-3 with elevated number (4-6) retinacula each *N. KIRGIZI* Fišer et al., 2009
--- Pleopods 1-3 with 2 retinacula each……5
5. Urosomal segment 1 at ventroposterior margin with 2 spines *N. SERTACI* Fišer et al., 2009
--- Urosomal segment 1 at ventroposterior margin with 1 spine or seta……..……6
6. Mandibular palpus article 1 with setae……..……7
Mandibular palpus article 1 naked…….…..…….8
7. Telson with facial spines; epimeral plates angular; urosomites less spinose
N. RELIGIOSUS G. Karaman, 2012a
--- Telson without facial spines; epimeral plates subrounded; urosomites more spinose
N. TURCICUS Andreev & Kenderov, 2012
8. Dactylus of pereopods 5-7 with additional spines at inner margin……9
--- Dactylus of pereopods 5-7 with one spine or spine-like seta at inner margin……..…..10
9. Epimeral plates 1-3 sharply pointed and produced
N. VALACHICUS Dobreanu & Manolache, 1933
--- Epimeral plates 1-3 angular to poorly pointed *N. ORIENTALIS* S. Karaman, 1950b
10. Dactylus of pereopods 3-4 with additional spines at inner margin
N. INCUS G. Karaman, 2012c
--- Dactylus of pereopods 3-7 with one spine or spine-like seta at inner margin…….…..11
11. Telson without facial spines; epimeral plates subrounded
N. ANATOLICUS S. Karaman, 1950b
---Telson with facial spines; epimeral plates pointed *N. SPOECKERI* Schellenberg, 1933

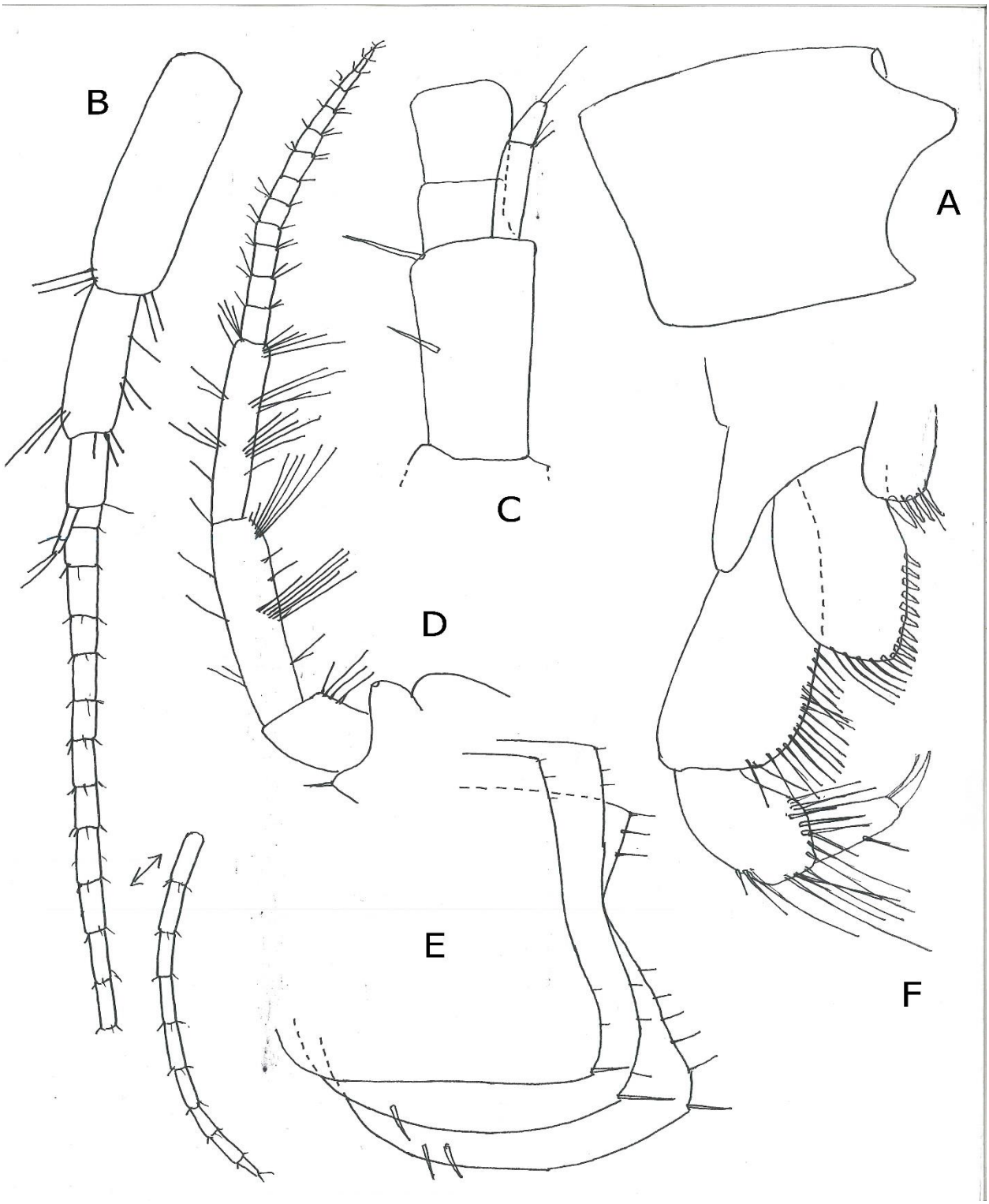

Fig. 1. *Niphargus anatolicus* S. Karaman, 1950, Emirgam, Turkey, female 6.5 mm (paratype): A = head; B = antenna 1; C = accessory flagellum; D = antenna 2; E = epimeral plates 1-3; F = maxilliped.

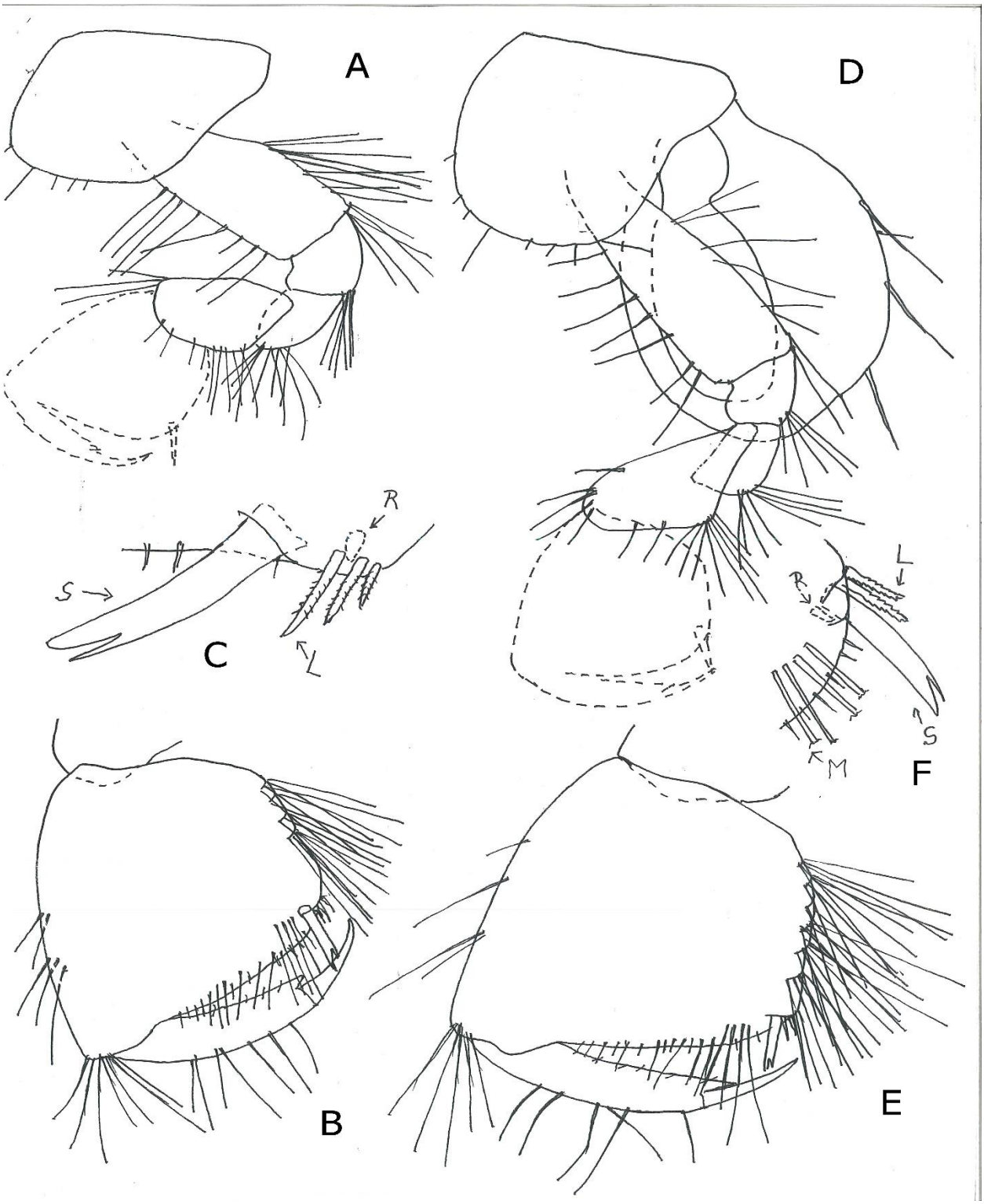

Fig. 2. *Niphargus anatolicus* S. Karaman, 1950, Emirgam, Turkey, female 6.5 mm (paratype): A-B= gnathopod 1, outer face; C = distal corner of propodus, gnathopod 1 (S = corner S-spine; L = lateral L-spines; R = subcorner R-spine, inner face); D-E = gnathopod 2, outer face; F = distal corner of propodus gnathopod 2 (S = corner S-spine; L = lateral L-spines; M = corner facial M-setae; R = subcorner R-spine, inner face).

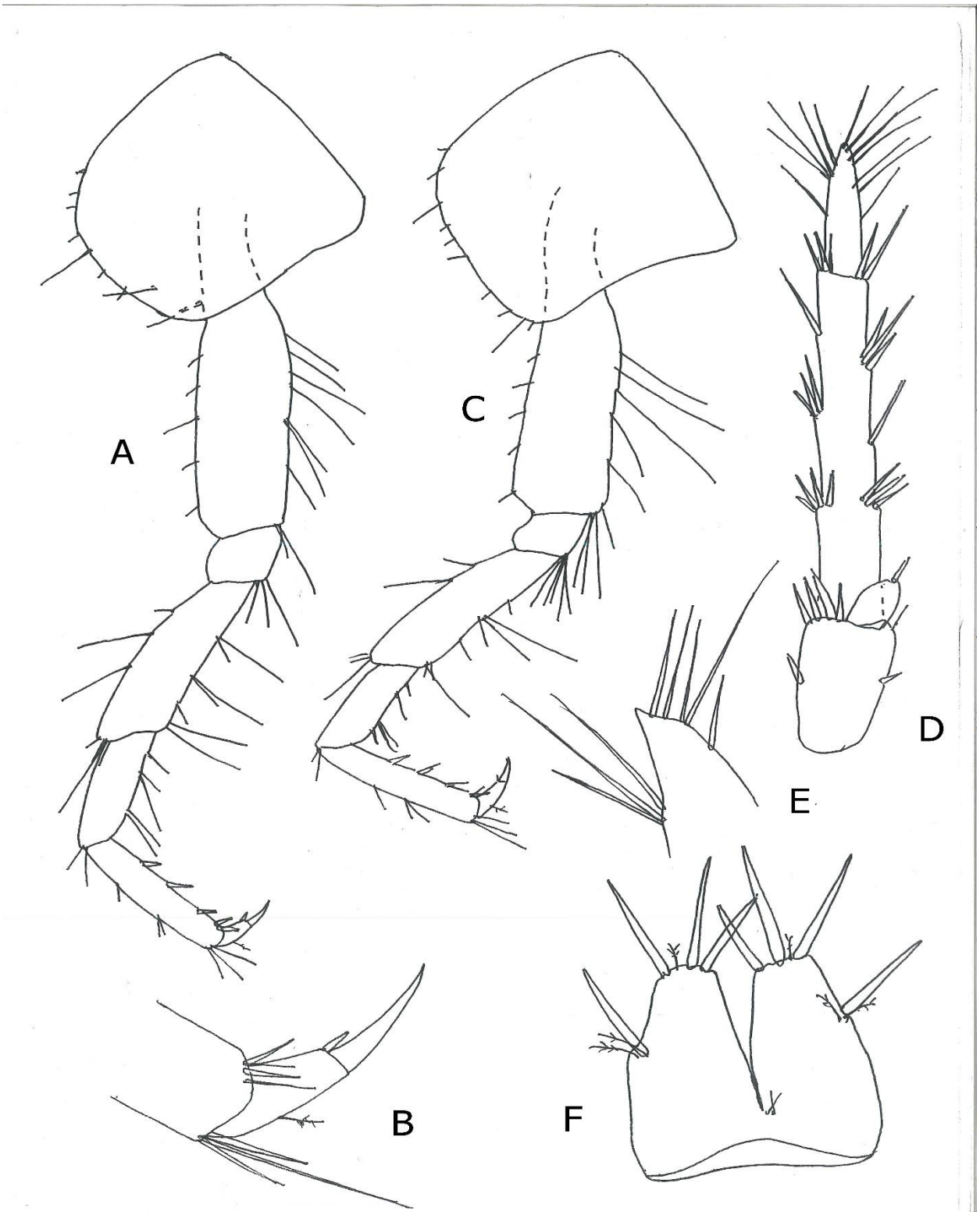

Fig. 3. *Niphargus anatolicus* S. Karaman, 1950, Emirgam, Turkey, female 6.5 mm (paratype): A = pereopod 3; B = dactylus of pereopod 3; C = pereopod 4; D = uropod 3; E = distal tip of uropod 3; F = telson.

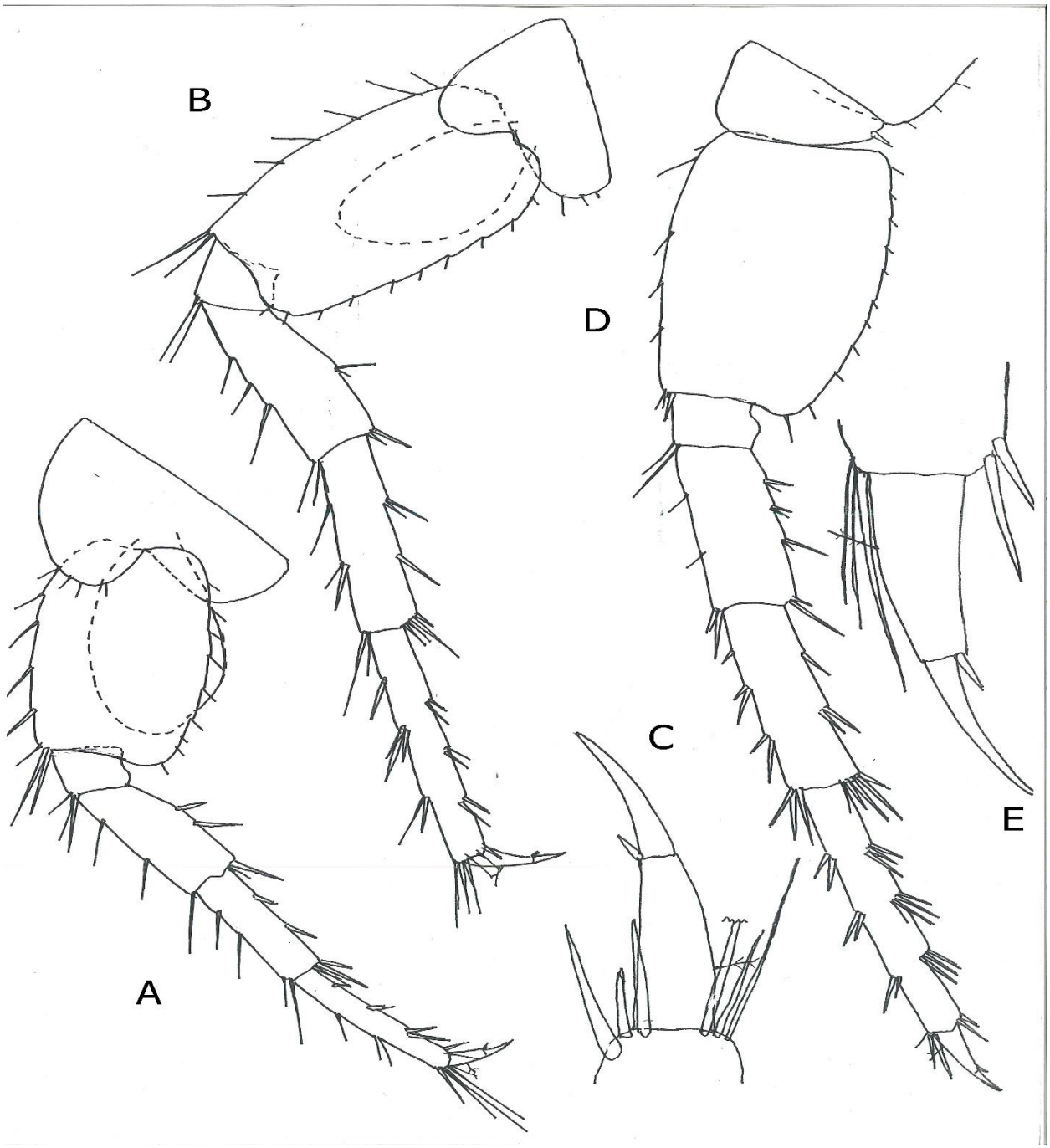

Fig. 4. *Niphargus anatolicus* S. Karaman, 1950, Emirgam, Turkey, female 6.5 mm (paratype): A = pereopod 5; B = pereopod 6; C = dactylus of pereopod 6; D = pereopod 7; E= dactylus of pereopod 7.

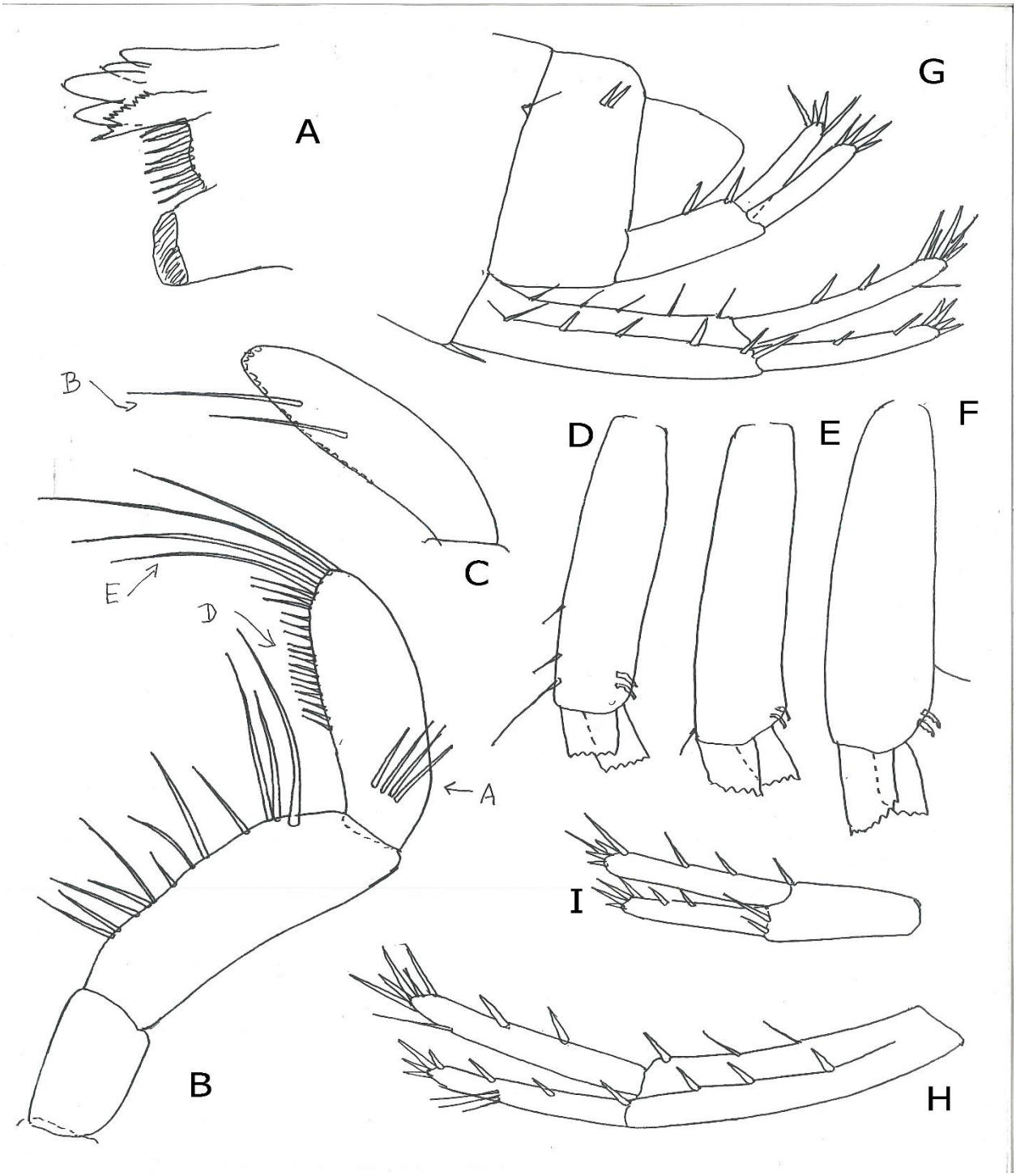

Fig. 5. *Niphargus anatolicus* S. Karaman, 1950, Emirgam, Turkey, female 6.5 mm (paratype): A = right mandible with lacinia mobilis and rakers. B = mandibular palpus, outer face (A = outer facial A-setae); C = mandibular palpus, distal article, inner face (B = facial B-setae, other setae omitted); D = peduncle of pleopod 1; E = peduncle of pleopod 2; F = peduncle of pleopod 3; G = urosome with uropods 1-2; H = uropod 1; I = uropod 2.

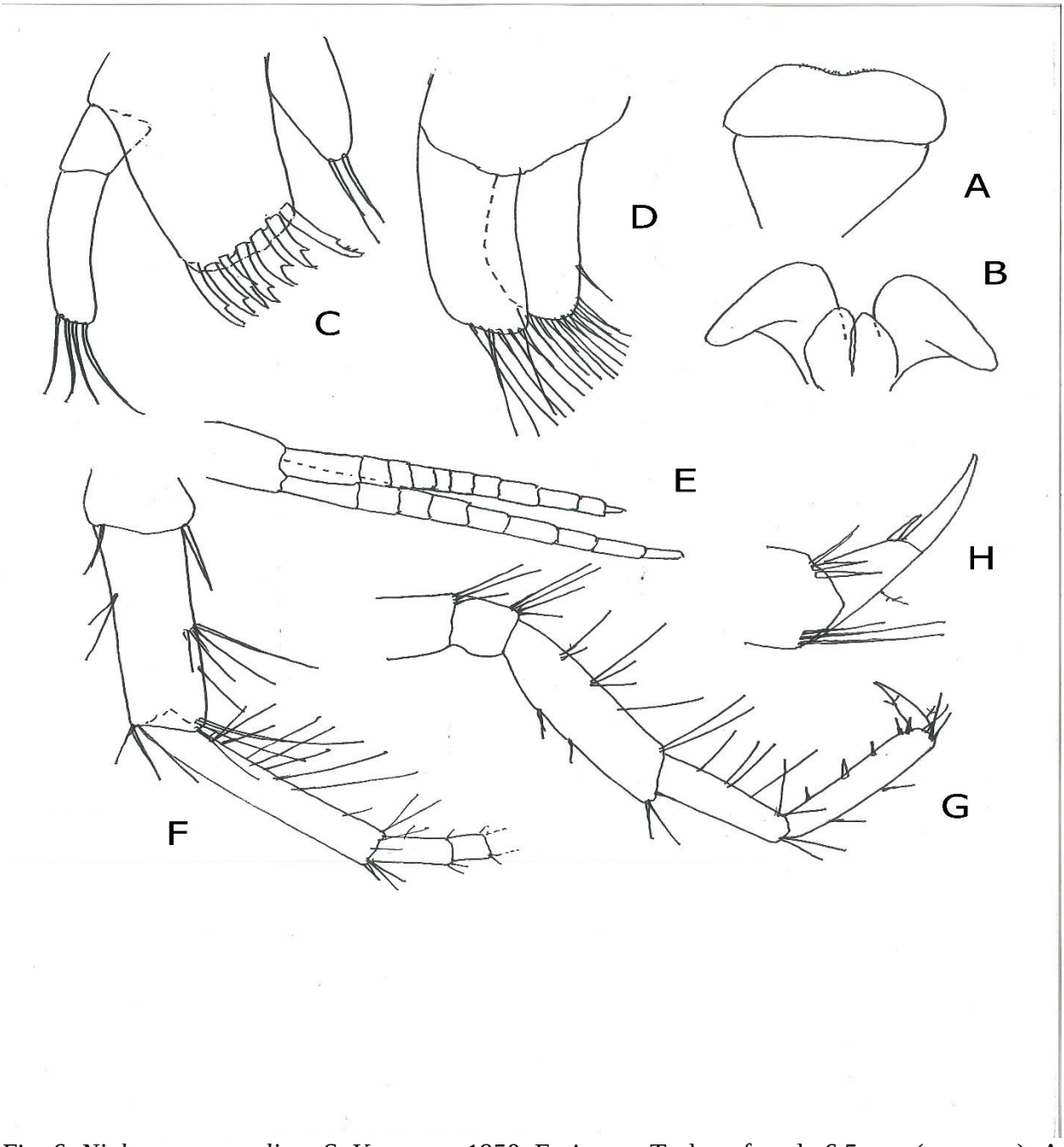

Fig. 6. *Niphargus anatolicus* S. Karaman, 1950, Emirgam, Turkey, female 6.5 mm (paratype): A = labrum; B = labium; C = maxilla 1; D= maxilla 2; E= pleopod 2 (setae omitted);
Male 8.0 mm (holotype): F = antenna 2 peduncle; G = pereopod 3; H = dactylus of pereopod 3.

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Rezime

DALJNA STUDIJA SLABO POZNATIH CRUSTACEA AMPHIPODA IZ TURSKE: *NIPHARGUS ANATOLICUS* S. KARAMAN, 1950 (333. PRILOG POZNAVANJU AMPHIPODA)

Podzemna vrsta iz familije Niphargidae (Amphipoda: Senticaudata), *Niphargus anatolicus* S. Karaman, 1950b, otkrivena i opisana iz podzemnih voda Emirgama, pokraj obala Mramornog mora (Turska), djelimično je dopunjena dodatnim podacima i opisom ženke te vrste na osnovu postojećeg holotipa i paratipova. Razmatran je taksonomski odnos te vrste prema nekim drugim *Niphargus* vrstama iz Turske i susjednih regiona Balkana. Sastavljen je ključ za determinaciju svih poznatih vrsta roda *Niphargus* iz Turske.

Ključne riječi: Amphipoda, Niphargidae, *Niphargus anatolicus*, taksonomija, ključ za determinaciju, Turska