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**NEW SPECIES *Niphargus religiosus*, sp. n. (Fam. Niphargidae),  
WITH REMARKS TO *Amathillina cristata* G.O. Sars, 1894  
(Fam. Gammaridae) IN TURKEY  
- Contribution to the Knowledge of the Amphipoda 257 -**

### SUMMARY

From the subterranean waters in Uragavaz Gecidi, Ballidag (Kastamonu), Turkey [spring on 1350 m. a.s.l.] one new member of the family Niphargidae, *Niphargus religiosus*, sp. n. is described and figured, and its taxonomical position is discussed. The stout body of this species likes that in members of *Niphargus puteanus*- group, but *N. religiosus* is characterized by the presence of one seta on first article of mandible palp, short and broad basipodites of pereopods 5-7, by presence of 2 retinacula on pleopods, by elevated number of setae along outer margin of dactylus in gnathopods 1-2, short uropod 3, by presence of one median spine at inner margin of dactylus in pereopods 3-7, etc. The further discovery of the males of *N. religiosus* will make possible to understand the closer position of this species within the genus *Niphargus*.

The epigeal species *Amathillina cristata* G.O. Sars, 1894 (family Gammaridae) was described and cited from various localities in Pontocaspian basin [Black and Caspian sea] and adjacent regions. Recently this species was mentioned at the first time in the freshwaters of Turkey (Özbek & Özkan, 2010). As this species was never described in detail after the first Sars's description (1894), we redescribed this species rather more in detail, from the Terkos Lake in Turkey, especially regarding some taxonomic details never mentioned before.

**Key words:** taxonomy, Amphipoda, Niphargidae, *Niphargus religiosus*, new species, *Amathillina cristata*, Gammaridae, Turkey, freshwater.

### INTRODUCTION

The freshwater fauna of Amphipoda in Turkey is very rich, but still only partially known. During last 50 years, numerous new or known species of various genera of Amphipoda have been discovered and mentioned from this country, especially these of the family Gammaridae: genus *Gammarus* Fabr., 1775 [Karaman, G. & Pinkster, 1977; 1977a, 1987; Akbulut & Sezgin, 2000; Özbek, 2007; Özbek & Çamur-Elipek, 2010, etc.]; genus *Amathillina* G.O. Sars, 1894 [Özbek & Özkan, 2010]; genus *Dikerogammarus* Stebbing, 1899 [Özbek & Özkan, 2011]; genus *Echinogammarus* Stebbing, 1899 [Karaman, G., 1971;

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Pinkster, 1993], family Crangonyctidae: genus *Synurella* Wrzesniowski, 1877 [Karaman, G., 2003; Ruffo, 1974]; genus *Lyurella* Dershavin, 1939 [Ruffo, 1974]; family Talitridae: genus *Orchestia* Leach, 1813/14 [Karaman, G., 1971; Akbulut & Sezgin, 2000; Karaman, G., 2003], etc.

The genus *Niphargus* Schiödte, 1849 (fam. Niphargidae) in Turkey is still poorly studied, and several taxa of this genus are known. First species was described by Schellenberg (1933) as *Niphargus aquilex tauri* [now distinct species, *Niphargus tauri*] from Taurus Mt., redescribed again based on the typical material by Karaman, G. (1973).

Karaman, S. (1950) described two new species of this genus: *Niphargus ilidzensis orientalis* (now distinct species, *N. orientalis*), described from Göksu, E. side of Dardanelles (= Çanakkale Bogazi], and *Niphargus anatolicus* described from Emirgan. Later, Bat et al. (2001) cited *Niphargus valachicus* Dobreanu & Manolache, 1933 from western Black Sea region of Turkey (Sinop vilayet).

Fišer et al. (2009) described two new species of Turkey, *Niphargus sertaci* from wells in Izmir, and *Niphargus kirgizi* from reservoir of drinking water in Katransekini (Bürücek pasture, Pozanti (Adana), mentioning *N. valachicus* from Turkey also.

Recently we received some material of the genus *Niphargus* from Eurasia and Asia Minor. Based on these studies, we established one new species of the genus *Niphargus* (fam. Niphargidae) from Kastamonu region in Turkey, described and figured here under the name *Niphargus religiosus*, sp. n. Evidently, the further studies of the subterranean waters in Turkey will discover many other new taxa of genus *Niphargus*.

## MATERIAL AND METHODS

Material was collected by different authors in Turkey, and the samples were preserved in 70% ethanol. Specimens were examined and dissected using a Wild M20 stereomicroscope and drawn using a camera lucida attachment. Small appendages (mouthparts, uropods, telson) were temporarily mounted in mixture of glycerine and water, and later transferred to liquid of Faure. The body length of specimens examined was measured by tracing individual's mid-trunk lengths (tip of the rostrum to end of telson) using a camera lucida. All illustrations were inked manually.

## RESULTS AND DISCUSSION

### NIPHARGUS RELIGIOSUS, sp. n.

Figs. 1-6

**MATERIAL EXAMINED:** Turkey: Urugavaz-Gecidi, Ballidag (Kastamonu), 1350 m. a.s.l., 31.5.1969, 2 exp. (leg. Osella, G.). Holotype and paratype are deposited in KARAMAN'S Collection in Podgorica, Crna Gora.

DIAGNOSIS (partially, females only): Body stout, epimeral plates angular, with poorly concave posterior margin; epimeral plate 3 with well marked ventroposterior corner. Urosomite 1 with dorsolateral setae only. Telson short, incised 2/3 of its length, with dorsal, lateral and facial short spines.

Coxae of moderate size, with numerous very short marginal setae each. Maxilla 1 inner plate with 3-4 setae, outer plate with 7 spines (6 with one strong lateral tooth each). Maxilliped inner plate with 3 distal spines. Mandible palp article 1 with one seta.

Propodus of gnathopods 1-2 smaller than corresponding coxae, quadrate, with palm inclined less than half of propodus length, their dactylus with row of bunches of setae along outer margin.

Pereopods 3-4 strong, with dactylus short and strong, bearing one short spine at inner margin near basis of pedestal. Pereopods 5-7 short and strong, with ovoid basipodit, bearing numerous short posterior marginal setae and slightly marked ventroposterior lobe; dactylus of pereopod 5 with one spine at inner margin.

Uropods 1-2 short, their inner ramus slightly longer than outer one. Uropod 3 short and strong, first article of outer ramus along inner margin with spines and single plumose setae, second article short. Coxal gills relatively long.

DESCRIPTION. FEMALE 10.5 mm with setose oostegites (Holotype). Body stout, mesosomites smooth, metasomal segments with several short dorsoposterior setae each (fig. 2D). Urosomite 1 with 2 dorsolateral setae on each side (fig. 1F); urosomite 2 with 2 dorsolateral spines on each side; urosomite 3 naked (fig. 1F). Urosomite 1 with one ventroposterior spine near basis of uropod 1 peduncle (fig. 1F).

Epimeral plate 1 with subrounded convex ventroposterior corner and row of posterior short marginal setae (fig. 2D). Epimeral plate 2 with well marked ventroposterior corner and poorly convex posterior margin bearing several short marginal setae. Epimeral plate 3 distinctly angular, with well marked ventroposterior corner and poorly convex posterior margin bearing several short marginal setae (fig. 2D). Epimeral plates 2 and 3 with 3 ventral submarginal (facial) spines each (fig. 2D).

Coxae 1-4 of moderate size. Coxa 1 almost quadrate, slightly longer than broad, with subrounded ventroanterior corner and provided with numerous very short marginal setae (fig. 3A).

Coxae 2-4 remarkably longer than broad, with convex distal (ventral) margin bearing numerous very short marginal setae (figs. 3D; 4A,C). Coxa 5 shorter than coxa 4, bilobed, anterior lobe larger than posterior one, both lobes with short marginal setae (fig. 5A).

Coxa 6 similar to coxa 5, but smaller, bearing short marginal setae (fig. 5C). Coxa 7 entire, with several strong spine-like marginal setae at ventral margin (fig. 5D).

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

Antenna 1 slightly shorter than half of body length. Peduncle articles 1-3 progressively shorter, all poorly setose (fig. 1B); peduncle article 3 not reaching half of peduncle article 2; main flagellum poorly setose, with 23 articles (most of them with one short aesthetasc each). Accessory flagellum 2-articulate (fig. 1B), shorter than peduncle article 3.

Antenna 2 strong, peduncle article 3 with one bunch of longer distal setae (fig. 1C); peduncle article 5 slightly shorter than 4, both articles along both sides with bunches of setae as long as or longer than diameter of articles themselves (fig. 1C); flagellum strong, 11-articulate, setae are short (fig. 1C); antennal gland cone short (fig. 1C).

Mouthparts basic. Labrum entire, broader than long (fig. 1D). Labium with entire, subrounded outer lobes and well developed smaller inner lobes (fig. 1E).

Maxilla 1: inner plate with 3-4 distal setae (fig. 2A); outer plate with 7 spines [6 spines with one strong lateral tooth each; one spine with 2 lateral teeth]; palp 2-articulate, distal article with 9 long setae (some setae as long as palp article 2 itself) (fig. 2A).

Maxilla 2: both plates of slightly unequal size, bearing marginal setae only (fig. 2B).

Maxilliped: inner plate short, with 3 distal smooth spines and numerous setae (fig. 2C); outer plate not exceeding half of palp article 2, along inner margin with row of smooth spines (fig. 2C); palp article 3 along outer margin with one group of median setae and one group of distal setae; nail shorter than pedestal of palp article 4 (fig. 2C).

Mandible tritritative. Left mandible: incisor with 4 teeth, lacinia mobilis bifurcate, finely serrate (fig. 6C). Right mandible: incisor with 5 teeth, lacinia mobilis with 4 teeth (fig. 6D). Left and right mandible palp symmetric to each other, 3-articulate: first article with one strong distal seta (fig. 6A); second article with 11 strong setae; palp article 3 subfalciform, nearly as long as second one, along inner margin with 19 D-setae and 5 long distal E-setae (fig. 6A). On outer face of article 3 appears one bunch of 5 long setae (fig. 6A), on inner face appear 4 groups of B-setae (fig. 6B).

Gnathopods 1-2 relatively small, their propodus smaller than corresponding coxae (fig. 3A,D), articles 3-5 remarkably setose, setae long.

Gnathopod 1: article 3 with one group of setae along posterior margin (fig. 3D); article 5 (carpus) poorly shorter than propodus. Propodus nearly quadrate, slightly longer than broad, with 5 transversal rows of setae along posterior margin (fig. 3B); palm inclined slightly less than half of propodus-length, convex, defined on outer face by one strong corner spine accompanied laterally by 2 slender serrate spines and 5 facial long setae (fig. 3B), on inner face by one short subcorner spine (fig. 3C); dactylus reaching posterior margin of propodus, with row of short strong setae at inner margin and with 5 bunches of longer setae along outer margin (fig. 3B).

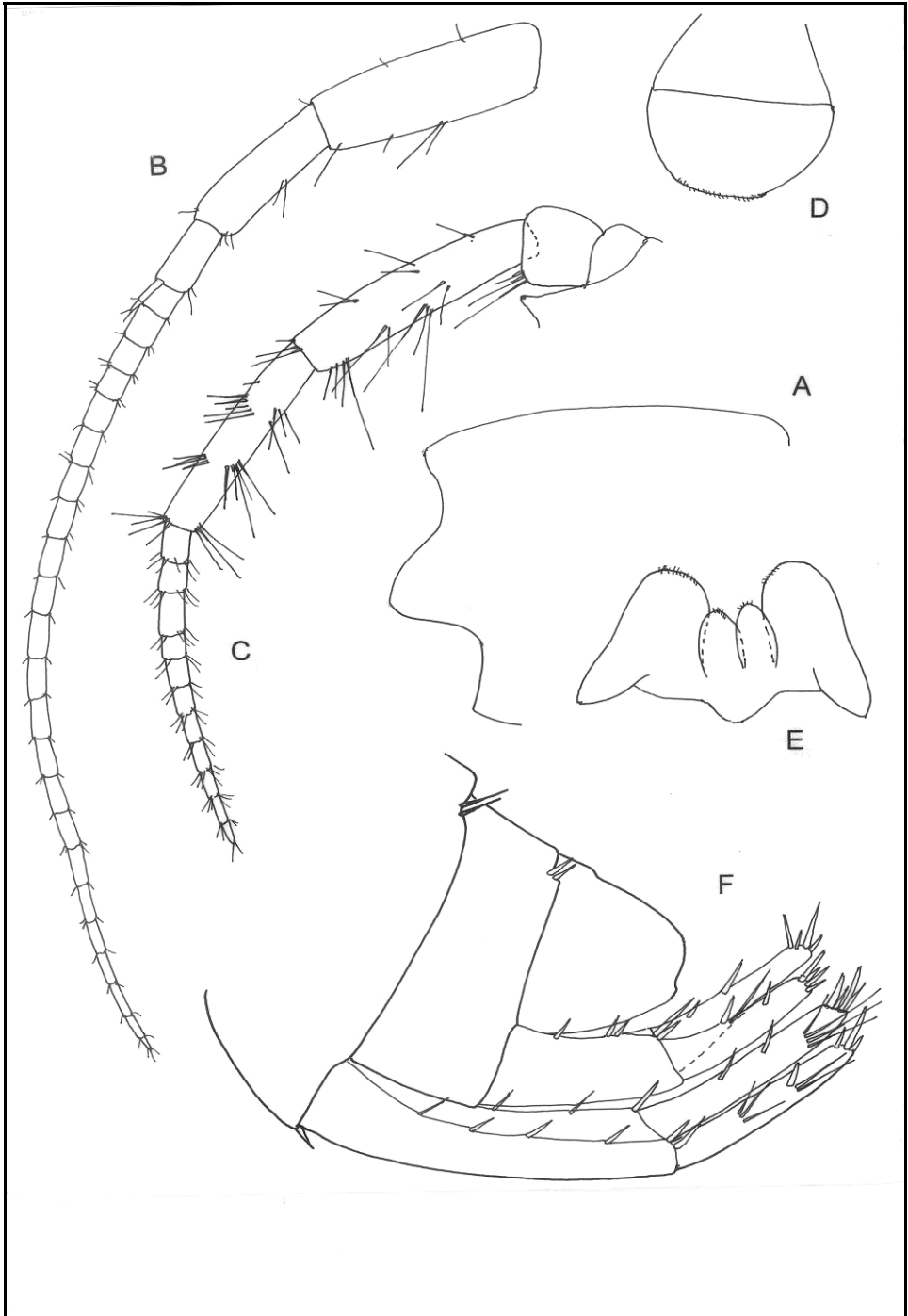


Fig. 1. *Niphargus religiosus* sp. n., female 10.5 mm (holotype), Uragavaz Gecidi, Ballidag (Kastamonu): A= head; B= antenna 1; C= antenna 2; D= labrum; E= labium; F= urosome with uropods 1-2

Gnathopod 2: pilosity of articles 3-5 like that in gnathopod 1; article 3 with one group of setae along posterior margin (fig. 3D); article 5 (carpus) hardly shorter than propodus. Propodus nearly as long as broad, quadrate, with 8 transverse groups of setae along posterior margin (fig. 3E); palm convex and inclined slightly less than half of propodus-length, defined on outer face by one strong corner spine, 2 lateral short serrate spines and 5 facial long setae (fig. 3E); on inner face by one short subcorner spine (fig. 3F). Dactylus reaching posterior margin of propodus, with row of short strong setae at inner margin and 5 bunches of longer setae along outer margin (fig. 3E).

Pereopods 3-4 strong and relatively short, similar to each other in size and shape. Article 2 in proximal part with long setae at both margins, and shorter setae in distal part; article 4 with spines at anterior margin and bunches of setae at posterior margin (fig. 4A,C); article 5 (carpus) along posterior margin with single spines accompanied by longer setae; article 6 with several pairs of short spines at posterior margin and bunches of setae along anterior margin (fig. 4A,C). Dactylus short and strong, reaching nearly one third of propodus-length, and bearing in pereopod 3 one strong spine at inner margin near basis of nail (fig. 4B), and 2 spines (in one bunch) in pereopod 4 (fig. 4D); nail slightly shorter than pedestal, with one median plumose seta at outer margin (fig. 4B,D).

Pereopods 5-7 short and stout. Pereopod 5: basipodit ovoid, slightly longer than broad, with convex both margins and indistinct ventroposterior lobe; anterior margin of basipodit with row of short spines, posterior margin with numerous very short strong setae (fig. 5A); articles 3-6 with spines and setae at both margins, article 6 with pairs of short strong spines at posterior margin (fig. 5A). Dactylus short and strong, not reaching one third of propodus length, bearing one strong spine at inner margin near basis of nail, and with one median plumose seta at outer margin; nail slightly shorter than pedestal (fig. 5B). Pereopod 6: basipodit ovoid, along posterior margin with weak ventroposterior lobe and numerous very short strong setae; along anterior margin with spines mixed with single short setae (fig. 5C); articles 3-6 with short spines at both margins, setae are very scarce (fig. 5C); dactylus missing.

Pereopod 7: article 2 (basipodit) ovoid, longer than broad, with well visible weak ventroposterior lobe and numerous posterior marginal short spine-like setae; along anterior margin with strong short spines (fig. 5D); article 4 with spines at both margins (fig. 5D), articles 5-7 missing.

Pleopods 1-3 with 2 retinacula each. Peduncle of pleopod 1 along outer margin with row of long 14 plumose setae, at inner margin with 5 short simple strong spine-like setae (fig. 6E). Peduncle of pleopod 2 along outer margin with row of 9 long plumose setae, at inner margin with 2 strong setae (fig. 6F). Peduncle of pleopod 3 at outer margin with row of 7 plumose setae, at inner margin with 2 strong spine-like setae accompanied by 2 weak setae (fig. 6G).

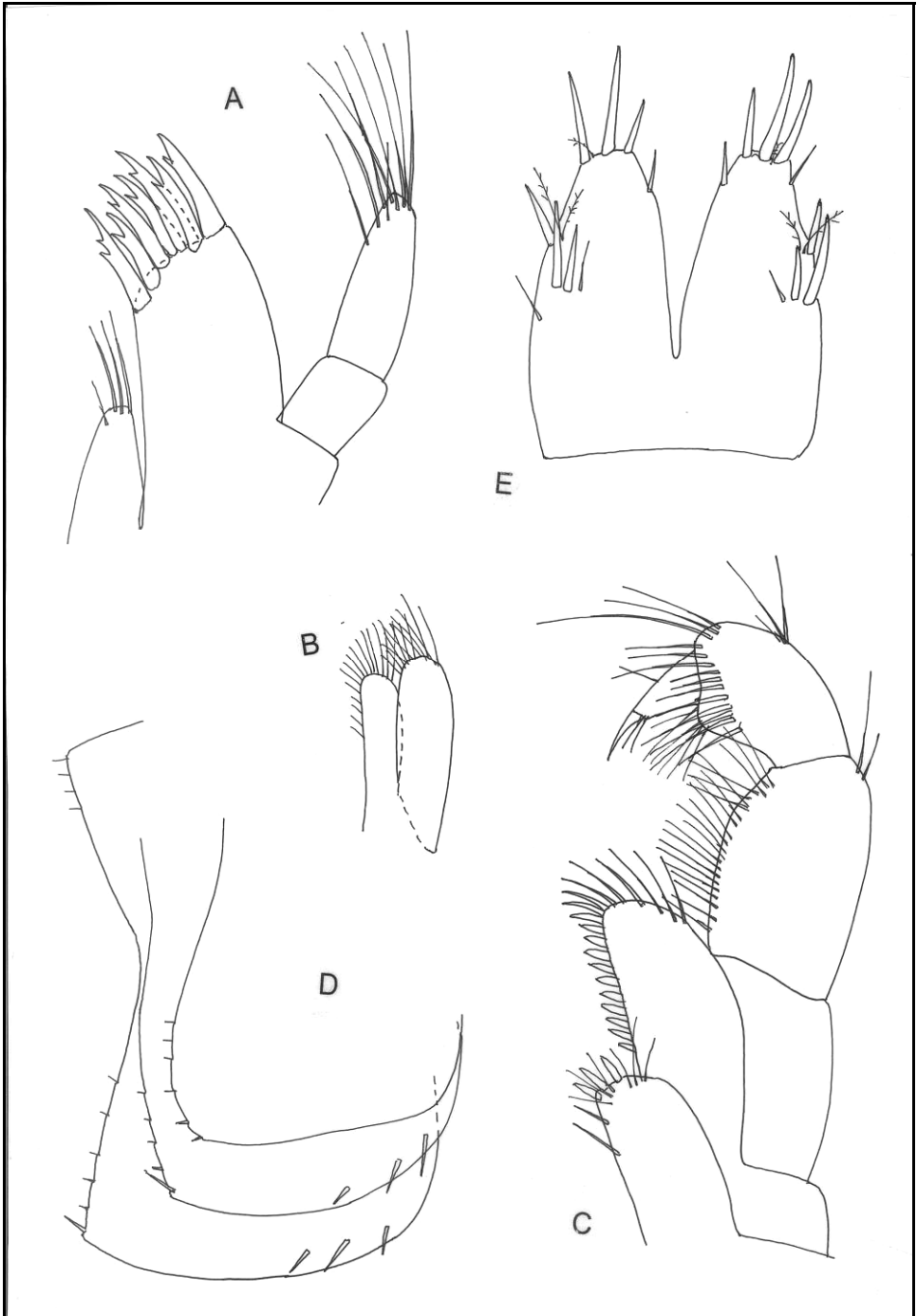


Fig. 2. *Niphargus religiosus* sp. n., female 10.5 mm (holotype), Uragavaz Gecidi, Ballidag (Kastamonu): A= maxilla 1; B= maxilla 2; C= maxilliped; D= epimeral plates 1-3; E= telson

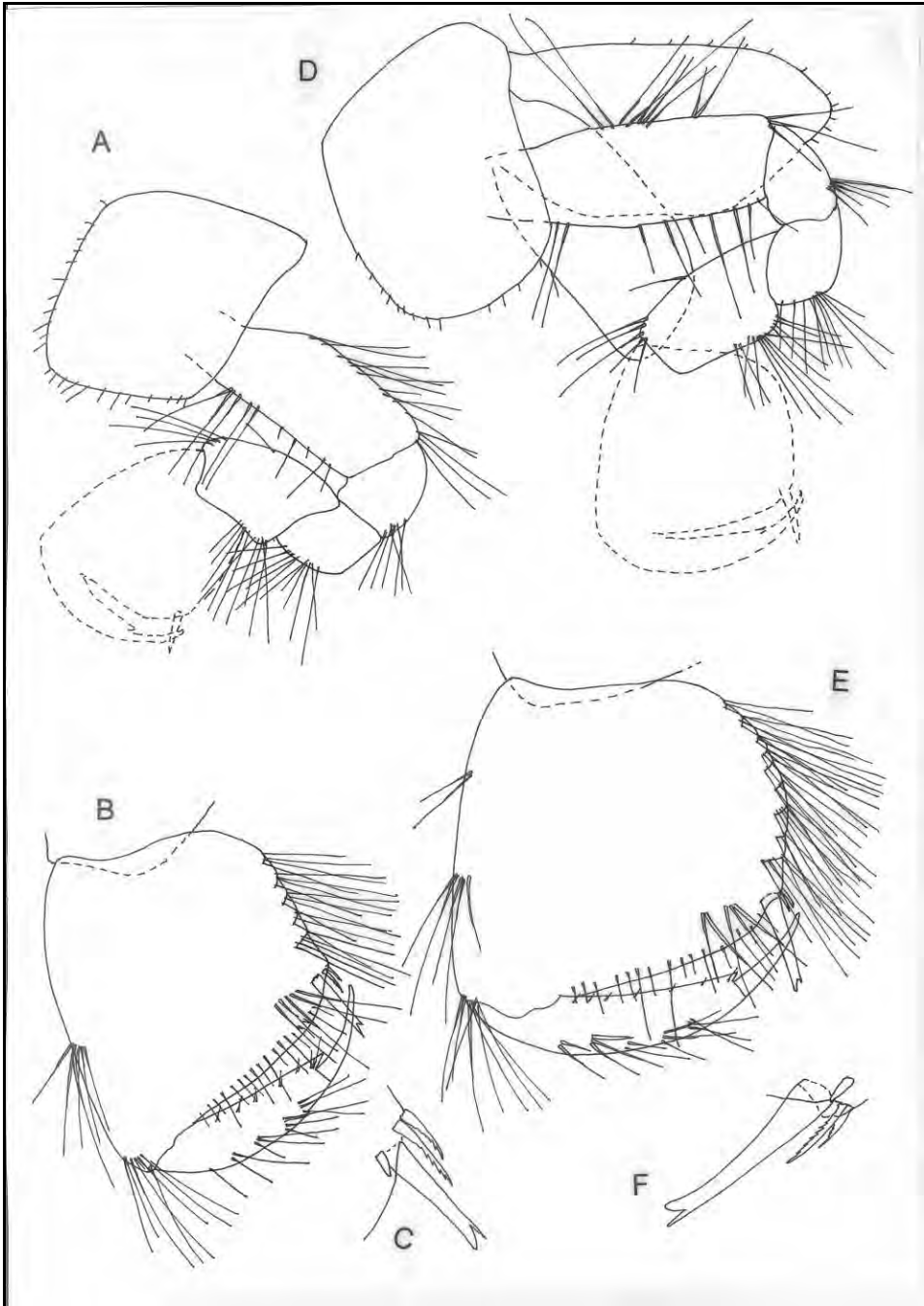


Fig. 3. *Niphargus religiosus* sp. n., female 10.5 mm (holotype), Uravavaz Gecidi, Ballidag (Kastamonu): A-B= gnathopod 1; C= inner face of gnathopod 1 propodus; D-E= gnathopod 2; F= inner face of gnathopod 2 propodus



Uropods 1-2 short and strong (fig. 1F). Uropod 1: peduncle with dorsoexternal row of spines and dorsointernal row of spine-like setae (except distal strong spine). Inner ramus slightly, but distinctly, longer than outer one (fig. 1F), both rami with lateral and distal short and strong spines, in distal part accompanied by bunch or single longer setae (fig. 1F).

Uropod 2: inner ramus distinctly longer than outer one, both rami with lateral and distal short spines (fig. 1F). Uropod 3 short and strong. Peduncle with lateral and distal short spines (fig. 4E). Inner ramus scale-like, short (fig. 4E). Outer ramus 2-articulate: first article strong, along both margins with bunches of short strong spines, along inner margin spines are accompanied by single long plumose setae (fig. 4E). Second article of outer ramus short, bearing short lateral and distal setae only (fig. 4E).

Telson as long as broad, incised 2/3 of telson-length; each lobe with 3 short distal spines; single spines appear along both margins, as well as one bunch of strong facial spines accompanied by one short seta (fig. 2E). A pair of short plumose setae appears in upper half of each lobe (fig. 2E).

Coxal gills relatively large, these on gnathopod 2 and pereopods 3-5 nearly reaching distal tip of article 2 (basipodit) (figs. 3D; 4A,C; 5A); gills on pereopod 6 are shorter (fig. 5C).

Oostegites broad, appear on gnathopod 2 and pereopods 3-5, provided with short marginal setae (fig. 3D).

MALES: unknown.

VARIABILITY. The damaged paratype, female 11.3 mm, agrees mainly with description of holotype. First article of mandible palp is with one seta also, inner plate of maxilla 1 bearing 3 setae.

Propodus of gnathopod 1 on outer face with 7 facial setae near corner spine; that of gnathopod 2 with 6 facial setae.

DERIVATIO NOMINIS: The name *religiosus* arrives from the Latin word “*religiosus*”, adequate word *religious* in English.

#### REMARKS AND AFFINITIES.

*Niphargus religiosus* is with stout body and stout, relatively short extremities, similar to *N. puteanus*-group within genus *Niphargus*. *N. religiosus* differs from all other known species from Turkey by the presence of one seta on first article of mandible palp, the character very rarely present within the *Niphargus* genus. One similar mandible palp is known in *Niphargus timavi* Karaman, S., 1954, known from the subterranean waters of Timavo near Trieste and adjacent areas of Italian/ Slovenian border.

*Niphargus anatolicus* Karaman, S. 1950, differs from *N. religiosus* also by much less spiniferous telson lacking facial spines, by elevated number of setae on outer margin of dactylus in gnathopods 1-2, by poorly setose peduncle of pleopods 1-3, etc.

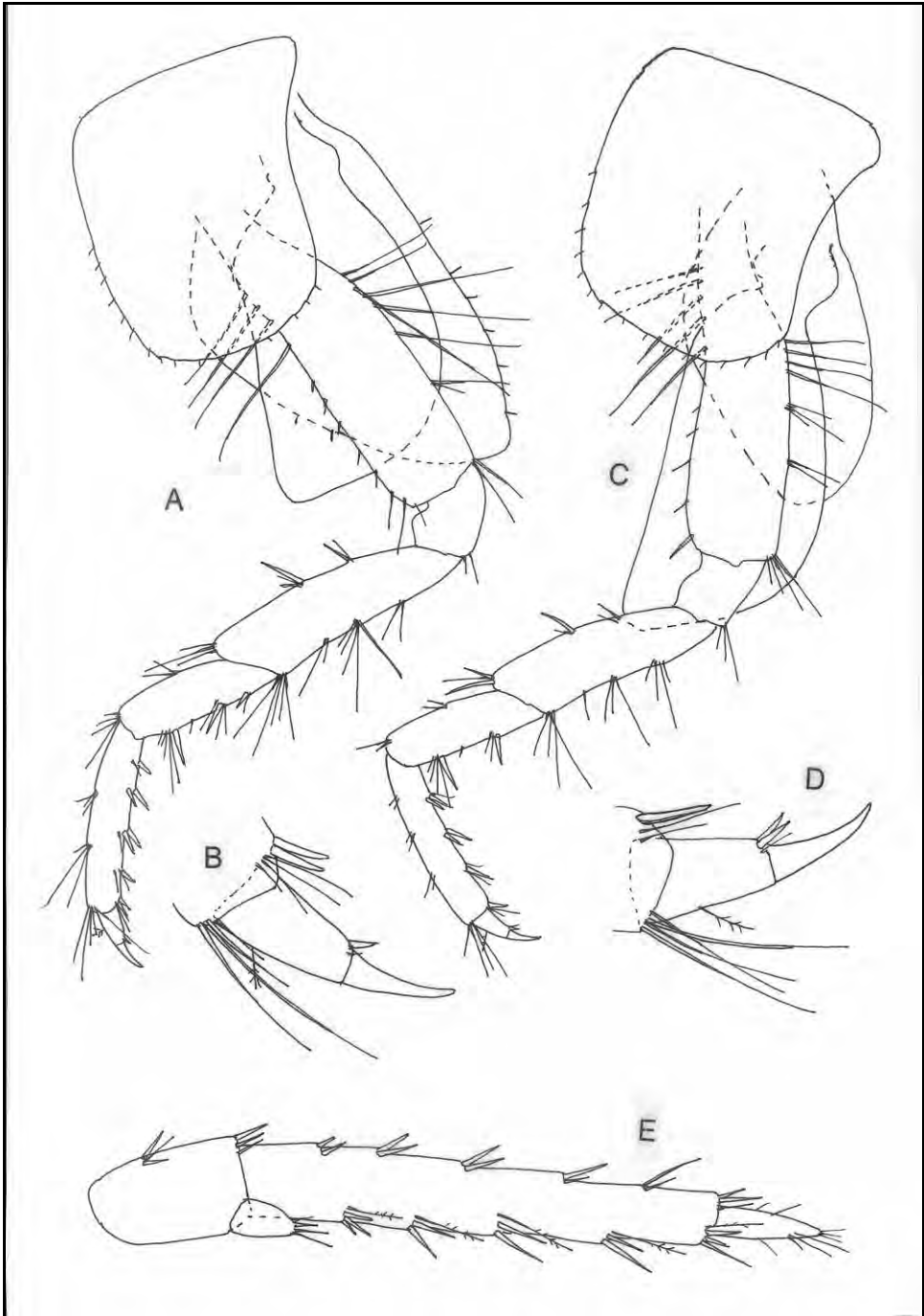


Fig. 4. *Niphargus religiosus* sp. n., female 10.5 mm (holotype), Uragavaz Gecidi, Ballidag (Kastamonu): A-B= pereopod 3; C-D= pereopod 4; E= uropod 3.

*Niphargus orientalis* Karaman, S., 1950, differs from our species also by presence of additional spines along inner margin of dactylus in pereopods, etc.

*Niphargus sertaci* Fišer et al., 2009, differs from our species also by presence of 2 ventroposterior spines on urosomite 1 near basis of uropod 1 peduncle (protopodite), by lower number of outer marginal setae on dactylus of gnathopods 1-2, etc.

*Niphargus kirgizi* Fišer et al, 2009, differs from our species by elevated number of retinacula on pleopods 1-3, by slender long pereopods, less number of setae on inner plate of maxilla 1, etc.

*Niphargus tauri* Schellenberg, 1934, differs remarkably from our species by presence of one seta along outer margin on dactylus of gnathopods 1-2, lower number of spines on telson, elevated number of retinacula, etc.

Various *Niphargus* species described from former USSR differ distinctly from our new species, although the relatively poor descriptions and figures of these species made impossible one more detailed comparison of various taxonomical characters of these species with *N. religiosus*.

#### Genus *AMATHILLINA* G.O. Sars, 1894

The freshwater genus *Amathillina* G.O. Sars, 1894 (fam. Gammaridae) is known from the Pontocaspian basin, especially from the Caspian and Black Sea, as well as from the corresponding drainage systems through which the species of this genus invaded various continental waters in Eurasia [Ketelaars, 2004], and later, some freshwater basins of North America (Great Lakes system), probably introduced by men. [Ricciardi & MacIsaac, 2000].

All known 5 species of this genus are originated from the Caspian Sea, where they have been discovered and described: *Amathillina affinis* G.O. Sars 1894 [locus typicus: N. part of Caspian Sea, Tschisty Bank]; *Amathillina cristata* G.O. Sars, 1894 [locus typicus: Bay of Baku, Caspian Sea]; *Amathillina maximowiczi* G.O. Sars, 1896 [locus typicus: Karabugas Bay, Caspian Sea]; *Amathillina pusilla* G.O. Sars 1896 [locus typicus: Karabugas Bay, Caspian Sea] and *Amathillina spinosa*, Sars, 1896 [locus typicus: S. part of Caspian Sea, 108 fathoms depth].

Sars, G.O. (1894a) mentioned Grimm as author of genus *Amathillina*, as well as of the species *A. cristata* and *A. spinosa*. The most of the recent authors considered G.O. Sars as author of this genus and these species [Bellan-Santini, D. & Costello, M.J., 2001; Özbek, M. & Özkan, N., 2010, etc.].

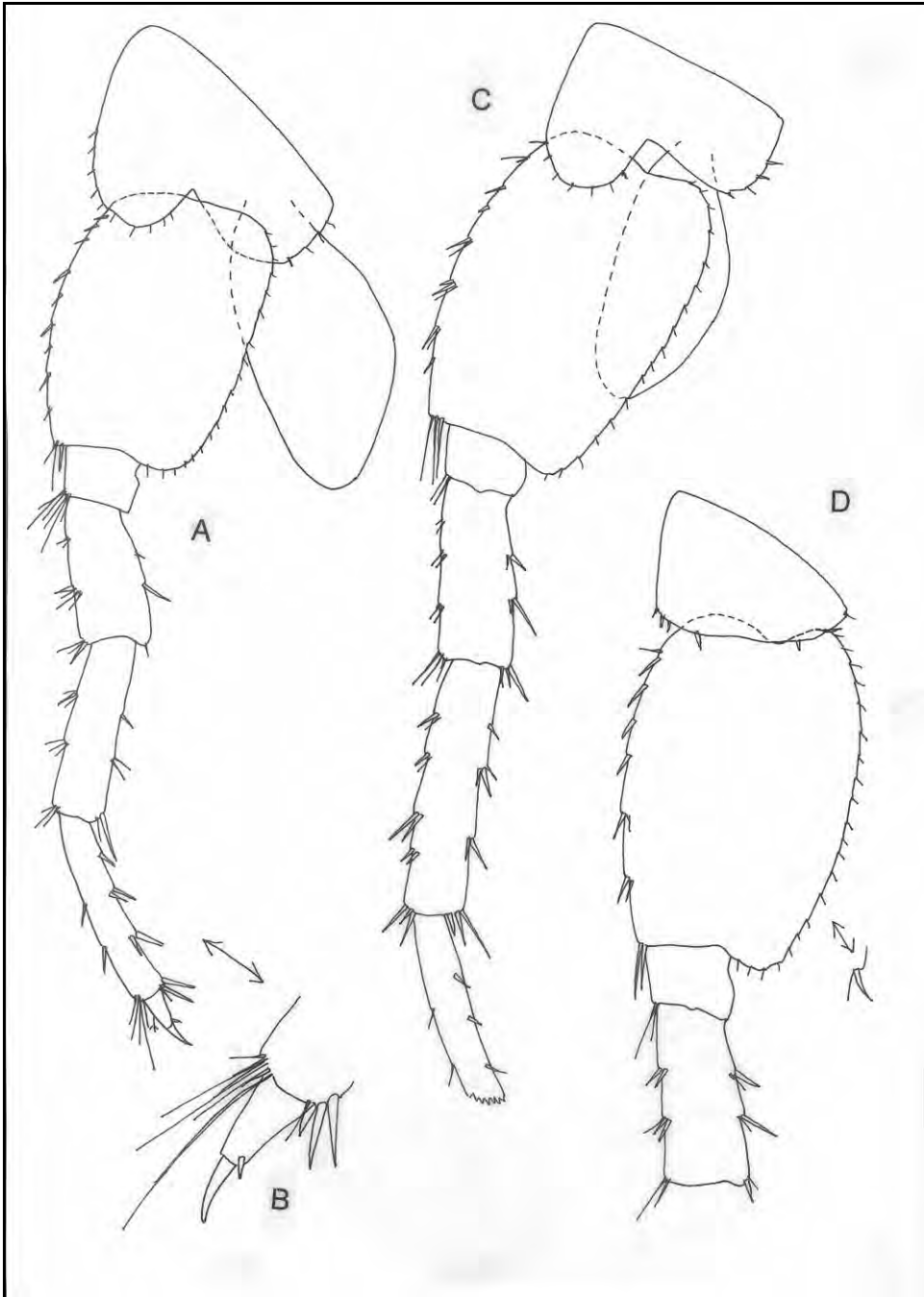


Fig. 5. *Niphargus religiosus* sp. n., female 10.5 mm (holotype), Uragavaz Gecidi, Ballidag (Kastamonu): A-B= pereopod 5; C= pereopod 6; D= pereopod 7.

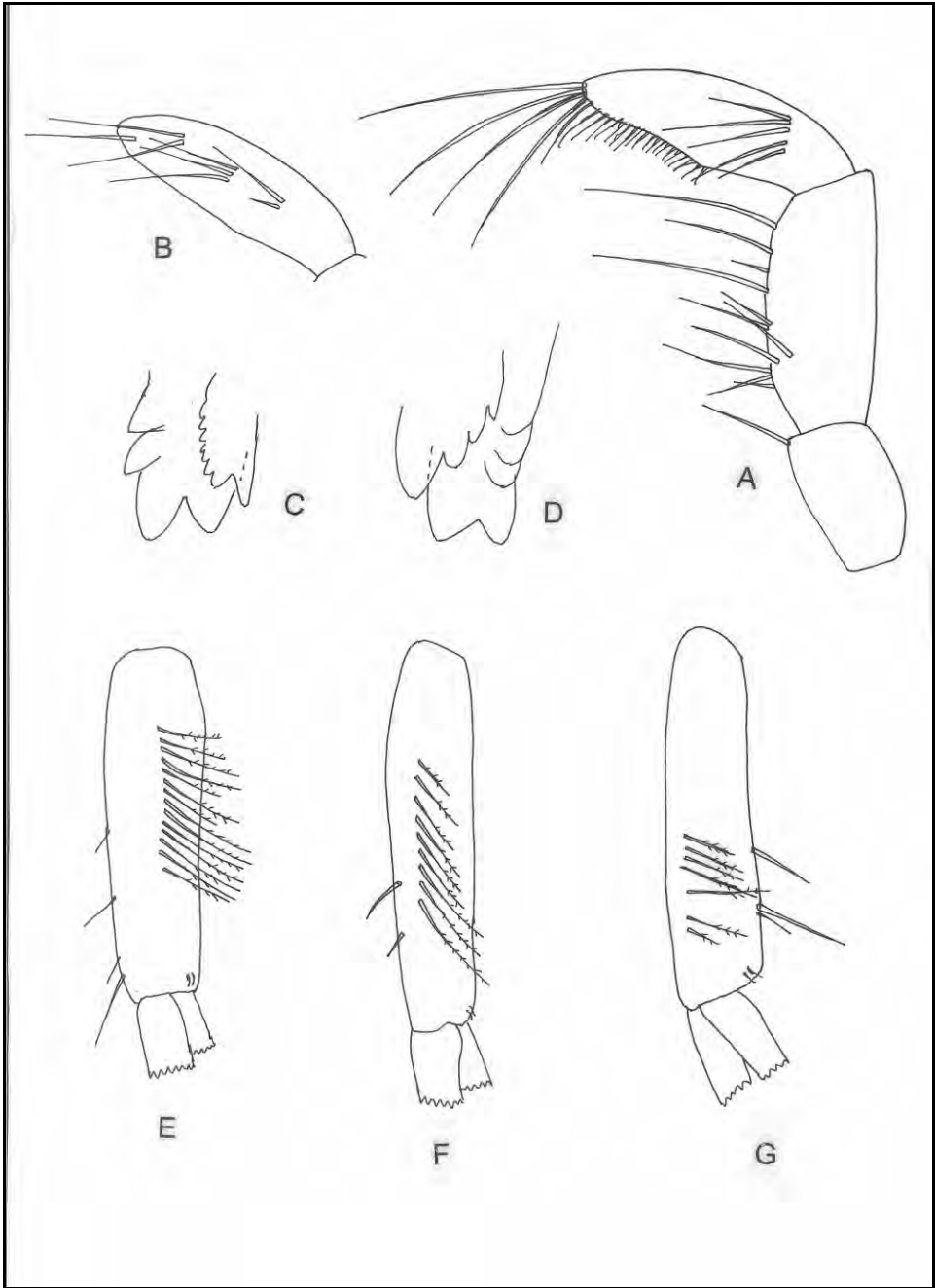


Fig. 6. *Niphargus religiosus* sp. n., female 10.5 mm (holotype), Uragavaz Gecidi, Ballidag (Kastamonu): A= mandible palp, outer face; B= tip of mandible palp, inner face; C=left incisor and lacinia mobilis; D= right incisor and lacinia mobilis; E= peduncle of pleopod 1; F= peduncle of pleopod 2; G= peduncle of pleopod 3

## AMATHILLINA CRISTATA G.O. Sars, 1894

Figs. 7-11

*Amathillina cristata* Sars, 1894: 202, pl. 5; pl. 6, figs. 1-8; Birstein & Romanova, 1968: 249, fig. 260; Mordukhai-Boltovskoi et al., 1969: 464, pl. VIII, fig. 1; Barnard & Barnard, 1983: 531; Stock et al., 1998: 215; Mirzajani & Kiabi, 2001: 513; Özbek & Özkan, 2010, fig. 1.

MATERIAL EXAMINED: Turkey: Terkos Lake, 16.10.1971, several specimens (leg. A. Koçatas).

DIAGNOSIS. Body with longitudinal dorsal strong keel, urosomites free; eyes developed, accessory flagellum present, telson deeply incised. Mouthparts basic: labium without inner lobes. Maxilla 1 with triangular inner plate bearing row of marginal setae, outer plate with nearly 11 toothed spines, left and right mandible palp asymmetric to each other; inner plate of maxilla 2 with inclined facial row of setae; Mandible palp 3-articulate, subfalciform. Coxae 1-4 large, coxae 5-7 much shorter than coxae 1-4. Gnathopods 1-2 similar to each other, propodus in males with median palmar spine.

Pereopods 3-4 stout. Pereopods 5-7 dissimilar to each other, basipodit of pereopods 5 and 6 is not lobed, basipodit of pereopod 7 distinctly lobed. Pleopods with 2 retinacula. Uropods biramous, spinose. Uropod 3 short, biramous, inner ramus scale like, outer ramus 2-articulate, second article short. Sexual dimorphism present.

DESCRIPTION: MALE 12.3 mm. Body-length up to 13 mm. Body dorsally longitudinally keeled, mesosomal and metasomal segments with dorsal carina prolonged into a tooth. These dorsal teeth are very low in the first mesosomal segments, and successively are higher and acute towards the last metasomal segment (fig. 8A). The dorsal keel on last metasomal segment is not acute, but subrounded (in lateral view). Urosome is keeled also, especially that on urosomite one (fig. 8F); the keel on urosomites 2 and 3 is subrounded and diminish towards last urosomite (fig. 8E).

Epimeral plate 1 subrounded but with marked ventroposterior corner and serrate posterior margin (fig. 9E). Epimeral plates 2-3 with weakly pointed ventroposterior corner and poorly crenellated posterior margin bearing row of short setae.

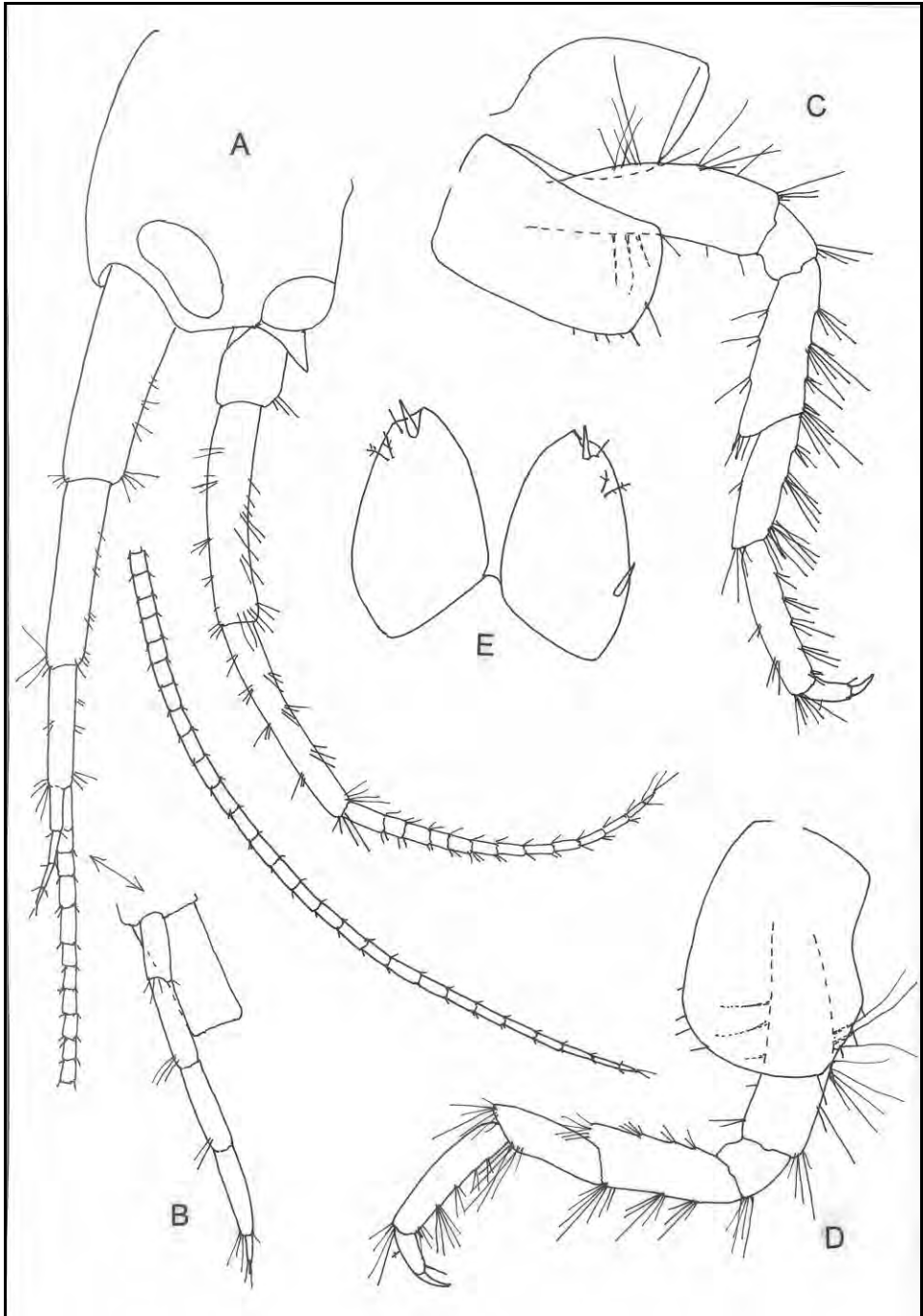


Fig. 7. *Amathillina cristata* Sars, male 12.3 mm, Terkos Lake: A= antenna 1; B= accessory flagellum; C= pereopod 3; D= pereopod 4; E= telson

Ventral surface of epimeral plate 1 with 4-5 facial long setae (fig. 9E), that of epimeral plate 2 with 10-12 facial setae and one spine (fig. 9E). Epimeral plate 3 with row of ventral submarginal spines (fig. 9E).

Urosomite 1 with dorsal saddle (in lateral view), bearing 2 dorsomedian setae (fig. 8F), dorsolateral elements absent. Ventroposterior corner spine near basis of uropod 1-peduncle absent (fig. 8F). Urosomites 2 and 3 with one group of 2-3 dorsomedian setae each; dorsolateral groups of 1-2 spines and setae are present on each side of urosomites 2-3 (fig. 8F).

Head with short rostrum, obtuse lateral cephalic lobes and with ventroanterior subrounded notch (figs. 7A; 8A). Eyes reniform, larger than the diameter of the peduncle of antenna 1 (fig. 7A).

Antenna 1 slender and long, reaching  $2/3$  to  $3/4$  of the body-length. Peduncle articles 1-3 progressively shorter and narrowed; ratio of peduncle articles 59: 49: 33; all peduncle articles with very scarce short setae (fig. 7A). Main flagellum consisting of 38 articles scarcely setose (fig. 7A); most of the flagellum articles with one short aesthetasc each. Accessory flagellum long, 4-5 articulate, nearly as long as last peduncle article (fig. 7B).

Antenna 2 slender, nearly reaching half of antenna 1-length (fig. 7A); peduncle article 3 short. Peduncle articles 4 and 5 are nearly equally long, with several bunches of short setae each, setae are not exceeding the width of the articles themselves (fig. 7A). Flagellum consisting of 13 slender articles bearing scarce number of short setae each; calceola absent (fig. 7A). Antennal gland cone short (fig. 7A).

Mouthparts basic. Labrum entire, ovoid (fig. 10A). Labium with well developed entire subrounded outer lobes, inner lobes absent (fig. 8B).

Maxilla 1: inner plate triangular, with row of distolateral plumose setae (fig. 8C); outer plate with nearly 11 spines bearing 1-5 lateral teeth each (fig. 8C). Palp of left and right maxilla 1 is 2-articulated, asymmetric to each other: left palp is more narrow, with 4 distal narrow spines and 3-4 setae (fig. 8D); right palp is more dilated, with 5-6 distal large spines and 2-3 setae (fig. 8C).

Maxilla 2: outer plate is longer than inner one, with numerous distal and subdistal setae (fig. 8E); inner plate with distal and lateral row of setae, as well as with a row of inclined facial strong setae, like that in genus *Gammarus* (fig. 8E).

Maxilliped with short and stout plates. Inner plate with 3 distal spines and distolateral row of setae (fig. 11C); outer plate with row of mesial marginal spines; palp 4-articulated, palp article 3 with several setae along outer margin (fig. 11C).



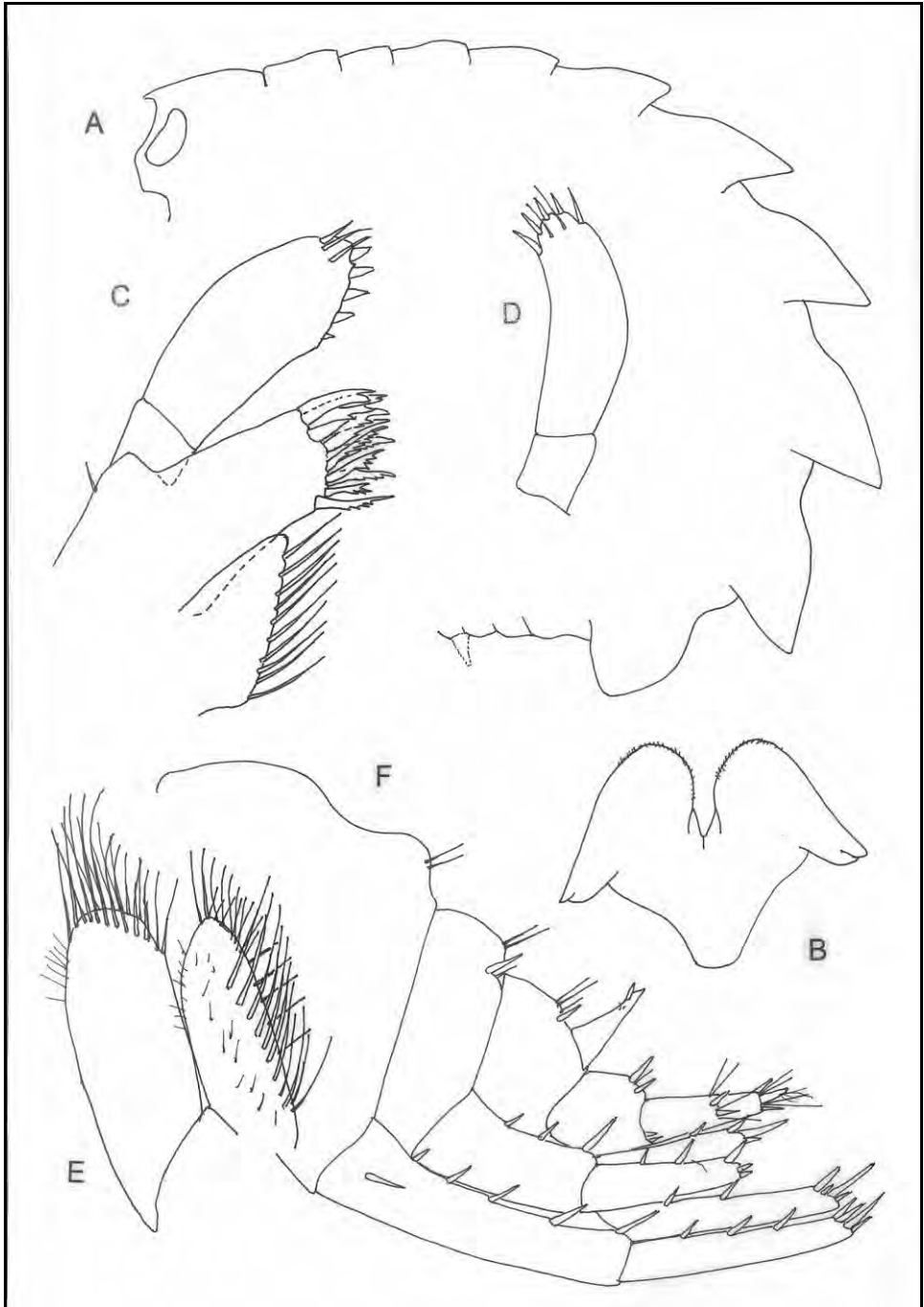


Fig. 8. *Amathillina cristata* Sars, male 12.3 mm, Terkos Lake: A= dorsal body keel; B= labium; C= right maxilla 1; D= left palp of maxilla 1; E= maxilla 2; F= urosome with uropods 1-3

Mandible: body similar to that of genus *Gammarus*. Mandible palp 3-articulated: first article smooth; second article with 3-4 setae in proximal part and 7-9 setae in distal part (fig. 11A). Palp article 3 subfalciform, with 20-24 D-setae and 4 distal long E-setae; on outer face appear 3 groups of A-setae (fig. 11B), on inner face appear 2 groups of B-setae; C-setae absent (fig. 11A).

Coxae 1-4 elongated, remarkably longer than broad, quadrate. Coxa 1 with slightly concave anterior margin and subrounded ventroanterior corner (fig. 9A), bearing row of longer setae along ventral (distal) margin. Coxa 2 with slightly concave anterior margin, bearing less number of ventral marginal setae than coxa 1 (fig. 9C). Coxae 3-4 are with slightly convex anterior margin and scarce number of ventral marginal setae each (fig. 7C, D).

Coxae 5-7 much shorter than coxa 4, with scarce number of ventroposterior short strong setae (fig. 10B, C,D). Coxa 5 with remarkably smaller anterior lobe than posterior one (fig. 10B); coxa 6 with anterior lobe slightly larger than posterior one (fig. 10C); coxa 7 slightly lobed also (fig. 10D).

Gnathopods 1-2 of the similar size, their article 2 with long setae along both margins; article 4 with one posteromedian and posterodistal group of setae (fig. 9A,C). Article 5 (carpus) short, triangular, less than twice as long as propodus, bearing along anterior margin one distal group of setae (fig. 9A, C). Propodus (article 6) of gnathopod 1 quadrate, slightly less than twice longer than wide, along posterior margin with 4 groups of relatively short setae. Palm concave, with one strong median and 2 palmar spines on outer face (fig. 9B), as well as one short subcorner spine at inner face (fig. 9B); dactylus reaching posterior margin of propodus, slightly dilated in the middle, and with one median seta along outer margin (fig. 9B).

Gnathopod 2 article 5 (carpopodit) almost reaching half of propodus-length. Propodus is slightly less than twice as long as broad, quadrate, along posterior margin with 9-10 groups of setae (fig. 9D). Palm inclined, wave-shaped, on outer face with one median strong spine and 2 subcorner spines; on inner face with 2 short subcorner spines (fig. 9D); dactylus with one median seta along outer margin (fig. 9D).

Pereopods 3-4 moderately stout, of similar shape, but pereopod 3 hardly longer than 4. Pereopod 3: posterior margin of articles 4-6 with bunches of longer setae accompanied sometimes with single short spines; dactylus strong, with strong seta at inner margin near basis of nail, and with one median plumose seta at outer margin (fig. 7C). Pereopod 4 with less number of setae than pereopod 3 (fig. 7D).

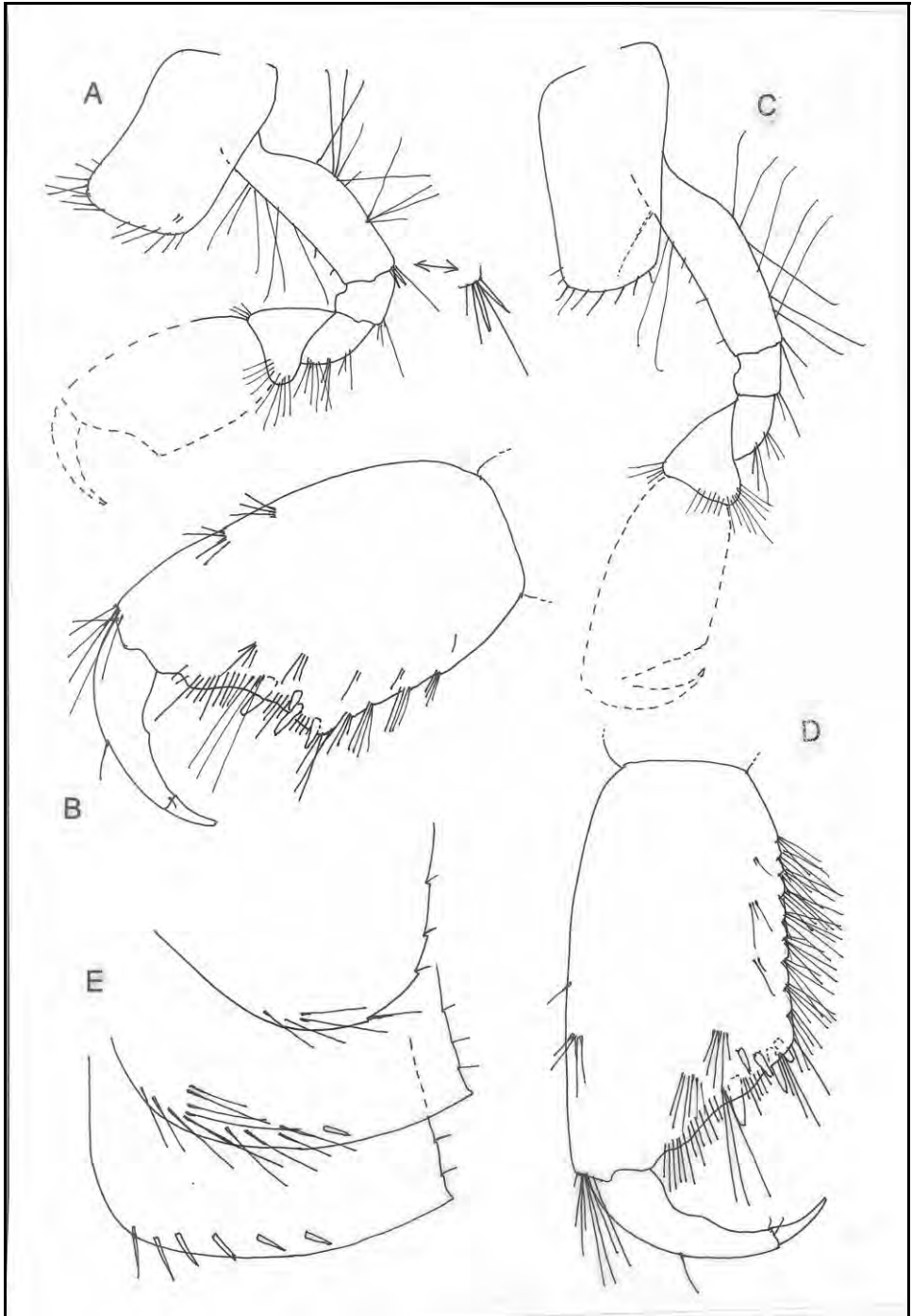


Fig. 9. *Amathillina cristata* Sars, male 12.3 mm, Terkos Lake:  
A-B= gnathopod 1; C-D= gnathopod 2; E= epimeral plates 1-3

Pereopods 5-7 strong and stout, dissimilar to each other, pereopod 6 is the longest one (fig. 10B,C,D). Pereopod 5: basipodit almost quadrate, slightly longer than broad, with nearly straight posterior margin bearing a row of 9-12 short marginal setae (fig. 10B), ventroposterior lobe absent; articles 4-5 with bunches of short setae and single spines along both margins; article 6 along both margins with bunches of long setae. Dactylus strong, with strong median seta along inner margin near basis of nail, and with one median outer marginal plumose seta (fig. 10B).

Pereopod 6: basipodit slightly larger than that of pereopod 5, slightly longer than broad, with convex posterior margin bearing row of short marginal setae, ventroposterior lobe absent. Articles 3-4 along both margins with bunches of short spines and setae; article 6 along both margins with bunches of long marginal setae; dactylus like that of pereopod 5 (fig. 10C).

Pereopod 7: basipodit oval, slightly longer than broad, with row of short posterior marginal setae and developed strong ventroposterior lobe; inner surface of basipodit with several bunches of short facial setae (fig. 10D). Articles 4-5 along anterior margin with bunches of setae and spines, along posterior margin with bunches of spines (fig. 10D); article 6 along both margins with bunches of long marginal setae, dactylus like that in pereopods 5-6 (fig. 10D).

Pleopods 1-3 well developed, bearing 2 retinacula each; rami subequal, pluriarticulated.

Uropod 1-3 stout and short. Uropod 1: protopodite (peduncle) with row of dorsomarginal spines and one strong basifacial spine on outer proximal surface (fig. 8F). Rami subequal or outer ramus hardly longer than inner one; both rami with lateral and distal short strong spines (fig. 8F).

Uropod 2 short, not reaching tip of uropod 1-rami; rami are of subequal length, bearing strong short lateral and distal spines (fig. 8F).

Uropod 3 short, not exceeding tip of uropods 1-2 (fig. 8F). Peduncle strong, slightly longer than broad, with distal spines. Inner ramus scale-like, with distal spine. Outer ramus 2-articulated: first article hardly longer than peduncle, bearing at both margins one median and one distal bunch of long simple setae (fig. 10E); along outer margin of first article single spines are attached to the bunches of setae (fig. 10E). Distal (second) article of outer ramus very short and narrow, with bunch of subdistal long simple setae (fig. 10E).

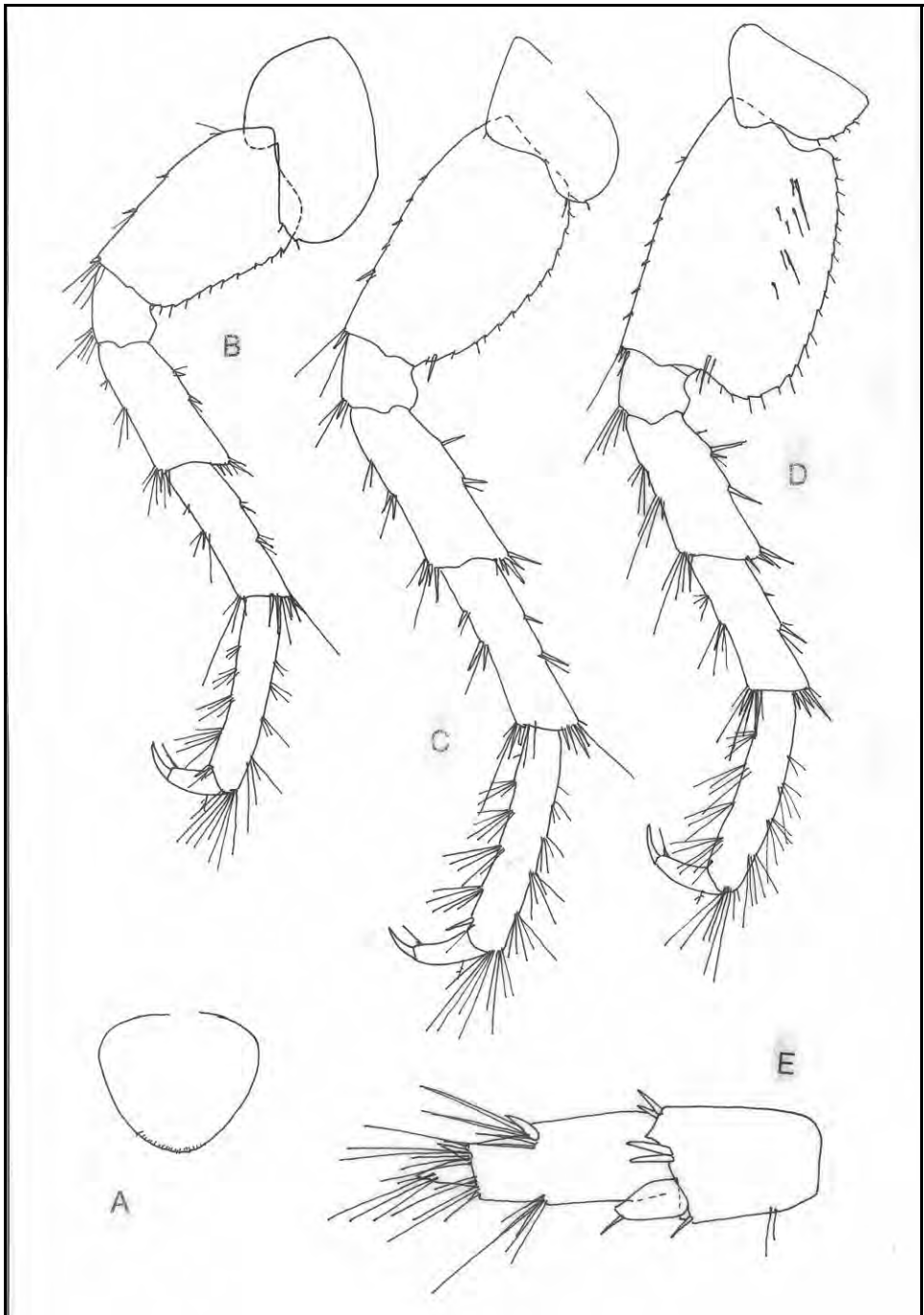


Fig. 10. *Amathillina cristata* Sars, male 12.3 mm, Terkos Lake:  
A= labrum; B= pereopod 5; C= pereopod 6; D= pereopod 7; E= uropod 3

Telson slightly broader than long, incised near to the basis (fig. 7E); each lobe with one distal short spine accompanied by one short seta. Sometimes one spine appears in proximal part of each lobe along outer margin. A pair of short plumose setae appears in distal outer part of each lobe (fig. 7E).

Gills ovoid, appear on thoracic segments 2-7 (fig. 7C).

**FEMALE:** Body size 9.5 mm. Females is rather similar to the males (shape of body dorsal keel, antennae, pereopods, telson, urosomites, pleopods, epimeral plates, etc.). But, the females differ from the males by smaller gnathopods 1-2 (fig. 11D, F).

Gnathopod 1: article 4 along posterior margin with one median and one distal group of setae (fig. 11D ); article 5 shorter than article 6 (fig. 11D). Propodus (article 6) distinctly smaller than corresponding coxa (fig. 11D), slightly longer than broad, quadrate, with 5 groups of setae along posterior margin (fig. 11E); palm inclined but not concave, without median palmar spine and defined on outer face by one short corner spine, on inner face defined by one short subcorner spine (fig. 11E). Dactylus narrow, without median dilatation, and with one median seta along outer margin (fig. 11E).

Gnathopod 2: article 4 along posterior margin with one median and one distal group of setae (fig. 11F). Carpus (article 5) shorter than propodus (article 6). Propodus quadrate, nearly twice as long as broad, with 9-10 groups of setae along posterior margin. Palm slightly convex, without median palmar spine and defined on outer face by one strong corner spine, on inner face by one short subcorner spine. Dactylus without median dilatation and with one median seta along outer margin (fig. 11G).

Uropod 3 like that in males, but slightly shorter and bearing less number of setae.

Oostegites broad, like these in genus *Gammarus*, bearing long marginal setae (fig. 11F).

**VARIABILITY.** Some characters are rather variable, as number of the setae on basipodit of pereopod 7, number of spines on epimeral plates 2-3 and uropod 3; the number of spines on urosomites 1-2 (1-2 spines), as well as of lateral spines and setae on lobes of telson.

The stable characters are medially dilated dactylus of gnathopods 1-2 in males and narrow, non dilated in females; shape of epimeral plates and urosomites; lobed basipodit of pereopod 7 and absence of ventroposterior lobe on basipodit of pereopods 5-6, shape of uropod 3, etc.

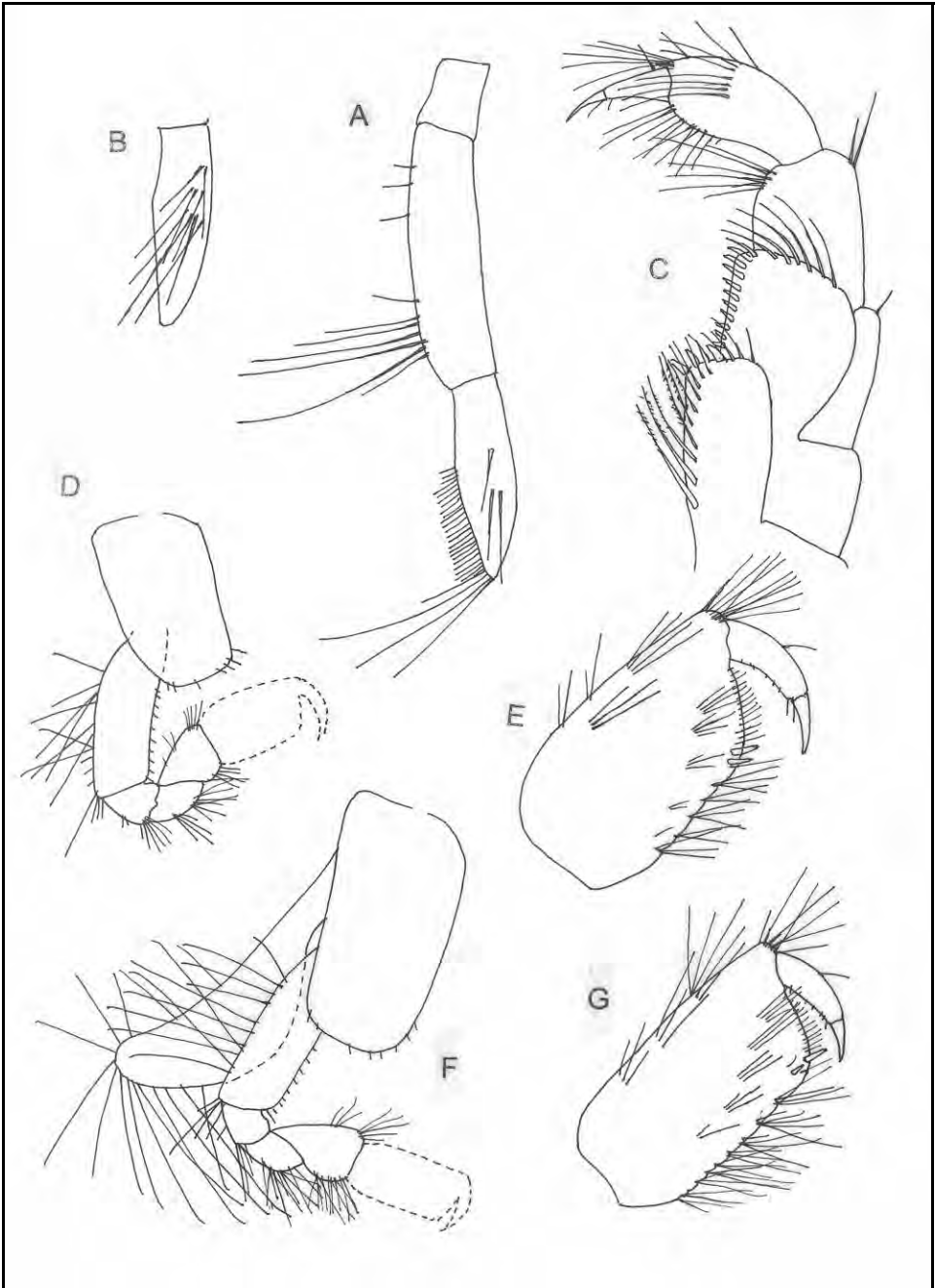


Fig. 11. *Amathillina cristata* Sars, male 12.3 mm, Terkos Lake: A= mandible palp, inner face; B= tip of mandible palp, outer face; C= maxilliped; D-E= gnathopod 1, female 9.5 mm; F-G= gnathopod 2, female 9.5 mm.

REMARKS. Although numerous authors mentioned the presence of this species within the Pontocaspian Basin and other localities where this invader species penetrated actively or passively [Birstein & Romanova, 1968; Mordukhai-Boltovskoi et al., 1969; Stock et al., 1998; Mirzajani & Kiabi, 2000; Özbek & Özkan, 2010, etc.], the best description and figures of this species were given by Sars (1894).

Some other authors mentioned sporadically some taxonomic characters of this species, only. For this reason we put here one more detailed redescription of this species, especially regarding some taxonomic characters not mentioned in previous short descriptions. Özbek & Özkan (2010) cited this species for the Lake Terkos, based on specimens up to 8.3 mm, and females up to 6.7 mm only.

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**Gordan S. KARAMAN**

**NOVA VRSTA *Niphargus religiosus*, sp. n. (fam. Niphargidae),  
SA OSVRTOM NA *Amathillina cristata* G.O. Sars, 1894  
(fam. Gammaridae) IZ TURSKE  
- 257. Prilog poznavanju Amphipoda -**

**SAŽETAK**

Iz podzemnih voda u Uragavaz Gecidi, Ballidag (Kastamonu), Turska (izvor na 1350 m nadmorske visine) opisana je i nacrtana jedna nova vrsta iz familije Niphargidae, *Niphargus religiosus*, sp. n., i analiziran je njen taksonomski položaj.

Zdepasto tijelo ove vrste podsjeća na tijelo članova *Niphargus puteanus* grupe, ali se *N. religiosus* odlikuje prisustvom jedne snažne dlake na prvom segmentu mandibularnog palpusa, kratkim i širokim bazipoditima pereopoda 5-7, prisustvom samo 2 retinakule na pleopodima, povećanim brojem dlaka na vanjskom rubu daktilusa prvog i drugog gnatopoda, kratkim trećim uropodom, prisustvom samo jednog trna sa unutrašnje strane daktilusa svih pereopoda, itd. Daljna otkrića mužjaka vrste *Niphargus religiosus* će omogućiti razumjevanje bližeg taksonomskog položaja ove vrste unutar roda *Niphargus*.

Površinska vrsta *Amathillina cristata* G.O. Sars, 1894 (familija Gammaridae) je bila opisana i citirana iz različitih lokaliteta Pontokaspijskog bazena (Crno i Kaspijsko more) i susjednih oblasti. Nedavno je ta vrsta citirana po prvi put za oblast Turske (Özbek & Özkan, 2010). Kako *A. cristata* nije bila opisana detaljno još od prvog opisa Sarsa (1894), mi smo opisali i nacrtali ovu vrstu iz Terkos jezera, naročito u pogledu nekih taksonomskih karaktera koji nisu bili ranije navedeni.

**Ključne riječi:** Taksonomija, Amphipoda, Niphargidae, *Niphargus religiosus*, nova vrsta, *Amathillina cristata*, Gammaridae, Turska, slatke vode.