

Karaman, G.S. (2026). New data on *Niphargus orientalis* S. Karaman, 1950 (Fam. Niphargidae) in Turkey (Contribution to the knowledge of the Amphipoda, 348). Agriculture and Forestry, 72 (2): 379-389. <https://doi:10.17707/AgricultForest.72.2.23>

DOI: 10.17707/AgricultForest.72.2.23

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**NEW DATA ON NIPHARGUS ORIENTALIS S. KARAMAN 1950  
(FAM. NIPHARGIDAE) IN TURKEY  
(CONTRIBUTION TO THE KNOWLEDGE OF THE AMPHIPODA  
348)**

**SUMMARY**

New data of the subterranean species from Turkey, *Niphargus orientalis* S. Karaman, 1950 (Amphipoda, Family Niphargidae) from Göksu, E side of Dardanelles, Turkey, are presented. Some additional new body-parts are described and figured and relation of this species regarding other *Niphargus* species from Turkey is given

**Keywords:** Amphipoda, subterranean, *Niphargus orientalis*, description, valid acceptance, distinct status, Turkey

**INTRODUCTION**

The subterranean fauna of Amphipoda (Crustacea Senticaudata) in Turkey is consisting of several families and genera, and it is still only partially investigated by various researchers. Within subterranean Amphipoda, the most numerous is family Niphargidae, with known nearly 15 species and subspecies in Turkey (G. Karaman, 2024).

First new species, *Niphargus tauri* was described in 1933 by Schellenberg [Loc. typ.: Cave in Taurus- Mts., Asia Minor, Turkey] under the name *Niphargus aquilex tauri*, later elevated on species level and redescribed in detail from type-locality (G. Karaman, 1973). Seventeen years later, Stanko Karaman described 2 new species from Turkey, *Niphargus illidzensis orientalis* S. Karaman 1950 [Loc. typ.: Göksu, E side of Dardanelles], later elevated on species level, and *Niphargus anatolicus* S. Karaman, 1950 [Loc. typ.: Emirgan (N. off Istanbul, European part of Turkey)]. Over half of Century later, in 2009, started discoveries of various further new *Niphargus* species from Turkey by various authors till today (Fišer, G. Karaman, Camur-Elipek, Andreev, Kenderov, Ozbek, etc.).

Along with discovery of more and more new species of *Niphargus*, it was necessary to describe more and more taxonomic characters in order to distinguish different old and new species. By this way, we refigured body parts on slides of holotype of *N. orientalis* and added some new figures and morphological data. By

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Notes: The authors declare that he has no conflicts of interest. Authorship Form signed online.

Recieved:11/05/2026

Accepted:15/06/2026

this way we completed description of *N. orientalis* (only uropod 3 missing) showing clear distinct taxonomical characters and differences regarding other member of this genus.

### MATERIAL AND METHODS

The studied material was preserved slides of Stanko Karaman's holotype with name *Niphargus illidzensis orientalis*, TYPUS, single ovigerous female of 9.0 mm. Stanko described the species and published 8 figures of body-parts, and we redrawing these body-parts more in details, as well as some other additional body parts present on the slides.

Some morphological terminology and seta's formulae follow Karaman's terminology (Karaman, G., 1969) 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 (2012d) for setae and spines on 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].

Term "setae" and "spines" are used based on its shape, not origin. The work is based on morphological, ecological and zoogeographical investigations and 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 G. Karaman, 1962 (sensu Bousfield, 1977: 303; 1982: 267).

#### Genus *NIPHARGUS* Schiödte, 1849

#### *NIPHARGUS ORIENTALIS* S. Karaman 1950

#### Figures 1-3

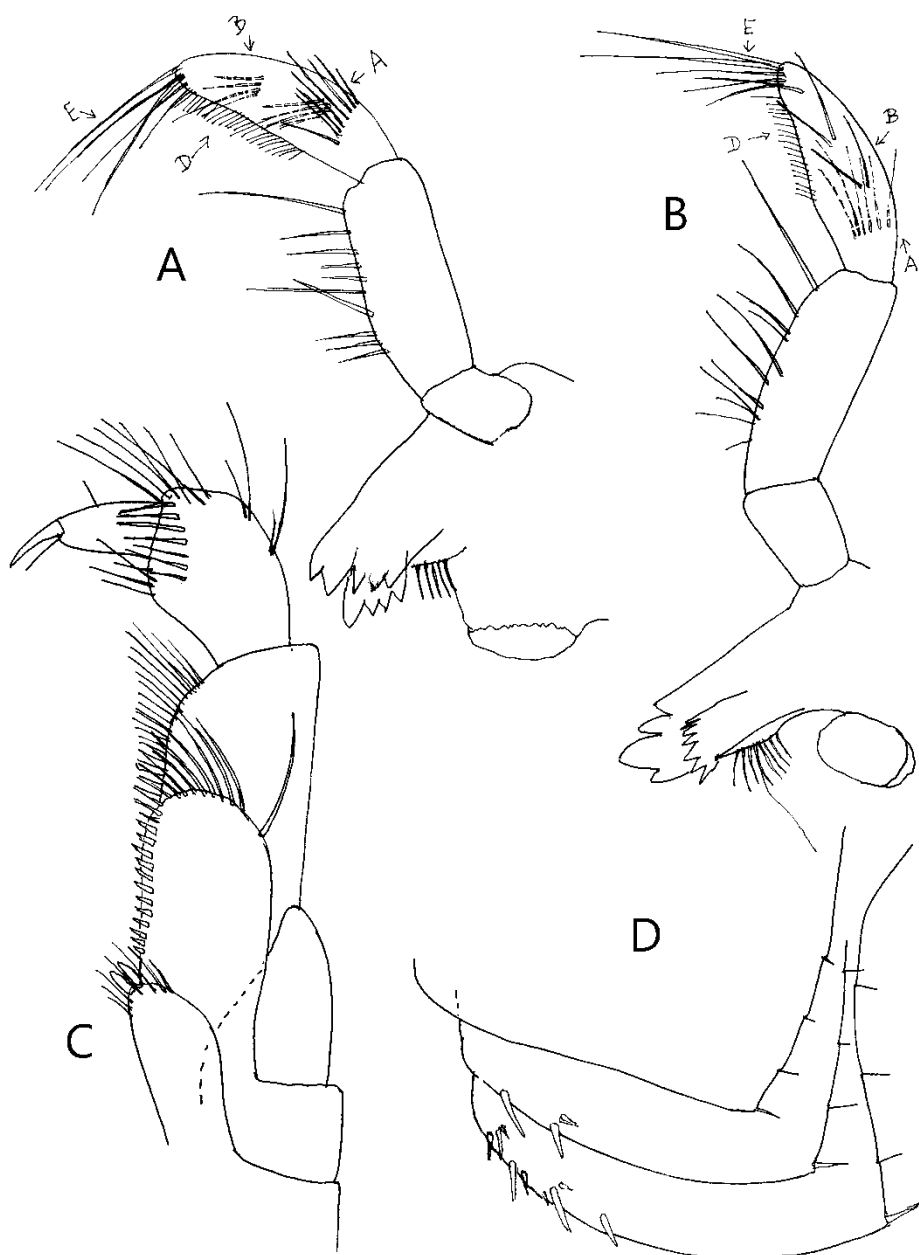
*Niphargus (Supraniphargus) ilidzensis orientalis* S. Karaman, 1950: 34, 43, figs. 1-8; S. Karaman, 1960: 83;

*Niphargus illidzensis orientalis*; G. Karaman, 1972: 7; G. Karaman, 1974: 56; Barnard, J.L and Barnard, C.M., 1983: 692; G. Karaman and Ruffo, 1986: 522; Akbulut, 2001: 235; Bat *et al.*, 2001: 235; Ozbek and Ustaoglu, 2006: 231;

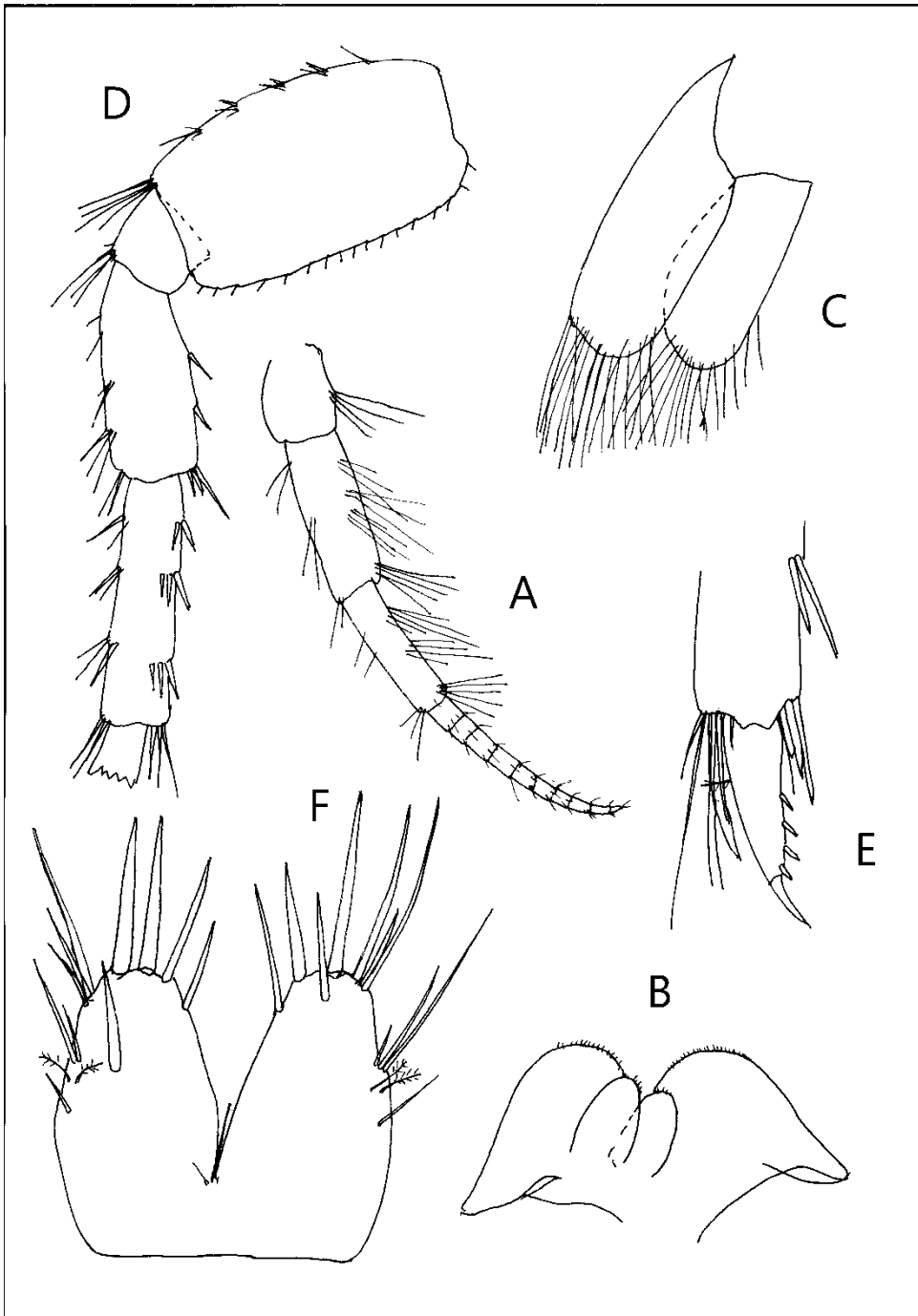
*Niphargus orientalis* Fišer *et al.*, 2009: 140; G. Karaman, 2012a: 50, 59; G. Karaman, 2012b: 50; G. Karaman, 2012c: 68 (KEY); Esmaeili-Rineh *et al.*, 2015: 426 (key); G. Karaman, 2024: 7, 10 (key); Ozbek, 2026: 1093.

### MATERIAL EXAMINED:

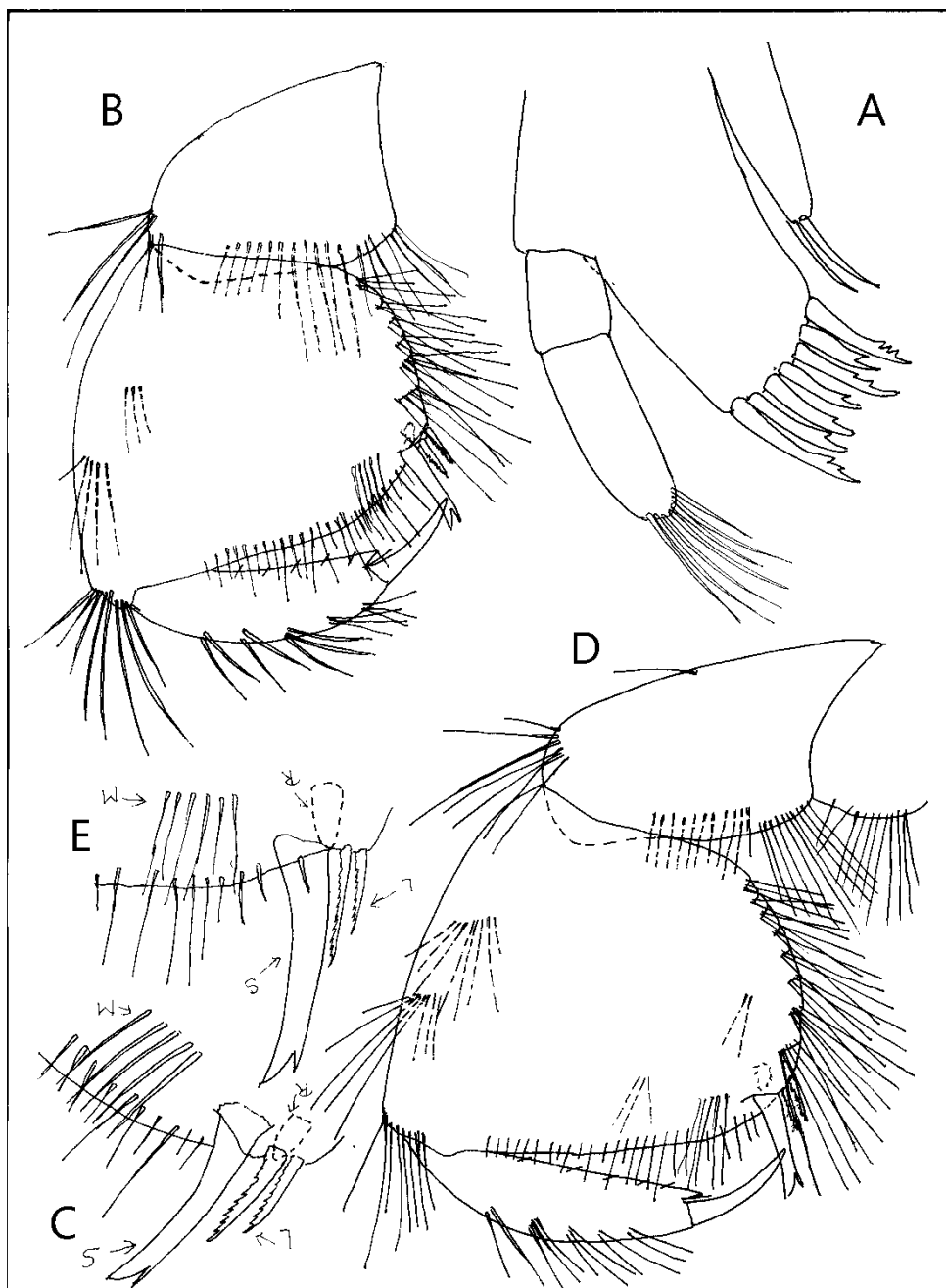
-- Göksu, E side of Dardanelles, Turkey, Ovigerous female 9.0 mm (Holotype) on slides, Coll. KARAMAN, Podgorica, Montenegro.



**Fig. 1.** *Niphargus orientalis* S. Karaman, 1950, Göksu, E side of Dardanelles, Turkey, female 9.0 mm, holotype: A=left mandible [E=distal F-setae; D=lateral D-setae; A=A-setae on outer face; B=B-setae on inner face]; B=right mandible; C=maxilliped; D=epimeral plates 1-3.



**Fig. 2.** *Niphargus orientalis* S. Karaman, 1950, Göksu, E side of Dardanelles, Turkey, female 9.0 mm, holotype: A=labium; B=maxilla 2; C=antenna 2; D=pereopod 6; E=dactylus of pereopod 7; F=telson



**Fig. 3.** *Niphargus orientalis* S. Karaman, 1950, Göksu, E side of Dardanelles, Turkey, female 9.0 mm, holotype: A=maxilla 1; B=gnathopod 1; C=distal corner of gnathopod 1-propodus [S=corner S-spine; L=lateral L-spines; M= corner facial M-setae; R=subcorner R-spine on inner face]; D=gnathopod 2; E=distal corner of gnathopod 2-propodus [S=corner S-spine; L=lateral L-spines; M= corner facial M-setae; R= subcorner R-spine on inner face]

**DIAGNOSIS** (ovigerous female): Body moderately slender, metasomal segments with dorsoposterior setae, urosomal segment 1 with setae, urosomal segment 2 with spines, urosomal segment 3 naked, Epimeral plates distinctly angular, especially epimeral plate 3, plates 2-3 with various number of ventral spines, eyes absent, lateral cephalic lobes subrounded. Antenna 1 multiarticulate, accessory flagellum present, 2-articulate, antenna 2 moderately setose, antennal gland cone short.

Mouthparts well developed, mandibular palpus article 1 naked; maxilla 1 inner plate with 2 setae, palpus short. Maxilliped inner plate with 2 spines.

Coxae 1-4 moderate. Propodus of gnathopods 1-2 quadrate, with rather inclined palm bearing S, R, L spines and corner facial M-setae, dactylus with several groups of median setae each. Dactylus of pereopods 3-7 rather strong, along inner margin with 3--4 spines each; article 2 of pereopods 5-7 dilated but without ventroposterior lobe, along posterior margin with row of short setae. Pleopods with 2 retinacula. Inner ramus of uropods 1 and 2 (female) rather longer than outer one. Uropod 3 missing. Telson broad, strongly spinose, deeply incised, with distal, lateral and facial long spines.

**DESCRIPTION** [female only] holotype 9.0 mm:

Body moderately strong, metasomal segments with 3-4 dorsoposterior marginal setae; urosomal segment 1 with 2 setae on each dorsolateral side, Urosomal segment 2 with 2 spines on each dorsolateral side, urosomal segment 3 naked.

Epimeral plates 1-3 angular, epimeral plate 1 naked, poorly concave ventromedially; epimeral plates 2 and 3 with convex ventral margin; plate 2 bearing 2 ventral spines and one very short spine; epimeral plate 3 with 4 ventral spines mixed with single very short spines (**Fig. 1D**).

**Head with short rostrum and subrounded** lateral cephalic lobes, ventroanterior excavation developed, eyes absent.

Antenna 1 moderately long, peduncular articles progressively shorter, scarcely setose; main flagellum consisting of 19 articles, most of them with one aesthetasc; accessory flagellum 2-articulate.

Antenna 2 moderately setose: article 3 with distoventral bunch of setae (the longest seta exceeding diameter of article itself); articles 4 and 5 along ventral margin with 3-4 bunches of longer setae (the longest setae remarkably exceeding diameter of articles themselves); flagellum composed of 10-11 articles scarcely setose (**Fig. 2A**); antennal gland cone short.

Mouthparts well developed. Labium with well-developed inner lobes, outer lobes entire, convex distally. (**Fig. 1B**).

Mandible well developed. Left mandible: incisor with 5 teeth, lacinia mobilis with 4 teeth, accompanied by 5 rakers; palpus 3-articulate, first article naked, second article with 10 setae; third article with 5 distal E-setae and nearly 20 D-setae, on outer face with 8 A-setae, on inner face with 2 groups of B-setae (**Fig. 1A**). Right mandible: incisor with 4 teeth, lacinia mobilis serrate,

accompanied by 8 rakers; palpus article 1 naked, article 2 with 11 setae; article 3 with 5 E-setae and nearly 18 D-setae, on outer face with one group of 6 A-setae, on inner face by 3 groups of B-setae (Fig. 1B).

Maxilla 1: inner plate with 2 setae, outer plate with 7 spines bearing 1-2 lateral teeth (the mesial spine with 3 lateral teeth) (Fig. 3A); palpus 2-articulated, first article naked, second article not reaching distal tip of outer plate-spines and provided with 7 distal setae.

Maxilla 2 longer than broad, outer plate rather longer than inner one, both plates with numerous distal setae, on inner plate accompanied by several distomesial marginal setae (Fig. 2C).

Maxilliped: inner plate short, with 2-3 distal spines mixed with several setae, outer plate reaching nearly half of second palpus article, bearing along mesial margin a row of short spines and setae at tip (Fig. 1C); palpus article 3 at dorsoexternal margin with several setae; article 4 at outer margin with one median seta, at inner margin with one seta near basis of the nail, nail shorter than pedestal.

Coxa 1 as long as broad, coxae 2-4 longer than broad, all with marginal setae.

Gnathopods 1-2 moderately large, gnathopod 2 rather larger than gnathopod 1. Gnathopod 1: article 2 with longer setae at both margins; article 5 rather shorter than propodus, at anterior margin with one median seta and bunch of distoanterior setae. Propodus quadrate, nearly as long as broad, along posterior margin with 6 transverse rows of setae (Fig. 3B). Palm slightly convex, inclined nearly half of propodus length, defined on outer face by corner S-spine accompanied laterally by 2 slender serrate L-spines and 5 corner facial M-setae, on inner face by one subcorner R-spine (Fig. 3C). Dactylus reaching posterior margin of propodus, along outer margin with 5 bunches of median setae, along inner margin with row of short submarginal single setae; nail much shorter than pedestal.

Gnathopod 2: article 5 almost as long as propodus, along anterior margin with one median and one bunch of distoanterior setae, along posterior margin with numerous setae (Fig. 3D). Propodus quadrate, nearly as long as broad, along posterior margin with 8 transverse rows of setae. Palm rather convex, inclined nearly half of propodus-length, defined on outer face by corner S-spine accompanied laterally by 2 slender serrate L-spines and 6 facial M-setae, on inner face by one subcorner R-spine (Fig. 3E). Dactylus reaching posterior margin of propodus, along outer margin with 5 groups of setae, along inner margin with row of short submarginal setae.

Pereopods 3-7 with strong dactylus bearing along outer margin one median plumose seta, along inner margin of dactylus in pereopod 3 appear 4 spines, in pereopod 4 appear 4 spines,

Pereopods 5-7 strong, with article 2 dilated, longer than broad, with row of short setae along posterior rather convex margin, ventroposterior lobe absent (Fig. 2D). Articles 3-6 with various number of spines, along both margins of

articles 3 mixed often with single or paired setae (Fig. 2D). Dactylus of pereopod 5 with 3 spines, dactylus of pereopods 6 and 7 with 4 spines each (Fig. 2E), nail is shorter than pedestal (Fig. 2E)

Pleopods with 2 retinacula each. Uropods 1 and 2 with inner ramus rather longer than outer one, like that in female of *N. illidzensis*. Uropod 3 missing.

Telson broader than long, deeply incised nearly  $\frac{3}{4}$  of telson-length, strongly spinose: each lobe with 3-5 distal spines of different length and diameter {the longest spine remarkably exceeding half of telson-length}, along outer margin with 2-3 groups of setae or spine-like seta, at mesial margin with 1 spine; on outer face is attached one shorter spine (Fig. 2F); a pair of short plumose setae is attached near the middle of outer margin of both lobes.

Coxal gills relatively broad, oostegites with nearly 20 eggs in it.

### REMARKS AND AFFINITY

*Niphargus orientalis* is described and known based on ovigerous female from Göksu, E side of Dardanelles, Turkey, in detail (uropod 3 missing) and published in publication of Serbian Academy of Sciences and Arts on German and Serbian language, accompanied by 8 figures of various body-parts on two plates. This species was clearly distinct from all other known species of this part of Eurasia by presence of several spines on dactylus of pereopods 3-7, distinctly angular (almost acute) epimeral plate 3, presence of several single or groups of spines on epimeral plates 2 and 3, etc.

By this way, this species (described as subspecies of subgenus *Supraniphargus*) was accepted and mentioned by numerous authors as subspecies, and later as distinct acceptable species, *N. orientalis* (Barnard, Ruffo, G. Karaman, Ozbek, etc.,) and incorporated also in several keys to the Turkish *Niphargus* species (G. Karaman, 2012c, Esmaeili-Rineh *et al.*, 2015, G. Karaman, 2024).

Recently it was described *Niphargus gokturki* sp. n. by Ozbek (2026) from the Yiğitler Stream, Izmir Province, Western Anatolia, Turkey. This species is rather similar to *N. orientalis* by various characters (shape of gnathopods, telson) but differing from *N. orientalis* by presence of 3 retinacula on pleopod 3, by presence of one seta on first palpus article of maxilla 1, by inner plate of maxilla 1 with 3 setae, inner plate of maxilliped with 5 distal spines, outer margin of palpus article 4 in maxilliped with 2 median setae, remarkably less setose antenna 2, less setose outer margin of dactylus in gnathopods 1-2, article 2 of pereopods 5-7 rather more narrowed, dactylus of pereopods 3-7 with 2 spines only, epimeral plates subrounded, with less number of ventral spines, telson more narrow and less incised, bearing shorter spines and setae. Further comparison between female of *N. orientalis* and male of *N. gokturki* requests new material of both taxa.

The additional number of spines at ventroposterior corner near basis of the uropod 1 peduncle, character presented in few *Niphargus* species only, is present in *N. gokturki*. This character is present also in *Niphargus* (*Orniphargus*) *lindbergi* S. Karaman, 1956 [Loc. typ.: Cave Draconera, Attica (=Attique),

Greece], overlooked by previous authors and observed by G. Karaman (2018) as well as in *Niphargus bodoni* G. Karaman, 1985 [Loc. typ.: springs of Cassana, La Spezia, Italy] and only several other distinct species of genus *Niphargus*.

The elevated number of spines on dactylus of pereopods is present in various species in almost all countries of Balkan, but always with distinct other taxonomical characters. So, in Northern Macedonia is present only one species: *Niphargus stankoi* G. Karaman, 1974 [Loc. typ.: Spring near village Bukovo on road Resen - Ohrid, Northern Macedonia] differing remarkably by shape of telson, narrowed article 2 of pereopods 5-7, maxilliped, etc. In Bulgaria are 2 species with elevated spines on dactylus of pereopods, *Niphargus* (*Phaenogammarus*) *valachicus* Doboreanu & Manolache 1933 [Loc. typ.: Bucharest, Romania] and *Niphargus bulgaricus* Andreev, 2001 [Loc. typ.: Lake Bolata, in one fountain near river Ropotamo (Bulgaria), both taxa remarkably different from *N. orientalis* by numerous morphological characters.

In Romania and Ex-Yugoslavia there are more species with elevated number of spines on dactylus in pereopods, especially *Niphargus illidzensis* – Complex of taxa, as well as various species belonging to various other groups or single taxa, but all of them are relatively well defined.

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