

Gordan S. Karaman  
Biological Institute, Titograd

FIRST DISCOVERY OF GENUS NIPHARGUS SCH. IN IRAQ,  
ISRAEL AND ADJACENT REGIONS, WITH DESCRIPTION OF *N.*  
*ITUS*, NEW SPECIES (FAM. NIPHARGIDAE) (CONTRIBUTION  
TO THE KNOWLEDGE OF THE AMPHIPODA 153)

**Abstract**

The members of genus *Niphargus* Schiödte 1849 (*Amphipoda Gammaridea, Niphargidae*) are discovered at the first time in the subterranean waters of Iraq, Israel and adjacent regions, and *Niphargus nadarini* Alouf 1972 is redescribed and figured from both countries; this species was found in Israel often associated with the subterranean amphipod *Foroniphargus pori* G. Karaman.

New species, *Niphargus itus*, n. sp. is described and figured from the subterranean waters of two localities in Israel.

**Introduction**

Genus *Niphargus* Schiödte 1849 (*Amphipoda Gammaridea*, family *Niphargidae*) is widely distributed through the whole central and southern Europe (except major part of Iberian peninsula and northern part of Great Britain), Asia Minor up to Transcaucasus in USSR. Alouf extended (1972, 1973, 1977) the distribution of this genus to the south discovering two new *Niphargus* species from the subterranean waters of Lebanon, *Niphargus nadarini* Alouf 1972 and *N. altagahizi* Alouf 1973.

Thanks to Dr. S. Ruffo, Dr. A. N. Khalaf, Dr. F. Dov Por, Dr. H. J. Bromley-Schnur and Dr. R. Ginot, who gave us some collected material of Amphipoda from Iraq, Israel and adjacent regions and Lebanon, for study, it was possible to



establish the presence of genus *Niphargus* in Iraq and Israel with adjacent regions, and discover one new species of this genus. By this way, the areal of distribution of genus *Niphargus* is extended now remarkably more towards East and South of recent known areal of this genus.

**Acknowledgments:** I am indebted to Dr. Sandro Ruffo from the Museum of Natural History in Verona (Italy) and Dr. A. N. Khalaf from the Biological Research Centre in Adhamiya, Baghdad (Iraq) for the loan of material of amphipods from Iraq, to Dr. F. Dov Por and Dr. Heather J. Bromley-Schnur from the Hebrew University of Jerusalem (Israel) for the loan of material of amphipods from Israel, and to Dr. René Ginet from the University of Lyon (Villeurbanne) (France) for the loan of material from Lebanon, used in this study.

**TAXONOMIC PART**  
**NIPHARGUS NADARINI Alouf 1972**

figs.: I-V

**Material examined:** IRAQ: — Baghdad, 4 spec. (no data) (leg. A. N. Khalaf);

— *ibid*, 2 spec. (leg. A. N. Khalaf);

— Haditha (= Al Hadithah, Euphrates drainage system), July 7, 1979, several spec. (leg. H. Al-Amidi);

ISRAEL AND ADJACENT REGIONS: — N. Dan, station I, Drift, March 2, 1983, one spec. (leg. D. Allan);

— *ibid*, April 7, 1983, 2 spec. accompanied by *Foroniphargus pori* G. Karaman. (leg. D. Allan);

— *ibid*, August 9, 1983, 2 spec. (leg. G. Herbst);

— *ibid*, September 4, 1983, 2 spec. (leg. G. Herbst);

— *ibid*, October 12, 1983, 2 spec. accompanied by *Foroniphargus pori* G. Karaman (leg. G. Herbst);

— Hule, 204, October 26, 1940, 2 spec. (leg. H. Steinitz);

— En Taron, August 3, 1984, one spec. (leg. H. Glazman);

— N. Moisa, March 21, 1984, 2 spec. (leg. G. Herbst);

— Enot Avi, October 12, 1983, one spec. (leg. Z. Koller) (laboratory sorters N. Harari and M. Barry).

LEBANON: — Hâlâ (Hawa), May 5, 1971, several spec. (leg. Alouf, N. J.).

**Description** (based on specimens from Iraq): **Males:** Body — length of our specimens up to 16 mm. Mesosomal and metasomal segments smooth but metasomal segments 1-3 with a

few dorsoposterior marginal setae each (fig. V, 6). Urosome low, urosomite 1 on each side with 1-2 spines, urosomite 2 on each dorsolateral side with 2-3 spines (fig. III, 11), urosomite 3 smooth.

Body rather stout. Head with short rostrum, dorsal surface of head remarkably convex in lateral projection (fig. III, 2), lateral cephalic lobes short, subrounded, ventroanterior sinus present, eyes absent (fig. III, 2).

Antenna 1 exceeding half of the body (9:13 or 11:16), peduncular segments 1-3 slender and long (fig. V, 1), poorly setose; peduncular segment 2 hardly longer than peduncular segment 1, peduncular segment 3 nearly half of segment 2 (fig. V, 1); main flagellum with up to 46 articles bearing one short aesthetasc each (fig. V, 2), aesthetascs are longer in distal segments, shorter in proximal segments of main flagellum; accessory flagellum short, 2-segmented (fig. V, 1).

Antenna 2 shorter than antenna 1, slender, peduncular segments 4 and 5 are nearly long, each with 3-4 bunches of short ventral setae (fig. V, 3); flagellum slender, exceeding the length of peduncular segment 5, poorly setose, consisting of up to 14 articles (fig. V, 3), antennal gland cone short (fig. V, 3).

Mouthparts normal. Labrum entire, broader than long. Labium with small inner lobes (fig. III, 9). Mandible strong. Left mandible: incisor with 5 teeth, lacinia mobilis with 4 teeth (fig. III, 5, 6), between them a row of plumose setae. Right mandible: incisor with 4 teeth, lacinia mobilis bifurcate, pluritoothed (fig. III, 3-4), between them a row of plumose setae. Mandibular palp 3-segmented: palp segment 1 smooth (fig. III, 1), segment 2 with up to 15 setae; segment 3 falciform, on outer face with 1 group of A-setae, on inner face 4 groups of B-setae, at margins up to 34 D-setae and up to 9 E-setae (fig. III, 1).

Maxilla 1: inner plate with 2 setae, outer plate with 7, rather 8 or 9 spines bearing 1-3, rarely 4 lateral teeth each (fig. III, 10, 12), only inner spine sometimes with several teeth; palp 2-segmented, short, not exceeding basis of spines of outer plate, bearing 4-5 distal long setae (fig. III, 10, 12).

Maxilla 2: inner plate with distal and several distolateral setae (fig. III, 7), dorsal oblique row of setae absent.

Maxilliped: inner plate short, not reaching outer tip of first palp segment, bearing 3 distal spines (fig. III, 8); outer plate not exceeding half of second palp segment, bearing a row of distolateral spines (fig. III, 8); palp 4-segmented, with short nail.

Coxae moderately long, coxa 1 nearly as long as broad, with subrounded ventroanterior corner (fig. I, 1), coxae 2-4 longer than broad, usually with short ventral setae and 1-2 ventroposterior short

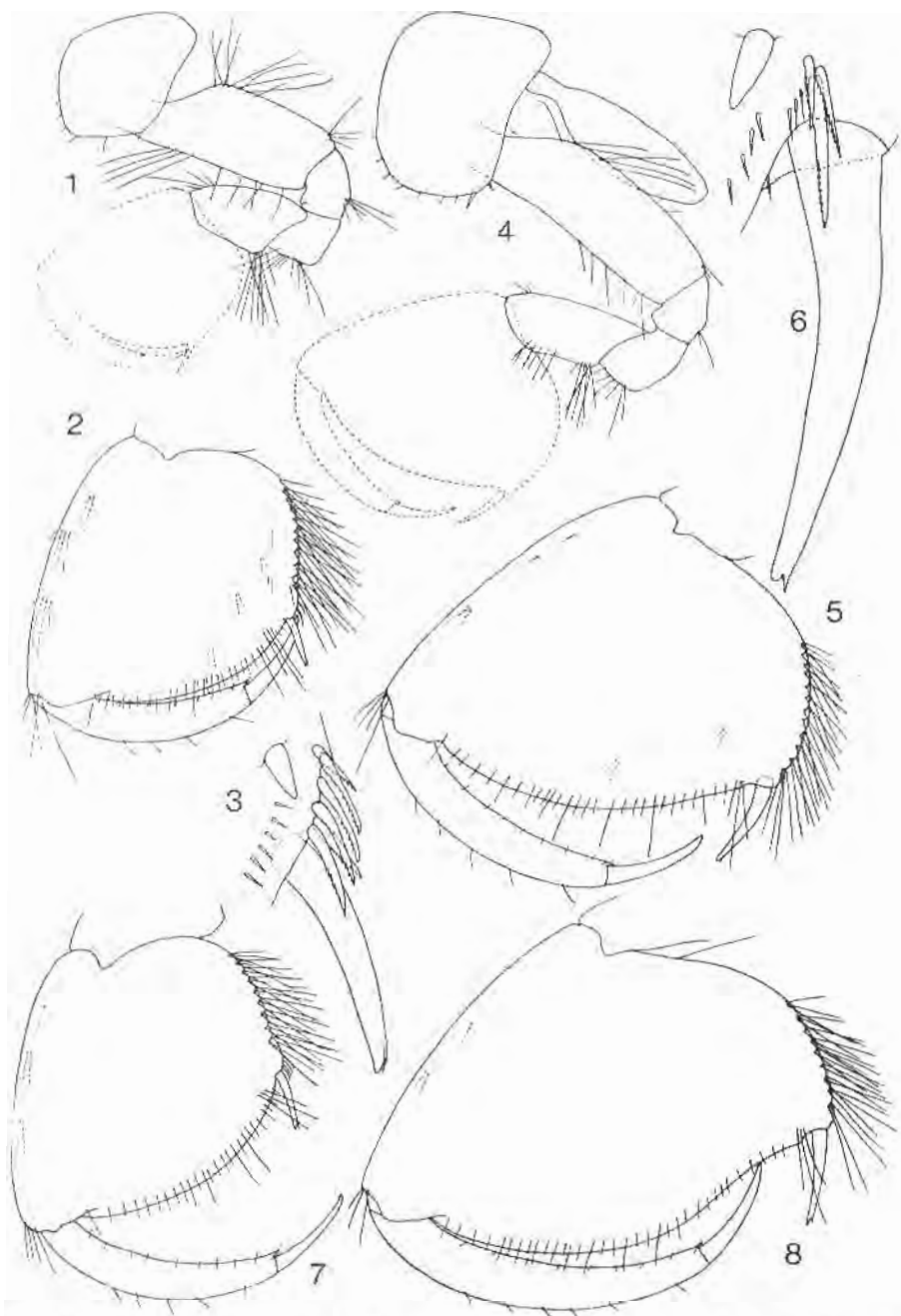


Fig. 1. *Niphargus nadarini* Alouf, Baghdad, male 13 mm: 1-3 = gnathopod 1; 4-6 = gnathopod 2; 7-8 = gnathopods 1-2, male 13.1 mm.

spines (fig. I, 4; II, 1, 3), coxa 4 with short ventroposterior lobe poorly visible (fig. II, 3), coxa 5 distinctly shorter than coxa 4 broad, usually with short ventral setae and 1-2 ventroposterior short spines (fig. I, 4; II, 1, 3); coxa 4 with short ventroposterior lobe poorly visible (fig. II, 3), coxa 5 distinctly shorter than coxa 4 (fig. II, 5, 7, 9), coxae 6 and 7 short.

Gnathopods 1-2 large, gnathopod 2 larger than gnathopod 1. Gnathopod 1: segment 2 short and broad, with long setae at both margins (fig. I, 1), segments 3-4 short, with one group of setae at posterior margin (fig. I, 1); segment 5 short; segment 6 large, slightly longer than broad, with convex oblique palm defined by one strong corner spine accompanied on outer face by 3 facial long setae and 4-6 lateral slender toothed spines (fig. I, 2, 3), on inner face by one short subcorner spine (fig. I, 3); dactyl reaching posterior margin of segment 6 and bearing a row of 4-6 setae along outer margin, nail long (fig. I, 1, 2).

Gnathopod 2: segment 2 longer than that of gnathopod 1 (fig. I, 4), segments 3-4 short, with one group of setae at posterior margin; segment 5 short; segment 6 nearly as long as broad: in adult specimens in last stage (males and females) segment 6 is with extended posterior part, palm convex to sinusoid (fig. I, 5, 8), defined by one strong spine accompanied on outer face by 3 long facial setae and by 3 short toothed slender spines sitting behind strong corner spine (fig. I, 6); dactyl not reaching posterior margin of segment 6, bearing a row of short setae along outer margin (fig. I, 8).

In other smaller specimens (males and females), segment 6 of gnathopod 2 is narrower, without posterior extension, slender toothed spines sitting partially or completely laterally regarding the long corner spine (fig. IV, 1-4), dactyl of gnathopod 2 reaching posterior margin of segment 6 (fig. IV, 1).

Pereopods 3 and 4 nearly subequal, slender, poorly setose, dactyl short, with one (exceptionally 2) spine at inner margin and with one plumose seta at outer margin (fig. II, 2, 4; V, 10, 11), nail shorter than the remaining part of dactyl.

Pereopods 5-7 slender, pereopod 5 remarkably shorter than pereopods 6 and 7; segment 2 of pereopods 5-7 longer than broad, with distinct ventroposterior lobe and with short setae at posterior margin (fig. II, 5, 7, 9); segments 3-6 with short spines along both margins; dactyls short, these of pereopods 5-6 with 2-4 spines at inner margin (fig. II, 6, 8, 10), dactyl of pereopod 7 with 4-5 spines at inner margin (fig. II, 10). Dactyls of pereopods 5-7 at outer margin with one, rarely 2 plumose setae, nail shorter than the remaining part of dactyl (fig. II, 6, 8, 10).

Pleopods with 2 retinacula each (no setae or spine near retinacula); peduncle of pleopod 3 at posterior margin with several short setae.

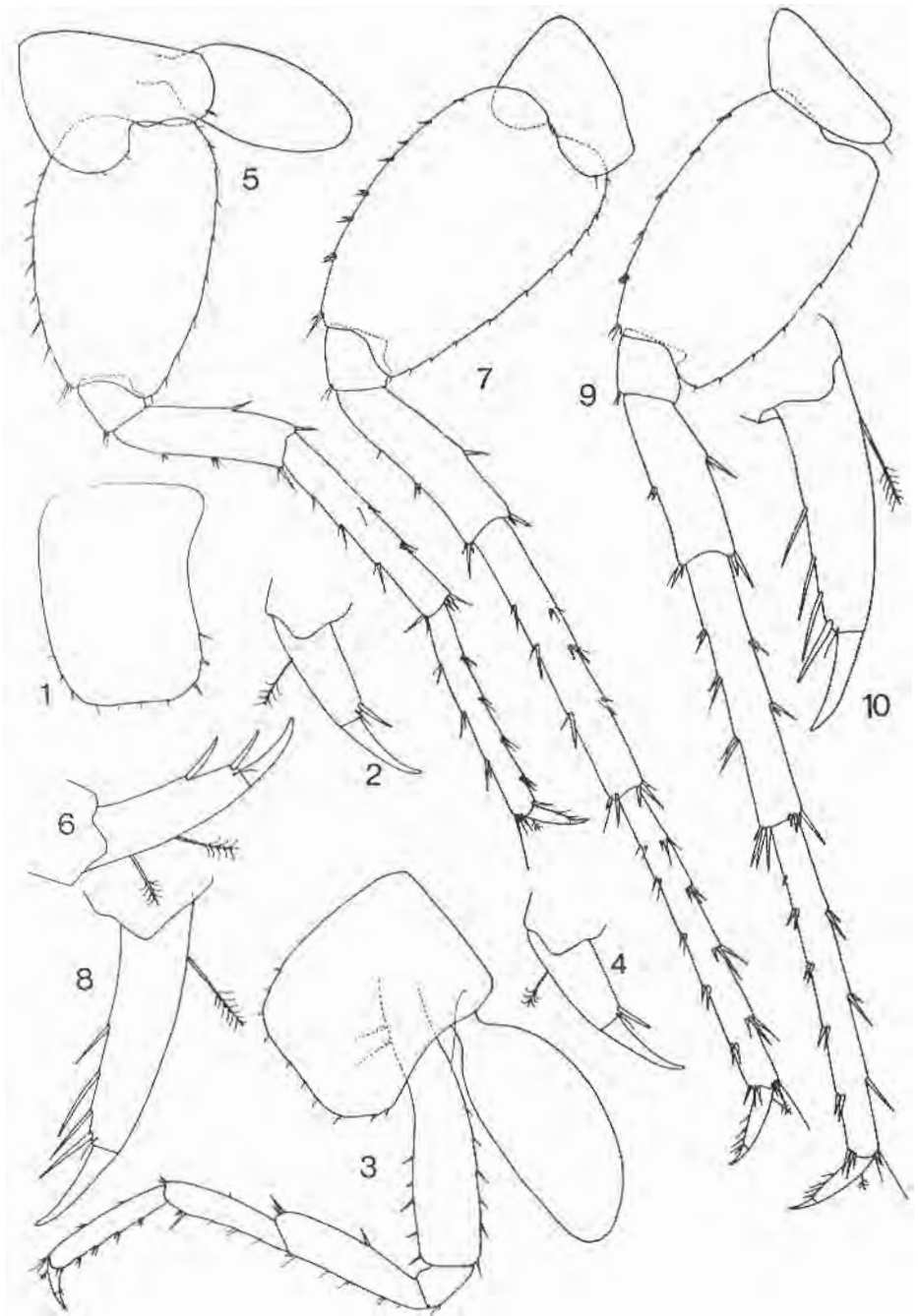


Fig. II. *Niphargus nadarini* Alouf, Baghdad, male 13 mm: 1 = coxa 3; 2 = dactyl of pereopod 3; 3-4 = pereopod 4; 5-6 — pereopod 5; 7-8 = pereopod 6; 9-10 = pereopod 7.

Epimeral plates 1-3 with slightly pointed ventroposterior corner (fig. V, 6)), epimeral plates 2-3 with several subventral spines each, posterior margin of epimeral plates 1-3 oblique, straight or concave.

Urosomite 1 near basis of peduncle of uropod 1 with one strong short spine (fig. III, 11). Uropod 1: peduncle without ventrofacial spine, but with dorsal external and dorsal internal row of short spines (fig. III, 11); outer ramus is slightly to distinctly longer than inner one, rarely rami are subequal or inner ramus is slightly longer than outer one; both rami with lateral and distal spines.

Uropod 2: peduncle with dorsal spine, inner ramus is always distinctly longer than outer one, both rami with short lateral and distal spines (fig. III, 11).

Uropod 3 relatively short but exceeding the tip of rami of uropods 1-2: peduncle short, inner ramus scale-like, short; outer ramus is 2-segmented, first segment with bunches of spines at both margins, each accompanied at inner margin of segment with 1-2 plumose setae longer than spines (fig. V, 5); second segment of outer ramus reaching up to 1/4 or 1/3 of first segment, bearing simple setae only.

Telson short, but exceeding tip of peduncle of uropod 3, longer than broad, deeply incised, narrow; each lobe with 3-4 distal and 0-1 subdistal marginal spines (fig. V, 4); a pair of longer plumose setae appears near the middle of each lobe; facial spines absent.

Coxal gills occur on thoracal segments 2-6.

**Females:** They are similar to males in all taxonomic characters (shape of body, coxae, antennae 1-2, gnathopods 1-2, pereopods 3-7, epimeral plates, uropods 1-3, telson, etc). Uropod 1 with outer ramus usually longer than inner one. The largest female in hands was 21 mm long (from Haditha), with some characters slightly different in relations with its large size: inner plate of maxilla 1 was with 4 setae (fig. III, 13), second peduncular segment of antenna 1 was nearly as long as first one (fig. V, 7), second segment of outer ramus in uropod 3 was slightly elongated, reaching almost half of first segment (fig. V, 9); main flagellum of antenna 1 was with 42 articles, dactyl of pereopods 3-4 with one spine at inner margin; dactyl of pereopod 5 with 2 spines, that of pereopod 6 with 3 spines; dactyl of pereopod 7 with 5-6 spines or spine-like setae at inner margin (fig. IV, 6, 7).

Oostegys broad, setose, occur on thoracal segments 2-5.

**Variability:** (specimens of Iraq only): Second segment of outer ramus in uropod 3 similar in males and females, relati-

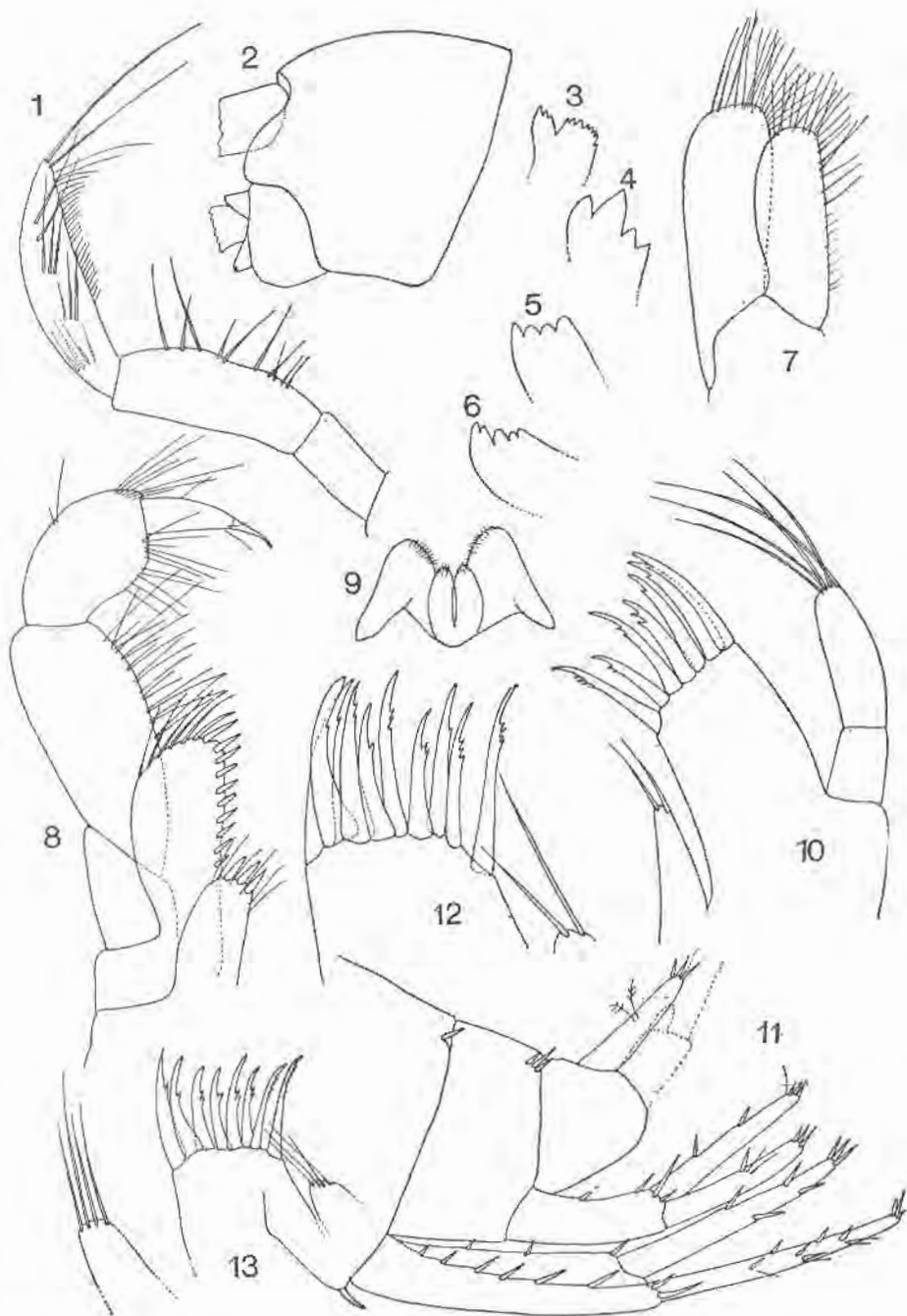


Fig. III. *Niphargus nadarini* Alouf, Baghdad, male 13 mm: 1 = mandibular palp; 2 = head; 3-4 = lacinia mobilis and incisor of right mandible; 5-6 = lacinia mobilis and incisor of left mandible; 7 = maxilla 2; 8 = maxilliped; 9 = labium; 10 = maxilla 1; 11 = urosome with uropods 1-2; 12 = maxilla 1, male 13.1 mm; 13 = maxilla 1, female 21 mm from Haditha.



vely short, but not as short as that in *N. orcinus*-group of species; on the other hand, second segment was never completely elongated like that in *N. stygius*-group of species; the spines were present always at both margins of first segment.

The pereopods 3-4 were always with one spine at inner margin except in one male of 13.1 mm from Baghdad (fig. V, 10, 11) having 2 spines. On the other hand, the number of spines on dactyl of pereopods 5-7 is rather variable, and it seems that the number of the spines is in positive correlation with the size of the animals.

The presence of 2 plumose setae at outer margin of dactyl in pereopods 5-7 is not usual, but more or less occasional case.

Outer ramus of uropod 1 in males and females is identical, prevalently is longer than inner ramus, rather rami are subequal, rarely inner ramus is slightly longer than outer one.

The number of spines on outer plate in maxilla 1 is usually 7, rarely 8 or 9; these spines are provided with 1-3 lateral teeth each (occasionally 4 teeth), only inner spine with 4 or more teeth.

All specimens from Haditha (males and females, 9-21 mm long) were with extended segment 6 of gnathopod 2 having sinuoid palm and dactyl not reaching posterior margin of segment 6 (fig. I, 8; IV, 5); palm defined by one strong corner spine accompanied by slender toothed spines sitting behind strong corner spine.

Among 6 specimens (males and females) from Baghdad, 3 specimens were similar to each other, like these from Haditha. One male of 13 mm was with poorly extended segment 6 (fig. I, 5), dactyl almost reaching posterior margin of segment 6 and outer ramus of uropod 1 longer than inner one (fig. III, 11). One non adult male of 11.2 mm, was with segment 6 of gnathopod 2 not extended, more quadrate, with dactyl distinctly reaching posterior margin of segment 6 (fig. IV, 1, 3), palmar slender toothed spines sitting laterally of main corner spine (fig. IV, 2, 4); uropod 1 with inner ramus hardly longer than outer one; coxa 2 with ventro-posterior spine.

Segment 6 of gnathopod 2 in one non adult male of 10 mm was with more inclined palm defined by strong corner spine and 3 slender toothed spines sitting only partially behind strong corner spine (fig. IV, 3, 4), and dactyl hardly not reaching posterior margin of segment 6, uropod 1 with outer ramus longer than inner one.

As all other characters of these males of 10 mm, 11.2 and 13 mm were identical with other males and females provided with extended segment 6 of gnathopod 2, it was not possible to separate these specimens into a distinct taxon, especially because one successive transition from one form to other is evident.

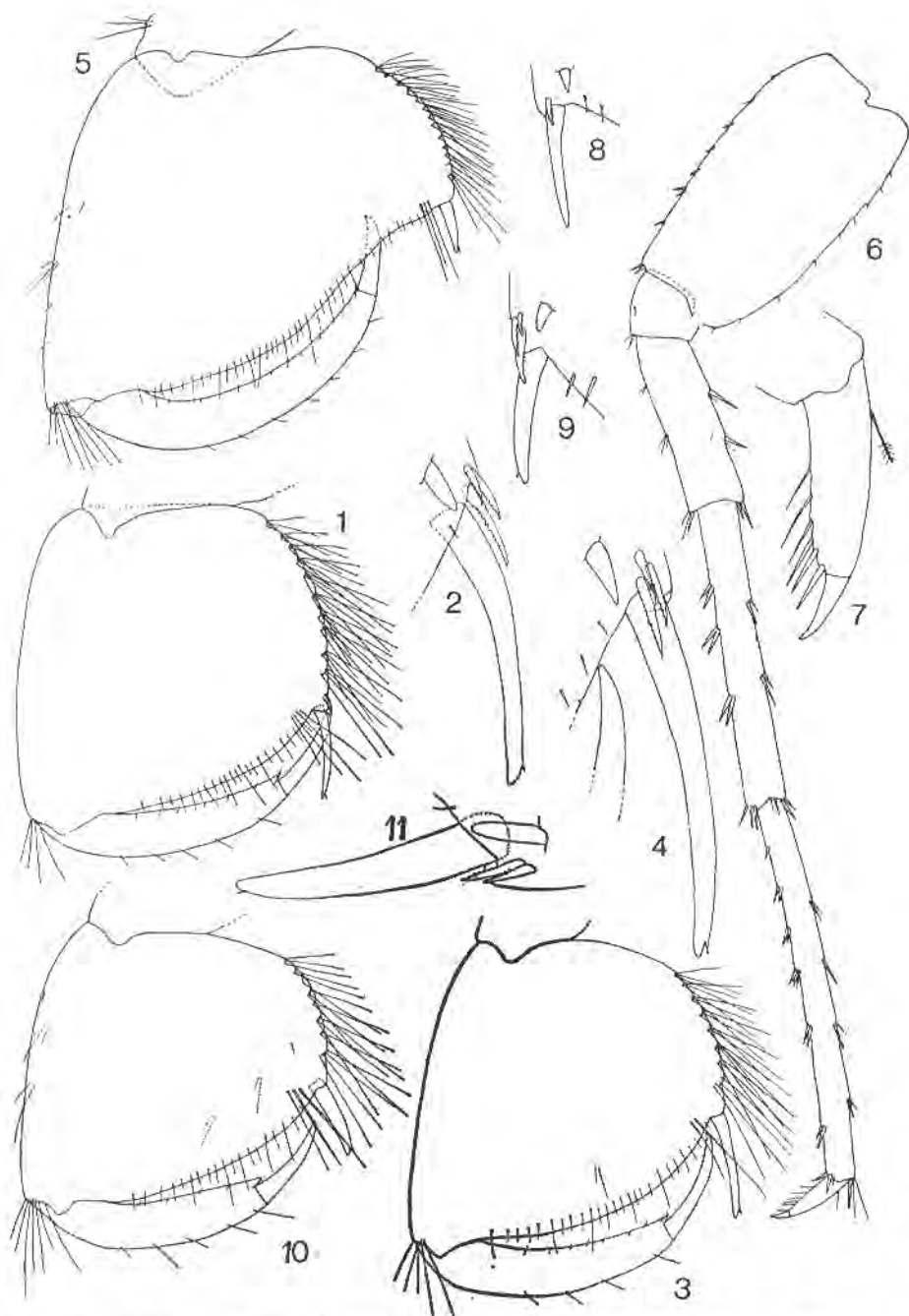


Fig. IV. *Niphargus nadarini* Alouf, Baghdad: 1-2 = gnathopod 2, male 11.2 mm; 3-4 = gnathopod 2, male 10 mm; 5 = gnathopod 2, female 21 mm from Haditha; 6-7 = pereopod 7, female 21 mm from Haditha; 8 = gnathopod 2, female 7.2 mm from Enot Avi; 9 = gnathopod 2, female 7.2 mm from N. Moisa; 10-11 = gnathopod 2, female 9.7 mm from N. Dan.

The specimens from Israel and adjacent regions in hands were up to 9.7 mm long, consequently not completely adult (females with oostegys without setae). They agree with description of *N. nadarini* given by A l o u f (1972) from Lebanon with some small differences: Segment 6 of gnathopod 2 in most of the specimens with palm more or less oblique, defined by one strong corner spine accompanied by 1-3 slender toothed spines (A l o u f mentioned only 1 toothed spine for *N. nadarini*), sitting laterally (fig. IV, 10, 11), or behind main corner spine (fig. IV, 8, 9). Dactyl of gnathopod 2 usually reaching posterior margin of segment 6 in smaller specimens, not reaching in larger specimens (fig. IV, 10).

Rami of uropod 1 with subequal rami or inner ramus is slightly longer than inner one, or outer ramus is slightly longer than inner one (A l o u f mentioned than inner ramus of uropod 1 is longer than outer one in *nadarini* from Lebanon).

Urosomite 1 on each side with 1-3 spines; urosomite 2 on each side with 2-5 spines. Dactyl of pereopods 3-4 with 1 spine, that of pereopods 5-6 with 1-2 spines; dactyl of pereopod 7 with 2-3 spines at inner margin. Segment 2 of pereopod 7 is lobed, with setae at posterior margin. Pleopods with 2 retinacula each, without associated spines or setae.

Telson with 3-4 distal spines on each lobe. Maxilla 1: inner plate with 2, rarely 3 setae (Hule), outer plate with 7 spines bearing 1-4 lateral teeth each; palp short, with 4-5 distal setae.

The specimens of Lebanon (Hale or Hawa up to 12 mm length, ovig. female) like these of Israel: segment 6 of gnathopod 2 very inclined, palm defined by one strong and 2 slender toothed lateral spines on outer face, and one subcorner spine on inner face, dactyl reaching posterior margin of segment 6, but segment 6 is not extended like the specimens from Iraq.

Palm of segment 6 in gnathopod 1 defined by one strong corner spine accompanied by 3-4 slender toothed lateral spines on outer face and 1 subcorner spine on inner face. Dactyl of pereopods 3-7 usually with only one inferior marginal spine, but dactyl of pereopod 7 often with 2 inferior spines.

Rami of uropod 1 subequal long or outer ramus hardly longer than inner one. Inner ramus of uropod 2 is only slightly longer than outer one. Urosomite 1 with 1 seta or 1 spine, urosomite 2 on each side with 2-3 spines. Inner plate of maxilliped with 2-3 distal spines, outer plate with row of strong spines.

A l o u f collected numerous specimens of *N. nadarini* in Lebanon (1972, 1977) up to 14 mm long, with inclined palm of segment 6 of gnathopod 2, but segment 6 is not extended and

dactyl reaching posterior margin of segment 6, like in our specimens of Israel.

The finding in our samples from Israel the specimens without, and these with slightly extended segment 6 of gnathopod 2 and short dactyl not reaching posterior margin of segment 6 in gnathopod 2, as well as the discovery in our sample from Baghdad the specimens similar to these of typical *N. nadarini*, with not extended segment 6, the specimens with partially extended segment 6 and the specimens with remarkably extended segment 6 of gnathopod 2, indicated that the specimens from Iraq with extended gnathopod 2 can be not a distinct taxon but only one stage (adult) of *N. nadarini*, known from Lebanon already, and now also from Israel and Iraq.

It seems that, in connection with the extension of gnathopod 2-propodus, appears also the position of slender toothed corner spines (sitting behind main corner spine in extended gnathopod 2-propodus, sitting laterally in non extended gnathopod 2-propodus).

In specimens with non extended segment 6 of gnathopod 2, rami of uropod I are subequal, rather inner or outer ramus is longer. It is necessary to underline that the impression of length of rami depends also of the position of rami regarding the peduncle: when rami are more inclined (geniculate), inner ramus looks like to be longer than outer one; when the same rami are in horizontal position regarding peduncle, outer ramus looks like to be longer than inner one.

Localities cited: LEBANON: Bekaa plain: wells in vill. Hawsh-Hala (Alouf, 1972); springs Ras-l'Ayn in Qabb Ilyàs; spring in Shamsine; well in vill. Talia (Alouf, 1977).

Loc. typ.: well in Hawsh-Hala (Bekaa plain, Lebanon).

Distribution: *Niphargus nadarini* is now known from the subterranean waters of Lebanon, Israel and Iraq. Although the localities in Iraq are very far from these of Lebanon and Israel (over 600 km) based on our present knowledge and material in hands, we attributed all populations to this species.

Remarks and affinities. *Niphargus nadarini* Alouf is very similar to the species *N. altagahizi* Alouf 1973 known from Ras Chekka cave in Lebanon (S. of Dahr Al'ayn) near sea shore. Among all mentioned characters of this species, only a few of them differs more remarkably from these of *N. nadarini*: urosomite 1 on each dorsolateral side with one seta (spines in *nadarini*); pleopods with 2 retinacula accompanied by one spine («2 crochets pluridentés plus 1 crochet simple») (only 2 retinacula without other spines in *N. nadarini*); nail of dactyl of pereopods 3-4 is slightly longer (shorter in *N. nadarini*).

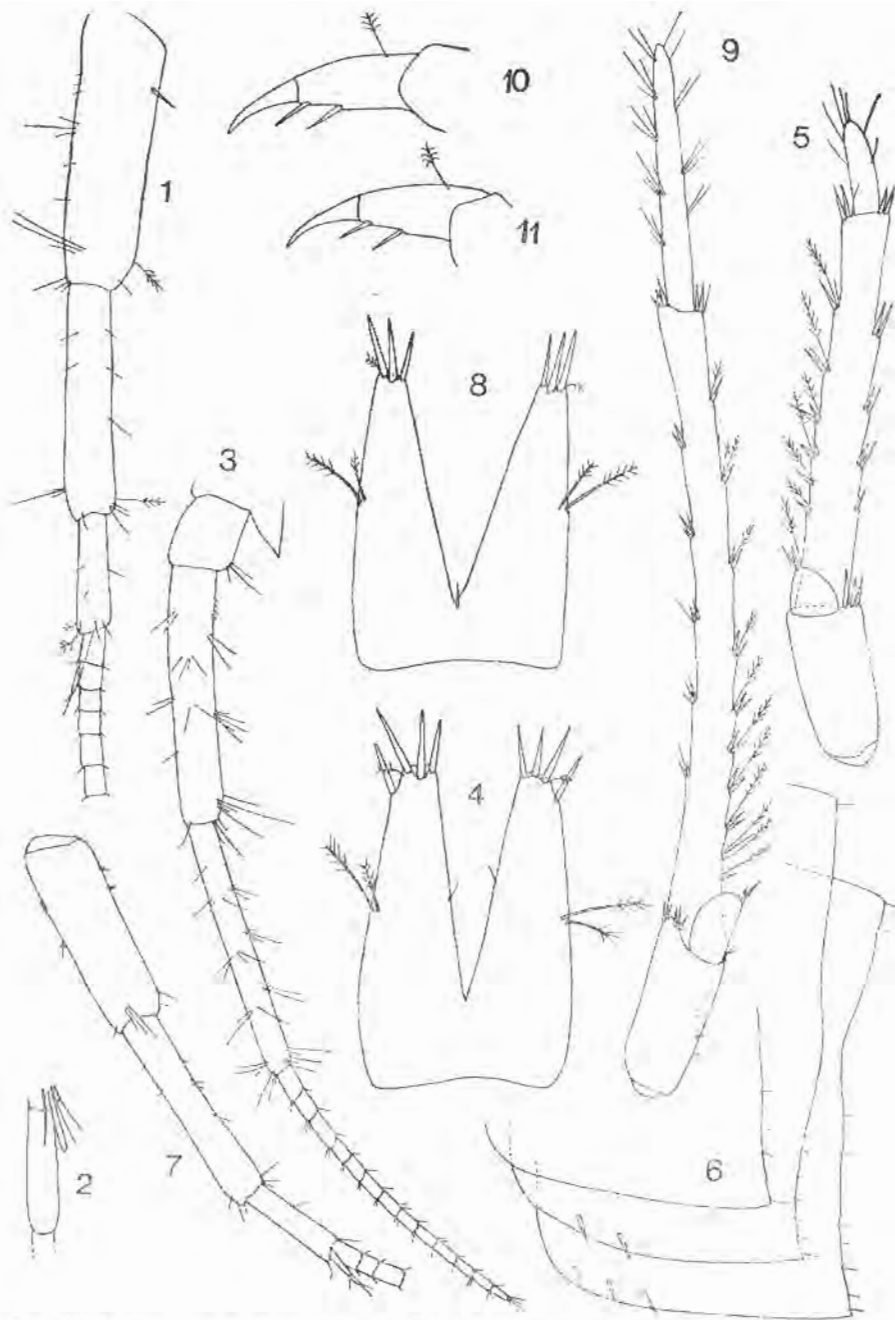


Fig. V. *Niphargus nadarini* Alouf, Baghdad, male 13 mm: 1-2 = antenna 1; 3 = antenna 2; 4 = telson; 5 = uropod 3; 6 = epimeral plates 1-3; 7 = antenna 1, female 21 mm from Haditha; 8 = telson, female 21 mm from Haditha; 9 = uropod 3, female 21 mm from Haditha; 10-11 = dactyl of pereopods 3-4, male 13.1 mm from Baghdad.

It is necessary to reexamine this species and establish its real taxonomic status regarding *N. nadarini*.

Birstein described (1961) one new member of the *Niphargus orcinus* group of species from Krym (Crymea) peninsula (USSR), *Niphargus vadimi*, n. sp. from cave Skela. This species distinctly differs from *N. nadarini* by very long pereopods 3-7 with slender dactyl bearing only one spine at inner margin, by long palp of maxilla 1, by broadly excavated telson provided with several long lateral spines, pleopods with 6 retinacula each, etc.

*Niphargus nadarini* belongs to the *Niphargus orcinus* group of species, although with some transitive characters towards the *Niphargus stygius* group (*»Niphargus sensu stricto«*) (see sub Remarks and affinities of *N. itus*).

#### NIPHARGUS ITUS, n. sp.

figs.: VI-VIII

**Material examined:** ISRAEL: — En Awazin, April 9, 1985, several specimens (paratypes and holotype) (leg. R. Ortal);

— ibid, June 23, 1984, one juv. spec. (leg. H. Glazman);

— En Teo, October 5, 1982, one juv. spec. (leg. R. Ortal).

**Description:** Female 10 mm with oostegyts without setae: Body like that of *Niphargus nadarini*. Mesosome smooth, metasomsegments 1-3 each with 3-4 short dorsoposterior setae; urosome low, urosomite 1 on each side with 2 spines or 1 spine and 1 seta (fig. VI, 8); urosomite 2 on each side with 2 spines; urosomite 3 smooth (fig. VI, 8).

Head with short rostrum, lateral cephalic lobes subrounded, short (fig. VI, 6), eyes absent.

Antenna 1 slightly shorter than body (7.2 : 10), peduncular segments 1-3 progressively shorter, poorly setose (fig. VI, 3); main flagellum consisting of up to 30 articles bearing one short aesthetasc each (fig. VI, 3); accessory flagellum short, 2-segmented (fig. VI, 3).

Antenna 2 slender, peduncular segments 4 and 5 subequal (fig. VI, 4), flagellum very slender, consisting of 11 articles, antennal gland cone short (fig. VI, 4).

Labrum subrounded, entire, broader than long. Labium with well developed inner lobes, like these in *N. nadarini*. Incisor and molar of mandible like these in *N. nadarini*. Mandibular palp segment 1 smooth, palp segment 2 with 11 setae (fig. VI, 7), palp segment 3 with one group of A-setae, 4 groups of B-setae, up to 21 D-setae and 7 E-setae (fig. VI, 7).

Maxilla 1: inner plate with 4 setae, outer plate with 7 pectinate spines (each spine with 11-16 lateral teeth); palp short, 2-segmented not exceeding the basis of spines of outer plate (fig. VI, 1, 2), and bearing 6 distal setae (fig. VI, 1).

Maxilla 2 inner plate without dorsal oblique row of setae, distal setae on both plates present, like these in *N. nadarini*.

Maxilliped: inner plate short, not reaching outer tip of first palp segment, bearing 4 distal spines (fig. VII, 11); outer plate nearly reaching half of second palp segment, bearing a row of distolateral spines (fig. VII, 11); palp 4-segmented, with slender nail shorter than the remaining part of dactyl.

Coxae moderate, coxa 1 broader than long, with subrounded ventroanterior corner (fig. VIII, 1); coxae 2-4 longer than broad, with distal (ventral) marginal setae only, spines absent (fig. VII, 1, 3; VIII, 1, 4), coxa 4 with poorly developed ventroposterior lobe (fig. VII, 3), coxa 5 remarkably shorter than 4 (fig. VII, 5), coxa 6 bilobe.

Gnathopods large, gnathopod 2 is larger than 1. Gnathopod 1: segments 3-4 short, with one group of setae at posterior margin, segment 5 short (fig. VIII, 1, 2); segment 6 much larger than corresponding coxa, nearly as long as broad (fig. VIII, 2); palm oblique, convex, defined by one strong corner spine accompanied on outer face by 3 facial long setae and 4 slender short toothed lateral spines, on inner face by one short subcorner spine (fig. VIII, 3); dactyl reaching posterior margin of segment 6, with a row of setae on outer margin (fig. VIII, 2).

Gnathopod 2: segments 3-4 with one group of setae at posterior margin, segment 5 short (fig. VIII, 4); segment 6 slightly broader than long, with very inclined convex palm defined by one strong corner spine accompanied on outer face by 3 facial long setae and 3 short toothed slender spines sitting behind main corner spine (fig. VIII, 6, 8), on inner face by one short subcorner spine; dactyl with a row of single setae at outer margin and reaching or not reaching posterior margin of segment 6 (fig. VIII, 5, 7).

Pereopodst 3-4 similar to each other, slender, poorly setose (fig. VII, 3), their dactyl short, with one spine at inner margin (fig. VII, 2, 4), and with one plumose seta at outer margin.

Pereopods 5-7 slender, with segment 2 ovoid, longer than broad, with short but distinct ventroposterior lobe (fig. VII, 5, 7, 9); segment 2 of pereopod 7, occasionally also that of pereopod 6 (fig. VII, 7, 9) at posterior margin with setae intermixed with single marginal spines; segments 3-6 of pereopods 5-7 slender, bearing spines at both margins; dactyls short, dactyl of pereopod 5 with 2 spines at inner margin (fig. VII, 5, 6), dactyl of pereopods 6 and 7 with 3 spines at inner margin, nail shorter than the rema-

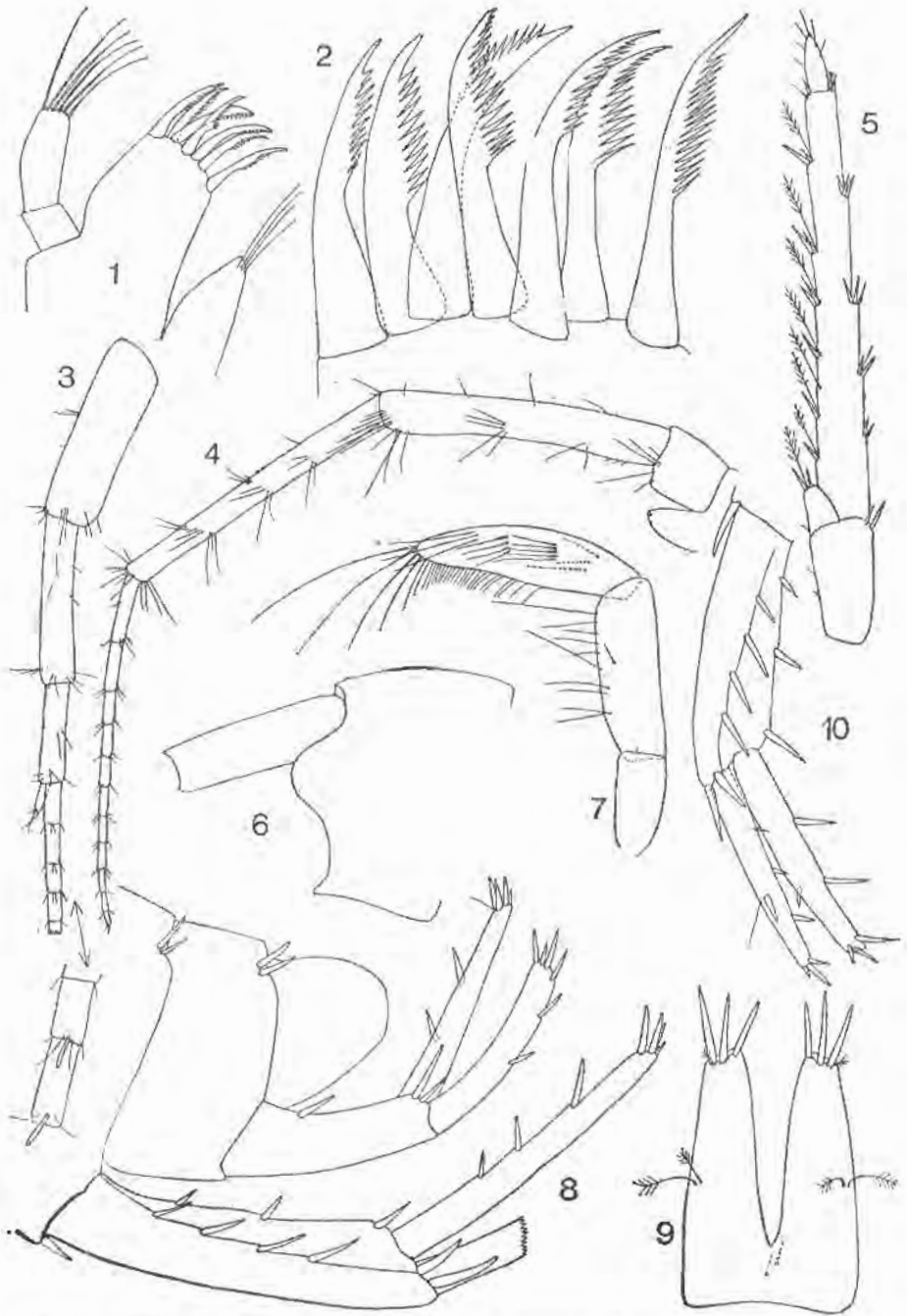


Fig. VI. *Niphargus itus*, n. sp., En Awazin, female 10 mm: 1-2 = maxilla 1; 3-4 = antennae 1-2; 5 = uropod 3; 6 = head; 7 = mandibular palp; 8 = urosome with uropods 1-2; 9 = telson; 10 = uropod 1, male 5.8 mm from En Teo.



ining part of dactyl (fig. VII, 8, 9, 10); outer margin of dactyl of pereopods 3-7 with one plumose seta only (fig. VII, 2, 4, 6, 8, 10).

Pleopods with 2 retinacula each, without accompanied setae or spine. Peduncle of pleopod 3 with several posterior marginal setae.

Epimeral plates 1-3 pointed, (fig. VII, 12), plates 2 and 3 each with 4 submarginal spines. Urosomite 1 near basis of peduncle of uropod 1 with one strong short spine (fig. VI, 8).

Uropod 1: peduncle without ventrofacial spine, but with dorsal external and dorsal internal row of spines (fig. VI, 8); rami subequal or inner ramus is hardly longer than outer one; both rami with lateral and distal short spines (fig. VI, 8, 10).

Uropod 2: inner ramus distinctly longer than outer one, both rami with lateral and distal spines.

Uropod 3: peduncle short, first segment of outer ramus with bunches of spines at both margins and with a row of single plumose setae along inner margin (fig. VI, 5); second segment of outer ramus short, bearing setae only (fig. VI, 5); inner ramus short, scale-like.

Telson short, deeply incised, longer than broad (fig. VI, 9), each lobe with 3 distal spines; a pair of plumose setae appears in the middle of each lobe.

Coxal gills occur on thoracal segments 2-6. Oostegites occur on thoracal segments 2-5 (without setae in our specimens).

Male: Non adult male in hands of 5.6 mm and 7 mm was similar to the females of the same size. But gnathopod 2 of the male of 7 mm length, was with very inclined palm of segment 6, bearing one strong corner spine accompanied laterally by 2 slender toothed spines (fig. VIII, 8), and dactyl of gnathopod 2 not reaching posterior margin of segment 6 (fig. VIII, 7).

Variability: The small number of specimens in hands, prevalently juvenile ones, don't permit us to establish the limits of the variability of this species. The stable characters are the presence of pectinate spines on outer plate of maxilla 1 existing already in juvenile specimens of 3.6 mm length. The presence, at posterior margin of segment 2 in pereopod 7, the spines intermixed with setae appears in all larger specimens.

We don't have the last stage (completely adult) of this species, and probably exist larger specimens than these in our hands, probably with extended segment 6 of gnathopod 2.

Holotype: female 10 mm. Holotype is deposited in KARAMAN's Collection in Titograd; the paratypes are deposited in Hebrew University in Jerusalem, Israel.

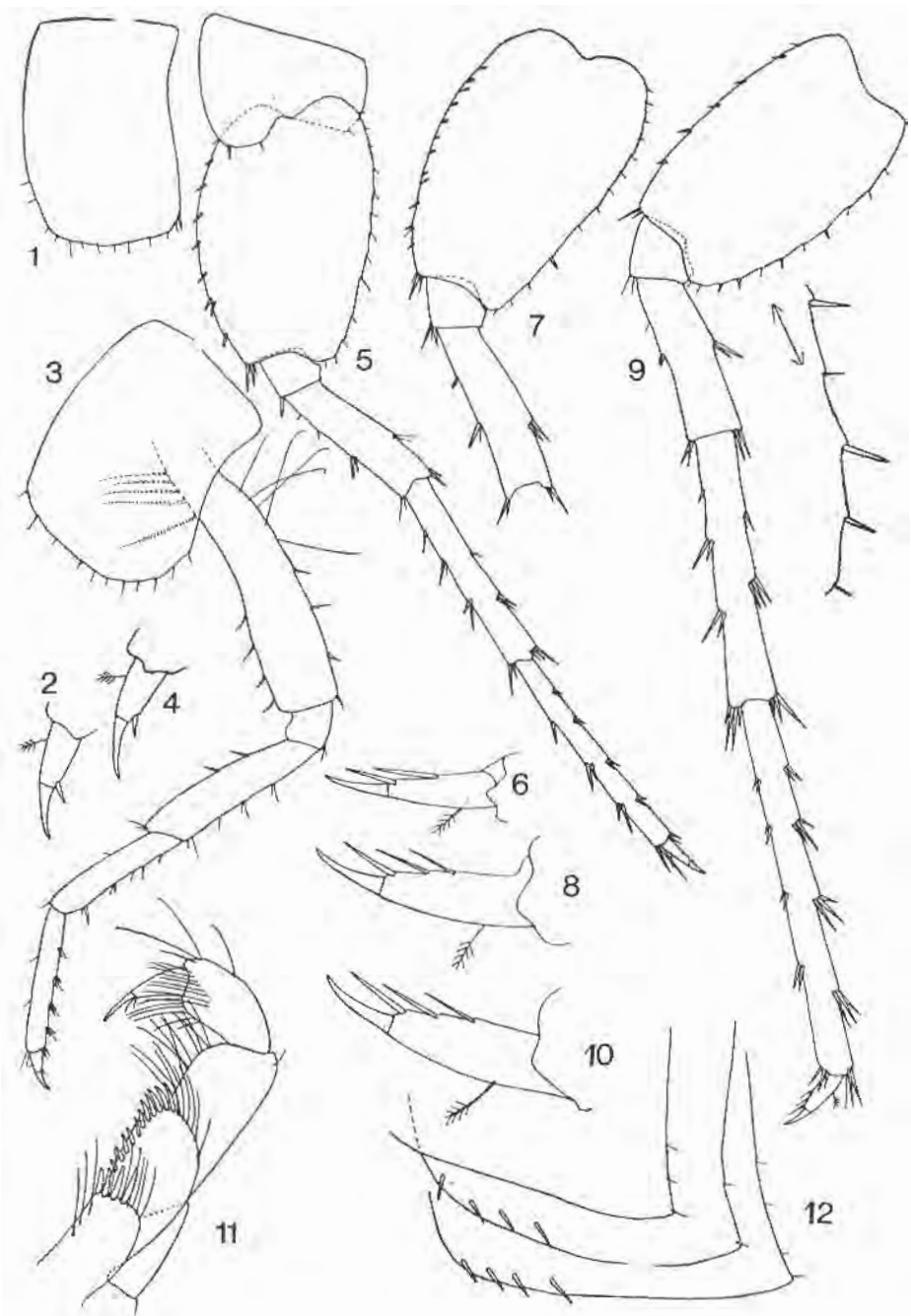


Fig. VII *Niphargus itus*, n. sp., En Awazin, female 10 mm: 1 = coxa 3; 2 = dactyl of pereopod 3; 3-4 = pereopod 4; 5-6 = pereopod 5; 7-8 = pereopod 6; 9-10 = pereopod 7; 11 = maxilliped; 12 = epimeral plates 1-3.

Remarks and affinities: *Niphargus itus*, n. sp. is very similar to *Niphargus nadarini* Alouf 1972 (shape of gnathopods 1-2, antennae, epimeral plates, uropods 1-3, telson, head, etc.). *N. itus* differs from *N. nadarini* by presence of pectinate spines on outer plate of maxilla 1, by presence of spines intermixed with setae at posterior margin of segment 2 in pereopod 7 (similar spines on segment 2 of pereopod 7 have been observed in *Niphargus spinulifemur* S. Kar. 1954 from N. Italy and Yugoslavia, in *Niphargus armatus* G. Kar. 1985 from Italy, etc.).

The presence in the same population the specimens with extended segment 6 of gnathopod 2 having short dactyl not reaching posterior margin of segment 6, as well as the specimens with not extended segment 6 of gnathopod 2 having dactyl reaching posterior margin of segment 6 (similar to these in population from Baghdad), indicate the relative variability of this taxonomic character within the same population and, consequently, not valid specific character usefull for establishing of distinct taxa.

*Niphargus altagahizi* Alouf 1973, known from Lebanon also, differs from *N. itus* by non pectinate spines on outer plate of maxilla 1, absence of spines at posterior margin of segment 2 in pereopod 7, etc.

*Niphargus nadarini* Alouf 1972, *N. altagahizi* Alouf 1973 and *N. itus*, n. sp. are rather similar to each other and belong to the *Niphargus orcinus* group of species (shape of gnathopods, body, uropods, pereopods, mouthparts, etc.). Among other members of this group, only *Niphargus rejici* Sket 1958, known from Slovenia (Yugoslavia) is with several spines at inner margin of dactyl in pereopods 3-7; but it differs from *N. itus* by non pectinate spines of outer plate in maxilla 1, different shape of telson, etc.

#### Conclusions

The genus *Niphargus* (*Amphipoda Gammaridea*, fam. *Niphargidae*) is found at the first time in Israel and Iraq. From the subterranean freshwaters of Israel is described a new species, *Niphargus itus*, n. sp.; this species differs from *N. nadarini* Alouf by presence of pectinate spines on outer plate of maxilla 1 and by presence of marginal spines intermixed with setae at posterior margin of segment 2 in pereopod 7.

*Niphargus nadarini* Alouf 1972, known only from the subterranean waters of Lebanon, now is established for the subterranean waters of Israel and Iraq also.

Three known species of genus *Niphargus* from this region, *Niphargus altagahizi* Alouf 1973, known from Lebanon, *N. nadarini* Alouf 1972 and *N. itus*, n. sp. belong to the *Niphargus orcinus* group

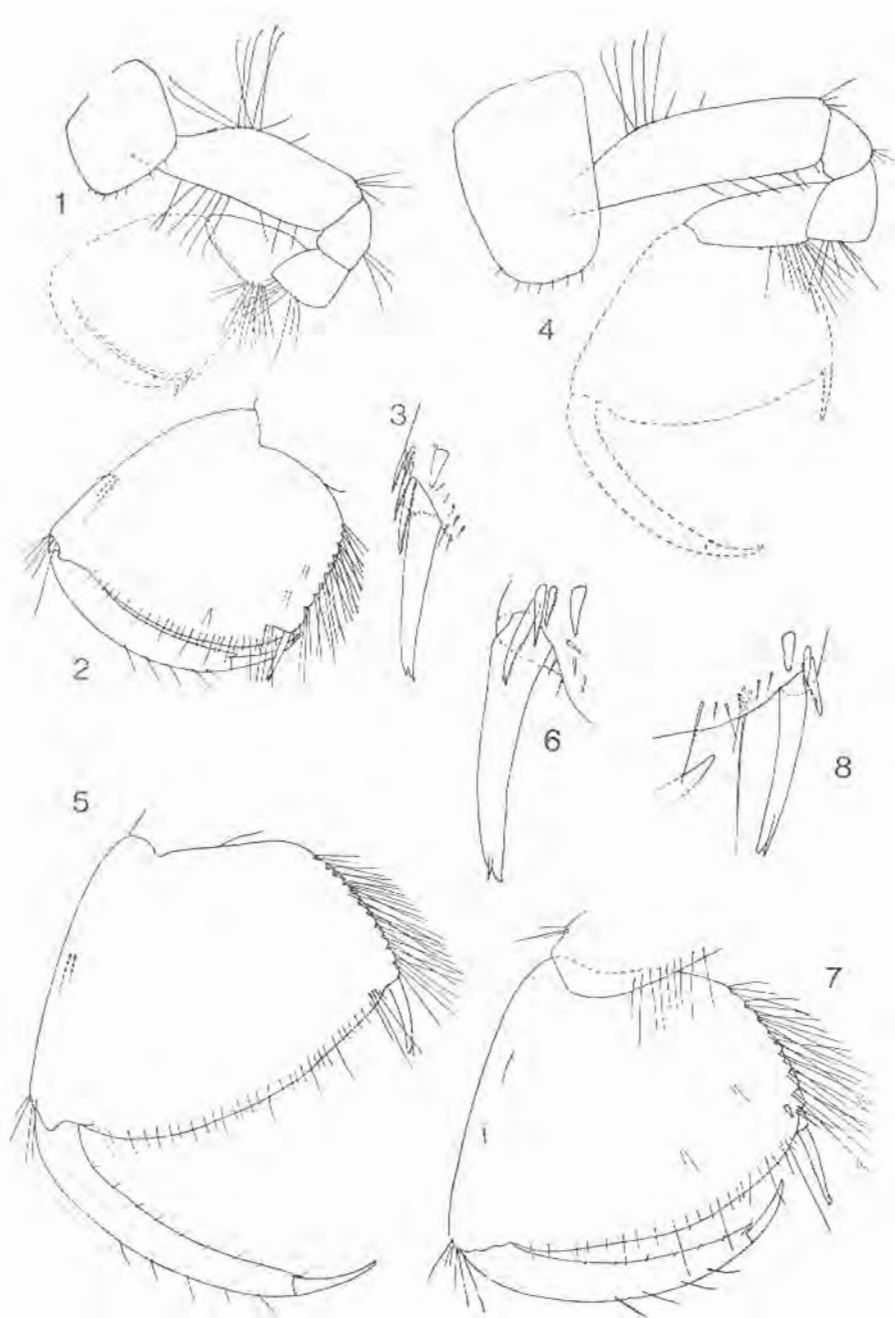


Fig. VIII. *Niphargus itus*, n. sp., En Awazin, female 10 mm: 1-3 = gnathopod 1; 4-6 = gnathopod 2; 7-8 = gnathopod 2, male 7 mm.

of species, although the second segment of outer ramus in uropod 3 in *N. nadarini* is slightly elongated, representing the transition between *Niphargus orcinus* group and *Niphargus »sensu stricto«*.

The adult specimens of *N. nadarini* and *N. itus* are often with extended segment 6 of gnathopod 2 having short dactyl not reaching posterior margin of segment 6; slender toothed corner spines are sitting laterally or behind main corner spine; rami of uropod 1 are subequal or inner or outer ramus is longer than other one.

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## Rezime

### PRVI NALAZ RÓDA NIPHARGUS SCH. U IRAKU, IZRAELU I SUSJEDNIM OBLASTIMA, SA OPISOM NOVE VRSTE, N. ITUS G. KARAMAN (FAM.: NIPHARGIDAE) (153. PRILOG POZNAVANJU AMPHIPODA)

Na osnovu proučavanja sakupljenog materijala podzemnih *Amphipoda* iz Iraka, Izraela i susjednih oblasti, utvrđeno je po prvi put prisustvo roda *Niphargus* Schiödte 1849 (*Amphipoda Gamma-ridea*, familija *Niphargidae*) u podzemnim vodama Izraela, Iraka i susjednih oblasti. Ovaj rod je do sada bio poznat samo iz srednje i južne Evrope, Male Azije, Kavkaza i Zakavkazja u SSSR-u i iz Libana; ovim se je areal ovog roda znatno proširio u pravcu juga i istoka.

U podzemnim vodama Iraka (Bagdad i Haditha) utvrđena je vrsta *Niphargus nadarini* Alouf 1972, poznata do sada samo iz Libana.

U podzemnim vodama Izraela i susjednih oblasti, utvrđene su dvije vrste roda *Niphargus*: *N. nadarini* Alouf 1972, i jedna druga vrsta, nova za nauku, *N. itus* G. Kar. Vrsta *N. nadarini* je nađena u nekoliko lokaliteta u Izraelu i susjednim oblastima, a u dva lokaliteta nađena je zajedno sa drugim rodom i vrstom podzemnih amfipoda, *Foroniphargus pori* G. Kar. 1985, kojeg smo nedavno opisali.

U radu je dat detaljni opis i crteži vrste *N. nadarini* Alouf, kao i njen varijabilitet i poznato rasprostranjenje (lokaliteti u Libanu, Izraelu, Iraku i susjednim oblastima).

Prezentiran je detaljni opis i crteži nove vrste za nauku, *Niphargus itus* G. Kar., koja je nađena u lokalitetima En Awazin i En Teo u Izraelu.

Kratka dijagnoza vrste *Niphargus itus* G. Kar.:

Veličina tijela do 10 mm, ali se na osnovu građe može zaključiti da postoje i veći primjerci. Tijelo liči na vrstu *N. nadarini*, ali sa izvjesnim razlikama.

Prvi urozomit nosi sa svake strane po 2 trna ili po jedan trn i jednu dlaku; drugi urozomit nosi sa svake strane po dva trna.

Bočne glavne ploče su kratke i zaobljene, oči nisu razvijene. Prva antena je malo kraća od dužine tijela (7.2 : 10), glavni bič je sastavljen od 30 segmenata koji nose po jedan kratak hijalini štapić; bočni bič je dvočlan i kratak.

Druga antena je tanka i slabo dlakava, njen bič je sastavljen od 11 segmenata. Labrum je cjelovit, labium sa uskim, ali dobro

razvijenim unutrašnjim lobusom. Mandibule su dobro razvijene, palpus je 3-član, liči na isti kod *N. nadarini*.

Prva maksila: unutrašnja grana nosi 4 dlake, vanjska grana nosi 7 češljastih trnova, palpus je dvočlan, kratak i nosi 6 distalnih dlaka. Unutrašnja grana druge maksile je bez kosog dorzalnog reda dlaka.

Maksiliped je sa dobro razvijenim granama i 4-članim palpusom koji nosi dobro razvijen nokat.

Koksalne ploče su srednje veličine, prva koksa je šira od dužine, druga, treća i četvrta koksalna ploča su duže od svoje širine, peta koksalna ploča je jasno kraća od četvrte ploče.

Prvi i drugi gnathopodi su veliki, drugi gnathopod je veći od prvog. Šesti segment drugog gnathopoda ima kosu palmu koja se završava jednim jakim trnom uz koji se nalaze 2-3 tanka nazubljena trna; daktilus ne dostiže ili dostiže stražnji rub šestog segmenta gnathopoda 2, na vanjskom rubu sa nizom pojedinačnih dlaka.

Daktilusi trećeg i četvrtog pereopoda nose po jedan trn na unutrašnjem rubu. Pereopodi 5-7 su sa širokim drugim segmentom koji nosi kratak stražnji donji lobus i stražnje marginalne trnove uz dlake. Daktilus petog pereopoda nosi 2 trna, daktilus šestog i sedmog pereopoda nosi po 3 trna na unutrašnjem rubu.

Pleopodi nose po 2 retinakule. Epimeralne ploče su zašiljene. Uropod 1 sa granama iste dužine ili je jedna od grana malo duža od druge. Kod drugog uropoda je unutrašnja grana značajno duža od vanjske. Treći uropod ima kratku dršku i kratku unutrašnju granu; vanjska grana je 2-člana, prvi članak nosi trnove sa obe strane, drugi članak je kratak i nosi samo dlake. Telzon je kratak i duboko usječen na dva lobusa; svaki lobus nosi po 3 distalna trna i po jedan par perastih dlaka smještenih u sredini svakog lobusa.

Mužjaci su veoma slični ženjkama.

*N. itus* se razlikuje od slične vrste *N. nadarini* Alouf po prisustvu češljastih trnova na vanjskoj grani prve maksile i po trnovima na stražnjem rubu drugog segmenta pereopoda 7.