

Gordan S. KARAMAN\*

NEW DATA ON GENUS NIPHARGUS Schiödte 1849  
( FAM. NIPHARGIDAE ) IN AUSTRIA  
( CONTRIBUTION TO THE KNOWLEDGE OF THE AMPHIPODA 207 )

Synopsis

Two poorly known subterranean species of the genus *Niphargus* Schiödte 1849 ( *Amphipoda Gammaridea*, fam. *Niphargidae* ) are redescribed and figured based on material from the subterranean waters of Austria: *Niphargus danconai* Benedetti 1942 and *Niphargus inopinatus* Schellenberg 1932, and their variability and taxonomical position are discussed. *N. danconai* is found at the first time in Austria.

Sinopsis

NOVI PODACI O RODU NIPHARGUS Schiödte 1849  
( FAM. NIPHARGIDAE ) U AUSTRIJI  
( 207. PRILOG POZNAVANJU AMPHIPODA )

Dvije slabo poznate vrste podzemnih amfipoda iz roda *Niphargus* Schiödte 1849 ( *Amphipoda Gammaridea*, fam. *Niphargidae* ) opisane su i nacrtane na osnovu materijala iz podzemnih voda Austrije : *Niphargus danconai* Benedetti 1942 i *Niphargus inopinatus* Schellenberg 1932; razmatran je njihov varijabilitet i taksonomski položaj. *N. danconai* je nađen po prvi put u Austriji.

INTRODUCTION

The freshwater fauna of *Amphipoda* in Austria has been only partially studied by various scientists ( S c h e l l e n b e r g , V o r n a t s c h e r , G . K a r a m a n ,

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\* Prof. dr Gordan S. Karaman  
Faculty of Sciences  
Biological Institute, 81000 Podgorica

Ruffo, etc.) and the species belonging to several genera of the *Gammaridean Amphipoda* were discovered (genera *Gammarus* Fabr. 1775, *Dikerogammarus* Stebb. 1899, *Synurella* Wrzes. 1877, *Crangonyx* Bate 1859, *Bogidiella* Hertzog 1933, *Niphargellus* Schellenberg 1938, *Niphargopsis* Chevreux 1922, *Niphargus* Schiödte 1849).

Genus *Niphargus* (fam. *Niphargidae*) is presented in Austria by various species (see Vornatscher, 1965).

More recently, G. Karaman (1980, 1990b) mentioned *Niphargus bajuvaricus bajuvaricus* again from various localities in Austria (wells near Wien; Hoflein a/d Danube; wells near Salzburg).

G. Karaman (1992) described *Niphargus schusteri*, n. sp. from Kasten Gradenfeld (Austria).

Our further studies on the subterranean fauna of Austria based on material sent us by P. Pospisil from Wien, R. Schuster from Graz and D. Danielopol from Mondsee, increased the number of known *Niphargus* species in Austria and the limits of its variability. As both species have been never described in detail, we redescribed and figured both species establishing their taxonomical position within the genus *Niphargus*.

ACKNOWLEDGEMENTS. I am thankful to Dr. Dan Danielopol from Institute of Limnology in Mondsee, Dr. Peter Pospisil from Zoological Institute of the University in Wien and Dr. R. Schuster from the Zoological Institute in Graz (Austria), and Dr. Boris Sket from the University of Ljubljana (Slovenia), for the loan of material used in this study.

#### NIPHARGUS INOPINATUS Schellenberg 1932

Figs. : I - III; IV, 1 - 8

Syn. : *Niphargus puteanus* (part.) Schellenberg 1932a : 137.  
*Niphargus inopinatus* Schellenberg 1932b: 320, fig. 4; Schellenberg 1933a; 425; Strouhal 1939 : 77; Schellenberg 1940 : 469; Schell. 1942 : 58, fig. 37; Carausu, Dobreanu, Manolache 1955 : 242, fig. 216, 217; Priesel - Dichtl 1959 : 330; Husmann 1964: 181; Vornatscher 1965 : 2; Husmann 1966 : 241; Straskraba 1972 : 37, 42, fig. 3 (map); G. Karaman & Ruffo 1986: 526.

*Niphargus leopoliensis molnari* (part.) Schell. 1933b: 26; Schell. 1933c: 256 (in key).

*Niphargus molnari* (part.) Wagler 1937: 202, fig. 591.

? *Niphargus* cf. *inopinatus* Skalski 1981: 63.

MATERIAL EXAMINED : AUSTRIA: - Subterranean waters near the coast of Danube near Wien, A - 63, August 10, 1988, many spec. accompanied by *Niphargopsis casparyi* (Pratz 1866) (leg. Peter Pospisil);

- ibid., A - 64, July 28, 1988, 2 spec. (leg. P. Pospisil);

- ibid., A - 81, July 5, 1988, 2 spec. (leg. P. Pospisil);

- ibid., A - 84, July 19, 1988, 4 spec. intermixed with *Niphargopsis casparyi* (Pratz), and *Niphargus* sp. (leg. P. Pospisil);

- ibid., A - 90, July 19, 1988, several spec. intermixed with *Niphargopsis casparyi* (Pratz) (leg. Peter Pospisil);

- *ibid.*, MS 3, Oct. 23, 1980, 2 spec. ( leg. D. Danielopol );
- *ibid.*, MS 4, Oct. 23, 1980, 1 spec. ( leg. D. Danielopol );
- *ibid.*, MS 5, Oct. 23, 1980, 4 spec. intermixed with *Niphargus* sp. ( leg. D. Danielopol );
- *ibid.*, Lobaw, Oct. 1975, 2 spec. ( leg. D. Danielopol );
- *ibid.*, Lobaw, April 1978, 8 juv. spec. ( leg. D. Danielopol );
- *ibid.*, LB 1, Oct. 15, 1980, 15 spec ( leg. D. Danielopol );
- *ibid.*, LB 2, Oct. 15, 1980. 7 spec. ( leg. D. Danielopol );
- *ibid.*, LC 120, March 12, 1980, 7 spec. juv. ( leg. D. Danielopol );
- *ibid.*, LB 4, April 17, 1980, 1 juv. spec. ( leg. D. Danielopol ).

DESCRIPTION: FEMALE with oostegys 5.6 mm: Body stout, metasom-segments 1-3 with 2-4 dorsoposterior marginal setae only ( fig. IV, 8 ); urosomite 1 with 1 spine, urosomite 2 with 2 spines on each side; urosomite 1 with very strong ventral spine near basis of peduncle of uropod 1 reaching up to 2/5 of peduncle - length ( fig. I, 5 ).

Head with short rostrum, lateral cephalic lobes short and subrounded ( fig. II, 7 ), eyes absent.

Antenna 1 reaching or hardly exceeding half of body, peduncular segments 1-3 progressively shorter : peduncular segment 3 exceeding half of ped. segment 2; main flagellum consisting of 15-16 articles, most of articles bearing 1 aesthetasc each ( aesthetasc as long as or shorter than the length of the articles themselves ); accessory flagellum 2 - segmented, shorter than third peduncular segment ( fig. I, 1 ).

Antenna 2: peduncular segment 5 slightly shorter than 4; flagellum with 6 articles; antennal gland cone short ( fig. I, 2 ).

Labrum entire, broader than long. Labium with well developed inner lobes.

Mandibles with triturative molar provided on right mandible with long subdistal seta. Right mandible: incisor with 4 teeth, lacinia mobilis bifurcate, pluritoothed, accompanied by several rakers ( fig. IV, 4-6 ). Left mandible: incisor with 5 teeth, lacinia mobilis with 4 teeth ( fig. IV, 2-3 ); mandibular palp 3 - segmented, second segment with 4-5 setae; segment 3 slightly longer than segment 2, bearing on outer face 1 group of 2-3 A - setae, on inner face 2 groups of 1 - 2 B - setae each, cca 11 marginal D - setae and 4 distal long E - setae ( fig. IV, 7 ).

Maxilla 1: inner plate narrow, bearing 1 distal seta ( fig. I, 3 ); outer plate with 7 spines ( inner spine with 4 - 5 lateral teeth, other 6 spines with 2 - 4 lateral strong teeth each ); palp short, not reaching tip of spines of outer plate, provided with 3 distal setae ( fig. I, 3 ).

Maxilla 2 normal, both plates with distal setae only.

Maxilliped: inner plate long, reaching outer tip of first palp segment and provided with 2 strong smooth distal spines accompanied by several plumose setae ( fig. I, 4 ); outer plate not reaching tip of second palp segment and provided with row of distoinferior marginal smooth spines ( fig. I, 4 ); palp 4 - segmented, segment 4 with nail shorter than pedestal ( fig. I, 4 ).

Coxae 1 - 4 slightly longer than broad, with subrounded ventral margin bearing single setae only ( figs. II, 1, 3; II, 1 ), coxa 4 with poorly developed ventroposterior lobe ( fig. III, 1 ); coxa 5 remarkably shorter than 4, coxae 5 - 6 bilobed, with anterior lobe larger than posterior one ( fig. III, 5, 7 ); coxa 7 entire, shallow ( fig. III, 8 ).

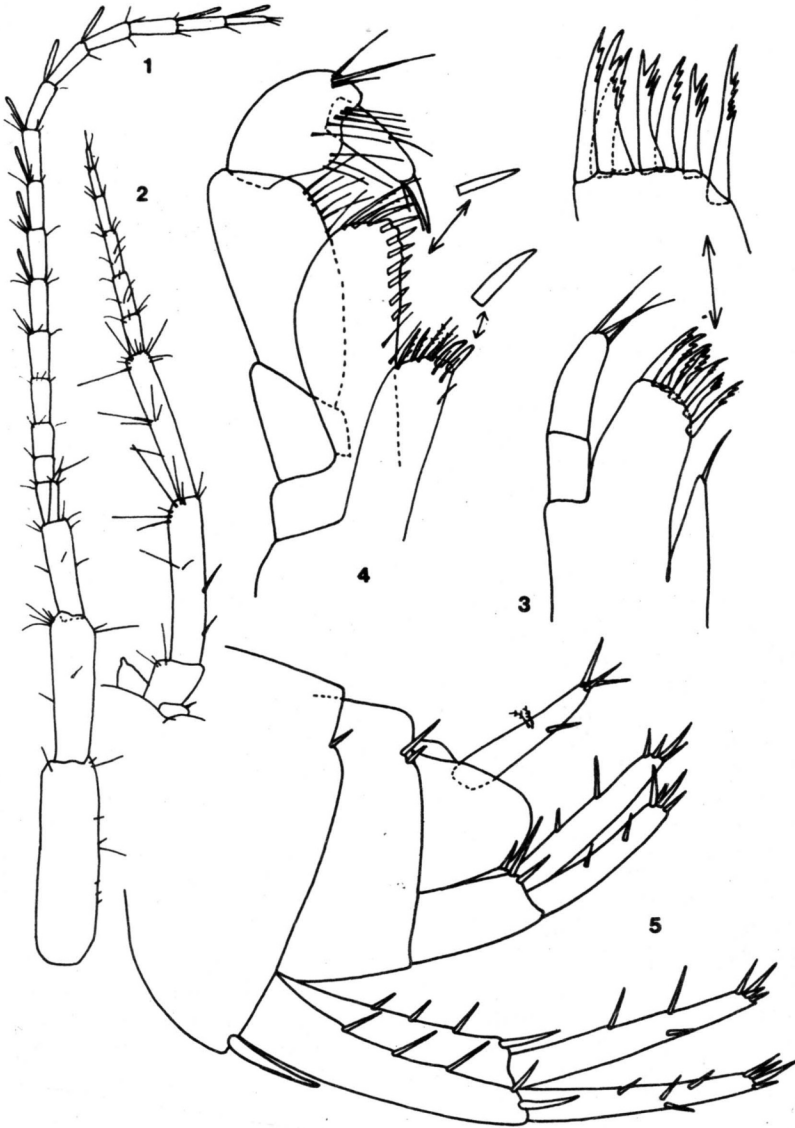


Fig. I. *Niphargus inopinatus* Schell. 1932, Wien, female 5.5 mm: 1 = antenna 1; 2 = antenna 2; 3 = maxilla 1; 4 = maxilliped; 5 = urosome with uropods 1 - 2.

Gnathopod 1 remarkably smaller than 2, with segments 3 - 4 bearing one group of posterior setae ( fig. II, 1, 2 ); segment 5 shorter than 6. Segment 6 slightly longer than broad, of „kochianus - type”, with dilated and slightly produced ventroposterior corner and bearing 4 groups of posterior setae; palm transverse, finely crenellate, defined on outer face by one strong corner spine accompanied by 2 - 3 slender lateral toothed spines, as well as by 2 facial long setae, on inner face by 1 short subcorner spine ( fig. II, 2 ); dactyl reaching posterior margin of segment 6, provided with one medial seta at outer margin ( fig. II, 2 ).

Gnathopod 2: segments 3 - 4 with one group of posterior setae; segment 5 slightly shorter than 6. Segment 6 almost as long as broad or hardly longer than broad, with 6 groups of posterior setae; palm oblique 2/5 of posterior margin of segment 6, convex, finely crenellate, defined on outer face by 1 strong corner spine accompanied laterally by 2 slender toothed spines as well as by 2 facial long setae, on inner face by 1 short subcorner spine ( fig. II, 3, 4 ); dactyl reaching posterior margin of segment 6, bearing one median seta at outer margin ( fig. II, 4 ).

Pereopods 3 - 4 similar to each other, but pereopod 3 longer, both with slender dactyl reaching nearly half of segment 6, bearing 1 seta at inner margin; nail as long as or hardly longer than pedestal ( fig. III, 1 - 4 ).

Pereopods 5 - 7 relatively slender, with spines along both margins of segments 3 - 6; segment 2 ovoid, longer than broad, with unlobed anterior margin and with well developed ventroposterior lobe not exceeding distal tip of segment 3; posterior margin of segment 2 with row of short setae only ( fig. III, 5, 7, 8 ). Dactyl of pereopods 5 - 7 slender but short, with 1 spine along inner margin and with 1 plumose seta at outer margin; a nail is slightly shorter than pedestal ( fig. III, 6, 9 ).

Epimeral plates 1 - 3 angular to slightly pointed, plate 2 with 1, plate 3 with 2 subventral spines each ( fig. IV, 8 ). Pleopods 1 - 3 with 2 retinacula each. Peduncle of pleopods 1 - 2 smooth; peduncle of pleopod 3 with smooth anterior margin and with 2 - 3 median setae along posterior margin ( fig. II, 5 ).

Uropod 1: peduncle with dorsoexternal and dorsointernal row of spines, distal peduncular spines not elongated ( fig. I, 5 ); rami subequal or inner ramus slightly longer than outer one, both rami with short lateral and distal spines ( fig. I, 5 ).

Uropod 2 : peduncle remarkably shorter than rami: inner ramus longer than outer one, both with short lateral and distal spines ( fig. I, 5 ).

Uropod 3 short, first segment of outer ramus with 4 - 5 bunches of spines on both margins, accompanied by single plumose setae along inner margin ( fig. IV, 1 ); second segment of outer ramus short, reaching nearly 1/4 of first segment.

Telson short, deeply incised, slightly longer than broad; each lobe tapering distally, provided with 3 distal and 1 outer marginal spine; a pair of short plumose setae appears near the middle of each lobe ( fig. II, 6 ).

Coxal gills occur on pereonites 2 - 6 ( figs. II, 3; III, 1, 3, 5, 7 ); oostegyts occur on pereonites 2 - 5 ( figs. II, 3; III, 1; IV, 13 ).

MALES like females.

VARIABILITY: Urosomite 2 usually with 2, rarely with 3 spines on each side. Epimeral plate 3 angular to slightly pointed. Larger specimens are provided with longer ventral spines on urosomite 1 near basis of peduncle of uropod 1.



Fig. II. *Niphargus inopinatus* Schell. 1932, Wien, female 5.5 mm: 1 - 2 = gnathopod 1; 3 - 4 = gnathopod 2; 5 = pleopod 3; 6 = telson; 7 = head.

Our specimens in hands never exceed size of 6 mm., but Schellenberg mentioned size of up to 8 mm.

**REMARKS AND AFFINITIES.** This species is characterized by very long and strong ventral spine near basis of peduncle of uropod 1, by presence of transverse palm of segment 6 in gnathopod 1 ( gnathopod 2 with oblique palm ), by short uropod 3 in males and females, by presence of only 1 seta at outer margin of dactyl in gnathopods 1 - 2.

Similar very strong ventral spine on urosomite 1 near basis of peduncle of uropod 1 appears in *Niphargus latingerae* G. Karaman 1983a known from the subterranean waters of Croatia ( Dolje near Zagreb ). But this species differs from *N. inopinatus* by different shape of gnathopods 1 - 2, by one lateral tooth on spines of outer plate in maxilla 1, short coxae ( coxa 5 as long as 4 ), gnathopods 1 - 2 similar to each other, etc.

**LOC. TYP. :** Moosach, well ( Germany ).

**LOCALITIES CITED:** GERMANY: Moosach and Freising, wells ( Schellenberg 1932a sub *N. puteanus*; Schellenberg 1932b); Aschaffenburg, Frühlingslust ( valley of Main River ) ( Schellenberg 1940 ); Föhring near München; Karlsdorf S. of Dachau; Karlsruhe; ( Schellenberg 1942 ) subterranean waters of Main River ( Husmann 1964 ); wells and hyporrheic waters in southern Germany ( Baden, Bayern ) ( G. Karaman & Ruffo 1986 ).

AUSTRIA: wells in Wien and Wienerwald ( Strouhal 1939 ); coast of Danube River near Wien; Höflein and Gieshübl near Wien; Wiener Prater ( Schellenberg 1942 ); Salzburg Region ( Mattighofen - Eggelsberg, Upper Austria ) ( Priesel - Dichtl 1959 ); Upper Donau ( = Danube ) drainage system, Schwemmland ( Melk; Höflein; Wien - Donaueschingen; Gieshübl; Anger near Weiz ) ( Vornatscher 1965 ).

POLAND: Thermal waters in Jaszczurowce near Zakopane ( Skalski 1981 ).

CZECHOSLOVAKIA: Slovakia, rhenodanubien ( Straskraba 1972 ).

HUNGARY: Mecsek Mts. N. of Fünfkirchen, in caves ( Strouhal 1939 ).

**DISTRIBUTION:** Danube drainage system in S. Germany, Austria, Czechoslovakia, Hungary; S. Poland.

**ECOLOGY:** Along coast of Danube River was found together with *N. bajuvanicus*, *N. aquilex*, *Niphargopsis casparyi* and *Crangonyx subterraneus* ( Schellenberg 1942; Priesel - Dichtl 1959; present work ). Husmann ( 1966 ) mentioned it as stygobiont ( Eustygopsammal ).

Priesel - Dichtl ( 1959 ) mentioned water temperature of 9.5 - 10.5 °C.

#### NIPHARGUS DANCONAI Benedetti 1942

Figs. : IV, 9 - 14; V - IX

**Syn. :** *Niphargus skopljensis d' anconai* Benedetti 1942: 7, fig. 1 - 6.  
*Niphargus skopljensis D'Anconai* Ruffo 1954: 675.  
*Niphargus skopljensis d'anconai* ( sic ) Vigna - Taglianti 1972: 15.  
*Niphargus danconai* Ruffo 1982: 147; G. Karaman & Ruffo 1986: 524.

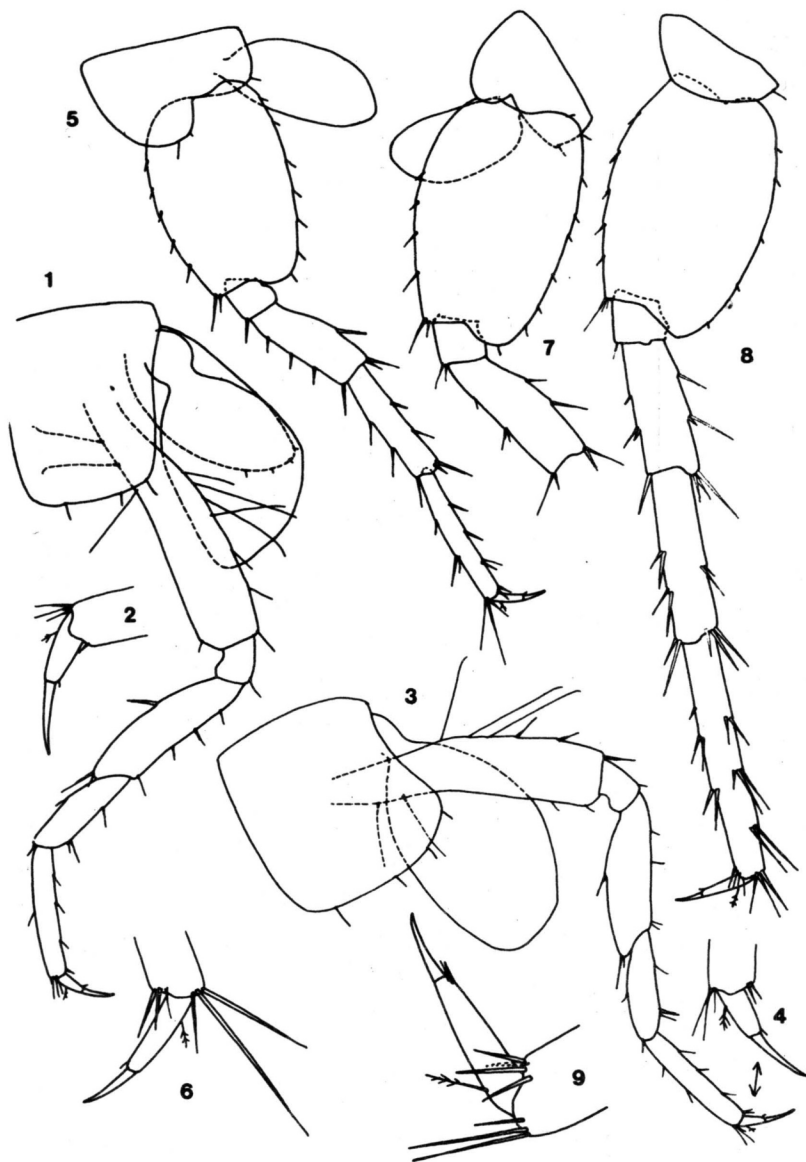


Fig. III. *Niphargus inopinatus* Schell. 1932, Wien, female 5.5 mm: 1 - 2 = pereopod 3; 3 - 4 = pereopod 4; 5 - 6 = pereopod 5; 7 = pereopod 6; 8 - 9 = pereopod 7.



MATERIAL EXAMINED: AUSTRIA: - GM 18, Feldkirchen, well, Oct. 15, 1973, 2 spec. intermixed with 1 spec of *Niphargus schusteri* G. Kar. 1992 and *Niphargus* sp. ( leg. I. Macher );

- GM 37, Feldkirchen, well, Jan. 21, 1974, 1 spec. ( leg. I. Macher ).

ITALY: Verona, Duomo, well, 1940/1941 ( leg. U. D'Ancona ).

DESCRIPTION ( specimens from Austria ): FEMALE with setose oostegys 5. 8 mm. : Body stout, urosomite 1 with 1 spine on each side, urosomite 2 with 2 - 4 spines on each side, urosomite 3 smooth ( fig. V, 6 ). One short strong spine appears near basis of peduncle of uropod 1 ( fig. V, 6 ).

Head with short subrounded lateral cephalic lobes ( fig. VI, 9 ), eyes absent.

Antenna 1 slightly shorter than body; peduncular segments 1 - 3 progressively shorter, but peduncular segment 3 elongated ( fig. VI, 1 ); main flagellum with 22 articles ( most of articles with 1 aesthetasc ); accessory flagellum 2 - segmented, shorter than third peduncular segment ( fig. VI, 1 ).

Antenna 2 slender, peduncular segments 4 - 5 nearly subequal; flagellum shorter than peduncle, consisting of 7 slender articles, antennal gland cone short ( fig. VI, 2 ).

Labrum entire, broader than long ( fig. IX, 1 ).

Labium fleshy, outer lobes broad, inner lobes narrow ( fig. IX, 2 ).

Mandibles with triturative molar provided on right mandible with long subdistal seta. Right mandible: incisor with 4 teeth, lacinia mobilis weak, relatively narrow, bifurcate, with serrate inner margins and accompanied by cca 13 rakers ( fig. VIII, 2 ). Left mandible: incisor with 5 teeth ( sometimes last tooth is less developed ), lacinia mobilis strong, with 4 strong teeth ( fig. VIII, 3 ), and accompanied by row of cca 12 rakers. Palp 3 - segmented: first segment smooth, second segment with 3 setae; third segment nearly as long as second one, provided with 2 - 3 A - setae, 1 - 2 B - setae, 9 - 11 marginal D - setae and 3 - 4 long E - setae ( fig. VIII, 4, 5 ).

Maxilla 1: inner plate narrow, with 1 distal seta; outer plate with 7 strongly recurved pectinated spines ( fig. V, 3, 4 ); palp short, not exceeding tip of spines of outer plate, 2 - segmented, provided with 6 - 7 setae ( fig. V, 3 ).

Maxilla 2: both plates narrow, with distal setae only ( fig. V, 2 ).

Maxilliped: inner plate long and strong, remarkably exceeding tip of first palp segment, bearing 4 - 6 distal rather ciliated spines intermixed with setae ( fig. V, 1 ); outer plate weak, only slightly larger than inner plate, not exceeding  $\frac{2}{3}$  of second palp segment, provided with only 5 smooth marginal spines and single setae; palp strong, 4 - segmented, nail shorter than pedestal ( fig. V, 1 ).

Coxae 1 - 4 long, remarkably longer than broad, with single marginal setae only ( figs. IV, 11, 13; VII, 1, 5 ); coxa 1 with subrounded ventral corners ( fig. VII, 1 ), coxa 4 with poorly developed ventroposterior lobe ( fig. VII, 13 ); coxa 5 remarkably shorter than 4; coxae 5 - 6 short, bilobed, coxa 7 entire ( fig. VI, 3, 5, 7 ).

Gnathopods 1 - 2 subchelate, slender, slightly dissimilar to each other, gnathopod 2 remarkably stronger than 1.

Gnathopod 1: segments 3 - 4 with 1 group of posterior setae, segment 4 with elevated posterior smooth hump ( fig. VII, 1 ); segment 5 hardly longer than 6, unlobed; segment 6 nearly as long as broad, dilated distally, with produced ven-

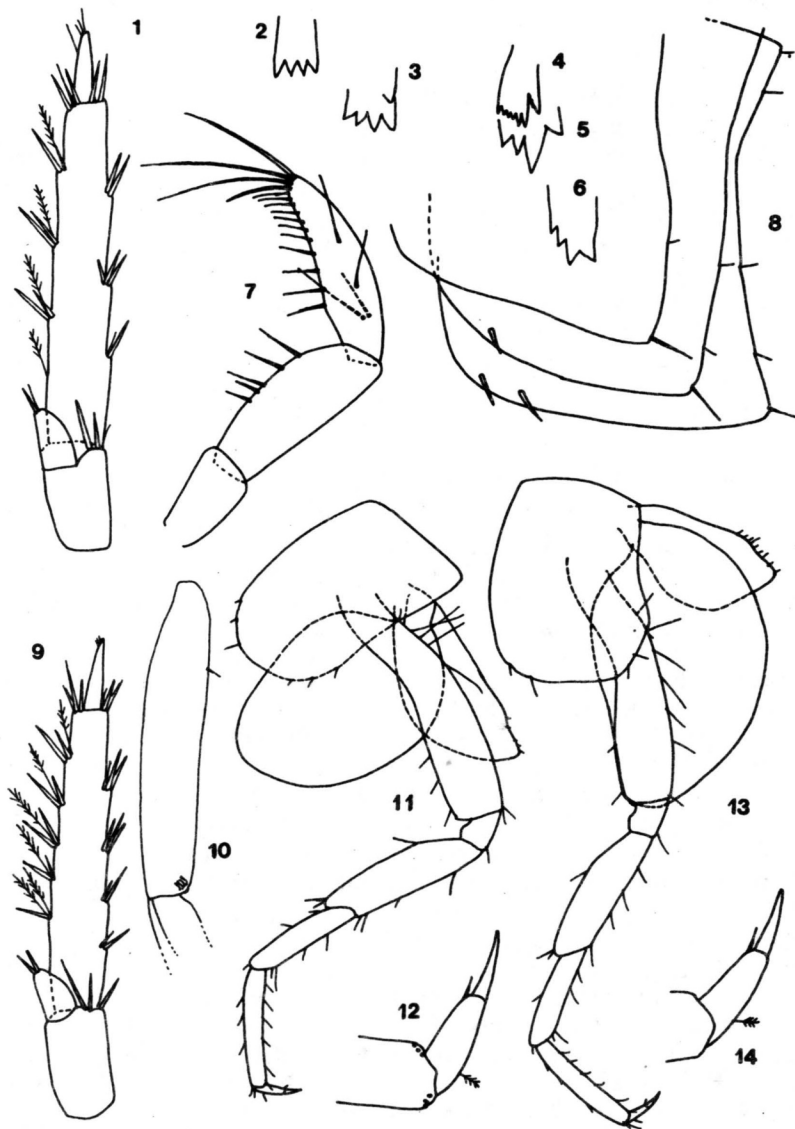


Fig. IV. *Niphargus inopinatus* Schell. 1932, Wien, female 5.5 mm: 1 = uropod 3; 2 = left lacinia; 3 = left incisor; 4 = right lacinia; 5 - 6 = right incisor; 7 = mandibular palp; 8 = epimeral plates 1 - 3.

*Niphargus danconai* Bened. 1942, Feldkirchen, female 5.8 mm; 9 = uropod 3; 10 = pleopod 3; 11 - 12 = pereopod 3; 13 - 14 = pereopod 4.

troposterior corner („kochianus - type”) and cca 8 posterior transverse groups of setae; palm convex, transverse, defined on outer face before the posterior corner of segment 6 by 1 stronger corner spine accompanied by 4 slender lateral toothed spines, as well as with 2 facial long setae ( fig. VII, 2, 3 ), on inner face by 1 short subcorner spine ( fig. VII, 3, 4 ); dactyl not reaching posterior corner of segment 6, bearing one seta at outer margin ( fig. VII, 2, 3 ).

Gnathopod 2: segments 3 - 4 with one group of posterior setae; segment 4 with strong posterior humps; segment 5 longer than 6, unlobed; segment 6 longer than broad, dilated distally, with cca 10 posterior transverse groups of setae and with produced ventroposterior corner ( fig. VII, 5, 6 ); palm transverse, convex, like that of gnathopod 1, but with 2 - 4 facial setae; dactyl not reaching posterior margin of segment 6, like that of gnathopod 1 ( fig. VII, 7, 8 ).

Pereopods 3 - 4 slender, dactyl not exceeding half of segment 6, with strong nail and with 1 spine - like seta at inner margin ( fig. IV, 11 - 14 ).

Pereopods 5 - 7 moderately long, and progressively stronger; their segment 2 ovoid, longer than broad, with well developed ventroposterior lobe not exceeding distal tip of segment 3 ( fig. VI, 3, 5, 7 ); posterior margin of segment 2 with short setae only; segments 3 - 6 with spines along both margins. Segment 6 of pereopod 7 distinctly stronger than that of pereopods 5 - 6 ( fig. VI, 7 ). Dactyl of pereopods 5 - 7 slender and short, not reaching half of segment 6, bearing nail much shorter than pedestal, and with one spine along inner margin and 1 plumose seta at outer margin ( fig. VI, 4, 6, 8 ).

Epimeral plates 1 - 3 angular, with marked ventroposterior corner; subventral spines appear on epimeral plates 2 - 3 ( fig. V, 5 ).

Pleopods 1 - 3 with 3 - 4 retinacula each ( formula 3 - 3 - 4 ). Peduncle of pleopod 3 along posterior margin with 1 - 2 small median setae ( fig. IV, 10 ).

Uropod 1: peduncle with dorsoexternal and dorsointernal row of spines, distal peduncular spines short ( fig. V, 6 ); inner ramus slightly longer than outer one, both rami with lateral and distal short spines ( fig. V, 6 ).

Uropod 2: inner ramus remarkably longer than outer one, both rami with short lateral and distal spines ( fig. V, 6 ).

Uropod 3 short, inner ramus scale - like; outer ramus 2 - segmented, first segment with bunches of spines along both margins, accompanied along inner margin with single plumose setae ( fig. IV, 9 ); second segment of outer ramus short.

Telson relatively short, hardly exceeding tip of peduncle of uropod 3, incised over 4/5 of its length, longer than broad; each lobe with 5 - 6 distal spines and one spine along inner margin ( fig. VIII, 1, 6 ); a pair of short plumose setae appears near the middle of each lobe.

Coxal gills ovoid, elongated, occur on pereonites 2 - 6 ( fig. IV, 11, 13; VI, 5; VII, 5 ).

Oostegys broad, occur on pereonites 2 - 5 ( fig. IV, 12, 13 ).

MALES: Our single specimen of 3.6 mm from Austria was partially damaged, and urosomite 1 was with one spine - like seta, urosomite 2 with one spine on each side; epimeral plates 2 - 3 with obtuse ventroposterior corner ( abnormal! ); both rami of uropod 1 with slightly longer distal spines; telson without spines along inner margin and with three distal spines on each lobe.

VARIABILITY: The specimens from Austria are with telson bearing lateral spine along inner margin and distal spines; their palp segment 3 with 9 - 11 D

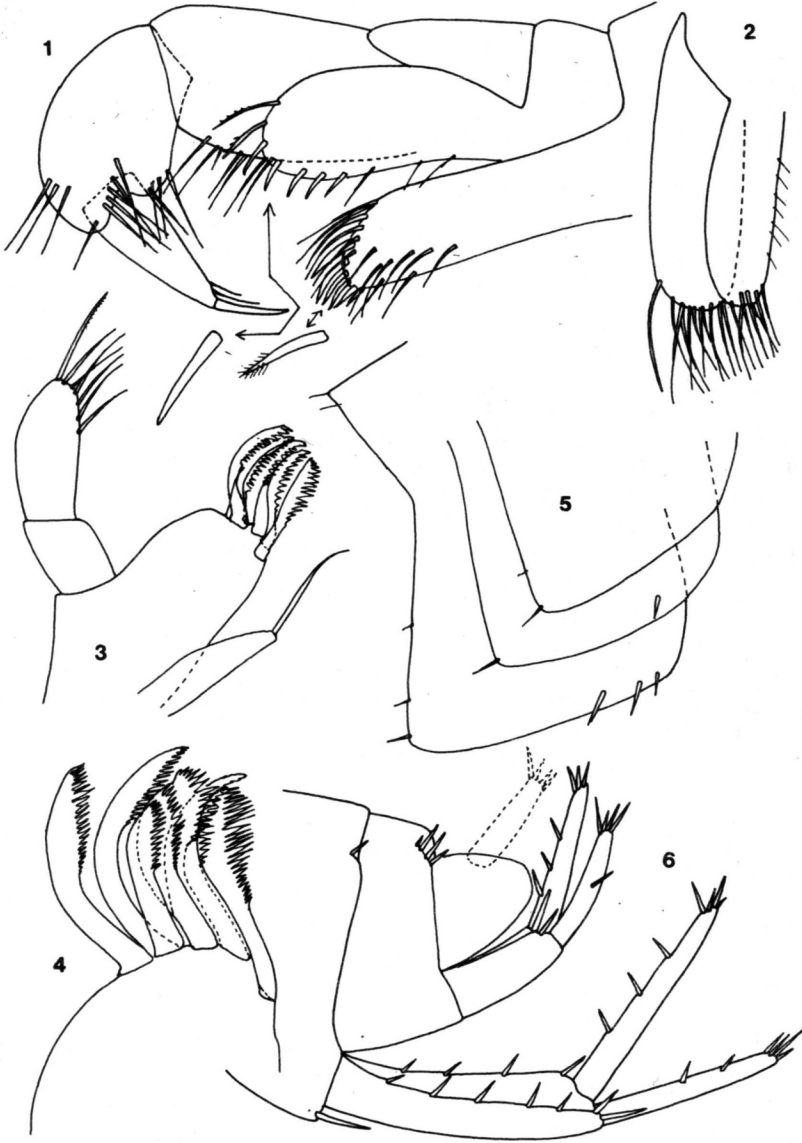


Fig. V. *Niphargus danconai* Bened. 1942, Feldkirchen, female 5.8 mm: 1 = maxilliped; 2 = maxilla 2; 3 - 4 = maxilla 1; 5 = epimeral plates 1 - 3; 6 = urosome with uropods 1 - 2.

setae; pleopods 1 - 3 with 3 - 4 retinacula each.

The specimens from Italy ( Verona ), are very similar to these from Austria ( fig. IX, 3 ), but telson seems to be slightly more narrow and broadly excavated, without lateral spine along inner margins ( fig. VIII, 8 ); palp segment 3 of mandible with tendency of decreased number of D - setae on third segment ( usually with 7 - 8 D - setae sitting in distal half of the palp ), but sometimes also with 11 D - setae ( female 5.9 mm ) ( fig. VIII, 7, 9 ). Inner plate of maxilliped with 4 - 6 slightly haired spines. The number of spines on left and right inner plate of maxilliped can be similar or dissimilar.

Urosomite 2 usually with only 2, rather 3 - 4 dorsolateral spines on each side. Pleopods 1 - 3 bearing 3 - 5 retinacula each. Peduncle of pleopod 3 with 1 - 3 small medial setae along posterior margin. Coxae nearly as these from Austria, but coxa 4 can be sometimes less lobed posteriorly.

Benedetti ( 1942 ) mentioned for the specimens from Italy the body size of 8 mm, flagellum of antenna 2 with 9 articles; dactyl of pereopods 3 - 4 with 1 spine along inner margin; each lobe of telson with 5 - 7 distal spines.

REMARKS AND AFFINITIES. The specimens from Austria differ very slightly from these from Italy ( shape and armature of telson, tendency of increased number of D - setae on third segment of mandibular palp ).

Unfortunately, the limits of the variability in the population of *N. danconai* from Austria are unknown, because of scarce material in hands, and it is not possible at the moment to establish the value of differences between it and these from Italy. For this reason we consider the specimens from Austria as a members of the same species, *N. danconai* Benedetti 1942. The further studies on a new material will show the real taxonomical position of the austrian population regarding these from Italy.

Similar shape of maxilla 1 is known in the species *Niphargus submersus* ( Dershavin 1945 ) known from SW. Transcaucasus ( spring in bed of river Sochi near town ), described by Dershavin under the name of a different new genus *Martynovia* Ders. 1945. Later this genus was submerged into genus *Niphargus* as synonym by many authors.

*N. submersus* is similar to *N. danconai* by short uropod 3, long antenna 1, lobed segment 2 of pereopod 7. But, *N. submersus* differs from *N. danconai* by presence of 2 spines on outer margin of each lobe of telson ( many other taxonomical characters of this species are unknown ).

The pectinate, but slightly less recurved spines on outer plate of maxilla 1 are present also in *N. angelieri* Ruffo 1954 known from Le Boulou ( Pirenees - Orientales, France ) and *N. messanai* G. Karaman 1990b, known from Caldine, Mugnone ( Italy ). But, *N. angelieri* differs remarkably from *N. danconai* by presence of 2 setae on inner plate of maxilla 1, shorter palp of maxilla 1, short telson bearing lower number of distal spines, by long distal spines on rami of uropod 1, etc. *N. messanai* differs from *N. danconai* by different armature of maxilliped, shape of gnathopods 1 - 2, telson, elevated number of setae on inner plate of maxilla 1, etc.

*N. angelieri* and various other transitive species between *N. danconai* and species with normal, straight spines on outer plate in maxilla 1 ( *N. stygius*, etc. ) obstruct for the moment the separation of the species with recurved spines on maxilla 1 into a distinct different genus ( = *Martynovia* Dershavin 1945 ) before one detailed analyse of all *Niphargus* species.

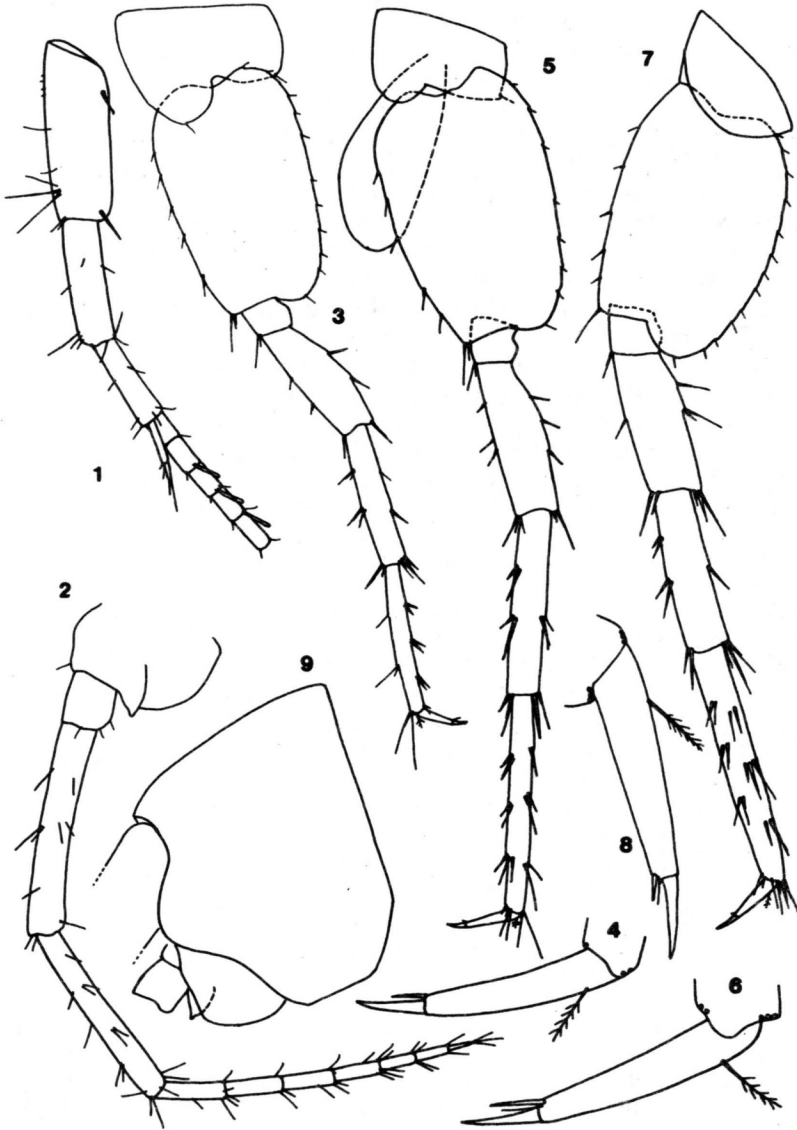


Fig. VI. *Niphargus danconai* Bened. 1942, Feldkirchen, female 5.8 mm: 1 = antenna 1; 2 = antenna 2; 3 - 4 = pereopod 5; 5 - 6 = pereopod 6; 7 - 8 = pereopod 7; 9 = head.



Fig. VII. *Niphargus danconai* Bened. 1942, Feldkirchen, female 5.8 mm: 1 - 4 = gnathopod 1; 5 - 8 = gnathopod 2.

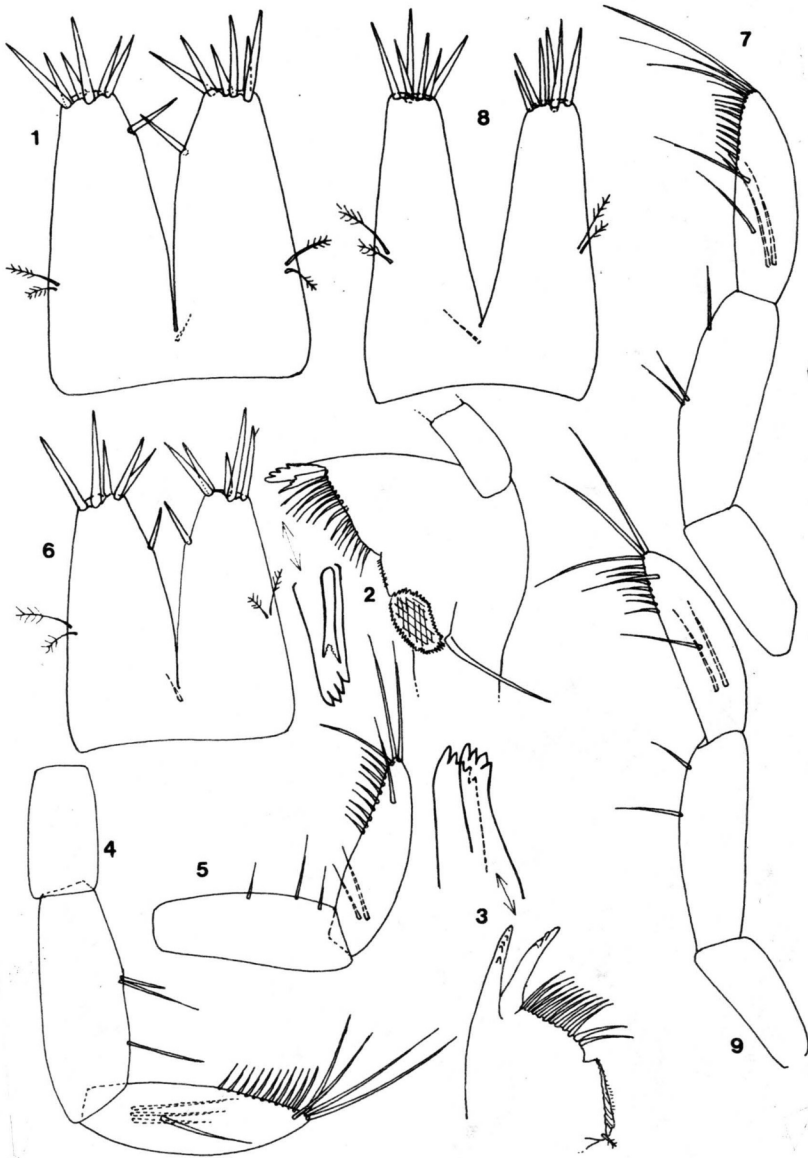


Fig. VIII. *Niphargus danconai* Bened. 1942, Feldkirchen, female 5.8 mm: 1 = telson; 2 = right mandible; 3 = left mandible; 4 = mandibular palp; 5 = mandibular palp, female 5.0 mm; 6 = telson, female 5.0 mm; 7 = mandibular palp, female 5.4 mm from Verona; 8 = telson, female 5.9 mm from Verona; 9 = mandibular palp, female 5.9 mm from Verona.



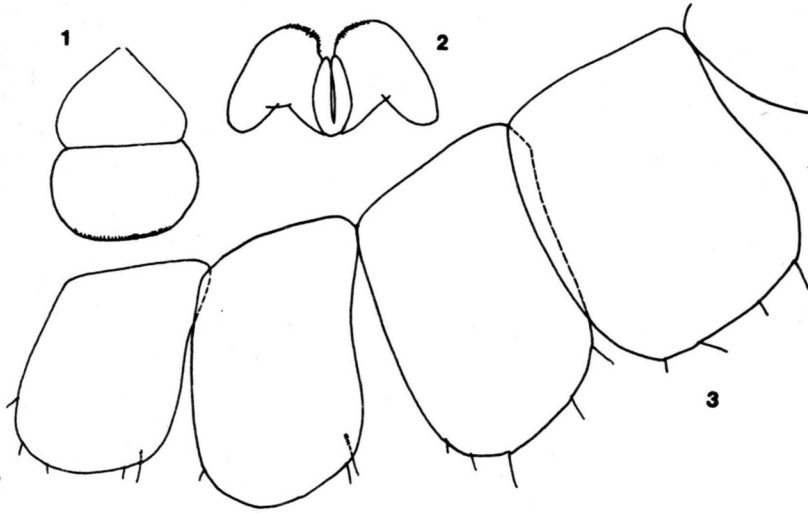


Fig. IX. *Niphargus danconai* Bened. 1942, Feldkirchen, female 5.8 mm: 1 = labrum; 2 = labium; 3 = coxae 1 - 4. female 5.9 mm from Verona ( Italy ).

Specific taxonomical character of *N. danconai* is relatively short dactyl of gnathopods 1 - 2 not reaching posterior margin of segment 6. This character has been found also in *N. labacensis* Sket 1956 known from Croatia and Slovenia ( toc. typ. : Stozice near Ljubljana ) ( see G. K a r a m a n 1983a ), but this species differs from *N. danconai* by different number and shape of spines on both plates of maxilliped, different shape of gnathopods 1 - 2, maxilla 1, etc.

Dactyl of some species is hardly reaching posterior margin of segment 6 in gnathopods 1 - 2 : *Niphargus minor* Sket 1956 ( known from Slovenia and Croatia ), *N. lattingerae* G. Karaman 1983a ( known from Croatia ).

LOC. TYP.: Verona, wells ( Italy ).

LOCALITIES CITED: ITALY: wells in Verona ( B e n e d e t t i 1942; G. K a r a m a n & R u f f o 1986 ).

DISTRIBUTION: N. Italy, Austria.

ECOLOGY: Found in the phreatic waters in the wells, accompanied often with *N. longidactylus* Ruffo ( Verona, Italy ) or *Niphargus schusteri* G. Kar. ( Feldkirchen, Austria ).

#### CONCLUSIONS

The poorly known subterranean species *Niphargus inopinatus* Schellenberg 1932 ( *Amphipoda Gammaridea*, fam. *Niphargidae* ) is redescribed based on the specimens from Wien ( Austria ). This species is characterized by very long and strong ventral spine on urosomite 1 near peduncle of uropod 1, similar to that of *Niphargus lattingerae* G. Karaman 1983, and by dissimilar segment 6 of gnathopods 1 - 2.

*Niphargus danconai* Benedetti 1942 known previously only from Italy ( Verona ), is established now for the first time in Austria ( wells in Feldkirchen ). It differs only slightly from the topotypic material from Verona by presence of lateral spine along inner margin of dactyl of telson, slightly more narrow telson and by tendency of elevation of number of D - setae on mandibular palp.

*N. schusteri* G. Kar. 1992 ( one juv. spec. ) is found now also in Feldkirchen ( Austria ), intermixed with *N. danconai* Ben. 1942.

#### LITERATURE

- BENEDETTI, G. B. 1942. Prime osservazioni sopra i *Niphargus* della Venezia Euganea. - Mem. R. Accad. Sc. Let. Arti Padova ( n. s. ), 58: 175 - 186.
- CARASU, S.,  
DOBREANU, E.,  
MANOLACHE, C. 1955. Amphipoda. Forme salmastre si de apa dulce. - Fauna Republicii Populare Romine, Crustacea, 4 ( 4 ): 1 - 410.
- DERSHAVIN, A. N. 1945. The subterranean Amphipoda of Transcaucasus. - Bulletin of the Academy of Sciences of the Azerbaidzhan SSR., 8: 27-43.
- HUSMANN, S. 1964. Studien zur ökologie und Verbreitung der Gattung *Chappuisius* Kiefer, 1938 ( Copepoda, Harpacticoida ); Mitteilung über Neufunde aus den Grundwasserströmen von Lahn, Niederrhein, Ruhr und Unterweser. - Crustaceana, 6 ( 3 ): 179 - 194.

- HUSMANN, S. 1966. Versuch einer ökologischen Gliederung des interstitiellen Grundwassers in Lebensbereiche eigener Prägung. - Arch. Hydrobiol. 62 ( 2 ) : 231 - 268.
- KARAMAN, G. 1980. Revision of *Niphargus giovanovici* - group ( Fam. Gammaridae ) ( Contribution to the Knowledge of the Amphipoda 110 ). - Poljoprivreda i šumarstvo, Titograd, 26 ( 2 ) : 3 - 22.
- KARAMAN, G. 1983a. Contribution to the Knowledge of the Amphipoda 128. A new subterranean Species from Yugoslavia, *Niphargus lattingeri*, n. sp. ( Fam. Gammaridae ). - Poljoprivreda i šumarstvo, Titograd, 29 ( 1 ) : 37 - 46.
- KARAMAN, G. 1983b. Three poorly known subterranean *Niphargus* Species (Fam. Gammaridae ) from Yugoslavia ( Contribution to the Knowledge of the Amphipoda 132 ). - Poljoprivreda i šumarstvo, Titograd 29 ( 2 ) : 37 - 56.
- KARAMAN, G. 1990a. On two subterranean Gammaridean Species from Italy, *Niphargus messanai*, n. sp. and *Ilvanelia inexpectata* V. T. 1972 ( Contribution to the Knowledge of the Amphipoda 194 ). - Acta biologica Iugoslavica, Biosistematika, Beograd, 15 ( 1 ) : 55 - 70 ( 1989 ).
- KARAMAN, G. 1990b. Taxonomical investigations on *Niphargus bajuvaricus* Schell. 1932 and its Subspecies ( Contribution to the Knowledge of the Amphipoda 200 ). - Glas. Republ. Zavoda zast. prirode - Prirodnjačkog muzeja Titograd, 22 : 95 - 111 ( 1989 ).
- KARAMAN, G. 1992. Some new or interesting Gammaridean species from Austria and adjacent regions ( Contribution to the Knowledge of the Amphipoda 206 ) - Glasnik Republ. Zavoda zašt. prirode - Prirodnjačkog muzeja Podgorica ( in press ).
- KARAMAN, G.,  
RUFFO, S. 1986. Amphipoda: *Niphargus* - Group (*Niphargidae* sensu Bousfield, 1982 ), in: Botosaneanu, L. ( edit. ) : Stygofauna Mundi, A. Faunistic, Distributional, and Ecological Synthesis of the World Fauna inhabiting Subterranean Waters ( including the Marine Interstitial ). Leiden, E. J. Brill/Dr W. Backhuys, pp. 514 - 534.
- PRIESEL - DICHTL, G. 1959. Die Grundwasserfauna im Salzburger Becken und im anschließenden Alpenvorland. - Arch. f. Hydrobiol. 55 ( 3 ) : 281 - 370.
- RUFFO, S. 1954. Anfipodi di acque interstiziali raccolti dal Dr C. Delamare Deboutteville in Francia, Spagna e Algeria. - Vie et Milieu, 4 ( 4 ) : 669 - 681.
- RUFFO, S. 1982. Gli Anfipodi delle acque sotterranee italiane ( Studi sui Crostacei Anfipodi 93 ). - Lavori della Societa italiana di biogeografia, nuova serie, 7 : 139 - 169.
- SCHELLENBERG, A. 1932a. Vier blinde Amphipodenarten in einem Brunnen Oberbayerns. - Zool. Anzeiger, 98, ( 5 - 6 ) : 131 - 139.

- SCHELLENBERG, A. 1932b. Deutsche subterrane Amphipoden. - Zool. Anzeiger, 99 (11 - 12) : 311 - 323.
- SCHELLENBERG, A. 1933a. Niphargus - Probleme. - Mitt. Zool. Museum Berlin, 19: 406 - 429.
- SCHELLENBERG, A. 1933b. Weitere deutsche und ausländische Niphargiden. - Zool. Anzeiger, 102 ( 1 - 2 ) : 21 - 33.
- SCHELLENBERG, A. 1933c. Niphargus puteanus am alten Fundort neue entdeckt. Revision der deutschen Niphargusarten. - Zool. Anzeiger, 102 (9 - 10) : 255 - 257.
- SCHELLENBERG, A. 1940. Die subterrane Amphipoden des unteren Maintales. - Sond. Archiv für Hydrobiologie, 36: 466 - 482.
- SCHELLENBERG, A. 1942. IV. Flohkrebse oder Amphipoda. - Die Tierwelt Deutschland und der angrenzenden Meeresteile, Jena, pp. 1 - 252.
- SKALSKI, A. 1981. Podziemne obunogi ( Amphipoda ) Polski.- V Rocznik Muzeum okregowego w Czestochowie, 2: 61 - 83.
- STRASKRABA, M. 1972. L'état actuel de nos connaissances sur le genre Niphargus en Tchécoslovaquie et dans le pays voisins. - Actes I. Col. Int. Niphargus, Verona 1969, Memorie Mus. civ. St. Naturale. Verona, fuori serie 5: 35 - 46.
- STROUHAL, H. 1939. Einige Bemerkenswerte Vorkommnisse von Wirbellosen, besonders von Isopoden in der Ostmark. - Festschr. Strand., 5: 68 - 80 ( Amp. pp. 77 - 79 ).
- VIGNA- TAGLIANTI, A. 1972. La attuali conoscenze sul genere Niphargus in Italia ( Crustacea Amphipoda ). - Actes I. Col. Int. Genre Niphargus Verona 1969, Museo civ. St. Naturale Verona, Memorie Fuori serie, 5: 11 - 23.
- VORNATSCHER, J. 1965. Ordn.: Amphipoda, Flohkrebse. - österreichische Akad. Wiss., Catalogus Faunae Austriae, VIII f: 1 - 3.
- WAGLER, E. 1937. Crustacea. - Die Tierwelt Mitteleuropas, Leipzig, 2 : 1 - 224.

Gordan S. Karaman

NOVI PODACI O RODU NIPHARGUS Schiödte 1849  
(FAM. NIPHARGIDAE) U AUSTRIJI  
(207. PRILOG O POZNAVANJU AMPHIPODA)

REZIME

Slatkovodna fauna grupe rakova iz reda *Amphipoda* je na teritoriji Austrije još uvijek nedovoljno poznata i pored niza studija različitih istraživača (Schellenberg, Vornatscher, Ruffo, G. Karaman, itd.).

Među njima je svakako najinteresantniji rod *Niphargus* Schiödte 1849 (fam. *Niphargidae*) čijih nekoliko vrsta je bilo pronađeno u podzemnim vodama Austrije (vidi Vornatscher, 1965). Kasnije G. Karaman (1980, 1990b) navodi vrstu *Niphargus bajuvaricus bajuvaricus* Schell. 1932. iz nekih lokaliteta u Austriji, i opisuje jednu novu vrstu (1992), *Niphargus schusteri*, n. sp. iz podzemnih voda u Kasten Gradenfeld (Austrija).

Nastavljajući istraživanja podzemne faune *Amphipoda* Austrije, ustanovili smo po prvi put u Austriji (Feldkirchen) prisustvo podzemne vrste *Niphargus danconai* Benedetti 1942, poznate do sada samo iz podzemnih voda u Veroni, Italija. Primjerci iz Austrije, se samo neznatno razlikuju od istih iz Verone (oblik i armatura telzona, tendencija uvećanja broja D - dlaka na palpusu mandibule), ali zbog relativno malog broja primjeraka iz Austrije, nismo mogli utvrditi raspon varijabiliteta austrijske populacije i stepen njene raznolikosti od nominalne populacije iz Verone. Kako ova vrsta posle prvobitnog, dosta oskudnog opisa (Benedetti, 1942) nije bila nikad ponovo opisana, detaljno smo opisali tu vrstu na osnovu primjeraka iz Austrije (Feldkirchen) i iz Verone (Italija).

Vrsta *Niphargus inopinatus* Schellenberg 1932, prvobitno opisana iz Njemačke (loc. typ.: Moosach), a kasnije nađena i u podzemnim vodama Poljske, Čehoslovačke, Mađarske i Austrije, nije nikada bila detaljno opisana, pa su mnoge njene taksonomske karakteristike bile nepoznate. To je veoma otežavalo razgraničenje te vrste od nekih drugih sličnih vrsta u Evropi. Stoga smo detaljno opisali tu vrstu na osnovu primjeraka iz podzemnih voda okoline Beca (Wien, Austrija) i odredili njen taksonomski položaj unutar roda *Niphargus*.

