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Revision of *Niphargus jovanovići*-group (Fam. Gammaridae). (Contribution to the Knowledge of the Amphipoda 110)

ABSTRACT

The analyse of taxonomic characters of all members of *Niphargus jovanovići*-group (sencu auct.) (fam. Gammaridae) is provided. The subspecies *Niphargus jovanovići multipennatus* Sket 1957 from Yugoslavia, *N. jovanovići kieferi* Schell. 1936 from Germany and France, *N. jovanovići incertus* Dobr. Man. Pusc. and *N. jovanovići ponoricus* Dancau 1963 from Roumania are removed to the specific rank.

N. jovanovići grandii Ruffo 1937 from Yugoslavia and Italy, is removed to the species *N. bajuvaricus* Schell. 1932 as a distinct subspecies and it is redescribed and figured. *Niphargus bajuvaricus* Schell. 1932, considered for a long time as a subspecies of *N. jovanovići* S. Kar. (including Schellenberg also) is removed to the specific rank.

The species *Niphargus gallicus* Schell. 1935 from France and Roumania, *N. delamarei* Ruffo 1954 from France, *N. dobrogicus* Dancau 1964 from Roumania and Bulgaria, *N. kurdus* Dershavin 1945 from Kurdistan and *N. pavicevici* G. Karaman 1976 from Yugoslavia are separated from *Niphargus jovanovići*-group.

The key to the species and diagnosis of *N. jovanovići*-group is given, and the map of distribution of *N. bajuvaricus grandii* is presented.

INTRODUCTION

The number of known *Niphargus* species from Europe is very high (over 150 taxons). Many of these taxons (species or subspecies) are poorly described, sometimes on very scarce material. On the other hand, some of these species were described in other countries under different names. For that reason, the taxonomy of genus *Niphargus* is very confused and must be revised, including the value of already existing subgenera (*Supraniphargus*, *Orniphargus*, *Protoniphargus*, *Phaenogammarus*, *Jovaniphargus* etc.)

Recently, we had a possibility to study the samples of *Niphargus jovanovici*-group, and the results of this study is presented here.

Acknowledgments: I am thankful to prof. Dr. S. Ruffo from Museo Civico di Storia Naturale in Verona (Italy) for the loan of part of material used in this study, and to prof. Dr. H. E. Gruner from Zoologisches Museum der Humboldt Universität, Berlin (GDR).

TAXONOMIC POSITION OF *N. JOVANOVICI* — GROUP

S. Karaman described (1931) a new species from Macedonia, *Niphargus jovanovici*. Later, many other species with ovoid gnathopods 1-2 were attributed to this group of species, sometimes without detailed analyse of all taxonomic characters.

Schellenberg described (1932) *Niphargus bajuvaricus* from Germany (FRG), and later he removed it to *N. jovanovici* as a distinct subspecies (1933). He described also *N. jovanovici kieferi* from Germany (FRG).

Ruffo described (1937) *N. jovanovici grandii* from Italy, and Dobreanu, Manolache and Puscariu described (1951) *N. jovanovici incertus* from Roumania.

Sket described (1957) *N. jovanovici multipennatus*, and (1972) *N. microcerberus* and *N. aberrans* from Yugoslavia and Italy.

S. Karaman described (1960) *N. jovanovici serbicus* from Yugoslavia, and Dancau described (1963) *N. jovanovici ponoricus* from Roumania.

Graf and Stock described (1968) *N. jovanovici burgundus* from France.

S. Karaman created (1960) a new subgenus *Jovaniphargus* including in it all taxons similar to *N. jovanovici*. Because of existing of transitive species between the members of sbg. *Jovaniphargus* and other *Niphargus*-groups the taxonomic value of sbg. *Jovaniphargus* as that of other subgenera of genus *Niphargus* must be

proved in future. For this reason, we are using here the name *Niphargus jovanovici*-group of species. In our point of view, this group is consisting of species with more or less ovoid alike gnathopods 1-2 bearing one seta on outer margin of gnathopod-dactyl, and with short, undifferentiated uropods 1 and 3, with relatively long plumose sensitive setae on telson, with normal mouthparts, and with pleopods often with elevated number of retinacula.

Straškraba attributed (1972) to *N. jovanovici*-group also the species *N. gallicus* Schellenberg 1935 known from France and Roumania, *N. delamarei* Ruffo 1954 known from France, *N. kurdus* known from Kurdistan, USSR, and *N. dobrogicus* Dancau 1964 known from Roumania.

Although these species are with ovoid gnathopods 1-2 and with long plumose setae on telson, they don't belong to *N. jovanovici* group of species because of elongated, differentiated uropod 3 (*N. gallicus*, *N. delamarei*) i. e. because of presence of several setae on outer margin of gnathopod-dactyls (*N. kurdus*, *N. dobrogicus*).

G. Karaman described (1976) *N. pavicevici* from Montenegro (Yugoslavia), species with subequal narrow gnathopods, but dactyl of gnathopods is provided with 2 setae at outer margin so that this species don't belong to *N. jovanovici*-group.

TAXONOMIC PART

Diagnosis of Niphargus jovanovici-group:

Mouthparts normal, propodus (= art. 6) of gnathopods 1-2 more or less ovoid, alike, bearing one seta on outer margin of gnathopod-dactyl; uropods 1 and 3 undifferentiated, uropod 3 similar in males and females; telson with long plumose setae.

N. jovanovici-group is consisting of following species: *Niphargus aberrans* Sket 1972, *N. bajuvaricus* Schell. 1932, *N. bajuvaricus grandii* (Ruffo 1937), *N. burgundus* Graff et Straškraba 1968, *N. incertus* Dobr. Man. Pusc. 1951, *N. jovanovici* S. Karaman 1931, *N. kieferi* Schell. 1936, *N. microcerberus* Sket 1972, *N. multipennatus* Sket 1957, *N. ponoricus* Dancau 1963, *N. serbicus* S. Karaman 1960.

KEY TO THE NIPHARGUS JOVANOVICI — GROUP

1. Dactyl of pereopods 5-7 with several spines along inferior margin BURGUNDUS
- Dactyl of pereopods 5-7 with only one spine along inferior margin 2
2. Lobes of telson with 5-6 long distal plumose setae each
MULTIPENNATUS

- Lobes of telson with 2-3 distal or lateral plumose setae 3
- 3. Lobes of telson with 2-3 long distal plumose setae each; pleopods with 2 retinacula 4
- Lobes of telson with 2-3 long lateral plumose setae each 6
- 4. Lobes of telson with 2 long distal plumose setae. Basis of pereopod 7 narrow, lobed KIEFERI
- Lobes of telson with 3 distal long plumose setae. Basis of pereopod 7 unlobed 5
- 5. Gnathopods 1-2 with propodus nearly of subequal length. Rami of uropods 1-2 with very long distal spines. Basis of pereopod 7 narrow JOVANOVICI
- Propodus of gnathopod 1 remarkably smaller than that of gnathopod 2. Rami of uropods 1-2 with short distal spines. Basis of pereopod 7 broad SERBICUS
- 6. Propodus of gnathopod 2 with 1 long corner spine. Rami of uropods 1-2 with short distal spines. Pleopods with 2-3 retinacula 7
- Propodus of gnathopod 2 with 2-3 long corner spines. Pleopods with 3 or more retinacula 8
- 7. Coxae 3-4 distinctly longer than broad. Basis of pereopod 7 ovoid, lobed INCERTUS
- Coxae 3-4 broader than long. Basis of pereopod 7 narrow, unlobed PONORICUS
- 8. Pleopods with 2 retinacula MICROCERBURUS
- Pleopods with 3-6 retinacula 9
- 9. Dactyl of pereopod 7 with more than one seta along outer margin BAJ. GRANDII
- Dactyl of pereopod 7 with 1 seta along outer margin 10
- 10. Propodus of gnathopods 1-2 narrow, with relatively short palm. Uropods 1-2 with short distal spines on rami ABERRANS
- Propodus of gnathopods 1-2 broad, with relatively long palm. Distal spines on rami of uropods 1-2 long BAJ. BAJUVARICUS

NIPHARGUS ABERRANS Sket 1972

Syn.: *Niphargus aberrans* Sket 1972, p. 21, fig. 65-81, 109.

Localities cited: Slovenia: Ptuj; Stožice near Ljubljana (Sket 1972).

Loc. typ.: Ptuj.

Distribution: Yugoslavia.

Remarks. *N. aberrans* is very similar to *N. bajuvaricus* and *b. grandii*. *N. aberrans* differs from *N. b. bajuvaricus* by narrower propodus of gnathopods 1-2, by propodus of gnathopod 1 is remarkably smaller than that of gnathopod 2. *N. aberrans* differs from *N. b. grandii* by presence of only 1 seta at outer margin of dactyl of pereopod 7 and by narrower propodus of gnathopods 1-2.

Maybe all three taxons, *bajuvaricus*, *grandii* and *aberrans* represent only three forms of one species, *N. bajuvaricus*. But, as the variability of *bajuvaricus* and *aberrans* is still poorly known, we have not fused all three species together, but for the moment we leave all three taxons as distinct ones.

NIPHARGUS BAJUVARICUS BAJUVARICUS Schellenberg 1932

Syn. *Niphargus bajuvaricus* Schellenberg 1932, p. 134, fig. 1.

Niphargus giovanovici bajuvaricus Schellenberg 1933, p. 256 (key); Schellenberg 1935, p. 206 (key); Schellenberg 1942, p. 60, fig. 39; S. Karaman 1950, p. 49, fig. a-d; Dobreanu, Manolache, Puscariu 1951, p. 581; Carausu, Dobreanu, Manolache 1955, p. 267, fig. 246-248; Straškraba 1959, p. 170; Vornatscher 1965, p. 2 VIII f.

Material examined: Rajec, Slovakia (Czechoslovakia), 1 spec. (Karaman Coll.);

— Wells near Wien, many spec. (leg. Vornatscher) (Berlin Museum Coll.);

— Hoflein a/d Donau, 1 spec. (leg. Wollner) (Berlin Museum Coll.);

— Wells near Salzburg (Berlin Museum Coll.);

— Moosach near München (paratypes) (leg. Balss) (No. 23782, Berlin Museum Coll.).

Localities cited: Moosach near München; Dachau (Schellenberg 1932); Wien (Schellenberg 1935), Bisamberg, Klosterneuberg, Höflein (all N. of Wien) (Schellenberg 1942); Salzburg; Sisamberg (Vornatscher 1965); Rajec, Slovakia (S. Karaman 1950); Bratislava (Straškraba 1959); Bistrita (reg. Valcea, Roumania) (Dobreanu, Manolache, Puscariu 1951).

Loc. typ.: Moosach near München

Distribution: Germany, Austria, Czechoslovakia, Roumania.

Remarks. Schellenberg described this species in 1932, but one year later he removed it (1933) to *N. giovanovici* as a distinct

subspecies. The analyse of taxonomic characters of this species showed that *bajuvaricus* is a distinct species, differing from *N. jovanovici* by several very good characters: elevated number of retinacula on pleopods 1-3, by presence of only 2 long plumose setae on lobes of telson attached laterally in the middle of outer margin of lobes and by elevated number of corner spines on propodus of gnathopod 2.

N. bajuvaricus is characterized by presence of only one seta on outer margin of dactyl of pereopods 3-7, by very long distal spines on rami of uropods 1-2 (distal spines on uropod 1-rami reaching or exceeding 60% of rami-length, these on uropod 2 reaching or exceeding the length of rami).

N. bajuvaricus is presented in Central Europe (Germany, Austria, Czechoslovakia, Roumania). It seems that along southern margin of its distribution, the specimens show some differences (shorter spines on rami of uropods 1-2, elevated number of setae along outer margin of dactyl of pereopods 3-7) forming a different subspecies *grandii* Ruffo.

NIPHARGUS BAJUVARICUS GRANDII (Ruffo 1937) new rank

fig. 1-5

Syn.: *Niphargus Jovanovici Grandii* Ruffo 1937, p. 154, fig. I.

Niphargus jovanovici grandii Benedetti 1942, p. 6;

D'Ancona 1942, p. 156, fig. 5B, 6C, 8B, 9; S. Karaman 1960, p. 77; Sket 1972, p. 15, fig. 43-64, 108; G. Karaman 1974, p. 19.

Niphargus puteanus (part.) Garbini 1895, p. 42-48.

Niphargus jovanovici grandii Dancau 1963, p. 473 (key).

Description: Body-length up to 11 mm. Body smooth, urosomite 1 with one dorsolateral spine-like seta, urosomite 2 with one spine on each side (fig. III, 6).

Head without rostrum, lateral cephalic lobes relatively short (fig. I, 1). Antenna 1 reaching 1/2 to 3/4 of body-length, peduncular segments 1-3 progressively shorter (fig. III, 3); main flagellum up to 36-segmented, each flagellar segment with 1-3 aesthetascs. Accessory flagellum 2-segmented (fig. III, 3).

Antenna 2 remarkably shorter than antenna 1, its flagellum up to 16-segmented. Antennal gland cone short.

Labrum entire. Labium with inner lobes. Maxilla 1: inner lobe with 1-2 distal setae, outer lobe with 7 distal spines (inner spine with 4-11 lateral teeth, other spines with 1-3 lateral teeth each), palp slender, with 3-5 distal setae (fig. I, 2, 5).

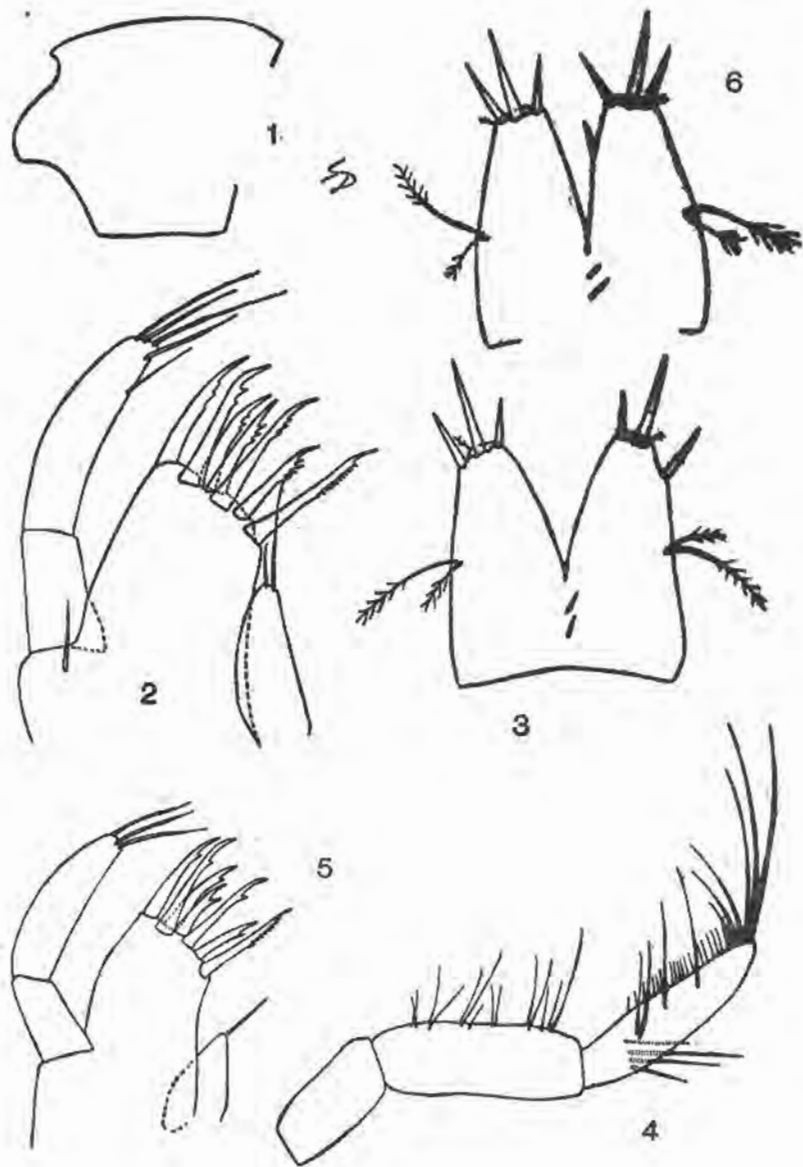


Fig. 1. *Niphargus bajuvaricus grandii* Ruffo, Pozzo Gabbianelle (Bergamo), female 9.6 mm: 1 = head; 2 = maxilla 1; 3 = telson; 4 = mandibular palp; —5 = maxilla 1, female 9.3 mm; 6 = telson, female 9.9 mm from Verona.

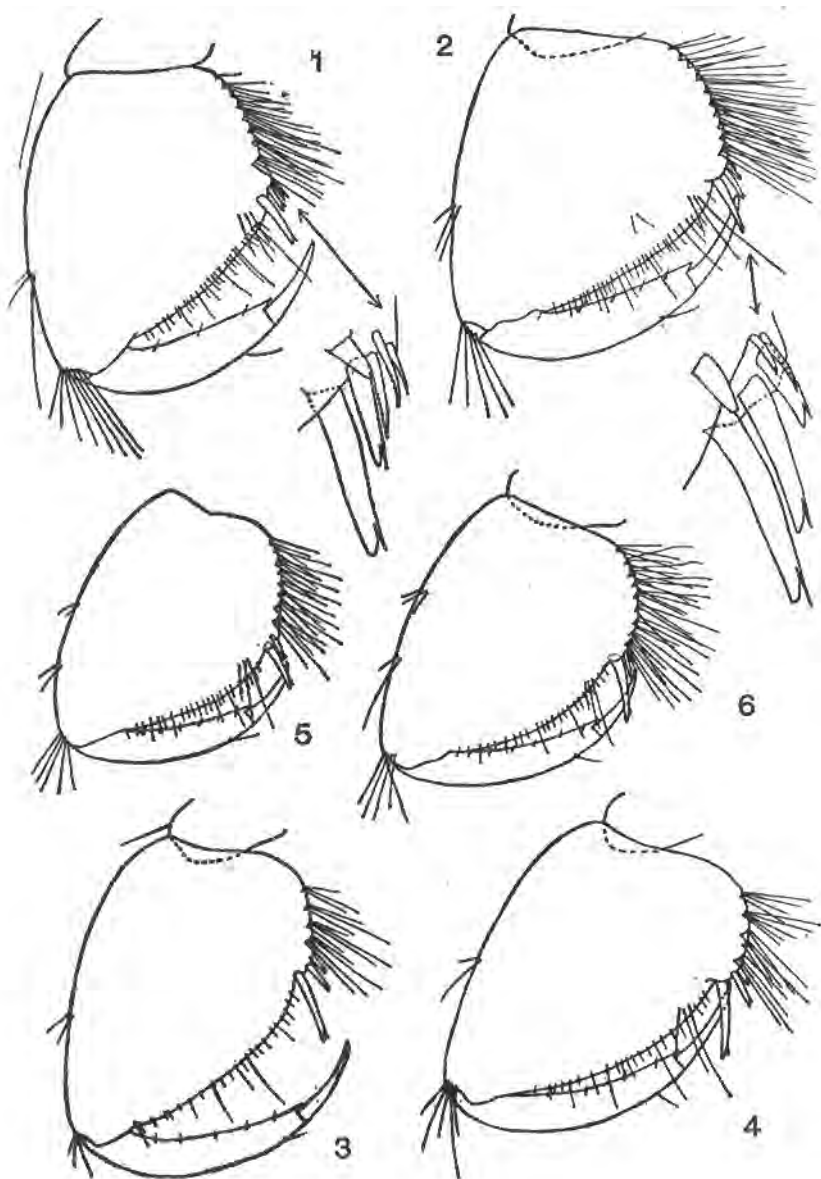


Fig. II. *Niphargus bajuvaricus grandii* Ruffo, Pozzo Gabbianelle (Bergamo), female 9.6 mm: 1 = gnathopod 1; 2 = gnathopod 2; 3 = gnathopod 1, female 9.3 mm; 4 = gnathopod 2, female 9.3 mm; 5 = gnathopod 1, female 9.9 mm from Verona; 6 = gnathopod 2, female 9.9 mm from Verona.

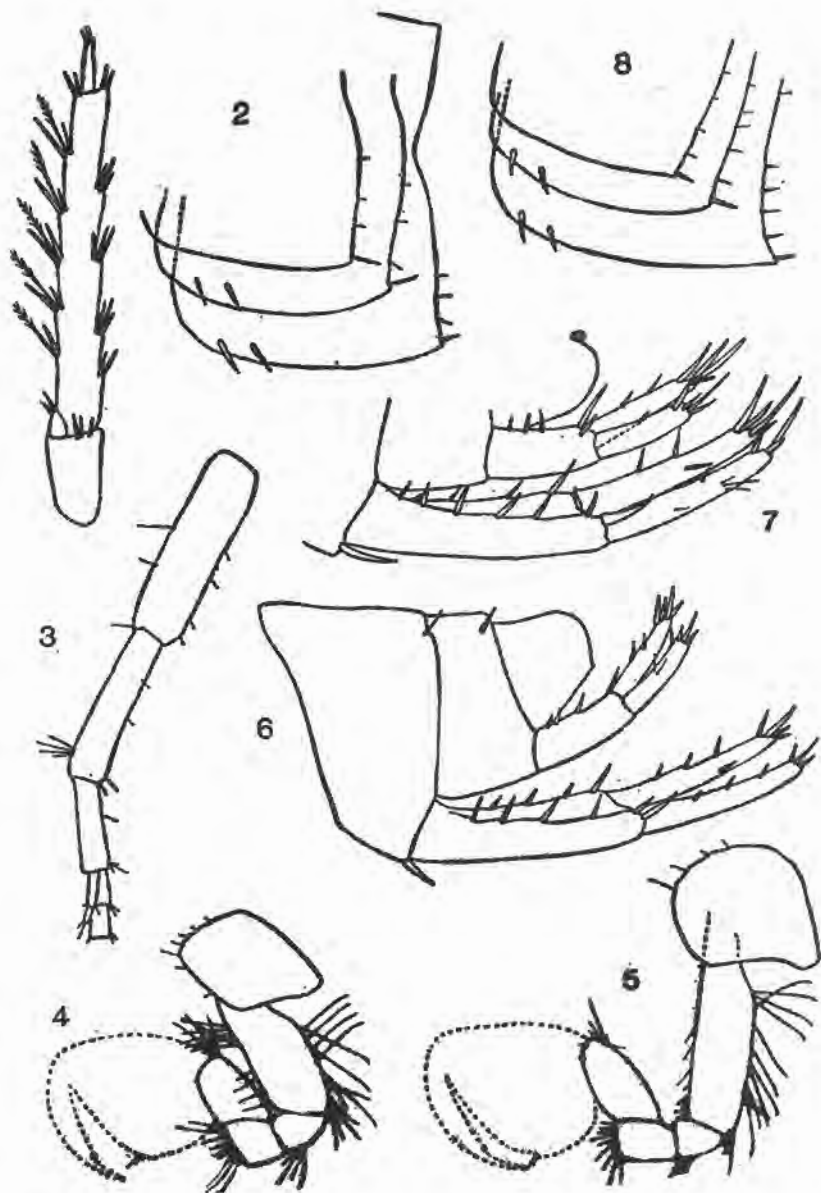


Fig. III. *Niphargus bajuvaricus grandii* Ruffo, Pozzo Gabbianelle (Bergamo), female 9.6 mm: 1 = uropod 3; 2 = epimeral plates 1-3; 3 = peduncle of antenna 1; 4 = gnathopod 1; 5 = gnathopod 2; 6 = urosome with uropods; 7 = uropods 1-2, female 8.8 mm, 8 = epimeral plates 1-3, female 9.9 mm from Verona.

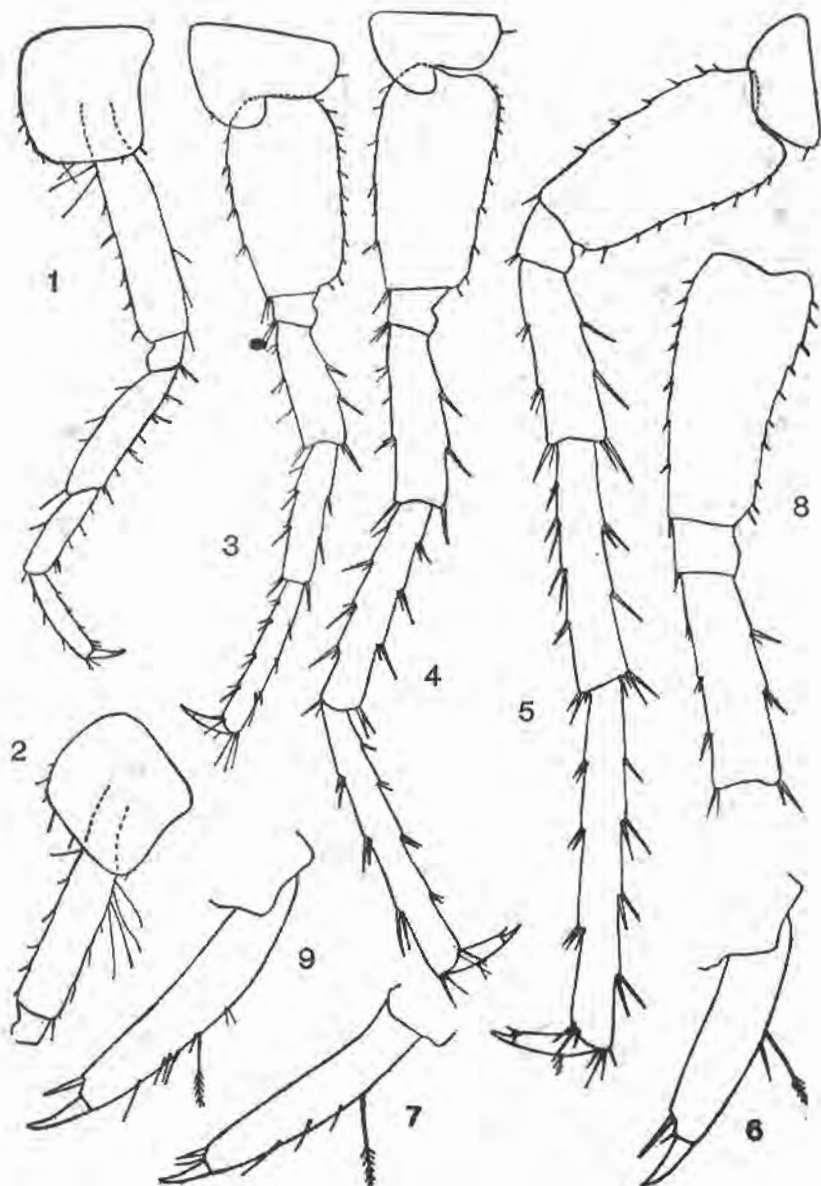


Fig. IV. *Niphargus bajuvaricus grandii* Ruffo, Pozzo Gabbianelle (Bergamo), female 9.6 mm: 1 = pereopod 3; 2 = pereopod 4; 3 = pereopod 5; 4 = pereopod 6; 5-6 = pereopod 7; 7 = dactyl of pereopod 7, female 9.3 mm; 8 = pereopod 7, female 9.9 mm from Verona.

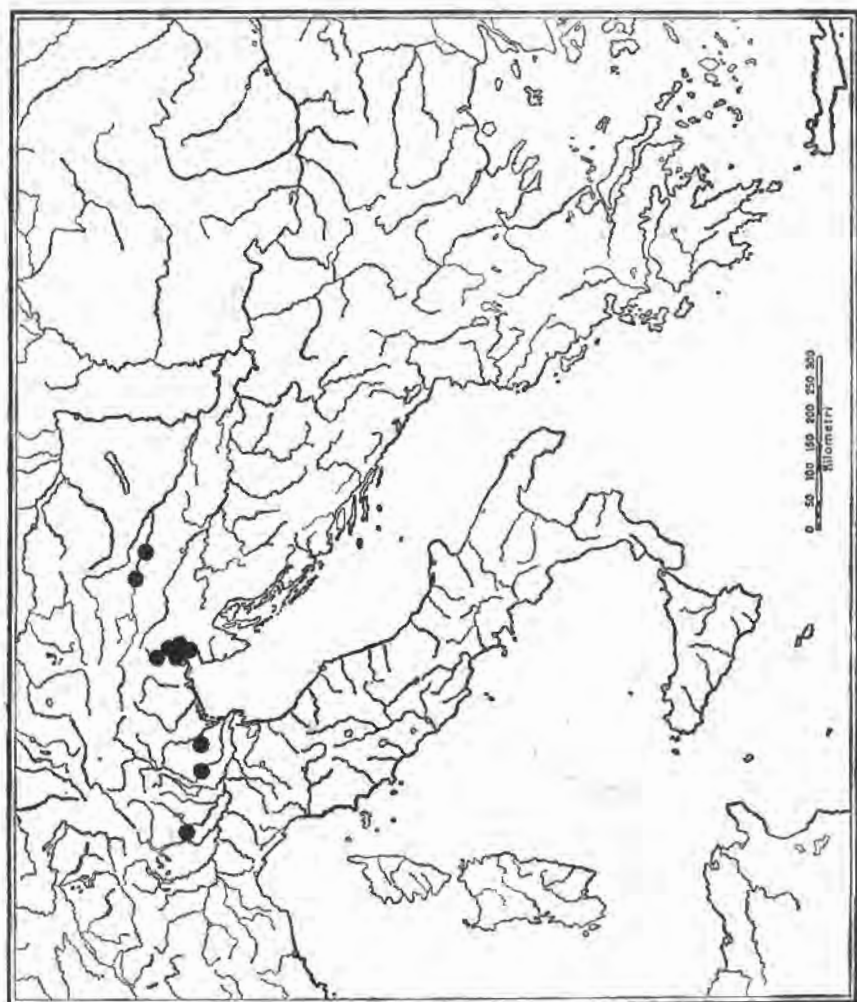


Fig. V. Distribution of *Niphargus bajuvaricus grandii* Ruffo.

Maxilla 2 normal. Maxilliped: inner lobe not reaching outer distal top of second palpar segment, bearing 3-4 distal spines.

Mandible: first palpar segment smooth, second segment with 6-14 setae, third palp segment with 17-22 D-setae, 4-6 E-setae, 3-4 groups of B-setae and 1-2 groups of A-setae (fig. I, 4).

Coxa 1 broader than long (fig. III, 4), coxae 2-4 as long as broad nearly (fig. III, 5; IV, 1, 2), or slightly broader than long (=high), coxa 4 without distoposterior lobe. Coxae 5-7 shorter than coxa 4, all with anterior lobe (part) larger than posterior one (fig. IV, 3-5).

Gnathopods 1-2 almost subequal in length or gnathopod 2 can be remarkably larger than gnathopod 1 (fig. II, 1-6). Gnathopod 1: segment 5 short, segment 6 (propodus) more or less ovoid, with palm exceeding half of posterior margin of segment itself, bearing 2 strong corner spines accompanied by 3 slender toothed spines on outer margin and with one short subcorner spine on inner face (fig. II, 1); dactyl with one seta at outer face.

Gnathopod 2: segment 5 short, segment 6 like that of gnathopod 1 but slightly larger and slightly more inclined, palm with 2-3 long corner spines accompanied by 2-3 slender toothed spines on outer face and with one short subcorner spines on inner face of segment 6 (fig. II, 2).

Pereopods 3-4 relatively slender, poorly setose, with short dactyl bearing one seta at outer margin and with one spine at inner margin (fig. IV, 1-2).

Pereopods 5-7 relatively long, progressively longer towards pereopod 7 (fig. IV, 3-5). Pereopod 5 is much shorter than pereopod 6, pereopod 6 is poorly shorter than pereopod 7. Article 2 (basis) of pereopods 5-7 moderately narrow, with straight or concave posterior margin and without distoposterior lobe; articles 3-6 with spines along both margins; dactyl of pereopod 7 with one spine and seta at inner margin and with 2-4 groups of setae along outer margin (fig. IV, 6, 7, 9), dactyl not reaching half of article 6.

Pleopods 1-3 with 3-4, rather up to 7 retinacula each. Usually the number of retinacula increasing towards posterior pleopods.

Epimeral plates 1-2 angular, epimeral plate 3 is angular to pointed (fig. III, 2, 8). Posterior margin of plates can be straight or concave, distoanterior margin of epimeral plates 2-3 with 1-2 submarginal spines each.

Uropod 1: peduncle without distal tubercle in males. Rami subequal or outer ramus hardly longer than inner one, both rami with short distal spines (fig. III, 6, 7).

Uropod 2: inner ramus is slightly longer than outer one, both rami with short distal spines, never exceeding 60% of rami-length.

Uropod 3 relatively short, undifferentiated, similar in males and females (fig. III, 1). Peduncle relatively short, inner ramus scale-like; outer ramus 2-segmented, second segment short; first segment with bunches of spines along both margins, accompanied by short plumose setae along inner margin.

Telson is relatively short, deeply incised ($3/5$ to $3/4$ of telson-length), nearly as long as broad or weakly longer than broad (fig. I, 3, 6); each lobe with 3-4 distal spines, occasionally with one subdistal spines at inferior margin; a pair of long plumose setae attached in the middle of outer margin of each lobe.

Gills ovoid, moderately long. Oostegites broad, appear on thoracic segments 2-5.

The males are practically identical with females in all characters.

Variability: *N. bajuvaricus grandii* is very variable subspecies. The shape of segment 6 (propodus) of gnathopods 1-2 is prevalently pyriform, but sometimes can be only inclined (fig. II, 1-6). We found in the same sample the specimens with pyriform gnathopods as well as the specimens with less inclined gnathopods (propodus); after the examination of all our specimens we can not find the differences to separate both forms into two species because of existing of transitive specimens between them.

Dactyl of pereopod 7 bearing at outer margin 2-4 groups of setae, often in the same population. The shape of epimeral plates and of basis of pereopods 5-7 is more variable between different populations than between the specimens from one population. The number of distal and subdistal spines on telson is variable, but dorsal spines on telson were never observed.

The number of aesthetascs and its length is variable: there are the specimens with 1, 2 or three aesthetascs on each flagellar segment and these aesthetascs can be short or long.

Inner lobe of maxilla 1 bears 1, rather 2 distal setae; spines of outer lobe (except the inner spine) are with 1-3 lateral teeth each. The pluridentate spines of outer lobe of maxilla 1 were observed in specimens with pyriform gnathopods as well as in specimens with less inclined gnathopods.

The length of distal spines on rami of uropods 1-2 is also very variable: distal spines on rami of uropod 2 reaching up to 60% of rami-length (80-120% in *bajuvarivus*); distal spines on rami of uropod 1 reaching up to 40% of rami-length (over 50% in *bajuvaricus*).

The number of retinacula is between 3 and 7 on each pleopod. Distal tip of pereopod 7 (dactyl) is only reaching or remarkably exceeding the tip of rami of uropods 1-2.

Material examined: Italy: Verona: Via Muro Padri, well, Nov. 1938, many spec. (leg. S. Ruffo), Verona Museum Coll.; Via S. Paolo, August 1941, 1 spec. (leg. D'Ancona), Verona Museum Coll.; Via Pigna 1940/41, 1 spec. (leg. D'Ancona), Verona Museum Coll.;

Prov. di Bergamo: Pagazzano, well, June 7, 1974, 2 spec., VMC; Pozzo Gabbianelle, July 23, 1974, 10 spec., VMC; Fontanile Brancaleone, many samples collected by Italian scientists during 1974, VMC.

Localities cited: ITALY: Verona (Ruffo 1937); Dueville (N. of Vicenza) (Benedetti 1942); Torre near vil. Ruda; Gradisca near river Isonzo; cave over Timavo spring near S. Giovanni near Monfalcone; Belluno, subterr. water of Piave river (Sket 1972).

YUGOSLAVIA: Slovenia: subterr. water of Vipava near vill. Zalošče; well in Šempeter near Nova Gorica; Perilo spring near Robič; Ptuj; Bača, over the mouth of Soča (= Isonzo);

Croatia (Hrvatska): well in vill. Sračinec near Varaždin; well in vill. Petrijanec near Varaždin; vill. Majerje near Varaždin; (Sket 1972).

Loc. typ.: Verona.

Distribution: Northern Italy, northern Yugoslavia.

Remarks: *Niphargus jovanovici grandii* is not similar to *N. jovanovici*, because of elevated number of retinacula on pleopods, different number and position of long plumose setae on telson, etc.

On the other hand, *grandii* is very similar to *N. bajuvaricus* Schell. except two characters: distal spines on rami of uropods 1-2 are short, and dactyl of pereopod 7 with more than one seta along outer margin. As both of these differences existing between *bajuvaricus* and *grandii* are relatively scarce and rather variable, we can not exclude the possibility that *grandii* and *bajuvaricus* are identical to each other, as well as with *N. aberrans* Sket. But, as the variability of *N. bajuvaricus* and *aberrans* are still poorly known, we leave for the moment *grandii* as a distinct subspecies.

NIPHARGUS BURGUNDUS Graf and Straškraba 1968, new rank

Syn.: *Niphargus jovanovici burgundus* Graf and Straškraba 1968, p. 56, pl. 16, fig. A-H, pl. 17, fig. I-P; Morand-Chevat 1972, p. 29.

Localities cited: Dijon (Côte d'Or, France) (Graf and Straškraba 1968).

Loc. typ.: Dijon.

Distribution: France.

Remarks: Propodus of gnathopod 2 with only 1 corner spine, pleopods with 2 retinacula each. *N. burgundus* differs from all other members of *N. jovanovici*-group by very high number of long plumose setae on telson-lobes (6-7) and by elevated number of spines along inferior margin of dactyl of pereopods 3-7.

For this reason, we consider *burgundus* as a distinct species.

NIPHARGUS INCERTUS Dobreanu, Manolache, Puscariu 1951, new rank

Syn.: *Niphargus jovanovici incertus* Dobreanu, Manolache, Puscariu 1951, p. 581, fig. 3-4; Carausu, Dobreanu, Manolache 1955, p. 270, fig. 249-251; Dancau 1963, p. 409 (key); Dancau 1972, p. fig. I (charte).

Localities cited: Roumania: Valea Plaiului, valea Sig-histelului (both in reg. Bihor) (Dobreanu, Manolache, Puscariu 1951).

Loc. typ.: valea Plaiului (reg. Bihor).

Distribution: Roumania.

Remarks: *N. incertus* is close to *N. jovanovici* and *N. baj. grandii*, but differing from all other species of this group by narrow coxae 1-4 (coxae longer than broad).

N. incertus is characterized by telson and uropods 1-2 like these in *grandii*, gnathopods 1-2 like these in *jovanovici*, but pleopods are with 2-3 retinacula each.

For these reasons, we removed *incertus* to the specific rank as a distinct species.

NIPHARGUS JOVANOVICI S. Karaman 1931

Syn.: *Niphargus jovanovici* S. Karaman 1931, p. 93, fig. 1-2.

Niphargus jovanovici jovanovici Schellenberg 1935, p. 206 (key); S. Karaman 1943, p. 207, pl. 3, fig. 43-62; Dancau 1963, p. 473 (key); Sket 1972, p. 10, fig. 107; G. Karaman 1972, p. 5. G. Karaman 1974, p. 19.

Niphargus jovanovici (part.) Carausu, Dobreanu, Manolache 1955, p. 262, fig. 243-245.

Niphargus (Jovaniphargus) jovanovici jovanovici S. Karaman 1960, p. 86, fig. 5.

nec *Niphargus jovanovici jovanovici* Dobreanu, Manolache, Puscariu 1951, p. 579, fig. 1-2.

Localities cited: Yugoslavia: Skopje, well (S. Karaman 1931); springs Dulo and Banjani near Skopje (S. Karaman 1943); Katlanovo; Đorđe Petrov (G. Karaman 1974); spring near Kumanovska Reka (S. Karaman, in litt.).

Loc. typ.: Skopje.

Distribution: Macedonia.

Remarks: This species is characterized by presence of 2 retinacula on pleopods 1-3, by nearly subequal ovoid gnathopods 1-2 having one corner spine on propodus, and by presence of 3 long distal plumose setae on each lobe of telson.

NIPHARGUS KIEFERI Schellenberg 1936, new rank

Syn.: *Niphargus jovanovici kieferi* Schellenberg 1936, p. 71, fig. 2; Schellenberg 1942, p. 59, fig. 38; Balazuc 1954, p. 170; Dancau 1963, p. 473 (key); Straškraba 1972, p. 37.

Localities cited: Germanu (FRG): well in Gündlingen; Feldkirch near Freiburg, Badens (Schellenberg 1936; Sporeninsel near Kehl (Schellenberg 1942);

France: Strasbourg; Point de Kehl (?), Desaix (Balazuc 1954).

Loc. typ.: well in Gündlingen.

Distribution: France, Federal Republik Germany.

Remarks: This species is characterized by presence of only 1 corner spine on gnathopod 2-propodus, by 2 distal long plumose setae on each lobe of telson, shorter distal spines on rami of uropods 1-2, presence of lobed basis of pereopod 7, 2 retinacula etc.

Based of all differences existing between *kieferi* and *jovanovici*, we removed *kieferi* to the specific rank as a distinct species.

NIPHARGUS MICROCERBERUS Sket 1972

Syn.: *Niphargus microcerberus* Sket 1972, p. 25, fig. 82-105, 110; G. Karaman 1974, p. 21.

Localities cited: Yugoslavia: Slovenia: Šempeter near Nova Gorica (Sket 1972); Croatia (Hrvatska): vill. Sračinec and vil. Majerje near Varaždin (Sket 1972);

Italy: torrent Torre near vil. Ruda; river Isonzo (Soča) near Gradišče; Belluno (Piave) (Sket 1972).

Loc. typ.: Torre.

Distribution: N. Yugoslavia and N. Italy.

Remarks: *N. microcerberus* is characterized by ovoid, subequal propodus of gnathopods 1-2, by presence of 2 retinacula on pleopods, by presence of 2 long plumose setae attached laterally on each lobe of telson, etc.

NIPHARGUS MULTIPENNATUS Sket 1957, new comb.

Syn.: *Niphargus jovanovici multipennatus* Sket 1957, p. 71, fig. 3; Sket 1972, p. 106, fig. 25-42; G. Karaman 1972, p. 5; G. Karaman 1974, p. 19.

Localities cited: Yugoslavia: Slovenia: Stožice (Sket 1957) and Beričevo near Ljubljana; Dovjež; Kranj; Mostnica near Bohinj; Brežice;

Croatia (Hrvatska): Zagreb (Sket 1972);

Bosnia and Herzegovina: well between Dolac and Travnik (Sket 1972).

Loc. typ.: Stožice near Ljubljana.

Distribution: Yugoslavia.

Remarks: This taxon is characterized by presence of 5-6 distal long plumose setae on each lobe of telson. Based on this good stable character, it was possible to remove *multipennatus* to the specific rank, mentioning it as a distinct species.

NIPHARGUS PONORICUS Dancau 1963, new rank

Syn.: *Niphargus jovanovici ponoricus* Dancau 1963, p. 464, fig. 4-5; Dancau 1972, p. 56, fig. I (charte).

Localities cited: depression of Hateg, reg. Hunedoara, Roumania (Dancau 1963, 1972).

Loc. typ.: see sub localities cited.

Distribution: Roumania.

Remarks: This taxon is characterized by presence of only 1 corner spine on propodus of gnathopod 2, by short distal spines on rami of uropods 1-2, etc.

This taxon differs from *jovanovici* by elevated number of retinacula, by short spines on rami of uropods 1-2, by presence of only one (or 2?) long plumose setae attached laterally in the middle of lobes of telson. Based on these characters, we removed *ponoricus* from species *jovanovici* to the specific rank, as a distinct species.

NIPHARGUS SERBICUS . Karaman 1960

Syn.: *Niphargus (Jovaniphargus) jovanovići serbicus* S. Karaman 1960, p. 75, fig. 1-4, 6;

Niphargus serbicus Sket 1972, p. 101, fig. 1-24, 106;
G. Karaman 1974, p. 24.

Niphargus jovanovici jovanovici Dobreanu, Manolache,
Puscariu 1951, p. 579, fig. 1-2.

Niphargus jovanovici (part.) Carausu, Dobreanu, Ma-
nolache 1955, p. 262, fig. 240-242.

Niphargus jovanovici serbicus G. Karaman 1972, p. 5.

Localities cited: Yugoslavia: Slovenia: Kozarje; Mur-
ska Sobota; Gornja Radgona; vill. Beričevo near Ljubljana; Ptuj;
Gmajna near Slovenj Gradec (Sket 1972);

Croatia (Hrvatska): Kutjevo; vill. Majerje near Varaždin; Ko-
privnica;

Serbia: Valjevo; vill. Donja Gorevica near Čačak (Sket 1972);
well in Čuprija (S. Karaman 1960);

Bosnia and Herzegovina: Sarajevo; Donji Vakuf; vill. Plan-
dište near Ilidža; Kiseljak NW of Sarajevo; vill. Radanovići near
Kiseljak; vill. Nova Bila near Travnik; well between Dolac and
Travnik; vill. Dobrovo near Višegrad (Sket 1972).

Roumania: Clinceanca (S. of Prahova, Roumania) (Dobreanu,
Manolache, Puscariu 1951).

Loc. typ.: Čuprija, Yugoslavia.

Distribution: Yugoslavia, Roumania.

Remarks: *N. serbicus* is very similar to *N. jovanovići*, and
differs from later only by unequal sized propodus of gnathopods
1-2 and by shorter spines on distal tip of rami of uropods 1-2. As
no transitive specimens between both species were observed, we
consider *serbicus* as a distinct species. But the next studies of
distribution and variability of both species will show if *serbicus*
is a distinct species or only one form of *N. jovanovići*.

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REZIME

REVIZIJA NIPHARGUS JOVANOVICI GRUPE (FAM. GAMMARIDAE).

(110. Prilog poznavanju Amphipoda)

U radu je iznijeta analiza taksonomskih karaktera svih članova grupe *Niphargus jovanovici* (fam. *Gammaridae*, *Amphipoda*). Sastavljena je dijagnoza grupe *N. jovanovici* kao i ključ za determinaciju svih vrsta ove grupe.

Podvrste *Niphargus jovanovici multipennatus* Sket 1957 iz Jugoslavije, *N. jovanovici kieferi* Schell. 1936 iz Njemačke i Francuske, kao i *N. jovanovici incertus* Dobr. Man. Pusc. 1951 i *N. jovanovici ponoricus* Dancau 1963 iz Rumunije su podignuti na nivo zasebnih vrsta.

Vrsta *N. jovanovici grandii* Ruffo 1937. iz Jugoslavije i Italije, je premještena iz vrste *jovanovici* u vrstu *bajuvaricus* kao zasebna podvrsta, te je i detaljno opisana i nacrtana.

Vrsta *Niphargus bajuvaricus* Schell. 1932 iz centralne Evrope koja se dugo vremena vodila kao podvrsta od *N. jovanovici*, je podignuta ponovo na rang zasebne vrste.

Vrste *Niphargus gallicus* Schell. 1935 iz Francuske i Rumunije, *N. delamarei* Ruffo 1954 iz Francuske, *N. dobrogicus* Dancau 1964 iz Rumunije i Bugarske, *N. kurdus* Deržavin 1945 iz Kurdistanu i *N. pavicevici* G. Karaman 1976 iz Jugoslavije su izdvojene iz grupe *N. jovanovici* na osnovu diferenciranog trećeg uropoda odnosno na osnovu prisustva niza dlaka na daktilusu prvog i drugog gnatopoda.

Niphargus jovanovici grupa je sastavljena iz slijedećih vrsta: *Niphargus aberrans* Sket 1972, *N. bajuvaricus* Schell. 1932, *N. bajuvaricus grandii* (Ruffo 1937), *N. burgundus* Graff i Straškraba 1968, *N. incertus* Dobr. Man. Pusc. 1951, *N. jovanovici* S. Karaman 1931, *N. kieferi* Schell. 1936, *N. microcerberus* Sket 1972, *N. multipennatus* Sket 1957, *N. ponoricus* Dancau 1963 i *N. serbicus* S. Karaman 1960.