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ONE NEW SPECIES OF FAMILY NIPHARGIDAE (GAMMARIDEA), NIPHARGUS FORROI SP. N. FROM HUNGARY*

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One new subterranean species of the family Niphargidae (Amphipoda, Gammaridea), *Niphargus forroi* sp. n. from the Diabáz Cave in the Bükk National Park (Hungary) is described and figured; its taxonomic relationships to other *Niphargus* species from Hungary are discussed.

Although the fauna of the subterranean Amphipoda in Hungary has been studied by several scientists (DUDICH, HANKÓ, MÉHELY, SCHELLENBERG, etc.), it is still poorly known and needs further studies.

Thanks to Dr. B. SKET, University of Ljubljana (Yugoslavia) and Dr. L. FORRÓ, Zoological Department, Hungarian Natural History Museum, Budapest (Hungary), I had the opportunity to study one sample of the subterranean amphipods collected in the Diabáz Cave in the Bükk National Park (Hungary), belonging to the family Niphargidae. The specimens in hands belong to the genus *Niphargus* SCHIÖDTE, one genus widely distributed over the whole Central and South Europe to the Caspian Sea region (absent in Scandinavia and the middle and northern parts of Great Britain), consisting of over one hundred species, many of them still poorly known.

After one detailed study of all taxonomic characters of the specimens in hands, it was established that these specimens represent a new species, *Niphargus forroi* sp. n. This species is nominated in honour to DR. LÁSZLÓ FORRÓ of the Hungarian Natural History Museum in Budapest.

Acknowledgements: I am indebted to Prof. DR. BORIS SKET of the University of Ljubljana (Yugoslavia) and to DR. LÁSZLÓ FORRÓ of the Hungarian Natural History Museum, Budapest, for the loan of materials used in this study.

Niphargus forroi sp. n. (Figs 1—42)

D e s c r i p t i o n : Male: Body length 9.2—9.3 mm; body elongated, slender, metasomsegments each at dorsoposterior margin with 4 short setae

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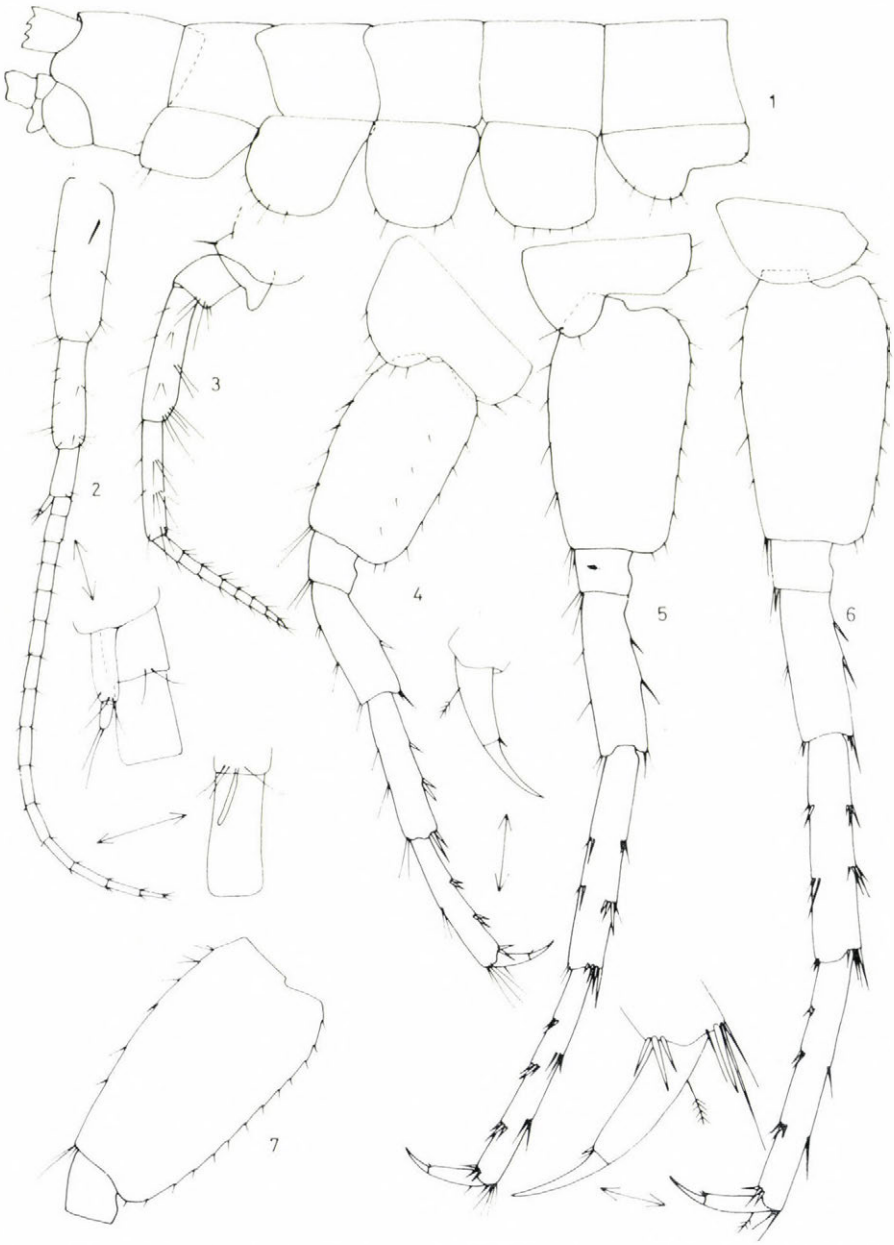


Figs 1—7. *Niphargus forroi* sp. n., Diabáz Cave, male 9.2 mm: 1 = anterior body part; 2 = antenna 1; 3 = antenna 2; 4—6 = pereopods 5—7; 7 = segment 2 of pereopod 7, male 9.3 mm

(Figs 1, 29); urosomite 1 on each side with 1 seta, urosomite 2 on each side with 2 setae (Figs 27, 28).

Head with short rostrum, lateral cephalic lobes short, subrounded (Fig. 1), eyes absent, ventroanterior sinus of head distinct (Fig. 1).

Antenna 1 short, slightly shorter than half of body (ratio is 3.5 : 9.2), peduncular segments 1—3 relatively short, poorly setose, peduncular segment 3 only twice longer than broad (Fig. 2), main flagellum consisting of 15—20 segments bearing one short aesthetasc each (Fig. 2); accessory flagellum short, 2-segmented, second segment short (Fig. 2).

Antenna 2 short, peduncular segment 3 short, peduncular segment 5 slightly shorter than 4, both with bunches of setae (Fig. 3), flagellum consisting of 8—9 segments and longer than last peduncular segment; antennal gland cone short (Fig. 3).

Coxae short (Fig. 1), coxae 1—4 broader than long, its ratio of length : width is 26 : 36, 35 : 40, 38 : 41, 36 : 43, respectively (Figs 1, 8, 11, 18, 19); coxa 4 unlobed, coxa 5 slightly shorter than 4 (Figs 1, 4).

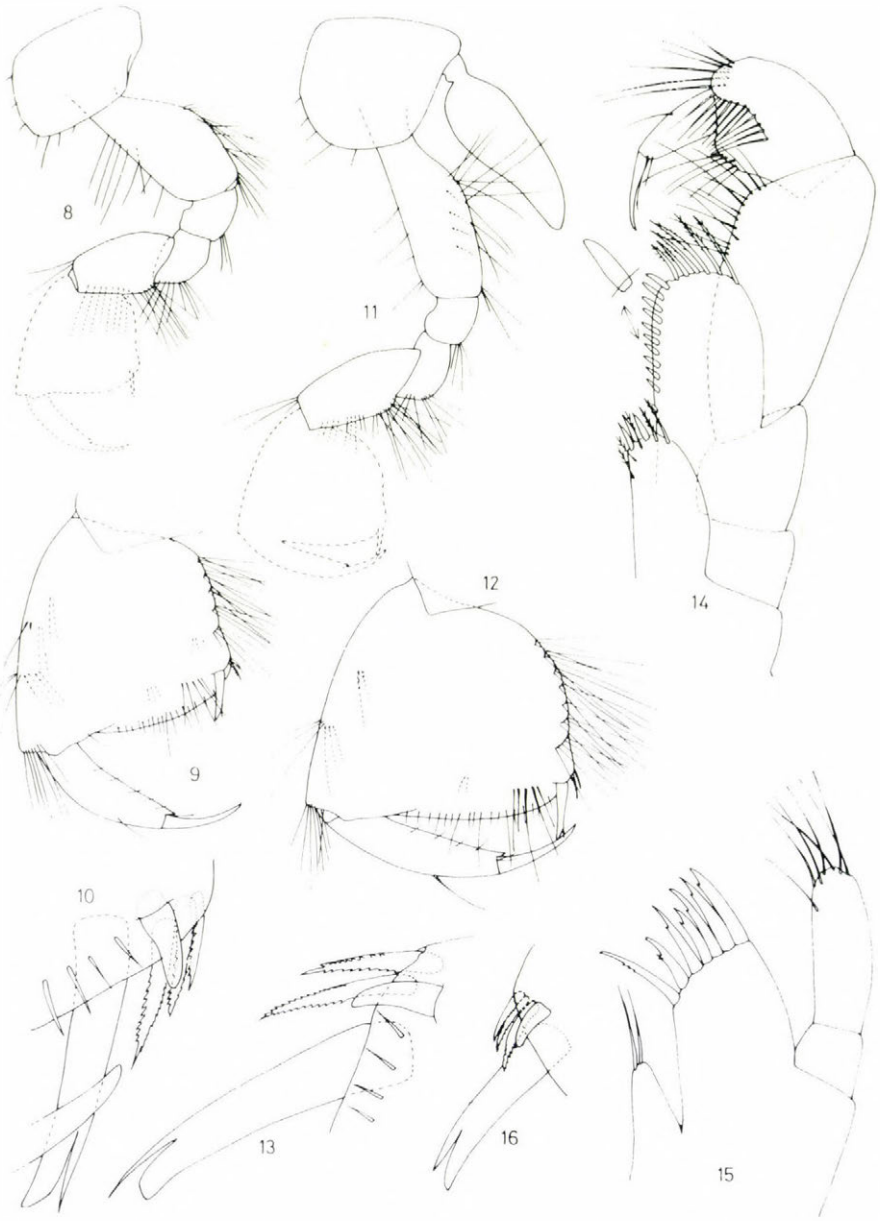
Labrum entire, broader than long, convex distally (Fig. 21); labium with well developed inner lobes, mandibular fingers prominent (Fig. 22).

Mandibular molar triturative, incisor toothed; between them a row of 7—8 plumose setae (Fig. 25); palp 3-segmented: first segment smooth (Fig. 25), second segment with about 10 setae; third segment with one group of *A*-setae on outer face, 2—3 groups of *B*-setae on inner face, up to 14 *D*-setae and 5—6 long distal *E*-setae; *C*-setae are absent.

Maxilla 1: inner plate with 2 distal simple setae (Fig. 15), outer plate with 7 spines (inner spine with 3 lateral teeth, 0—1 spine with 2 teeth, 5—6 spines with one lateral tooth), palp 2-segmented, second segment with about 7 setae (Fig. 15).

Maxilla 2: both plates with distal setae, inner plate with several distolateral setae also (Fig. 20). Maxilliped: inner plate short, not exceeding outer tip of first palp segment (Fig. 14), bearing 3 distal spines accompanied by several plumose setae; outer plate reaching half of second palp segment, bearing a row of lateral strong spines, without setae (Fig. 14) and with a row of strong plumose setae at distal margin (Fig. 14); palp 4-segmented, segment 4 with long nail, shorter than the remaining part of segment 4, and with one bunch of 2 setae at inner margin and with one median seta at outer margin.

Gnathopods 1—2 alike, relatively small, their segment 6 somewhat larger than corresponding coxae (Figs 8, 11). Gnathopod 1: segment 2 stout, with several bunches of setae along posterior margin and with a row of several single setae along anterior margin (Fig. 8); segments 3—4 short, each with one bunch of setae at posterior margin; segment 5 slightly shorter than segment 6, with a bunch of posterior setae (Fig. 8); segment 6 trapezoid, slightly longer than broad, its palm slightly inclinate, convex (Figs 9, 10), defined by



Figs 8—16. *Niphargus forroi* sp. n., Diabáz Cave, male 9.2 mm: 8—10 = gnathopod 1; 11—13 = gnathopod 2; 14 = maxilliped; 15 = maxilla 1; 16 = gnathopod 2, male 9.3 mm

one strong corner spine accompanied on outer face by 3 slender toothed spines (Fig. 10) and with one strong shorter spine on inner face (= subcorner spine); dactyl not exceeding posterior margin of segment 6, bearing one median seta at outer margin (Fig. 9); on segment 6, near corner spine, on the outer face one row of 5 facial setae appears (Fig. 9).

Gnathopod 2 slightly larger than gnathopod 1, its segment 2 slightly more slender than that of gnathopod 1 (Fig. 11), segments 3—4 short, with one bunch of setae at posterior margin each; segment 5 narrow, almost as long as segment 6 (Fig. 11); segment 6 trapezoid, slightly broader than long (Figs 11, 12); palm slightly inclinate, convex, defined by one strong corner spine accompanied on outer face by 2—3 slender toothed spines and with one strong subcornerspine on inner face (Figs 13, 16); near corner spine on outer face a row of 5—6 facial setae appears (Fig. 12); dactyl not exceeding posterior margin of segment 6, bearing one median seta at outer margin (Fig. 12).

Pereopods 3—4 similar to each other, but pereopod 4 somewhat shorter than pereopod 3 (Figs 18, 19); both pereopods slender, dactyl nearly reaching half of segment 6, with slender nail nearly as long as the remaining part of dactyl (Figs 18, 19), bearing one slender spine at inner margin and one plumose seta at outer margin.

Pereopods 5—7 relatively slender, progressively longer towards pereopod 7 (Figs 4—6), their segment 2 almost twice longer than broad, with ventro-posterior corner but without lobe (Figs 4—7); dactyl of pereopods 5—7 not reaching half of segment 6, with short spine at inner margin, nail exceeding half of the remaining part of dactyl (Figs 4—6).

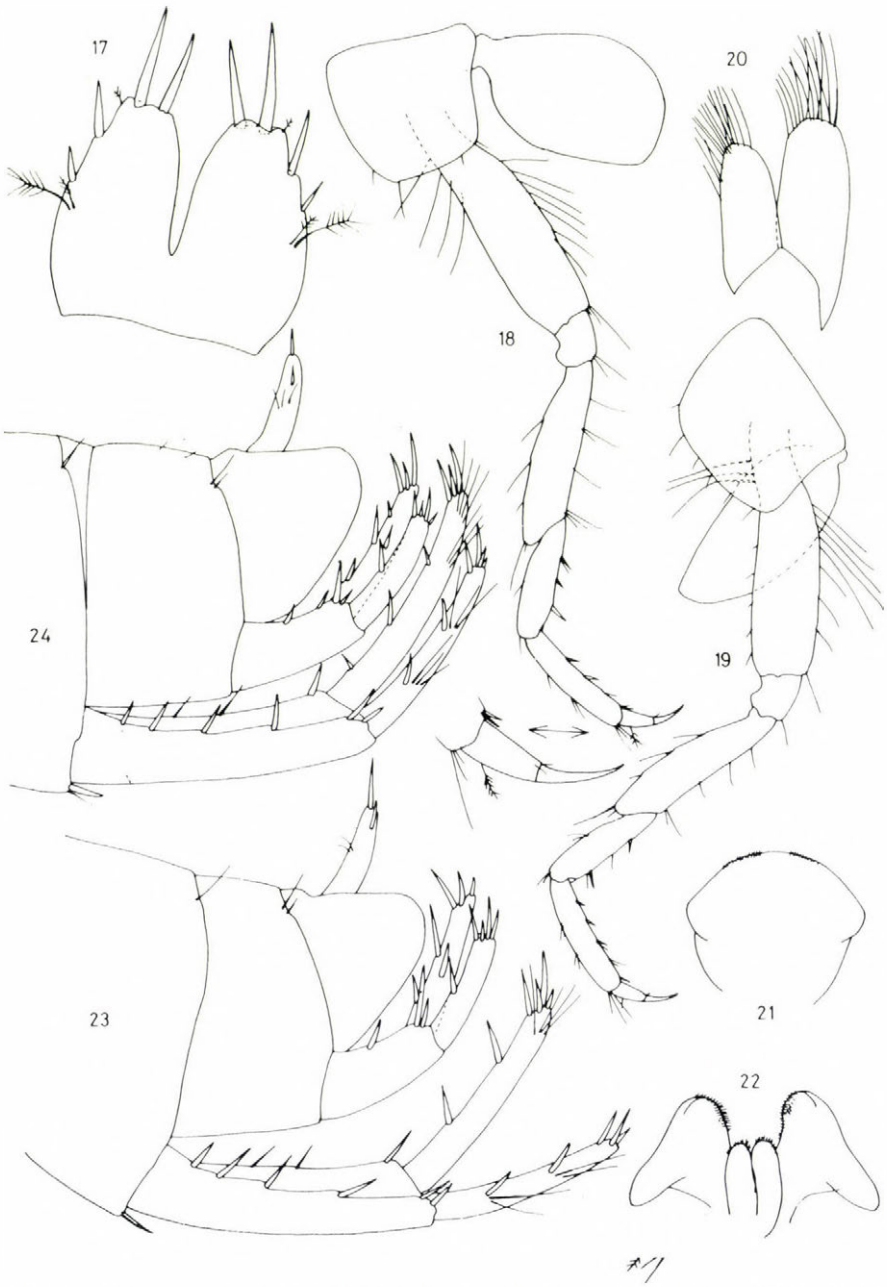
Pleopods 1—3 slender, subequal long, their peduncle with 2 retinacula each, retinacula without accompanying setae (Figs 26—28); anterior margin of peduncle of pleopod 1 with one seta (Fig. 26), posterior margin of peduncle of pleopod 3 with one short seta (Fig. 28).

Epimeral plates 1—3 subrounded, epimeral plates 2—3 each with several subdistal spines (Fig. 29), epimeral plate 1 smooth.

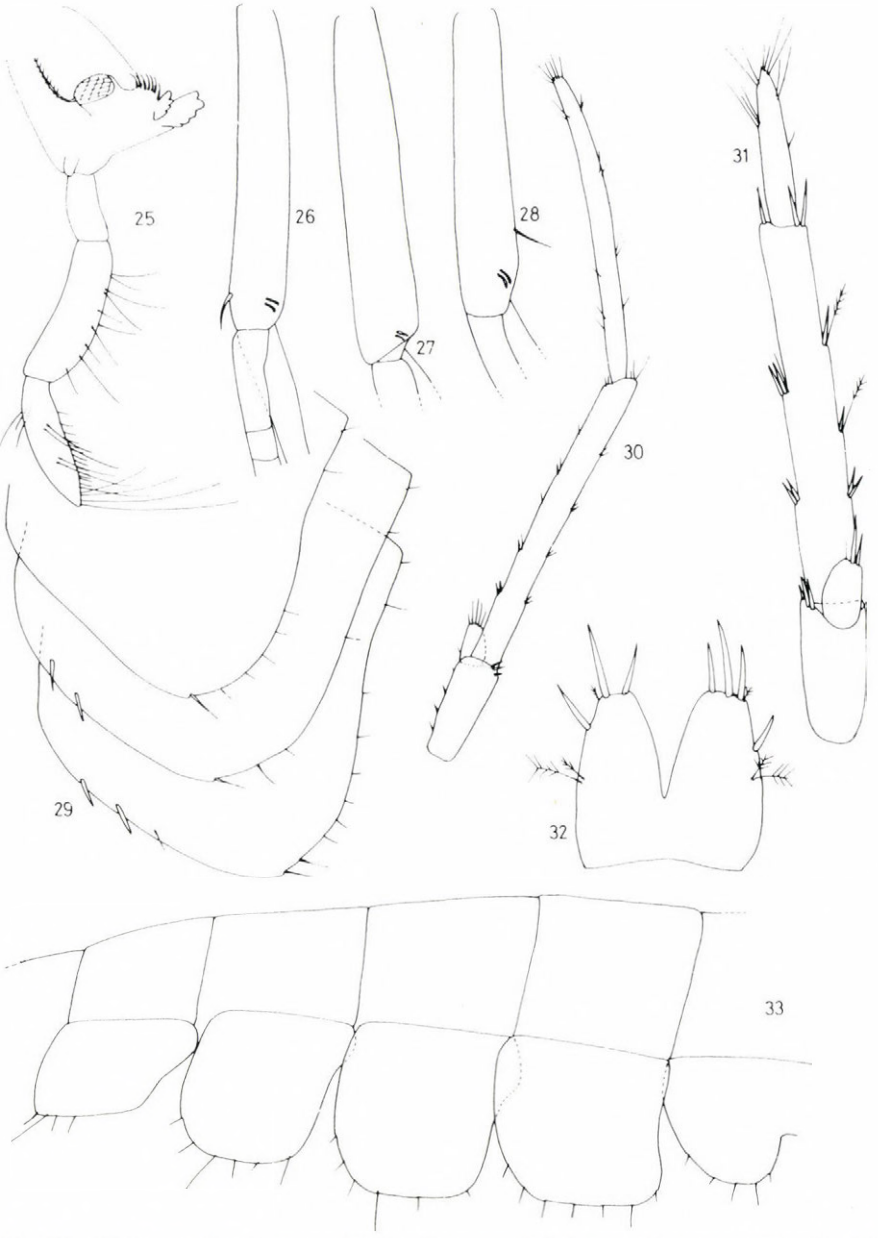
Urosomite 1 near peduncle of uropod 1 with 1 spine (Fig. 23). Peduncle of uropod 1 without ventrofacial spine and without distal tubercle (Figs 23, 24), but provided with a row of spines at dorsoexterior-margin and with a row of setae at dorsoinferior margin (except distal spine) (Figs 23, 24); rami unequal, outer ramus reaching up to 68% of inner ramus, both rami with lateral and distal short spines and lateral setae (Figs 23, 24).

Uropod 2: inner ramus longer than outer one, both rami with lateral and distal short spines (Figs 23, 24). Uropod 3 long, second segment of outer ramus nearly as long as first segment (Fig. 30), both segments with short setae at margins, inner ramus short, scale-like (Fig. 30).

Telson short, incised 2/3 of its length (Fig. 17), each lobe with 2 distal



Figs 17—24. *Niphargus forroi* sp. n., Diabáz Cave, male 9.2 mm: 17 = telson; 18 = pereopod 3; 19 = pereopod 4; 20 = maxilla 2; 21 = labrum; 22 = labium; 23 = urosome with uropods 1—2; 24 = urosome with uropods 1—2, male 9.3 mm



Figs 25—30. *Niphargus forroi* sp. n., Diabáz Cave, male 9.2 mm: 25 = mandible; 26—28 = pleopods 1—3; 29 = epimeral plates 1—3; 30 = uropod. — Figs 31—33. *N. forroi* sp. n., Diabáz Cave, female 8.5 mm: 31 = uropod 3; 32 = telson; 33 = anterior part of body

and 2 outer marginal spines; a pair of short plumose setae appearing in the middle of each lobe (Fig. 17).

Female: body length 8.5 mm, oostegyts broad, setose. Body like that of males but coxae 1—4 slightly longer (= higher) (Fig. 33), coxa 5 slightly shorter than 4 (Fig. 33).

Antenna 1 like that in males, its main flagellum consisting of 17—18 segments bearing one aesthetasc each. Flagellum of antenna 2 consisting of 7 segments.

Urosomite 1 on each side with 1 seta, urosomite 2 on each side with 1 spine and one seta (Fig. 34). Urosomite 1 near peduncle of uropod 1 with 2 spines or one spine and one seta (Fig. 34).

Gnathopods 1—2 like those in males but slightly smaller. Segment 6 of gnathopod 1 slightly longer than broad, palm oblique, convex (Fig. 35), defined by one strong corner spine accompanied on outer face by 3 slender toothed spines and with one stout subcorner spine on inner face; dactyl with one seta on outer margin (Fig. 35).

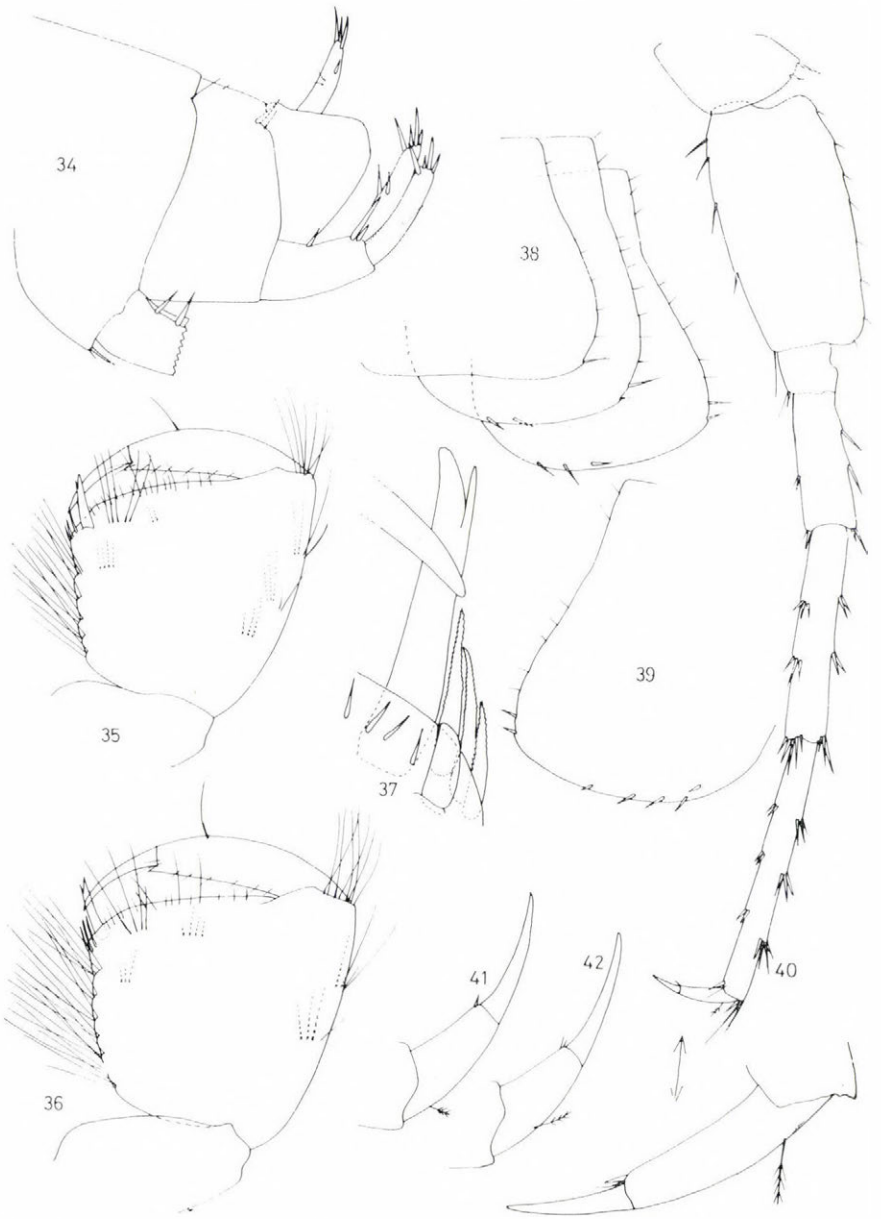
Gnathopod 2: segment 6 hardly longer than broad, palm like that in males, defined by one strong spine accompanied on outer face by 2—3 slender toothed spines and with one stout subcorner spine on inner face, dactyl with one seta on outer margin (Figs 36, 37).

Pereopods 3—4 like those in males, with nails as long as or hardly longer than the remaining part of dactyl (Figs 41, 42), with one plumose seta at outer margin. Pereopods 5—7 like those in males, with relatively narrow segment 2 slightly less than twice longer than broad (Fig. 40); dactyl of pereopods 5—7 like those in males.

Pleopods and epimeral plates like those in males (Figs 38, 39). Uropod 1 with no rami (Fig. 34). Uropod 2 with outer ramus slightly shorter than inner one (Fig. 34). Uropod 3 shorter than that in males (Fig. 31), second segment of outer ramus not reaching half of first segment; first segment with spines along both margins, accompanied by single plumose setae at inner margin of segment 1 (Fig. 31).

Telson short, slightly broader than long (Fig. 32), incised about 2/3 of its length, each lobe provided with 2—3 distal and one outer marginal spine; one pair of short plumose setae appears in the middle of each lobe (Fig. 32).

V a r i a b i l i t y : on urosomite 1 near basis of uropod 1 peduncle normally one spine appears, but sometimes one spine and one seta or 2 spines. On one damaged segment 6 of gnathopod 2 (male) appear on inner face 3 short strong subcorner spines and outer face 2 slender toothed spines and one strong corner spine. This is an aberration, because normally on the inner face one short strong subcorner spine and on outer face 2—3 slender toothed spines and one strong corner spine appear.



Figs 34—42. *Niphargus forroi* sp. n., Diabáz Cave, female 8.5 mm: 34 = urosome with uropod 2; 35 = gnathopod 1; 36—37 = gnathopod 2; 38 = right epimeral plates 1—3; 39 = left epimeral plate 3; 40 = pereopod 7; 41—42 = dactyl of pereopods 3—4

Material examined: HUNGARY: Bükk National Park, Nagyvisnyó, Diabáz Cave, August 26, 1981, 3 specimens (leg. ÁDÁM & HÁMORI).

Holotype: male 9.2 mm. Holotype is deposited in the Hungarian Natural History Museum, Budapest (Hungary). Two paratypes are deposited in KARAMAN's Collection in Titograd.

Remarks and affinities: *Niphargus forroi* sp. n. is characterized by subrounded epimeral plates, presence of only one seta on outer margin of dactyl in gnathopods 1—2 and by unequal rami of uropods 1—2 and only 2 retinacula on pleopods 1—3.

Niphargus adbiptus G. KARAMAN, 1973, known from Ravanica Cave in Serbia (Yugoslavia) is very similar to *N. forroi* (subrounded epimeral plates 1—3, shape and pilosity of gnathopods 1—2, uropod 3, etc.) but it differs from *N. forroi* by the higher number of retinacula on pleopods 1—3, nearly subequal rami of uropods 1—2, etc.

HANKÓ (1924) described a new species, *N. dudichi* from well in Nagysalló, Com. Bars (= Tekovski Lužany, Czechoslovakia); this species differs from *N. forroi* by the higher number of spines on inner margin of dactyl of pereopods, presence of many setae on outer margin of dactyl in gnathopods 1—2, etc.

MÉHELY (1927) described a new species, *N. molnari* from Kőlyuk Cave near Mánfa (Baranya, Mecsek Mts.); it differs from *N. forroi* by pluritoothed all spines of outer plate in maxilla 1, by very large and inclinate segment 6 of gnathopod 2, etc.

DUDICH (1932) described a new species, *N. aggtelekiensis* from Aggteleker Cave "Baradla" (Hungary); his species differs by presence of many setae on outer margin of dactyl in gnathopods 1—2, etc.

SCHELLENBERG (1934) described *N. foreli* gebhardti from Abaliget Cave in Mecsek Mts.; this is a good species, *N. gebhardti*, differing from *N. forroi* by higher number of retinacula on pleopods, broader segment 2 of pereopods 5—7, etc.

MÉHELY (1937) described a new species, *N. hungaricus* from one spring in the forest, Jámbor spring (Kőszeg Mts., W. and SW. of Kőszeg). This species was never figured, it differs from *N. forroi* by presence of 3 setae on outer margin of dactyl in gnathopods 1—2, by elongated inner ramus of uropod 1 in males (outer ramus reaching half of inner ramus), subequal rami of uropod 2 in males, etc.

DUDICH (1941a) described a new species, *N. mediodanubialis* from the middle of the Danubian basin (Szeged, Aszófő at Lake Balaton, etc.); it differs by the presence of tubercle on peduncle of uropod 1 in males, sharply pointed epimeral plates, the presence of several setae on outer margin of dactyl in gnathopods 1—2, etc.

In the same year (1941b) DUDICH described a second new species, *Niphargus thermalis* from the thermal spring (25 °C) of St. Lucas baths in Buda-

pest; this species differs by sharply pointed epimeral plates 1—3, presence of distal tubercle on peduncle of uropod 1 in males, etc.

MÉHELY (1941) described *N. pater* from Kisnyíres Cave (Com. Szolnok-Doboka); this species differs by presence of many setae on outer margin of dactyl in gnathopods 1—2, etc.

Some of these mentioned species, described from Hungary, have been later synonymized by other authors with other already known *Niphargus* species, but it is necessary to re-examine all these species to establish the exact taxonomic status and relation between these species described from Hungary and other species known from Balkan Peninsula (especially these from Romania and Yugoslavia) and Czechoslovakia.

DEDJU (1963, 1967) described and mentioned several *Niphargus* species from the USSR, provided with only seta on outer margin of dactyl in gnathopods 1—2 and long uropod 3 in males; but all these species are with more or less angular or pointed epimeral plates 1—3. Unfortunately, these species are not described in detail, so no exact comparison can be provided with *N. forroi*.

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