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FORONIPHARGUS PORI, NEW GENUS AND SPECIES OF
FAMILY NIPHARGIDAE
(CONTRIBUTION TO THE KNOWLEDGE OF THE
AMPHIPODA 152)

Abstract

New genus and species of the Gammaridean Amphipoda, *Foroniphargus pori*, n. gen. n. sp. (Family Niphargidae) is described and figured from the subterranean waters of N. Dan, Israel. The new genus is allied to the genera *Niphargus* Schiödte 1849 and *Haploginglymus* Mateus & Mateus 1958, but with distinct differences, especially in the structure of the mouthparts.

Introduction

The subterranean fauna of the Amphipoda from southern Europe, North Africa, Asia Minor and adjacent regions of SW. Asia are still relatively poorly known and many new genera and species have been discovered and described during last twenty years by numerous scientists: genus *Haploginglymus* Mateus & Mateus 1958 (type-species: *H. bragai* Mateus & Mateus 1958) from Portugal; genus *Pontoniphargus* Dancau 1970 (type-species: *P. racovitzai* Dancau 1970) from Romania; genus *Carinurella* Sket 1971 (type-species: *Karamaniella paradoxa* Sket 1964) from Slovenia (Yugoslavia); genus *Parasalentinella* Bou 1971 (type-species: *P. rouchi* Bou 1971) from France; genus *Ilvanella* Vigna-Taglianti 1972 (type-species: *I. inexpectata* V-T. 1972) from Italy; genus *Accubogammarus* G. Karaman 1974 (type-species: *Typhlogammarus algar* G. Karaman 1973) from Yugoslavia; genus *Pygocrangonyx* G. Karaman & J. L. Barnard 1979 (type-species: *Metacrangonyx remyi* Ruffo 1953) from Morocco; genus *Phreatomelita* Ruffo 1979 (type-

-species: *P. paceae* Ruffo 1979) from Iran; genus *Niphargobates* Sket 1981 (type-species: *N. orophobata* Sket 1981) from Yugoslavia; genus *Impertiopisa* G. Karaman 1984 (type-species: *Eriopisa gracilis* Ruffo & Scheicke 1976) from Malta Island, etc.

On the other hand, the subterranean fauna of *Amphipoda* in Israel and adjacent regions is very poorly known: *Bogidiella hebraea* Ruffo 1963, known from the subterranean waters S. of Dead Sea (Yam Hamelah, Bahr-El-Miyet), *Metacrangonyx sinaicus* Ruffo 1982, known from one well in dessert of Sinai (Wadi Watir, Beer Gideih).

Ruffo described (1970) a new species *Bogidiella somala* n. sp. from the subterranean waters of Somalia, removed later by G. Karaman and J. L. Barnard (1979) to the new genus *Afridiella* G. Kar & J. L. Barnard 1979.

Alouf described two new species of genus *Niphargus* from the subterranean waters of Liban, *Niphargus nadarini* Alouf 1972, and *N. altagahizi* Alouf 1973.

Ruffo described (1982) two new subterranean freshwater amphipods from Somalia, *Hadzia pachypoda*, n. sp. and *Afridiella pectinicauda*, n. sp.

Recently, he described (1984) one new species of the subterranean genus *Bogidiella* from Sudan, *Bogidiella nubica*, n. sp.

Our recent study of material of subterranean amphipods collected from Israel and gave us kindly at disposition for study by Dr. F. D. Por and H. J. Bromley-Schnur, showed the existence of other genera and species in this region, some of them new for the science. Some of results of these studies, regarding a new genus and species of the family *Niphargidae*, *Foroniphargus pori*, n. gen. n. sp., are presented in this work.

Acknowledgments: I am indebted to Prof. Dr. Francis Dov Por and Prof. Dr. Heather J. Bromley-Schnur from the Hebrew University of Jerusalem (Israel) for the loan of material used in this study.

TAXONOMIC PART

Genus FORONIPHARGUS, new genus

Type-species: *Foroniphargus pori*, n. sp.

Diagnosis: Body elongated, *Niphargus*-like, urosomites free. Head with short rostrum and short lateral cephalic lobes bearing ventroanterior lobe, eyes absent.

Antennae 1-2 well developed, slender, antenna 1 longer than 2, accessory flagellum 2-segmented, short.

Mouthparts: labrum entire, labium with well developed inner lobes, outer lobes entire, large. Mandible incisor toothed, molar tritritative, palp 3-segmented, *Niphargus*-like.

Left and right maxilla 1 symmetric to each other, with inner plate long, with many distal setae, outer plate with spines, palp short, 2-segmented. Both plates of maxilla 2 short and broad, bearing distal pectinate setae, inner plate without dorsal oblique row of setae. Maxilliped with short broad inner and outer plate bearing setae, palp strong, 4-segmented with nail.

Coxae moderate, coxa 4 unlobed, coxa 5 shorter than 4, coxa 7 as large as coxa 1. Gnathopods 1-2 subequal, subchelate, *Niphargus*-like. Pereopods 3-4 slender, with short segment 5. Pereopods 5-7 normal, with dilated lobed segment 2. Pleopods normal, biramous, rami plurisegmented. Uropods 1-2 biramous, rami well developed. Uropod 3 with short inner ramus, outer ramus 2-segmented. Telson short, deeply incised. Coxal gills ovoid, occur on thoracic segments 2-6. Oostegites occur on thoracic segments 2-5.

Sexual dimorphism unknown (males unknown).

Taxa: *pori*, n. sp.

Distribution and Ecology: known from subterranean freshwaters of Israel.

Remarks and Affinities of genus *Foroniphargus*: Based on the armature and shape of the body and the mouthparts, a new genus *Foroniphargus* belongs to the family *Niphargidae* (well developed mandible with 3-segmented palp, entire labrum, labium with well developed inner lobes, maxilla 1 with 2-segmented palp and inner plate with distal setae; inner plate of maxilla 2 without dorsal oblique row of setae, maxilliped with well developed both plates and palp, strong subchelate subequal gnathopods, well developed both rami of uropods 1-2, short inner ramus of uropod 3, absence of eyes, short accessory flagellum, incised telson, etc.).

Genus *Foroniphargus* is similar to the genus *Haploginglymus* by shape of gnathopods 1-2, pereopods 3-7, uropods 1-2, telson, lateral cephalic lobes, antennae 1-2, accessory flagellum, labium, pleopods etc. But, genus *Haploginglymus* Mateus & Mateus 1958, known from Iberian Peninsula, differs from genus *Foroniphargus* by narrow inner plate of maxilla 1 bearing only 2 distal setae, by long palp of maxilla 1, by long and narrow both plates of maxilla 2 and maxilliped, etc.

The genus *Pontoniphargus* Dancau 1970, known from subterranean waters of Romania near coast of Black Sea, is also rather similar to the genus *Foroniphargus* (shape of mandibles, short both plates of maxilliped, etc.) but it differs from *Foroniphar-*

gus by different shape of gnathopods 1-2, different shape and pilosity of uropod 3, armature of telson, longer palp of maxilla 1, by shorter and poorly setose inner plate of maxilla 1, different shape and pilosity of maxilla 2, etc.

The genus *Niphargus* Schiödte 1849, known from the subterranean waters of Europe, Asia Minor and some adjacent regions of SW. Asia (Iran, Iraq, Liban, Israel) is also very allied to genus *Foroniphargus* (antennae 1-2, gnathopods 1-2, pereopods 3-7, uropods 1-3, telson), but it differs from later by different shape and pilosity of maxillae 1 and 2, maxilliped, mandible (except palp), etc.

The genus *Niphargopsis* Chevreux 1922 known from the subterranean waters of Europe (from France to Romania), like genus *Niphargus*, differs from genus *Foroniphargus* by different shape and pilosity of most of mouthparts (maxilla 1, maxilla 2, maxilliped), shape of gnathopods, etc.

The genus *Niphargellus* Schellenberg 1938, known from the subterranean waters of central Europe, differs from genus *Foroniphargus* by poorly setose mandibular palp, by different shape (ped), shape of gnathopods, etc.).

The genus *Carinurella* Sket 1971, known from Slovenia and Italy, differs remarkably from genus *Foroniphargus* by very dilated segments 2,4 and 5 of pereopods 5-7, different shape of urosome and uropods, by *Niphargus*-like shape of maxillae 1-2, inflated first peduncular segment of antenna 1, etc.

The genus *Niphargobates* Sket 1981, known from Slovenia only, differs from genus *Foroniphargus* by presence of subcorner spines on palm of gnathopods 1-2, by very short palp and inner plate of maxilla 1 poorly setose, by unequal both plates of maxilla 2 bearing simple setae only, by 1-segmented accessory flagellum, etc.

Based on all these mentioned differences among all known genera of family *Niphargidae* and our species from N. Dan, it was established a new genus *Foroniphargus*, n. gen. with the type-species *F. pori*, n. sp.

FORONIPHARGUS PORI, n. sp.*

figs.: I - VI

Material examined: ISRAEL: — N. Dan, Station I, drift, October 12, 1983, one damaged specimen (holotype) consisting of 2 parts, accompanied by *Niphargus nadarini* Alouf (leg. G. Herbst); — N. Dan, Station I, drift, April 7, 1983, one juv. female

* Species dedicated to Prof. Dr. Francis Dov Por

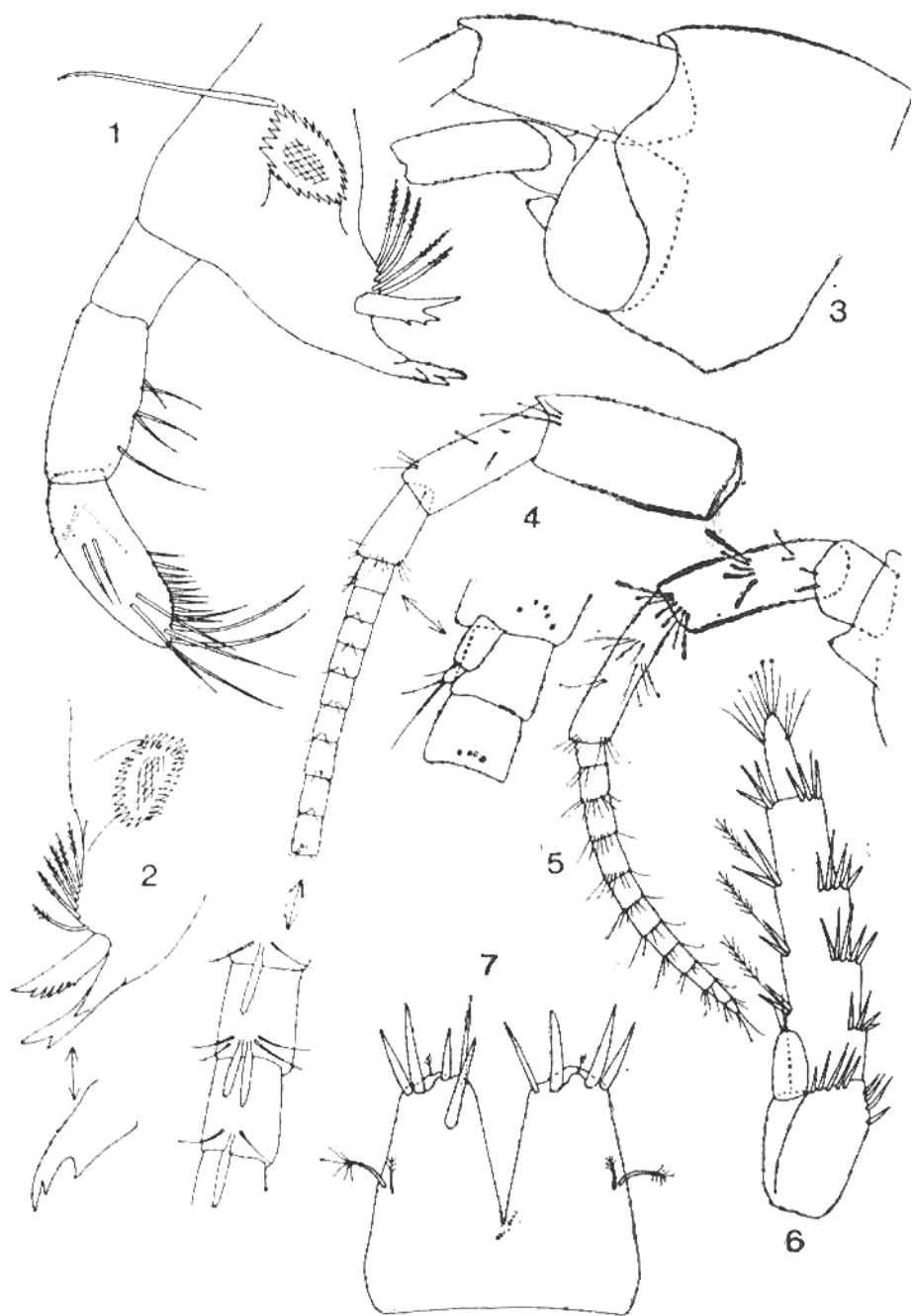


Fig. 1. *Foroniphargus pori*, n. gen. n. sp., N. Dan, female 6.2 mm : 1 = right mandible; 2 = left mandible; 3 = head; 4 = antenna 1; 5 = antenna 2; 6 = uropod 3; 7 = telson.

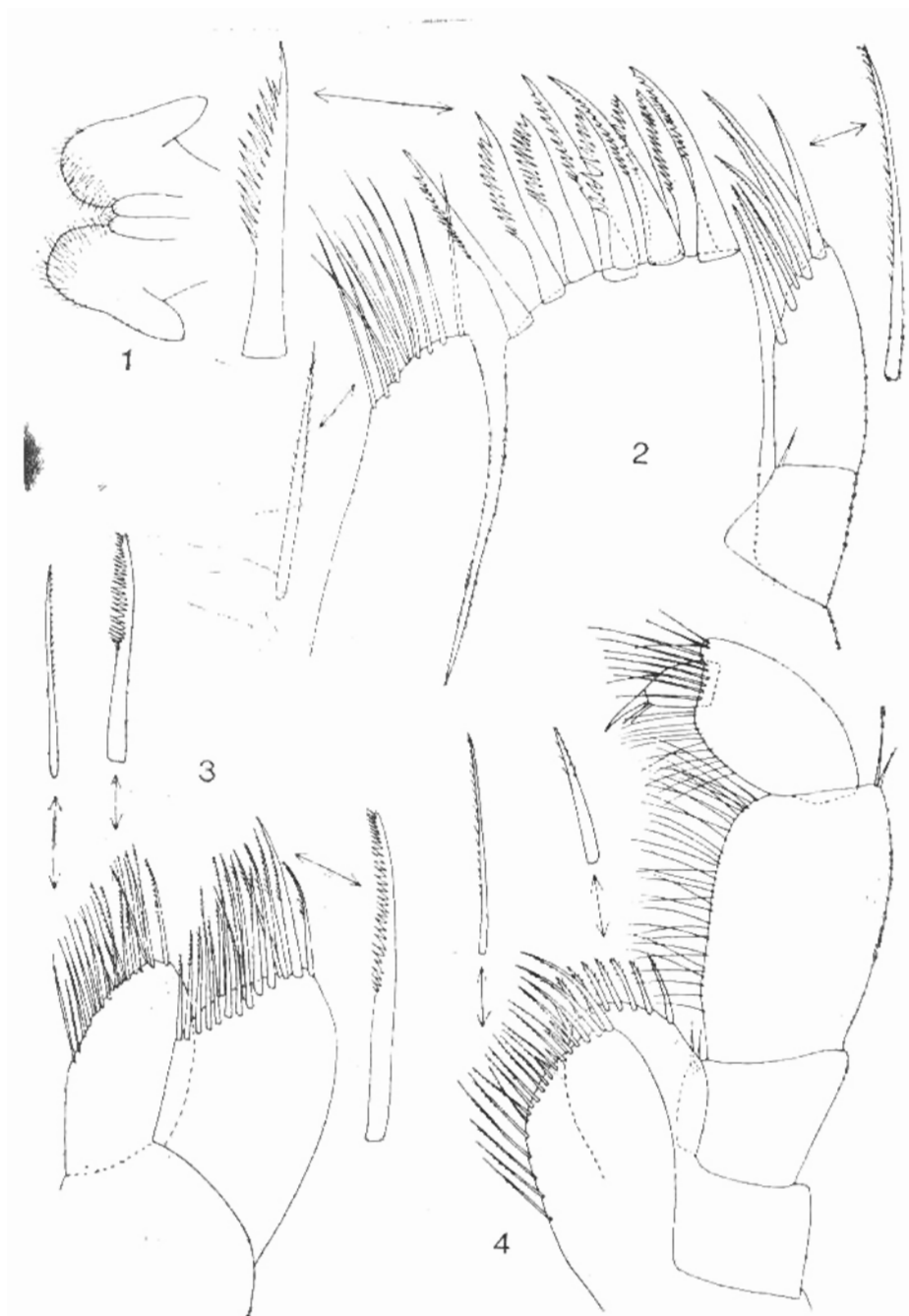


Fig. II. *Foroniphargus pori*, n. gen. n. sp., N. Dan, female 6.2 mm : 1 = labium; 2 = maxilla 1; 3 = maxilla 2; 4 = maxilliped.

accompanied by one spec. of *Niphargus nadarini* Alouf (leg. D. Allan).

Description: Female 6.2 mm (holotype): Body moderately slender, *Niphargus*-like (fig. VI, 1). Body covered by some very short setulae (fig. V, 3). Mesosome smooth, metasomsegments 1-3 each with several dorsoposterior marginal setae (fig. V, 2, 3). Urosome low, urosomite 1 on each side with one group of 2 dorsolateral setae (fig. V, 3); urosomite 2 on each side with one group of 2-3 spines (fig. V, 3), urosomite 3 smooth.

Head with short rostrum, lateral cephalic lobes short and subrounded (fig. I, 3), ventroanterior sinus present, eyes absent (fig. I, 3).

Antenna 1 with missing tip of main flagellum; peduncle poorly setose, peduncular segments 1-3 progressively shorter (fig. I, 4), third peduncular segment nearly twice longer than broad (fig. I, 4); main flagellum with 15 articles (but missing distal part of flagellum, so that probably the number of flagellar articles is over 20); flagellar articles with 1-2 short aesthetasc each (fig. I, 4); accessory flagellum very short, 2-segmented, much shorter than third peduncular segment (fig. I, 4).

Antenna 2 much shorter than 1, peduncular segment 3 short; peduncular segments 4 and 5 slightly stout, bearing bunches of short setae only (fig. I, 5); flagellum nearly as long as peduncle, consisting of 11 articles bearing bunches of short setae each (fig. I, 5). Antennal gland cone short.

Labrum entire, slightly broader than long, bearing numerous very fine distal setulae (fig. V, 1).

Labium with large entire outer lobes bearing numerous very fine setulae on distal surface (fig. II, 1); inner lobes narrow but well developed (fig. II, 1).

Mandibles well developed, molar tritulative. Right mandible: incisor with 4 teeth, lacinia mobilis with 4 teeth. between it and molar appears a row of 5 plumose setae (fig. I, 1); near molar appears one long seta (fig. I, 1).

Left mandible: incisor with 3 teeth (fig. I, 2), lacinia mobilis with 7 teeth; between it and molar appears a row of 6 plumose setae (fig. I, 2). Palp of left and right mandible similar to each other, 3-segmented: first segment short, smooth; second segment with 5 setae; third segment poorly longer than second one, subfalciform, bearing on outer face one group of A-setae (fig. I, 1), on inner face 2 groups of B-setae; on tip appear 5 long distal E-setae, laterally about 9 D-setae (fig. I, 1).

Maxilla 1: inner plate strong, with 11-12 distal plumose setae (fig. II, 2), outer plate with 9-10 pectinate spines; palp 2-seg-

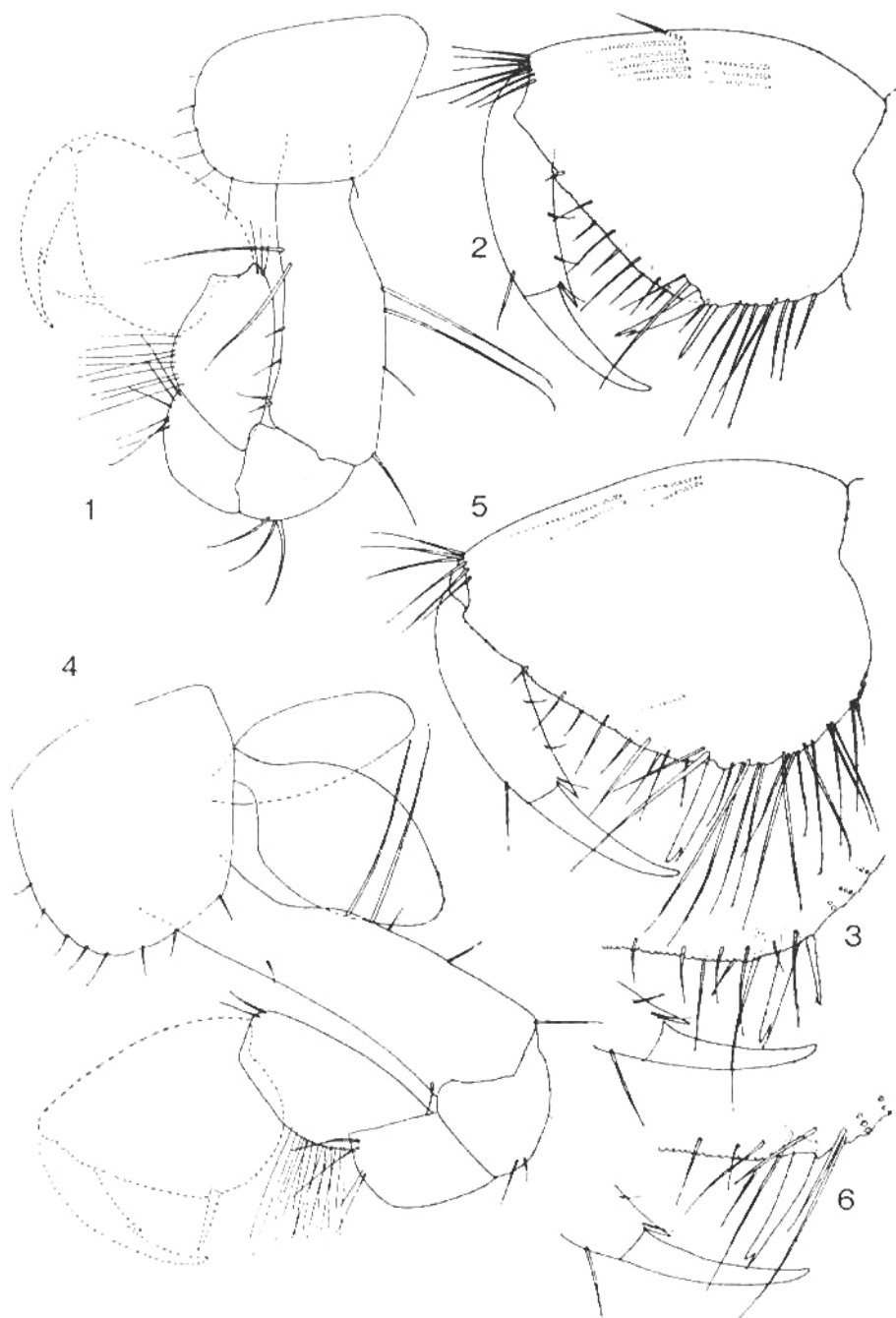


Fig. III. **Foroniphargus pori**, n. gen. n. sp., N. Dan, female 6.2 mm : 1-3 = gnathopod 1; 4-6 = gnathopod 2.

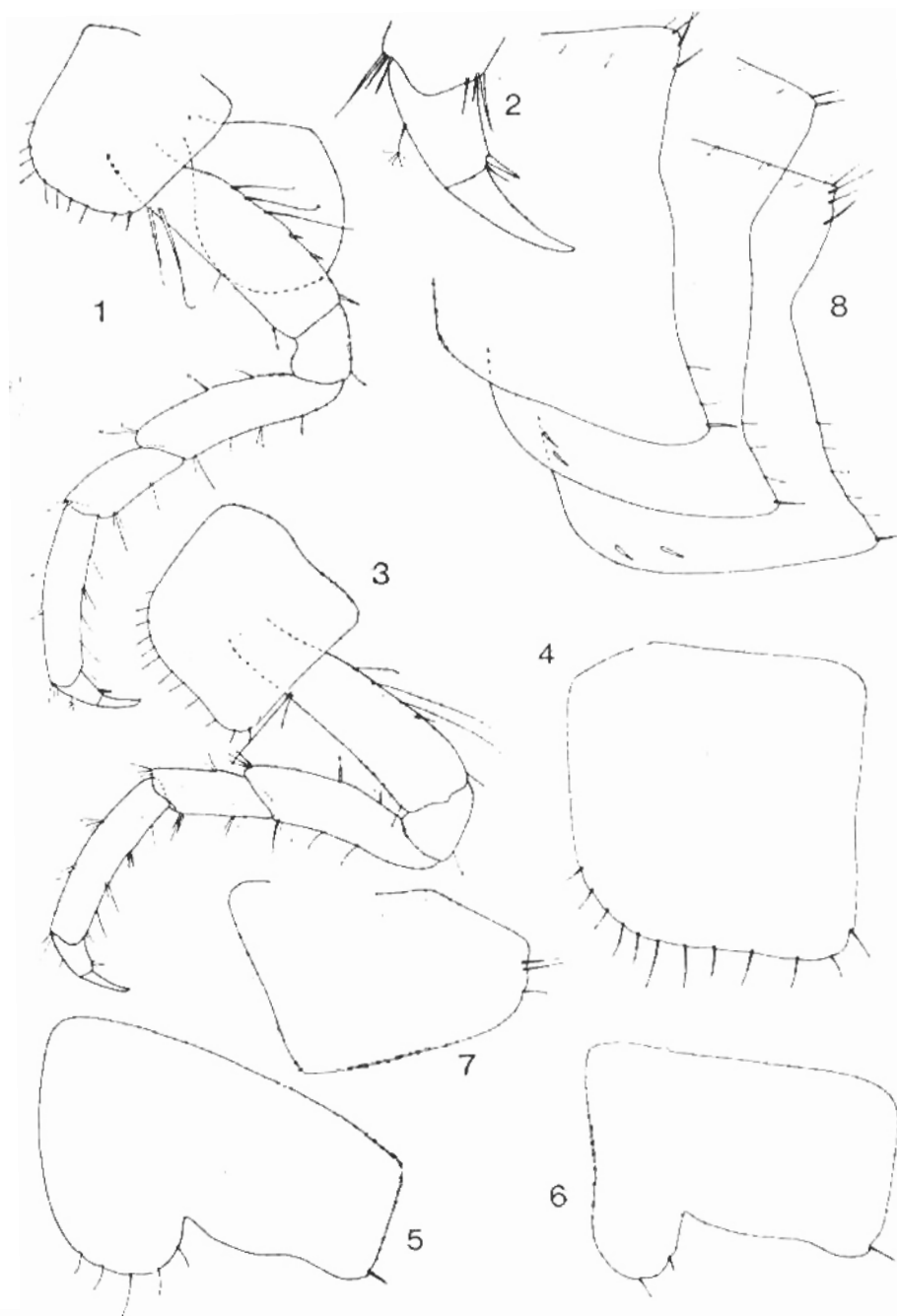


Fig. IV. *Foroniphargus pori*, n. gen. n. sp., N. Dan, female 6.2 mm : 1-2 = pereopod 3; 3 = pereopod 4; 4-7 coxae 4-7; 8 = epimeral plates 1-3.

mented, not exceeding basis of spines of outer plate (fig. II, 2), bearing 5-7 strong spine-like setae slightly plumose (fig. II, 2).

Maxilla 2: both plates short and broad, outer plate with numerous pectinate strong setae (fig. II, 3); inner plate with many pectinate setae in distocentral part of lobe and with poorly pectinate or plumose setae at distoinferior margin (fig. II, 3), facial oblique row of setae absent.

Maxilliped well developed, but both plates very short and broad, only slightly exceeding outer tip of first palp segment (fig. II, 4); inner plate bearing a row of strong plumose spine-like setae; outer plate hardly larger than inner one, bearing a row of short strong distal plumose spine-like setae (fig. II, 4); palp strong, 4-segmented, second segment with many simple setae at inner margin (fig. II, 4); palp segment 3 with short distal outer lobe; segment 4 short, with well developed nail (fig. II, 4), segment 4 at outer margin with one seta, at inner margin with 2 setae.

Coxae moderate (fig. III, 1, 4; IV, 1, 3-7). Coxa 1 broader than long (= high), with subrounded ventroanterior corner and setose anterior margin (fig. III, 1). Coxae 2-4 nearly as long as broad, bearing ventral marginal setae (fig. III, 4; IV, 1, 3). Coxa 4 without ventroposterior lobe (fig. IV, 3); coxa 5 slightly shorter than 4, bilobe (fig. IV, 5); coxa 6 slightly shorter than 5, bilobe (fig. IV, 6); coxa 7 shorter than 6, entire, nearly as large as coxa 1 (fig. IV, 7; VI, 1).

Gnathopods 1-2 large, subchelate, nearly subequal in shape, but gnathopod 2 is slightly larger than 1. Gnathopod 1: segment 2 at both margins with 2 long setae (fig. III, 1); segments 3 and 4 short, with one group of setae at posterior margin (fig. III, 1); segment 5 hardly shorter than 6, unlobed, with many setae at posterior margin; segment 6 ovoid, longer than broad, with oblique crenellated palm defined by one strong corner spine accompanied on outer face by one slender smooth spine and 2 facial setae (fig. III, 2, 3), subcorner spine on inner face absent (fig. III, 3); dactyl exceeding posterior margin of segment 6, with strong inferior tooth and with one seta at outer margin (fig. III, 2, 3).

Gnathopod 2: segments 3 and 4 with one group of setae at posterior margin (fig. III, 4), segment 5 shorter than 6, unlobed, with many posterior setae (fig. III, 4); segment 6 ovoid, like that of gnathopod 1, with crenellated palm defined by one strong corner spine accompanied on outer face by 2 facial setae only (fig. III, 5, 6), subcorner spine on inner face absent; dactyl like that of gnathopod 1 (fig. III, 5, 6).

Pereopods 3 and 4 strong, poorly setose, with slightly recurved segments 4-6 (fig. IV, 1, 3), segment 5 short; dactyl strong,

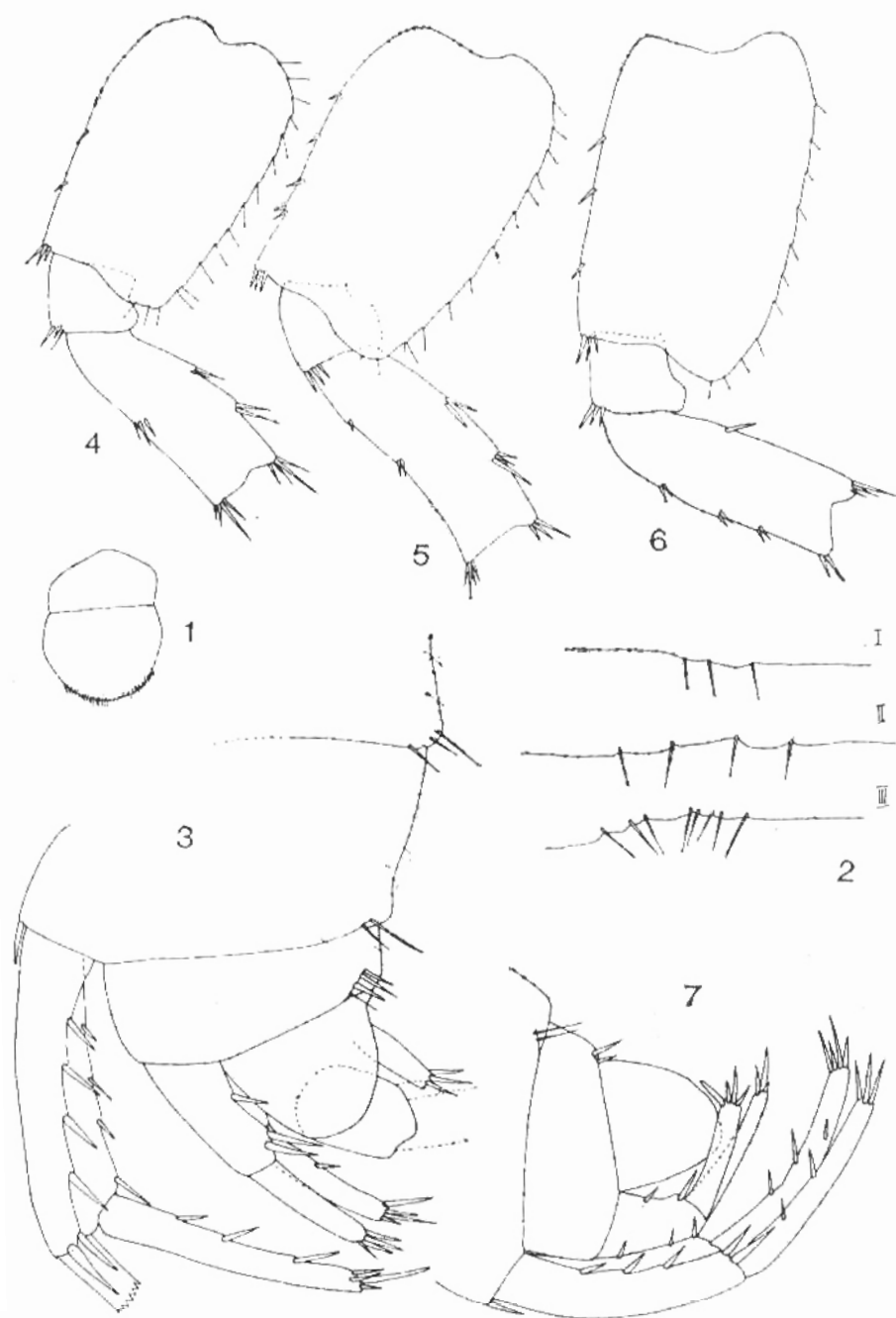


Fig. V. *Foroniphargus pori*, n. gen. n. sp., N. Dan, female 6.2 mm : 1 = labrum; 2 = metasomsegments 1-3; 3 = urosome with uropods 1-2; 4-6 = pereopods 5-7, female 4.6 mm; 7 = urosome with uropods, female 4.6 mm.

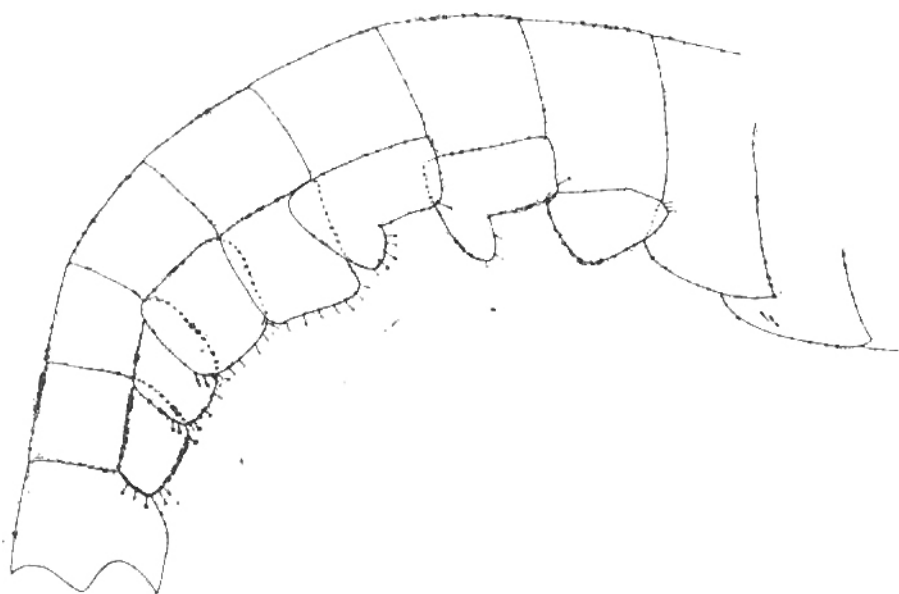


Fig. VI. **Foroniphargus pori**, n. gen. n. sp., N. Dan, female 4.6 mm : 1 = general aspect of body.

with one strong spine at inner margin and one plumose seta at outer margin (fig. IV, 2).

Pereopods 5-7 missing. Pleopods well developed, peduncle slender, bearing 2 retinacula each; rami plurisegmented, inner ramus slightly longer than outer one.

Epimeral plates 1-3 with produced ventroposterior corner and concave posterior margin, epimeral plates 2 and 3 with 2 sub-ventral spines each (fig. IV, 8).

Urosomite 1 near basis of peduncle of uropod 1 with one short strong spine. Uropod 1: peduncle with dorsal outer row and dorsal inner row of spines (fig. V, 3); inner ramus with strong lateral and distal spines, outer ramus missing.

Uropod 2: inner ramus is slightly longer than outer one (fig. V, 3). Uropod 3 much exceeding tip of uropods 1-2; peduncle short, inner ramus scale-like, short (fig. I, 6), outer ramus 2-segmented: first segment at both margins with bunches of spines, and at inner margin with a row of single plumose setae; second segment short, bearing setae only (fig. I, 6).

Telson short, reaching tip of peduncle of uropod 3 (fig. V, 3), broader than long, deeply incised (fig. I, 7); each lobe with 4 distal spines, one lobe with one dorsofacial spine also; a pair of short plumose setae appears near the middle of each lobe (fig. I, 7).

Coxal gills simple, ovoid, occur on thoracic segments 2-6. Other juv. female of 4.6 mm length: Oostegites small, without setae. Telson less spiniferous, each lobe with 2 spines only. Pereopods 5-7: segment 2 broad but longer than broad, with ventroposterior short lobe and with posterior marginal setae (fig. V, 4-6); segments 3-4 with spines at both margins, segments 5-7 missing. Coxae like these of holotype (fig. VI, 1). Urosomite 1 on each side with 2 setae, urosomite 2 on each side with 2 spines (fig. V, 7), urosomite 3 smooth.

Uropod 1: inner ramus slightly longer than outer one, both rami with lateral and distal short spines (fig. V, 7). Inner ramus of uropod 2 longer than outer one (fig. V, 7). Uropod 3 missing.

Variability: unknown. Two specimens in hands were partially damaged (holotype, female of 6.2 mm length, was divided in two parts, without pereopods 5-7 and outer ramus of uropod 1; other juv. female of 4.6 mm was without uropod 3 and without distal part of pereopods 5-7). New material is necessary to establish eventual sexual dimorphic characters and the characters of the male.

Holotype: female 6.2 mm. Holotype is deposited in KARAMAN's Collection in Titograd (Yugoslavia).

Loc. typ.: N. Dan, Israel.

Distribution: known only from type-locality.

Ecology: Freshwater subterranean species found accompanied by specimens of *Niphargus nadarini* Alouf.

Conclusions

Based on detailed analysis of taxonomic characters of studied material of *Amphipoda* in hands from Israel, it was established a new genus and species, *Foroniphargus pori*, n. gen. n. sp., from the subterranean waters of N. Dan.

New genus *Foroniphargus* belongs to the family *Niphargidae* based on numerous characters (shape of body, gnathopods, pereopods, uropods 1-3, telson, antennae 1-2, head, etc.), but it differs from all known genera of this family by specific shape and armature of maxillae 1-2 and maxilliped, mandible, etc.

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REZIME

FORONIPHARGUS PORI, NOVI ROD I VRSTA IZ FAMILIJE NIPHARGIDAE

(152. Prilog poznavanju Amphipoda).

Iz podzemnih kontinentalnih voda kod N. Dan u Izraelu, opisan je novi rod i vrsta slatkovodnih Amphipoda, *Foroniphargus pori*, n. g. n. sp.

Novi rod pripada porodici *Niphargidae* i pokazuje izvjesnu sličnost sa rodovima *Niphargus* Schiödte 1849 i *Haploginglymus* Mateus & Mateus 1958, ali se od oba roda razlikuje nizom taksonomskih karaktera.

Kratka dijagnoza roda *Foroniphargus*:

Tijelo izduženo, urozomalni segmenti slobodni. Bočne glavene ploče zaobljene, kratke, oči nisu razvijene. Prva i druga antena dobro razvijene, bočni bič kratak, sastavljen od dva segmenta; ek-skretorni konus kratak. Labrum cjelovit, labium sa razvijenim unutrašnjim lobusima. Mandibule sa dobro razvijenim molarom i incisorom, palpus sastavljen od 3 segmenta. Prva maksila sa dugim unutrašnjim lobusom koji nosi veći broj dlaka, vanjski lobus sa trnovima, palpus kratak, dvočlan. Oba lobusa druge maksile kratka i široka, sa mnogobrojnim distalnim češljastim dlakama. Maksiliped sa kratkim i širokim lobusima, palpus sastavljen od 4 segmenta, poslednji segment sa noktom.

Koksalne ploče srednje veličine, četvrta koksalna ploča bez stražnjeg lobusa, peta malo kraća od četvrte, sedma približno iste veličine kao prva.

Gnatopodi 1 i 2 međusobno slični, sa širokim šestim segmentom. Pereopodi 3 i 4 jaki, slabo dlakavi, sa daktilusom koji nosi jedan trn na unutrašnjem rubu. Pereopodi 5, 6, i 7 sa širokim drugim segmentom koji ima stražnji lobus razvijen. Uropodi 1 i 2 sa dobro razvijene obe grane. Treći uropod sa kratkom unutrašnjom granom i dvočlanom dužom vanjskom granom koja nosi trnove. Telzon je kratak, duboko usječen na dva lobusa koji nose po 4 distalna jaka trna.

Tip roda: *Foroniphargus pori*, n. sp.

Ekologija: Jedinke ove vrste i roda nađene u podzemnim slatkim vodama kod N. Dan u Izraelu, u zajednici sa jedinkama vrste *Niphargus nadarini* Alouf.

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MLIJEČNOST VIRTEMBERŠKE I JEZEROPIVSKE OVCE U EKSTENZIVNIM USLOVIMA GAJENJA

Uvod

Ispitivanje osobina mliječnosti virtemberške ovce počelo je u našoj zemlji sredinom pedesetih godina, kada i počinje uvoz nešto većeg broja ovaca ove rase iz Njemačke i Francuske. Tako, prve podatke o mliječnosti virtemberške ovce nalazimo kod Mihala (1954), a znatno kasnije svoja istraživanja na većem broju grla objavljuje Ogloblin (1975). Proučavanja mliječnosti ove rase u Crnoj Gori prvi put su započeta 1962 godine i nastavljena još dvije godine. Poslije toga, proučavanja se prekidaju do 1979, kada se ponovo formira jedno stado virtemberških ovaca uvezenih iz Bosne (Kupres) i Njemačke.

O mliječnosti virtemberške ovce u njenom zavičajnom području (Bavarskoj) zanimljive podatke daje Schmidt (1956. i 1957). Podaci ovog autora znatno se razlikuju od onih koji su dobijeni u našoj zemlji, pa nam je bio cilj da uporedno proučimo neke osobine mliječnosti virtemberške rase i domaće jezeropivske ovce, istovremeno i u istim uslovima odgajivanja. To je bilo značajno uraditi i zbog toga što se virtemberška ovca u svim brdsko-planinskim područjima Jugoslavije koristi kao glavni meliorator naše autohtone gruborune pramenke, koja posjeduje relativno razvijene osobine mliječnosti. Stoga će poređenja osobina mliječnosti virtemberške ovce i domaće pramenke ukazati da li će se korišćenjem odabranog melioratora pogoršati osobine mliječnosti domaće ovce ili će one ostati iste.

Usporedna ispitivanja mliječnosti domaće i virtemberške ovce izvršena su na objektima tadašnje Stanice za stočarstvo u Gornjoj Bukovici (kod Žabljaka). U eksperimentu je bilo 37 virtemberških i 71 domaća jezeropivska ovca. Virtemberške ovce koje su obuhvaćene ovim proučavanjima uvezene su iz Njemačke i Francuske koju godinu ranije, dok su jezeropivske ovce otkupljene od individualnih proizvođača sa područja Žabljaka i Šavnika. U oba slučaja u pitanju su prosječna grla razne starosti, tako da su njihove nasljedne osobine bile na nivou prosjeka populacije u područjima iz kojih potiču.

Uslovi odgajivanja u Stanici za stočarstvo bili su za obje usporedne grupe isti i uglavnom ekstenzivni, kao kod većine individualnih proizvođača u tom kraju. Ovce su bile zimi smještene u ovčarnicama i jedina im je hrana bila planinsko sijeno prirodnih livada u količini od 1,5 do 2 kg dnevno. U ljetnjoj sezoni ovce su bile stalno na planinskim pašnjacima na 1300 — 1700 m nadmorske visine. Minimalne količine koncentrata davane su ovcama uz sijeno samo izuzetno, i to neposredno poslije jagnjenja.

Osobine mliječnosti istraživane su od aprila pa do septembra jer su se obje grupe jagnjile tokom marta. Poslije odlučivanja jagnjadi prosječne starosti od 3,5 mjeseci, jezeropivske ovce redovno su mužene, dok su jagnjad virtemberških ovaca sisala do završetka laktacije — do početka avgusta.

Količina mlijeka utvrđivana je na osnovu individualnih mjesečnih kontrola mliječnosti, kojih je u virtemberških ovaca bilo šest, a u jezeropivskih, zbog duže laktacije, sedam. Pored količine mlijeka, individualno je utvrđena i dužina laktacije, dok je masnoća mlijeka tokom laktacije utvrđivana počev od druge kontrole mliječnosti, ali samo za zbirno mlijeko pomuzeno na dan ispitivanja. Količina mlijeka utvrđivana je u kilogramima mjerenjem, dok je masnoća ispitivana butirometrijskom metodom po Gerberu.

Podaci o količini mlijeka i dužini laktacije obrađeni su usvojenim statističkim metodama.

Rezultati i diskusija

Statistički obrađeni rezultati za količinu mlijeka i dužinu laktacije pregledno su prikazani u tabeli 1, iz koje je uočljiva znatna razlika kako za količinu mlijeka, tako i za dužinu laktacije između pivske i virtemberške ovce. Razlika u količini mlijeka za laktaciju iznosi prosječno 299 kg u korist jezeropivske ovce i ta razlika vrlo je značajna ($P < 0,001$). Jezeropivska ovca imala je i dužu laktaciju skoro jedan mjesec (28,77 dana), pa je i ta razlika na nivou visoke značajnosti ($P < 0,001$).

Mihal (1954) na Ogladnom dobru Poljoprivredno-šumskog fakulteta u Sarajevu ustanovio je za 4 ovce prosječno 96 kg mlijeka s variranjima od 64 do 143 kg. Masnoća je bila vrlo visoka (8,04%). Do sličnih rezultata došao je Ogloblin (1975) ispitujući mliječnost 150 ovaca iste rase, ali francuskog uzgoja. Za 150 ovaca koje su bile u eksperimentu prosječna mliječnost bila je 90 kg (60-139), uz masnoću 5,97%. Međutim, prema istraživanjima Zavoda za stočarstvo Poljoprivrednog instituta — Titograd, vršenim na Pivskoj planini od 1979. do 1981. godine, mliječnost vertemberskih ovaca, zavisno od godine i redosljeda laktacije, kretala se prosječno između 51 i 97 kg pri takođe prosječnoj dužini laktacije između 148 i 201 dan. Maksimalna mliječnost po grlu iznosila je 156,8 kg kod jedne ovce u trećoj laktaciji kada se inače postiže najveća proizvodnja. U ovim ispitivanjima broj grla u eksperimentalnim grupama bio je mali (8-14), tako da rezultati nijesu uvijek dovoljno pouzdani. Za iste ovce prosječna masnoća varirala je od 5,46 do 6,25%.

Tab. 1. — Rezultati statističke obrade osobina mliječnosti
Table 1. — Results of statistical adaptation of milking features

Rasa — Breed	Količina mlijeka (kg) Milk yield (kg)	Lenght of lactation (days) Dužina laktacije (dana)
Virtemberska — Württembergous		
N	37	38
$\bar{x} \pm 1-s_x$	74,84 $\pm$ 2,63	145,76 $\pm$ 1,61
s	16,20	9,72
Cv	21,65	6,67
Var.	44,20 — 109,30	114 — 158
Domaća — Autochtonous		
N	71	71
$\bar{x} \pm s-s_x$	103,76 $\pm$ 2,78	174,53 $\pm$ 1,20
s	23,40	10,14
Cv	22,55	5,81
Var	47,76 — 154,58	145 — 196

Znatno povoljnije rezultate o količini i masnoći mlijeka virtembeške ovce u Njemačkoj navodi Schmidt (1956. i 1957). Prema istraživanjima koja su tokom dvije godine vršena u Nojhofu, Akselšvangu i Grubu, prosječna količina mlijeka iznosila je za ova

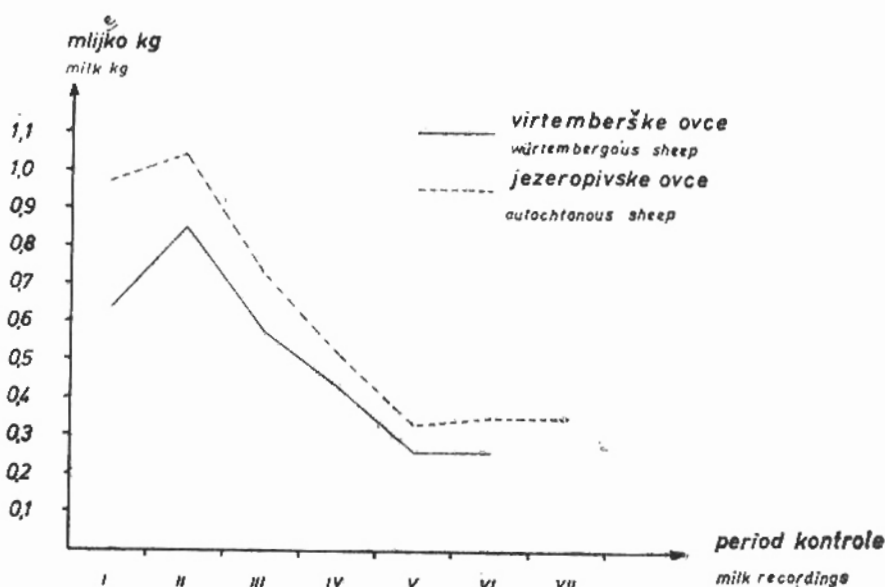
tri područja u prvoj godini 120,2, 135,0 i 179,3 kg, a u drugoj za ista područja mliječnost je bila veća (prosječno 170,6, 137,8 i 202,1 kg.). Prosječna masnoća, zavisno od područja, kretala se između 5,18 (Akselšvang) i 6,91‰ (Grub). Maksimalne mliječnosti kretale su se po područjima između 169,5 i 285,1 kg. Navedena mliječnost postignuta je u laktaciji od prosječno 155 dana, te je bila nešto duža od one koja je ustanovljena u našim istraživanjima.

Mliječnost po periodima, prema podacima iz tabele 2. i grafikona 1, ima sličan tok za obje upoređene rase s porastom od prvoga do drugog perioda i od tada postepenim padom do kraja laktacije. Uporedno s padom količine rasla je masnoća mlijeka kako u virtmberških, tako i u jezeropivskih ovaca.

Tab. 2. — Mliječnost tokom laktacionog perioda
Table 2. — Milking capacity during the lactation period

Mjesečne kontrole Monthly recordings		Količina mlijeka u periodu Milk yield in the period	Ukupan br. dana Number of days	Dnevna kol. mlijeka (kg) Milk per day (kg)	Kol. masti Milk fat kg	% masti fat %
I	1)	441,22	701	0,629	—	—
	2)	345,80	365	0,971	—	—
II	1)	780,23	916	0,852	0,69	3,30
	2)	2 514,17	2 403	1,046	1,27	3,60
III	1)	662,30	1 140	0,581	1,06	5,93
	2)	1 558,58	2 130	0,731	0,98	4,46
IV	1)	488,70	1 140	0,429	0,92	7,60
	2)	1 111,50	2 130	0,521	1,02	6,53
V	1)	288,33	1 124	0,256	0,62	8,00
	2)	712,76	2 130	0,334	0,80	8,00
VI	1)	132,96	518	0,256	0,45	12,40
	2)	784,13	2 254	0,347	0,79	7,20
VII	1)	—	—	—	—	—
	2)	340,72	980	0,347	—	7,20
Ukupno Total	1)	2 793,74	5 539	0,504	4,54	6,02
	2)	7 367,60	12 392	0,594	5,36	5,17

- 1) Württembergous sheep
2) Autochthonous sheep



graf. 1. - tok laktacije kontrolisanih ovaca

course of lactation

Posebnu pažnju zaslužuje poređenje rezultata koje smo mi dobili i onih koje navodi Schmidt za područje Njemačke. Nesumnjivo je da je na razlike u rezultatima najviše uticala ishrana, a ne genetske razlike. Već je naprijed rečeno o ishrani naših ovaca, koja je bila veoma oskudna ako se uporedi sa ishranom ovaca iste rase u Njemačkoj. Tako su u Najhofu ovce prije jagnjenja dobijale dnevno 1,5 kg sijena, isto toliko stočne repe i 0,25 kg raznih koncentrata, a u našim uslovima samo 1,5 — 2 kg sijena. Poslije jagnjenja obrok je u našim uslovima ostao uglavnom isti, dok su ovce u Najhofu dobijale sljedeći dnevni obrok: 1,5 kg sijena, 2 kg repe i 0,5 kg kvalitetnih koncentrata. Nešto lošija ishrana u periodu laktacije odrazila se na količinu i masnoću mlijeka u Akselšvangu. Tamo su ovce po isteku prvog mjeseca laktacije bile na pašnjacima, gdje su, pored paše, dobijale nešto sijena i silaže. Pašnjaci su, kako navodi Schmidt, bili loši, sa kiselim travama, dakle s manjim sadržajem mineralnih materija, što je smanjivalo ne samo količinu mlijeka nego i procenta masti u njemu.

Treba, najzad, istaći da se rezultati ispitivanja mliječnosti jezeropivske ovce skoro potpuno podudaraju sa onima iz ranijih, pa i kasnijih, istraživanja (Lalatović, 1954, Adžić 1979, 1980. i 1981) i Zavoda za stočarstvo (1982). Prosječna mliječnost na os-

novu više ispitivanja i u raznim područjima neznatno je varirala ispod ili iznad 100 kg dok je masnoća bila malo iznad 5%, kao i u našim istraživanjima. Tako podudarni rezultati nesumnjivo su dobijeni zbog toga što je u ispitivanom području, pa i u pojedinim njegovim užim lokalitetima, ishrana prilično ujednačena, kao, uostalom, i celokupna tehnologija odgajivanja. Prirodni uslovi u odgajivačkom području jezeropivske ovce ne razlikuju se bitno od lokaliteta do lokaliteta, pa je i to uticalo da dođe do podudarnih rezultata.

Zaključak

Na osnovu uporednih rezultata ispitivanja nekih osobina mliječnosti virmberške i jezeropivske ovce u ekstenzivnim uslovima odgajivanja mogu se izvesti sljedeći zaključci:

Virmberška ovca koja se gaji u ekstenzivnim uslovima kao autohtona pramenka reaguje značajnim smanjenjem količine mlijeka u poređenju sa mliječnošću iste rase u njenom originalnom odgajivačkom području u Njemačkoj, gdje su uslovi ishrane povoljniji. Međutim, smanjenje količine mlijeka nije prouzrokovalo i smanjenje njegove masnoće, koja je približno ista kao i u Njemačkoj.

Virmberška ovca, prema dobijenim rezultatima, ne može poboljšati mliječnost domaćoj pramenki od koje ima ne samo značajno manju količinu mlijeka nego i kraću laktaciju. Jedino virmberška ovca ima veći sadržaj mliječne masti, što, do izvjesne mjere kompenzira manju količinu mlijeka.

Široki raspon individualne varijabilnosti u količini mlijeka omogućava da se kod virmberške ovce postigne veća prosječna proizvodnja mlijeka.

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Milking Capacity of Würtembergous and Autochtonous Pramenka Sheep under Extensive Farming Conditions

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S u m m a r y

In this paper comparative results of investigations of some milking properties of Würtembergous sheep and autochtonous coarse — wool Pramenka under extensive farming conditions are presented. The experiments were done in 1963. year on a farm in mountainous region of Montenegro. The results obtained are shown from the tables 1 and 2 and graph 1.

On the bases of the results obtained the following conclusions may be inferred:

Würtembergous sheep reared under extensive conditions, as the autochtonous Pramenka breed, reacts with the significantly decreased milk yield in comparason to those of the same breed in its original breeding region in Germany where feeding conditions are more suitable. However, decreased milk yield did not cause fat decreasing in it, so the fat content remained nearly as in Germany.

Würtembergous sheep according to the results obtained can not improve the milk yield of autochtonous Pramenka breed from which it has not only significantly decreased milk yield, but also shorter lactation. Würtembergous sheep has only more fat content in milk than autochtonous one with which decreased milk yield is compensated in a certain measure.

The expressed individual variability in the milk yield make possible improving the average milk yield in Würtembergous sheep.