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NEW SPECIES OF THE FAMILY GAMMARIDAE FROM OHRID LAKE BASSIN, GAMMARUS SKETI, N.SP., WITH EMPHASIS ON THE SUBTERRANEAN MEMBERS OF GENUS GAMMARUS FABR.

(Contribution to the Knowledge of the Amphipoda 191.)

NOVA VRSTA IZ FAMILIJE GAMMARIDAE IZ BAZENA OHRIDSKOG JEZERA, GAMMARUS SKETI, N. SP., SA OSVRTOM NA PODZEMNE ČLANOVE RODA GAMMARUS FABR.
(191. prilog poznavanju Amphipoda)

Abstract

The new blind species of the family *Gammaridae (Amphipoda Gammaridea), Gammarus sketi,* n.sp., is described from the Biljanini izvori Springs (= Studenčišće) on NE. coast of Ohrid Lake in Macedonia (Yugoslavia).

The rewiev and evolution of the subterranean members of the genus *Gammarus* Fabr. 1775 is discussed.

Izvod

Iz Biljaninih izvora (= Studenčišče) na sjeveroistočnoj obali Ohridskog jezera u Makedoniji (Jugoslavija), opisana je nova slijepa vrsta iz familije *Gammaridae (Amphipoda Gammaridea), Gammarus sketi,* n.sp.

Razmatrani su pregled i evolucija podzemnih predstavnika iz roda *Gammarus* Fabr. 1775.

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INTRODUCTION

The fauna of *Amphipoda* from Ohrid Lake Bassin in Macedonia (Yugoslavia) is very rich, with high percentage of endemic species (S. Karaman 1929a, 1929b, 1931, 1943, 1950; G. Karaman 1963, 1973, 1974a, 1974b, 1976a, 1976b, 1977, 1985; Schäferna 1926; Schellenberg 1943).

Among several genera of *Amphipoda* existing in the Lake itself and in the springs along its coasts, the most numerous is genus *Gammarus* Fabr. 1775 (Fam. *Gammaridae),* presented here mainly by several endemic species, living in the lake itself: *Gammarus ochridensis* (Schäferna 1926), *G. lychnidensis* Schellenberg 1943, *G. macedonicus* G. Karaman 1976, *G. stankokaramani* G. Karaman 1976, *G. solidus* G. Karaman 1977, *G. parechiniformis* G. Karaman 1977 and *G. salemaai* G. Karaman 1985.

Two other species with wide distribution in Europe, are present here also: *Gammarus balcanicus* Schäferna 1922, living in various springs along the coasts of the lake, and *Gammarus roeseli* Gervais 1835 with its forma *triacanthus* Schäferna 1922, living in the lake itself, as well as in the springs along the coasts of the lake.

Recently Dr. B. Sket from the University of Ljubljana, sent me very kindly one sample of specimens of one blind *Gammarus* species collected in the springs Biljanini Izvori in town Ohrid. During my last stay in Ohrid (1988), we collected two specimens of the same species from the same locality also.

This blind species was dissimilar to all other *Gammarus* species known from Ohrid Lake Bassin ,mentioned above. On the other hand, this species was very similar to one other blind species from Macedonia, *Gammarus albimanus* G. Karaman 1968, known from Golema Peštera cave near Gostivar but with distinct differences.

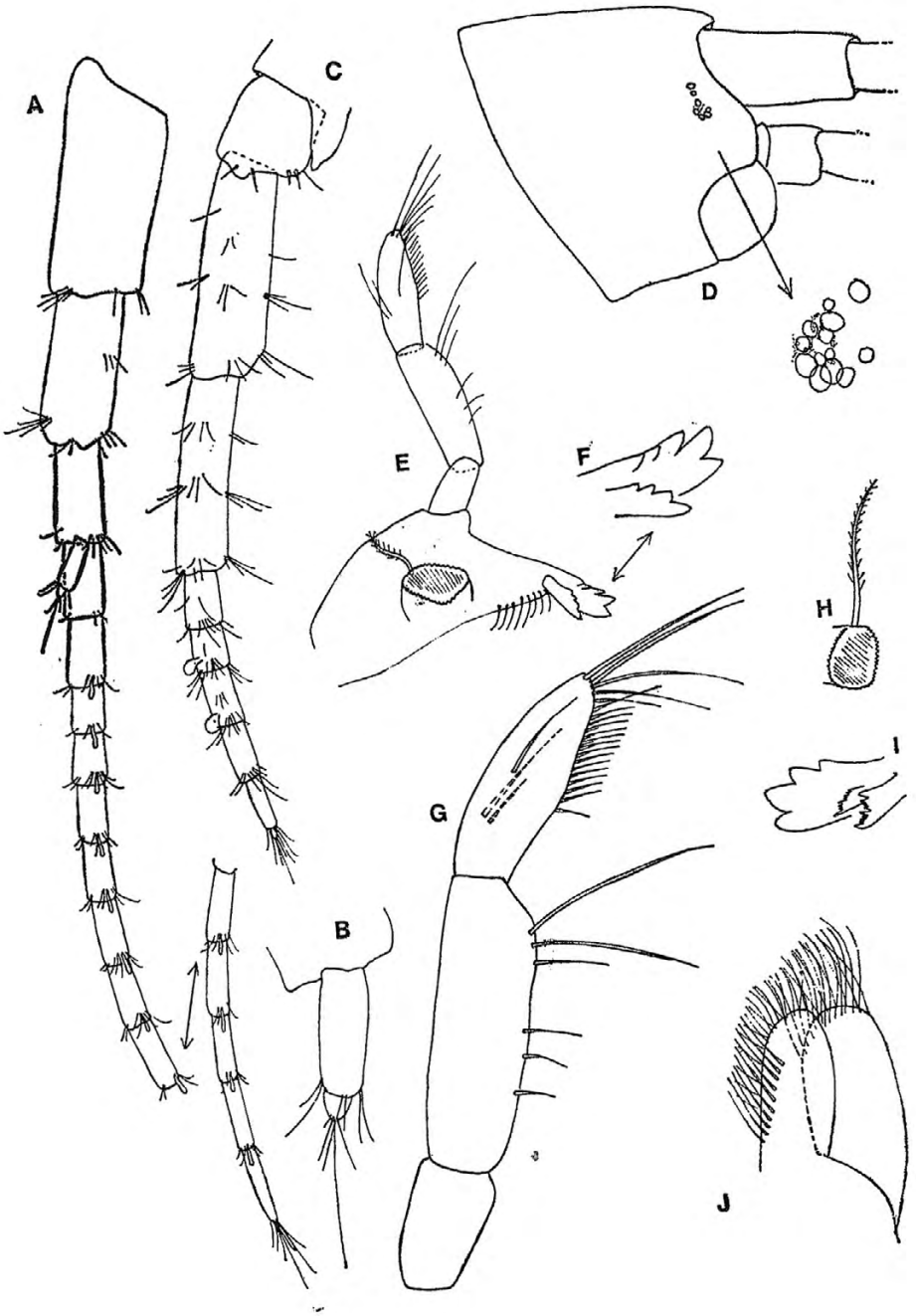
Acknowledgments: I am indebted to prof. Dr. *Boris Sket* from the University of Ljubljana for the loan of material used in this study.

GAMMARUS SKETI, N. SP.

figs.: 1—7

Material examined: Yugoslavia: Macedonia: Biljanini izvori Springs (= Studenčišće) in town Ohrid, on the NE. coast of Ohrid Lake, drift, Sept. 1981, 12 spec. (leg. B. Sket). — ibid, Oct. 14, 1988, 2 spec. (leg. G. Karaman).

Fig. 1. *Gammarus sketi,* n. sp., Biljanini izvori Springs, Ohrid, male 6 mm : A = antenna 1; B = accessory flagellum; C = antenna 2; D = head with eyes; E — F = left mandible; G = mandibular palp; H = right molar; I = right incisor and lacinia; J = maxilla 2.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Description: Male 6 mm: Body stout, mesosomal segments smooth, metasomal segments 1—3 with 3—4 dorsoposterior marginal setae each (fig. 2 E; 4 D). Urosome slightly elevated, but not laterally compressed: urosomite 1 with 2 dorsomedian setae only (fig. 4 E); urosomite 2 with one dorsomedian group of 2 spines and setae, and yith 2 dorsolateral groups of 0—1 spines and setae (fig. 4 E), often one dorsolateral group of elements can be absent (fig. 4 E).

Urosomite 3 with 1—2 dorsomedian setae and 2 dorsolateral groups of elements consisting of 0—2 spines and single setae; sometimes one dorsolateral group of elements can be absent.

The entire body is covered by single very short hairs (fig. 4 D). Head with short rostrum, lateral cephalic lobes subrounded, eyes partially or completely absent (fig. 1 D); if present, eyes are composed of single omatidia with or without black pigment (fig. 1 D).

Antenna 1 reaching half od body, peduncular segments 1—3 progressively shorter, relatively stout and poorly setose (fig. 1 A); main flagellum consisting of 14 articles bearing one short, 2-segmented aesthetasc much shorter than segments themselves (fig. 5 F). Accessory flagellum 2-segmented ,short, not reaching tip of first flagellar segment (fig. 1 B).

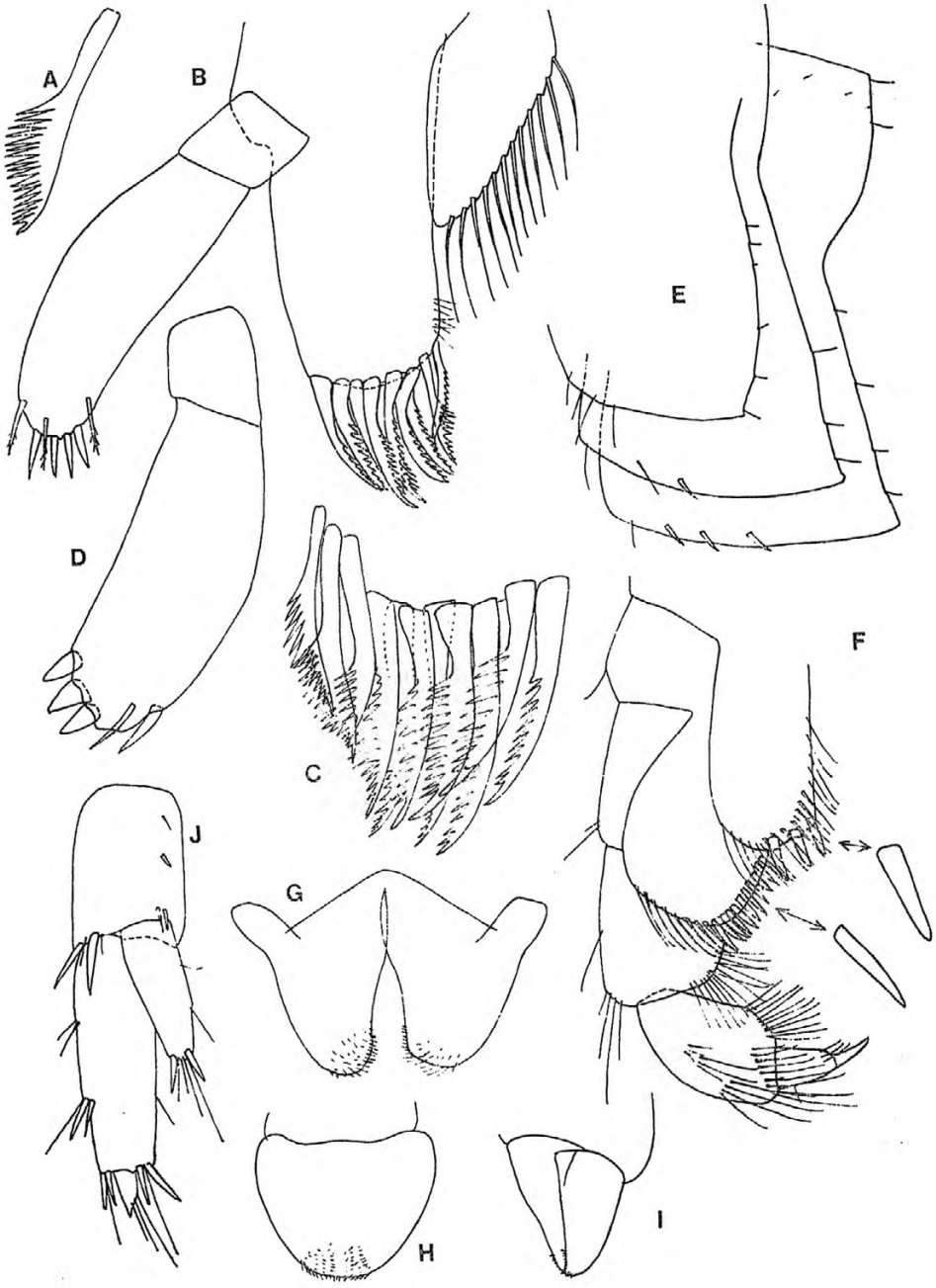
Antenna 2 short and relatively stout, peduncular segment 5 hardly shorter than peduncular segment 4, both bearing 3—4 ventral groups of short setae only (fig. 1 C); flagellum stout, but not inflated, consisting of 6 articles poorly setose (fig. 1. C), calceola present only on two of the articles (fig. 1 C); antennal gland cone not exceeding tip of third peduncular segment (fig. 1 C).

Labrum entire, broader than long, with subrounded epistome (fig. 2 H, I). Labium without inner lobes, outer lobes subrounded (fig. 2 G).

Mandible with cylindrical triturative molar provided with short (left mandible) or long (right mandible) distolateral plumose seta (fig. 1 E, H). Left mandible: incisor 5 — toothed, lacinia mobilis 4 — toothed, accompanied by row of rakers (fig. 1 E, F).

Right mandible: incisor 4-toothed, lacinia mobilis consisting of 2 pluritoothed lamellae, accompanied by row of rakers (fig. 1 I). Mandibular palp 3-segmented: second segment with 6 setae (fig. 1, G), third palp segment shoter than second one, on outer face with

Fig. 2. *Gammarus sketi*, n. sp., Biljanini izvori Springs, Ohrid, male 6 mm : A — B = left maxilla 1; C — D = right maxilla 1; E = epimeral plates 1—3; F = maxilliped; G = labium; H — I = labrum, dorsal and lateral projection; J = uropod 3.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one group of A-setae, on inner face with one group of B-setae, at margins with 14 D and 6 E setae; C- setae are absent.

Maxilla 1: inner plate triangular, with row of lateral plumose setae (fig. 2 B); outer plate with cca 12 spines bearing 10—18 lateral teeth each (fig. 2 A,B,C). Left mandibular palp narrow, distally with 4 slender spines and 3 strong plumose setae (fig. 2 B). Right mandibular palp broad, distally with 3 strong teeth and one narrow spine and 1 seta (fig. 2 D).

Maxilla 2: inner plate with facial oblique row of setae as well as with lateral and distal marginal setae (fig. 1 J).

Maxilliped: inner plate with 3 strong obtuse distal spines (fig. 2 F), outer plate with row of distolateral smooth spines (fig. 2 F); palp segment 4 with nail slightly shorter than pedestal (fig. 2 F).

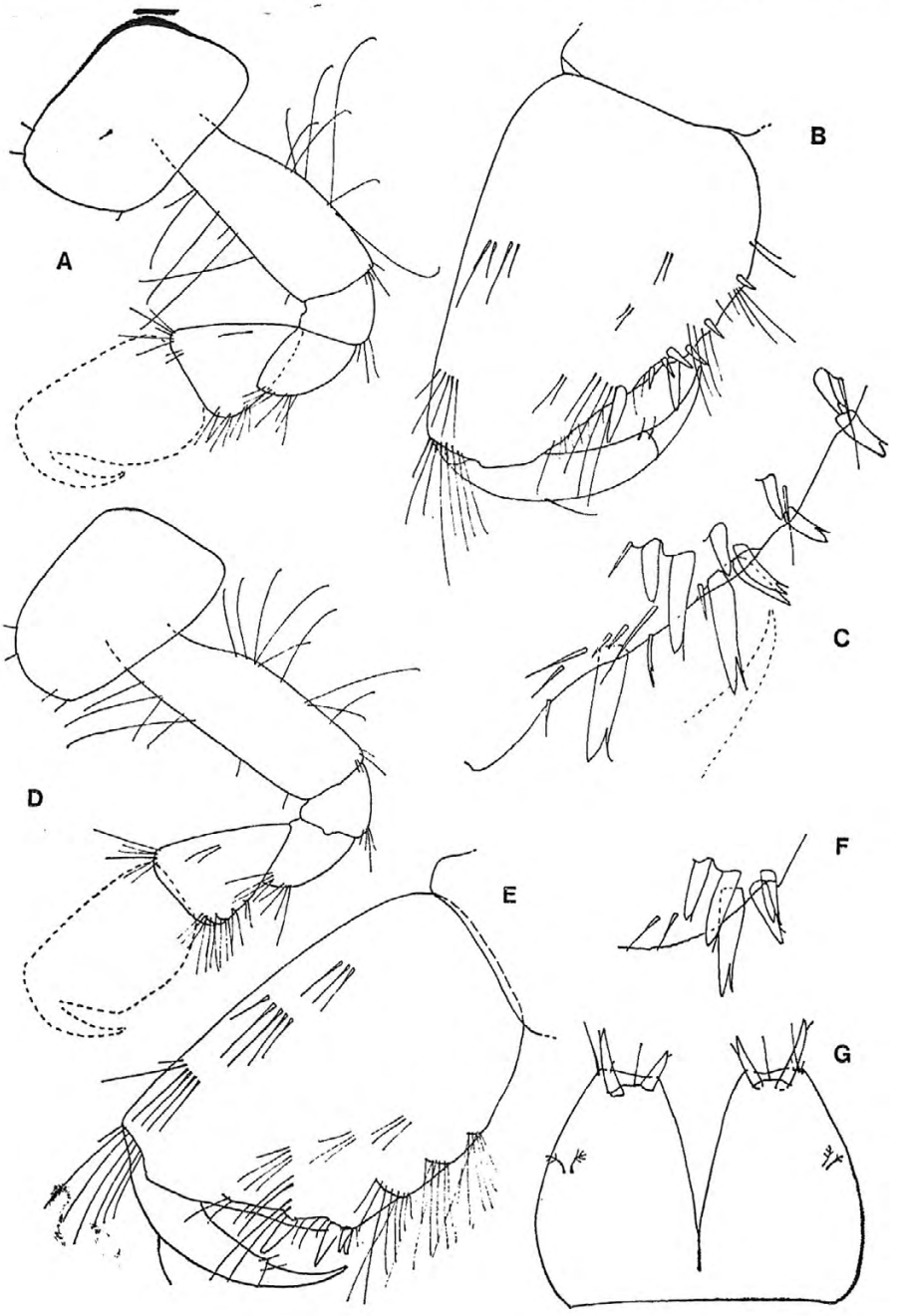
Coxae 1—4 slightly longer than broad (fig. 3 A, D; 4 A, C), coxa 1 non dilated distally, coxae 2—3 slightly tapering distally, coxa 4 hardly longer than broad, with well developed ventroposterior lobe (fig. 4 C). Coxae 5—6 bilobe (anterior lobe small, posterior lobe subrounded) (fig. 5 A,B); coxa 7 entire (fig. 5 C).

Gnathopods 1—2 subequally large (fig. 3 A,D). Gnathopod 1: segments 3—4 with one group of posterior setae; segment 5 slightly shorter than 6 (fig. 3 A); segment 6 dilated, only slightly longer than broad, poorly setose (all setae are straight) (fig. 3 B); palm with one median and 2 corner spines on outer face, accompanied by single or pairs of submarginal spines below corner spine (fig. 3 B,C); on inner face of segment 6 appear several submarginal spines also (fig. 3 C); dactyl recurved, with 2 inner setae near nail (fig. 3 B) and one medial seta at outer margin.

Gnathopod 2: segment 5 slightly shorter than 6, with 4 rows of posterior setae (fig. 3 D); segment 6 poorly setose (all setae are straight), slightly longer than broad, at posterior margin with 3 groups of short setae; palm on outer face with one median and 3 corner spines (fig. 3 E,F), on inner face palm is defined by 2 subcorner spines (fig. 3 F); dactyl like that of gnathopod 1 but shorter (fig. 3 E).

Perepods 3—4 similar to each other, stout, segments 5—6 along posterior margin with very short spines accompanied by single very short setae (setae and spines are remarkably shorter than diameter of the articles); posterior margin of segment 4 with short setae oly (fig. 4 A,C); dactyl short and stout at inner margin with one strong seta, at outer margin with one plumose seta (fig. 4 B), nail shorter than pedestal, recurved (fig. 4 B).

Fig. 3. *Gammarus sketi*, n. sp., Biljanini izvori Springs, Ohrid, male 6 mm : A — C = gnathopod 1; D — F = gnathopod 2; G = telson.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Pereopods 5—7 short and stout, almost of the same lenght (fig. 5 A,B,C), although pereopod 6 seems, to be the longest one.

Segment 2 of pereopods 5—7 is slightly longer than broad, with poorly mared ventroposterior tooth, posteriorly with 8—9 short marginal setae each (fig. 5 A—C); inner face of segment 2 without groups of medial setae. Segments 3—6 stout, along anterior and posterior margin with bunches of short spines, setae are practically absent (fig. 5 A,B,C); dactyl short and stout, at inner margin with one strong seta, at outer margin with one medial plumose seta (fig. 5 D), nail recurved, slightly shorter than pedestal.

Pleopods 1—3 well developed, rami plurisegmented; peduncle with 2 retinacula accompanied by 1, rarely 2 strong setae (fig. 5 E—J). Peduncle of pleopods 1—2 poorly setose (fig. 5 E, G), peduncle of pleopod 3 with several bunches of short setae (fig. 5 I).

Epimeral plates 2—3 with produced and pointed ventroposterior corner (fig. 2 E); epimeral plate 1 with short ventroposterior tooth and with several distoanterior setae (fig. 2 E), epimeral plate 2 with 1—2 subventral spines, sometimes accompanied by one seta (fig. 2 E); epimeral plate 3 with 3 subventral spines sometimes accompanied by one short seta (fig. 2 E).

Urosomite 1 near basis of uropod 1-peduncle with one short spine and one seta (fig. 4 D). Uropod 1: peduncle with one short basifacial spine and with row of dorsoexternal short spines (fig. 4 D), dorsointernal row of spines (except distal spine) absent; both rami with one median and 4 short distal spines each (fig. 4 D), outer ramus is slightly shorter than inner one or almost subequal long.

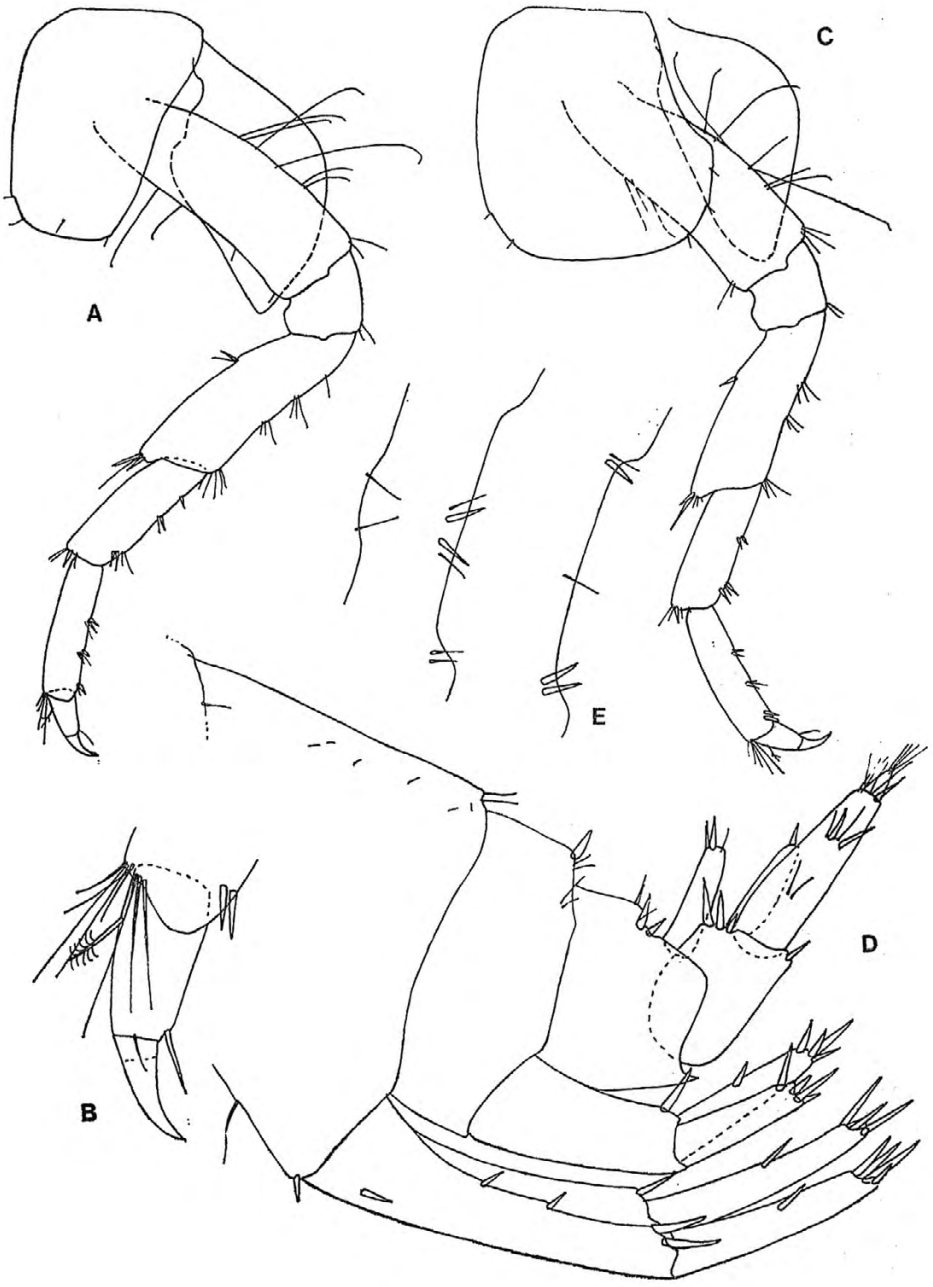
Uropod 2: pedunche with stronger distal spine (fig. 4 D), inner ramus remarkably longer than outer one, bearing one median and 4 distal spines (fig. 4 D), outer ramus with 4 distal spines.

Uropod 3 short, only slightly exceeding tip of uropods 1—2 (fig. 4 D); peduncle stout and strong, exceeding half of outer ramus--length (fig. 2 I); inner ramus reaching nearly half of outer ramus, bearing single simple lateral and distal setae and 2 distal spines (fig. 2 J); outer ramus 2-segmented, second segment short; first segment at outer margin and tip with single simple setae and spines (fig. 2 J).

Telson short, broader than long, incised nearly to the basis (fig. 3 G), each lobe with 2 distal short spines and short setae; a pair of short plumose setae appears near the middle of each lobe (fig. 3 G).

Coxal gills ovoid, simple, with peduncle, occur on pereonites 2—7 (fig. 4 A,C).

Fig. 4. *Gammarus sketi*, n. sp., Biljanini izvori, Springs, Ohrid, male 6 mm : A — B = pereopod 3; C = pereopod 4; D = urosome with uropods 1—3; E = urosome, dorsal projection.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Females: up to 5,2 mm long, with non setose oostegyts. Female like males, but appendages are slightly shorter. Antenna 1 is slightly shorter than half of body (ratio 2.1 : 5.2); eyes poorly developed or completely absent (fig. 6 E). Main flagellum of antenna 1 is consisting of 15 articles; peduncular segments 4—5 of antenna 2 with 2—3 ventral groups of longer straight setae each (fig. 6 E), flagellum 5-segmented, without calceola (fig. 6 E); antennal gland cone hardly longer than that in males, reaching tip of third peduncular segment (fig. 6 E).

Mouthparts like these in males. Gnathopods 1—2 shorter than these in males, but slightly more setiferous (all setae are straight). Gnathopod 1: segment 6 along posterior margin with 4 transverse roys of setae and single spines (fig. 7 D), palm without median spine, and defined on outer face by 2 corner spines, on inner face is defined by 2 subcorner spines (fig. 7 D, E), dactyl with one medial seta at outer margin (fig. 7 D).

Gnathopod 2: segment 6 along posterior margin with row of 5 transverse groups of setae, palm without median spine, on outer face defined by one corner spine (fig. 7 E), on inner face by 2 subcorner spines (fig. 7 G); dactyl remarkably exceeding posterior margin of segment 6, at outer margin with one median seta (fig. 7 F).

Pereopods 3—4 like these in males, but posterior margin of segments 4—5 with slightly longer straight setae (fig. 6 A,B), posterior margin of segments 5—6 with single short spines and setae (fig. 6 A,B), dactyl like that in males.

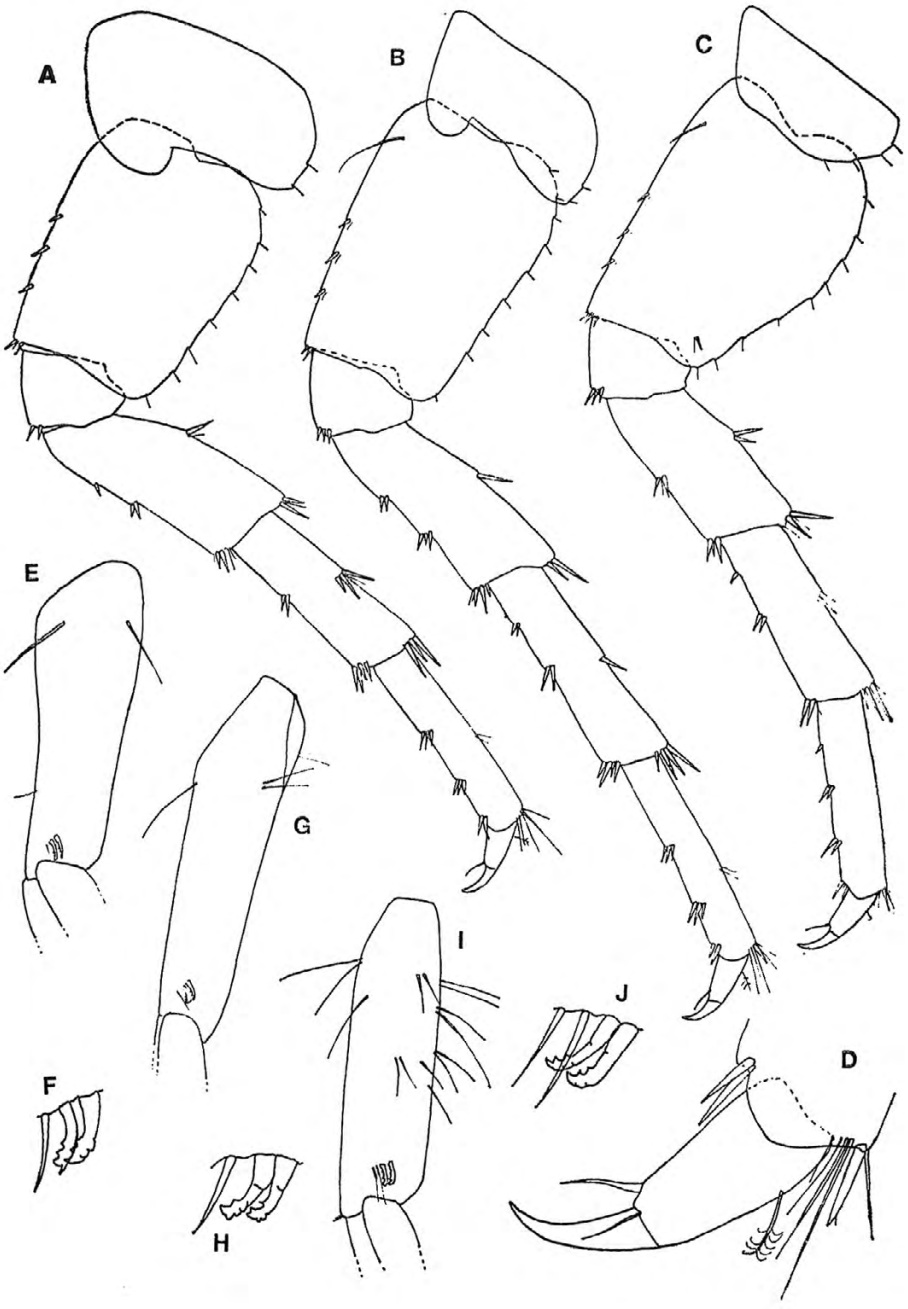
Pereopods 5—7 like these in males but stouter, its segment 2 slightly broader (fig. 7 A,B,C); segments 4—6 at anterior and posterior margin with bunches of spines only; dactyl short and stout, like that in males (fig. 7 A,B,C).

Pleopods like these in males. Epimeral plates like these in males (fig. 7 H), the number of subventral spines on epimeral plates 2—3 is rather variable (1—3 spines) (epimeral plate 2 with 1—2 spines, epimeral plate 3 with 2 spines and one seta).

Mandibular palp segment 2 with 5—6 setae, palp segment 3 with 16 D, 5 E, one group of A and one group of B-setae.

Urosomite 1 without dorsolateral groups of elements (fig. 6 G); urosomite 2 often also without some of lateral groups of elements; urosomite 3 with 2 dorsomedian setae and 2 dorsolateral groups of elements (spines and/or setae), sometimes some of lateral groups of elements can be absent (fig. 6 G).

Fig. 5. *Gammarus sketi*, n. sp., Biljanini izvori Springs, Ohrid, male 6 mm : A = pereopod 5; B = pereopod 6; C — D = pereopod 7; E — F = pleopod 1; G — H = pleopod 2; I — J = pleopod 3.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Uropods 1—2 like these in males. Uropod 3 like that in males, with all simple setae and spines only (fig. 6 C).

Telson like that in males, always distinctly broader than long, each lobe with 2 distal spines and single short setae (fig. 6 D,H).

Oostegyts occur on pereonites 2—5, setae absent on all oostegyts (may be non adult specimens).

Variability: The number of spines and setae in dorsomedian and dorsolateral groups of elements on urosomites 2—3 is rather variable, sometimes one or both dorsolateral groups of elements can be partially or completely reduced, but excavation of urosomite on this place is still present (fig. 4 E, 6 G).

Urosomite 1 in all specimens without lateral excavation and without lateral groups of elements (spines or setae).

Segment 2 of pereopod 7 in some specimens with 2 median setae on inner face. Epimeral plates 2—3 with 0—1 subventral seta.

Eyes are extremely reduced to some omatidia or completely absent.

Holotype: male 6 mm. Holotype is deposited in KARAMAN's Collection in Titograd, Yugoslavia.

Etymology: This species is dedicated to prof. Dr. *Boris Sket* from the University of Ljubljana, who collected that species in Macedonia.

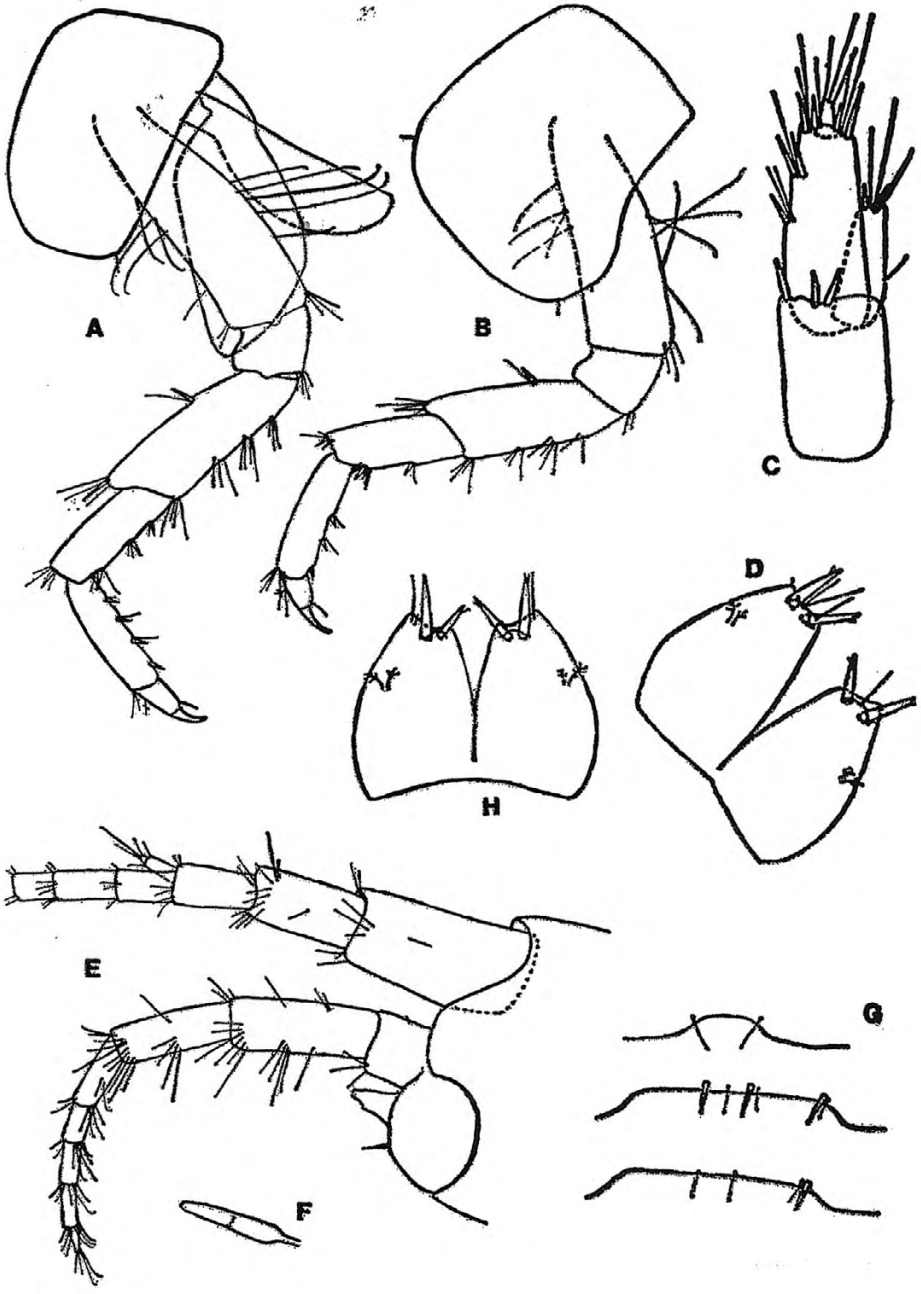
Distribution: Known only from type-locality.

Loc. typ.: Biljanini izvori-Springs, Ohrid, Macedonia.

Remarks and affinities. *Gamarus sketi*, n.sp. is very close to the blind species *Gmmarus albimanus* G. Karaman 1968, known from Golema peštera — Cave near Gornja Džonovica village (Gostivar reg. in Macedonia). *G. albimanus* agree with *G. sketi* by shape of head, absence of eyes (although some of specimens of *G. sketi are* with trace of eyes), by poorly setose pereopods 3—4, by absence of setae on pereopods 5—7, by stout all extremities, by shape of mouthparts, especially maxilla 1, by short inner ramus of uropod 3, shape of epimeral plates 1—3, by presence of calceola on flagellum of antenna 2 in males, etc.

But, *G. albimanus* differs from *G. sketi* by well developed all dorsolateral groups of elements (spines and setae) on urosomites 1—3, by 3-segmented accessory flagellum, by less reduced outer ramus of uropod 3 provided with higher number of lateral setae, by less

Fig. 6. *Gammarus sketi*, n. sp., Biljanini izvori Springs, Ohrid, female 5,2 mm : A = pereopod 3; B = pereopod 4; C = uropod 3; D = telson; E = head with antennae 1—2; F = aesthetasc of antenna 1; G = urosome, dorsal projection; H = telson, female 5,1 mm.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reduced flagellum of antenna 2 consisting of higher number of articles and calceola, by more slender pereopods 5—7 and narrower gnathopods 1—2, larger body-size, etc.

In the caves of Macedonia lives one other subterranean species *Gammarus hälilicae* G. Karaman 1969, known from Donja Halilica cave near village Tresonče (W. part of Macedonia). But, this species differs remarkably from *G. sketi* by larger and much more slender body and extremities, by well developed eyes, narrow and long uropod 3, longer telson provided with one distal spine on each lobe, by absence of calceola on antenna 2 in males, by presence of dorsolateral groups of elements (spines and setae) on urosomite 1, etc.

Within the genus *Gammarus* Fabr. 1775, there are known two other blind species, *Gamarus vignai* Pinkster & G. Karaman 1978, known from cave Çamlik Dalayman Çocuk (Konya region, Turkey), and *Gammarus pulex polonensis* G. Karaman & Pinkster 1977, known from the subterranean waters of Warta river near Polznan in Poland.

G. vignai differs from *G. sketi* by long pereopods 3—4 densely setose, long pereopods 5—7, by long inner ramus of uropod 3 remarkably exceeding half of outer ramus, by slender dactyl of pereopods 3—7, by long, 15-segmented flagellum of antenna 2, by well developed dorsolateral group of elements on urosomite 1, etc.

G. pulex polonensis differs from *G. sketi* by swollen flagellum of antenna 2, by densely setose pereopods 3—4 and uropod 3, by more setose telson, larger body-size (up to 16 mm), by long inner ramus o uropod 3, well developed dorsolateral groups of elements (spines and setae) on urosomite 1, etc.

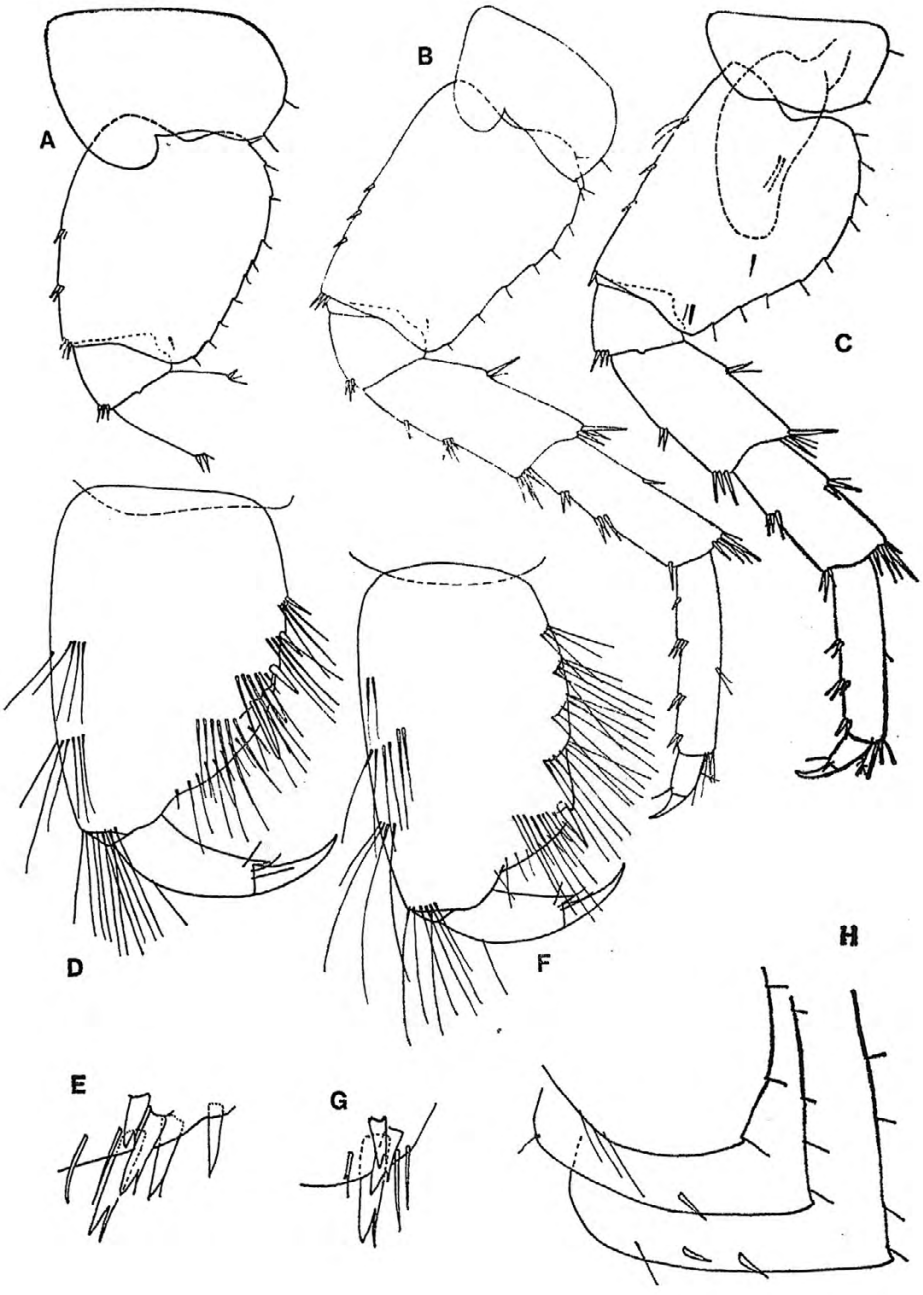
THE SETTLEMENT OF SUBTERRANEAN WATERS BY MEMBERS OF GENUS GAMMARUS

Genus *Gammarus* Fabr. 1775 is known over the World (Euroasia, N. America, N. Africa, Madagascar) through over 80 species.

The most of these species are living in the surfacial waters (rivers, springs, lakes, coast of the sea).

But, some surfacial species can be found also in the subterranean waters, especially in the caves (*G. balcanicus* Schäf., *G. fossarum* Koch, etc.)

Fig. 7. *Gammarus sketi*, n.sp., Biljanini izvori Springs, Ohrid, female 5.2 mm : A = pereopod 5; B= pereopod 6; C = pereopod 7; D — E = gnathopod 1; F — G = gnathopod 2; H epimeral plates 1—3.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During the long period of evolution, as well as today, the surfacial species of the genus *Gammarus* attempt to settle the subterranean waters more or less successfully.

Some of these attempts are only temporarily or in the initial phase only, when the surfacial populations are living in the subterranean waters only for one limited period of its life, being in the reproductive connection with surfacial populations.

In these cases, these subterranean specimens are identic with surfacial specimens (for example the specimens of *G. balcanicus* Schäf. 1922 or *G. fossarum* Koch 1835 in some caves of Yugoslavia); or, some of the subterranean specimens of one population can be provided with partial reduction of eyes and with slightly more elongated antennae. In that case, but, other taxonomic characters of surfacial and subterranean specimens appear identic (For example the subterranean specimens of *Gammarus fossarum* forma *subterranea* S. Karaman 1931 known from Monfalcone springs (NW. Italy near Trieste).

Rather different evolution is by the surfacial populations of genus *Gamarus,* penetrated in the subterranean waters and settled these subterranean waters permanently, loosing the reproductive connections (breedings) with surfacial populations.

By this way, these isolate subterranean populations, during long period of his evolution and isolation, have been developed into different species adapted to the subterranean life *(G. halilicae* G. Kar. 1969, *G. albimanus* G. Kar. 1968, *G. vignai* Pink, & G. Kar. 1978, etc.).

In some cases, in the springs near the entrance of the caves, it is possible to find the subterranean species and surfacial species together in the same place, and no transitive specimens between both species apper and distinct reproductive isolation (bariera) of these species exists *(G. balcanicus* Schäf. and *G. albimanus* G. Kar. in Golema peštera-Cave; *G. balcanicus* Schäf. and *G. halilicae* G. Kar. 1969 in Donja Halilica-Cave).

It seems that adaptation of *Gammarus* populations to the subterranean life are going into two ways.

First way: Elongation of the body and extremities, especially pereopods and antennae, slender dactyl of pereopods 3—7, preservation of setae on body and extremities. These modifications are an adaptation of the animals to the swiming in the slow running subterraenan waters or subterranean lakes, where the animals can swim as well as to squeeze through the narrow subterranean channels and where the water resistance is low (for example: *Gammarus halilicae* G. Karaman 1969, *G. pulex polonensis,* G. Karaman & Pinkster 1977, *G. vignai* Pinkster & G. Karaman 1978, *G microps* Pinkster & Goedmakers 1975, *G. longipedis* G. Karaman & Pinkster 1987).

Second way: The body of the animals remains as stout and strong as or stouter and stronger that these of the surfacial populations. Body is with short and strong extremities (especially pereopods, antennae and uropod 3), dactyl of pereopods 3—7 is very strong, many setae of the body and extremities are replaced by spines.

This is an adaptation to the life in the subterranean fast running waters, between the rocks, coarsed gravel, etc. where the animals must be strongly attached to the bottom or walls of the channels by strong dactyls; the animals reduced strong water resistance of fast subterranean waters by replacing the numerous setae by short spines (for example: *G. albimanus* G. Kar. 1968, *G. sketi*, n.sp.)

In the both ways (first and second) ,the animals can preserve well developed large eyes *(G. halilicae, G. longipedis),* or small eyes *(G. microps),* or partially to completely reduced eyes *(G. sketi, G. albimanus, G. vignai).*

So, the reduction of the eyes was not developed in all subterranean *Gammarus* species, despite remarkable change of other taxonomic characters in the subterranean populations.

For the moment, we can not explain that fact, except by the theorie that the reduction of the eyes requests much longer time that the change of other morphological characters on the animal, or that these subterranean species with eyes can have some daylight in some parts of its areal of distribution.

Present knowledge of the taxonomy and distribution of the genus *Gammarus* Fabr. proved that this genus is one very old freshwater genus, and that the penetration of its surfacial populations into subterranean waters is one permanent and interrupted process, going on today also.

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Rezime

NOVA VRSTA IZ FAMILIJE GAMMARIDAE IZ BAZENA OHRIDSKOG JEZERA, GAMMARUS SKETI, N. SP., SA OSVRTOM NA PODZEMNE ČLANOVE RODA GAMMARUS FABR. (191. PRILOG POZNAVANJU AMPHIPODA)

Fauna *Amphipoda* bazena Ohridskog jezera u Makedoniji je veoma bogata, sa visokim procentom endemskih vrsta.

Od svih rodova koji tu dolaze, najbrojniji je rod *Gammarus* Fabr. 1775 (fam. *Gammaridae*), koji je zastupljen u Ohridskom jezeru sa nekoliko vrsta: *Gammarus ochridensis* (Schäf. 1926), *G. lychnidensis* Schell. 1943, *G. macedonicus* G. Karaman 1976, *G. stankokaramani* G. Karaman 1976, *G. solidus*, G. Karaman 1977, *G. parechiniformis* G. Karaman 1977 i *G. salemaai* G. Karaman 1985.

Druge dvije vrste, *Gammarus roeseli* Gerv. 1835 i *Gammarus balcanicus* Schäf. 1922, imaju mnogo šire rasprostranjenje širom Evrope.

Iz Biljaninih izvora u Ohridu, na sjeveroistočnoj obali Ohridskog jezera, opisana je nova podzemna vrsta roda *Gammarus, G. sketi*, n. sp., koja se odlikuje djelimičnom ili potpunom redukcijom očiju.

Gammarus sketi nije srodna ni sa jednom poznatom vrstom iz Ohridskog jezera, već je veoma bliska podzemnoj vrsti *Gammarus albimanus* G. Karaman 1968, poznatoj iz pećine Golema peštera kod Gostivara. Ova poslednja vrsta također nema očiju, a tijelo je depigmentirano kao i kod naše vrste *G. sketi*.

Međutim, *G. sketi* se jasno razlikuje od *G. albimanus* nerazvijenim bočnim grupama trnova i dlaka na prvom urozomalnom segmentu, dvočlanim bočnim bićem prve antene, više reduciranom vanjskom granom trećeg uropoda, koji nosi manji broj bočnih dlaka ,kraćim bičem druge antene, zdepastijim pereopodima i manjom tjelesnom dužinom, i širim gnatopodima.

Druga pećinska vrsta iz Makedonije, *Gammarus halilicae* G. Karaman 1969, (poznate iz pećine Donja Halilica kod Tresonče), jasno se razlikuje od vrste G. sketi dobro razvijenim očima, većom tjelesnom dužinom, jako izduženim svim ekstremitetima, slabije trnovitim telzonom itd.

U okviru roda *Gammarus* Fabr., poznate su još dvije slijepe vrste, *Gammarus vignai* Pinkster & G. Karaman 1978. (pećina Camlik Dalayman Cocuk u Turskoj) i *Gammarus pulex polonensis* G. Karaman & Pinkster 1977 (poznate iz podzemnih voda rijeke Warte kod Poznanja u Poljskoj). Međutim, *G. sketi* se nizom odlika jasno razlikuje od obije ove vrste.

Razmatran je proces prodiranja i naseljavanja površinskih vrsta roda *Gammarus* podzemnih voda, i njihova adaptacija i evolucija u podzemnim uslovima života.