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**ONE NEW SPECIES OF THE FAMILY BOGIDIELLIDAE FROM CRE-  
TA ISLAND, GREECE, BOGIDIELLA (MEDIGIDIELLA)  
AQUATICA, N. SP.**

Contribution to the Knowledge of the Amphipoda 192

**JEDNA NOVA VRSTA IZ FAMILIJE BOGIDIELLIDAE SA OTOKA  
KRETE U GRČKOJ, BOGIDIELLA (MEDIGIDIELLA) AQUATICA, N. SP.**

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**ONE NEW SPECIES OF THE FAMILY BOGIDIPELLIDAE FROM CRETA ISLAND, GREECE, BOGIDIPELLA (MEDIGIDIPELLA) AQUATICA, N. SP.**

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Karaman, S. G. (1990): *One new species of the family Bogidiellidae from Creta Island, Bogidiella (Medigidiella) aquatica, n. sp.* — *Contribution to the Knowledge of the Amphipoda 192*. — Bulletin of Natural History Museum, Belgrade, B 45: 27—39.

A new species of the family *Bogidiellidae* (*Amphipoda Gammaridea*), *Bogidiella (Medigidiella) aquatica*, n. sp., is described from Creta Island in Greece (river Kourkaliotiko), and its taxonomic status is discussed. A review of all known *Bogidiella* species from Creta Island is given.

INTRODUCTION

The Family *Bogidiellidae* (*Amphipoda Gammaridea*) from the subterranean waters of Creta Island in the Mediterranean Sea (Greece) was discovered and studied only by single scientists during last 13 years.

Ruffo and Schiecke (1976) described a new species *Bogidiella minotaurus* n. sp. from the subterranean coastal waters in Hierapetra (S. part of Creta Island).

Bou and Ruffo (1979) mentioned the species *Bogidiella longiflagellum* S. Karaman 1959 for wells near Macrigialos and for well in Pahlia Amos in Creta, one species known from Macedonia (Yugoslavia) (S. Karaman 1959; G. Karaman 1973) and Greece (Bou and Ruffo 1979).

G. Karaman (1979) removed *B. minotaurus* to the species *Bogidiella chapuisi* Ruffo 1952 as synonym.

Stock (1981) removed *Bogidiella chapuisi* to the new subgenus *Bogidiella (Medigidiella)* n. sbg. as type species.

Later, several attempts on the revision of the family *Bogidiellidae* were made by single authors, and a number of new taxonomical characters was used in the taxonomy of this group.

Based on that, G. Karaman (1988, *in press*) removed *Bogidiella minotaurus* again from *B. chappuisi* to the status of a distinct species.

Recently Dr. Boris Sket from the University of Ljubljana (Yugoslavia) sent me very kindly the material of the subterranean *Amphipoda* collected by him during Yugoslav speleological expedition to Creta (= Kriti), organized by the Caving club Prebold. Among other taxa, one new species of the genus *Bogidiella* was established and described in this work.

#### TAXONOMIC PART

#### *BOGIDIELLA (MEDIGIDIELLA) AQUATICA*, N. SP.

Figs. I—V

**Material examined:** GREECE, CRETA (= KRITI) ISLAND: Preveli, a gravel bank (collected by Karaman — Chappuis sonde) of the Kourtaliotiko River, cca 50 meters from the sea, Sept., 1988, 4 specimens (leg. B. Sket).

**Description.** Adult **female** 1.9 mm: Head with short rostrum and short subrounded lateral cephalic lobes and developed ventroanterior sinus, eyes absent (Fig. I 6).

Antenna 1: nearly reaching half of body; peduncular segments 1—3 progressively shorter (Fig. I 1), peduncular segment 1 with 2 ventral spines; peduncular segment 3 exceeding half of ped. segment 2 (Fig. I 1); main flagellum consisting of 7 articles (most of them with one aesthetasc up to as long as article itself); accessory flagellum 2-segmented, hardly longer than last peduncular segment (Fig. I 2), with long distal segment.

Antenna 2: peduncular segments 3—4 with one ventral spine each (Fig. I 3), peduncular segment 5 shorter than 4 and bearing only setae; flagellum consisting of 5 articles (Fig. I 3); antennal gland cone short, not reaching tip of third peduncular segment (Fig. I 3).

Labrum entire, broader than long (Fig. I 4); labium with acute distoinferior tip of outer lobes (Fig. IV 7), inner lobes small, subrounded, ventral lobes (fingers) narrow (Fig. IV 7).

Mandible with well developed cylindrical molar bearing one distolateral seta (Fig. I 7, V 12). Left mandible: incisor consisting of 5 unequal teeth (Fig. V 5), lacinia mobilis is provided with 5 teeth (Fig. I 8), near them appear 3 rakers.

Right mandible: incisor with 5 unequal teeth (Fig. I 7), lacinia mobilis consisting of two toothed parts (Fig. I 7, V 7), near them appear 3 rakers (Fig. I 7). Mandibular palp 3-segmented, second segment with one seta (Fig. I 7), third segment almost as long as se-

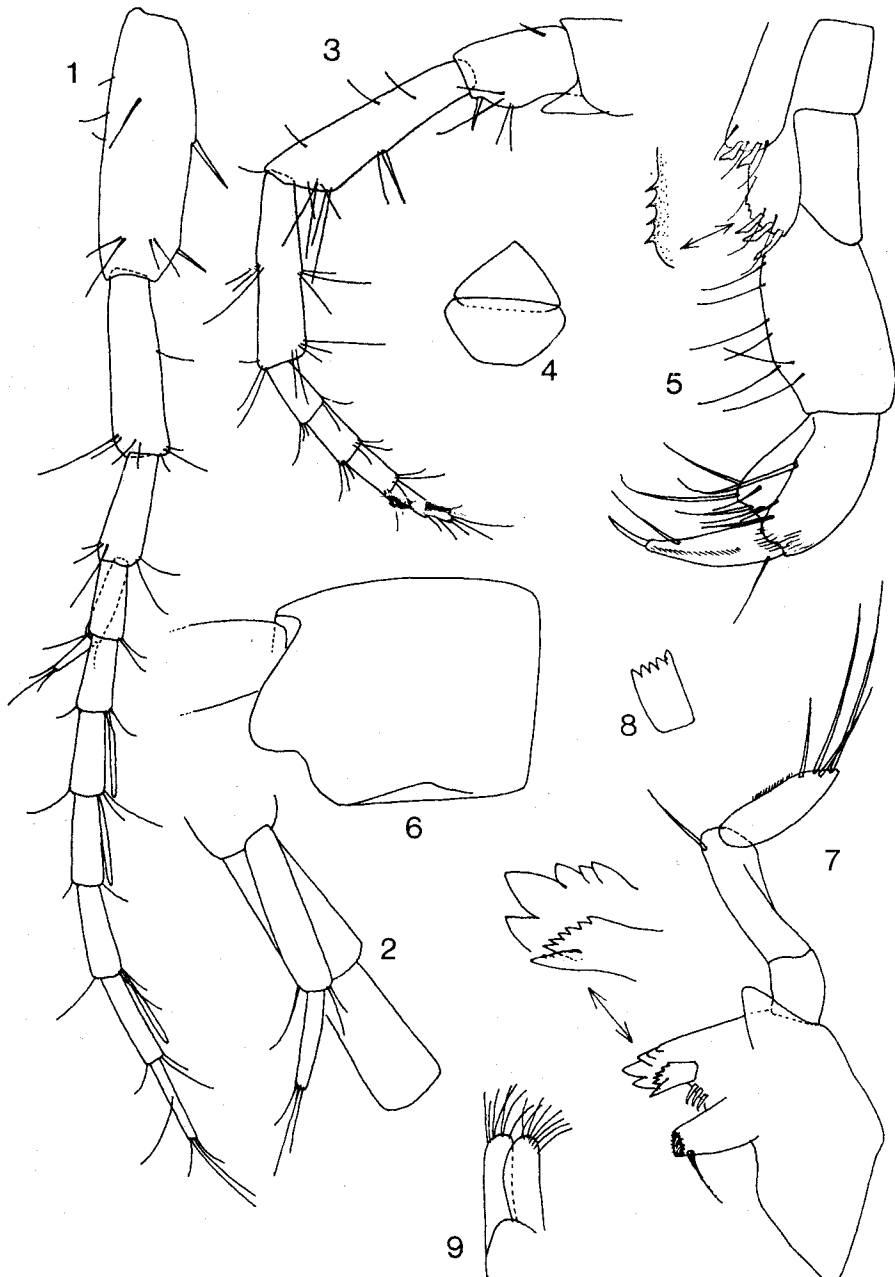


Fig. 1. — *Bogidiella (Medigidiella) aquatica*, n. sp., Preveli female 1.9 mm:  
 1) antenna 1; 2) accessory flagellum; 3) antenna 2; 4) labrum; 5) maxilliped;  
 6) head; 7) right mandible; 8) left lacinia mobilis; 9) maxilla 2.

cond one, bearing 4 distal setae (some of these setae are longer than segment itself) (Fig. I 7).

Maxilla 1: inner plate with 2 setae (Fig. IV 8), outer plate with 7 spines: 3 spines with numerous very fine setulae or teeth (?), 4 spines with 2—3 teeth each (Fig. IV 8); palp 2-segmented, almost reaching tip of spines of outer plate, bearing 3 distal setae.

Maxilla 2: both plates narrow, with 7—8 distal setae each, lateral and facial setae absent (Fig. I 9).

Maxilliped: inner plate short, with 2 distal bicuspidate spines and setae (Fig. I 5); outer plate short, with 3 distointernal spines, distointernal margin of outer plate with 4 small teeth (Fig. I 5); palp strong, 4-segmented, segment 4 with one ventral seta, nail much shorter than pedestal (Fig. I 5).

Coxae 1—7 shallow, much broader than long (high) (Fig. II 1 3; III 1, 3, 4—6), coxa 7 also slightly excavated (Fig. III 6), coxae 5—7 with distoposterior spine.

Gnathopods 1—2 moderately large. Gnathopod 1: segment 2 along posterior margin with 2 long median and 1 short distal seta (Fig. II 1), along anterior margin with one short distal seta only; segment 5 short and narrow, with strongly produced and pointed distoposterior lobe (Fig. II 1); segment 6 longer than broad, slightly dilated medially (Fig. II 2), palm oblique nearly to the half of posterior margin of segment 6, with finely crenellated proximal and distal part and with smooth median part (Fig. II 2); palm is defined on outer face by one strong corner spine and 1 facial seta, on inner face appear 2 submarginal strong spines (Fig. II 2); palm provided with several slender bicuspidate spines and simple setae; dactyl reaching posterior margin of segment 6, bearing along inner margin 2 teeth, along outer margin one median seta (Fig. II 2).

Gnathopod 2: it is hardly longer than gnathopod 1, its segment 2 along posterior margin with one long median and one short distal seta, along anterior margin with one short seta (Fig. II 3); segment 5 triangular, exceeding half of segment 6-length, unlobed posteriorly (Fig. II 3); segment 6 nearly twice as long as broad, with almost parallel lateral margins (Fig. II 4); palm oblique nearly to the 2/5 of posterior margin of segment 6, finely crenellated in proximal and distal part, and smooth in the middle (Fig. II 4); palm defined on outer face by one strong corner spine and 2 facial setae, on inner face appears one submarginal spine (Fig. II 4); palm provided with several slender bicuspidate spines and simple setae, dactyl like that of gnathopod 1 (Fig. II 4).

Pereopods 3—4 similar to each other, with rather dilated segment 2 bearing convex anterior margin and well visible ring-shaped Hertzog's organ (diameter of Hertzog's organ is larger than that of segments 3—6); dactyl short and stout, reaching nearly half of segment 6, and bearing 2 setae near basis of nail and nail much shorter than pedestal (Fig. III 1—3).

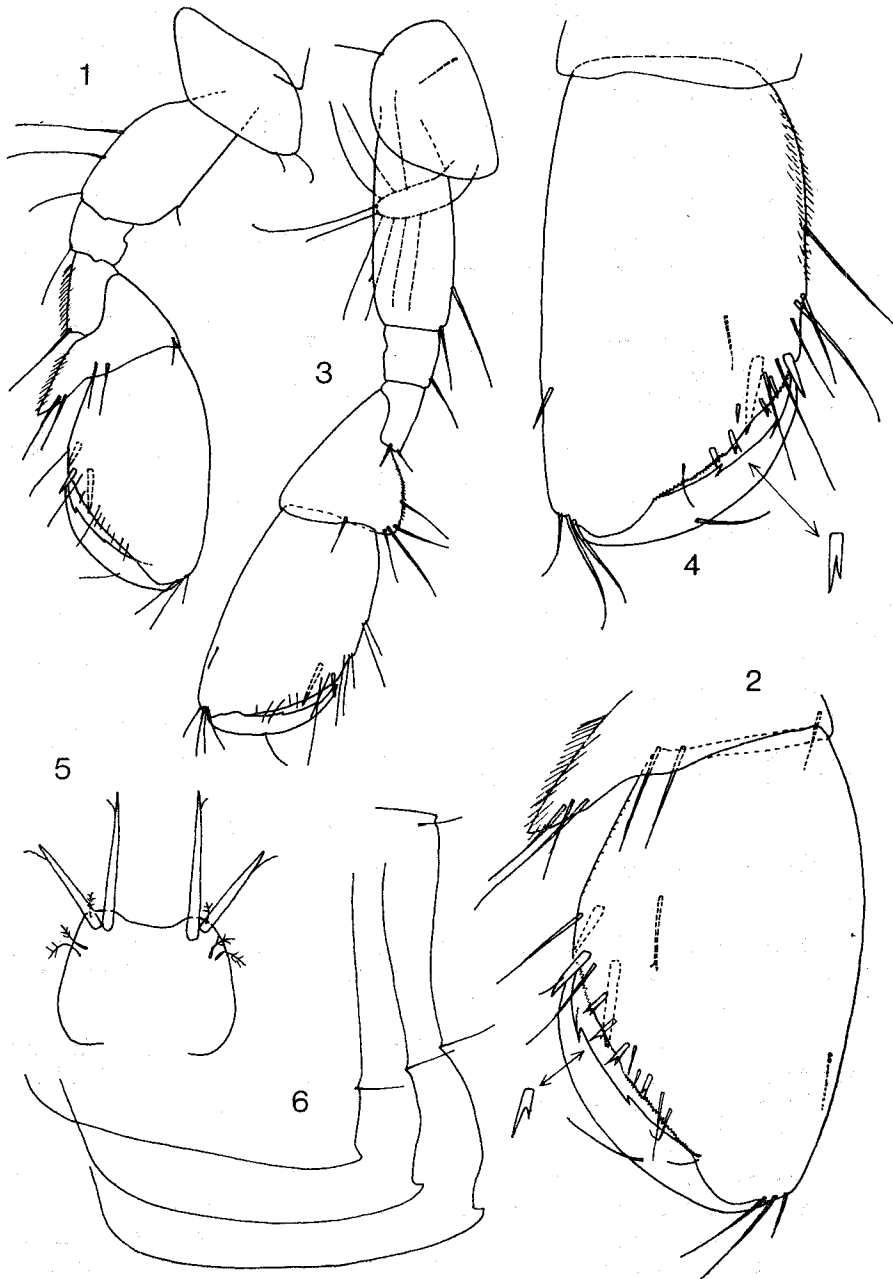


Fig. II. — *Bogidiella (Medigidiella) aquatica*, n. sp., Preveli, female 1.9 mm: 1—2) gnathopod 1; 3—4) gnathopod 2; 5) telson; 6) epimeral plates 1—3.

Pereopod 5: segment 2 dilated, less than twice as long as broad, provided along posterior margin with 3 short setae (Fig. III 4); Hertzog's organ like that of pereopods 3—4; segments 4—6 with short strong spines along posterior margin; dactyl short, hardly shorter than half of segment 6, bearing 2 setae near basis of nail and one seta at outer margin (Fig. III 4), nail much shorter than pedestal.

Pereopods 6—7 missing.

Epimeral plates 1—3 with weakly sinusoid posterior margin and with pointed ventroposterior corner, spines absent (Fig. II 6).

Pleopods 1—3 unmodified, similar to each other: peduncle smooth, bearing 2 retinacula each (Fig. III 7), without accompanied setae; inner ramus absent; outer ramus reaching 3/4 of peduncle-length, 3-segmented, each with 2 long distal setae (Fig. III 7).

Uropods 1—2 unmodified. Uropod 1: peduncle with one strong basifacial spine and 2 distal short spines (Fig. III 8); inner ramus is distinctly longer than outer ramus, bearing 5 distal spines (Fig. III 8), outer ramus with 4 distal spines (Fig. III 8).

Uropod 2: peduncle with 2 distal spines (Fig. III 8); outer ramus is shorter than inner ramus, both rami with 4 short distal spines each.

Uropod 3 missing. Telson short, broader than long (high), with shallow broad distal excavation and bearing 4 distal spines (2 longer and 2 shorter spines, longer spines exceeding the length of telson itself) (Fig. II 5); a pair of short plumose setae appears distolaterally on each side of telson, and 1 short seta at tip.

Coxal gills short, occur on pereonites 4—6 (Fig. III 3—4).

Oostegys narrow, with long marginal setae, occur on pereonites 2—5 (Fig. II 3, III 1, 4).

**Male:** Length of body 1.9 mm: like female in many characters, including unmodified pleopods 1—3 and uropod 1 (Fig. IV 5). Gnathopods like these in females.

Pereopod 5 like that in female (Fig. IV 1). Pereopod 6 is slightly longer than pereopod 5, but of the same shape, its segment 2 along posterior margin with 4 setae (Fig. IV 2), dactyl slightly exceeding half of segment 6.

Pereopod 7 is longer than pereopod 6 (Fig. IV 3), its segment 2 stouter and broader than that of pereopod 6, along posterior margin with 3 strong spines and 1 seta (Fig. IV 3), along anterior margin with 3 setae; segments 4—5 stout, with spines along both margins; segment 6 more narrow, with row of long setae along anterior margin and tip (Fig. IV 3); dactyl hardly exceeding half of segment 6, narrow, with very short nail (Fig. IV 4).

Uropod 2 slightly modified: peduncle like that in female, with 2 distal spines (Fig. IV 5, 6), but rami subequal long: inner ramus

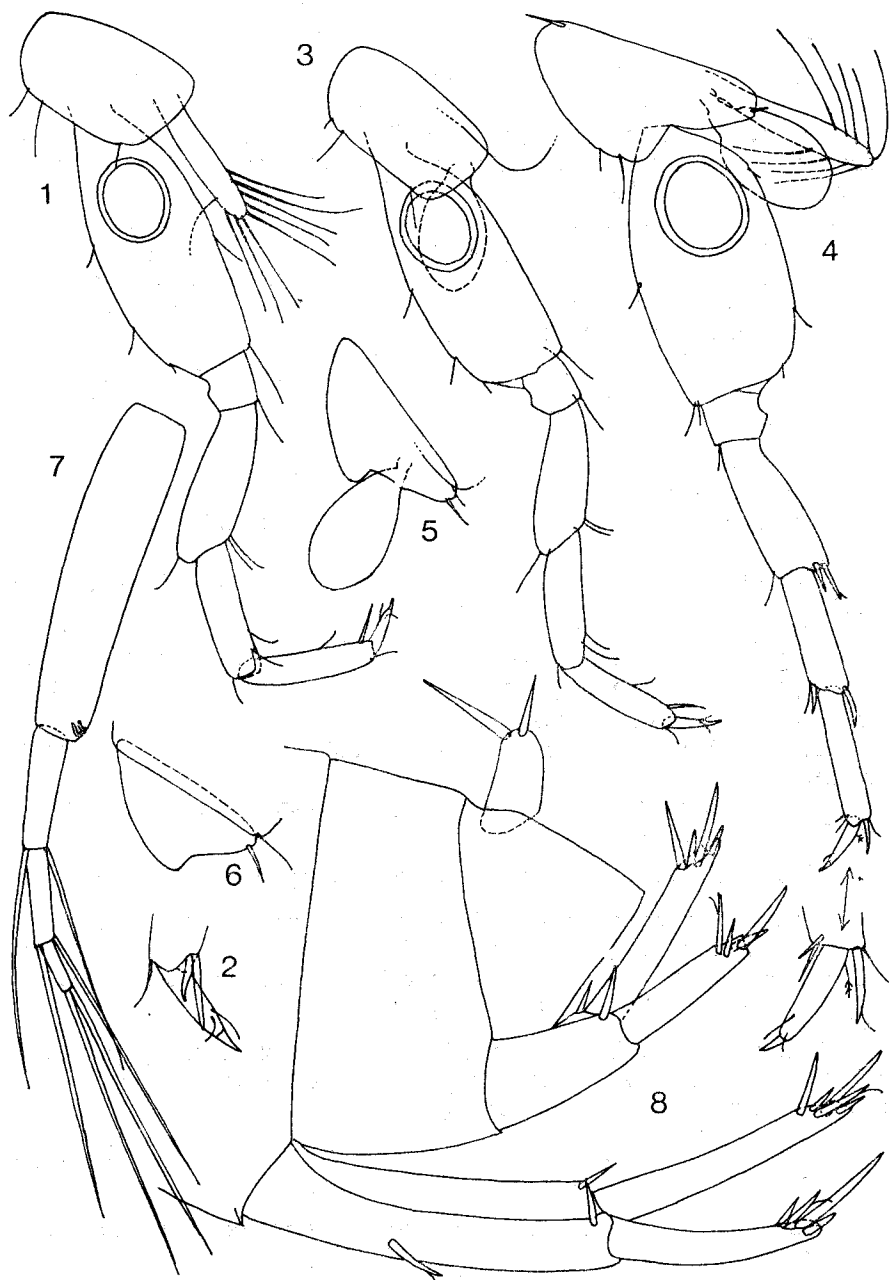


Fig. III. — *Bogidiella (Medtigiella) aquatica*, n. sp., Preveli female 1.9 mm:  
 1—2) pereopod 3; 3) pereopod 4; 5) coxa 6; 6) coxa 7; 7) pleopod 3; 8) uro-  
 some with uropods 1—2.



with 5 distal spines (one strong spine is recurved, other 4 spines are short, straight or hardly recurved, smooth) (Fig. IV 5, 6); outer ramus with 4 distal normal straight spines (Fig. IV 5, 6).

Uropod 3 missing. Telson with 4 distal unequal spines, like these in female.

**Variability:** Two specimens (females) from the same sample, were with telson provided with only 2 distal spines. At the first glance, it seems to be a different species, but one detailed analysis showed high similarity with specimens provided with 4 spines on telson: the same number of posterior long setae on segment 2 of gnathopods 1—2, similar shape of segment 6 in gnathopods 1—2 provided with palm smooth in the middle and finely serrate at proximal and distal part (Fig. V 2, 3); segment 2 of pereopods 3—6 with ring-shaped distinct Hertzog's organ (Fig. V 8, 9), similar shape of pereopods 3—6, pleopods and epimeral plates (Fig. V 8, 9, 11). Uropods 1—2 like these in holotype.

Uropod 3 with short peduncle and 2 long, hardly unequal 1-segmented rami bearing groups of long lateral and 6 distal unequal spines (Fig. V 1) (the longest distal spine reaching half of ramus — length).

Telson broader than long, with 2 long distal spines only (Fig. V 10).

Mouthparts seems to be similar to these of holotype: left mandible with 5-toothed incisor (Fig. V 4) and 6-toothed lacinia mobilis (one tooth very small) (Fig. V 5). Right mandible: incisor 5-toothed (Fig. V 6), lacinia mobilis with 2 serrate plates (Fig. V 7).

Mandibular palp segment 2 with 2 setae, palp segment 3 with 4 setae.

Labium like that in holotype, angular. Maxillae 1—2 and maxilliped like these in holotype.

The males with telson provided with 2 spines are unknown.

Because of scarce material in hand, high similarity of these specimens with specimens bearing 4 spines on telson, absence of male, we consider, for the moment, the specimens with 2 spines on telson as members of the same species, *B. aquatica*, n. sp.

The similar problem of specimens from one locality provided with 2 and 4 spines, we observed also in some other species (*Bogidiella sinica*, G. Karaman & Sket, *in press*, etc.).

**Holotype:** female 1.9 mm with setose oostegys. Holotype is deposited in KARAMAN'S Collection in Titograd.

**Loc. typ.:** Preveli, Kourtaliotiko r., 50 meters from sea, Creta island, Greece.

**Distribution:** known only from type-locality.

**Remarks and Affinities.** The new species *Bogidiella* (*Medigidiella*) *aquatica*, n. sp. is very allied to the species *Bogidiella chappuisi* and *Bogidiella minotaurus* by several taxonomic characters:

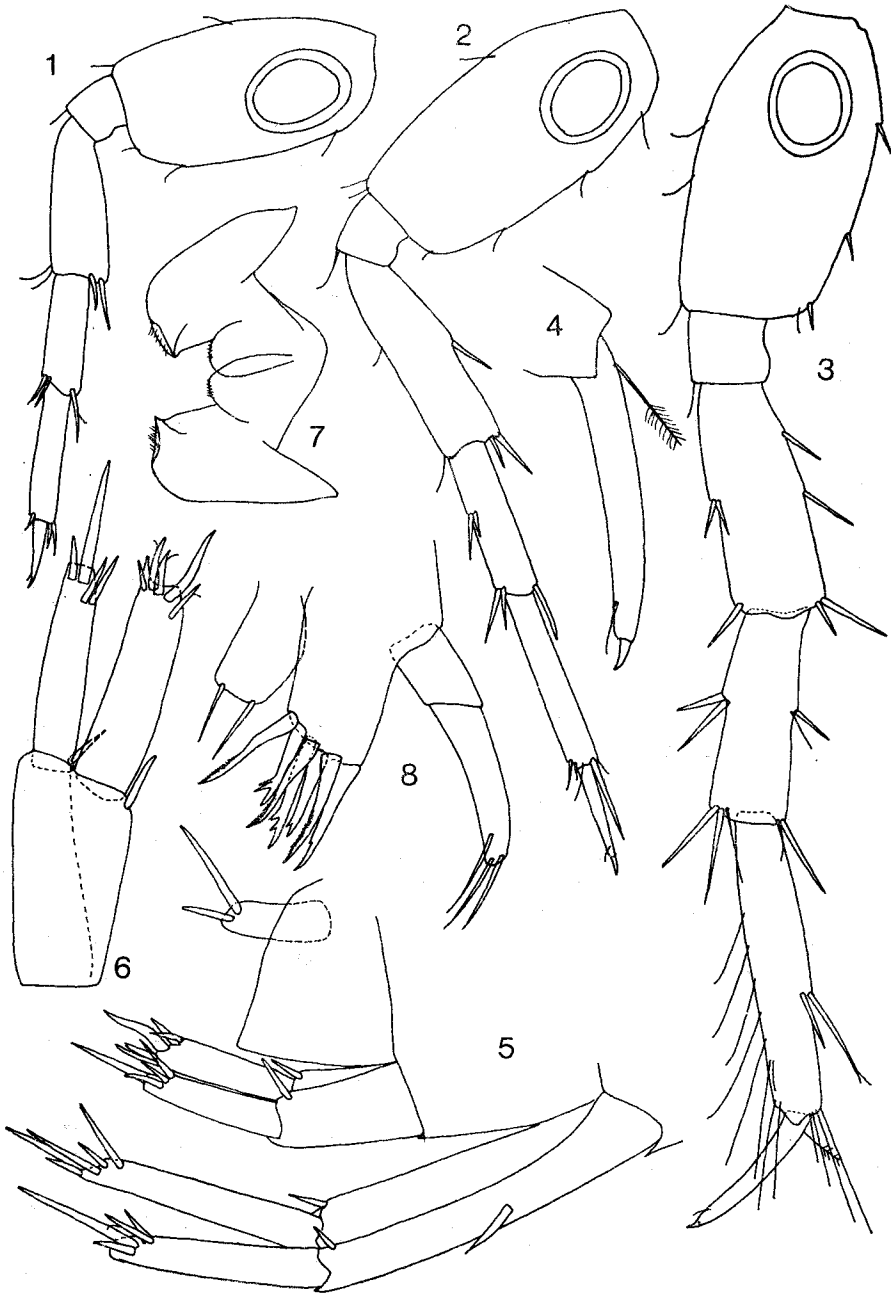


Fig. IV. — *Bogidiella (Medigidiella) aquatica*, n. sp., Preveli, male 1.9 mm:  
 1) pereopod 5; 2) pereopod 6; 3—4) pereopod 7; 5) uropods 1—2; 6) uropod  
 2; 7) labium; 8) maxilla 1.

telson with 4 unequal spines, inner plate of maxilla 1 with 2 setae, presence of Hertzog's organ, etc., but differs from them by several characters.

*Bogidiella chappuisi* Ruffo 1952, known from coastal subterranean waters of France and Italy (?) (see G. Karaman 1979), differs from *B. aquatica* by presence of only one long medial seta at posterior margin of segment 2 in gnathopod 1, by toothed modified spine on inner ramus of uropod 2 in males, etc.

The subspecies *Bogidiella chappuisi pescei* G. Karaman 1988, known from Sardinia only (females are known only), differs from *B. aquatica* by remarkably longer distal spines on uropods 1—2, by 3-segmented accessory flagellum of antenna 1, by different shape of gnathopods 1—2 bearing continuous serrate palm of segment 6, by presence of only one long medial seta at posterior margin of segment 2 of gnathopod 1, etc.

*Bogidiella minotaurus* Ruffo & Schiecke 1976, known from Creta Island (Hierapetra), agree with *B. aquatica* by telson provided with 4 unequal spines (2 longest spines are longer than telson itself) by presence of Hertzog's organ, short dactyl of pereopods 3—7, by 2-segmented accessory flagellum, by presence of 2 setae on inner plate of maxilla 1 and by shape of pleopods 1—3.

But, *B. minotaurus* differs clearly from *B. aquatica* by remarkably longer distal spines on uropods 1—2, by absence of serrate distal spine on inner ramus of uropod 2 in males, by presence of 1 long posterior medial long seta on segment 2 in gnathopod 1, by ring shaped Hertzog's organ, etc.

Bou and Ruffo (1979) mentioned from Creta the species *Bogidiella longiflagellum* S. Karaman 1959, described by S. Karaman from Macedonia (Yugoslavia). But, this species differs remarkably from *B. aquatica* by presence of only one long medial seta on segment 2 of gnathopod 1 (posterior margin), by presence of 3 setae on inner plate of maxilla 1, by presence of only 2 distal long spines on telson, by absence of Hertzog's organ, by developed inner ramus on pleopods 1—3, etc.

Bou and Ruffo (1979) described from Greece the new species *Bogidiella cerberus*, from cave Alepotrypa on Peloponesus, but this species differs from *B. aquatica* by presence of inner ramus on pleopods 1—3, by presence of 3 setae on inner plate of maxilla 1, 2 spines on telson, etc.

Bou and Ruffo (1979) mentioned from Eubea Island (Greece) the species *Bogidiella skopljensis* (S. Karaman 1933), but this last citation needs confirmation and reexamination in the light of new, very fine differences, established between various very similar, but distinct species within the genus *Bogidiella*.

Based on present taxonomy of the family *Bogidiellidae* (G. Karaman 1981, 1982; Stock 1981), *Bogidiella aquatica* belongs to

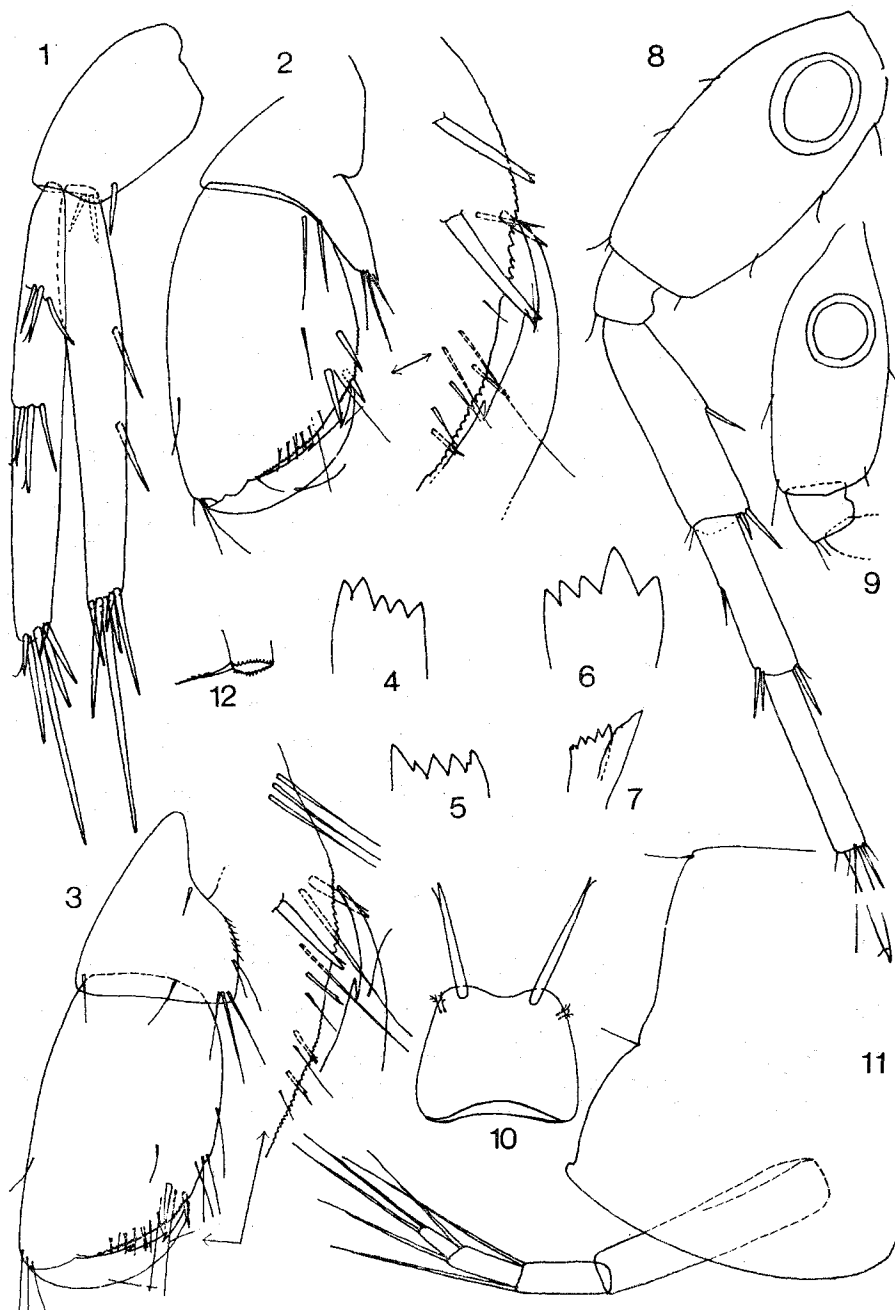


Fig. V. — *Bogidiella (Medigidiella) cf. aquatica*, n. sp., Preveli, female 1,7 mm: 1) uropod 3; 2) gnathopod 1; 3) gnathopod 2; 4) left incisor; 5) left lacinia mobilis; 6) right incisor; 7) right lacinia mobilis; 8) pereopod 6; 9) articles 2—3 of pereopod 3; 10) telson; 11) epimeral plate 3 with pleopod; 12) mandibular molar.

the subgenus *Bogidiella* (*Medigidiella*) Stock 1981 (type species: *Bogidiella chappuisi* Ruffo 1952) based on modified uropod 2 in males, although the taxonomy of the family *Bogidiellidae* must be revised.

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#### LITERATURA

- Bou, C., Ruffo, S. (1979): Contributo alla conoscenza delle *Bogidiella* di Grecia (*Crustacea, Amphipoda, Gammaridae*). — *Natura, Soc. ital. Sci. nat. Mus. civ. Storia Naturale e Acquario civ. Milano*, 70 (4), 295—309.
- Karaman, G. (1973): 54. Contribution to the Knowledge of the *Amphipoda*. On the Genus *Bogidiella* Hert. (fam. *Gammaridae*) in Yugoslavia. — *Poljoprivreda i šumarstvo, Titograd*, 19 (4), 21—53.
- Karaman, G. (1979): Contribution to the Knowledge of the *Amphipoda* 92. *Bogidiella chappuisi* Ruffo 1952 and its variability with remarks to some other species (fam. *Gammaridae*). — *Poljoprivreda i šumarstvo, Titograd*, 25 (1), 17—30.
- Karaman G. (1981): Revision of *Bogidiella*- group of genera with description of some new taxa (fam. *Gammaridae*) (Contribution to the Knowledge of the *Amphipoda* 121). — *Poljoprivreda i šumarstvo, Titograd*, 27 (3), 23—44.
- Karaman, G. (1982): Critical remarks to the recent revisions of *Bogidiella*- group of genera with study of some taxa (Fam. *Gammaridae*) (Contribution to the Knowledge of the *Amphipoda* 126). — *Poljoprivreda i šumarstvo, Titograd*, 28 (3—4), 31—57.
- Karaman, G. (1988): *Bogidiella chappuisi pescei*, new subspecies from the subterranean freshwaters of Sardinia, with remarks to some other taxa (*Gammaridea*, fam. *Bogidiellidae*) (Contribution to the Knowledge of the *Amphipoda* 184) (*in press*).
- Karaman, S. (1933): Über zwei neue Amphipoden, *Balcanella* und *Jugocrangonyx* aus dem Grundwasser von Skopje. — *Zoolog. Anzeiger*, 103 (1—2), 41—47.
- Karaman, S. (1959): Über eine neue Art und Unterart der Gattung *Bogidiella* (*Crustacea, Amphipoda*) aus Jugoslawien. — *Acta Zool. Acad. Sc. Hungaricae*, 4 (3—4), 339—348.
- Ruffo, S., Delamare-Deboutteville, C. (1952): Deux nouveaux Amphipodes souterraines de France. *Salentinella angelieri* n. sp. et *Bogidiella chappuisi* n. sp. — *C. R. Acad. Sci. Paris*, 234, 1636—1638.
- Ruffo, S., Schiecke, U. (1976): Una nuova *Bogidiella* di Creta. — *Boll. Mus. civ. St. Nat. Verona*, 3, 147—155.
- Stock, J. H. (1981): The taxonomy and zoogeography of the family *Bogidiellidae* (*Crustacea, Amphipoda*) with emphasis on the West Indian taxa. — *Bijdragen tot de Dierkunde*, 51 (2), 345—374.

**JEDNA NOVA VRSTA IZ FAMILIJE BOGIDIPELLIDAE SA OTOKA  
KRETE U GRČKOJ, BOGIDIPELLA (MEDIGIDIPELLA) AQUATICA, N. SP.**

(192. Prilog poznavanju Amphipoda)

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I z v o d

Familija *Bogidiellidae* (*Amphipoda Gammaridea*) iz podzemnih voda otoka Krete u Sredozemnom moru (Grčka) je još uvijek relativno slabo proučena. Prvi nalaz datira iz 1976 godine, kada su Ruffo i Schiecke, iz podzemnih obalnih voda kod mjesta Hierapetra, opisali novu vrstu, *Bogidiella minotaurus*, n. sp.

Kasnije su Bou i Ruffo (1979) našli na tom otoku i već rarije poznatu vrstu iz Makedonije, *Bogidiella longiflagellum* S. Karaman 1959, u bunarima u mjestu Pahia Amos na Kreti.

Istraživanja materijala podzemnih *Amphipoda*, koje je nedavno sakupio na tom otoku Dr. Boris Sket sa Univerziteta u Ljubljani (Jugoslavija), dovela su do opisa jedne nove vrste iz roda *Bogidiella* iz podzemnih voda rijeke Kourtaliotiko, cca 50 metara od mora kod mjesta Preveli, nazvane *Bogidiella (Medigidiella) aquatica*.

Ova nova vrsta, *Bogidiella (Medigidiella) aquatica*, n. sp. je po svojim taksonomskim odlikama dosta bliska vrstama *Bogidiella (Medigidiella) chappuisi* Ruffo 1952, poznate iz podzemnih voda blizu mora u južnoj Francuskoj i Italiji, i *Bogidiella minotaurus* Ruffo & Schiecke 1976, poznate iz podzemnih voda kod Hierapetra na Kreti.

Međutim, *B. aquatica* se jasno razlikuje od obje ove vrste po posebnom obliku distalnog trna na unutrašnjoj grani drugog uropoda kod mužjaka, po drugačijem broju dugih srednjih dlaka na stražnjem rubu drugog segmenta prvog i drugog gnatopoda, itd.

Druge dvije vrste iz roda *Bogidiella*, poznate iz Grčke, *Bogidiella longiflagellum* S. Karaman 1959 (Bou & Ruffo 1979 je navode za otok Kretu i nekoliko drugih lokaliteta u Grčkoj) i *Bogidiella cerberus* Bou & Ruffo 1979 (poznate iz pećine Alepotrypa na Peloponezu) se znatno razlikuju od *B. aquatica* nizom karaktera, kao i treća vrsta, *Bogidiella skopljensis* (S. Karaman 1933) (Bou & Ruffo je navode za otok Eubeju u Grčkoj).