

Netherlands biospeleological explorations in Turkey, 2

## First records of the family Microparasellidae in Turkey, and description of two new species of the genus *Microcharon* Karaman (Crustacea Isopoda: Janiroidea)

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### Abstract

A collection of microparasellid isopods from springs, hyporheic and phreatic habitats of Turkey has been studied. Two new species, belonging to the genus *Microcharon* Karaman, are described, viz.: *M. anaticus* n. sp. and *M. lydicus* n. sp.. New localities are reported for the species *M. ullae* Pesce, 1981, up to now only known from Greece (Rhodes).

A map with the distribution of the species of the genus *Microcharon* in Turkey is provided.

### Résumé

Deux nouvelles espèces du genre *Microcharon* Karaman (Isopoda: Microparasellidae) sont décrites des eaux souterraines de Turquie. Il s'agit de *M. anaticus* n. sp. et *M. lydicus* n. sp.. Plusieurs nouvelles stations sont mentionnées pour l'espèce *M. ullae* Pesce, 1981, et une carte de la distribution des espèces de *Microcharon* de Turquie est présentée.

Recent biospeleological research in different types of ground water of south-west Anatolia (Turkey), carried out from May to June 1987 by the biospeleological group "Speleo Nederland" (Amsterdam, Netherlands), yielded, besides other terrestrial and aquatic fauna, some samples of microparasellid isopods from springs, wells and hyporheic habitats of that country.

This material was entrusted to us for identification through the kindness of Ir. J. Notenboom, Institute of Taxonomic Zoology, University of Amsterdam, to whom we express our sincere thanks.

Three species, belonging to the genus *Microcharon* Karaman, which is for the first time recorded from Turkey, have been identified, viz.: *M. anaticus* n. sp., *M. lydicus* n. sp. and *M. ullae* Pesce, the latter up to now known only from island of Rhodes (Greece). One sample, lacking in males and mature females, is provisionally recorded as *Microcharon* sp.

Type-material preserved in the collections of the Zoölogisch Museum of the University of Amsterdam, The Netherlands (ZMA) and in the senior author's collections (GPC) at the "Dipartimento di Scienze Ambientali", University of L'Aquila (Italy).

### List of stations and species

Station 87-5/6: Izmir, well about 1 km East of the mosque of Siğacik, 90 m West of the road to Seferihisar. *Microcharon anaticus* n. sp.

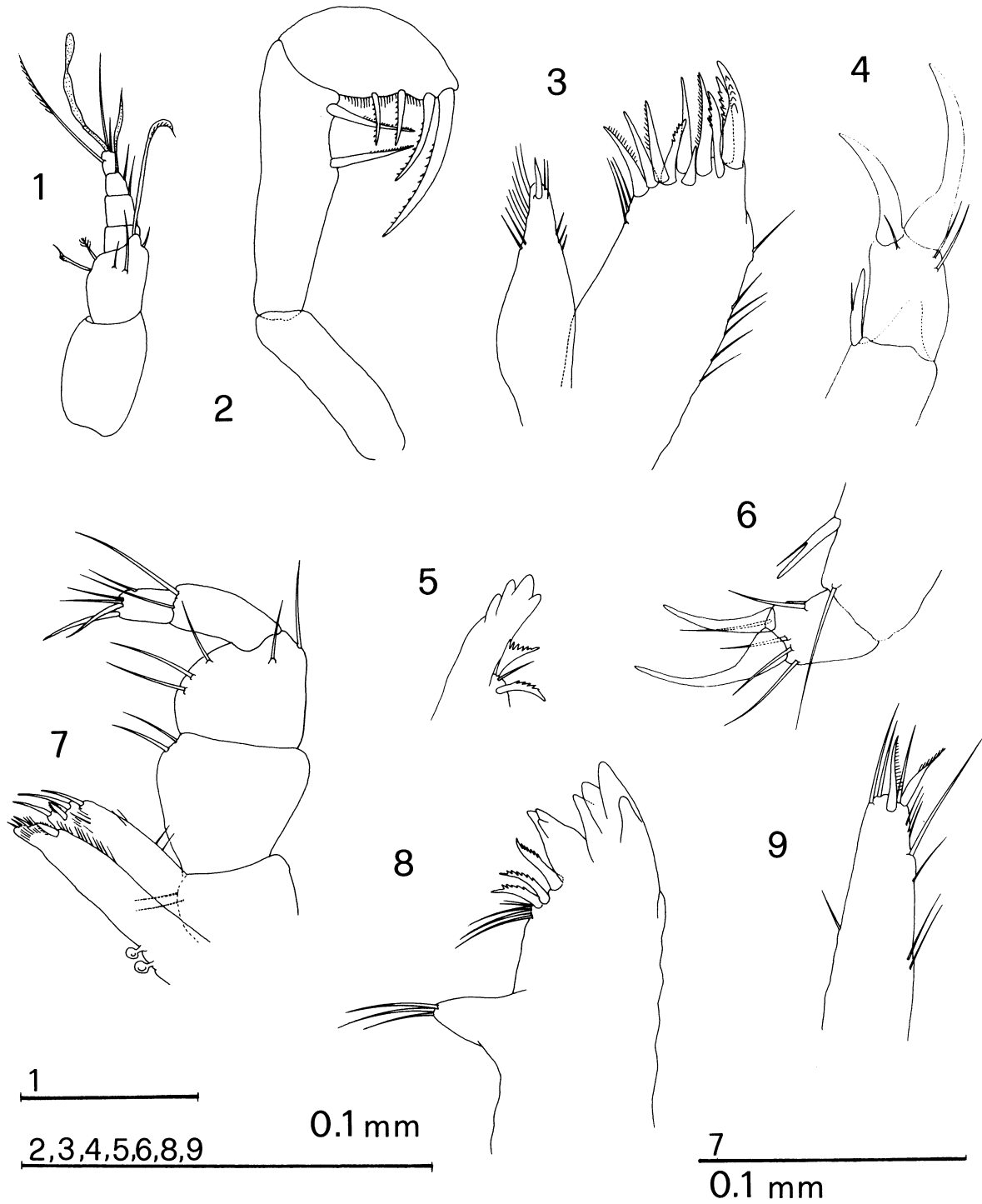
Station 87-5/11: Izmir, well about 400 m North of "Haritacilar", 7.5 km North of Doğanbey. *Microcharon anaticus* n. sp.

Station 87-5/18: Muğla, hyporheic habitat of Kemiş Cayi river, near the crossing with the road 330 to Milas. *Microcharon ullae* Pesce 1981.

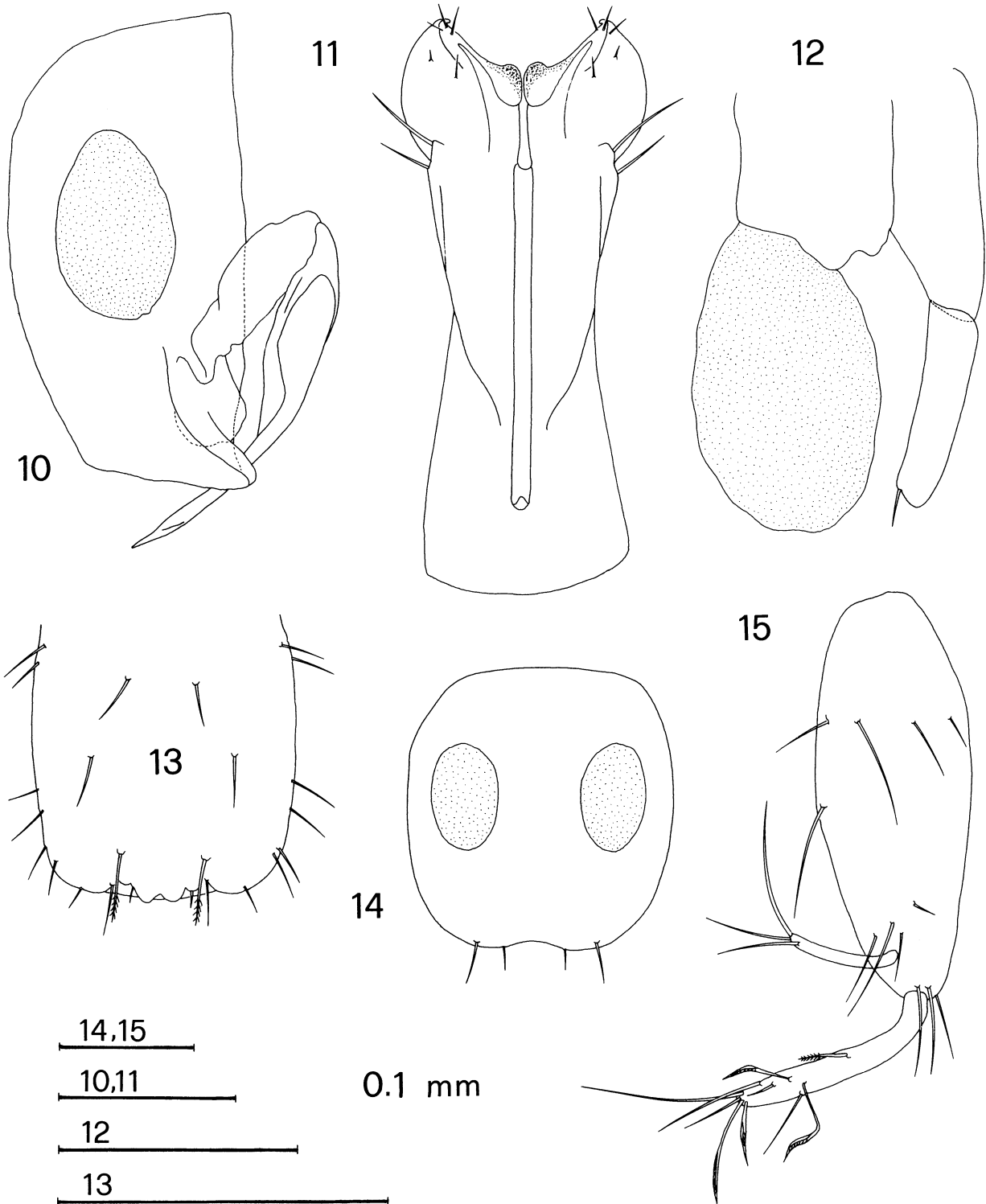
Station 87-5/33: Izmir, hyporheic habitat of Derebağaz river, 6.5 km upstream of Gümüşsu. *Microcharon ullae* Pesce 1981.

Station 87-5/36b: Muğla, submarine freshwater springs, 2 km South-West of "Güvercenlik", north of the road Milas-Bodrum. *Microcharon ullae* Pesce 1981.

Station 87-6/1: Antalya, hyporheic habitat of Karpuzçay river, 5.5 km East of Kisilot. *Microcharon lydicus* n. sp.



Figs. 1–9. *Microcharon anatolicus* n. sp., holotype: 1, first antenna; 2, mandibular palp; 3, first maxilla; 4, 7th pereopod, dactylus; 5, right mandible, pars incisiva; 6, first pereopod, dactylus; 7, maxilliped; 8, left mandible; 9, second maxilla, inner endite.



*Figs. 10–15. M. anatolicus* n. sp., holotype (10–13), allotype (14–15): 10, second pleopod; 11, first pleopod; 12, third pleopod; 13, telson; 14, second pleopod; 15, uropod.

Station 87-6/18a: Antalya, hyporheic habitat of Göynük river, 9 km North of Kemer. *Microcharon* sp.

Station 87-6/33: Konya, well North of the road to Bozkir, about 17 km East of Seydişehir. *Microcharon lydicus* n. sp.

Station 87-6/34: Konya, well East of the road to Hadim, about 3 km South of Bozkir. *Microcharon anatolicus* n. sp.

### ***Microcharon anatolicus* n. sp. (Figs. 1–15)**

Material. – 1 ♂ (holotype), 1 ♀ (allotype), completely dissected and mounted on slides in Faure's medium (GPC nn. Mch. 123–124), Izmir, freshwater well about 1 km East of the mosque of Siğacık, 90 m West of the road to Seferihisar, 15 May 1987, UTM coordinates MC 8227, 10 m a.s.l. (type-locality). 1 ♀ (paratype), mounted as above (ZMA Is. 105424). Izmir, well about 400 m North of "Haritacilar", 300 m from the sea coast (7.5 km North of Doğanbey), 16 May 1987, UTM coordinates MC 8423 (sea level). 1 ♀, mounted as above (GPC n. Mch. 125). Konya, freshwater well just East of the road to Hadim, about 3 km South of Bozkir, 14 June 1987, UTM coordinates VG 3313, 1150 m a.s.l.

Description. – Body length (excluding first and second antennae and uropods) 2.3 mm (holotype), 1.8–1.9 mm (paratypes). Cephalosome slightly longer than wide. Pleon consisting of one pleonite and a short pleotelson (length/width ratio: 1.01–1.03) with bilobed distal margin; armature as in Fig. 13.

Antenna 1, 6-segmented; distal and subdistal segments, each with single aesthetasc; aesthetasc on segment 2, long, well overreaching the distal segment; other armature as in Fig. 1. Antenna 2, flagellum 7-segmented, exopod consisting of a strong scale armed with 2 subdistal setae.

Left mandible, lacinia mobilis with 3 subconical teeth; pars incisiva with 4 strong teeth; pars molaris with 3 long naked setae; remaining armature as in Fig. 8. Right mandible differs in lacking lacinia mobilis; armature as in Fig. 5. Mandibular palp, 3-segmented, segment 2 longest (1.35–1.40 times longer than first segment), bearing 2 subdistal fringed spines on outer margin; segment 3, median margin convex, armed with 1 strong distal and 3 subdistal fringed spines, and a row of thin "cilia" along the outer margin.

Maxilla 1, inner ramus slender, with one strong distal spine and simple distal and subdistal setae; outer ramus with 10–11 strong, apical spines (4

finely pectinate, 3 denticulate, 3–4 naked). Maxilla 2, inner ramus with 2 pectinate spines and several simple setae; lobes of outer ramus each with 4 simple setae.

Maxilliped, endite with 3 distal long setae, 2 stout spines and several "cilia"; palp, segments 2 and 3 expanded, armature as in Fig. 7.

Pereopods similar in shape and length, showing some differences in the armature: pereopod 1, dactylus bearing 2 strong apical spines and 5 subdistal setae; pereopods 2 to 7, dactylus with 2 strong spines distally, and 3 subdistal setae.

Male pleopod 1, bilobed, distally enlarged; armature consisting of 5 distal and 2 longer subdistal setae in each lobe.

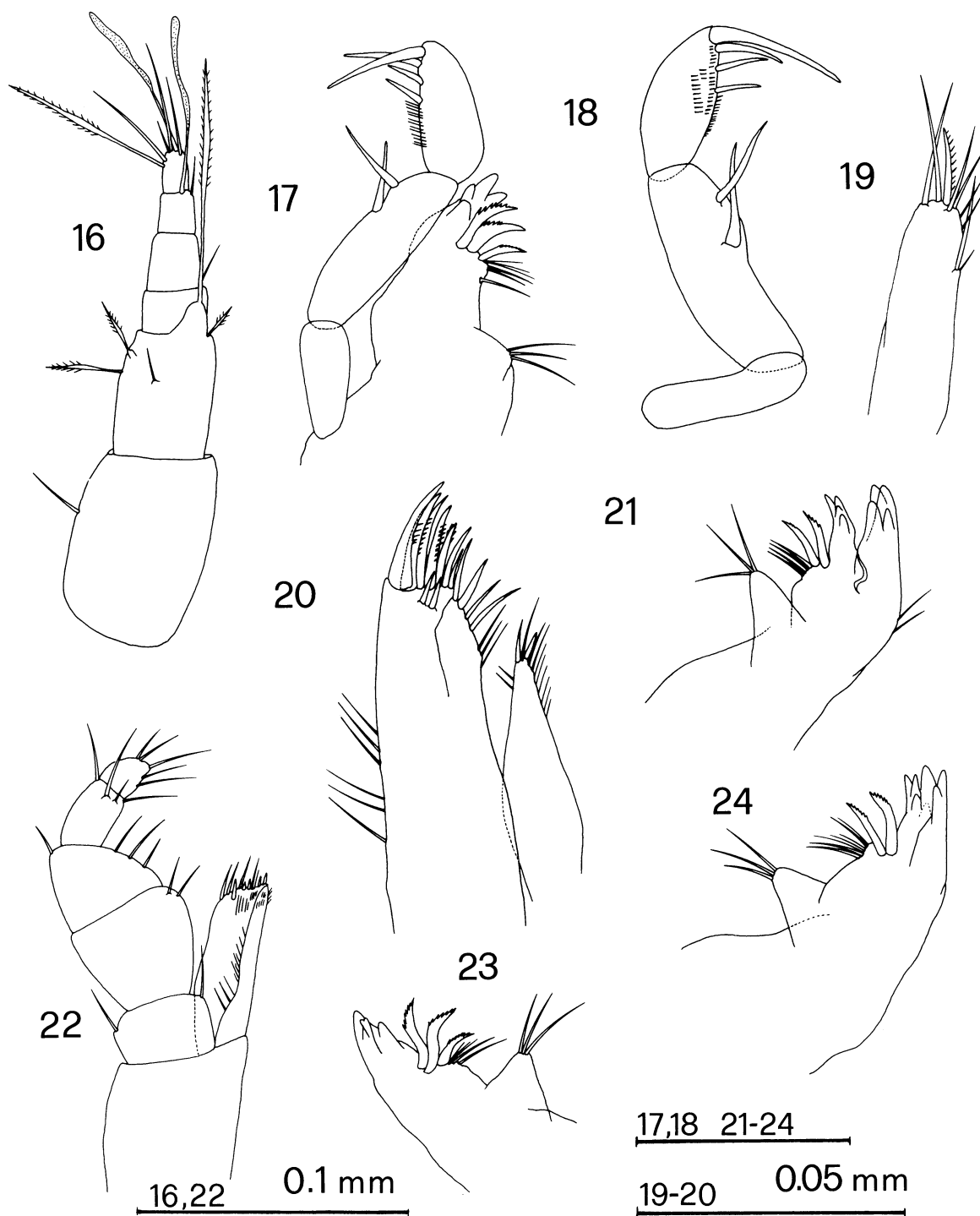
Male pleopod 2, sympodite not much enlarged (length/width ratio: 1.89), with subparallel margins; endopod long, recurved, overreaching the corner of sympodite; exopod reduced to a small subovoidal lobe.

Female pleopod 2, about as long as wide, armed with 4 distal setulae.

Pleopods 3 and 4 not sexually dimorphic: pleopod 3, exopod shorter than endopod, bearing short subdistal seta; pleopod 4 consisting of naked, 1-segmented rudiment.

Uropods, sympodite slender (length/width ratio: 2.65–2.71), tapering posteriorly; exopod and endopod reduced, much shorter than sympodite; armature as in Fig. 15.

Affinities. – Recently, Pesce & Galassi (in press) suggested the existence of an intermediate group between marine and freshwater species and subspecies of the genus *Microcharon*, comprising taxa combining the following morphological characteristics; antenna 1 6-segmented, maxillae 1 and 2 with pectinated or denticulate elements, pereopods with rather elongated unguli, female pleopod 2 with or without distal setulae and pleopod 3 without distal setae. *M. anatolicus* n. sp., on account of its ecology and morphological characteristics, fits quite well the primitive (thalassoid) lineage (Pesce & Galassi, in press) of the nominate group, being most closely related to *M. othrys* Argano & Pesce, 1979, reported from Greece, due to the similar construction of male first and second pleopods, and the



*Figs. 16–24. Microcharon lydicus* n. sp. (16; 18–23); *Microcharon ullae* Pesce & Tetè 1978 (17; 24): 16, first antenna (holotype); 17, right mandible (paratype); 18, mandibular palp (holotype); 19, second maxilla, inner endite (paratype); 20, first maxilla (paratype); 21, left mandible (holotype); 22, maxilliped (holotype); 23, right mandible (holotype); 24, left mandible (paratype).

morphology of uropods. Moreover, judging from the general appearance of the same pleopods and the morphology and armature of female second pleopod, the new species shows also some resemblance to *M. major* Karaman, 1954 and *M. profundalis profundalis* Karaman, 1940, both from ground waters of Yugoslavia.

From all these species, as well as from the others in the same group, *M. anatolicus* n. sp. differs markedly by the original morphology and armature of the first male pleopod, and in having short antennal flagellum, 2 pectinated setae on the inner endite of the second maxilla, less elongated female second pleopod and different construction and armature of the third pleopod.

***Microcharon lydicus* n. sp.** (Figs. 16; 18–23; 25; 27–32)

Material. – 1 ♂ (holotype), 1 ♀ (allotype), 1 ♂ and 2 ♀ ♀ (paratypes), completely dissected and mounted on slides in Faure's medium (GPC nn. Mch. 131–135), Antalya, hyporheic habitat of Karpuzçay river, 5.5 km East of Kisilot (15 km East of Manavgat), 2 June 1987, UTM coordinates UF 7665, 20 m a.s.l. (type-locality). 2 ♂ ♂, 2 ♀ ♀, mounted as above (1 ♂ and 1 ♀ in ZMA Is. 105424; remaining paratypes in GPC nn. Mch. 136–137), Konya, well North of the road to Bozkir, about 17 km East of Seydişehir, 14 June 1987, UTM coordinates VG 1238, 100 m a.s.l.

Description. – Body length (excluding antennae, antennulae and uropods) 1.60 mm (holotype), 1.64 mm (male paratype), 1.73–1.75 (female paratypes). Cephalosome longer than wide. Pleon consisting of 1 pleonite; pleotelson as long as wide; armature as in Fig. 30.

Antenna 1, 6-segmented; distal and subdistal segments, each with single aestheasc; aesthetasc on segment 2, long, well overreaching distal segment; other armature as in Fig. 16. Antenna 2, lacking flagellum in all specimens; exopodal scale armed with 2 subdistal setae.

Left mandible: lacinia mobilis with 4 small subconical teeth; pars incisiva with 4 strong rounded teeth; pars molaris consisting of conical elongated protrusion, armed with 3 long naked setae; remaining armature as in Fig. 21. Right mandible differs in lacking lacinia mobilis; armature as in Fig. 23. Mandibular palp, 3 segmented, segment 2 longest

(1.34–1.36 times longer than first segment) and bearing 2 subdistal naked spines on outer margin; segment 3, median margin convex, armed with 1 strong apical and 3 smaller subapical spines, and some rows of thin "cilia" along the outer margin.

Maxilla 1, inner ramus slender, armed with 2 distal spines, 1 long distal seta and some shorter subdistal setae; outer ramus with 9–10 strong distal spines (3–4 pectinated); 2 smaller subdistal spines and some long setae on both inner and outer margins.

Maxilla 2, inner ramus with apical pectinate element, other armature as in Fig. 19; lobes of outer ramus, each with 4–5 simple setae.

Maxilliped, with slender naked epipodite; endite armed with 4–5 distal small spines and some setae and cilia; palp segments 2 and 3 expanded, armature as in Fig. 22.

Pereopods rather similar in shape, but differences in armature, viz.: pereopod 1, dactylus bearing 2 strong apical spines and 6 subdistal naked setae; pereopods 2 to 7, dactylus armed with 2 strong distal spines and 3 subdistal naked setae.

Male pleopod 1, bilobed, deeply cleft; armature consisting of 3 long and 1 short apical setae, and 3 long subdistal setae.

Male pleopod 2, sympodite slightly enlarged (length/width ratio: 1.92–1.97), with rounded outer margin; endopod long, not recurved, with filiiform distal part; exopod consisting of large rounded lobe.

Female pleopod 2, about as long as wide, armed with 2 distal setulae.

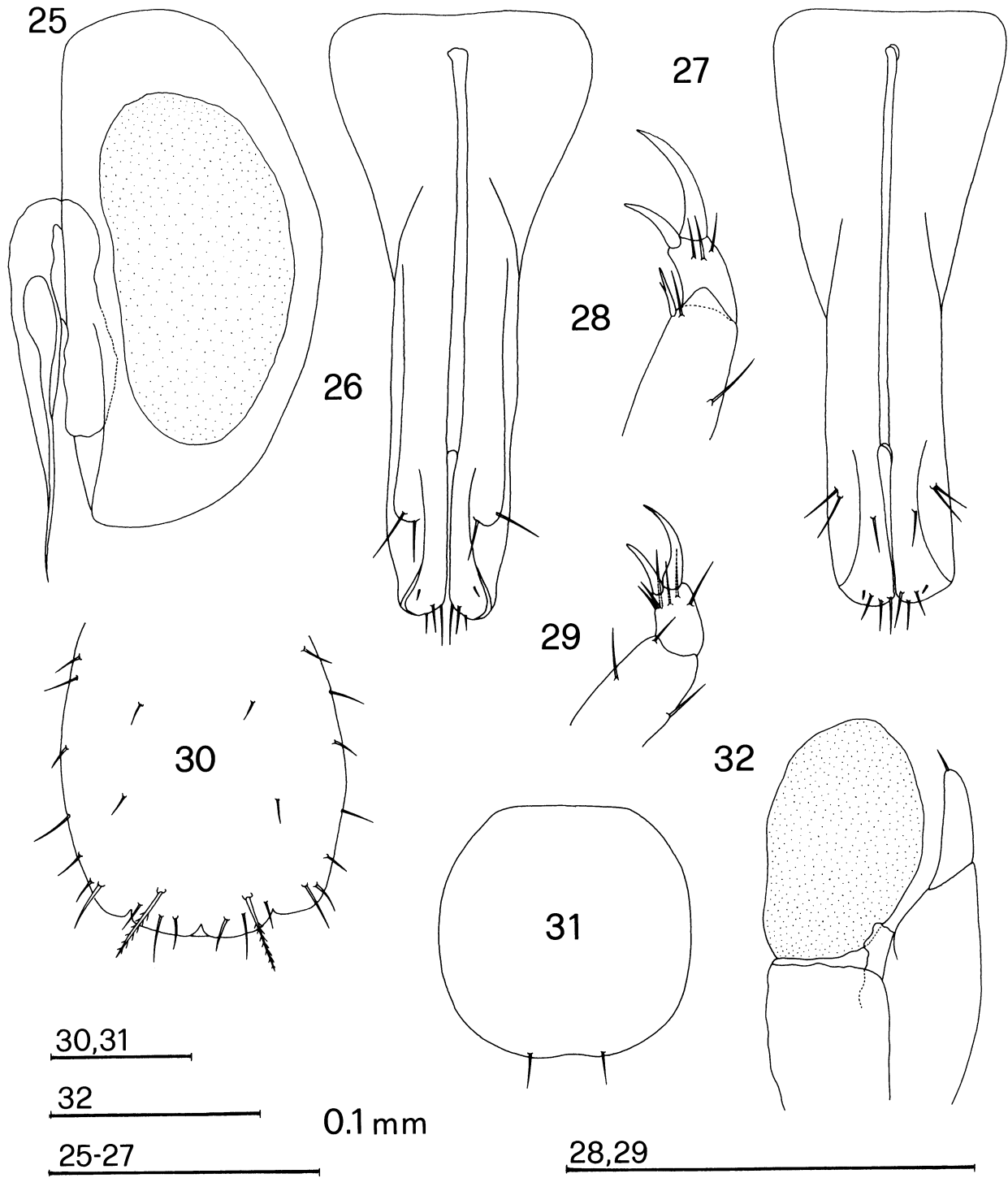
Pleopods 3 and 4 not sexually dimorph. Pleopod 3, exopod much shorter than endopod, with 1 distal short seta; pleopod 4 consisting of naked, 1-segmented rudiment.

All specimens lacking uropods.

Etymology. – Specific epithet after the ancient Lydian Kingdom.

Affinities. – *M. lydicus* n. sp., like the above-described *M. anatolicus* n. sp., fits the "thalasoid" group of species of *Microcharon* (sensu Pesce & Galassi, in press).

Within this group, the present new species resem-



*Figs. 25–32. M. lydicus* n. sp. (25; 27–32); *M. ullae* (26): 25, second pleopod (holotype); 26, first pleopod (paratype); 27, first pleopod (holotype); 28, 7th pereopod, dactylus (paratype); 29, first pereopod, dactylus (paratype); 30, telson (paratype); 31, second pleopod (allotype); 32, third pleopod (allotype).

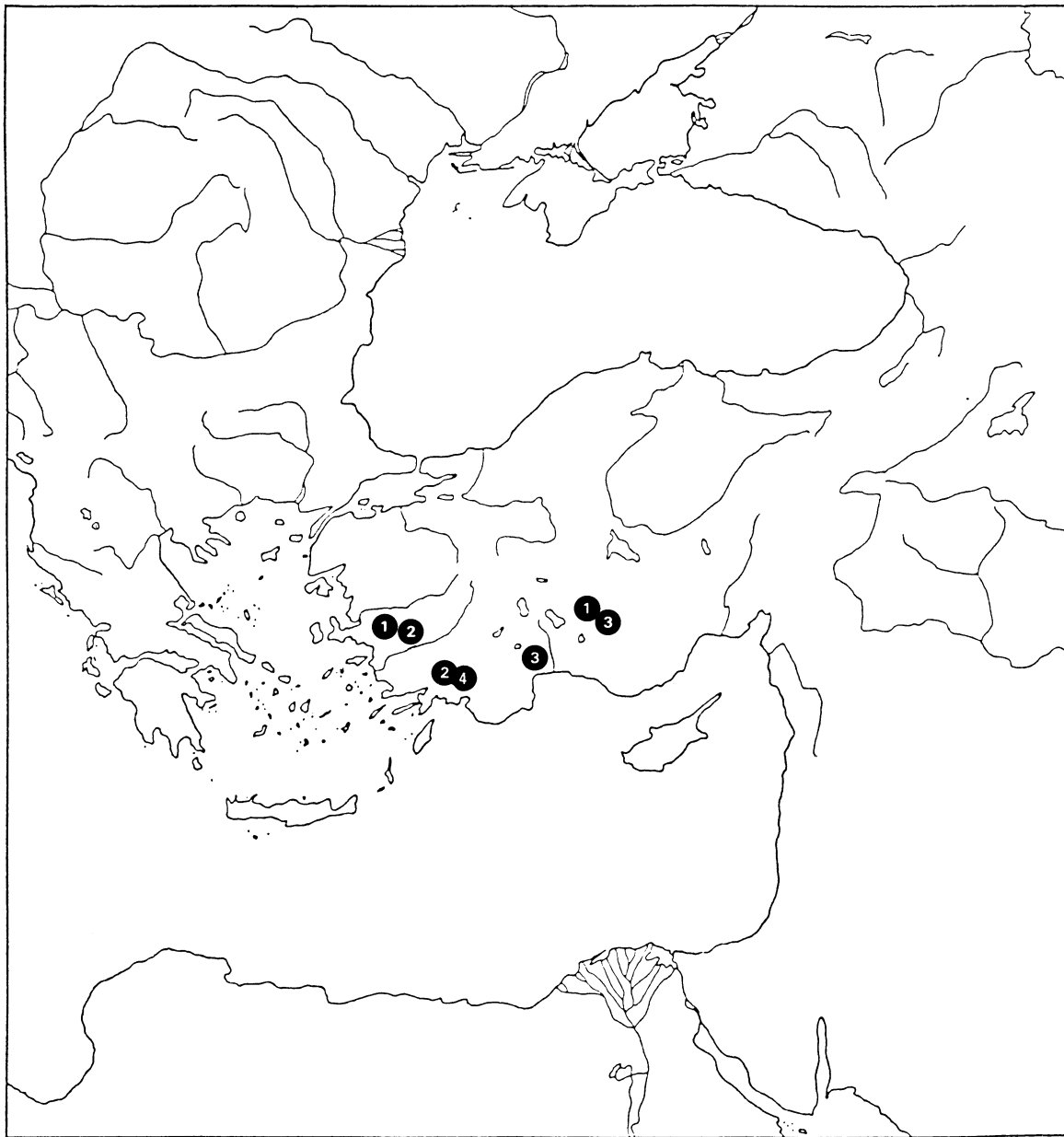


Fig. 33. Map of distribution of the genus *Microcharon* in Turkey: 1, *M. anatolicus* n. sp; 2, *M. ullae* Pesce 1981; 3, *M. lydicus* n. sp; 4, *M. sp.*

bles most *M. hispanicus* Pesce & Galassi (in press) and *M. karamani* Pesce & Tetè, 1978, recorded from ground waters of Spain and Algeria; with the former it shares the armature of second maxilla, which, respectively bears a strongly pectinated element on inner ramus, the morphology and armature of mandibular palp, and the similar construc-

tion of both first and second male pleopods; with the latter, the presence of a pectinate seta on the inner endite of second maxilla, the same construction and armature of the mandibular palp and the morphology and ornamentation of female pleopod 2.

From the above species *M. lydicus* n. sp. differs considerably by the armature of first maxilla, the



original morphology of male first pleopod and the shortness of the exopod of third pleopod.

**Microcharon ullae** Pesce 1981 (Figs. 17; 24; 26)

Material. – 1 ♂, 1 ♀ (topotypes), completely dissected and mounted on slides in Faure's medium (GPC nn. Mch. 118–119), Rhodes, freshwater well along the main road Rhodes-Kamiro, at Paradission. 1 ♂, 2 ♀♀, mounted as above, 3 ♀♀, preserved in alcohol 70° (GPC nn. Mch. 120–122), Muğla, freshwater springs in litoral sub-marine, 2 km S.W. of "Güvercenlik" 12 km SSW of Güllük, north of the road (Milas-Bodrum, 18 May 1987, UTM coordinates NB 5110 (sea level). 1 ♂, 1 ♀, mounted as above (GPC nn. Mch. 121–122), Muğla, hyporheic habitat of Kamyş Cayı river, near the crossing with the road 330 to Milas, 900 m West of Yatağan, 18 May 1987, UTM coordinates NB 9834, 400 m a.s.l. (temperature of interstitial water: 18.8°C; temperature of river: 19.8°C). 4 ♂♂, 1 ♀, mounted as above (GPC nn. Mch. 126–130), Izmir, hyporheic habitat of Derebağaz river, 6.5 km upstream of Gümüşsu (= 18 km ENE of Doğanbey), 16 May 1987, UTM coordinates NCO 619, 10 m a.s.l.

*Microcharon ullae* was originally described by Pesce (1981) without particular attention to mouthparts and male first pleopod. The present record of the species in Turkey, as well as the availability of some topotypical material, let us to define better the systematic status of this species. The rather concise description, given below, deals exclusively with the overlooked characters.

Left mandible, lacinia mobilis with 3 subconical teeth; pars incisiva with 4 rounded teeth; pars molaris consisting of protuberance armed with 3 naked setae; between lacinia mobilis and pars molaris there are 2 fringed spines and 7–8 naked setae. Right mandible lacking lacinia mobilis; pars in-

cisiva consisting of 4 teeth; between pars incisiva and pars molaris there are 3 fringed strong spines and 6–7 slender setae; pars molaris as in left mandible, but more protruding. Mandibular palp, 3-segmented, segment 2 longest (1.65–1.68 times longer than first segment), bearing 2 subdistal fringed spines on outer margin; segment 3, median margin convex, armed with 4 fringed spines and a row of "cilia" on the outer margin.

Maxilla 2, inner ramus with 1 pectinated seta and 3 simple setae distally, and some "cilia" on both inner and outer margins.

Male first pleopod bilobed, elongated (length/width ratio: 2.35–2.45), armed with 4 distal and 2 subdistal long setae (Fig. 26).

**Microcharon** sp.

Material. – 1 ♀, completely dissected and mounted on slide in Faure's medium (GPC nn. Mch. 138), Antalya, hyporheic habitat on the beach at the mouth of Göynük river, 9 km North of Kemer, 9 June 1987, UTM coordinates TF 8261.

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