

**THE FIRST MICROPARASELLID FROM
SUBTERRANEAN WATERS OF IRAN,
MICROCHARON RAFFAELLAE
N. SP. (CRUSTACEA, ISOPODA)**

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ABSTRACT

During research on the fauna of the underground phreatic systems of Iran, promoted by the Zoological Institute of the University of L'Aquila (Italy), a fairly large number of isopods of the family Microparasellidae were obtained from some fresh-water wells in the Highland of Isfahan.

These records are noteworthy and of some systematic and biogeographical value as, till now, no representatives of this family had been reported from this region.

All the collected material belongs to a new species of the genus *Microcharon* Karaman 1933, which is described here.

MICROCHARON RAFFAELLAE n. sp. (*)

MATERIALS.

Holotype (♂), allotype (♀), 2 ♂♂ and 8 ♀♀ (paratypes), preserved in alcohol and glycerol, from a fresh-water well (n. IR/41), among the houses of the Village of Cialestore (Shahr-E-Kord), 20 May 1978, coll. RAHIM; 2 ♂♂ and 1 ♀, completely dissected and mounted on coverslips with Faure solution, from a fresh-water well (n. IR/17) in Shahr-E-Kord, along the Palavi Road, 19 September 1977, coll. PACE and RAHIM;

(*) In honour of Miss. Raffaella PACE who collected the new species.

2 ♂♂, 18 ♀♀ and some late embryonic stages (st. II and III according to COINEAU, 1971), preserved in alcohol and glycerol, from some fresh-water wells (nn. IR/19, IR/26, IR/39) in Shahr-E-Kord, along the Boulevard Dashghari, 20 September 1977, coll. PACE and RAHIM. Holotype, allotype and a series of 10 paratypes preserved at the « Museo Civico di Storia Naturale di Verona », Verona, Italy; other material preserved in the collections of the author, at the Zoological Institute of the University of L'Aquila, Italy.

DESCRIPTION.

Body completely unpigmented and blind; body length (i.e. excluding antennules, antennae and uropods) 1.12-1.35 mm in the males, 1.30-1.62 mm in the females; corresponding mean body width 0.15-0.16 mm, which is about 1/10 of the length. Cephalosome about as long as wide ($L/l = 0.90-0.92$). Thoracic segments slightly larger than long. Pleotelson subquadrangular, longer than large ($L/l = 1.25-1.26$) and armed with 6 setae of different length on the distal margin and 3-4 setae on each lateral margin.

Antennula 5-segmented; the first segment is both longer and larger than following ones and is armed with 1 naked seta; segment 2 bears distally, implanted on a marked protuberance, a plumose seta reaching over the segment 5, and laterally 2 aesthete-like elements; segment 3 with a short, naked seta; segment 4 with an aesthete and 1 simple seta; segment 5 bears apically a very heavy aesthete, 3 simple setae, 1 aesthete-like element and, laterally, a short aesthete.

Second antenna with a 1-segmented exopod, armed with 2 slender lateral setae; flagellum with 8-9 elongate segments.

Mouthparts, excluding the second maxilla, without marked differences as compared to those of the other fresh-water species of the genus. Second maxilla bears 3 arthrites of about the same length; the outer one and the central one each with 4 apical setae of different length, and a row of 4-5 small setulae near the base; the medial arthrite bears apically 3 setiform spines and 3 setae of different length; laterally there are a long seta and a row of 13-14 hair-like setules.

The pereopods, rather similar in shape, are more elongated than in the other fresh-water species of the genus and with some differences in the armature. Dactylus bears 2-4 setae and 2 long claws, the longer one about twice as long as the dactylus. Pereiopod

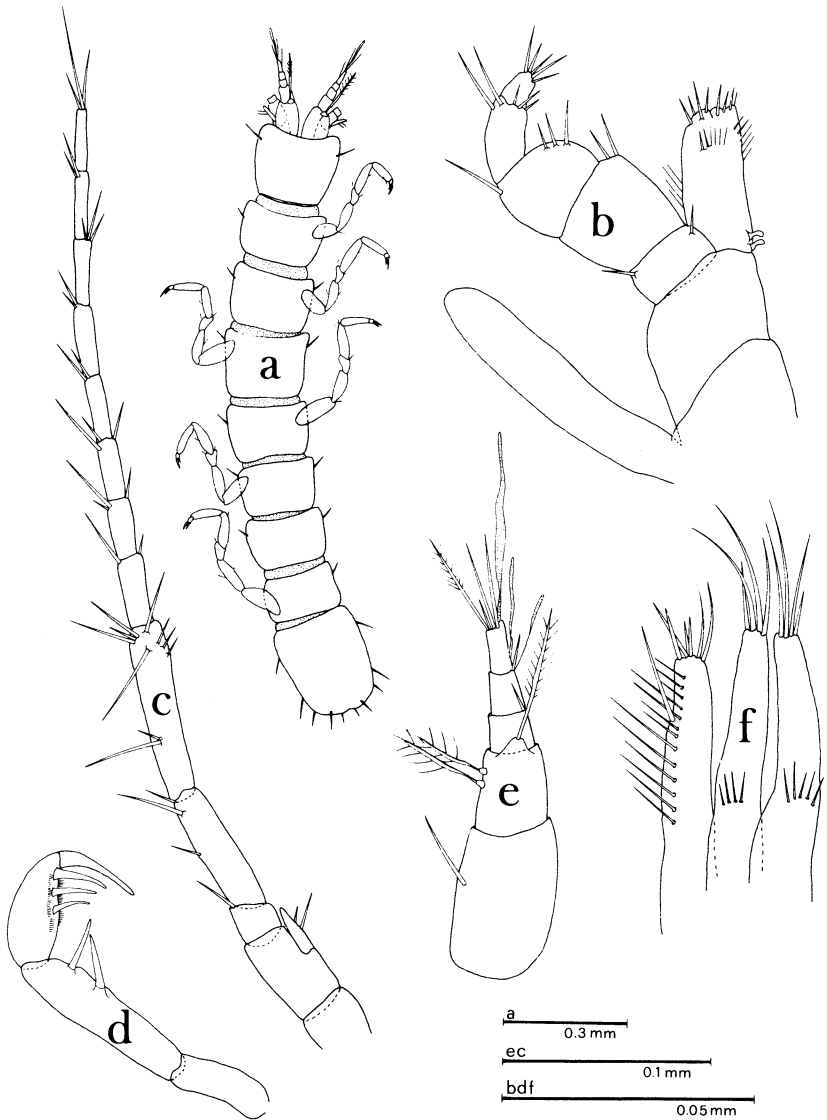


FIG. 1. — *Microcharon raffaellae* n.sp. a : body, dorsal view; b : maxilliped; c : second antenna; d : mandible, palp; e : first antenna; f : maxilla 2.

1 with the posterior margin of the propodus armed with a row of stiff cilia, one stout spine and a slender seta; basis of the pereopods 2-6 armed with a long plumose seta on the anterior margin, basis of pereopods 1 and 7 armed with naked setae only.

Male. First pleopod consisting of two subparallel coalescent halves, slightly wider at the basis than at the distal margin ($L/l = 1.55-1.62$) and apically truncated; each half is armed with two long apical inner setae and 4 shorter subapical setae.

Pleopod 2 with sympod elongated and subovoidal, with rounded distal corner; endopod recurved, with distal part remarkably pointed and slightly overreaching the distal corner of the sympod. Exopod not well defined.

Female. Pleopod 2 rounded, longer than wide ($L/l = 1.15-1.17$) and with a marked distal median notch; distal margin armed with 4 small setules, subequal in length.

Pleopod 3 ($\delta \delta$ and $\varphi \varphi$): exopod curved inward, distal segment with an apical small seta implanted in a little notch, proximal

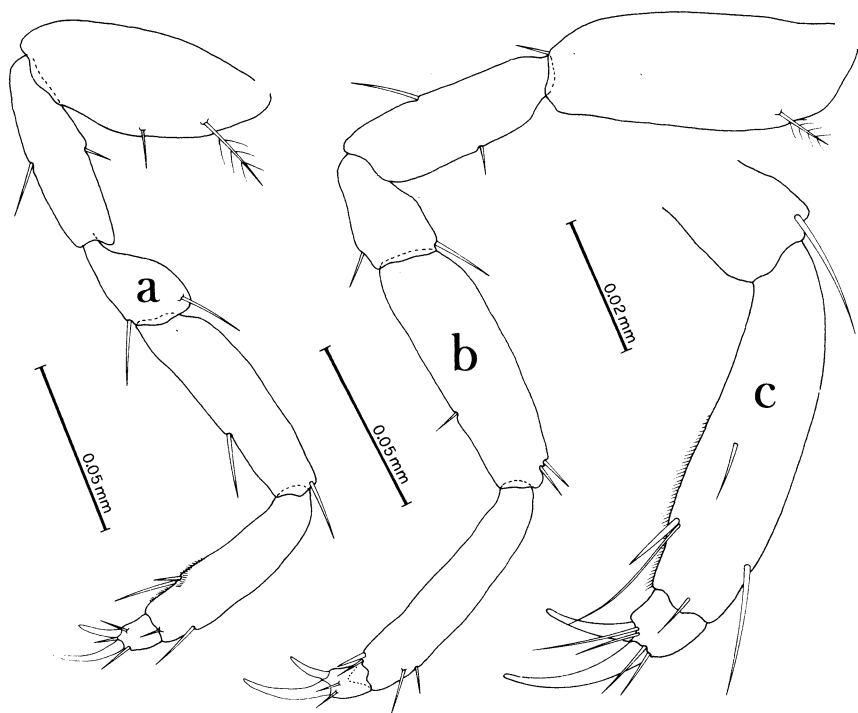


FIG. 2. — *Microcharon raffaellae* n.sp. a: pereiopod 1; b: pereiopod 7; c: pereiopod 1, detail of propod, dactylus and claws.

segment with 2 marked protuberances on the inner margin; endopod large, irregularly rounded and with no apical setae.

Pleopod 4 is also similar in both males and females and consists of a 1-segmented subovoidal naked segment.

Uropod : peduncle enlarged, slightly longer than the pleotelson and about twice as long as large, armed with 8-9 naked setae of different length; exopod short, laterally implanted and armed with 3 naked setae on the distal margin; endopod about 1/2 as long as the peduncle and armed with 2 longer terminal setae, 2 shorter terminal setae, 3 subapical setae, 2 lateral plumose setae and 2 subbasal setae.

ECOLOGY.

Microcharon raffaellae n.sp. lives in underground phreatic fresh-waters of the Highland of Isfahan (Iran). The new species was collected from some man-made wells sunked in Pliocenic sandstone and clay : we suppose that they receive their water from one and the same subterranean water-bearing system, and this idea is endorsed by the homogeneity of the physico-chemical and biological characteristics of the water as well as of the bottom sediment (water depth : 4-4.5 m; H₂O temperature : 15.5° C - 15.6° C; pH : 7.5; NO₂ : 0.1 mg/l; salinity : 0.9 ‰; bottom sediment composed of thin sandstone with clay and numerous small plant detritus; associated fauna : amphipods, cyclopids, harpacticoids, ostracods, oligochaetes, nematods and some mosquito larvae).

REMARKS.

Microcharon raffaellae n.sp. belongs to the freshwater species of the genus *Microcharon*, characterized by a 5-segmented antennula, a female second pleopod with apical setae and a male second pleopod with rounded sympod. The new species is particularly close to *M. kirghisicus* Jankowskaya 1964 from Central Asia and to *M. phreaticus* Coineau et Botosaneanu 1973 from the Island of Cuba for both the absence of setae on pleopod 3 and lacking pectinated elements on maxilla 2. From the above species, as well as from the others with a 5-segmented antennula, *M. raffaellae* n.sp. differs markedly by the morphology and the armature of the first male pleopod, the elongated female pleopod 2, the pointed protu-

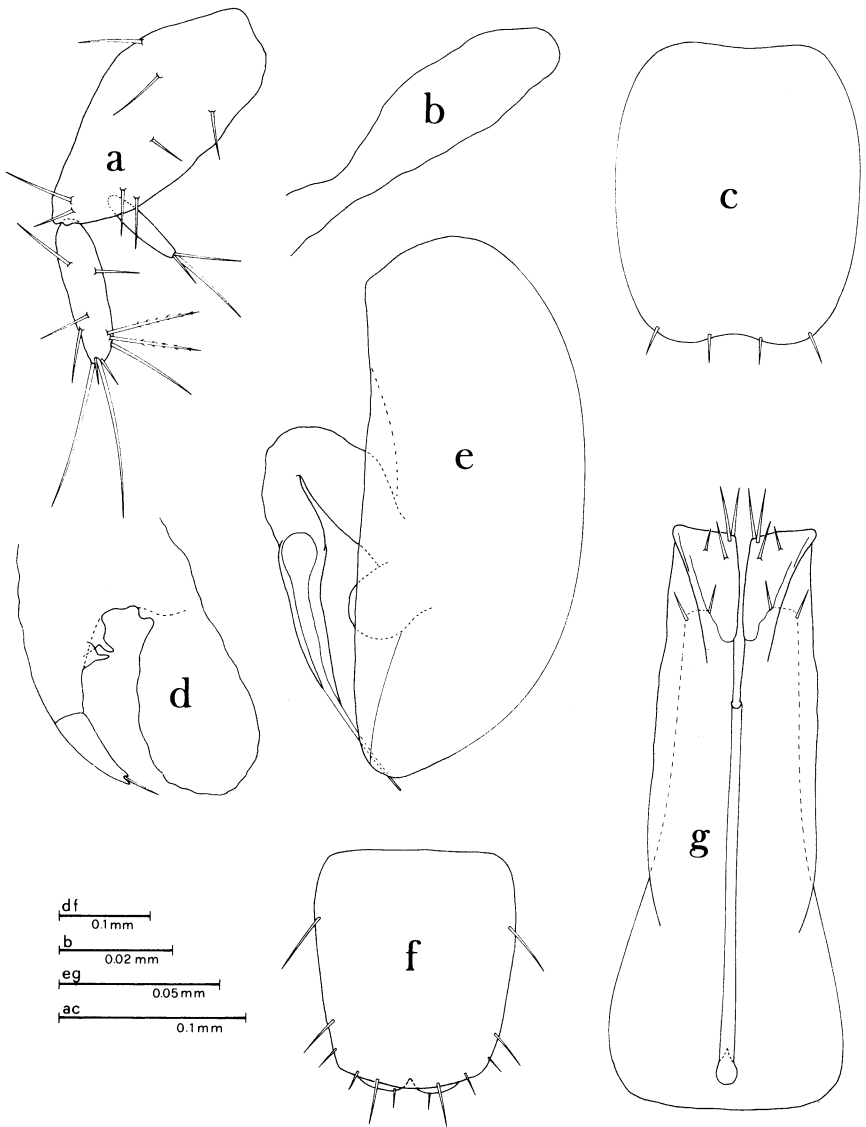


FIG. 3. — *Microcharon raffaellae* n.sp. a : uropod; b : pleopod 4; c : female pleopod 2; d : pleopod 3; e : male pleopod 2; f : pleotelson; g : male pleopod 1.

berances at the base of the exopod of the pleopod 3 and the mean ratio between the uropod and the pleotelson.

To date, the genus *Microcharon* includes several species and subspecies and shows a wide, cosmopolitan distribution (Europe, Asia, Northern Africa, New Caledonia, West Indies, etc.). Numerous species are found in continental subterranean waters (fresh-brackish waters), others are marine, belonging to the intertidal and meiofaunal biocoenosis, the former being adapted to the continental waters during the Miocene regressions of the 'Tethys Sea' in the way of other hypogean groups such as Thermosbenaceans, Cirolanids, etc.; STOCK (1977) named this kind of colonization "Regression Model".

The treatment of the genus by COINEAU (1968) provided a separation between the marine (with a 5-segmented antennula) and the freshwater and brackish water (with a 6-segmented antennula) species and subspecies.

STOCK (1977) pointed out that the marine species are usually (but not always) characterized by a 5-segmented antennula, and one marine species at least (*M. monnoti* Bocquet 1970) has a 6-segmented antennula like the freshwater species and subspecies; in the same way, some freshwater and brackish-water species (e.g. *M. kirghisicus* Jankowskaya 1964, *M. phreaticus* Coineau et Botosaneanu 1973, *M. herrerae* Stock 1977) can be characterized by a 5-segmented first antenna. Moreover, the present author reported that other discriminative features can be considered between the marine and the continental species and subspecies of *Microcharon*, i.e. the presence of 3 plumose setae on the endopod of the pleopod 3 in the first ones (versus inarmed), short claws and dactylus on the pereopods in the marine species (versus dactylus and claws somewhat long), presence of pectinated elements on the maxilla 2 (versus absence).

However, as to this latter feature, we recently collected two new species from subterranean freshwaters of Algeria (*M. karamani* and *M. zibani* Pesce and Tete, in press) which are characterized by pectinated elements on the inner arthrite of the maxilla 2 as well as by pectinated spines on the outer endite of the maxilla 1. Moreover, *M. raffaellae*, too, shows features of both freshwater and marine species, such as a 5-segmented antennula, endopod of pleopod 3 without plumose setae, etc.

In conclusion, all these facts raise some doubts about the opportunity to assign a discriminative value to the characteristics proposed for separating the marine *Microcharon* from the freshwater species; in reality the only difference between these groups is, as far as we know to date, the unequal length of the claws and

the dactylus of the pereopods, which are shorter in the marine species and longer in the freshwater hypogean species in which, as in other subterranean crustaceans, they constitute a remarkable adaptative feature (possibly related to the nature of the bottom sediment).

RÉSUMÉ

Description de *Microcharon raffaellae* n.sp., nouveau Microparasellide des eaux souterraines d'Iran.

La nouvelle espèce se rapproche de *M. kirghisicus* et de *M. phreaticus* par la présence d'une sétation des soies de la maxille 2, par la constitution des antennules et par son pléopode 3 glabre.

M. raffaellae n.sp. se distingue des autres espèces dulçaquicoles par la morphologie du pléopode 1 du mâle, la morphologie des maxilles 2 et par la constitution des antennes 1.

Le genre *Microcharon* est décrit pour la première fois des eaux souterraines d'Iran.

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