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***Melita mirzajanii* n. sp. (Crustacea: Amphipoda: Melitidae), a puzzling new member of the Caspian fauna**

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Abstract

Described is *Melita mirzajanii* n. sp. (Melitidae) from the southwestern corner of the Caspian Sea. It shows no particular similarity to any species known from the Mediterranean Sea. It inhabits, as the only amphipod species, dense growths of *Amphibalanus* cf. *improvisus* (Darwin 1854) in a port, at low and highly fluctuating salinities. Its most striking characters are: absence of any pleonal or urosomal dorsal teeth (projections), elongated distal article of the mandibular palp, hind margin of last pereopod bases strongly narrowed distad, and epimera posterodistally rectangular. An identification key for the species group of *Melita* without dorsal teeth and without article 2 on the exopodite of the third uropod is provided.

Key words: Crustacea, Amphipoda, Melitidae, *Melita* n. sp., Caspian Sea

Introduction

The huge *Melita*-group *sensu lato* was originally diagnosed as "melitids" by Barnard & Barnard, 1983. Several genera were then split-off from *Melita* by different authors. Lowry & Springthorpe (2009: 718) counted 22 genera within a newly defined *Melita*-group. Lowry & Myers (2013: 37) re-defined the family Melitidae and included 23 genera.

Melita spp. in general are free-moving omnivores, mainly inhabitants of under-rock habitats at intertidal to shallow-sublittoral depths; only a few live also in the bathyal or even abyssal depths. Reduction of setation or length of mouthparts and enlargement of the second gnathopod may correlate with different feeding modes. The uniquely modified form of the first gnathopod in males and the modified anterior lobe of coxa 6 in females have long been known, but only recently their precopula mate-carrying function has been demonstrated (Conlan 1991; Bousfield & Shih 1994).

Reduction or loss of mouthpart structures as well as of the second article in the exopodite of the third uropod (Yamato 1990; Zeidler 1989) could be apomorphies (but also present in other unrelated groups), while the disposition of the presence of dorsal teeth on the pleon and urosome among *Melita* species points to the plesiomorphy of the character state in this genus. Plesiomorphic features seem to us also to be evident in a comparatively high number of articles in the accessory flagellum, a rich setation on mouthparts, the presence of a second article on the uropod 3 exopodite or a rich spination on the uropods and telson.

Stock & Vonk (1992: 279) assume that the presence of different freshwater species of *Melita* is a result of independent evolutionary processes, maybe from marine ancestors similar to *M. palmata* (Montagu, 1804). "All over the world Melitidae have crawled out of the sea" to populate freshwater habitats. The following species were found at limnic conditions or nearly so: *M. dulcicola* Stock & Vonk, 1990, *M. cognata* Stock & Vonk, 1992 (both Canary Islands), *M. nitidula* Ruffo, 1958 (Madagascar), *M. plumulosa* Zeidler, 1989 (lake in New Zealand), *M. shimizui* Ueno, 1940 (Manchuria). Some others often occur mainly interstitially in sands with a slight freshwater influence: *M. bulla* G. Karaman, 1978 and *M. valesi* S. Karaman, 1955 (both Mediterranean), *M. leiotelson* Vonk, 1989 (Netherlands Antilles). Perhaps the marked euryhalinity of several melitids has made them particularly exapted ('preadapted') for the invasion of hyposaline waters.

		<i>M. mirzajanii</i> n. sp
18.	Gnathopod 1 male length of propodus subequal to carpus	19
-	Gnathopod 1 male propodus shorter than carpus	20
19.	Mandible palp mainly terminally beset with setae; telson lobes apically acute (Fig. 6S); Brasil, 5 mm	
		<i>M. mangrovi</i> Oliveira, 1953
-	Mandible palp densely setose on article 2 and article 3; telson lobes apically blunt (Fig. 6T); Alaska, 7 mm	
		<i>M. alaskensis</i> Jarrett & Bousfield, 1996
20.	Antenna 1 accessory flagellum with 3 + 1 articles; Brasil, 7.5 mm	<i>M. lagunae</i> Oliveira, 1953
-	Antenna 1 accessory flagellum with 1 + 1 articles	21
21.	Mandible palp article 2 swollen; Mediterranean, 4.5 mm	<i>M. bulla</i> S. Karaman, 1978
-	Mandible palp regularly slender	22
22.	Mandible palp article 3 only distal setae; pereopod 5–7 merus slender; Great Barrier Reef, Lizard Island, Fiji, New Caledonia 4.4 mm.	<i>M. myersi</i> Karaman, 1987
-	Mandible palp with rich setation on article 2–3; pereopod 5–7 merus widened (Fig. 6U); Japan, 6 mm	
		<i>M. shimizui</i> (Ueno, 1940)

Discussion

The great majority of indigenous Caspian amphipods forms a molecularly very homogeneous group within Gammaridae (Hou *et al.* 2014), although some of them are united in a separate family Pontogammaridae (Grabowski 2006; Lowry & Myers 2013). Exceptions include numerous members of Corophiidae and single species of Gammaracanthidae, Uristidae and Pontoporeiidae, while the phylogenetic position of Behningiellidae and Caspicolidae remains unsolved. It is possible that they are all just aberrant gammarids. The non-gammarid *Niphargus caspius* Derzhavin, 1945 most probably came to the Caspian from intralacustrine springs (Derzhavin 1945). All the other non-gammarid species, except corophiids, are widely spread in the middle part of the Caspian on deep loamy bottoms with pelagic habits. Their origin is evidently from the Eurasian north, where related species are present in the sea and in estuaries (Birstein & Romanova 1968). So, the numerous *Chelicorophium* spp., two *Onisimus* spp., *Monoporeia microphthalma* (G.O. Sars, 1896), and *Gammaracanthus caspius* G.O. Sars, 1896 seem to be products of ancient invasions, like the gammarids; they are regarded 'Arctic immigrants' (Zenkevich 1947). Only *Corophium volutator* (Pallas, 1766) from southern parts of the lake and widely spread outside of it, may be a younger invader.

The origin of the new *Melita* species is unclear. Its morphology, its ecology, as well as its late discovery and evidently limited distribution, suggest a recent immigration into the Caspian, but it could also be a relict. It is very intriguing that this member of the globally distributed genus has not (yet) been found or recognized in the Mediterranean, the most probable source of many other, non-amphipod young immigrants into the Caspian.

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