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THE ANCHIALINE AMPHIPODA (CRUSTACEA) IN THE SUBTERRANEAN WATERS OF CRNA GORA (MONTENEGRO)

(CONTRIBUTION TO THE KNOWLEDGE OF THE AMPHIPODA 261)

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The Amphipoda (Crustacea) found in subterranean brackish waters (subterranean estuaries) in Crna Gora (Montenegro) is represented by 12+ species belonging to the families Bogidiellidae, Gammaridae, Hadziidae, Melitidae, Niphargidae, Pseudoniphargidae and Salentinellidae.

Keywords: Amphipoda, brackish waters, subterranean, cave, spring.

INTRODUCTION

Thanks to the specific geomorphologic and geological history of Crna Gora (Montenegro), as well as to the elevated precipitation (rain, snow), numerous sources of fresh water empty into the Adriatic Sea along the coast of Crna Gora [Skadar Lake through the Bojana River, numerous torrents and springs along the entire Adriatic coast of Crna Gora; some caves]. On the other hand, the karstic nature of rocks has produced numerous karstic phenomena (caves, subterranean streams and lakes, subterranean estuaries, etc.), excellent ecological conditions for the existence and diversity of numerous endemic animals, including Amphipoda.

MATERIAL & METHODS

Material was collected by various methods: the Karaman-Chappuis method, by Bou-pump, by various types of hand-nets, by use of traps, as well as by hand. Numerous data have been collected from the literature also. The collected specimens were preserved in 70 percent ethanol and studied under the microscope.

RESULTS AND DISCUSSION

Based on our investigations as well as data from literature, the present known fauna of Amphipoda collected in the subterranean brackish waters along the coast of the Adriatic Sea in Crna Gora is very rich, especially considering the relatively short coast of Crna Gora [293.5 km]. The following species were identified as being present along the coast of Crna Gora during our investigations and from the studies of other scientists (KARAMAN, S., 1950; 1953; 1955; KARAMAN, G., 1973; 1978; 2011a; 2011b, SKET, 1969; 1981, etc.]:

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Family Bogidiellidae
Medigidiella dalmatina (Karaman, S., 1953)
Family Gammaridae
Neogammarus adriaticus Karaman, G., 1973
Rhipidogammarus karamani Stock, 1971
Family Hadziidae
Hadzia fragilis fragilis Karaman, S., 1932
Family Melitidae
Melita bulla Karaman, G., 1978
Melita valesi Karaman, S., 1955
Psammogammarus caecus Karaman, S., 1955
Family Niphargidae
Niphargus abavus Karaman, G., 2011
Niphargus kusceri Karaman, S., 1950
Niphargus spp.
Family Pseudoniphargidae
Pseudoniphargus adriaticus Karaman, S., 1955
Family Salentinellidae
Salentinella angelieri Del. Deb. & Ruffo, 1952

Among them, the species *Melita bulla*, *Melita valesi*, *Rhipidogammarus karamani* and *Neogammarus adriaticus* are semisubterranean species, because they have preserved the eyes, but they also occur in subterranean brackish waters, often together with some other, blind, anchialine amphipods.

The species *Hadzia fragilis fragilis*, described from Vjetrenica cave in Herzegovina, in pure freshwater, was collected in many localities along the Adriatic sea in brackish, anchialine waters, usually in the anchialine caves, together with some other anchialine amphipods.

The species *Salentinella angelieri* was usually collected in brackish subterranean waters (Bečići near Budva), but in Italy many populations of this species were found in pure fresh water, far from the sea [probably genetically different].

Within the members of the genus *Niphargus* collected near the coast of the Adriatic Sea in Crna Gora, only for two species have we confirmation that they were collected in freshwater as well as in subterranean brackish waters: *Niphargus kusceri* and *N. abavus*. But we believe that some other members of the genus *Niphargus*, collected in subterranean fresh water near the coast of the Adriatic sea, probably colonised brackish waters as well, like some *Niphargus* species from the North Adriatic region (SKET & KARAMAN, 1990).

Regarding endemism, it seems that only a limited number of endemic species of eastern Adriatic coast occur along the coast of Crna Gora (Montenegro): *Hadzia fragilis fragilis*, *Medigidiella dalmatina*, *Niphargus abavus*, *N. kusceri*].

Many of the new species described from the coast of Crna Gora were later discovered in other parts of the Mediterranean Sea [*Psammogammarus caecus*, *Melita valesi*, *Neogammarus adriaticus*, *Pseudoniphargus adriaticus*]. We suppose that *Melita bulla* will be discovered in some other localities along the Mediterranean Sea also.

CONCLUSION(S)

The taxonomical studies conducted by various authors showed that the subterranean brackish waters of the Adriatic coast of Crna Gora are settled by 11+ known Amphipoda species belonging to 7 families and 9 genera. We expect other freshwater species of the genus *Niphargus* to be found in the anchialine waters when ecological studies on Amphipoda of the anchialine waters of Crna Gora are undertaken.

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