

**BEYOND THE RULE: A MOUNTAINOUS CAVE SPECIES,
Mesoniscus graniger (ISOPODA, ONISCIDEA)
ON A PLAIN OF SOUTH-WESTERN ROMANIA**

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Abstract. *Mesoniscus graniger* (Frivaldsky, 1865) is a terrestrial isopod species generally known from mountainous karstic caves. Nevertheless, we found an endogeic population in Blahnița Plain, south-western Romania, on a stream bank, at 81 m altitude. The presence of this endogeic plain population may represent a new proof upon the species' habitat of origin.

Keywords: woodlice, tolerance, limestone, distribution, adaptation.

Rezumat. Dincolo de regulă: o specie de peșteri montane, *Mesoniscus graniger* (Isopoda, Oniscidea) într-o zonă de câmpie din sud-vestul României. *Mesoniscus graniger* (Frivaldsky, 1865) este un izopod terestru cunoscut, în general, din zone montane carstice. Totuși, noi am găsit o populație endogee în Câmpia Blahniței, sud-vestul României, pe malul unui pârâu, la 81 m altitudine. Prezența acestei populații endogee la câmpie poate reprezenta o nouă dovadă asupra habitatului de origine al speciei.

Cuvinte cheie: izopode terestre, toleranță, zone calcaroase, distribuție, adaptare.

INTRODUCTION

Mesoniscus graniger (Frivaldsky, 1865) is a Carpatho-Dinaric terrestrial isopod species (TĂBĂCARU & GIURGINCA, 2013), present in Slovenia, Serbia, Bosnia and Herzegovina, Slovakia, Romania (SCHMALFUSS, 2003) and Hungary, where it was described (FRIVALDSZKY, 1865) and re-identified subsequently (VILISICS et al., 2008, 2011). In Romania, it occurs first of all in the karstic caves of the Carpathian Mountains, but surface dwelling populations in mountainous areas were also recorded (e.g. GIURGINCA, 2000-2001, 2009; TĂBĂCARU & GIURGINCA, 2013). Nevertheless, there are too few endogeic occurrences known in order to establish their distribution (GIURGINCA, 2000-2001, 2009), although new cases were recently recorded (IANC & FERENȚI, 2014; FERENȚI & COVACIU-MARCOV, 2016). The species is considered to be absent in Dobrogea and the Romanian Plain (GIURGINCA, 2000-2001, 2009). *M. graniger* occurs in mountains in other areas than its distribution range (e.g. PIKSA & FARKAS, 2007; GIURGINCA, 2009).

MATERIAL AND METHODS

In order to investigate the terrestrial isopod fauna in the south-western Romanian plains, we used the direct, hand-sorting method. The investigated habitat is situated in the Blahnița Plain, near Scăpău village (44°26'58.39"N / 22°43'01.92"E), at an altitude of 81 m. After the first identification of *M. graniger* in the autumn (September) of 2012, we monitored the habitat four more years (2013-2016). Each time the investigation method was represented by the direct method. We searched for terrestrial isopods in the wet soil near the water, but also under stones or concrete pieces. The identified individuals were stored in alcohol, and identified subsequently in the laboratory.

RESULTS

We identified *M. graniger* near Scăpău village in the Blahnița Plain in south-western Romania (Fig. 1), in September 2012, 2013, 2015 and 2016. The individuals of *M. graniger* were present on the bank of a small stream, under a bridge. The stream has a stony substratum with some abandoned concrete pieces (Fig. 2). Even in the driest years, when the stream is dried out, there was moist under the concrete pieces. The stream is surrounded by rich herbaceous vegetation, reeds and some willows followed by agricultural zone. The closest forest habitat is few km away. Nine *M. graniger* individuals (1 male and 8 females) were collected in three of the four years monitoring.

DISCUSSIONS

Taking into account *M. graniger* mountainous distribution, (e.g. GIURGINCA, 2009), we did not expect to encounter it on a plain. Based on the present data (e.g. GIURGINCA, 2000-2001, 2009) this seems to be the first record of *M. graniger* in a plain within its entire distribution range. Its presence during the four years of monitoring let us suppose that *M. graniger* has a constant presence in the region. Previously, *M. graniger* was recorded in limestone free area in Romania only in the north-western part of the Transylvanian Plateau (see in: GIURGINCA, 2000-2001). Although the species was mentioned at low altitude (70 m) before, the locality was a cave in a limestone area with steep slopes and typical mountainous region of the Danube Gorge (GIURGINCA, 2009). At Scăpău *M. graniger* occurs in a flat plain

without forest (Blahnița Plain), being the warmest and driest region from Romania (STOENESCU et al., 1966) where the species was recorded. Previously *M. graniger* was considered adapted to a stenothermal environment with a low temperature range (e.g. GERE, 1964; ŠUSTR et al., 2005), but it seems to be more tolerant to the temperature. Probably the cave populations are more stenothermic (ŠUSTR et al., 2005) compared with the endogeic ones.

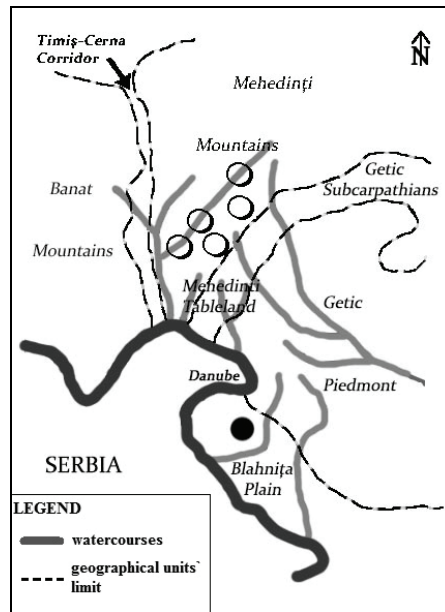


Figure 1. The distribution of *Mesoniscus graniger* in south-western Romania: ○-old records (GIURGINCA, 2009), ●- new record.



Figure 2. The habitat of *M. graniger* from Scăpău (original picture).

The presence of *M. graniger* at Scăpău is unexpected compared to the previous distribution data on this species (GIURGINCA, 2009). This plain population found in a region without limestone, provides a good argument in the debate regarding the species origin (see in: TĂBĂCARU & GIURGINCA, 2013), probably advocating for its primarily endogeic nature. In Romania, another terrestrial isopods species, considered to be a cave species, was recently recorded at the soil surface (FERENȚI et al., 2016). The zoogeography of *Mesoniscus* has been discussed in different papers (e.g. STROUHAL, 1951; GIURGINCA, 2009; TĂBĂCARU & GIURGINCA, 2013). Because in the region there aren't caves, the individuals from Scăpău had not been resurfaced accidentally from caves in the soil's superficial layers, but they normally populate the soil. In the case of other invertebrates, like centipedes, species considered to be cave or typically mountain species, were recently identified in soil; the presence in soil was considered a consequence of their preference for low temperature (TUF et al., 2017). *M. graniger* seems to occupy the soil at 25-65 cm in depth, in karst areas (RENDOŠ et al., 2016). Nevertheless, being easier to identify it in caves than in soil, the number of *M. graniger* records from caves is higher than the one from soil (GIURGINCA, 2009). In the same time, the species was not identified in artificial underground habitats like abandoned railroad tunnels which are isolated from the natural substratum (COVACIU-MARCOV et al., 2017a). The species presence in Blahnița Plain may suggest that *M. graniger* is present also in other plains from its distribution range.

The presence of *M. graniger* in Blahnița Plain is an additional example of the peculiarities in the distribution of some animal groups in this region. In Blahnița Plain other epigeic mountain terrestrial isopods (*Hyloniscus transsilvanicus* (Verhoeff, 1901), *Ligidium germanicum* Verhoeff, 1901) were recorded at their lowest altitude in the country, being also considered relicts (FERENȚI & COVACIU-MARCOV, 2014). In addition, the Blahnița Plain shelters a forest lizard species in unforested habitats (COVACIU-MARCOV et al., 2009). Moreover, recently a *Salamandra salamandra* (Linnaeus, 1758) population was identified near Scăpău, at the lowest altitude in Romania (COVACIU-MARCOV et al., 2017b), at only few km from *M. graniger* habitat. Probably, *M. graniger* is also a relict species in the region, the endogenous population being able to survive in the glacial periods only in refuge areas without permafrost. Nevertheless, this plain population opens a new perspective in the global insight of *M. graniger* distribution range, origin and ecology.

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