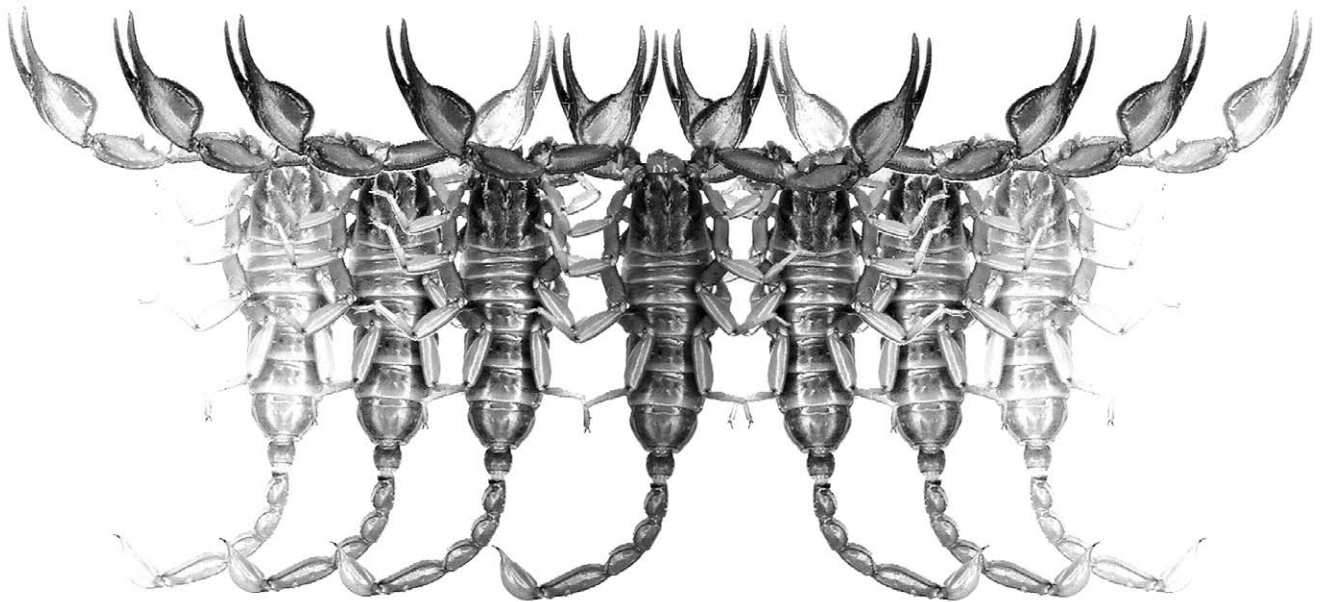


Euscorpius

Occasional Publications in Scorpiology



**An Endemic Species in a Protected Area:
Euscorpius carpathicus (L., 1767) in the Cozia National Park,
Romania (Scorpiones: Euscorpiidae)**

Severus-Daniel Covaciu-Marcov & Sára Ferentő

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The name *Euscorpius* Thorell, 1876 refers to the most common genus of scorpions in the Mediterranean region and southern Europe (family Euscorpiidae).

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An endemic species in a protected area: *Euscorpius carpathicus* (L., 1767) in the Cozia National Park, Romania (Scorpiones: Euscorpiidae)

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Summary

In 2016-2018, we identified 48 distribution records of *Euscorpius carpathicus* in the Cozia National Park, from the Romanian Southern Carpathians. The Carpathian scorpion was found between 300 and 847 m a.s.l., in forested regions, being more numerous in the lower areas situated along the Olt River. *E. carpathicus* is a native species in the region; it populates natural areas with low human impact.

Introduction

Euscorpius carpathicus is a species with a distribution range limited to some areas in the Romanian Carpathians (Fet & Soleglad, 2002). Its status was confirmed in a recent review of the genus (Fet & Soleglad, 2002). The distribution range of *E. carpathicus* is fragmented into three apparently isolated areas: one in the western portion of the Southern Carpathians, one in the Olt River Gorge, and one in Buzău Mountains (e.g. Bunescu, 1959; Gherghel et al., 2016). Despite this small distribution range, the climatically suitable area for this species seems larger (Gherghel et al. 2016). Among the three distribution areas, the smallest one is situated in the Olt River Gorge (e.g. Bunescu, 1959; Gherghel et al., 2016). With all the recent data on *E. carpathicus* (Gherghel et al., 2016), the ecology and biology of this species are still insufficiently known (Vignoli & Salomone, 2008; Gherghel et al., 2016). The information upon *E. carpathicus* is even more important because this endemic species with a small distributions range is not protected (O.U.G. 57/2007), despite its presence in many protected areas. This note presents the distribution of *E. carpathicus* in a protected area in the Olt River Gorge, in the Cozia National Park.

Material and Methods

Field research was done in 2016-2018, between April and September. We made dozens of transects in Cozia National Park (CNP), covering most of its surface.

While studying terrestrial isopods in the CNP with direct method, which implies their identification under different shelters (e.g. Vilisics & Hornung, 2009; Ferentő & Covaciu-Marcov, 2016, 2017), we encountered scorpions too. In other cases, scorpions were also recorded with the same method (e.g. Crucitti et al., 1998; Colombo, 2006, 2009). Thus, we decided to note scorpions in the CNP, especially because the region is a national park. Because of its rarity and because *E. carpathicus* is the only scorpion species in the Romanian Carpathians (Fet & Soleglad, 2002; Fet et al., 2002), we did not collect or disturb any individuals. They were only observed in their shelters. The GPS coordinates of each location were noted and occasionally some photos were made. CNP is situated in the central part of the Romanian Southern Carpathians, along the Olt River Gorge, comprising three mountain units separated by Olt and Lotru Rivers, with a maximum altitude of 1668 m. Over 85% of its surface is forested, mostly with beech forests (Ploaie, 2004; Ploaie & Turnock, 2001).

Results and Discussion

In the CNP, we identified 48 distribution points of *E. carpathicus* (Figure 1), despite the fact that the region is situated at the limit of the climatically suitable area for this species (Gherghel et al., 2016). Most of the distribution points were recorded in the lower-altitude areas of the CNP, in the Olt River Gorge, Călineşti Valley, Lotrişor Valley and in the western sector of Băiaşu Valley, downstream the gorge. *E. carpathicus*

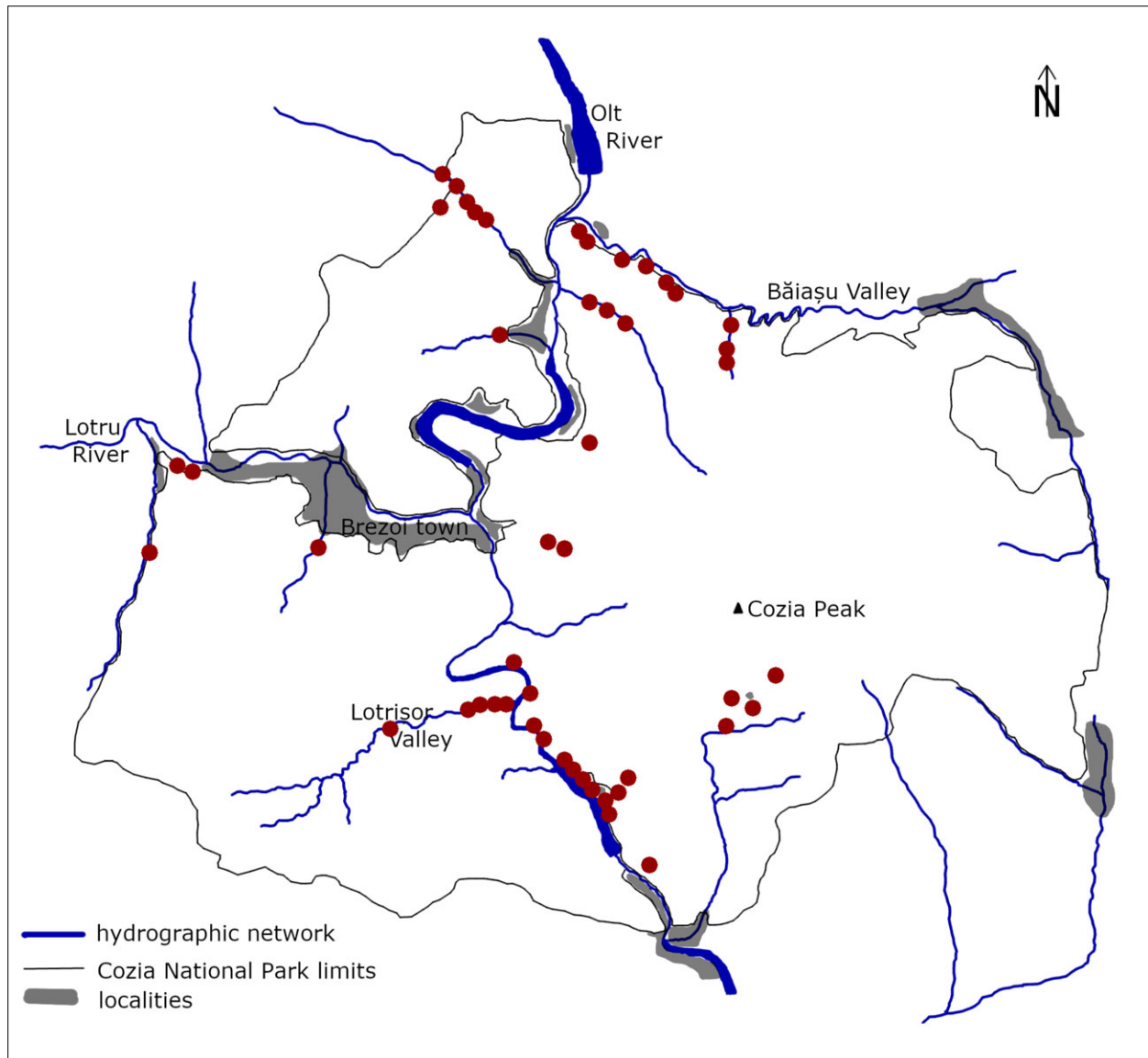


Figure 1: Distribution of *E. carpathicus* in the Cozia National Park.

(Figure 2) was recorded in all three mountain massifs from the CNP. Nevertheless, it is not distributed on the park's entire territory, missing from its eastern part. This sector of the CNP is oriented towards Făgăraș Mountains, with lower average annual temperatures compared to the majority of the park's area (Stoenescu et al., 1966). The distribution of *E. carpathicus* seems to be influenced by the temperatures (Gherghel et al., 2016), being present in areas with sub-Mediterranean climate (Bunescu, 1959). In the same time, the eastern parts of the CNP were affected in the past by massive deforestations (Ploaie & Turnock, 2001), where even a narrow-gauge forest railroad was constructed (Turnock, 2005). Thus, the present aspect of the region's forest is far from the original one. Nowadays, it is a compact regeneration

forest with coniferous plantations, which are situated outside their normal distribution range.

E. carpathicus is present in the CNP in forested zones, just like in other regions (Bunescu, 1959). It usually populates beech forests, but also oak forests, and even alder coppices in the meadow of large water courses, like the Lotru River. Scorpions were encountered both in the vicinity of water courses and on drier forested slopes (Figure 3). In many cases, *E. carpathicus* was observed on the edges of forest roads and even near the national road westwards of Brezoi town. The observed individuals were sheltering approximately equally under stones and fallen logs. In Europe, different scorpion species share their shelters with numerous invertebrates (e.g. Colombo, 2006, 2009). In the CNP, *E.*



Figure 2: *E. carpathicus* from the Cozia National Park.

carpathicus was sometimes identified together with the terrestrial isopod *Trachelipus ater*, an endemic species in the southern Carpathians (e.g. Tomescu et al., 2015; Ferenti & Covaciu-Marcov, 2017).

E. carpathicus was observed from the lower limits of the protected area, near the Olt River, at 300 m altitude, up to the vicinity of Stănișoara Monastery, at 847 m. In the last case, the scorpions were encountered on a southern slope situated upstream the monastery, under a fallen oak. This seems to be the highest altitude where *E. carpathicus* was observed so far, compared to the localities indicated in the literature (e.g. Bunescu 1959, Gherghel et al. 2016). Low altitude mountain areas are considered to shelter Euscorpius species at their distribution range limit (Fet et al. 2002). The upper altitude limit of *E. carpathicus*, mentioned on the website of CNP without any distribution point, is 450 m (<https://cozia.ro/fauna.html>). The presence of *E. carpathicus* at high altitudes in the CNP is not an isolated case. In the protected area, other species related to warmer climate were also encountered at unusually high altitudes (Iftime & Iftime, 2006).

Although in the literature the introduction of *E. carpathicus* in different zones of its distribution range is discussed (Fet et al. 2002), in the CNP it is present only

in natural habitats covered with native forests. Thus we consider that in the region *E. carpathicus* is a native species. Probably its distribution range connected with forests was recently narrowed by deforestations, as in the case of other forest related species, such as the lizard *Darevskia praticola* (Gherghel et al. 2011). *E. carpathicus* is not the only endemic species to the region. The southern Carpathians shelter numerous, even local endemic species (e.g. Grossu, 1983; Kenyeres et al., 2009; Barloy & Prunar, 2011; Csuzdi et al. 2011; Iorgu et al., 2012; Bartók & Pócs, 2014; Hurdu et al., 2012, 2016). Probably, *E. carpathicus* survived in the region in the glacial periods, just like the endemic isopod *T. ater* (Tomescu et al., 2015). Cozia Mountains were not severely affected by the Quaternary glaciations (e.g. Ploaie & Turnock, 2001); glacial refugia of other invertebrates was indicated in the region (e.g. Kenyeres et al., 2009). Moreover, the entire Southern Carpathians were indicated as a glacial refuge for other groups (e.g. Schmitt et al., 2007; Ronikier et al., 2008, Fijarczyk et al., 2011; Homburg et al., 2013).

The wide distribution of the endemic *E. carpathicus* in the CNP underlines the conservation value of the protected area. At least in the CNP the species is well represented in diverse wooded habitats. Thus, at this



Figure 3: *E. carpathicus* habitat in the Băiașu Valley.

moment *E. carpathicus* does not seem to be endangered in the region, because it is present also in areas which are difficult to reach. This is an advantage for a species related to regions with moderate anthropogenic impact (Gherghel et al., 2016). Nevertheless, the fact that in other regions of Europe the human impact determined the disappearance of some scorpion populations (Kovařík & Fet, 2003), must be taken into account. In the CNP, the protection of *E. carpathicus* depends much on the protection of the native forests from the park. Although *E. carpathicus* is not a protected species (O.U.G. 57/2007), its large distribution in a protected area can guarantee, at least for now, its survival in the region.

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