

DISTRIBUTION AND CURRENT STATUS OF THE HERPETOFAUNA FROM THE NORTHERN MĂCIN MOUNTAINS AREA (TULCEA COUNTY, ROMANIA)

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Abstract. The present paper presents the results of a study focused on one of the most important herpetofaunal areas from Romania, the Macin Mountains. Twelve amphibian (*Triturus dobrogicus*, *Lissotriton vulgaris*, *Bombina bombina*, *Pelobates fuscus*, *Pelobates syriacus balcanicus*, *Hyla arborea*, *Bufo viridis*, *Bufo bufo*, *Pelophylax lessonae*, *Pelophylax ridibundus*, *Pelophylax kl. esculentus*, *Rana dalmatina*) and thirteen reptile (*Emys orbicularis*, *Testudo graeca iberica*, *Ablepharus kitaibelli stepaneki*, *Podarcis tauricus*, *Lacerta viridis*, *Lacerta trilineata dobrogica*, *Natrix natrix*, *Natrix tessellata*, *Dolichophis caspius*, *Zamenis longissimus*, *Elaphe sauromates*, *Coronella austriaca*, *Vipera ammodytes montandoni*) species or subspecies have been identified in the research area. *Pelobates syriacus*, *Pelobates fuscus*, *Pelophylax lessonae* and *Pelophylax kl. esculentus* have been recorded for the first time in the region. Precise distribution maps were made for all the identified species/subspecies and the local status and endangering factors of the species is discussed.

Keywords: Măcin Mountains, Dobruja, Romania, amphibians, reptiles, distribution, conservation.

Rezumat. Distribuția și statutul actual al herpetofaunei din nordul zonei Munții Măcinului (Jud. Tulcea, România). Prezenta lucrare prezintă rezultatele unui studiu ce a vizat una dintre cele mai importante zone herpetofaunistice din România, Munții Măcin. Douăsprezece specii de amfibieni (*Triturus dobrogicus*, *Lissotriton vulgaris*, *Bombina bombina*, *Pelobates fuscus*, *Pelobates syriacus balcanicus*, *Hyla arborea*, *Bufo viridis*, *Bufo bufo*, *Pelophylax lessonae*, *Pelophylax ridibundus*, *Pelophylax kl. esculentus*, *Rana dalmatina*) și treisprezece specii de reptile (*Emys orbicularis*, *Testudo graeca iberica*, *Ablepharus kitaibelli stepaneki*, *Podarcis tauricus*, *Lacerta viridis*, *Lacerta trilineata dobrogica*, *Natrix natrix*, *Natrix tessellata*, *Dolichophis caspius*, *Zamenis longissimus*, *Elaphe sauromates*, *Coronella austriaca*, *Vipera ammodytes montandoni*) au fost identificate în zona de studiu. *Pelobates syriacus*, *Pelobates fuscus*, *Pelophylax lessonae* și *Pelophylax kl. esculentus* au fost identificate în premieră pentru zona de studiu. Hărți de distribuție precise au fost realizate pentru toate speciile/subspeciile identificate iar statutul local și factorii de periclitate sunt discutați.

Cuvinte cheie: Munții Măcinului, Dobrogea, România, amfibieni, reptile, distribuție, conservare.

Introduction

The Dobrudjan Plateau is probably one of the most intensively studied areas from Romania from a herpetofaunistic view point (Covaciu-Marcov *et al.*, 2006), due probably to the fact that it hosts a large diversity of amphibian and reptile species. Therefore, the Macin Mountains area has also been the subject of numerous herpetological studies. Fuhn (1960) and Fuhn & Vancea (1961) summarized the data

collected until the dates of the publications. Cogălniceanu (1991) and Cogălniceanu *et al.* (2000) bring new data with regards to the amphibian species in the area. Further herpetofaunal data is published by Oțel (1998), Torok (1996, 1997, 1999, 2005a,b, 2006), Sos (2005) and Covaciu-Marcov *et al.* (2006). However, it is our opinion that the herpetofauna in the area is far from being well known, especially considering the fact that a large part of it is an important national park (Măcin Mountains National Park) and numerous vulnerable, endangered or critically endangered species have been recorded in the area (Iftime, 2005). None of the papers published on the area show precise distribution of the species within the different habits. Establishing proper conservation management programs for the herpetofauna first implies that the precise composition and distribution of the species must be known (Ghira *et al.*, 2002). Thus, the aim of the present paper represents is to contribute to the knowledge regarding the composition and distribution of the herpetofauna from the northern area of the Măcin Mountains and surroundings, establish the proper conservation status for the identified species, identify the human activities which have a negative impact over the herpetofauna and discuss further management proposals.

Material and Methods

Several field excursions (2-7 days long) have been made by the authors in the research area in the following periods: august 2002 (A. Strugariu and T. Sahlean), july 2004 (A. Strugariu and M. Huțuleac-Volosciuc.), june 2005 (T. Sahlean.), july 2005 (A. Strugariu. and C. Pușcașu.), august 2005 (T. Sos.), august 2006 (A. Strugariu., M. Huțuleac-Volosciuc., I. Gherghel. and C. Pușcașu; T. Sos), may 2007 (A. Strugariu. and I. Ghira; T. Sos), june 2007 (T. Sos), august 2007 (A. Strugariu and I. Gherghel; T. Sos).

With the aim of mapping the herpetofauna, we used the visual and auditory transects methods (Cogălniceanu, 1997). Transects were performed throughout the day. However, nocturnal searches were conducted on fewer occasions and covered shorter transects.

Live animals were usually directly observed but some specimens were captured by hand, with the help of nooses (lizards), snake hooks (vipers) or various nets (aquatic amphibians). A small number of pitfall traps were installed during the latest visit but no amphibians or reptiles were caught with this method and the traps were removed. All the captured animals were released into their habitat after they were studied and photographed. The hybrids (individuals of *Pelophylax kl. esculentus*) were determined by the morphological and chromatic characteristics indicated in the literature (Berger, 1966, 1973; Cogălniceanu *et al.*, 2000; Csata, 1998; Fuhn, 1960). Distribution maps were drawn using the UTM technique (Lehrer & Lehrer, 1990) with 2 X 2 km and quadrates with 500 X 500 m dots.

Our study area comprises of the northern part of the Măcin Mountains (all the Pricopan Chain and more than half of the Măcin Chain) as well as the surrounding areas. The region is located in south-eastern Romania, in the historical region of Dobrudja, in the north-western part of Tulcea County (Fig. 1).

The Măcin Mountains are amongst the oldest geological structures in Romania, dating to the second part of the Paleozoic and comprise of mostly volcanic rocks. The lowest altitude in the area is 7 m a.s.l. and the highest is at 467 m a.s.l. The habitats offered by the region are relatively diverse: pastures, exposed rocky areas, deciduous forests, steppe land, small streams, ditches and ponds etc.

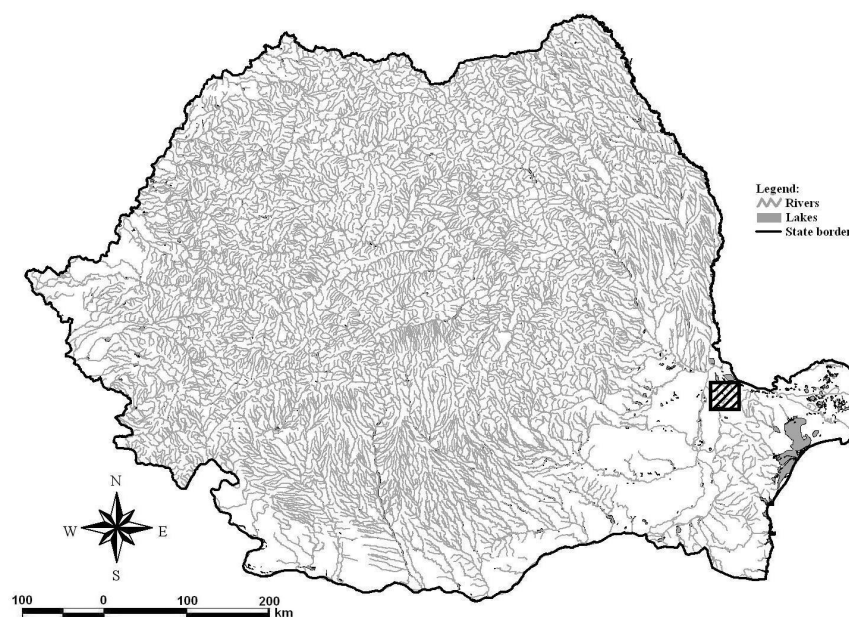


Figure 1. Location of the research area in Romania.

Results and Discussion

Species account (note: where subspecies is not mentioned, we refer to the nominal subspecies).

Triturus dobrogicus (Kiritescu, 1903)

The Danube crested newt is a rare species in the research area. It was recorded only outside the Măcin Mountains National Park, in the small ditches from near the Danube, west of Măcin (Fig. 5). *T. dobrogicus* has previously been reported in the area by Cogălniceanu *et al* (2000).

Lissotriton vulgaris (Linnaeus, 1758)

The smooth newt is as rare as the previous species. It was recorded in the same habitats as *T. dobrogicus* (Fig. 5). The presence of *L. vulgaris* was previously reported in the area by Cogălniceanu *et al* (2000).

Bombina bombina (Linnaeus, 1758)

The fire-bellied toad (Fig. 4) is a rare species in the area, being recorded in very few habitats from Greci, the Pricopan Chain area and west of Măcin (Fig. 5). The species was previously mentioned in the area by Cogălniceanu *et al* (2000), Torok (2005a) and Covaciu-Marcov *et al* (2006). Torok (2005) mentions that the species was probably extinct in the Pricopan Chain. Thus, our data indicates that the species is still present in the Măcin Mountains National Park.

Bufo bufo (Linnaeus, 1758)

The common toad appears in isolated populations and it is concentrated around the few available breeding places in the area. The water drainage ponds in the north-western part of the Măcin Mountains National Park are used in that purpose (Fig. 5). In these areas, they are relatively common. The species has previously been identified in the area by Oțel (1998), Cogălniceanu *et al* (2000), Torok (2005a) and Covaciu-Marcov *et al*. (2006).



Figure 2. *P. s. balcanicus* found between Greci and Măcin (photo by. A. Strugariu).



Figure 3. *R. dalmatina* from Greci (photo by A. Strugariu).



Figure 4. *B. bombina* from the Pricopan Chain, ventral view (photo by T. Sos).

Bufo viridis (Laurenti, 1768)

The green toad is the most common amphibian species in the northern Măcin Mountains area. We recorded it both on the Pricopan and Măcin Chains as well as in the village of Greci and the town of Măcin (Fig. 5). In the summer of 2005, thousands of freshly metamorphosed specimens could be seen in literally every terrestrial habitat investigated in the Măcin Chain (A. Strugariu, pers. obs.). The species was previously mentioned in the area by Torok (1996, 1999, 2005a), Cogălniceanu *et al* (2000), Sos (2005) and Covaciu-Marcov *et al* (2006).

Pelobates fuscus (Laurenti, 1768)

The common spadefoot toad avoids the rocky areas, being present in the adjacent pastures or agricultural fields. The latter sometimes are preferred for its loose soil, which increases the species vulnerability to the agricultural activities. This species has now been reported for the first time in the Măcin Mountains National Park (Fig. 5).

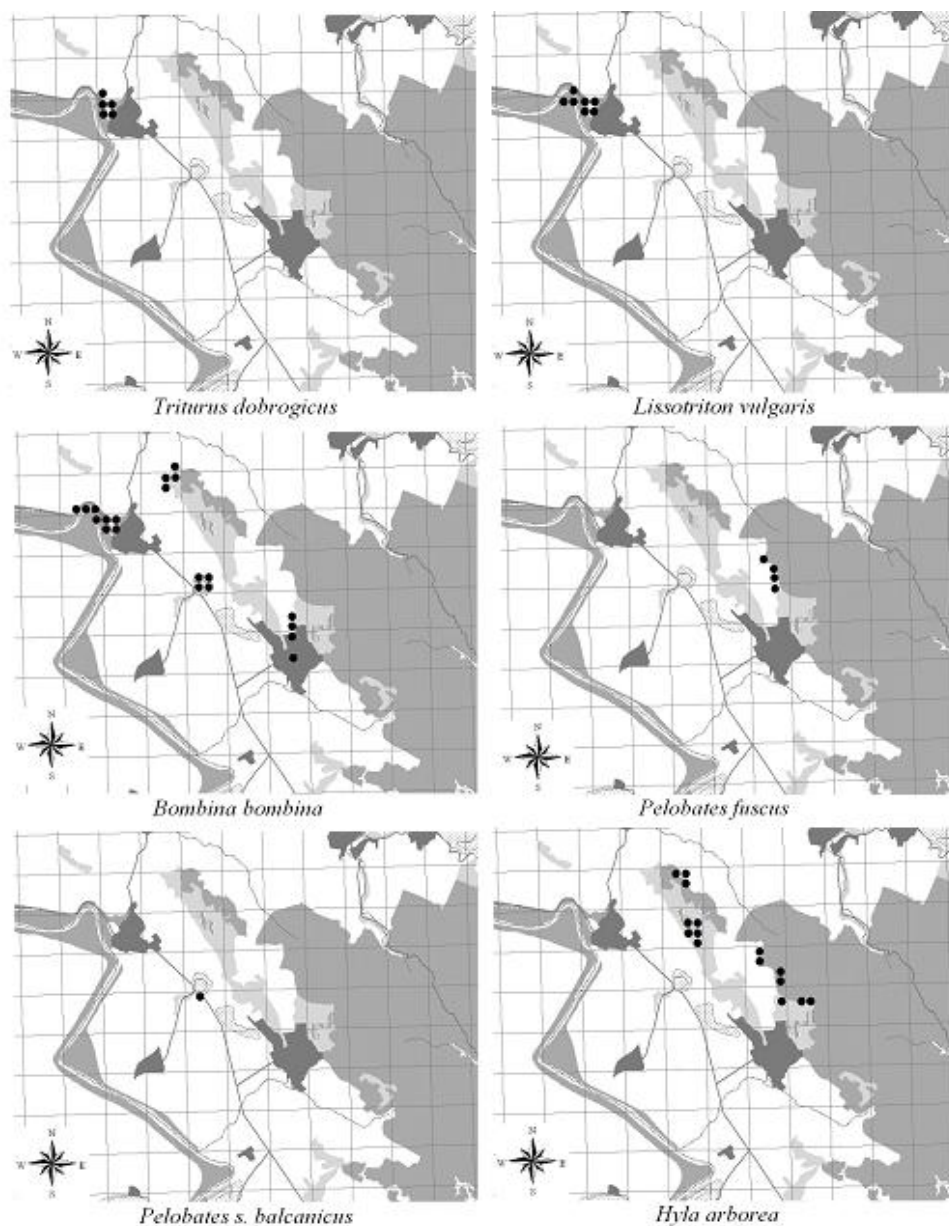


Figure 5. Distribution of the amphibian species in the research area.

Pelobates syriacus balcanicus (Karaman, 1928)

The eastern spadefoot toad (Fig. 2) seems to be a very rare species in the area, with only one specimen having been recorded by us. It has previously been reported only from the eastern and south-western regions of Dobrudja (Fuhn, 1960; Torok, 1996; Cogălniceanu *et al.*, 2000; Iftime 2005; Covaciu-Marcov *et al.*, 2006). Thus, we now report *P. s. balcanicus* for the first time not only in the Măcin Mountains area but in the entire north-western Dobrudja (Fig. 5).

Hyla arborea (Linnaeus, 1758)

The European tree-frog is a relatively rare species in the area. It has been recorded by us in a few habitats from both the Pricopan Chain and the Măcin Chain (Fig. 5). The species has previously been recorded in the area by Torok (1996, 2005a), Sos (2005) and Covaciu-Marcov *et al* (2006).

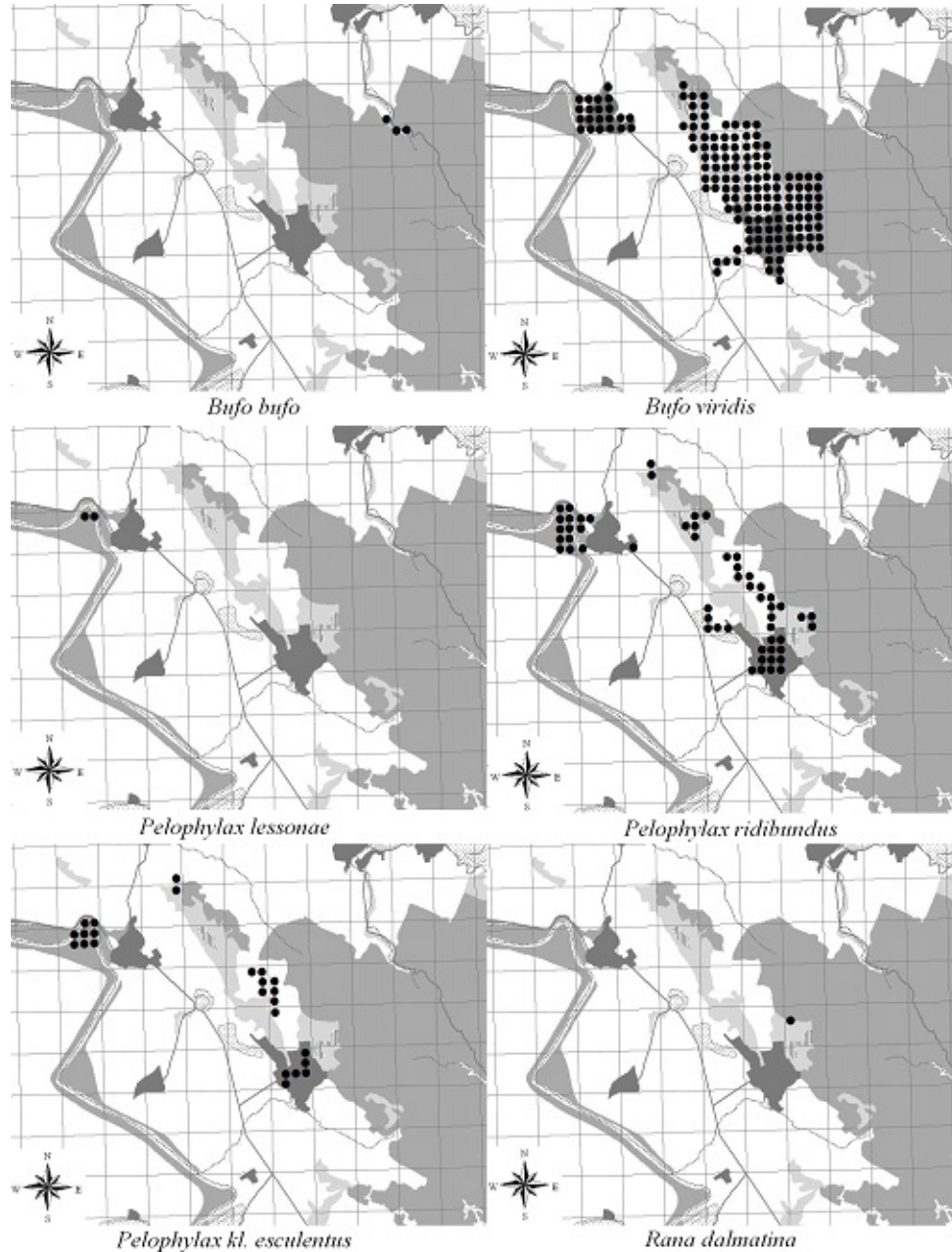


Figure 5 - continued. Distribution of the amphibian species in the research area.

Rana dalmatina (Bonaparte, 1839)

During our surveys in the area, only one specimen was found (Fig. 3), in a open pasture on the Măcin Chain, near the village of Greci (Fig. 5). The species was previously reported from the area by Torok (2005a) and Covaciu-Marcov *et al.* (2006).

Pelophylax ridibundus (Pallas, 1771)

The marsh frog is the most common green frog species from the area. It was identified in all the permanent and temporary water bodies observed (Fig. 5). Torok (1996, 1999, 2005a), Cogălniceanu *et al.* (2000), Sos (2005) and Covaciu-Marcov *et al.* (2006) previously recorded this species in the area.

Pelophylax lessonae (Camerano, 1878)

The pool frog seems to be a very rare species in the area. It was identified by us only in the medium sized ponds from near the Danube river, west of Măcin (Fig. 5). *P. lessonae* is now reported for the first time in the area. Recently, this species was found in a single other locality in northern continental Dobrudja (Covaciu-Marcov *et al.*, 2006).

Pelophylax kl. esculentus (Linnaeus, 1758)

The edible frog is less common then the marsh frog in the research area. However, it was also identified in most of the observed water bodies (Fig. 5). It was previously reported in the area by Covaciu-Marcov *et al.* (2006).

Emys orbicularis (Linnaeus, 1758)

The european pond turtle (Fig. 6) was previously identified only in the Danube river meadow, near the Măcin Mountains area (Torok, 2005b; Iftime, 2005). We reconfirm the species' presence in the previously mentioned area and we report the pond turtle for the first time in the Măcin Mountains National Park (Fig. 10). The species was identified in a small pond from the northern part of the Pricopan Chain.



Figure 6. *E. orbicularis* from the Pricopan Chain (photo by T. Sos).



Figure 7. *L. t. dobrogica* from the Pricopan Chain (photo by T. Sos).

Testudo graeca iberica (Pallas, 1814)

The spur-tighed tortoise is a common species in the area. It was identified in forested areas as well as open agricultural fields and pastures and along streams (Fig. 10). It was previously recorded in the area by Fuhn & Vancea (1961), Torok (1996, 1999, 2005b), Oțel (1998), Sos (2005) and Covaciu-Marcov *et al.* (2006).

Ablepharus kitaibelli stepaneki (Fuhn, 1970)

The snake-eyed skink is a relatively common species in the forested areas from the Măcin Chain. We have also identified this species in the Pricopan Chain (Fig. 10). In areas between the Măcin and Pricopan Chains, *A. k. stepaneki* was found in agricultural fields. The species was previously reported in the area by Torok (1996, 1999, 2005b), Oțel (1998), Sos (2005) and Covaciu-Marcov *et al.* (2006).

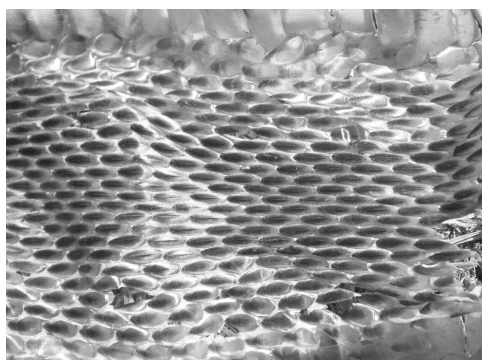


Figure 8. *E. sauromates* exuvia found on the Pricopan Chain (photo by T. Sos).



Figure 9. *Z. longissimus* from the Măcin Chain (photo by A. Strugariu).

Podarcis tauricus (Pallas, 1841)

The Balkan wall lizard is very common and abundant throughout the research area. It occurs in almost every type of habitat but is rarer in dense forests (Fig. 10). The species was previously recorded in the area by Fuhn & Vancea (1961), Torok (1996, 1997, 1999, 2005b), Oțel (1998), Sos (2005) and Covaciu-Marcov *et al.* (2006).

Lacerta viridis (Laurenti, 1768)

The green lizard is, like the previous species, very common in the Măcin Mountains area. It was identified in almost every investigated habitat (Fig. 10). However, *L. viridis* is more rare in agricultural fields than *Podarcis tauricus*. It was previously recorded in the area by Fuhn & Vancea (1961), Torok (1996, 1997, 1999, 2005b), Oțel (1998), Sos (2005) and Covaciu-Marcov *et al.* (2006).

Lacerta trilineata dobrogica (Fuhn & Mertens, 1959)

The Balkan green lizard (Fig. 7) is a rare species in the research area. Isolated populations of no more than 20 individuals each appear in the northern half of the Pricopan Chain (Fig. 10). The species was found in more moist valleys, even along small streams. It was previously recorded in the area by Fuhn & Vancea (1961), Torok (1996, 1997, 1999, 2005b), Oțel (1998), Sos (2005) and Covaciu-Marcov *et al.* (2006).

Natrix natrix (Linnaeus, 1758)

The grass snake is a relatively common species in the area, being recorded mostly near water sources but also at the edges of forests (Fig. 10). Torok (1996, 2005b), Oțel (1998), Sos (2005) and Covaciu-Marcov *et al.* (2006) previously recorded the species in the area.

Natrix tessellata (Laurenti, 1768)

The dice snake is a rare species in the research area. It was identified near the Danube river, west of Măcin as well as in the swamps from north of the Greci village, near the Pricopan Chain. This is the first time in which this species is identified so close to the Măcin Mountains National Park (Fig. 10). In the Danube river area it has been previously mentioned by Torok (2005b).

Coronella austriaca (Laurenti, 1768)

The smooth snake is a very rare species in the northern Măcin Mountains area. During our surveys, only 2 live specimens have been found, one on the Pricopan Chain and one on the Măcin Chain (Fig. 10). Both specimens were found on dirt roads near forested areas. Sos (2005), Torok (2005b) and Covaciu-Marcov *et al.* (2006) previously cited this species in the research area.

Dolichophis caspius (Gmelin, 1789)

The Caspian whip-snake is a common species in our research area. Numerous specimens were found in almost every investigated habitat (Fig. 10). The presence of the species was previously reported in the area by Fuhn & Vancea (1961), Torok (1996, 1999, 2005b), Oțel (1998), Sos (2005) and Covaciu-Marcov *et al* (2006).

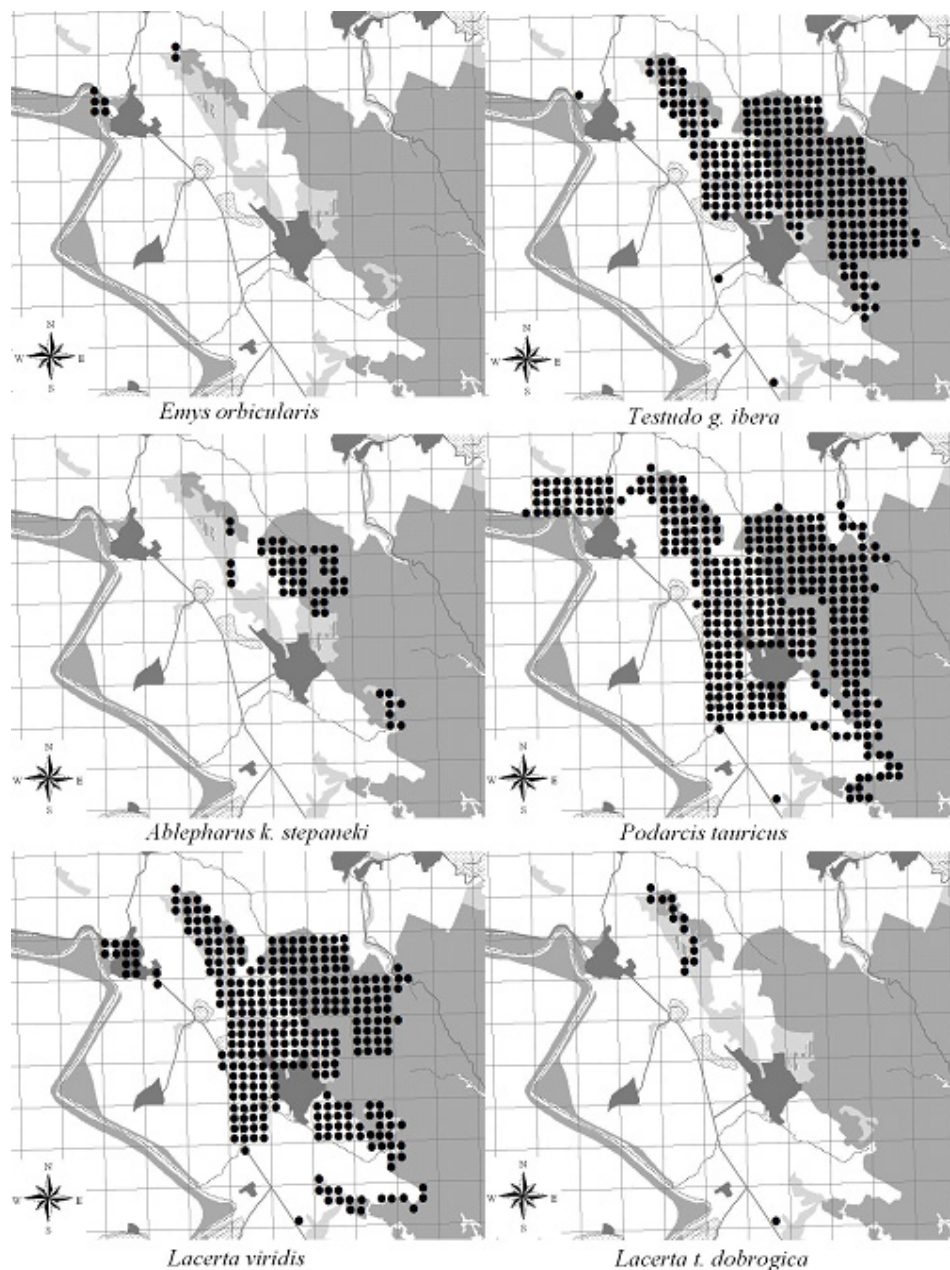


Figure 10. Distribution of the reptiles species in the research area.

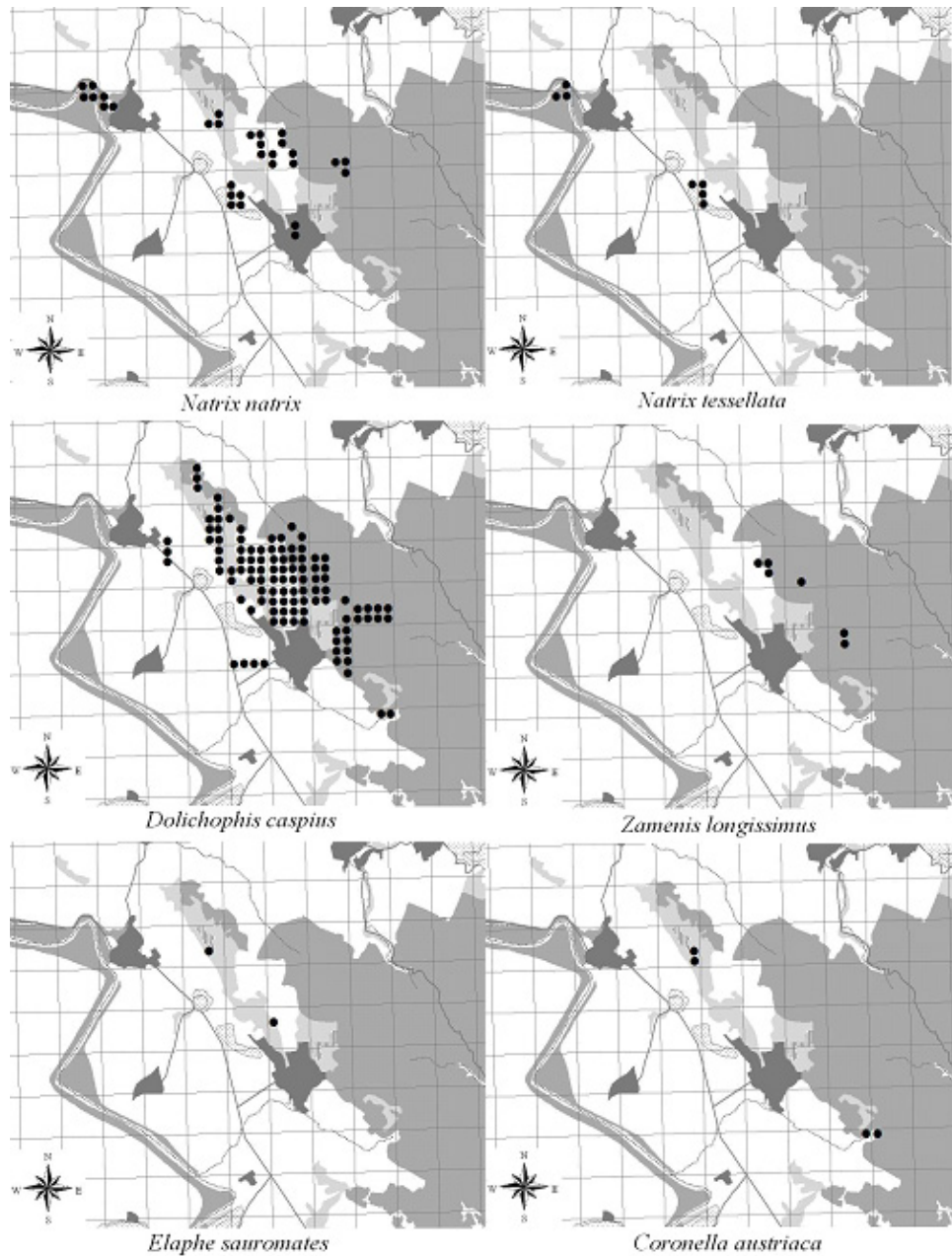
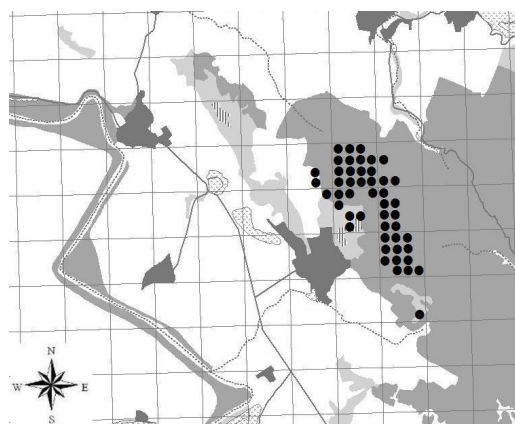


Figure 10 – continued. Distribution of the reptile species in the research area.

Zamenis longissimus (Laurenti, 1768)

The aesculapian rat-snake (Fig. 9) is a very rare species in the research area. It was found exclusively in the forested or rocky regions from the western slopes of the Măcin Chain (Fig. 10). The species has been previously mentioned for the research area by Torok (1996, 2005b), Oțel (1998) and Covaciu-Marcov *et al.*(2006).



Vipera a. montandoni

Figure 10 – continued (2). Distribution of the reptile species in the research area.

Elaphe sauromates (Pallas, 1814)

The blotched snake (Fig. 8) is an extremely rare species in the research area. Only one specimen and one exuvia were found during our surveys, both of them on the Pricopan Chain (Fig. 10). The species was previously reported in the area by Fuhn & Vancea (1961), Fuhn (1969), Oțel (1998), Torok (1999, 2005b, 2006) and Covaciu-Marcov *et al.* (2006b).



Figure 11. *V. a. montandoni* from the Măcin Chain (photo by A. Strugariu).

Vipera ammodytes montandoni (Boulenger, 1804)

The Dobruđan nose-horned viper (Fig. 11) is a relatively common species the Măcin Mountains. It was found in forested areas, rocky areas and even in pasture grounds from the western slopes of the Măcin Chain (Fig. 10). Previous publications (Oțel, 1998; Torok, 1999) reported *V. a. montandoni* from the Pricopan Chain as well. However our

surveys as well as other recent ones (Sos, 2005) failed to identify the species in the area. However, the possibility that the species still occurs in the Pricopan chain is not excluded.

Conservation status and management proposals

Our results indicate the presence of 12 amphibian and 13 reptile species in the northern Măcin Mountains area. Two of amphibian and one reptile species are considered to be nearly threatened on an international scale by the IUCN and one reptile species is considered vulnerable (Table 1). On a national scale, three amphibian and two reptile species are considered of least concern, four amphibian and one reptile species are considered near threatened, three amphibian and five reptile species are considered vulnerable, two amphibian and three reptile species are considered endangered and two reptile species are considered critically endangered (Table 1). The local status of some of the species identified by us in the area has been previously proposed in the Red List of the Flora and Fauna of the Măcin Mountains National Park (Tudor & Parpala, 2006). According to this publication, four of the amphibian species and eight reptile species are vulnerable in the M.M.N.P. and one amphibian and three reptile species are endangered. The species for which a conservation status has not been proposed do not occur or were not previously known to occur in the M.M.N.P. The herpetological conservation status that we have established in the present study indicates: two reptile species of least concern, one amphibian and two reptile species which are near threatened, one amphibian and three reptile species which are vulnerable, five amphibian and three reptiles species which are endangered and four amphibian and three reptiles species which are critically endangered in the Măcin Mountains area (Table 1).

The factors which pose a threat to the herpetofauna from our research area are varied. Due to the fact that their reproductive biology is linked to the aquatic habitats (e.g. Fuhn, 1969), amphibians in the area are much rarer than in other parts of the country, with a moister climate. Thus, the presence of the amphibian species as well as aquatic or semi-aquatic reptiles (*Emys orbicularis*, *Natrix natrix*, *Natrix tessellata*) is dependent on the few aquatic habitats present in the area. Purposely draining of the water bodies, natural draught conditions or introducing predatory fish could pose a very serious threat to these species (Hartel, 2007). With respect to these arguments, we propose that all aquatic habitats in which amphibians reproduce in the area be constantly monitored and protected, in order to ensure the survival of the amphibian species. Covaciu-Marcov *et al* (2006) showed that numerous specimens of *Bufo bufo* are killed by traffic due to the fact that they frequently reproduce in small temporary pools on dirt roads. Hartel (2007) showed that in central Romania numerous amphibian specimens are killed on roads during the mating migration. With regards to this aspect, we consider that precise studies should be performed on the migration patterns of the species in order to identify which sectors of which roads are more likely to cause amphibian casualties. Educating young people from the area to help the amphibians cross the roads on their way to the reproductive pool during the reproductive period and placing road indicators which tell drivers to pay attention to the crossing amphibians could help reduce the anthropogenic stress induced upon the native species (Hartel, 2007).

The terrestrial reptile species are mostly threatened by road traffic, poaching, habitat destruction caused by livestock grazing, mining activities and, probably most importantly, direct persecution.

To our knowledge, no patterns have yet been identified for the movements of most of the reptile species from our research area. Thus, implying management methods similar to those we proposed for reducing the stress caused by road traffic on amphibians would not be practical or efficient for reptiles. However, studies should be performed in order to identify which parts of which roads account for the highest rate of mortality and,

subsequently, road indicators could be placed in the approximate areas with the same aim as those that we proposed to be placed for the amphibian species.

Table 1. International, national and local status of the herpetofauna from the research area.

Species	IUCN Red List	National Status (Iftime, 2001, 2005)	Local Status	
			M.M.N.P. Red List	present study
<i>Triturus dobrogicus</i>	NT	EN		EN
<i>Lissotriton vulgaris</i>		NT		EN
<i>Bombina bombina</i>		NT		EN
<i>Bufo bufo</i>		NT	EN	CR
<i>Bufo viridis</i>		NT	VU	NT
<i>Hyla arborea</i>	NT	VU	VU	EN
<i>Pelobates fuscus</i>		VU		CR
<i>Pelobates s. balkanicus</i>		EN		CR
<i>Rana dalmatina</i>		VU	VU	CR
<i>Pelophylax ridibundus</i>		LC	VU	NT
<i>Pelophylax esculentus</i>		LC		VU
<i>Pelophylax lessonae</i>		LC		EN
<i>Emys orbicularis</i>	NT	VU		EN
<i>Testudo g. Ibera</i>	VU	EN	VU	NT
<i>Ablepharus k. stepaneki</i>		EN	VU	VU
<i>Podarcis tauricus</i>		NT	VU	LC
<i>Lacerta viridis</i>		LC	VU	LC
<i>Lacerta t. dobrogica</i>		EN	EN	CR
<i>Natrix natrix</i>		LC	VU	VU
<i>Natrix tessellata</i>		VU		EN
<i>Coronella austriaca</i>		VU	VU	CR
<i>Dolichophis caspius</i>		VU	VU	NT
<i>Zamenis longissimus</i>		VU	VU	EN
<i>Elaphe sauromates</i>		CR	EN	CR
<i>Vipera a. montandoni</i>		CR	EN	VU

(CR – Critic periclitat; EN – Endangered; VU – Vulnerable; NT – Near threatened;

LC – Least concern; M.M.N.P. – Măcin Mountains National Park;

IUCN = The International Union for the Conservation of Nature and Natural Resources)

Tortoises and several snake species (especially *Vipera ammodytes montandoni*) are known to be illegally collected for the pet trade (all species) or to be illegally farmed with the aim of extracting and selling venom for pharmaceutical purposes (*V. a. montandoni*) (Iftime, 2001, 2005; Torok, 2005b). To help prevent these illegal activities we recommend that more intensive searches and verifications should be performed by the responsible authorities on the visitors and camp sites, etc.

Habitat destruction caused by livestock (cattle, sheep, horses and especially goats) is a major factor of concern with regards to the conservation of the herpetofauna in our research area. This human activity is very widely spread in the Măcin Mountain areas, even inside the perimeter of the protected areas. The number of reptile and amphibian species found on pastures was found to be significantly lower than in similar areas which

were not grazed (Strugariu *et al.*, in preparation). Due to its highly destructive nature, in spite of the fact that it might not be socially and economically accepted, we suggest that grazing of livestock in the area should be stopped or kept to an absolute minimum, at least within the borders of the protected areas.

Table 2. Legislative protection status of the herpetofauna from the research area.

Species	O.G. 57.2007	Bern Convention	CEE Natura 2000 Habitats
<i>Triturus dobrogicus</i>	3	II	II
<i>Lissotriton vulgaris</i>	4B	III	
<i>Bombina bombina</i>	3, 4A	II	II, IV
<i>Bufo bufo</i>	4B	III	
<i>Bufo viridis</i>	4A	II	IV
<i>Hyla arborea</i>	4A	II	IV
<i>Pelobates fuscus</i>	3, 4A	II	IV
<i>Pelobates s. balkanicus</i>	4A	II	IV
<i>Rana dalmatina</i>	4A	II	IV
<i>Pelophylax ridibundus</i>	5A	III	V
<i>Pelophylax esculentus</i>	5A	III	V
<i>Pelophylax lessonae</i>	4B	III	IV
<i>Emys orbicularis</i>	3, 4A	II	II, IV
<i>Testudo g. Ibera</i>	3, 4A	II	II, IV
<i>Ablepharus k. stepaneki</i>	4A	II	IV
<i>Podarcis tauricus</i>	4A	II	IV
<i>Lacerta viridis</i>	4A	II	IV
<i>Lacerta t. dobrogica</i>	4A	II	IV
<i>Natrix natrix</i>		III	
<i>Natrix tessellata</i>	4A	II	IV
<i>Coronella austriaca</i>	4A	II	IV
<i>Dolichophis caspius</i>	4A, 4B	II	IV
<i>Zamenis longissimus</i>	4A	II	IV
<i>Elaphe sauromates</i>	3	II	II, IV
<i>Vipera a. montandoni</i>	4A	II	IV

Legend:

O.G. 57.2007 (see references for complete title):

Anexa 3 – Species of plants and animals which demand the establishment of special areas of conservation and important bird areas. Anexa 4A – Species of community interest, which need strict protection.

Anexa 4B – Species of national interest, which need strict protection.

Anexa 5A – Species of community interest, for which management methods are needed in order to harvest them (birds excluded).

Bern Convention (see references for complete title):

Anexa II: Protected animal species.

Anexa III: Strictly protected animal species.

CEE Natura 2000 Habitats (see references for complete title) :

ANEXA II: Species of plants and animals which demand the establishment of special areas of conservation.

ANEXA IV: Species of community interest, which need strict protection.

ANEXA V: Species of community interest, for which management methods are needed in order to harvest them (birds excluded).

All snake species and, occasionally, the tortoises are subjects of direct persecution by locals and tourists. We have observed many animals killed by people

during most, if not all, of our field investigations. Several past publications have also revealed extremely rare species such as *Elaphe sauromates* killed, most probably by local people (e.g. Torok, 2005b, Torok, 2006). With regards to this problem, we suggest that several educational activities be organized in the settlements from the area with the aim of reducing the level of superstitious beliefs or misconceptions that indirectly cause the death of numerous rare species. This, combined with more intense activity of the proper authorities could also help reduce the rate of herpetofaunal mortality in the area.

A continuous stress factor is represented by the open mines located in close vicinity to the park or even inside territory of the park. In most cases, no buffer zones between the park and the mines exist. The factors which affect the herpetofauna as a consequence of mining activities are: the frequent explosions, which especially cause the distribution of snakes, the high rate of transport with heavy utility-trucks and, at the end, the resulted relief form with rapid slope, which, in case of *T. g. ibera*, is a real accident cause.

Last, we point out the fact that several species that demand the establishment of special areas of conservation (SAC) (Table 2) are present in areas which do not belong to the Măcin Mountains National Park (see distribution maps above) and thus, are not protected. We suggest that the area from between the Măcin and Pricopan Chain, which is now mostly covered by agricultural fields of vineyards, be included in the Măcin Mountains National Park, as well as the wetlands from west and north of the Pricopan Chain. A separate protected area should be established in the region located west of the town of Măcin, where all the aquatic habitats should be conserved and managed appropriately.

Conclusions

During our survey in the northern Măcin Mountains area, twelve amphibian (*Triturus dobrogicus*, *Lissotriton vulgaris*, *Bombina bombina*, *Pelobates fuscus*, *Pelobates syriacus balcanicus*, *Hyla arborea*, *Bufo viridis*, *Bufo bufo*, *Pelophylax lessonae*, *Pelophylax ridibundus*, *Pelophylax kl. esculentus*, *Rana dalmatina*) and thirteen reptile (*Emys orbicularis*, *Testudo graeca ibera*, *Ablepharus kitaibelli stepaneki*, *Podarcis tauricus*, *Lacerta viridis*, *Lacerta trilineata dobrogica*, *Natrix natrix*, *Natrix tessellata*, *Dolichophis caspius*, *Zamenis longissimus*, *Elaphe sauromates*, *Coronella austriaca*, *Vipera ammodytes montandoni*) species or subspecies have been identified in the research area.

Pelobates syriacus balcanicus, *Pelobates fuscus*, *Pelophylax lessonae* and *Pelophylax kl. esculentus* have been recorded for the first time in the region. *Bombina bombina* was rediscovered on the Pricopan Chain.

Our data indicates that two reptile species are of least concern, one amphibian and two reptile species are near threatened, one amphibian and three reptile species are vulnerable, five amphibian and three reptiles species are endangered and four amphibian and three reptiles species are critically endangered in the Măcin Mountains area.

The anthropogenic factors that negatively affect the herpetofauna of the area are road traffic, poaching, habitat destruction caused by livestock grazing, mining activities and direct persecution. Draining of the aquatic habitats or the introduction of predatory fish in the existing aquatic habitats could potentially pose further threats to the amphibians.

Due to the fact that several species of great conservation interest are present in areas located outside the Măcin Mountains National Park, we suggest that these areas should either be included in the National Park or be declared autonomous protected areas.

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