The composition and distribution of the herpetofauna from the Valea Neagra river basin (Neamț County, Romania)

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Abstract. Our study focused upon an area in which the herpetofauna had previously been very poorly studied. We have managed to identify 12 species of amphibians (Triturus cristatus, Triturus vulgaris, Bombina bombina, Bombina variegata, Hyla arborea, Rana ridibunda, Rana dalmatina, Rana temporaria, Bufo bufo, Bufo viridis, Pelobates fuscus) and 4 reptile species (Lacerta agilis, Lacerta viridis, Anguis fragilis and Natrix natrix) in the 16 investigated localities. Nine of these species have been cited now for the first time in the area. We have also identified hybrid between B. bombina and B. variegata at 420 m ASL, this altitude is the superior limit of hybrids between Bombina species in Romania.

Key word: amphibians, reptiles, Valea Neagra river, distribution, Bombina, hybrids.

Introduction

The first publication which contained data regarding the distribution of the herpetofauna in the “Valea Neagra” River Basin appeared along with the “Fauna R.P.R.” volume: “Reptilia” (Fuhn & Vancea 1961). Forty years later, Cogalniceanu et al (2000) published new data about the distribution of amphibians in Romania, data which also concerned this region.

In the near past, more authors have published data regarding the distribution of amphibians and reptiles (Ghiurca et al. 2005, Gherghel & Ile 2006). Still, the herpetofauna of the region is far from being well studied. Therefore, we aimed to realize a synthesis of the knowledge concerning this topic, based both on the previous publications and our own research in the field.

Material and Methods

Study Methods

Our study was conducted between the years 2004 and 2006. Studiul nostru sa realizat intre anii 2004 si 2006. With the aim of mapping the herpetofauna, the transects method (Cogalniceanu, 1997) was used. The hybrids were determined by their morphological and chromatic characteristics, the determination being made after main features and measurements indicated in the scientific literature (Berger 1966, 1973, Cogălniceanu et al 2000, Fuhn 1960, Ghira & Mara 2000, Stugren 1980, Szymura 1993). The distribution maps were made using the UTM technique (Lehrer & Lehrer 1990) with 2X2 km quadrate.

Study area

The Valea Neagra river basin occupies a surface of 320km² and is situated in North-Eastern Romania, between the Siret river meadow and the Cracau-Bistrita depression. The hydrographical units of the area mainly consists of streams, lakes, temporary and permanent ponds, swamps, and marshlands. A large part of the Valea Neagra rivers basin is covered by agricultural fields. The forested regions are isolated and do not have a surface of over 50 ha (fig. 1).

The minimum altitude of the region is 170 m ASL in the Siret river meadow and the maximum altitude is 439 m ASL at the Poiana Mare Hill.

Results and Discussions

In the investigated region we have identified 12 species of amphibians (Triturus cristatus, Triturus vulgaris, Bombina bombina, Bombina variegata, Hyla arborea, Rana ridibunda, Rana dalmatina, Rana temporaria, Bufo bufo, Bufo viridis, Pelobates fuscus) and 4 reptile species (Anguis fragilis, Lacerta agilis, Lacerta viridis, Natrix
Amongst these, we have also identified hybrids between Bombina bombina and Bombina variegata. (tabel 1).

**Fig. 1** - Location of the study area in Neamț County (Romania).

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Tabel 1 – Distribution of the herpetofauna in the study area

Tc = Triturus cristatus, Lv = Lissotriton vulgaris, Bb = Bombina bombina, Bv = Bombina variegata, Bx = Bombina bombina X Bombina variegata, Pf = Pelobates fuscus, Bf b = Bufo bufo, Pv = Pseudopidela viridis, Ha = Hyla arborea, Pr = Pelophylax ridibundus, Rd = Rana dalmatina, Rt = Rana temporaria, Af = Anguis fragilis, La = Lacerta agilis, Nn = Natrix natrix
Triturus cristatus Laurentus 1768. The crested newt is a well represented species in the area, being identified by us in 8 localities, in reproductive pools rich in vegetation from the margins of forests.

Lissotriton vulgaris Linnaeus 1758. The smooth newt is a relatively rare species in the studied region, being identified by us in only 2 localities, in the same habitats as the crested newt with which it cohabitates (Fuhn 1960, Cogalniceanu et al. 2000).

Pelophylax ridibundus Linnaeus 1758. This is a very common species in the area, being identified in all of the 16 localities, in all of the water pools.

Rana temporaria Linnaeus 1758. The common frog is a common species, being identified by us in 6 localities, in the North-Eastern areas of the river basin, near lakes, ponds and swamps where it reproduces and sometimes lives during summer.

Rana dalmatina Bonaparte 1839. The agile frog is more common than the previous species, being observed by us in 11 localities. It especially inhabits the deciduous forests.

Bombina bombina Linnaeus 1758. The fire-bellied toad is a common species in the area, being identified by us in all of the 16 investigated localities. In the majority of cases, it was found at altitudes of 250-300m ASL but we have also found populations at 430 m ASL in the center of the investigated region. Populations of agile frogs at altitudes of over 400 m have been found in North-Eastern Romania, in the Suceava Plateau (Strugariu et al. 2006), where the ecological situation is similar.

Bombina variegata Linnaeus 1758. The yellow-bellied toad is a relatively common species in the area, being observed in 12 localities. This species was found in the North-Eastern and Eastern areas of the river basin, frequently cohabiting with Bombina bombina.

Bombina bombina X Bombina variegata. During our study, we have identified hybrid populations between the two native species of Bombina in 12 localities from the North, East and Central areas of the river basin, at altitudes of 300-420 m ASL. In western Romania, the Bombina hybrids are found at altitudes of 150 m ASL (Covaciu-Marcov et al, 2000, 2002, 2003a, b, 2004, 2005, 2006, Sas et al. 2005) and 300 m ASL (Ghira et al. 2002) and in North-Eastern Romania, at altitudes of 400 m ASL (Strugariu et al. 2006).

Hyla arborea Linnaeus 1758. The treefrog being very common in the investigated region. It was identified by us in all of the investigated localities, near lakes and forests.
The herpetofauna of the Valea Neagra river basin

Fig. 3a. Distribution of the herpetofauna in the Valea Neagra river basin.
*Bufo bufo* Linnaeus 1758. The common toad is a relatively common species in the area, being identified by us in 7 localities, in forests and gardens.

*Pseudepidelea viridis* Laurentus 1768. The green toad is more common than the previous species, being identified by us in 13 localities, in similar habitats to the common toad.

*Pelobates fuscus* Laurentus 1768. The common spade-foot toad is a common species in the area, being identified in 12 localities.

*Lacerta agilis* Linnaeus 1758. The sand lizard is a rare species in the Valea Neagra river basin, being identified in only 3 localities. We encountered it at forest margins or at the edges of roads, in areas with thick vegetation.

*Lacerta viridis* Laurentus 1768. The green lizard is more common than the previous species, being identified in 4 localities. It was found at forest margins and on steep sunny slopes with thick vegetation.

Fig. 3b. Distribution of the herpetofauna in the Valea Neagra river basin.
Anguis fragilis Linnaeus 1758. The slow-worm was found in 5 localities, inside forests or at the edges of roads.

Natrix natrix Linnaeus 1758. The grass snake is the most common reptile species of reptile in the region, being identified by us in all of the 16 localities, in forests, swamps, near streams or in fish farms.

Conclusions

During our research in the Valea Neagra river basin, we have identified 12 amphibian species (Triturus cristatus, Triturus vulgaris, Bombina bombina, Bombina variegata, Hyla arborea, Rana ridibunda, Rana dalmatina, Rana temporaria, Bufo bufo, Bufo viridis, Pelobates fuscus) and 4 species of reptiles (Anguis fragilis, Lacerta agilis, Lacerta viridis, Natrix natrix). We have also identified hybrids between Bombina bombina and Bombina variegata.

Rana dalmatina, Bombina variegata, Hyla arborea, Bufo bufo, Bufo viridis, Lacerta agilis, Lacerta viridis, Anguis fragilis si Natrix natrix have now been cited for the first time in the Valea Neagra rivers basin. Bombina bombina and the hybrids between this species and Bombina variegata are found in the area at their superior altitude limite.

In the 16 investigated geographical localities, we have identified 146 new localities for the distribution of the herpetofauna in Romania.

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