

DISTRIBUTION OF THE HERPETOFAUNA IN THE LOTRIOARA RIVER BASIN, SIBIU DISTRICT (ROMANIA)

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Abstract. The paper gives an overview of the distribution of the herpetofauna (8 amphibian and 12 reptile species) in the Lotrioara river basin, Sibiu District, Romania; based on the results of several surveys carried out in the 1998–2001 time period, records from the literature, and data of the collections of the Hungarian Natural History Museum, Budapest (HNHM) and the Museum of Natural History from the Bruckenthal National Museum, Sibiu (MBSR). The distribution patterns are discussed and the possible threatening factors for the local herpetofauna are listed.

Résumé. Les études sur le terrain faites pendant 1998 – 2001 et sur les collections du Muséum Hongrois des Science de la Nature, Budapest (HNHM) et du Muséum d'Histoire Naturelle de Muséum National Bruckenthal, Sibiu ainsi que les données de la littérature on permis d'établir la distribution de la herpétofaune (8 espèces d'amphibiens et 12, de reptiles) dans la Vallée Lotrioara, département de Sibiu. On discute les modèles de cette distribution ainsi que les facteurs de risque.

Key words: distribution, amphibians, reptiles, threats, Lotrioara valley, Sibiu District, Romania

INTRODUCTION

In the last century many herpetological surveys were carried out in Romania, but the major part of the country, especially the mountain areas, still remained white spots, regarding the knowledge of their herpetofauna.

The single comprehensive works, which discussed the distribution of the different amphibian and reptile species in Romania, are the two volumes of the Fauna RPR – vol. XIV/1-Amphibia (Fuhn, 1960) and vol. XIV/2-Reptilia (Fuhn & Vancea, 1961). A recent work by Cogălniceanu et al. (2000) gives an updated distribution of the amphibians in the country. Ghira et al. (2002) summarized the records of a mapping survey in Transylvania.

As an exception the herpetofauna of the Lotrioara basin and the nearby regions was studied quite well in the past. The first records are those by Bielz (1856, 1888). Additional data for some species can also be found in many herpetological papers (eg. Călinescu, 1931; Fejérváry-Láncz, 1943 b; Mara et al., 1999; Ghira et al., 2002). Graef's unpublished B.Sc. thesis (1972) is the only comprehensive and relatively complete work for the valley.

Bielz's (1856, 1888), Graef's (1972) and Mara's et al. (1999) records are covering more or less the entire area, but the authors have surveyed different parts of the valley, according to the following: Bielz (1856, 1888), the area of the village, Prejba peak, and entrance of the valley at Turnu Roșu; Graef (1972) and Mara et al. (1999), the lower part of the valley up to the village.

Our purpose was to give a complete species list to the Lotrioara valley, and to present the spatial distribution of the herpetofauna there. In addition to our personal

observations, we have included the records from the literature and also tried to gather data from the collections of the Hungarian Natural History Museum, Budapest (HNHM) and Museum of Natural History from the Bruckenthal National Museum, Sibiu (MBSR).

Description of the valley

The Lotrioara basin is situated more or less in the center of Romania, being a part of the Lotrului Mountains, between the following coordinates: 45°32' and 45°37' N lat. and 24°16'12" E long.; covering an area of 117 square kilometers (Fig. 1). From South it is bordered by peaks and hills with altitude between 774 and 2,141 m (a.s.l.) (Păltiniș hill, Sterpu peak) and the hills of Răchițele, Pleșile and Pietrelor. These are followed by the Leul, Florea, Stănișoara, Părcălabului, Sterpului, Cocăcii and Voineasa peaks, which continue in the Cibin Mountains. In West and North it is delimited by the Sadu river basin, represented by the Duduranului and Pleșului peaks, and in the east by the Olt river basin. Its mean altitude is 2,000 m, with higher values in the Sterpu (2,142 m), Florei (2,060 m) and Părcălabu (2,060 m) peaks (Dobroș, 1997).

The valley is deep, more than 900 m. Sedimentary and crystalline sheets form the basement of the area. The mean annual temperature is 3.1-4.7°C, and has positive values nine months a year, with the highest ones in August (Buioc, 1997).

The basin is a specific alpine habitat, with a broad leafed and coniferous forested zone in its lower part that is replaced by mostly coniferous forest in the upper part of the valley.

In the valley, 7 km distance from the main road lays a small village Lotrioara, with only 20-30 houses. There is one big limestone quarry at 500 m from the main road. In the upper part of the valley intensive timber production works are going on for several years, and the small road which follows the course of the valley is used by many lorries daily.

MATERIALS AND METHODS

The area was surveyed for several times during the 1998-2001 time period, as follows: 1998 – one, three-days survey in summer (L. K., T. Sike); 1999 – two, four-days surveys, one in spring and one in summer (L. K., T. Sike); 2000 – one, five-days survey in spring (L. K., T. Sike) and 2001 – one week survey in summer (L. K., T. Sike, T. Sos). During this period, we managed to sample the entire area, and to obtain a quite complete view of the spatial distribution of the different amphibians and reptiles.

RESULTS

A total number of 20 herpetofauna species were reported in the valley; 8 amphibians and 12 reptiles. Identified species accounts are in the following section.

Salamandra salamandra (Linnaeus, 1758) (Fig. 2)

Bielz (1888) was the first who recorded *S. salamandra* from the valley, from the Prejba area. Graef (1972), Mara et al. (1999) and Ghira et al. (2002) also listed

the species. The first two works relate on preserved specimens in the collection of MBSR. Ghira et al. (2002) listed it from Turnu Roşu as well. We have found this species in the lower part of the area up to 700 m a.s.l..

Triturus alpestris alpestris (Laurenti, 1768) and

Triturus cristatus cristatus (Laurenti, 1768)

We discuss the distribution of the two newt species together as there are only two records by Mara et al. (1999) and Ghira et al. (2002) in the area. We were not able to find these two species during our surveys. They could be present in the first 4-7 km of the valley, up to 800 m elevation. *T. c. cristatus* is present at the entrance of the valley, at Turnu Roşu (Ghira et al., 2002).

Bombina variegata (Linnaeus, 1758) (Fig. 2)

Graef (1972), Mara et al. (1999) and Ghira et al. (2002) reported the species based on their own observations and specimens in the MBSR. Fejérváry-Lángh (1943 a) and Ghira et al. (2002) recorded it from Turnu Roşu. We observed adult specimens and tadpoles in the first 8 km of the valley, in small ponds along the road.

Bufo bufo bufo (Linnaeus, 1758) (Fig. 2)

As in the case of *B. variegata*, *B. b. bufo* was also recorded by Graef (1972), Mara et al. (1999) and Ghira et al. (2002). Graef (1972) and Mara et al. (1999) listed specimens from the MBSR as well. The species occurs in the lower part of the valley, up to the village.

Bufo viridis viridis Laurenti, 1768 (Fig. 2)

Graef (1972) and Ghira et al. (2002) were the observers of the green toad here, in the area of the village. We found crashed specimens in 1999 and 2000 there.

Hyla arborea arborea (Linnaeus, 1758) (Fig. 2)

H. a. arborea was also recorded by Graef (1972) and Ghira et al. (2002). A single male was observed in 1998, 2 km from the main road at 450 m a.s.l..

Rana temporaria temporaria Linnaeus, 1758

In spite of its abundance its records are poor: Bielz (1888) and Călinescu (1931) from Prejba, and Ghira et al. (2002) for the village area. It occurs in the entire area up to 1,500 m (a.s.l.). We have been able to observe the species during all the field surveys.

Emys orbicularis (Linnaeus, 1758)

Mara et al. (1999) and Ghira et al. (2002) listed the species from the valley, based on Graef's report. These were the first records of the species from this area and the vicinal regions. Since Bielz (1888), the closest populations were known from the towns Bungard and Avrig, which are at 30 and 29 km distance from the Lotrioara valley. During the field surveys no individuals could be observed, and proper habitats could not be identified either. We question the species occurrence in the basin.

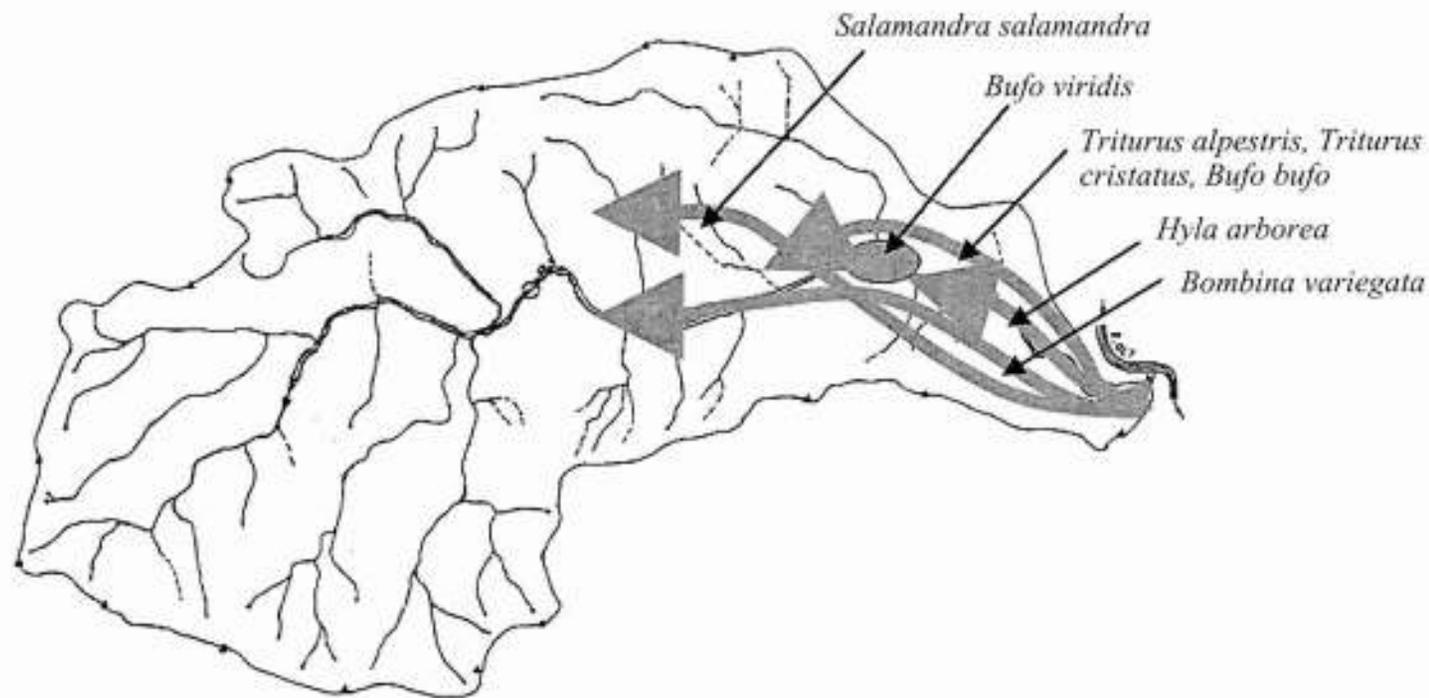


Fig. 2 - Distribution map of the amphibians in the area.

Lacerta agilis agilis Linnaeus, 1758 (Fig. 3)

The lizard was recorded by Fejérváry-Lángh (1943 b), Mara et al. (1999) and Ghira et al. (2002). We have observed it up to 700 m a.s.l. in the lower part of the valley.

Lacerta viridis viridis (Laurenti, 1768) (Fig. 3)

L. v. viridis has the most interesting taxonomy from all the reptiles of the area. The Transylvanian endemic, presently unrecognized, variety of the green lizard, var. *trassylvanica* (Kimakowicz, 1888, in Bielz, 1888) was described from this region. This form occurs beneath other Transylvanian localities, in the Cibin Mountains at Sibiu, Tâlmăciu, Lotrioara and Turnu Roşu (Kimakowicz, 1888, in Bielz, 1888). Mojsisovics (1889 a) reported var. *trassylvanica* from the Sibiu area. Méhely (1892) assigned it to *L. agilis* and questioned the validity of the form. In spite of Méhely's opinion, Mertens & Wermuth (1960) listed it only in the synonyms for *L. v. viridis*.

The species has been collected in the village area by Bielz (1888), Călinescu (1931), Fejérváry-Lángh (1943 b), Graef (1972), Mara et al. (1999) and Ghira et al. (2002). Conserved specimens can be found in the MBSR, too (Graef, 1972; Mara et al., 1999). Fejérváry-Lángh (1943 b) and Ghira et al. (2002) observed it at Turnu Roşu.

Several individuals have been observed in 1998, 1999 and 2000 at 700 m (a.s.l.) in the lower part of the valley.

Podarcis muralis muralis (Laurenti, 1768) (Fig. 3)

Bielz (1856, 1888), Entz (1888 a, b), Düringen (1897), Méhely (1918), Călinescu (1931), Fejérváry-Lángh (1943 b) and Ghira et al. (2002) recorded the wall lizard from Turnu Roşu. Fejérváry-Lángh (1943b), Mara et al. (1999) and Ghira et al. (2002) listed the species from the valley based on conserved specimens from the HNHM and MBSR. It inhabits the first, stony part of the valley and its biggest population can be found on a the limestone quarry 500 m distance from the main road.

Zootoca vivipara (Jacquin, 1787) (Fig. 3)

The occurrence of this lizards in the valley was reported by Bielz (1888), Călinescu (1931) and Fejérváry-Lángh (1943 b). At Prejba the population was documented by Bielz (1888), Călinescu (1931) and Graef (1972). Many individuals have been observed in the upper part of the valley, up to the highest peaks.

Anguis fragilis colchicus (Nordmann, 1840) (Fig. 3)

Its occurrence was reported by Bielz (1888), Călinescu (1931), Fejérváry-Lángh (1943 b), Mara et al. (1999) and Ghira et al. (2002). The records from Prejba are the ones by Bielz (1888) and Graef (1972). Fuhn & Vancea (1961), Stugren et al. (1962) and Ghira et al. (2002) reported it from Turnu Roşu. Preserved specimens can be found in the collection of the MBSR, too (Mara et al., 1999). Sympatric populations with *Z. vivipara* and *V. b. berus* have been found in the upper part of the valley.

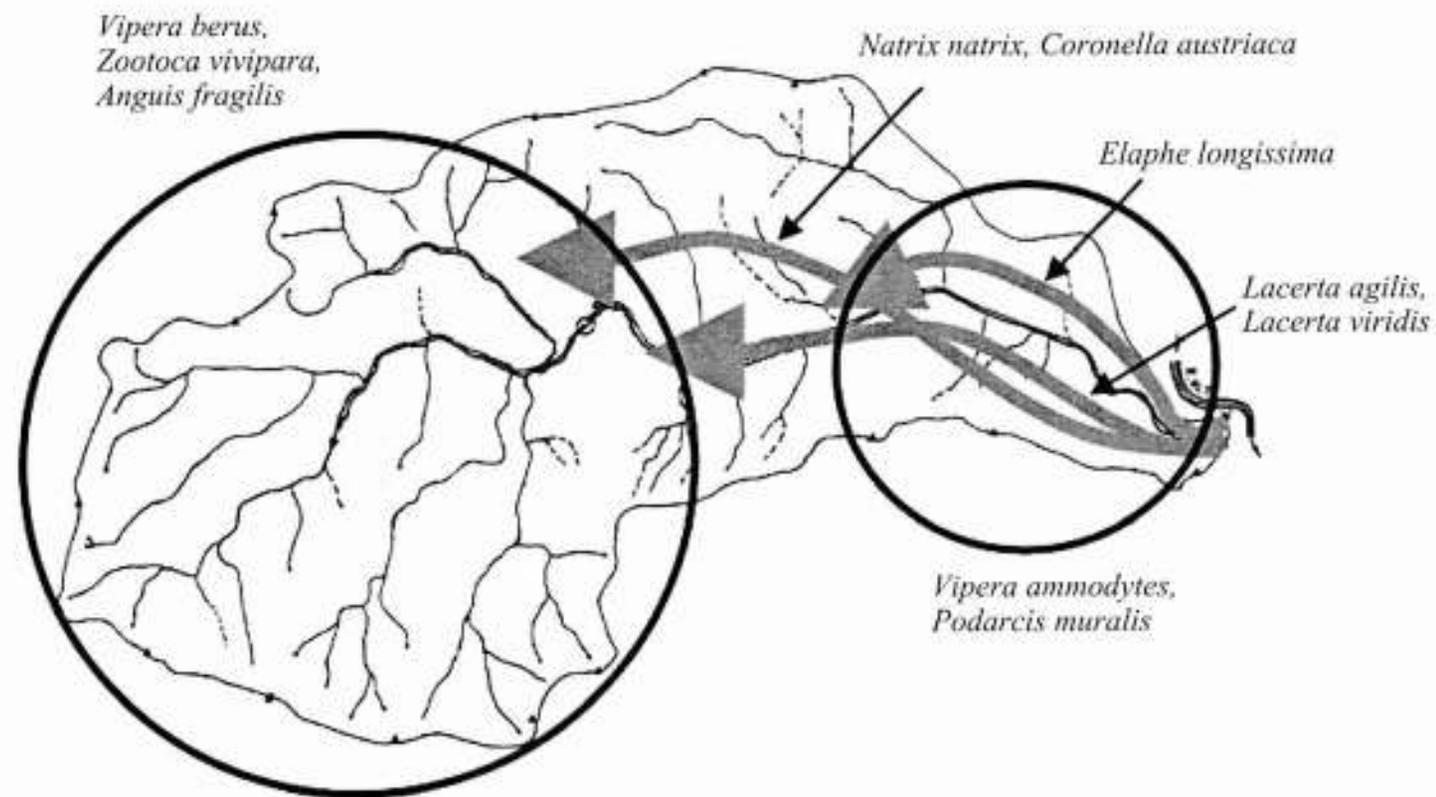


Fig. 3 – Occurrence of the reptile species in the Lotrioara valley.

Natrix natrix natrix (Linnaeus, 1758) (Fig. 3)

Graef (1972), Mara et al. (1999) and Ghira et al. (2002) collected the species in the area. According to Mara et al. (1999) one individual is deposited in the MBSR.

An adult male was collected in 2001 at 8 kms distance from the main road, and on several roads some killed ones have been observed during the 1998 and 1999 surveys in the village area. The snake occurs in the lower part of the valley up to 800 m a.s.l.

Natrix tessellata tessellata (Laurenti, 1768)

Bielz (1888) reported the species from "Lotrioara village at Turnu Roşu". His record was attributed to Lotrioara valley (Călinescu, 1931; Fejérváry-Lángh, 1943 b; Mara et al., 1999; Ghira et al., 2002) and Turnu Roşu (Méhely, 1918; Călinescu, 1931; Fejérváry-Lángh, 1943 b; Fuhn & Vancea, 1961; Ghira et al., 2002).

The specimen observed by Bielz could be an itinerant one from the Olt river. The species occurs in the Olt river at Turnu Roşu, but we doubt its existence in the Lotrioara.

Coronella austriaca austriaca Laurenti, 1768 (Fig. 3)

Bielz (1888), Călinescu (1931) and Fejérváry-Lángh (1943 b) collected this snake in the village area. Two specimens have been observed in 1999 and 2000 closed to the village. It inhabits the lower part of the valley up to 800 m a.s.l.

Elaphe longissima longissima (Laurenti, 1768) (Fig. 3)

Only Mara et al. (1999) and Ghira et al. (2002) listed the snake from the area. Bielz (1888), Méhely (1918), Călinescu (1931), Fejérváry-Lángh (1943 b) and Ghira et al. (2002) proved its existence at Turnu Roşu. In 1999 and 2000, 3 adult specimens have been found killed in the village area, and one live male was observed at 4 kms distance from the main road.

Vipera berus berus (Linnaeus, 1758) (Fig. 3)

The adder population from Prejba is one of the well known ones from Sibiu district, both by herpetologists (Bielz, 1888; Méhely, 1895; Graef, 1972; Krecsák, 2001; Ghira et al., 2002) and forestry authorities (there are indicator panels placed by rangers, marking one of the habitats). More than 60 individuals have been observed in the Prejba area during the surveys.

Vipera ammodytes ammodytes (Linnaeus, 1758) (Fig. 3)

The other venomous snake of the valley is *V. a. ammodytes* (Bielz, 1888; Mojsisovics 1889 b; Călinescu, 1931; Fejérváry-Lángh, 1943 b; Fuhn & Vancea, 1961; Graef, 1972; Mara et al., 1999; Ghira et al., 2002). Its occurrence at Turnu Roşu is documented as well (Bielz, 1888; Mojsisovics, 1889b; Méhely, 1893; 1918; Călinescu, 1931; Fejérváry-Lángh, 1943 b; Ghira et al., 2002). Preserved specimens should be found in the collection of the MBSR (Mara et al., 1999). One male specimen was collected in 1999 in a rocky habitat, close to the village and several skin shades were found, as well in this part of the valley.

DISCUSSION

It is interesting that Fuhn (1960) has not recorded *S. salamandra*, *B. variegata*, *B. b. bufo*, *B. v. viridis*, *R. t. temporaria* respectively Fuhn & Vancea (1961) *L. agilis*, *L. v. viridis*, *P. m. muralis*, *A. f. colchicus*, *C. a. austriaca* from the valley, even he referred to Bielz's 1856 and 1888 works and reported them from Voineasa. Fejérváry-Lángh (1943 a, b) listed *B. variegata*, *L. v. viridis*, *E. l. longissima* from Turnu Rosu, and *P. m. muralis*, *Z. vivipara* and *L. a. agilis* from Lotrioara valley based on specimens from the HNHM. These, together with the greatest part of the collections, have been destroyed during the 1956 air raids on the Hungarian Natural History Museum (Budapest).

The existence of the preserved specimens reported by Graef (1972) and Mara et al. (1999) from the MBSR could not be checked out as no data could be obtained about this collection.

Even if we take into account only the herpetofauna of the Lotrioara valley, we can state that it is worth for a protection as a reserve. Unfortunately, the area is not protected at all, in spite of the firm attempt of the Faculty of Ecology from the Lucian Blaga University, Sibiu (Benedek and Sirbu pers. comm.).

The possible threats for the local herpetofauna are the following:

- a) urbanization and human disturbance – In the last few years many holiday houses have been built in the area. Unfortunately, the tourists do not take care about the nature and fill the valley with big rubbish hills. They represent a real threat for the reptiles and amphibians. During our surveys two *E. l. longissima* specimens, of around 1 m long, were found killed in the area of the village. The locals reported that they use to kill every snake, which gets in their way, and especially the vipers (these are mostly *A. f. colchicus*).
- b) limestone quarry – The walls of the quarry are inhabited by a population of *P. m. muralis*. This population is decimated by the blasting and many specimens are killed by the lorries that bear the rock, too.
- c) timber production – It decimates especially the habitats of *V. b. berus*, *Z. vivipara* and *A. f. colchicus*.
- d) cars – Many specimens are crashed by lorries. During our surveys we found dead individuals of almost every occurring herpetofauna species: *S. salamandra*, *B. b. bufo*, *B. v. viridis*, *A. f. colchicus*, *P. m. muralis*, *Z. vivipara* and *V. b. berus*.

ACKNOWLEDGMENTS

Dr. Zoltán Korsós' comments (HNHM, Budapest) highly improved the MS. Magor Lőrincz (ELTE, Budapest) joined us to our first survey in the area. Ioan Sirbu and Ana Maria Benedek (Lucian Blaga University, Sibiu) were our hosts during our last survey that was carried out during the Summer University for Nature Protection organized by the Eco Studia Society from Cluj. Several participants helped us during this period. They are all acknowledged here. Thanks go also to anonymous referees.

RĂSPÂNDIREA AMFIBIENILOR ȘI REPTILELOR ÎN BAZINUL RĂULUI
LOTRIOARA, JUDEȚUL SIBIU (ROMÂNIA)

REZUMAT

Pe baza unor studii de teren efectuate în perioada 1998-2001, a datelor din literatură și a colecțiilor Muzeului Ungar de Științe ale Naturii, Budapesta (HNHM) și Muzeului Național Bruckental, Sibiu (MBSR) se prezintă distribuția herpetofaunei (8 specii de amfibieni și 12 de reptile) în Valea Lotrioara, județul Sibiu. Sunt discutate modelele distribuției herpetofaunei și sunt notați factorii de risc, posibili.

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Received: December 9, 2003
Accepted: February 12, 2004

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