

OBSERVATIONS ON THE HERPETOFAUNA OF THE BUILA-VÂNTURARIȚA MASSIF (SOUTHERN CARPATHIANS, ROMANIA)

ALEXANDRU IFTIME, OANA IFTIME

Abstract. The results of herpetological investigations in the Buila-Vânturarița massif (Southern Carpathians, Romania) and its surrounding areas are reported here. 19 amphibian and reptile species were identified (*Salamandra salamandra*, *Triturus cristatus*, *Ichthyosaura alpestris*, *Lissotriton vulgaris*, *Bombina variegata*, *Bufo bufo*, *B. viridis*, *Hyla arborea*, *Rana temporaria*, *R. dalmatina*, *Pelophylax ridibundus*, *P. lessonae*, *Emys orbicularis*, *Lacerta agilis*, *L. viridis*, *Podarcis muralis*, *Zootoca vivipara*, *Zamenis longissimus*, *Natrix natrix*) and are presented together with distribution and ecological data.

Résumé. On présente les résultats des études herpétologiques dans le massif de Buila-Vânturarița (Carpathes méridionaux, Roumanie). Les 19 espèces, identifiées sur le terrain (*Salamandra salamandra*, *Triturus cristatus*, *Ichthyosaura alpestris*, *Lissotriton vulgaris*, *Bombina variegata*, *Bufo bufo*, *B. viridis*, *Hyla arborea*, *Rana temporaria*, *R. dalmatina*, *Pelophylax ridibundus*, *P. lessonae*, *Emys orbicularis*, *Lacerta agilis*, *L. viridis*, *Podarcis muralis*, *Zootoca vivipara*, *Zamenis longissimus*, *Natrix natrix*), sont présentées avec les données concernant leur distribution et leur biotope.

Key words: Amphibia, Reptilia; habitat, thermophilic, cryophilic, montane, Buila-Vânturarița mountains, Romania.

INTRODUCTION

The Buila-Vânturarița Mountains are a southern offshoot of the Căpățâni Mountains, which are part of the Parâng-Lotru-Șureanu-Căpățâni larger division of the Southern Carpathians of Romania. Their highest altitude is reached in Buila peak (1849 m a.s.l.). The Buila-Vânturarița massif is a high, fragmented limestone ridge oriented from the south-west to the north-east; it is linked to the Căpățâni massif by a lower ridge and is surrounded by numerous hill chains. The hills and also the limestone ridge are dissected (often creating spectacular gorges) by rivers that have their source either in the massif or between it and the Căpățâni Mountains: Bistrița, Costești, Otăsău, Cheia, and Olănești. It is interesting to note that above (and north) of the gorges, in the area between the Buila-Vânturarița ridge and the main Căpățâni massif, the vegetation has a more cryophilic character, corresponding to a colder, less sunnier microclimate. The present-day vegetation (after Măciu et al., 1982; Neblea & Bodescu, 2012; and satellite imagery data) is dominated by oak (*Quercus robur*), sessile oak (*Quercus dalechampii*), and hornbeam (*Carpinus betulus*) on the lower, southern hill slopes (and never above the gorges), by beech (*Fagus sylvatica*) on the upper hills and lower mountain reaches, then by an altitudinal gradation of mixed beech, fir (*Abies alba*) and spruce (*Picea abies*) forests, then pure spruce stands, above which, on the high ridge, there are alpine grasslands and alpine thickets with juniper (*Juniperus communis*) and mountain pine (*Pinus mugo*). Alder (*Alnus incana*) and poplar (*Populus* sp.) thickets are present along the river valleys, juniper (*Juniperus sabina*) thickets on some limestone cliffs, and yew (*Taxus baccata*) in

some deep limestone gorges. On the southern hills there are a number of villages surrounded by traditional-use rural landscape mosaic: patches of forest, pastureland, orchards and cropland. The non-traditional human impact consists of logging and some touristic development, especially in the Olănești area, and the exploitation of an immense limestone quarry at Arnota. A map of the vegetation and land use in the study area is given in figure 1.

The Buila-Vânturarița Mountains have extremely few published herpetological records. Amphibian records are summed up by Cogălniceanu et al. (2000, 2013) and pertain to four species: *Triturus cristatus*, *Ichthyosaura alpestris*, *Lissotriton vulgaris* and *Bombina variegata*. We have previously added the record of *Rana temporaria*, in the context of discussing the predation of its eggs by a gastropod (Iftime & Iftime, 2010 a).

MATERIALS AND METHODS

Field observations were performed in the region in April and May 2009; the amphibians and reptiles were searched using the active transect method (active search of specimens along a 4 m wide randomly chosen transect; see Cogălniceanu 1997). Transects and additional observation points are shown in figure 1.

RESULTS

We have recorded 12 amphibian species: *Salamandra salamandra* (Fig. 2), *Triturus cristatus* (Fig. 3), *Ichthyosaura alpestris*, *Lissotriton vulgaris*, *Bombina variegata*, *Bufo bufo*, *B. viridis*, *Hyla arborea* (Fig. 4), *Rana temporaria*, *R. dalmatina*, *Pelophylax ridibundus*, *P. lessonae*; and 7 reptile species: *Emys orbicularis* (Fig. 5), *Lacerta agilis* (Figs 6, 7), *L. viridis*, *Podarcis muralis*, *Zootoca vivipara*, *Zamenis longissimus*, *Natrix natrix*.

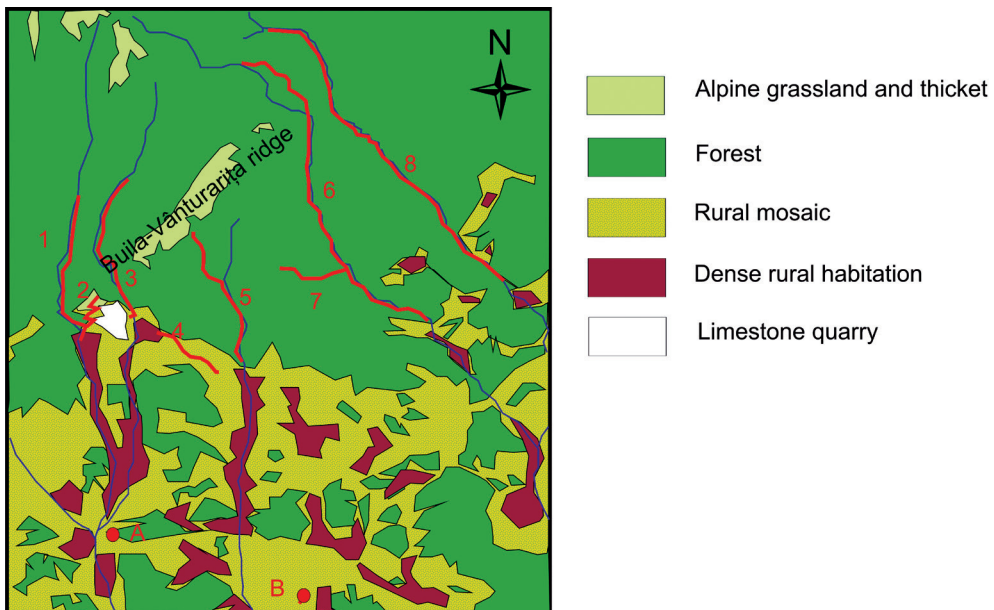


Fig. 1 - Vegetation/land use map of the study area; studied transects and stations in red.



Fig. 2 - *Salamandra salamandra*, adult female depositing larvae, upper Otăsău valley (Photo Al. Iftime).



Fig. 3 - *Triturus cristatus*, adult male, Olănești valley (Photo O. Iftime).



Fig. 4 - *Hyla arborea*, adult, Bărbătești ponds (Photo O. Iftime).



Fig. 5 - *Emys orbicularis*, adult, Bărbătești ponds (Photo O. Iftime).



Fig. 6 - *Lacerta agilis*, adult male, with *erythronotus* and *immaculata* coloration, Lupului valley (Photo Al. Iftime).



Fig. 7 - *Lacerta agilis*, adult male, with *chersonensis*-like single postnasal, Lupului valley (Photo Al. Iftime).

Distribution data

Transect 1 (Bistrița valley): from N 45°11'28.4346", E 24°2'26.9982", ca. 500 m a.s.l., to N 45°13'39.0468", E 24°2'7.839", ca. 800 m a.s.l. The transect follows a river and crosses the limestone ridge along the Bistrița gorges. The vegetation is mixed beech and other deciduous species south of the gorges and beech forest in the gorges and north from them. Species found: *Salamandra salamandra*, *Ichthyosaura alpestris*, *Lissotriton vulgaris*, *Bombina variegata*, *Bufo bufo*, *Rana temporaria*, *Lacerta agilis*. All of them are distributed all along the transect.

Transect 2 (Arnota mountain): from N 45°11'28.4346", E 24°2'26.9982", ca. 500 m a.s.l., to N 45°12'15.9006", E 24°2'51.7164", ca. 1200 m a.s.l. The transect climbs up a limestone mountain; the vegetation is mixed deciduous forest, beech forest and grassland. *Bombina variegata*, *Lacerta viridis*, *Podarcis muralis*. All of them are distributed all along the transect.

Transect 3 (Costești valley): from N 45°11'32.571", E 24°3'46.7172", ca. 350 m a.s.l. to N 45°14'9.729", E 24°3'15.1986", ca. 1000 m a.s.l. The transect follows a river and crosses the limestone ridge along the Costești gorges. The vegetation is mixed beech and other deciduous species south of the gorges, beech forest and juniper bushes in the gorges, and beech and beech-coniferous forest north from them, with extensive alder and poplar stands along ponds and marshy areas lining the Costești river. Species found: *Salamandra salamandra*, *Triturus cristatus*, *Ichthyosaura alpestris*, *Lissotriton vulgaris*, *Bufo bufo*, *Hyla arborea*, *Rana temporaria*, *R. dalmatina*, *Pelophylax ridibundus*, *Emys orbicularis*, *Lacerta agilis*, *L. viridis*, *Podarcis muralis*, *Zootoca vivipara*. *Triturus cristatus*, *Hyla arborea*, *Rana dalmatina*, *Pelophylax ridibundus*, *Emys orbicularis* and *Lacerta viridis* are found only below the gorges; *Ichthyosaura alpestris*, *Rana temporaria* and *Zootoca vivipara* only above them.

Transect 4 (Bărbărești hilltops and ponds): from N 45°9'50.418", E 24°7'57.615", ca. 600 m a.s.l., to N 45°10'0.4404", E 24°7'28.2012", ca. 600 m a.s.l., maximum altitude ca. 800 m a.s.l. The transect crosses a southern hill ridge; the vegetation is secondary pastureland with marshy vegetation including clumps of willow and alder. Species found: *Lissotriton vulgaris*, *Bombina variegata*, *Hyla arborea* (Fig. 4), *Pelophylax ridibundus*, *P. lessonae*, *Emys orbicularis* (Fig. 5). All of them are distributed all along the transect.

Transect 5 (Otășău valley): from N 45°10'11.769", E 24°7'3.8532", ca. 400 m a.s.l., to N 45°13'22.5078", E 24°5'33.0108", ca. 1300 m a.s.l. The transect follows a valley then climbs the limestone ridge. The vegetation is mixed beech and other deciduous species in the lower reaches then upwards beech and beech-coniferous forest, with some alder and poplar stands along ponds and marshy areas lining the Otășău river and some grassland patches in the uppermost reaches. Species found: *Salamandra salamandra* (Fig. 2), *Triturus cristatus*, *Ichthyosaura alpestris*, *Lissotriton vulgaris*, *Bombina variegata*, *Bufo bufo*, *B. viridis*, *Rana temporaria*, *Pelophylax ridibundus*, *Lacerta agilis*, *Podarcis muralis*.

Transect 6 (Cheia valley): from N 45°11'47.814", E 24°11'54.3048", ca. 450 m a.s.l., to N 45°16'39.8094", E 24°6'34.3434", ca. 900 m a.s.l., maximum altitude ca. 1180 m a.s.l. The transect follows a valley then crosses the limestone ridge above the Cheia gorges. The vegetation is beech in the lower reaches, and then upwards beech and beech-coniferous forest, with some alder and poplar stands along the river. Species found: *Salamandra salamandra*, *Lissotriton vulgaris*, *Bombina variegata*, *Bufo bufo*, *Rana temporaria*, *Lacerta agilis*, *Podarcis muralis*. Of these, *Lissotriton vulgaris* does not cross the ridge.

Transect 7 (Lupului valley): from N 45°12'50.511", E 24°9'35.568", ca. 550 m a.s.l., to N 45°12'50.2956", E 24°7'54.5268", ca. 750 m a.s.l.. The transect follows a valley; the vegetation is beech forest, with some alder and poplar stands along the river. Species found: *Salamandra salamandra*, *Bombina variegata*, *Bufo bufo*, *Rana temporaria*, *Lacerta agilis* (Figs 6, 7), *Podarcis muralis*, *Natrix natrix*. All of them are distributed all along the transect.

Transect 8 (Olănești valley): from N 45°12'23.3028", E 24°14'6.5508", ca. 450 m a.s.l., to N 45°17'20.8998", E 24°7'16.2114", ca. 1050 m a.s.l. The transect follows a river and crosses the limestone ridge along the Olănești river gorges. The vegetation is mixed beech and other deciduous species in the lower reaches, beech forest and beech-coniferous forest further upriver, with some alder and poplar stands along the river and grassland patches. Species found: *Salamandra salamandra*, *Triturus cristatus* (Fig. 3), *Lissotriton vulgaris*, *Bombina variegata*, *Bufo bufo*, *Rana temporaria*, *R. dalmatina*, *Lacerta agilis*, *Podarcis muralis*, *Natrix natrix*. Only *Salamandra salamandra*, *Bombina variegata*, *Bufo bufo* and *Rana temporaria* were found in and above the gorges.

Additionally, *Hyla arborea* was found at Costești, N 45°7'55.7904", E 24°3'24.4686" (point A on fig. 1) and *Zamenis longissimus* and *Natrix natrix* were found at Bârlogu, 45°6'29.2314", E 24°8'13.3764" (point B on fig. 1), both outside the transects but still within the Buila-Vânturarița foothills, in mixed deciduous forest areas.

The occurrence of amphibian and reptile species in different habitat types and of reproducing amphibians in different waterbody types is summarized in tables 1 and 2, respectively.

Table 1
Summary table on the occurrence of amphibian and reptile species in different habitat types in the Buila-Vânturarița Massif, Southern Carpathians (Romania).

Species	Altitude range in area (m a.s.l)	Alder and poplar thicket and marsh	Mixed broadleaf forest	Beech forest	Beech-spruce forest	Spruce forest	Juniper thickets	Grassland With ponds and marshes
<i>Salamandra salamandra</i>	350-1000		+	+	+			
<i>Triturus cristatus</i>	350-600	+	+					+
<i>Ichthyosaura alpestris</i>	500-1000	+		+	+	+		
<i>Lissotriton vulgaris</i>	350-800	+	+	+				+
<i>Bombina variegata</i>	400-1300	+	+	+	+	+		+
<i>Bufo bufo</i>	350-1000	+	+	+	+	+		+
<i>Bufo viridis</i>	ca. 500		+					
<i>Hyla arborea</i>	350-800	+						+
<i>Rana temporaria</i>	500-1000	+	+	+	+	+		
<i>Rana dalmatina</i>	350-500		+					+
<i>Pelophylax ridibundus</i>	350-800	+	+	+				+
<i>Pelophylax lessonae</i>	600-800							+
<i>Lacerta viridis</i>	350-1000		+	+			+	
<i>Lacerta agilis</i>	500-1300		+	+	+	+		+
<i>Zootoca vivipara</i>	800-1000			+	+	+		
<i>Podarcis muralis</i>	500-1200		+	+	+		+	
<i>Zamenis longissimus</i>	ca. 350		+					
<i>Natrix natrix</i>	450-750	+	+	+				

Table 2

Summary table on the occurrence of reproducing amphibians in different waterbody types in the Buila-Vânturarița Massif, Southern Carpathians (Romania).

Species	Slow-flowing brooks	Small, temporary ponds	Large, permanent ponds	Man-made ditches
<i>Salamandra salamandra</i>	+	+		
<i>Triturus cristatus</i>		+	+	+?
<i>Ichthyosaura alpestris</i>	+	+	+	+
<i>Lissotriton vulgaris</i>	+	+	+	+
<i>Bombina variegata</i>	+	+	+	+
<i>Bufo bufo</i>	+	+	+	+
<i>Bufo viridis</i>	? (was not found breeding, only one dead specimen)			
<i>Hyla arborea</i>			+	
<i>Rana temporaria</i>	+	+	+	+
<i>Rana dalmatina</i>			+	
<i>Pelophylax ridibundus</i>	+	+	+	+
<i>Pelophylax lessonae</i>			+	

DISCUSSION

The list of amphibian and reptile species known for this area was greatly expanded in number of species, from five to nineteen. The presence of the previously found species was confirmed.

The herpetofaunal assemblage is typical for the Romanian (and Central European) hills and lower mountains; thermophilic/sub-Mediterranean species such as *Darevskia praticola* or *Vipera ammodytes*, which are present relatively close in the Cozia massif (Iftime & Iftime, 2006), were not found here. However, it is interesting to note that several species which usually favour larger waterbodies (e.g. *Triturus cristatus*, *Emys orbicularis*) are found in the hill area surrounding the main limestone ridge.

The limestone ridge clearly divides the herpetofaunal assemblages into a richer, more thermophilic one on the southern hills and slopes and along the valleys below the gorges (all species found in the massif are present here except for *Zootoca vivipara*; however, *Ichthyosaura alpestris* is rather rare in this area) and a poorer, cryophilic one on the northern slopes and on the valleys above the gorges (comprising *Salamandra salamandra*, *Ichthyosaura alpestris*, *Lissotriton vulgaris*, *Bombina variegata*, *Bufo bufo*, *Rana temporaria*, *Lacerta agilis*, *Podarcis muralis*, *Zootoca vivipara* – of which *Lissotriton vulgaris* and *Podarcis muralis* are rarely found). This division corresponds to that of the vegetation and microclimate.

The altitudinal distribution of the recorded species is not remarkable, except for *Pelophylax ridibundus* which, on Transect 4, is found at the approximate maximum altitude at which this species was found in Romania (ca. 700 m a.s.l. – see Iftime et al., 2009 and literature quoted therein), and even slightly above it.

Mention should be made of the colour varieties of *L. agilis*, a species which shows considerable variation in this respect (as already discussed, see Iftime & Iftime, 2010 b). In the Olănești valley, besides the “common” morph seen in *L. a. agilis*, we have found the morph known as “*erythronota*” (older authors, e.g. Fuhn & Vancea, 1961, call it “*erythronotus*”, but see the emendation by Kotenko & Sviridenko, 2010) and also, in the Valea Lupului valley, an interesting colour morph that pertains to *erythronota* by the reddish hue of the back but also to *immaculata* by the absence of any black spots, ocelli etc. (Fig. 6). Such specimens having

intermediate characteristics between *erythronota* and *immaculata* are mentioned by Fuhn & Vancea (1961) for *L. a. chersonensis*, but not for *L. a. agilis*. Yet the *L. agilis* found by us in Buila (except the Valea Lupului specimen) have the typical coloration of *L. a. agilis*, but many of them have a single postnasal scute as typical for *L. a. chersonensis* (Fuhn & Vancea, 1961) – see, e.g., fig. 7. We might conclude that the foothills of Buila-Vânturarița are a region where the influence of intergrading between the two subspecies is felt, just as it is in the Cozia massif not far from here (Iftime & Iftime, 2006).

OBSERVAȚII ASUPRA HERPETOFAUNEI MASIVULUI BUILA-VÂNTURARIȚA (CARPAȚII MERIDIONALI, ROMÂNIA)

REZUMAT

În prezenta lucrare sunt expuse rezultatele unor investigații herpetologice desfășurate pe teritoriul masivului Buila-Vânturarița (jud. Vâlcea, România). Cele 19 specii identificate în teren (*Salamandra salamandra*, *Triturus cristatus*, *Ichthyosaura alpestris*, *Lissotriton vulgaris*, *Bombina variegata*, *Bufo bufo*, *B. viridis*, *Hyla arborea*, *Rana temporaria*, *R. dalmatina*, *Pelophylax ridibundus*, *P. lessonae*, *Emys orbicularis*, *Lacerta agilis*, *L. viridis*, *Zootoca vivipara*, *Podarcis muralis*, *Zamenis longissimus*, *Natrix natrix*) sunt prezentate împreună cu date legate de distribuția lor și de biotopul în care au fost găsite.

LITERATURE CITED

- COGĂLNICEANU, D., 1997 - Practicum de ecologie a amfibienilor: Metode și tehnici în studiul ecologiei amfibienilor. Edit. Universității din București, 122 pp. (in Romanian)
- COGĂLNICEANU, D., F. AIOANEI, B. MATEI, 2000 - Amfibienii din România. Determinator. Edit. Ars Docendi, București. (in Romanian)
- COGĂLNICEANU, D., P. SZÉKELY, C. SAMOILĂ, R. IOSIF, M. TUDOR, R. PLĂIAȘU, F. STĂNESCU, L. ROZYLOWICZ, 2013 - Diversity and distribution of amphibians in Romania. *ZooKeys*, 296: 35-57.
- IFTIME, A., O. IFTIME, 2006 - Preliminary data on the herpetofauna of the Cozia massif (Romania). 1. Reptiles. *Travaux du Muséum National d'Histoire Naturelle „Grigore Antipa”*, 49: 331-340.
- IFTIME, A., O. IFTIME, 2010 a - *Radix cf. labiata* (Gastropoda, Lymnaeidae) as an opportunistic predator and scavenger of *Rana temporaria* egg clutches. *The Herpetological Bulletin*, 113: 20-22.
- IFTIME, A., O. IFTIME, 2010 b - Contributions to the knowledge of the herpetofauna of the Eastern Jiu and Upper Lotru drainage basins (Southern Carpathians, Romania). *Travaux du Muséum National d'Histoire Naturelle „Grigore Antipa”*, 53: 273-286.
- IFTIME, A., O. IFTIME, D. A. POP, 2009 - Observations on the herpetofauna of the Iezer-Păpușa Massif (southern Carpathians, Romania). *Herpetozoa* (Wien), 22(1/2): 55-64.
- KOTENKO, T. I., YE. YU. SVIRIDENKO, 2010 - Variability of Coloration and Pattern of the Sand Lizard, *Lacerta agilis* (Reptilia, Sauria, Lacertidae): Methodic Aspects. *Vestnik zoologii*, 44 (2): 137-162.
- MĂCIU, M., A. CHIOREANU, V. VĂCARU (eds), 1982 - Enciclopedia geografică a României. Edit. Științifică și Enciclopedică, București, 847 pp. (in Romanian)
- NEBLEA, M., F. BODESCU, 2012 - Preliminary studies on the natural habitats from Buila-Vânturarița Mountains. *Universitatea din Craiova/University of Craiova, seria: Biologie, Horticultură, Tehnologia prelucrării produselor agricole, Ingineria mediului*, 17 (53): 729-734.

Received: April 30, 2013

Accepted: July 3, 2013

“Grigore Antipa” National Museum of Natural History
Șos. Kiseleff 1, 011341 Bucharest 2, Romania
e-mail: aiftime@antipa.ro