

Short Communication

## Systematic survey of amphibian and reptile fauna in the Bosilegrad region of southern Serbia

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**Summary.** This study represents a contribution to our knowledge of amphibian and reptile fauna of the Bosilegrad region. The distribution of amphibians and reptiles in the area surrounding Bosilegrad is almost unknown; there are only a few published reports for this region. Over a period of four consecutive years, basic faunistic research was conducted on wide area of the region: 12 species of amphibians and 11 species of reptiles were recorded.

**Keywords:** amphibians, Bosilegrad region, distribution, reptiles.

### INTRODUCTION

Amphibians and reptiles in the Bosilegrad region have to date been poorly investigated. The first record is given by Džukić (1987) for *Anguis fragilis* found in the vicinity of Bistar, followed by Džukić (1993) for *Lissotriton vulgaris*, *Mesotriton alpestris*, *Salamandra salamandra*, *Triturus karelinii*, *T. macedonicus* in the vicinity of Bosilegrad, Vlasina and Ostrozub. More recent data from Crnobrnja-Isailović et al. (2011), Jelić et al. (2012) and Ljubisavljević et al. (2013), refer only to particular species of reptiles (*Testudo hermanni*, *Vipera ammodytes*, *V. berus*).

Bosilegrad is a mountainous region in southern Serbia surrounded by Mt. Besna Kobila, Mt. Rudina and Mt. Milevska (Randelović et al. 2008). Habitats in this region are located at altitudes from 600 (Ribarci) to 1800 meters (Crnook) and divided into three groups: 1) near-river and moist vegetation; 2) hilly and sub-mountainous vegetation; and 3) sub-alpine and alpine vegetation (Milosavljević et al. 2008).

### METHODS

A list of species of amphibians and reptiles taken from published data was created, including species expected to be found in the field considering habitat and climate preferences.

This research was conducted between 2001-2004 in an area near the town of Bosilegrad Serbia, and on the slopes of above-mentioned mountains: at altitudes from 850 to 1800 meters above sea level. The following localities were visited for field work: Dukat Mt. (Crnook peak) and the villages of Božica, Brankovci, Buceljevo, Donja Lisina, Dukat, Gornja Lisina, Izvor, Jarešnik, Milevci, Mlekominci, Rajčilovci, Resen, Ribarci, Rikačevo, Žeravino and Zli Dol and their surroundings. Field trips were conducted mostly in the morning and evening hours when animals were the most active. Specimens were identified according to the field guides of Radovanović (1951) and Arnold and Ovenden (2002). A collection was made of the most frequently observed species (private collection of the author).

## RESULTS

In the present study, 137 specimens of 19 species (8 amphibians and 11 reptiles) were found at 16 localities (Table 1):

**Table 1.** List of species and number of localities in the Bosilegrad region of southern Serbia.

Species	No. of localities
<b>Amphibians</b>	
1 <i>Salamandra salamandra</i> (Linnaeus, 1758)	2
2 <i>Bombina variegata</i> (Mertens & Muller, 1928)	14
3 <i>Rana graeca</i> (Boulenger 1891)	7
4 <i>Pelophylax ridibundus</i> (Pallas, 1771)	9
5 <i>Rana dalmatina</i> (Bonaparte, 1840)	5
6 <i>Bufo bufo</i> (Mertens & Muller 1928)	13
7 <i>Pseudepidalea viridis</i> (Laurenti 1768)	15
8 <i>Hyla arborea</i> (Linnaeus, 1758)	5
<b>Reptiles</b>	
1 <i>Testudo hermanni</i> Gmelin 1788	1
2 <i>Anguis fragilis</i> (Linnaeus, 1758)	11
3 <i>Podarcis muralis</i> (Laurenti 1768)	13
4 <i>Lacerta viridis</i> (Laurenti 1768)	9
5 <i>Lacerta agilis</i> (Linnaeus, 1758)	2
6 <i>Zamenis longissimus</i> (Laurenti, 1768)	7
7 <i>Coronella austriaca</i> (Laurenti 1768)	6
8 <i>Natrix natrix</i> (Linnaeus, 1758)	8
9 <i>Natrix tessellata</i> (Laurenti 1768)	3
10 <i>Vipera ammodytes</i> (Linnaeus 1758)	5
11 <i>Vipera berus</i> (Linnaeus 1758)	2

In following text, a list of species with exact localities, UTM grids and date of observation are provided.

### Class Amphibia (Amphibians)

#### Order Caudata (salamanders, newts)

##### *Salamandra salamandra* (fire salamander)

This species was found in 2 localities: Mlekominici locality (FN20) on 29.04.2002; Resen (FN20) on 01.05.2002.

#### Order Anura (frogs and toads)

##### *Bombina variegata* (yellow-bellied toad)

This species was recorded in 14 localities: Mlekominici (FN20) on 28.04.2002; Rajčilovci (FN20) on 30.07.2003; Ribarci (FM29) on 29.07.2003; Buceljevo (FN20) on 03.08.2003; Dukat (FM09) on 24.07.2001; Jarešnik (FM19) on 23.07.2001; Zli Dol (FM19) on 04.08.2003; Žeravino

(FM18) on 25.07.2001; Božica (FN12) on 02.08.2001; Milevci (FN11) on 15.04.2003; Izvor (FN20) on 10.06.2004; Resen (FN20) on 01.05.2002; Donja Lisina (FN11) 01.08.2003 and in Gornja Lisina (FN11) on 01.08.2001.

##### *Rana graeca* (Balkan stream frog)

This species was found in 7 localities: Mlekominici (FN20) on 28.04.2002; Ribarci (FM29) on 29.07.2003; Brankovci (FM29) on 26.07.2001; Dukat (FM09) on 24.07.2001; Jarešnik (FM19) on 23.07.2001; Božica (FN12) on 02.08.2001; Donja Lisina (FN11) on 01.08.2003.

##### *Pelophylax ridibundus* (marsh frog)

This species was recorded in 9 locations: Mlekominici (FN20) on 29.04.2002; Rajčilovci (FN20) on 30.07.2003; Ribarci (FM29) on 29.07.2003; Brankovci (FM29) on 26.07.2001; Buceljevo (FN20) on 03.08.2003; Božica (FN12) on 02.08.2001; Resen (FN20) on 01.05.2002; Donja Lisina (FN11) on 01.08.2003; Gornja Lisina (FN11) on 01.08.2001.

##### *Rana dalmatina* (agile frog)

This species was found in 5 localities: Mlekominici (FN20) on 29.04.2002; Ribarci (FM29) on 29.07.2003; Brankovci (FM29) on 26.07.2001; Božica (FN12) on 02.08.2001; Donja Lisina (FN11) on 01.08.2003.

##### *Bufo bufo* (common toad)

This species was recorded in 13 localities: Mlekominici (FN20) on 28.04.2002; Rajčilovci (FN20) on 30.07.2003; Ribarci (FM29) on 29.07.2003; Buceljevo (FN20) on 03.08.2003; Dukat (FM09) on 24.07.2001; Jarešnik (FM19) on 23.07.2001; Zli Dol (FM19) on 04.08.2003; Božica (FN12) on 02.08.2001; Milevci (FN11) on 15.04.2003; Izvor (FN20) on 10.06.2004; Resen (FN20) on 02.05.2004; Donja Lisina (FN11) on 01.08.2003; Gornja Lisina (FN11) on 01.08.2001.

##### *Pseudepidalea viridis* (European green toad)

This species was recorded in 15 localities: Mlekominici (FN20) on 28.04.2002; Rajčilovci (FN20) on 30.07.2003; Ribarci (FM29) on 29.07.2003; Crnook (FM19) on 23.07.2001; Buceljevo (FN20) on 03.08.2003; Dukat (FM09) on 24.07.2001; Jarešnik (FM19) on 23.07.2001; Zli Dol (FM19) on 04.08.2003; Žeravino (FM18) on 25.07.2001; Božica (FN12) on 02.08.2001; Milevci (FN21) on 15.04.2003; Izvor (FN20) on 10.06.2004; Resen (FN20) on 02.05.2004; Donja Lisina (FN11) on 01.08.2003; Gornja Lisina on (FN11) on 01.08.2001.

##### *Hyla arborea* (European tree frog)

This species was recorded in 5 localities: Mlekominici (FN20) on 29.04.2002; Rajčilovci (FN20) on 30.07.2003; Ribarci (FM29) on 29.07.2003; Žeravino (FM18) on 25.07.2001; Donja Lisina (FN11) on 01.08.2003.

**Class Reptilia** (Reptiles)**Order Testudines** (Tortoises and turtles)*Testudo hermanni* (Herman's tortoise)

This species was recorded in 1 locality: Gornja Lisina (FN11) on 01.08.2001.

**Order Squamata****Suborder Lacertilia** (Lizards and lacertids)*Anguis fragilis* (slow worm)

This species was recorded in 11 localities: Mlekominci (FN20) on 29.04.2002; Rajčilovci (FN20) on 30.07.2003; Ribarci (FM29) on 29.07.2003; Buceljevo (FN20) on 03.08.2003; Dukat (FM09) on 24.07.2001; Jarešnik (FM19) on 23.07.2001; Rikačevo (FM19) on 04.08.2003; Božica (FN12) on 02.08.2001; Milevci (FN21) on 15.04.2003; Izvor (FN20) on 10.06.2004; Donja Lisina (FN11) on 01.08.2003.

*Podarcis muralis* (wall lizard)

This species was recorded in 13 localities: Mlekominci (FN20) on 29.04.2002; Rajčilovci (FN20) on 30.07.2003; Ribarci (FM29) on 29.07.2003; Buceljevo (FN20) on 03.08.2003; Dukat (FM09) on 24.07.2001; Jarešnik (FM19) on 23.07.2001; Rikačevo (FM19) on 04.08.2003; Božica (FN12) on 02.08.2001; Milevci (FN21) on 15.04.2003; Izvor (FN20) on 10.06.2004; Resen (FN20) on 02.05.2004; Donja Lisina (FN11) on 01.08.2003; Gornja Lisina (FN11) on 01.08.2001.

*Lacerta viridis* (European green lizard)

This species was found in 9 localities: Mlekominci (FN20) on 28.04.2004; Rajčilovci (FN20) on 30.07.2003; Ribarci (FM29) on 29.07.2003; Buceljevo (FN20) on 03.08.2003; Rikačevo (FM19) on 04.08.2003; Izvor (FN20) on 10.06.2004; Resen (FN20) on 01.05.2002; Donja Lisina (FN11) on 01.08.2003; Gornja Lisina (FN11) on 01.08.2001.

*Lacerta agilis* (sand lizard)

This species was found in 2 localities: Crnook (FM19) on 23.07.2001; Žeravino (FM18) on 25.07.2001.

**Suborder Serpentes** (snakes)*Zamenis longissimus* (Aesculapian Snake)

This species was found in 7 localities: Mlekominci (FN20) on 29.04.2002; Rajčilovci (FN20) on 30.07.2003; Buceljevo (FN20) on 03.08.2003; Milevci (FN21) on 15.04.2003; Izvor (FN20) on 10.06.2004; Resen (FN20) on 01.05.2002; Gornja Lisina (FN11) on 01.08.2001.

*Coronella austriaca* (smooth snake)

This species was found in 6 localities: Mlekominci (FN20) on 28.04.2002; Rajčilovci (FN20) on 30.07.2003; Dukat (FM09) on 24.07.2001; Rikačevo (FM19) on 04.08.2003;

Izvor (FN20) on 10.06.2004; Resen (FN20) on 02.05.2004.

*Natrix natrix* (grass snake)

This species was found in 8 localities: Mlekominci (FN20) on 29.04.2002; Ribarci (FM29) on 29.07.2003; Dukat (FM09) on 24.07.2001; Jarešnik (FM19) on 23.07.2001; Žeravino (FM18) on 25.07.2001; Božica FN12 on 02.08.2001; Resen (FN20) on 01.05.2002; Gornja Lisina (FN11) on 01.08.2001.

*Natrix tessellata* (dice snake)

This species was found in 3 localities: Mlekominci (FN20) on 29.04.2002; Ribarci (FM29) on 29.07.2003; Gornja Lisina (FN11) on 01.08.2001.

*Vipera ammodytes* (nose-horned viper)

This species was found in 5 localities: Mlekominci (FN20) on 28.04.2002; Rajčilovci (FN20) on 30.07.2003; Ribarci (FM29) on 29.07.2003; Donja Lisina (FN11) on 01.08.2003; Gornja Lisina (FN11) on 01.08.2001.

*Vipera berus* (adder)

This species was found in 2 localities: Crnook (FM19) on 23.07.2001; Žeravino (FM18) on 25.07.2001.

**DISCUSSION**

Results of the present study and previously published data from the literature suggest that there are 12 species of amphibians in the Bosilegrad region. This represents 57% of the total number of amphibians (21 species) recorded in Serbia (Vukov et al. 2013). With respect to reptiles, results of the present study and literature data suggest that there are 11 species in this region, representing 48% (of 23) of the total reptile fauna in Serbia (Gasc et al. 1997).

Over the course of the present study, we did not observe some amphibian species that have been reported previously in the literature (Džukić 1993) for the Bosilegrad region. We attribute this discrepancy to the fact that most field trips were conducted during the summer months. There are several species of amphibians (*Lissotriton vulgaris*, *Mesotriton alpestris*, *Salamandra salamandra*, *Triturus karelinii*, *T. macedonicus*), which are expected to be present in the ponds along the Dragovištica river between Bosilegrad and Brankovci and in the upper waterways of the Brankovska river from Brankovci.

For the Bosilegrad region, only 9 species (5 for amphibians and 4 for reptiles) were recorded for 9 localities. In the present study, 12 species of amphibians and 11 species of reptiles were recorded in 17 localities along the whole range of the region. This data represents the first systematic study of the distribution of these species of amphibians and reptiles in the Bosilegrad region, and should provide a solid basis for future research.

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