

ISBN 86-905195-0-5

Contribution to Distribution and Conservation of Batrachofauna and Herpetofauna on Bjelasica Mountain in Montenegro

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Abstract

We present results of three consecutive years of research of batrachofauna and herpetofauna of Bjelasica Mountain and "Biogradska Gora" National Park, in north-eastern part of Montenegro. We found 9 amphibian and 9 reptile species inhabiting area in concern, that represent 56.3% of batracho and 26.5% of herpetofauna in Montenegro. We discuss conservation status of some species and suggest future perspectives for research and protection

Key words: batrachofauna, herpetofauna, distribution, Bjelasica Mt., conservation, biodiversity

Izvod

Prilog Distribuciji i Konzervaciji Batrahofaune i Herpetofaune Planine Bjelasica u Crnoj Gori

Prezentirani su rezultati tri godine istraživanja batrahofaune i herpetofaune na Planini Bjelasica i u Nacionalnom Parku "Biogradska Gora", u sjevero-istočnom dijelu Crne Gore. Nađeno je 9 vrsta vodozemaca i 9 vrsta gmizavaca na području istraživanja što predstavlja 56.3% batrahofaune i 26.5% herpetofaune Crne Gore. Diskutovan je i konzervacioni status nekih vrsta i predložena buduće perspektive za istraživanja i zaštitu.

Ključne riječi: batrachofauna, herpetofauna, rasprostranjenje, Bjelasica pl., konzervacija, biodiverzitet

Introduction

Flora and fauna of Biogradska Gora National Park has been subject of general interest (LAKUŠIĆ, 1966; STEVANOVIĆ, 1995). Contrary to comprehensive data

about flora and vegetation, only partial data of batrachofauna and herpetofauna of Biogradska Gora and Bjelasica Mountain are available. Detailed species lists are generally missing. Prior to this research only a few species were reported for this area (KARAMAN, 1939; CRNOBRNJA-ISAILOVIĆ, 2002). General remarks on distribution of amphibian and reptile species in northern mountainous Montenegro, and specially at Durmitor Massif and Tara Canyon, includes 25 species (DŽUKIĆ, 1991; DŽUKIĆ *et al.*, 1997; TOMOVIĆ *et al.*, 2001).

Results and discussion

During summer months of three consecutive years (2000. – 2002.) we have recorded distribution of batracho- and herpetofauna on the northwestern slopes of the Bjelasica Mountain. Nine amphibian and nine reptile species were noticed (Table 1) .

AMPHIBIA

Urodela

Salamandridae

Salamandra salamandra – River Biogradska rijeka; River Jezerštica; ponds in the Biogradska gora virgin forest; Lazovi.

Triturus alpestris – localities: Pešića Lake; Svatovsko groblje; spring at Lalevića Dolovi.

Anura

Bufonidae

Bufo bufo – banks of Biogradsko Lake; Lazovi.

Discoglossidae

Bombina variegata – River Jezerštica; River Biogradska rijeka; Lalevića dolovi; Jarčeve strane.

Hylidae

Hyla arborea – River Jezerštica

Ranidae

Rana dalmatina – banks of Biogradsko Lake; the Biogradska gora virgin forest; River Biogradska rijeka; Lazovi.

Rana graeca - River Jezerštica.

Rana ridibunda - banks of Lake Biogradsko.

Rana temporaria – banks of Lake Biogradsko; Biogradska gora virgin forest; River Biogradska rijeka; Lalevića Dolovi.

REPTILIA

Sauria

Anguidae

Anguis fragilis – western slopes of Bjelasica beneath Lalevića Dolovi.

Lacertidae

Lacerta agilis – Lalevića Dolovi

Lacerta vivipara – Svatovsko groblje; Lalevića Dolovi

Podarcis muralis – banks of Lake Biogradsko; River Jezerštica.

Ophidia

Colubridae

Natrix natrix – Lake Biogradsko and coastal area.

Natrix tessellata - foothills of Bjelasica around Tara river (from Jezerštica River underneath of Bjelasica Massif).

Viperidae

Vipera ammodytes – foothills of Bjelasica along Tara river (from River Jezerštica underneath of Bjelasica Massif).

Vipera berus - Gola Glava Peak; Lalevića Dolovi.

Vipera ursinii – Gola Glava Peak; Lalevića Dolovi.

Comparing the most detailed available list of herpetofauna of northern Montenegro – that of Durmitor Massif and Tara River Canyon (DŽUKIĆ, 1991), with our list for Bjelasica Mountain, we estimated that 81.8% of amphibian and 64.3% reptile species known for the northern Montenegro are present at the Bjelasica Mountain. The lack of records for the certain species that occur at Durmitor Massif, and have not be recorded for Bjelasica Mountain, could be explained by the short-time research period (only three years), limited research area (mainly above 1000 m s. l.) and/or limited research season (we had no possibility to organize field trips during spring and autumn season). Also, contrary to Durmitor Massif and Tara River Canyon, our research area did not include habitats under significant influences of Mediterranean and/or Submediterranean climate. In other words, according to geomorphological and climatic characteristics of the area (MATVEJEV, 1974; MATVEJEV AND PUNCER, 1989), we suppose that representatives of Mediterranean herpetofauna whose distribution extends through suitable habitats in canyons from southern Montenegro (e. g. *Lacerta oxycephala*) could not occur at Bjelasica Mountain. Future long-time research that would include other seasonal aspects and biotopes, would certainly confirm the presence of at least following taxa at Bjelasica Mountain: *Triturus vulgaris*, *Bufo viridis*, *Coronella austriaca* and *Elaphe longissima*.

Comparison of herpetofauna of Bjelasica Mountain with that of herpetofauna of Montenegro in general (BRELIH AND DŽUKIĆ, 1974; DŽUKIĆ, 1995; CRNOBRNJA-ISAILOVIĆ AND DŽUKIĆ, 1997), showed that 56.3% and 26.5% of amphibian and reptile species, respectively, known for Montenegro occur at Bjelasica Mountain, too (Table 2). Concerning the fact that Montenegro have diverse types of climates, biotopes and biomes, from Mediterranean, Oromediterranean, Submediterranean, to high mountains, lack of records for eumediterranean and endemic species at the Bjelasica Mountain is understandable.

Conservation status

All species inhabiting Bjelasica Mountain can be found at least in one of conservation lists of protected amphibian and reptile species in Europe (Table 1,

for detailed information see in: GASC *et al.*, 1997). On the contrary, only three species are protected by republic legislations of Montenegro Ministry for Nature Protections. Some of the species (e. g. *Vipera ursinii*) that are protected by CITES convention and are evaluated as “endangered” by the IUCN categorization, are not included into the list of the protected species in Montenegro. We found that those inconsistencies could be hazardous for population status and protection of endangered amphibian and reptile species, not only at Bjelasica Mountain, but in whole Montenegro, too.

Table 1. Conservation status of amphibian and reptile species present on Bjelasica Mountain (DŽUKIĆ, 1995; GASC *et al.*, 1997).

Convention	Habitats	Bern	CITES	IUCN	YUZ
AMPHIBIA					
<i>Salamandra salamandra</i>		III			
<i>Triturus alpestris</i>		III			CG
<i>Bufo bufo</i>		III			
<i>Bombina variegata</i>	II/IV	II			
<i>Hyla arborea</i>	IV	II		LR	CG
<i>Rana dalmatina</i>	IV	II			
<i>Rana graeca</i>	IV	III			
<i>Rana ridibunda</i>	V	III			
<i>Rana temporaria</i>	V	III			
REPTILIA					
<i>Anguis fragilis</i>		III			
<i>Lacerta agilis</i>	IV	II			
<i>Lacerta vivipara</i>		III			
<i>Podarcis muralis</i>	IV	II			CG
<i>Natrix natrix</i>		III			
<i>Natrix tessellata</i>	IV	II			
<i>Vipera ammodytes</i>	IV	II			
<i>Vipera berus</i>		III			
<i>Vipera ursinii</i>	II/IV	II	I	EN	

Although our research at Bjelasica Mountain showed that populations of some species are generally not endangered and that there are no need for special conservation measures at the habitats, we found that education would improve understanding of local communities for significance of biodiversity conservation and reduce the superstitions and fear regarding some (especially snake) species. We believe that the authorities of the National Park “Biogradska Gora” are generally aware of the significance of habitat protection, but have limited authority to thwart capture, killing and illegal sale of protected species

Table 2. Biodiversity of amphibians and reptiles of Bjelasica Mountain, Durmitor and Tara River Canyon in Montenegro.

Taxa	Bjelasica Mountain (this paper)	Durmitor and Tara River Canyon (DŽUKIĆ, 1991)	Montenegro (DŽUKIĆ, 1995)
Amphibia	9	11	16
Urodela	2	3	5
Anura	7	8	11
Reptilia	9	14	34
Chelonia	0	1	6
Sauria	4	6	14
Ophidia	5	7	14

Acknowledgements

The authors are grateful to the authorities of the National Park “Biogradska Gora” and the Republic Institute for Nature Protection in Podgorica for permissions, logistic support and hospitality. Species thanks go to our colleagues VLADIMIR PEŠIĆ, Faculty of Natural Sciences in Podgorica and GORDANA TOMOVIĆ, Faculty of Biology in Belgrade.

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APPENDIX



a



b



c

FIGURE 1a-c. Some of representatives of batracho- and herpetofauna of Biogradska Gora National Park and Bjelasica Mountain (photo J. Crnobrnja-Isailović and R. Ajtić). a. *Rana temporaria*; b, c, *Vipera ursinii*.



d



e



f

FIGURE 1d-f. Some of representatives of batracho- and herpetofauna of Biogradska Gora National Park and Bjelasica Mountain (photo J. Crnobrnja-Isailović and R. Ajtić). d, *Vipera ursinii*; e, f *Vipera berus*.



FIGURE 2. Characteristic biotop of *Vipera ursinii* at Lalevića Dolovi founding site (photo J. Crnobrnja-Isailović).