

First Record of the Threatened Martino's vole, *Dinaromys bogdanovi* (Rodentia, Cricetidae) on Mt. Čvrsnica (Bosnia and Herzegovina)

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Scientific article

UDK: 598.323.4 (497.6 Čvrsnica) "2012"

This paper presents the first finding of the threatened Martino's vole, *Dinaromys bogdanovi* for Mt. Čvrsnica in Western Herzegovina. A single individual was found on 21st October 2012 at about 2100 m a.s.l., below Pločno peak. *D. bogdanovi* is a globally threatened (VU) and Natura 2000 species for which protection sites should be designated. In Bosnia and Herzegovina the species is protected and included on the Red List of protected species of Republika Srpska and the Red List of the Federation of Bosnia and Herzegovina. The finding site of Martino's vole on Mt. Čvrsnica is located west of the Neretva River and falls within the area of distribution of the highly endangered and evolutionary significant unit of Martino's vole.

Key words: Balkan, distribution, mammals, Natura 2000, paleoendemic, red list, West Herzegovina.

INTRODUCTION

Martino's vole *Dinaromys bogdanovi* (Martino 1922) is a rare paleoendemic arvicoline restricted to the karstic regions of the Western Balkan Peninsula. The range extends from Croatia to Western Macedonia, and includes parts of Bosnia and Herzegovina (BiH), Montenegro, and Kosovo (Kryštufek and Bužan, 2008). Its presence in Albania is predicted by habitat modelling (Shenbrot and Krasnov, 2005), but still not confirmed (Bego et al., 2008).

Although the knowledge of mammal distribution is poor in BiH (Kotrošan et al., 2005), the occurrence of Martino's vole is documented from 27 localities, mostly in the eastern part of the country (Fig. 1). A recent Capture-Mark-Recapture study confirmed the presence of the animal on Mt. Bjelašnica in central Bosnia (Kryštufek et al., 2010) where it was collected as long ago as the early 1920s (Bolkay, 1924).

Martino's vole is a habitat specialist that depends on underground shelters in cracks and cavities in calcareous rocky substrate (Kryštufek and Bužan, 2008). The vole descends through underground cracks and crevices to as deep as 70 m from the surface (Tvrtković, 2006). The scattered

distribution of suitable habitats is the main reason of the species' fragmented range. Populations are therefore isolated and often very small (Kryštufek et al., 2007). In terms of altitude, the species is generalist, occurring from sea level to 2200 m a.s.l., although it is mostly found above 1500 m (Kryštufek, 1999; Kryštufek and Bužan, 2008).

MATERIALS AND METHODS

During a visit to Mt. Čvrstica on 21st October 2012, an individual Martino's vole was spotted in the early afternoon between rocks and caught by hand (Fig. 2). After being examined and photographed, the animal was released. The site (43°35'55" N, 17°34'05" E) (Fig. 1) was at about 2100 m a.s.l., below the Pločno peak (2222 m a.s.l.). The site was largely bare limestone rock with sparse vegetation (Fig. 2), which corresponds to the published data on the habitat preferences of Martino's vole (Kryštufek, 1999; Tvrtković, 2006; Kryštufek and Bužan, 2008). The vegetation of screes and rocky habitats on Mt. Čvrstica is classified to classes of *Thlaspietea rotundifolii* Br.-Bl. 1948 and *Drypetea spinosae* Quezel 1967 (Redžić et al., 2011).

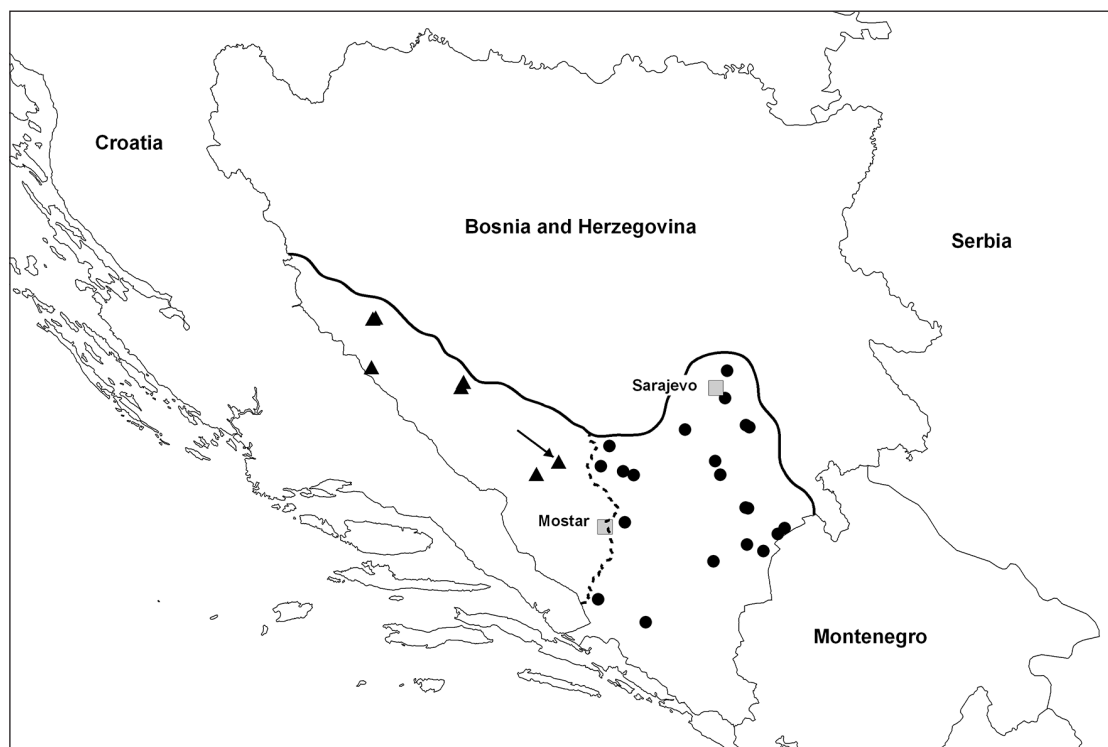


Figure 1. Distribution of Martino's vole in Bosnia and Herzegovina. The presumed border is shown in heavy line while the two phylogeographic lineages are delimited by a dashed (triangle – north-western lineage records; circles – central lineage records). The new site is pointed by an arrow (Modified from Kryštufek et al., 2007 and Kryštufek and Bužan, 2008).



Figure 2. Living specimen of Martino's vole (*Dinaromys bogdanovi*) captured on Mt. Čvrsnica (left) and the position of the site (right).

RESULTS AND DISCUSSION

On 21st October 2012 an individual Martino's vole was found on Mt. Čvrsnica at about 2100 m a.s.l., below the Pločno peak (2222 m a.s.l.). This is the first record of Martino's vole on Mt. Čvrsnica. In 1986, 2007 and 2008 the Slovenian Museum of Natural History sampled small mammals on Mt. Čvrsnica on the Blidinje plateau, between Risovac (1300 m) and Grkuš (1380 m), but Martino's vole was not found. The following species were recorded: *Erinaceus roumanicus*, *Dryomys nitedula*, *Nannospalax leucodon*, *Apodemus sylvaticus*, *Microtus arvalis* and *Chionomys nivalis*. Rocky habitats were occupied by the European snow vole *Chionomys nivalis*.

Martino's vole and the European snow vole have partly overlapping ranges and possibly identical habitat requirements. This may result in competitive exclusion of Martino's vole, but little is known of the mechanisms involved (Kryštufek and Bužan, 2008). Only long-term monitoring can provide the answer. It would be therefore of interest to obtain detailed insight into the distribution of Martino's vole and the European snow vole on Mt. Čvrsnica.

Martino's vole consists of three allopatric evolutionary lineages. The River Neretva tentatively delimits the Northwestern (NW) and the Central lineages which presumably diverged about one million years ago. Our observation of Martino's vole on Mt. Čvrsnica falls within the area of the distribution of the NW lineage, being the seventh record in BiH (cf. Kryštufek and Bužan, 2008).

D. bogdanovi is a globally threatened (VU) and the Natura 2000 species for which protection sites

should be designated (Kryštufek, 2008; Council of the European Union, 2013). In BiH, in Republika Srpska the species is included on the Red List of protected species (Službeni glasnik Republike Srpske, 2012), while the Red List of the Federation of BiH listed *D. bogdanovi* as vulnerable (VU) species (Službeni list Bosne i Hercegovine, 2014). It is noteworthy that the NW lineage in particular fulfils all criteria for the highly endangered, evolutionary significant unit of Martino's vole (Kryštufek et al., 2007).

CONCLUSION

Martino's vole *Dinaromys bogdanovi* is a rare paleoendemic arvicoline with scattered distribution in the karstic regions of the Western Balkan Peninsula, from Croatia to Western Macedonia. This is the first record of Martino's vole on Mt. Čvrsnica that falls within the area of distribution of highly endangered NW lineage. It is important from the conservation point as Martino's vole is a globally threatened (VU) and Natura 2000 species, as well as protected species in BiH.

ACKNOWLEDGEMENTS

The field survey conducted by the first author at Mt. Čvrsnica was carried out within the project "Identification of areas important for protection of threatened Odonata species in Federation of Bosnia and Herzegovina" supported by the Environmental Fund of the Federation of Bosnia and Herzegovina.

BIBLIOGRAPHY

- Bego F., Kryštufek B., Paspali G., Rogozi E. 2008. Small terrestrial mammals of Albania: annotated list and distribution. *Hystrix* It. J. Mamm. 19(2): 83–101.
- Bolkay S. 1924. Catalogue of the mammals occurring in Bosnia-Herzegovina and preserved in the Land-Museum in Sarajevo. *Biol. Hung.* 1(2): 1–7.
- Council of the European Union 2013. Council Directive 2013/17/EU of 13 May 2013 adapting certain directives in the field of environment, by reason of the accession of the Republic of Croatia. *Official Journal of the European Union*, L158: 193–229.
- Kotrošan D., Bjedov V., Kryštufek B. 2005. State of research on the mammal fauna in Bosnia and Herzegovina. *Works of the Faculty of Forestry*, 1: 29–55.
- Kryštufek B. 1999. *Dinaromys bogdanovi* (Martino, 1922). In: Mitchell-Jones A.J., Amori G., Bogdanowicz W., Kryštufek B., Reijnders P.J.H., Spitzenberger F., Stubbe M., Thissen J.B.M., Vohralík V., Zima J. (eds), *Atlas of European Mammals*. Academic Press, London, UK, pp. 218–219.
- Kryštufek B. 2008. *Dinaromys bogdanovi*. The IUCN Red List of Threatened Species 2008: e.T6607A12790367. Published on Internet: <http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T6607A12790367.en> (accessed on 16 October 2016)
- Kryštufek B., Bužan E.V. 2008. Rarity and decline in palaeoendemic Martino's vole *Dinaromys bogdanovi*. *Mammal Rev.* 38(4): 267–284.
- Kryštufek B., Bužan E.V., Hutchinson W.F., Hänfling B. 2007. Phylogeography of the rare Balkan endemic Martino's vole, *Dinaromys bogdanovi*, reveals strong differentiation within the western Balkan Peninsula. *Mol. Ecol.* 16: 1221–1232.
- Kryštufek B., Engelberger S., Muzaferović Š., Bužan E.V., Skok J., Škrijelj R., Herzig-Straschil B. 2010. Assessing population size of Martino's vole (*Dinaromys bogdanovi*) in central Bosnia. *Hystrix* It. J. Mamm. 21(2): 165–169.
- Redžić S., Barudanović S., Trakić S., Kulijer, D. 2011. Vascular plant biodiversity richness and endemo relictiness of the karst mountains Prenj–Čvrsnica–Čabulja in Bosnia and Herzegovina (W. Balkan). *Acta Carsologica*, 40(3): 527–555.
- Shenbrot G.I., Krasnov B.R. 2005. *An Atlas of the Geographic Distribution of the Arvicoline Rodents of the World (Rodentia, Muridae: Arvicolinae)*. Pensoft, Sofia, Bulgaria, 336 pp.
- Službeni glasnik Republike Srpske 2012. Uredba o Crvenoj listi zaštićenih vrsta flore i faune Republike Srpske [Act on Red List of protected species of flora and fauna of Republic of Srpska]. *Official Gazette of Republic of Srpska*, 124/12, 54 pp.
- Službeni list Bosne i Hercegovine 2014. Crvena lista divljih vrsta i podvrsta biljaka, životinja i gljiva [Red List of wild species and subspecies of plants, animals and fungi]. *Official Gazette of Federation of BiH*, 7, pp. 111–125.
- Tvrčković N. 2006. Dinarski voluhar, Balkan Snow Vole, *Dinaromys bogdanovi* (Martino, 1922). In: Tvrčković, N. (ed), *Red Book of Mammals of Croatia*. Ministry of Culture, State Institute for Nature Protection, Zagreb, Croatia, pp. 69–70.

SAŽETAK

Prvi nalaz ugrožene dinarske voluharice, *Dinaromys bogdanovi* (Rodentia, Cricetidae) na planini Čvrsnici (Bosna i Hercegovina)

U ovom radu prezentiran je prvi nalaz ugrožene dinarske voluharice, *Dinaromys bogdanovi* na planini Čvrsnici u Zapadnoj Hercegovini. Jedan primjerak je pronađen 21. oktobra 2012. godine na nadmorskoj visini od oko 2100 m, ispod vrha Pločno. *D. bogdanovi* je globalno ugrožena (VU) i Natura 2000 vrsta za koju je potrebno odrediti područja za zaštitu. U BiH ova vrsta je zaštićena i uvrštena u Crvenu listu zaštićenih vrsta Republike Srpske i Crvenu listu Federacije BiH. Lokalizacija pronalaska dinarske voluharice na planini Čvrsnici nalazi se zapadno od rijeke Neretve, području koje naseljavaju posebno ugrožene populacije dinarske voluharice.

Cljučne riječi: Balkan, distribucija, sisari, Natura 2000, paleoendem, crvena lista, zapadna Hercegovina.