

A VIPER IN THE CITY – REDISCOVERY OF *VIPERA BERUS BOSNIENSIS* (BOETTGER, 1889) IN ZAGREB (SERPENTES: VIPERIDAE)

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The finding of *Vipera berus bosniensis* (Boettger, 1889) in one of Zagreb's "islands of nature" is presented, indicating that this species had not disappeared from the city area. The importance and implications of this near threatened (NT) taxon is discussed.

Key words: Balkan adder, urban fauna, Croatia, peri-urban environment

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Predstavljeni su nalazi riđovke *Vipera berus bosniensis* (Boettger, 1889) iz jednog zagrebačkog "otoka prirode", što dokazuje da ova vrsta nije nestala na području grada Zagreba. Raspravlja se o važnosti i implikacijama ovog nalaza svojte koja ima status gotovo ugrožene vrste (NT) u Hrvatskoj.

Ključne riječi: bosanska riđovka, urbana fauna, peri-urbani okoliš, Hrvatska

The adder, *Vipera berus* (Linnaeus, 1758) is the most widely distributed terrestrial snake species in the world; throughout its range it is found in a variety of humid habitats (SPEYBROECK *et al.*, 2016). The lowland *V. b. bosniensis* population in north-western Croatia is known from rural areas, however there is little-to-no information published regarding the biology, ecology, population trends and risk of extinction (JELIĆ *et al.*, 2012). In the historical suburban areas of Zagreb there are only very old records from Maksimir and Bukovac (HIRTZ, 1935), with a 43-year old observation near Trpuci (Donji Dragonožec) being the only published recent finding for the entirety of the territorial unit of the city of Zagreb (TVRTKOVIĆ *et al.*, 2011). The city proper itself lacks any recent published findings, which also goes for most of Croatia (JELIĆ *et al.*, 2013). The rediscovery of the adder from a somewhat preserved natural habitat within the immediate city limits is presented here.

On 19 March 2016, during a cursory visit to the somewhat preserved natural habitats of Krčevine, immediate Zagreb urban area, just west of the newly constructed estate of Sopnica-Jelkovec (= Novi Jelkovec), south of Sesvete, an adult male *V. b. bosniensis* was found by the author (N: 45.812389°, E: 16.098766°, 109 m a.s.l., Figs 1–2). It was found within some 30 min, during which about 270 m along the bush edges was patrolled. The male was basking on a small pile

of branches within the grass, at the very edge of a thicket of *Prunus spinosa* L., *Crataegus* Tourn ex L., *Rosa* L. and others. The snake immediately tried to escape. Its colouration was still dull, indicating it had not yet shed its skin after emerging from hibernation (Figure 2).



Fig. 1. Location of the find and its position within Zagreb, Croatia. Red dot – the line of bushes where the *Vipera berus bosniensis* specimen was found. The digital orthophoto image is from 2011 (DGU, 2015).



Fig. 2. The *Vipera berus bosniensis* individuals caught (left: male, right: female), found at Krčevine, Zagreb.

During a visit on 07 April 2018 an adult female (Fig. 2) had been found at the same location by the author, basking in the grass at the edge of the same thicket, with the same time and distance covered. Her colours were vibrant, indicating a recent shed. Additionally, old remains of an *Anguis fragilis* (Linnaeus, 1758) were found nearby and green frogs (*Pelophylax* Fitzinger, 1843) were heard in the stream along the eastern edge of the area during the 2016 visit.

The expansion of cities inevitably causes habitat fragmentation, which leads to a decline in species richness and is recognised as the main contributing factor for local biodiversity extinction (BURGIN & WOTHERSPOON, 2009; MCKINNEY, 2008). In the 20th century Zagreb city expanded greatly. Many natural areas turned into concrete jungles with at most only traces of their previous natural features. However, fairly well preserved areas, like Maksimir and Tuškanac, are still in their (semi-)natural states (TVRTKOVIĆ, 2010). The attitudes and opinions of city residents towards wildlife in urban areas vary. Some animal groups, like small birds, squirrels and butterflies, are generally accepted and welcome co-habitants, while others, like rats, spiders, and most other insects, are detested, even feared. Reptiles living in urban environments, i.e. within or on the edges of cities, have within the past 15 years been the subject of several research projects, which explored their ability to survive and how they have adapted in the urban jungle and/or outlining the problems they face (HITCHEN *et al.*, 2011; MOLLOV, 2011; PERRY *et al.*, 2008; RUGIERO, 2004; TVRTKOVIĆ, 2010; VUORISALO *et al.*, 2001; WHITE & BURGIN, 2004).

The peri-urban area of Krčevine, with Retkovečina and Čulinečina, represents an island of a somewhat preserved natural habitat within Zagreb. It is bordered by residential neighbourhoods to the north-west, north and east. Also, to the east and south it is delimited by large roads. The south-western part is bordered by commercial areas and railroad tracks pass through the north-western corner. Being a refuge area in the event of a catastrophic earthquake, it is possibly more likely to stay undeveloped and accordingly remain an island of biodiversity within the city (UHS, 2016). However, during the winter of 2019 construction was observed on a large portion of the land. In the meantime, the rest is left alone – to overgrow. Examining historical imagery in Google Earth Pro [v. 7.1.8.3036 (32-bit), Google Inc.], it is evident the area has undergone substantial changes in land use and vegetation cover. The earliest image is dated 23 March 2002 (©2017 DigitalGlobe, Image NASA; image not shown) and shows most of the area covered by agricultural fields with shrubbery/hedges between them, several meadows, and a forest in the south western part. The most recent image, dated 17 July 2017 (©2017 CNES / Airbus; image not shown), shows most of the fields are abandoned, with succession evidently rampant in the southern, central and north-eastern parts. Some meadows or former fields in the eastern part appear to have been mown at least once in the last couple of years, for the moment slowing the succession there (personal obs. 2015–2018).

The old literature records for the adder in Zagreb are intriguing. They should be regarded with care, due to their vagueness and low precision, since that was a time long before GPS. It is difficult, maybe even impossible, to trace the sources

of information for the locations summarized in HIRTZ (1935) – it is possible they are misidentifications.

Finding that a species that is gravely threatened by habitat loss (JELIĆ *et al.*, 2012) has managed to survive in Croatia's largest city gives hope that it may still be found in other fragmented areas throughout the country. Future surveys should target other such areas, in order to try and find additional adder populations and uncover the other threatened or near threatened reptile and amphibian taxa that still inhabit the suburban areas of Zagreb and other lowlands of Northern Croatia.

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SAŽETAK

Ljutica u gradu – nalaz bosanske riđovke *Vipera berus bosniensis* (Boettger, 1889) u Zagrebu (Serpentes: Viperidae)

M. Zadavec

Širenje gradova neminovno uzrokuje fragmentaciju i gubitak staništa i prepoznato je kao jedan od glavnih čimbenika koji doprinosi gubitku bioraznolikosti na lokalnoj razini (BURGIN & WOTHERSPON, 2009; MCKINNEY, 2008). Stvaranje periurbanog, odnosno mješovitog, krajolika može dovesti do izolacije dijela populacije pojedine vrste od ostatka. Grad Zagreb uvelike se proširio od početka 20. stoljeća do danas, prešavši čak na desnu obalu rijeke Save. Time su mnoga prirodna područja pretvorena u "betonirane džungle", s tek jedva primjetnim, ili čak potpuno izgubljenim, nekadašnjim tragom bioraznolikosti. No neka (polu) prirodna područja, poput Maksimira i Tuškanca, su dan-danas ostala sačuvana kao oaze bioraznolikosti (TVRTKOVIĆ, 2010). Mišljenja stanovnika gradova prema raznim životinjskim vrstama koje obitavaju na takvim područjima različita su. Dok su neke općeprihvaćene, poput leptira, prema drugima, poput zmija, vlada odbojnost, a mogu postati i žrtve aktivnog progona (HITCHEN et al., 2011; MOLLOV, 2011; PERRY et al., 2008; RUGIERO, 2004; TVRTKOVIĆ, 2010; VUORISALO et al., 2001; WHITE & BURGIN, 2004). Riđovka (*Vipera berus*), široko rasprostranjena zmija otrovnica, u Hrvatskoj živi u tri međusobno odvojene populacije, od kojih je ona nizinska podvrste *V. b. bosniensis* poznata i iz ruralnih krajeva (JELIĆ et al., 2013), a postoje i stari nalazi iz urbanog dijela Zagreba (HIRTZ, 1935). Dana 19. ožujka 2016. godine, prilikom posjeta poluprirodnom području Krčevine, pored novoizgrađenog naselja Sopnica-Jelkovec, ulovljena je jedan mužjak riđovke, a 07. travnja 2018. ulovljen je jedna ženka. Spomenuta lokacija u podmaklom je stupnju zarašćivanja. Moguće je da kroz buduća istraživanja prirodnih područja Zagreba bude pronađeno još populacija riđovke, ali i drugih vodozemaca i gmazova koji su uspjeli opstati u (peri)urbanom okolišu.

