

## **DISTRIBUTION OF THREE *VIPERA* SPECIES IN THE REPUBLIC OF SERBIA**

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In the most recent comprehensive distribution of vipers in the western and central Balkans, 210 precise records (146 UTM cells) for all three species of vipers (*Vipera ammodytes*, *V. berus*, and *V. ursinii*) were presented for Serbia. During the past eight years, extensive field investigations within the ongoing conservation projects in our country (e.g. Ecological Networks and Natura 2000), significantly increased the number of faunistic records, which urged the need for publishing the updated distribution of all three species of vipers in Serbia. We collected a total of 770 records of vipers in Serbia, of which literature data constitute 49.4% ( $n = 380$ ) and unpublished field data made as much as 50.6% ( $n = 390$ ) of the records. As expected, *V. ammodytes* was the best-represented species, accounting for 614

records (79.8%), followed by *V. berus* with 145 records (18.8%), and *V. ursinii* with 11 records (1.4%). Results of the present study showed that in our country there are three areas crucially important for the diversity of vipers, with all three species present: Koritnik Mt. and Žljeb Mt. in Metohija, as well as Mokra Gora Mt. in south-western Serbia. We also found 25 10×10 km UTM squares with sympatry of two species of vipers. The designation of areas of special importance for vipers (e.g. Mokra Gora Mt., Dukat Mt., Besna kobila Mt., Kamena Gora Mt.) should be one of the priority actions for improvement of their conservation statuses in our country.

**Keywords:** *Vipera ammodytes*, *V. berus*, *V. ursinii*, distribution ranges, sympatry, conservation

## INTRODUCTION

The most recent comprehensive distribution of vipers in the western and central Balkans (including Serbia) was provided by Jelić *et al.* (2012). In the given publication, 210 precise records (146 UTM cells) for all three species of vipers (*Vipera ammodytes*, *V. berus*, and *V. ursinii*) were presented for Serbia, both from literature sources and from field research (Jelić *et al.* 2012, and references therein). In addition, distribution of vipers was given in the Red Book of Fauna of Serbia II – Reptiles (Tomović *et al.* 2015a), but without precise locations, and only for the purpose of assessment of their conservation statuses.

The nose-horned viper, *Vipera ammodytes* (Linnaeus, 1758), is widely distributed in Serbia; the major part of its distribution covers the hilly-mountainous regions south of the Sava and Danube rivers (Tomović 2015). In the Peripannonian and the Pannonian regions, only a few localities were confirmed (Tomović *et al.* 2010, Jelić *et al.* 2012). Its altitudinal distribution in Serbia ranges from 100 to 2100 m a.s.l. (Jelić *et al.* 2012). According to morphological data and results of geostatistics (Tomović 2006, Tomović *et al.* 2010), two subspecies of the nose-horned viper inhabit our country, *V. a. ammodytes* and *V. a. montandoni*. However, molecular studies (Ursenbacher *et al.* 2008) revealed that three different genetic clades occur: north-western Serbia is inhabited by the clade corresponding to the nominotypic subspecies, extreme south and southeast by the clade matching *V. a. montandoni*, while the unique “Serbian” clade is present in the major part of the country.

The distribution of the adder, *Vipera berus* (Linnaeus, 1758) in Serbia is extremely disjunct, and groups of populations are geographically highly isolated (Ajtić & Tomović 2015). It occurs in less than 50 UTM squares,

many of which are known only from the literature (Jelić *et al.* 2012). Concerning altitudinal distribution, there are two groups of populations: from lowlands and hills (southern Banat, southern Srem, and north-western Serbia), and from alpine zones (central, eastern, south-eastern and south-western Serbia, Kosovo and Metohija). The adder's altitudinal distribution is between 70 and 2500 m a.s.l. (Jelić *et al.* 2012, Ajtić & Tomović 2015). Both lowland and alpine populations of the adder in Serbia belong to the Balkan subspecies, *V. b. bosniensis* (Jelić *et al.* 2012).

The meadow viper, *Vipera ursinii* (Bonaparte, 1835), is one of the rarest reptile species in Serbia. Its distribution range is exceptionally disjunct and limited to the mountain ranges of the Scardo-Pindhic and Dinaric mountain systems in the south-western part of the country (Kosovo, Metohija and south-western Serbia), at altitudes above 1600 m a.s.l. (Tomović & Ajtić 2015). Both morphological data and molecular genetic studies (Ferchaud *et al.* 2012) revealed that subspecies *V. u. macrops* is present in Serbia (Jelić *et al.* 2012).

Importantly, all three viper species are strictly protected (*V. berus* and *V. ursinii*) or protected (*V. ammodytes*) by law in Serbia (Anonymous 2010a,b) but they are also under threats due to various human activities, both legal and illegal (Tomović *et al.* 2014, Tomović *et al.* 2015b). In this sense, the presence of vipers in the given areas increases the value of those places: at least two vipers can be viewed as umbrella species and could contribute to the conservation of entire ecosystems.

During the past eight years, publications related to certain regions of Serbia (e.g. Kosovo & Metohija – Tomović *et al.* 2018), as well as extensive field investigations within the ongoing conservation projects in our country (e.g. Ecological Networks and Natura 2000), significantly increased the number of faunistic records, which urged the need for publishing the updated distribution of all three species of vipers in Serbia.

## MATERIAL AND METHODS

The present study included the recently published information on the distribution of vipers in the Republic of Serbia (e.g. Jelić *et al.* 2012, Tomović *et al.* 2018, and references therein) (Appendix I). New faunistic data were mostly collected from the year 2012 onward, and they were the result of *ad-hoc* observations by the authors and collaborators mentioned in the Acknowledgements (Appendix II). Since these observations were not obtained by systematic research, the absence of records in certain parts of the territory of Serbia does not imply the absence of vipers, but simply the

lack of data. Some distribution records presented in the Red Book of Fauna of Serbia II – Reptiles (Tomović *et al.* 2015a) were now omitted or corrected, because the locality data were imprecise (obtained from the Internet), the sources were not reliable enough and/or the findings were not confirmed (pers. comm.).

The collected records (both previously published and new) were mapped on the 10×10 km UTM (Universal Transverse Mercator) geographic coordinate grid system. All records were checked for plausibility and assigned to their respective UTM cells. Some record localities refer to areas rather than precise points and thus extend across two grid cells. For the analyses of diversity of vipers in Serbia, we used an application created in Visual Basic 6.1 in the program WinWord 2003 (Niketić 1999) and plotted on the 10×10 km National Grid UTM Reference for the Republic of Serbia.

Acronyms for Serbian regions: **Bt** – Banat; **C** – Central Serbia; **E** – Eastern Serbia; **K** – Kosovo; **M** – Metohija; **NE** – Northeastern Serbia; **NW** – Northwestern Serbia; **Po** – Great Pomoravlje; **S** – Southern Serbia; **SE** – Southeastern Serbia; **SW** – Southwestern Serbia; **Sr** – Srem; **Š** – Šumadija; **W** – Western Serbia. The boundaries of the regions on the maps are given according to Tomović *et al.* (2015a).

## RESULTS

### Catalogue of taxa and records

#### LITERATURE DISTRIBUTION RECORDS

##### *Vipera ammodytes* (Linnaeus, 1758)

**Bt Bela Crkva:** Kusić (v.), near Nera (r.), UTM EQ36, 23.10.2005., Džukić *et al.* 2017); UTM EQ37 (obs. *I. Petrović*, Džukić *et al.* 2005); **C Blace:** Prebreza (v.), UTM EN29, 09.08.1958, Džukić 1972); **Čeljsko Lake,** UTM EP10 (obs. *R. Ajtić* 31.05.2004, Jelić *et al.* 2012); **Goč Mt.:** mountain house, UTM DP72 (obs. *K. Vasić* 23.05.1977., Džukić *et al.* 2017); **Sokoljska Reka** (r.), UTM DP72, 05.06.1966, Džukić 1972); **Ibar Valley:** Ušće (v.), UTM DP71 (obs. *R. Ajtić* 01.07.1991, Jelić *et al.* 2012); **Jastrebac Mt.:** Buci (v.), UTM EP21 (obs. *D. Kataranovski* 09.09.1979., Džukić *et al.* 2017); **Kopaonik Mt.:** Brzeće (v.), Ravelj Hill, UTM DN99 (obs. *Lj. Tomović*, *R. Ajtić*, *Đ. Đoković* 27.08.2000, Jelić *et al.* 2012); UTM DN89 (obs. *Lj. Tomović*, *R. Ajtić* 28.08.2000., Džukić *et al.* 2017); **Čajetinsko Brdo Hill,** UTM DN88 (obs. *M. Niketić*, *D. Lakušić* 15.07.1983, Jelić *et al.* 2012); **Jošanička Banja, Gornje Čamage** (v.) - **Donje Čamage** (v.), UTM DP70, 16.07.1987., Džukić *et al.* 2017); **Lukovska Banja,** UTM EN07 (obs. *M. Niketić* 31.05.2000, Jelić *et al.* 2012); **Šanac,** UTM DN79 (obs. *Lj. Janković* 24.08.1973., Džukić *et al.* 2017); **Treska,** UTM DN88 (obs. *V. Bjedov* 24.06.2005, Jelić *et al.* 2012); **Kuršumlija:** Vlahinja (v.), UTM EN18 (obs. *B. Milenković* 02.07.1979., Džukić *et al.* 2017); UTM EN27 (obs. *S. Obradović* 10.09.1978., Džukić *et al.* 2017); **Prokuplje:** Donja Konjuša (v.), UTM EN38 (obs. *D. Gagulić* 13.09.1975., Džukić *et al.* 2017); **Viča** (v.), **Ložde Hill,** UTM EN38 (obs. *Lj. Tomović*, *M. Tomović* 15.06.1999., Jelić *et al.* 2012); **Vodice** (v.), UTM EN48 (obs. *M. Petković* 15.05.1981., Džukić *et al.* 2017); **Raška:** Raška - Leposavić, UTM DN79 (obs. *M. Niketić*, *G. Tomović* 02.05.2004., Jelić *et al.* 2012); **Sokolovica Mt.:** Sokolov krš, UTM EN36 (obs. *M. Niketić*, *G. Tomović* 01.05.1998, Jelić *et al.* 2012); **Stolovi Mt.:** Kamenica (v.), UTM

DP72 (obs. *M. Niketić* 15.05.2002., Jelić *et al.* 2012); **Trstenik**: Donja Crnišava (v.), Zbeg Hill, UTM EP02, Jelić *et al.* 2012, Džukić *et al.* 2017); UTM EP02, Džukić *et al.* 2017); **E Aleksinac**: Kraljevo (v.), UTM EP52 (obs. *M. Niketić*, 01.05.1983, Jelić *et al.* 2012); **Devica Mt.**: Ždrelo Gorge, UTM EP72 (obs. *M. Niketić* 31.04.1983, Jelić *et al.* 2012); **Dimitrovgrad**: Smilovci (v.), surroundings, UTM FN57, 15.07.1957., Džukić *et al.* 2017); **Knjaževac**: Svrlijski Timok Gorge, Podvis (v.), UTM EP92 (obs. *M. Niketić* 15.05.1983, Jelić *et al.* 2012); **Niš**: Jelašnička Gorge, Inatovac Peak, UTM EN89 (obs. *M. Niketić*, *G. Tomović* 28.02.2001, Jelić *et al.* 2012); Jelašnica (v.), Prozorac, UTM EN89 (obs. *M. Niketić* 31.03.1984, Jelić *et al.* 2012); Radovanski Kamen, UTM EN89 (obs. *M. Niketić* 15.05.1988., Jelić *et al.* 2012); UTM EN89 (obs. *R. Ajtić* 20.06.2005., Jelić *et al.* 2012); Kamenica (v.), Kamenička Reka (r.), UTM EP70 (obs. *M. Niketić* 31.05.1978, Jelić *et al.* 2012); Niška Banja, Banjsko Brdo, UTM EN89 (obs. *M. Niketić* 31.05.1980., Jelić *et al.* 2012); **Seličevica Mt.**: Mala Ibrovica, UTM EN78 (obs. *M. Niketić* 15.05.1978, Jelić *et al.* 2012); **Sićevačka Gorge**: Gradište (v.), Gradištanska Gorge, UTM EN99 (obs. *B. Zlatković*, *G. Tomović* 31.05.1997, Jelić *et al.* 2012); UTM EN99, Jović *et al.* 1997); Ječava Hill, UTM EN99, Jović *et al.* 1997); Krupac, UTM FN09, Jović *et al.* 1997); Kusača Hill, UTM FN09, Jović *et al.* 1997); Oblik, UTM EN99, Jović *et al.* 1997, Jelić *et al.* 2012); Sićevo (v.), Via Militaris, UTM EN89 (obs. *R. Ajtić* 24.06.2005., Jelić *et al.* 2012); Via Militaris, UTM EN89 (obs. *R. Ajtić* 24.06.2005., Džukić *et al.* 2017); **Sokobanja**: Bovansko Lake, UTM EP53, EP63 (obs. *V. Žikić* 30.06.1998., Jelić *et al.* 2012); **Stara Planina Mts.**: Crni Vrh, UTM FP20, 14.08.1983, Jelić *et al.* 2012); Topli Do (v.), UTM FN49, Ivančević *et al.* 2007); **Suva Planina Mt.**: Donji Dušnik (v.), UTM EN87 (obs. *Lj. Tomović* 01.06.2005., Jelić *et al.* 2012); Gadžin Han, UTM EN88, Jelić *et al.* 2012); Gornji Dušnik (v.), UTM EN97 (obs. *Lj. Tomović* 01.06.2005., Jelić *et al.* 2012); Grnčar (v.), Lužnička Gorge, UTM FN06 (obs. *M. Niketić* 01.04.1989, Jelić *et al.* 2012); Kaletinac (v.), UTM EN97 (obs. *M. Niketić* 01.05.1976., Jelić *et al.* 2012); Lužnička Gorge, UTM FN06 (obs. *I. Krizmanić* 09.05.2000., Džukić *et al.* 2017); Mosor, UTM EN98 (obs. *B. Zlatković*, *G. Anačkov*, Jelić *et al.* 2012); Šebet (v.), UTM EN97 (obs. *B. Zlatković* 01.07.2001., Jelić *et al.* 2012); Trem, UTM EN98 (obs. *V. Ranđelović* 08.07.1997., Jelić *et al.* 2012); **Svrlijske Planine Mt.**: Zeleni Vrh, UTM EP90 (obs. *B. Zlatković*, *G. Anačkov* 15.07.1994, Jelić *et al.* 2012); **Tresibaba Mt.**: Miljkovac (v.), UTM EP91 (obs. *M. Niketić*, *G. Tomović* 01.05.2003., Jelić *et al.* 2012); **Vlaška Planina Mt.**: Jerma Gorge, Zvonačka Banja, UTM FN25 (obs. *B. Zlatković* 02.05.2002., Jelić *et al.* 2012); **K Gazivode Lake**, UTM DN65, 694 m (obs. *S. Petković*, 14.06.2014., Tomović *et al.* 2018); **Gnjilane**: Buzalac (v.), Dobri Čiča Hill, UTM EN40 (obs. *G. Džukić* 17.05.1977., Džukić *et al.* 2017); Končulj (v.), UTM EN50, 08.2004., Džukić *et al.* 2017); Poneš (v.), UTM EN30, 616 m (obs. *B. Aksić* 15.08.2014., Tomović *et al.* 2018); Slivovo (v.), UTM EN21 (obs. *J. Simić* 07.09.1978., Džukić *et al.* 2017, Tomović *et al.* 2018); Straža (v.), UTM EN30, 716 m (obs. *N. Todorović* 02.06.2015., Tomović *et al.* 2018); UTM EN30, Pasuljević 1968); **Ibar Valley**: Ibarska Slatina (v.), Ceranjska Reka (r.), UTM DN86, 802 m, Džukić *et al.* 2017, Tomović *et al.* 2018); UTM DN86 (obs. *G. Pasuljević* 15.08.1975., Džukić *et al.* 2017); **Kosovska Mitrovica**: Vidomirić (v.), UTM DN84 (obs. *J. Vasić* 02.08.2014., Tomović *et al.* 2018); UTM DN84, Fejérváry 1922); **Leposavić**: Berberište (v.), UTM DN77, 1035 m (obs. *M. Timotijević* 22.07.2016., Tomović *et al.* 2018); Borikovac, UTM DN87 (obs. *M. Timotijević* 16.06.2016., Tomović *et al.* 2018); Desetak (v.), UTM DN87, 751 m (obs. *M. Timotijević* 23.07.2016., Tomović *et al.* 2018); Dobrava (v.), UTM DN86, 604 m (obs. *M. Timotijević* 10.07.2017., Tomović *et al.* 2018); Donji Krnjin (v.), UTM DN77, 448 m (obs. *M. Timotijević* 10.07.2017., Tomović *et al.* 2018); Gnježdane (v.), UTM DN77, 790 m (obs. *R. Kostović*, *G. Pasuljević* 24.05.1971., Džukić *et al.* 2017, Tomović *et al.* 2018); Ibarsko Postenje (v.), UTM DN78, 433 m (obs. *M. Timotijević* 28.08.2017., Tomović *et al.* 2018); Jarinje (v.), UTM DN78, 695 m (obs. *M. Timotijević* 29.07.2016., Tomović *et al.* 2018); Kijevčice (v.), UTM DN87, 838 m (obs. *G. Pasuljević*, *R. Kostović* 06.05.1973., Džukić *et al.* 2017, Tomović *et al.* 2018); Koporice (v.), UTM DN87, 935 m (obs. *G. Pasuljević* 10.06.1971., Džukić *et al.* 2017, Tomović *et al.* 2018); Kruševo (v.), UTM DN77 (obs. *G. Pasuljević*, *R. Kostović* 06.05.1973., Džukić *et al.* 2017); Lešak (v.), Kamen Hamlet, UTM DN77, 558 m (obs. *M. Timotijević* 27.07.2017., Tomović *et al.* 2018); Miliće (v.), UTM DN87, 804 m (obs. *M. Timotijević* 26.07.2016., Tomović *et al.* 2018); Ostraće (v.), UTM DN78, 767 m (obs. *M. Timotijević* 02.07.2016., Tomović *et al.* 2018); Potkomlje (v.), UTM DN77, 505 m (obs. *M. Timotijević* 11.08.2016., Tomović *et al.* 2018); Sočanica (v.), UTM DN86, 560 m (obs. *R. Novaković* 08.07.1978., Džukić *et al.* 2017, Tomović *et al.* 2018); Stubica Hill, UTM DN87 (obs. *M. Timotijević* 15.06.2016., Tomović *et al.* 2018); Tvrdan (v.), UTM DN87, 655 m

(obs. *M. Timotijević* 27.05.2016., Tomović *et al.* 2018); **Vračevo** (v.), UTM DN78, 678 m (obs. *M. Timotijević* 21.07.2016., Tomović *et al.* 2018); **Zavrata** (v.), UTM DN87, 1154 m (obs. *G. Pasuljević* 18.06.1971., Džukić *et al.* 2017, Tomović *et al.* 2018); **Zemanica** (v.), UTM DN88, 1032 m (obs. *M. Timotijević* 11.08.2016., Tomović *et al.* 2018); **Zrnosek** (v.), UTM DN87, 877 m (obs. *M. Timotijević* 19.08.2016., Tomović *et al.* 2018); UTM DN87, 545 m (obs. *G. Pasuljević*, *R. Kostović* 15.05.1973., Džukić *et al.* 2017, Tomović *et al.* 2018); **Novo Brdo: Bostane** (v.), UTM EN31 (obs. *P. Jakšić*, Džukić *et al.* 2017); **Jasenovik** (v.), UTM EN31 (obs. *P. Jakšić* 25.05.1986., Džukić *et al.* 2017); **Trničevce** (v.), UTM EN31 (obs. *P. Jakšić* 05.1985., Džukić *et al.* 2017); **Zebine** (v.), UTM EN31 (obs. *N. Todorović* 08.06.2017., Tomović *et al.* 2018); above flotation, UTM EN31 (obs. *G. Pasuljević* 24.07.1970., Džukić *et al.* 2017); UTM EN31 (obs. *D. Stanojević* 22.05.2007., Tomović *et al.* 2018); **Podujevo: town**, UTM EN14, Pasuljević 1968); **Priština: Badovac** (v.), Kišnica Hamlet, UTM EN11, 622 m (obs. *M. Petković* 17.05.2017., Tomović *et al.* 2018); **Grmija Hill**, UTM EN12, EN22, 1000 m (obs. *G. Pasuljević* 20.04.1970., Džukić *et al.* 2017, Tomović *et al.* 2018); surroundings, UTM EN12, Pasuljević 1968, Münch 1997); **Rogozna Mt.: Desetak** (v.), UTM DN87, 751 m (obs. *M. Timotijević* 23.07.2016., Tomović *et al.* 2018); **Grižani** (v.), UTM DN76, Džukić *et al.* 2017, Tomović *et al.* 2018); **Junake** (v.), UTM DN76, 957 m (obs. *D. Todorović* 28.05.1978., Tomović *et al.* 2018); **Rudine** (v.), UTM DN76 (obs. *N. Labus* 05.06.2003., Tomović *et al.* 2018); **Šar Planina Mts.: Brezovica, hotel "Narcis"**, UTM EM07 (obs. *P. Lazarević*, Jelić *et al.* 2012); **Prljevački Stream**, UTM DM97, EM07 (obs. *P. Jakšić* 17.07.1986., Džukić *et al.* 2017); **Durlov Potok**, UTM EM06, 1700 m (obs. *I. Krizmanić* 26.06.1995., Tomović *et al.* 2018); **Kodža Balkan Mt., Rusenica Gorge, Sveta Trojica Monastery**, UTM DM88 (obs. *I. Krizmanić*, Tomović *et al.* 2018); **Ošljak, Gornje Selo** (v.), UTM DM97 (obs. *R. Savić* 27.07.1979., Tomović *et al.* 2018); **the main peak**, UTM DM87 (obs. *M. Niketić* 01.08.1991, Jelić *et al.* 2012); UTM DM97, 864 m (obs. *I. Ilić* 12.08.1976., Tomović *et al.* 2018); **Prevalac**, UTM DM96 (obs. *M. Hajredini* 28.08.1979., Džukić *et al.* 2017, Tomović *et al.* 2018); **Uroševačka Strana**, UTM EM08, Karaman 1928); **Uroševac: Gornje Nerodimlje** (v.), UTM EM09, 713 m (obs. *G. Pasuljević* 10.07.1976., Džukić *et al.* 2017, Tomović *et al.* 2018); UTM EM19, 15.03.1977., Džukić *et al.* 2017); **Vučitrn: Čičavica Hill**, UTM DN93, 03.07.1973, Jelić *et al.* 2012); **Gornja Sudimlja** (v.), UTM DN93, 597 m (obs. *R. Grguri* 09.06.1977., Džukić *et al.* 2017, Tomović *et al.* 2018); **Zubin Potok: Lučka Reka** (v.), UTM DN75, 891 m (obs. *S. Bašanović* 30.09.1976., Džukić *et al.* 2017, Tomović *et al.* 2018); **Pridvorica** (v.), UTM DN75, 679 m (obs. *M. Orlović* 17.06.2015., Tomović *et al.* 2018); **Ugljare** (v.), UTM DN75, 578 m (obs. *M. Orlović* 06.09.2015., Tomović *et al.* 2018); **Zupče** (v.), UTM DN84, 529 m (obs. *M. Orlović* 08.06.2015., Tomović *et al.* 2018); **Zvečan: Banjska** (v.), UTM DN85 (obs. *D. Todorović* 28.09.1978., Džukić *et al.* 2017); **Valač** (v.), UTM DN85, 499 m (obs. *D. Todorović* 04.05.1978., Tomović *et al.* 2018); **M Dečani: Dečanska Bistrica Gorge**, UTM DN31 (obs. *V. Stevanović*, 12.07.1977., Džukić *et al.* 2017); **Đakovica: Babaj Boks** (v.), **Babaj Boks** (v.) - **Deva** (v.), UTM DM48 (obs. *G. Džukić* 18.07.1980., Džukić *et al.* 2017); UTM DM49 (obs. *G. Pasuljević*, *G. Džukić* 18.07.1980., Džukić *et al.* 2017); (obs. *S. Šajfa* 02.07.1980., Tomović *et al.* 2018); **Bistražin** (v.), **Zrze** (v.)- **Bistražin** (v.), gorge, UTM DM68, Džukić & Pasuljević 1979); **Erenik** (r.), UTM DM69 (obs. *J. Rosandić*, Jelić *et al.* 2012); UTM DM59, Fejérváry 1922); (obs. *Dž. Karadani* 13.04.1982., Tomović *et al.* 2018); **Istok: Mojstir** (v.), UTM DN63 (obs. *D. Lakušić* 26.09.1978., Džukić *et al.* 2017, Tomović *et al.* 2018); **Osojane** (v.), UTM DN62, 531 m (obs. *D. Lakušić* 24.04.1977., Džukić *et al.* 2017, Tomović *et al.* 2018); **Šaljnovica** (v.), UTM DN62 (obs. *D. Lakušić* 24.05.1978., Džukić *et al.* 2017, Tomović *et al.* 2018); **Klina: Kijevo** (v.), **Iglarevo** (v.), UTM DN71 (obs. *G. Pasuljević* 12.09.1975., Džukić *et al.* 2017, Tomović *et al.* 2018); **Volujak** (v.), UTM DN61 (obs. *B. Milošević*, *G. Pasuljević* 01.07.1980., Džukić *et al.* 2017, Tomović *et al.* 2018); **Koritnik Mt.: Rapča** (v.), UTM DM65 (obs. *M. Hajredini* 31.03.1980., Džukić *et al.* 2017, Tomović *et al.* 2018); **Koznik Mt.: Miruša Canyon**, UTM DN60, DN70 (obs. *Devčić*, *Todorović* 20.05.1977., Džukić *et al.* 2017); **Orahovac**, UTM DM69, 477 m (obs. *S. Trajković* 25.08.1976., Džukić *et al.* 2017, Tomović *et al.* 2018); **Peć**, UTM DN42, **Kopstein & Wettstein 1920**, **Mertens & Muuler 1928Prizren: Cvilen Mt.**, UTM DM76 (obs. *Z. Rosandić*, Jelić *et al.* 2012); **Dojnice** (v.), UTM DM87 (obs. *R. Ajtić*, Tomović *et al.* 2018); **Krajc** (v.), UTM DM78 (obs. *R. Ajtić*, Tomović *et al.* 2018); **Landovica** (v.), **Beli Drim Valley**, UTM DM77 (obs. *J. Rosandić*, Jelić *et al.* 2012); **Lokvica** (v.), UTM DM86, 07.09.1978., Džukić *et al.* 2017); **Ljukinaj** (v.), UTM DM68 (obs. *R. Ajtić*, Tomović *et al.* 2018); **Prizrenska Bistrica Gorge, Dušanov Grad**, UTM DM87 (obs. *R. Ajtić*, Tomović *et al.* 2018); **Duvška Gorge, Sveti Arhanđeli Monastery**, UTM DM87 (obs. *R. Ajtić*, Jelić *et al.* 2012);

Duvska Gorge, Vrbički Stream, UTM DM87 (obs. *R. Ajtić, Tomović et al.* 2018); UTM DM87 (obs. *I. Krizmanić, Tomović et al.* 2018); **Skorobište** (v.), UTM DM87 (obs. *R. Ajtić, Tomović et al.* 2018); **Smač** (v.), **Topluga** (r.), UTM DM78 (obs. *J. Rosandić, Jelić et al.* 2012); UTM DM78 (obs. *R. Ajtić, Tomović et al.* 2018); **Sredska** (v.), UTM DM97 (obs. *I. Ilić* 12.08.1976., *Džukić et al.* 2017); town, **Kaljaja**, UTM DM77 (obs. *R. Ajtić, Tomović et al.* 2018); **Šuklje**, UTM DM77 (obs. *R. Ajtić, Tomović et al.* 2018); UTM DM77, **Pasuljević** 1968, **Jelić et al.** 2012, **Džukić et al.** 2017); **Trepetnica** (v.), UTM DM78 (obs. *R. Ajtić, Tomović et al.* 2018); **Vrbičane** (v.), UTM DM87 (obs. *M. Petrović* 01.08.1979., *Džukić et al.* 2017, *Tomović et al.* 2018); (obs. *R. Ajtić, Tomović et al.* 2018); **Vrbnica** (v.), **Beli Drim Valley**, UTM DM66 (obs. *Z. Jovanović* 01.05.1999, *Jelić et al.* 2012); **Prokletije Mts.:** **Junička Planina Mt.**, **Batuša** (v.), UTM DN30 (obs. *I. Krizmanić, Tomović et al.* 2018); **Lazović**, UTM DN32, DN42 (obs. *I. Krizmanić* 11.06.1997., *Džukić et al.* 2017, *Tomović et al.* 2018); **Žljeb Mt.**, UTM DN33, **Kopstein & Wettstein** 1920, **Fejérváry** 1922; **Schwartz** 1936); **Suva Reka:** **Dulje** (v.), UTM DM99, 859 m (obs. *G. Pasuljević* 10.09.1977., *Džukić et al.* 2017, *Tomović et al.* 2018); **Šar Planina Mts.:** **Ošljak**, **Lokvica** (v.), UTM DM86, 398 m (obs. *M. Bardaini* 07.09.1979., *Tomović et al.* 2018); **Rečane** (v.), UTM DM86 (obs. *M. Petković* 02.07.1979., *Tomović et al.* 2018); **NE Beljanica Mt.:** **Beljanička Kapa**, UTM EP58 (obs. *R. Ajtić*, 15.07.1997, *Jelić et al.* 2012); **Lisina** (r.), spring, UTM EP48, 20.07.1997, *Jelić et al.* 2012); **mountain house**, UTM EP58 (obs. *R. Ajtić* 01.07.1998., *Džukić et al.* 2017); **Resava** (r.), UTM EP67 (obs. *R. Ajtić* 15.07.1997, *Jelić et al.* 2012); **Sokolica**, foothill, UTM EP58, **Džukić et al.** 2017); **Suvaja** (r.), UTM EP57 (obs. *R. Ajtić* 15.07.1997, *Jelić et al.* 2012); **Donji Milanovac:** **quarry**, UTM EQ82, 17.09.1965., *Džukić* 1972); **Veliki Greben**, UTM EQ91, 18.09.1965., *Džukić* 1972); **Đerdapska Gorge:** **Kazani**, UTM FQ04 (obs. *M. Niketić* 31.04.1994., *Jelić et al.* 2012); **Štrbac**, **Golubinja** (v.), UTM EQ92, 16.09.1965., *Džukić* 1972); **Golubac:** **Dobra** (v.), UTM EQ74 (obs. *G. Tomović, P. Lazarević* 15.04.2003., *Jelić et al.* 2012); UTM EQ54, 29.04.1986., *Džukić et al.* 2017); **Homoljske Planine Mt.:** **Vukan**, **Veliki Vukan**, UTM EQ40 (obs. *M. Niketić* 31.05.2003., *Jelić et al.* 2012); **Kučajske Planine Mt.:** **Mikuljska Reka Canyon**, UTM EP67, 02.06.1983., *Džukić et al.* 2017); **Kučevo**, UTM EQ52, 04.1963., *Džukić et al.* 2017); **Malinik Mt.:** **Lazareva Reka Canyon**, **Prerasti**, UTM EP77 (obs. *G. Džukić* 09.07.1982., *Džukić et al.* 2017); **Vernjickica**, UTM EP77 (obs. *M. Niketić* 15.05.1998, *Jelić et al.* 2012); UTM EP77, *Jelić et al.* 2012, *Džukić et al.* 2017); **the main peak**, UTM EP77 (obs. *M. Niketić, D. Lakušić* 15.07.1984, *Jelić et al.* 2012); **Miroč Mt.**, UTM FQ03 (obs. *M. Raković* 01.07.2005, *Jelić et al.* 2012); **Negotin:** **Vratna** (r.), **Vratna Monastery**, UTM FQ01 (obs. *R. Ajtić* 06.07.2005, *Jelić et al.* 2012); **Paraćin:** **Baba Planina Mt.**, UTM EP45 (obs. *M. Niketić, G. Tomović* 01.05.2004, *Jelić et al.* 2012); UTM EP45 (obs. *M. Niketić, G. Tomović* 01.05.2004, *Jelić et al.* 2012); **Petrovac:** **Gornjačka Gorge**, **Gornjak Monastery**, UTM EQ40 (obs. *M. Niketić* 15.05.1986., *Jelić et al.* 2012); **Oreškovića** (v.), UTM EQ20 (obs. *J. Bulić* 01.05.1997., *Jelić et al.* 2012); **Rtanj Mt.:** **Baba Peak**, UTM EP74 (obs. *Z. Dunderski* 03.05.1977., *Džukić et al.* 2017); **Kusača**, UTM EP74 (obs. *M. Niketić* 01.06.1991., *Jelić et al.* 2012); **Stol Mt.:** **plateau**, **mountain house**, UTM EP99 (obs. *D. Pavićević* 19.05.1989., *Džukić et al.* 2017); **Zaječar:** **Sokolovica**, UTM FP17, 01.05.1908., *Džukić* 1972); **NW Bogatić:** **Badovinci** (v.), UTM CQ76 (obs. *M. Paunić, Jelić et al.* 2012); **Cer Mt.**, UTM CQ83, *Jelić et al.* 2012); **Jablanik Mt.:** **Počuta** (v.), **Ledenjak Spring**, UTM CP99 (obs. *Đ. Đoković* 02.05.2002., *Jelić et al.* 2012); UTM CP99, 23.07.1998., *Jelić et al.* 2012); UTM CP99, *Džukić* 1972); **Krupanj:** **Lipnik Hill**, UTM CQ60, **Bolkay & Čurčić** 1920, **Bolkay** 1924); **Loznica:** **Paskovac** (v.), UTM CQ52, *Džukić et al.* 2017); **Zajača** (v.), **Krivi Potok**, UTM CQ52 (obs. *M. Popović - Fant* 01.02.1990., *Džukić et al.* 2017); UTM CQ52 (obs. *M. Popović - Fant* 05.04.1990., *Džukić et al.* 2017); **Ljubovija:** **Gornja Trešnjica** (v.), **Trešnjica Canyon**, UTM CP78 (obs. *G. Džukić* 27.05.1972., *Džukić et al.* 2017); **Tribuća Canyon**, UTM CP79, 05.07.1978., *Jelić et al.* 2012, *Džukić et al.* 2017); **Mali Zvornik:** **Trešnjica Canyon**, **Jerinin Grad**, UTM CP88, *Džukić et al.* 2017); **Košlje** (v.), UTM CP88, *Džukić et al.* 2017); **Maljen Mt.:** **Brežde** (v.), UTM DP29 (obs. *M. Anđelković, A. Urošević* 08.06.2017., *Džukić et al.* 2017); **Divčibare**, **Paljba**, UTM DP18, *Džukić et al.* 2017); **Rior**, UTM DP28, 28.06.2003., *Džukić et al.* 2017); **road to Divčibare**, UTM DP18, DP28 (obs. *D. Kataranovski, V. Cvetković* 17.05.1994., *Džukić et al.* 2017); **Medvednik Mt.**, UTM CP99, *Jelić et al.* 2012, *Džukić et al.* 2017); **Mionica:** **Paštrić** (v.), **Ribnička Cave**, UTM DP29 (obs. *M. Đurić* 14.05.2005., *Džukić et al.* 2017); **Ribnička Gorge**, UTM DP29 (obs. *Đ. Đoković* 10.07.2000, *Jelić et al.* 2012); UTM DP29 (obs. *G. Džukić* 28.05.1980., *Džukić et al.* 2017); **Povlen Mt.:** **Debelo Brdo Mt.**, **Stubice Hill**, UTM DP08 (obs. *R. Ajtić* 29.06.1999., *Jelić et al.* 2012, *Džukić et al.* 2017); **Gornji Taor** (v.), **Mravinjci Hamlet**, **Magleš Hill**, UTM DP08 (obs.

Đ. Đoković 27.08.2005., Jelić *et al.* 2012); UTM DP08 (obs. Lj. Tomović, R. Ajtić 01.05.2003., Jelić *et al.* 2012); Srednji Povlen, Kneževo Polje, UTM CP98 (obs. D. Jovanović 17.06.2001., Jelić *et al.* 2012, Džukić *et al.* 2017); UTM CP98 (obs. D. Jovanović, Džukić *et al.* 2017); **Suvobor Mt.:** Pranjani (v.), UTM DP37 (obs. D. Kataranovski, V. Cvetković 17.05.1994., Džukić *et al.* 2017); **Valjevo:** Blizonje (v.), UTM DQ11 (obs. M. Niketić, G. Tomović 02.05.2004, Jelić *et al.* 2012); Donje Leskovice (v.), UTM DP09, 14.09.2009., Džukić *et al.* 2017); **Gradac** (r.), Konjičko (v.), gorge, UTM DQ10 (obs. Đ. Đoković 19.05.2004, Jelić *et al.* 2012); Suvaj (r.), UTM DP09 (obs. A. Hegediš 28.05.1992., Džukić *et al.* 2017); UTM DP09 (obs. I. Krizmanić 25.05.1995., Džukić *et al.* 2017); **Gradac Gorge,** Devojački Vir, UTM DQ10 (obs. Đ. Đoković 11.09.2005, Jelić *et al.* 2012); **Jablanica** (r.), UTM CP99 (obs. I. Krizmanić 31.07.1991., Džukić *et al.* 2017); UTM DQ00 (obs. M. Niketić, I. Krizmanić 30.04.1994., Jelić *et al.* 2012); **Petnica** (v.), Bujačić, UTM DP19 (obs. S. Stamenković 22.05.1985., Džukić *et al.* 2017); **Zabava** (r.), UTM DP18 (obs. Đ. Đoković 18.05.2002, Jelić *et al.* 2012); **Vlašić Hill,** UTM CQ82 (obs. M. Niketić, G. Tomović 15.03.2004, Jelić *et al.* 2012); **Po Čičevac:** Stalać, Stevanac, UTM EP33 (obs. R. Ajtić, 23.03.2005., Džukić *et al.* 2017); UTM EP33 (obs. R. Ajtić, Jelić *et al.* 2012); **Jagodina:** Dragoševac (v.), UTM EP15 (obs. G. Džukić, M. Kalezić 17.06.2001., Džukić *et al.* 2017); **Stalać:** Stalačka Gorge, Trubarevo (v.) - Cerovo (v.), UTM EP42 (obs. M. Niketić 30.04.1993, Jelić *et al.* 2012); **Svilajnac:** Bagrdanska Gorge, Gložane (v.), Miljkov Monastery, UTM EP19 (obs. M. Niketić, G. Tomović 15.04.2003, Jelić *et al.* 2012); UTM EP19, Jelić *et al.* 2012, Džukić *et al.* 2017); **Š Bujanovac:** Končulj (v.), UTM EN50 (obs. B. Lukić, Jelić *et al.* 2012); **Kukavica Mt.:** Krpejce (v.), UTM EN83 (obs. S. Antić, Jelić *et al.* 2012); **Lebane:** Grgurovce (v.), Šumanska River Gorge, UTM EN64 (obs. M. Živić 30.04.2002., Jelić *et al.* 2012, Džukić *et al.* 2017); **Medveđa:** Mačedonce (v.), UTM EN44 (obs. M. Živić 30.04.2002., Jelić *et al.* 2012, Džukić *et al.* 2017); **Preševo:** Miratovac (v.), UTM EM58, Ralev *et al.* 2013); **Vranje:** Kriva Feja (v.), UTM EN91, Džukić *et al.* 2017); **SE Bosilegrad:** Donja Lisina (v.), UTM FN11, 01.08.2003., Sterijovski 2014); Gornja Lisina (v.), Lisinsko Lake, UTM FN11, 01.08.2001., Sterijovski 2014); Mlekominici (v.), UTM FN20, 28.04.2002., Sterijovski 2014); Rajčilovci (v.), UTM FN20, 30.07.2003., Sterijovski 2014); Ribarci (v.), UTM FM29, 29.07.2003., Sterijovski 2014); **Grdelička Gorge:** Predejane (v.), UTM EN94 (obs. S. Antić, Jelić *et al.* 2012); **Milevska Planina Mt.:** Donja Ljubata (v.), UTM FN00 (obs. G. Anačkov 01.06.2004., Jelić *et al.* 2012); **Starac Mt.:** Pčinja Valley, UTM EM78 (obs. Lj. Tomović, R. Ajtić 24.05.2009., Džukić *et al.* 2017); Starac (v.), Donji Starac, UTM EM78 (obs. R. Ajtić 07.2004., Džukić *et al.* 2017); Gornji Starac, UTM EM78 (obs. Lj. Tomović, R. Ajtić 05.05.2002., Jelić *et al.* 2012, Džukić *et al.* 2017); Gornji Starac, Hamlet Čivčije, UTM EM78 (obs. Lj. Tomović, R. Ajtić 06.05.2002., Jelić *et al.* 2012, Džukić *et al.* 2017); **Trgovište:** Donja Trnica (v.), Crnovska Gorge, UTM EM89 (obs. Lj. Tomović, R. Ajtić 29.04.2000., Jelić *et al.* 2012, Džukić *et al.* 2017); **Vlasina Plateau:** Brod (v.), Vlasina Gorge, UTM FN04 (obs. J. Cmobrnja 20.07.1982, Jelić *et al.* 2012); **Vlasotince:** Gložane (v.), UTM EN85, Jelić *et al.* 2012); **SW Giljeva Mt.:** Raždaginja (v.), UTM DN28 (obs. G. Pasuljević, H. Mesić, Džukić *et al.* 2017); **Ibarski Kolašin,** UTM DN55 (obs. I. Ristović 28.04.1977., Džukić *et al.* 2017); **Jadovnik Mt.,** UTM DN09, Jelić *et al.* 2012); **Mokra Gora Mt.,** UTM DN54, Bolka 1924); **Nova Varoš:** Debelja (v.), Božetići Hamlet, UTM DP11 (obs. B. Mitić 02.05.2003., Jelić *et al.* 2012); **Novi Pazar:** Vranovina (v.), UTM DN58, Džukić *et al.* 2017); Schwartz 1936); **Ozren Mt.:** Dubočica Gorge, UTM DN08 (obs. R. Ajtić, Džukić *et al.* 2017); **Pešter Plateau:** Sjenica, Krš, UTM DN19 (obs. D. Mijajlović 15.08.1976., Džukić *et al.* 2017); **Prijepolje:** Divci (v.), UTM CN99 (obs. N. Labus 12.07.1996., Jelić *et al.* 2012, Džukić *et al.* 2017); **Karoševina** (v.), UTM CN89 (obs. N. Labus 10.06.1996., Jelić *et al.* 2012, Džukić *et al.* 2017); **Mileševka Canyon,** UTM CP90 (obs. R. Ajtić, Jelić *et al.* 2012); **Ninčiči** (v.), UTM CP91, 15.06.1996., Džukić *et al.* 2017); **Sedobro** (v.), Ninčiči Hamlet, UTM CP90 (obs. N. Labus 20.07.1996., Jelić *et al.* 2012); **Seljašnica** (v.), UTM CP80 (obs. N. Labus 15.06.1996., Jelić *et al.* 2012, Džukić *et al.* 2017); UTM CP90, 29.09.2005., Džukić *et al.* 2017); **Zlatar Mt.:** Vranjak, UTM DP00 (obs. G. Anačkov 25.07.2005., Jelić *et al.* 2012); **Š Bukulja Mt.,** UTM DQ60, Radovanović 1951, Džukić 1972, Džukić *et al.* 2017); **Gledičke Planine Mt.,** UTM DP95, Jelić *et al.* 2012); **Gornji Milanovac:** Brđanska Gorge, Brđani (v.), UTM DP57 (obs. M. Niketić, G. Tomović 03.05.2004., Jelić *et al.* 2012); **Vračevšnica** (v.), UTM DP77, Džukić *et al.* 2017); **Knić:** Borač (v.), Borački Krš, UTM DP66 (obs. M. Niketić, G. Tomović 08.04.2004., Jelić *et al.* 2012); **Kragujevac:** Dobrača (v.), Lazarevići, UTM DP77 (obs. M. Niketić, G. Tomović 02.05.2004., Jelić *et al.* 2012); town, Komarice, UTM EP07, Jelić *et al.* 2012); **W Bajina Bašta:** Drina (r.), Perućac Lake, UTM



CP76 (obs. G. Džukić, 21.05.1972., Džukić *et al.* 2017); **Javor Mt.**: Kušiči (v.), UTM DP21 (obs. Lj. Tomović 25.07.1996., Jelić *et al.* 2012); **Jelica Mt.**, UTM DP44 (obs. M. Niketić 15.05.1989., Jelić *et al.* 2012); **Mokra Gora Mt.**: Mečavnik, UTM CP85 (obs. G. Anačkov 25.07.2005., Jelić *et al.* 2012); Šargan, UTM CP85, 07.1958., Džukić *et al.* 2017); **Mučanj Mt.**: Anatema, UTM DP23 (obs. A. Rohalj 17.08.1989., Džukić *et al.* 2017); Glog, UTM DP22 (obs. A. Rohalj 17.08.1989., Džukić *et al.* 2017); **Ovčarsko-kablarska Gorge**: Ovčar Banja, UTM DP35 (obs. M. Niketić 15.09.2004, Jelić *et al.* 2012); **Požega**: Bakionica (v.), Zdravčići Hamlet, UTM DP25, Džukić *et al.* 2017); Skrapež Gorge, UTM DP25, Jelić *et al.* 2012); **Tara Planina Mt.**: Borovo Brdo, UTM CP76, 27.07.1967, Džukić 1972); Derventa Canyon, 2 km from the mouth, UTM CP66, Džukić *et al.* 2017); UTM CP66 (obs. M. Niketić 15.05.1990, Jelić *et al.* 2012); Janjač, UTM CP66 (obs. R. Ajtić 14.07.2004, Jelić *et al.* 2012); Kotroman (v.), Kršanje, UTM CP75 (obs. M. Niketić 15.05.2003., Jelić *et al.* 2012); Kremna (v.), UTM CP85 (obs. G. Anačkov 25.07.2005, Jelić *et al.* 2012); Zaovinsko Lake, UTM CP75 (obs. R. Ajtić 13.07.2004, Jelić *et al.* 2012); **Užice**: Đetinja Gorge, fortress, UTM DP05 (obs. M. Niketić 01.06.2004, Jelić *et al.* 2012); Stapani (v.), Đetinja Gorge, UTM CP95 (obs. B. Zlatković, Jelić *et al.* 2012); **Zlatibor Mt.**: Gaj (v.), Uvac Canyon, UTM CP92 (obs. M. Gvozdić 31.07.1992., Džukić *et al.* 2017); Ljubiš (v.), UTM DP02 (obs. I. Krizmanić 21.07.2000., Jelić *et al.* 2012, Džukić *et al.* 2017); Partizanske Vode, UTM CP94 (obs. G. Anačkov 27.07.2005, Jelić *et al.* 2012); Railroad station "Zlatibor", UTM CP84 (obs. S. Stamenković 07.08.2004., Džukić *et al.* 2017); Uvac Canyon, Uvac Monastery, UTM CP82 (obs. B. Zlatković 15.07.2001, Jelić *et al.* 2012); **Zvijezda Mt.**: Jagoštica (v.), Galine, UTM CP66 (obs. G. Džukić 21.05.1972., Džukić *et al.* 2017); Veliki Kraj, Vidača, UTM CP66 (obs. G. Džukić 23.05.1972., Džukić *et al.* 2017); UTM CP66, CP67 (obs. I. Krizmanić 16.06.1994., Džukić *et al.* 2017).

### *Vipera berus* (Linnaeus, 1758)

**Bt Vršacki Breg Mt.**: Markovac (v.), UTM EQ39 (obs. J. Rašajski, 01.10.1969., Džukić *et al.* 2017); Široko Bilo, 500 m from mountain house, UTM EQ29 (obs. B. Božićić 26.05.1985., Džukić *et al.* 2017); mountain house, UTM EQ29 (obs. Lj. Tomović, Jelić *et al.* 2012); near mountain house, UTM EQ29 (obs. Lj. Tomović 02.10.2002., Džukić *et al.* 2017); UTM EQ29, 09.07.1988., Džukić *et al.* 2017); UTM EQ39 (obs. B. Božićić 26.05.1985, Džukić & Purger 1988); **C Kopaonik Mt.**: Metođe, UTM DN89 (obs. M. Niketić, 31.07.1982, Jelić *et al.* 2012); Pančičev Vrh, Velika Ravan, UTM DN89, 18.07.1987., Džukić *et al.* 2017); UTM DN89, Jelić *et al.* 2012, Džukić *et al.* 2017); Suvo Rudište, UTM DN89 (obs. S. Matvejev 07.09.1954., Džukić *et al.* 2017); Žljeb, UTM DN89 (obs. A. Rohalj 17.07.1987., Džukić *et al.* 2017); **E Stara Planina Mts.**: Arbinje, UTM FN49 (obs. Lj. Tomović, R. Ajtić, 25.07.1999, Jelić *et al.* 2012); Babin Zub, UTM FP30, Ivančević *et al.* 2007); Kopren, Tri Kladenca, UTM FN49 (obs. Lj. Tomović, R. Ajtić 28.07.1999, Jelić *et al.* 2012); Midžor, near the border line, UTM FP30 (obs. I. Krizmanić 13.07.1991, Jelić *et al.* 2012); UTM FP30, Ivančević *et al.* 2007); Trem, UTM EN98 (obs. C. Gussev 08.07.1997., Jelić *et al.* 2012); Tri Kladenca, UTM FN49, Ivančević *et al.* 2007); Tupanar, UTM FP30 (obs. I. Krizmanić 14.07.1991, Jelić *et al.* 2012); Vučje Jame, Kozje Grbine, UTM FN58, Ivančević *et al.* 2007); Žarkova Čuka, UTM FP30, Jelić *et al.* 2012, Ivančević *et al.* 2007); **K Šar Planina Mts.**: Durlov Potok, UTM EM06, 1900 m (obs. I. Krizmanić, 26.06.1995., Jelić *et al.* 2012); Jažinačka Jezera Lakes, Gornje Šije, UTM DM97 (obs. I. Krizmanić 21.06.1995, Jelić *et al.* 2012); Livadica, Livadičko Lake, UTM DM96 (obs. M. Radovanović 17.08.1940, Radovanović 1951); Ljuboten Mt., UTM EM07, EM17, 18.06.1953., Džukić *et al.* 2017); Mekuš Bor, Careve Livade, UTM EM06 (obs. I. Krizmanić 27.06.1997, Jelić *et al.* 2012); Ošljak, UTM DM97 (obs. I. Krizmanić 14.06.1996, Jelić *et al.* 2012); Piribeg, Brezovica, UTM EM06, EM07, 1300 m (obs. P. Jakšić 20.07.1986., Džukić *et al.* 2017); Durlov Potok, UTM EM06, EM07, 1307.1988., Džukić *et al.* 2017); UTM EM06, EM07 (obs. I. Savić 19.09.1967., Džukić *et al.* 2017); **M Koritnik Mt.**, UTM DM65, Werner 1920); **Mokra Gora Mt.**: Savina Voda, UTM DN64 (obs. G. Džukić 09.06.1977., Džukić *et al.* 2017); **Paštrik Mt.**: Planeja (v.), Šeh Mahala, UTM DM67 (obs. R. Ajtić, Jelić *et al.* 2012); **Prokletije Mts.**: Jerebinje, UTM DN64 (obs. I. Krizmanić 04.06.1996., Jelić *et al.* 2012); Žljeb Mt., UTM DN33, Schwartz 1936); **Šar Planina Mts.**: Ošljak, Gornjeselsko Lake, UTM DM96 (obs. I. Krizmanić 19.06.1996., Jelić *et al.* 2012); Veljin Beg, UTM DM73 (obs. I. Krizmanić 24.07.1995., Jelić *et al.* 2012); **NW Bogatić**: Banovo Polje (v.), Batar (r.), UTM CQ87

(obs. *M. Stanković*, Stanković 2005); **Po Smederevo**: Velika Morava (r.), Godominsko Polje, mouth, UTM EQ04, Karaman 1948 [Karaman 1948]; **SE Besna kobilica Mt.**: Valozi, UTM FN01 (obs. *Lj. Tomović*, *R. Ajtić*, 16.08.2006., Jelić *et al.* 2012); **Bosilegrad**: Crnook, UTM FM19, 23.07.2001, Sterijovski 2014); **Žeravino** (v.), UTM FM18, 70-100 m, 25.07.2001, Sterijovski 2014); **Milevska Planina Mt.**: Božica (v.), above, UTM FN11 (obs. *G. Anačkov*, Jelić *et al.* 2012); **Vlasina Plateau**: road, UTM FN03, 30.06.2010., Crnobrnja-Isailović *et al.* 2011); **Sr Fruška Gora Mt.**: Iriški Venac, UTM DR00, Prša 1959, Popović *et al.* 1999); **Osovlje**, UTM CR90 (obs. *M. Mikeš*, Popović *et al.* 1999); **Sremska Kamenica**, Paragovo, UTM DR00, Živković 1956); UTM DR00, Radovanović 1957, 1964); **Stražilovo**, UTM DQ09, Džukić *et al.* 2017); **Vrdnik** (v.), UTM DQ09, Popović *et al.* 1999); **Pečinci**: Obrež (v.), Obedska Bara, Matijevica, UTM DQ15, 23.04.1988., Džukić & Purger 1988, Džukić *et al.* 2017); **Ruma**: Grabovci (v.), Široka Bara, UTM DQ05, 21.05.1988., Džukić & Purger 1988); UTM DQ05, 08.1989., Džukić *et al.* 2017); **Nikinci** (v.), UTM DQ06 (obs. *R. Silaški* 21.05.1988., Džukić *et al.* 2017); **Stara Pazova**: Stari Banovci (v.), UTM DQ48, 1200-2000 m, Anonimus 1932 [extinct population]); **SW Mokra Gora Mt.**: Mokra Planina Mt., Crvene Vode, UTM DN54 (obs. *B. Tatić*, Džukić *et al.* 2017); **Š Avala Mt.**: Ripanj (v.), UTM DQ64, 2000-2600 m, Anonimus 1890, Karaman 1939 [extinct population]); UTM DQ64, 1800-2200 m, Džukić 1972 [extinct population].

### *Vipera ursinii* (Bonaparte, 1835)

**M Koritnik Mt.**, UTM DM65, Werner 1920); **Paštrik Mt.**: Gorožup, UTM DM67, 1000-1100 m (obs. *G. Džukić* 19.07.1980., Džukić *et al.* 2017); **Planeja** (v.), Šeh Mahala, UTM DM67 (obs. *R. Ajtić* 2006, Jelić *et al.* 2012); UTM DM67, Kopstein & Wettstein 1920, Kramer 1961); **Prokletije Mts.**: Žljeb Mt., Radavac (v.), above, UTM DN33, Pasuljević 1968); **Šar Planina Mts.**: Crn Kamen, UTM DM73, Pasuljević 1968); **Kobilica Mt.**, UTM DM86, Kopstein & Wettstein 1920, Karaman 1938, Jelić *et al.* 2012); **SW Novi Pazar**: Vranovina (v.), UTM DN58, Schwartz 1936, Kramer 1961 [doubtful record]).

## NEW DISTRIBUTION RECORDS

### *Vipera ammodytes* (Linnaeus, 1758)

**C Čičevac**: Trubarevo (v.), UTM EP32 (obs. *R. Ajtić*); **Goč Mt.**: Bzenice (v.), Mitrovo Polje, UTM DP91 (obs. *J. Danilović* 07.07.2007.); **Ibar Valley**: Bogutovac (v.), UTM DP63, 271 m (obs. *A. Urošević*, *M. Mirč* 06.08.2018., NP "Kopaonik" project); **Maglič Grad**, Jelenino Kupatilo, UTM DP62 (obs. *S. Đorđević* 19.06.2004.); **Maglič - Bogutovac** (v.), road, UTM DP63, 263 m (obs. *A. Urošević* 07.07.2019.); UTM DP62 (obs. *A. Simović* 10.07.2012.); **Jastrebac Mt.**: Mali Jastrebac, Jasenove Vode, UTM EP50 (obs. *G. Džukić*); **Kopaonik Mt.**: Jošanička Banja, Gobeljska Reka (r.), UTM DP80, 870 m (obs. *I. Krizmanić*); **Krmeljica**, UTM DN79, 1150 m, 29.05.2006.); **Semeteš** (v.), Slap, UTM DN79, 1012 m (obs. *T. Vučić*, *M. Mirč*, *A. Urošević* 08.08.2018., NP "Kopaonik" project); **Treska**, UTM DN88, 1620 m (obs. *Lj. Janković*); **Kraljevo**: Gokčanica (v.), UTM DP71 (obs. *A. Mitić* 2015); **Studenica Valley**, Studenica Monastery, UTM DP61 (obs. *M. Krstić*); **Kruševac**: Klik Hill, UTM EP10 (obs. *R. Ajtić*); **Kuršumlija**: Prolom Banja, UTM EN36, 634 m (obs. *J. Čorović* 06.05.2015.); **Rača** (v.), UTM EN26, 434 m (obs. *J. Čorović* 24.06.2014.); **Vrševac** (v.), UTM EN28, 2019); **Raška**: Radošice (v.), UTM DN79, 554 m (obs. *J. Čorović* 22.04.2014.); **Stolovi Mt.**: Žiča (v.), Žička Reka (r.), UTM DP73 (obs. *A. Simović* 09.07.2012.); **Trstenik**: Bogdanje (v.), UTM EP03, 292 m (obs. *M. Maričić* 23.06.2018.); 372 m (obs. *A. Golubović* 23.06.2018., BIOLOGER); **Grabovac** (v.), Jerinin Grad, UTM DP93, 213 m (obs. *A. Golubović* 05.09.2013., Rufford project 20507-B); UTM DP93, 317 m (obs. *J. Čorović* 15.04.2016.); **Lozna** (v.), UTM DP93 (obs. *A. Simović*); surroundings, hill above town, UTM EP02 (obs. *A. Simović* 24.03.2012.); **E Aleksinac**: Prčilovica (v.), school, UTM EP51 (obs. *G. Džukić*); **Bela Palanka**: Gornja Koritnica (v.), Koritnjica Gorge, UTM FN07, 458.8 m (obs. *J. Čorović* 07.04.2016.); **Kremenica** (v.), Bela Palanka - Pirot,

Jančina Padina, UTM FN18 (obs. G. Džukić 01.07.1984.); Bela Palanka - Pirot, Vodni Dol, UTM FN18 (obs. G. Džukić 01.05.1981.); **Devica Mt.:** Oštra Čuka, UTM EP72, 1028 m (obs. A. Urošević 11.04.2014.); **Dimitrovgrad:** Donja Nevlja (v.), UTM FN45 (obs. M. Niketić 21.04.2014.); Smilovci (v.), Sv. Kirik Monastery, UTM FN57 (obs. D. Iliev 02.05.1992.); Verzar (v.), Melinje Hamlet, UTM FN45, 560 m (obs. M. Niketić 20.04.2014.); **Greben Planina Mt.:** Poganovo (v.), Borovsko Polje, Selište Hamlet, UTM FN35, 860 m (obs. G. Džukić 10.04.2008.); **Knjaževac:** Novo Korito (v.), Jojina Glama, UTM FP13 (obs. M. Niketić 12.06.2017.); Ošljane (v.), Čuka, UTM FP13 (obs. M. Niketić 13.06.2017.); **Malinik Mt.:** Bogovina (v.), UTM EP66 (obs. M. Nikolić 29.04.2018., BIOLOGER); Lazareva Reka Canyon, UTM EP77, 220 m (obs. A. Paunović 10.07.1995.); **Niš:** Gornji Matejevac, Latinska Crkva, UTM EP70 (obs. V. Žikić); Jelašnica (v.), road to Ploče, UTM EN99, 423 m (obs. D. Jović, I. Milosavljević 10.04.2012.); Jelašnička Gorge, Jelašnica (v.), UTM EN89, 315 m (obs. D. Jović, I. Milosavljević 14.06.2012.); Radovanski Kamen, UTM EN89 (obs. M. Niketić, G. Tomović 02.05.2014.); Ripaljka, UTM EN89, 9999 m (obs. G. Džukić 08.09.2005.); UTM EN89 (obs. D. Jović, R. Ajtić 08.09.2005.); Kunovica Hill, road to Ploče, UTM EN89, 350 m (obs. D. Jović, I. Milosavljević 09.06.2012.); Niška Banja, Kunovica (v.), UTM EN89 (obs. D. Jović 18.05.2006.); **Pirot:** Barje Čiflik (v.), UTM FN27, 384 m (obs. G. Džukić 10.04.2008.); Jerma Gorge, UTM FN35, 657 m (obs. I. Krizmanić); Veliki Jovanovac (v.), UTM FN37, 415 m (obs. D. Jović 08.07.2008.); Vlasi (v.), UTM FN36, 565.7 m (obs. J. Čorović 24.04.2018.); **Seličevica Mt.:** Donje Vlake (v.), UTM EN78, 373 m (obs. B. Zlatković); **Sićeavačka Gorge:** Crvena Reka (v.), road to Ploče, UTM EN99, 566 m (obs. D. Jović, I. Milosavljević 09.06.2012.); Gradište (v.), UTM EN99, 430 m (obs. D. Jović, R. Ajtić 18.05.2005.); Ostrovica (v.), Ostrovička Banjica, UTM EN99, 500 m (obs. A. Paunović 08.07.1994.); Via Militaris, UTM EN89, 449 m (obs. G. Džukić 27.09.2005.); UTM EN99, 430 m (obs. G. Džukić 24.06.2005.); UTM EN99, 303 m (obs. D. Jović, I. Milosavljević 13.06.2012.); Sićevo (v.), Via Militaris, UTM EN88 (obs. D. Jović, R. Ajtić 27.09.2005.); **Sokobanja:** Moravica Gorge, Lepteriya, UTM EP73, 331 m (obs. A. Urošević 14.04.2013.); Soko Grad, UTM EP73, 382 m (obs. A. Urošević 17.06.2012.); **Stara Planina Mts.:** Balta Berilovac (v.), UTM FP20 (obs. B. Jovanović); Boljevski Vrhovi, UTM FN57 (obs. M. Niketić 03.05.2015. [2 individuals]); Dojkinci (v.), Pakleški Vrh, UTM FN48, 1260 m (obs. M. Maričić 28.09.2019.); UTM FN48 (obs. A. Simović 13.07.2009.); Koprivštica (v.), UTM FN38 (obs. A. Simović 07.09.2011.); Oreovica (v.), UTM FN28 (obs. A. Simović 07.09.2011.); Rudinje (v.), UTM FN29 (obs. A. Simović 07.07.2008.); Senokos (v.), church, UTM FN57, 895 m (obs. M. Anđelković 02.08.2016.); UTM FN57, 831 m (obs. M. Anđelković 02.08.2016.); 928 m (obs. M. Anđelković 02.08.2016.); Temska (v.), Tumba, UTM FN29, 638 m (obs. M. Maričić 26.09.2019.); UTM FN29 (obs. A. Simović 15.07.2008.); Topli Do (v.), UTM FN49 (obs. A. Simović 12.07.2009.); Zavojsko Lake, Visočica (r.), UTM FN39, 590 m (obs. I. Krizmanić); Zavoje (v.), UTM FN39, 650 m (obs. I. Krizmanić); UTM FN38 (obs. A. Simović 09.07.2009.); **Suva Planina Mt.:** Crni Kamen, UTM EN89, 750 m (obs. V. Žikić); Čelije (v.), UTM EN88, 780 m (obs. I. Krizmanić); UTM EN98, 730 m (obs. D. Jović 22.03.2016.); Donji Dušnik (v.), Golaš, UTM EN97, 860 m (obs. I. Krizmanić); Grnčar (v.), UTM FN06, 620 m (obs. I. Krizmanić); Koritnjak (v.), UTM EN89 (obs. V. Žikić); Oreovac (v.), UTM FN08 (obs. L. Đurđević 01.05.1980.); **K Leposavić:** Dren (v.), UTM DN87 (obs. S. Vukosavljević, 31.08.2017., Serbian Herpetological Society); **NE Beljanica Mt.:** Čemernica (r.), UTM EP58 (obs. R. Ajtić); Resava (r.), Stanojev Potok, UTM EP58, 408 m (obs. M. Popović 01.07.1979.); Strmosten (v.), mountain house, UTM EP58, 367 m (obs. M. Anđelković 20.08.2018.); Resava Gorge, UTM EP48 (obs. A. Rohalj 17.07.2004.); the main peak, UTM EP58 (obs. R. Ajtić); Valkaluci, Nekudovo (r.), UTM EP57 (obs. R. Ajtić); **Bor:** Krivelj (v.), Veliki Krivelj, UTM EP88 (obs. B. Jovanović 15.06.1996.); Stol, UTM EP99, 800 m (obs. I. Krizmanić); Veliki krš, UTM EP89 (obs. M. Popović 30.05.2015., Rufford project 20507-B); **Đerdapska Gorge:** Kazan, UTM FQ04, 161 m (obs. M. Kalezić, G. Džukić, M. Slijepčević, A. Urošević 23.05.2012.); Tekija (v.), UTM FQ14 (obs. M. Niketić 18.09.2018.); **Kladovo:** Kladušnica (v.), UTM FQ24 (obs. B. Nadaždin 15.05.2016.); **Kučajske Planine Mt.:** Čestobrodica, UTM EP55, 539 m (obs. A. Rohalj 05.08.2008.); (obs. A. Simović 03.08.2008.); Grza Gorge, Koliba, UTM EP55 (obs. A. Simović 30.07.2008.); Markova Kosa, UTM EP56, 342 m (obs. A. Simović 01.08.2008.); mountain house, UTM EP56 (obs. A. Simović 28.07.2008.); Veliko Jezero, UTM EP56, 416 m (obs. A. Urošević 13.07.2009.); Vrelo, UTM EP56, 463 m (obs. A. Urošević 10.07.2010.); Izvor (v.), Sveta Petka Monastery, UTM EP45, 282 m (obs. D. Antić 13.07.2009.); Senje (v.), Ravanica Monastery, UTM EP46 (obs. G. Džukić, M. Kalezić 14.05.2000.); Sisevac (v.), Crnica (r.), UTM EP46, 470 m

(obs. *I. Krizmanić*); **Velika Papratna**, UTM EP56, 760 m (obs. *I. Krizmanić*); **Majdanpek**: Debeli Lug (v.), UTM EQ71 (obs. *Lj. Mihajlović* 1987); **Rudna Glava** (v.), Blizna Hamlet, UTM EQ81, 216 m (obs. *A. Golubović* 02.07.2013., Rufford project 20507-B); **Malinik Mt.**: Bogovina (v.), Bogovinska (r.), UTM EP76, 570 m (obs. *I. Krizmanić*); **Lazareva Reka Canyon**, Zlot, UTM EP77 (obs. *M. Zorić* 03.06.2012., Serbian Herpetological Society); **Podgorac** (v.), Valja Mare (r.), UTM EP76 (obs. *R. Ajtić*); **Valja Mika** (r.), UTM EP76 (obs. *R. Ajtić*); **Zlot** (v.), Beljevina Stream, UTM EP77, 210 m (obs. *A. Paunović* 11.06.1994.); **Valja De Mižlok** (r.), UTM EP77 (obs. *R. Ajtić*); **Negotin**: **Vratna** (r.), UTM FQ11 (obs. *R. Ajtić*); **Zamna** (r.), UTM FQ00 (obs. *R. Ajtić*); **Petrovac**: **Gornjačka Gorge**, Gornjak Monastery, UTM EQ40, 310 m (obs. *I. Krizmanić*); UTM EQ31, 348 m (obs. *S. Simić* 10.07.1977.); **Rtanj Mt.**: **Rtanj** (v.), road to Šiljak, UTM EP74 (obs. *M. Zorić* 03.06.2012., Serbian Herpetological Society); surrounding, UTM EP75 (obs. *M. Nikolić* 22.04.2019., BIOLOGER); **Rtanj Mine**, UTM EP74, 650 m (obs. *A. Paunović* 24.09.1995.); **Vrmdža** (v.), **Vrmdžansko Lake**, UTM EP64, 618 m (obs. *A. Urošević* 11.04.2014.); UTM EP64 (obs. *Z. Romčević* 31.05.1998.); **Zaječar**: **Mala Jasikova** (v.), UTM FP08, 337 m (obs. *A. Golubović* 28.04.2018., BIOLOGER); **Osnić** (v.), UTM EP85 (obs. *R. Ajtić*); **Šipikovo - v. Bračevac** (v.), UTM FP27 (obs. *A. Đurđević* 28.07.2018., BIOLOGER); **NW Cer Mt.**: **Milina** (v.), UTM CQ84, 599 m (obs. *M. Maričić*, 07.06.2017.); **Miloševac** (v.), UTM CQ83, 445 m (obs. *M. Maričić* 31.05.2016.); **Radovašnica** (v.), UTM CQ84, 355 m (obs. *M. Maričić* 31.07.2019.); 386 m (obs. *M. Maričić* 31.07.2019.); **Trbosilje** (v.), **Lipove Vode**, UTM CQ83, 586 m (obs. *M. Maričić* 23.08.2018.); **Vodice**, UTM CQ83, 584 m (obs. *M. Maričić* 21.08.2018.); UTM CQ83, 587 m (obs. *N. Milić* 10.07.2013.); 645 m (obs. *Đ. Petrović* 09.07.2012.); **Gučevo Mt.**: **Paskovac** (v.), **Turski Klanac**, UTM CQ52 (obs. *M. Popović - Fant* 20.02.1990.); **Jablanik Mt.**: **Jablanica** (r.), UTM CP99, 540 m (obs. *I. Krizmanić*); **Počuta** (v.), **Pustinja Monastery**, UTM CP99, 390 m (obs. *I. Krizmanić*); **Rebelj** (v.), UTM CP99, 950 m (obs. *I. Krizmanić*); **Rovni** (v.), **Jablanica** (r.), UTM DP09, 420 m (obs. *I. Krizmanić*); **Jablanica** (r.), accumulations, UTM DQ00, 400 m (obs. *I. Krizmanić*); **Vujinovača** (v.), **Arsići Hamlet**, UTM CP99, 620 m (obs. *I. Krizmanić*); **Koceljeva**: **Družetić** (v.), surrounding, UTM DQ02 (obs. *B. Jurišić* 15.04.2019., BIOLOGER); **Krupanj**: **Zavlaka** (v.), UTM CQ72 (obs. *G. Subakov* 01.08.2008.); **Ljubovija**: **Trešnjica Canyon**, UTM CP88 (obs. *S. Marinković* 11.05.2002.); **Maljen Mt.**: **Brežde** (v.), road to Divčibare, UTM DP29, 447 m (obs. *A. Urošević, M. Anđelković, M. Lazić* 15.06.2017.); (obs. *M. Anđelković* 08.06.2017.); **Divčibare**, **Bela Kamenica** (r.), UTM DP28, 750 m (obs. *I. Krizmanić*); **Medvednik Mt.**: **Vukobrača**, **Miljački Vis**, UTM CP99, 900 m (obs. *I. Krizmanić*); **Mionica**: **Paštrić** (v.), **Ribnica Gorge**, UTM DP29, 750 m (obs. *I. Krizmanić*); **Povlen Mt.**: **Debelo Brdo Mt.**, UTM CP98, 800 m (obs. *I. Krizmanić*); **Gornji Taor** (v.), **Mravinjci Hamlet**, UTM DP08 (obs. *S. Đorđević* 07.08.2003.); **Pašina Ravan**, UTM CP98, 890 m (obs. *I. Krizmanić*); **Veliki Povlen**, UTM CP98, 950 m (obs. *I. Krizmanić*); **Rajac Mt.**: **Slavkovića** (v.), mountain house, UTM DP38 (obs. *G. Džukić*); **Sokolska Planina Mt.**: **Glavica**, UTM CQ70, 700 m (obs. *I. Krizmanić*); **Sokolac** (v.), **Soko Grad**, UTM CQ70, 500 m (obs. *M. Niketić* 2010); **Uzovnica** (v.), UTM CQ60 (obs. *J. Crnobrnja* 04.04.1998.); **Suvobor Mt.**: **Šiljak**, UTM DP38, 845 m (obs. *V. Đorđević - Džo* 20.06.1977.); **Živanovića Brdo**, UTM DP38, 705 m (obs. *V. Đorđević - Džo* 23.06.1977.); **Valjevo**: **Brankovina** (v.), **Jaučanski Vis**, UTM DQ00 (obs. *Z. Vujošević* 27.04.2014., Serbian Herpetological Society); **Gradac - canyon** (r.), **Degurička Cave**, UTM DP19, 242 m (obs. *A. Urošević* 20.10.2013.); **Vajati**, UTM DP19, 207 m (obs. *A. Urošević, J. Pavlović* 25.10.2015.); **Gradac** (r.), **Čelije Monastery**, UTM DP09, 270 m (obs. *I. Krizmanić*); **Lelić** (v.), spring, UTM DP09, 280 m (obs. *I. Krizmanić*); **Sunčani Virovi**, UTM DP19, 230 m (obs. *I. Krizmanić*); **Jablanica** (v.), UTM DQ00 (obs. student association "Josif Pančić" 17.07.1998.); **Obnica** (r.), **Babac Hill**, UTM CQ90, 410 m (obs. *I. Krizmanić*); **Po Smederevska Palanka**: town, UTM DQ91 (obs. *A. Marković*, 20.08.2017., Serbian Herpetological Society); **Svilajnac**: **Vojska** (v.), UTM EP18 (obs. *G. Džukić*); **S Besna kobila Mt.**: **Kriva Feja** (v.), UTM EN91, 1090 m (obs. *G. Džukić*, 12.07.1978.); **Karadag Mt.**: **Bujić** (v.), **Pral prit** (r.), UTM EM58, 750 m (obs. *G. Džukić* 13.05.1976.); **Miratovac** (v.), **Suva Reka** (r.), UTM EM57, 567 m (obs. *S. Đorđević* 09.05.2014., MEP "DNA" project); UTM EM58, 590 m (obs. *S. Đorđević* 09.05.2014., MEP "DNA" project); 606 m (obs. *Lj. Tomović, A. Golubović, S. Đorđević* 09.05.2014., MEP "DNA" project); 607 m (obs. *Lj. Tomović, A. Golubović, S. Đorđević* 10.05.2014., MEP "DNA" project); **Kukavica Mt.**: **Barje Lake**, **Barje** (v.), UTM EN64 (obs. *S. Antić* 14.07.2002.); **Kita**, UTM EN74, 1000 m (obs. *V. Jovanović* 27.04.1973.); **Vučje**, **Skobaljci Grad**, UTM EN74 (obs. *V. Jovanović, V. Majić* 30.05.1975.); **Turjak stream**, UTM EN74, 600 m (obs. *V. Jovanović* 1974); **Leskovac**: **Kaluđerce** (v.), **Barje Lake**, UTM EN64, 520 m

(obs. *M. Anđelković* 20.05.2014.); Miroševce (v.), Umac Hill, UTM EN64, 319 m (obs. *A. Golubović* 07.06.2013., Rufford project 20507-B); **Radan Mt.:** Orane (v.), UTM EN55, 500 m (obs. *I. Krizmanić*); **Vranje:** Dobrejance (v.), Drenovac (v.) - Dobrejance (v.), UTM EN72, 627 m (obs. *M. Anđelković* 20.05.2014.); Drenovac (v.), road to Sikirje (v.), UTM EN72, 653 m (obs. *M. Anđelković* 22.06.2014.); UTM EN72, 720 m (obs. *I. Krizmanić*); Vrtogoš (v.), UTM EN60 (obs. *I. Stajčić*); **SE Bosilegrad:** Ribarci (v.), UTM FM29, 690 m (obs. *G. Džukić, M. Kalezić*, 16.06.2006.); **Dukat Mt.:** Brankovci (v.), Gornji Zli Do (v.), Ezerište, UTM FM19, 975 m (obs. *G. Džukić, M. Kalezić* 16.06.2006.); UTM FM29, 680 m (obs. *G. Džukić, M. Kalezić*); **Grdelička Gorge:** Novo Selo (v.), UTM EN94, 600 m (obs. *G. Džukić* 18.04.1970.); Predejane (v.), UTM EN94, 290 m (obs. *G. Džukić* 10.04.1970.); (obs. *G. Džukić, M. Kalezić* 01.04.2007.); **Ostrozub Mt.:** Krpejce (v.), UTM EN94 (obs. *S. Antić* 21.07.1998.); Rupilje (v.), UTM EN94, 802 m (obs. *G. Džukić, M. Kalezić* 12.09.2006.); **Pčinja Gorge:** Prohor Pčinjski Monastery, UTM EM78, 486 m (obs. *A. Urošević* 29.07.2010.); (obs. *Lj. Tomović, R. Ajtić* 06.05.2002.); **Starac Mt.:** Jablanica (v.), UTM EM78, 500 m (obs. *S. Đorđević* 18.05.2009.); **Starac** (v.), Gornji Starac, Čivčije Hamlet, UTM EM78, 400 m (obs. *Lj. Tomović, A. Golubović, S. Đorđević* 06.05.2014., MEP "DNA" project); **Trgovište:** Crnovska Reka Gorge, Govedarnik Hill, UTM EM89, 604 m (obs. *G. Danon, M. Anđelković, T. Vučić, A. Urošević* 21.05.2018.); Presveta Bogorodica Church, UTM EM89, 641 m (obs. *G. Danon, M. Anđelković, N. Bogdanović, M. Lakušić, A. Urošević, Lj. Tomović* 07.06.2018., Rufford project 25196-1); Vražji Kamen, UTM EM89, 608 m (obs. *G. Danon, M. Anđelković, A. Urošević, Lj. Tomović* 22.04.2018., Rufford project 25196-1); Donja Trnica (v.), road to Trgovište, UTM EM89, 612 m (obs. *G. Danon, M. Anđelković, T. Vučić, A. Urošević* 26.05.2018., Rufford project 25196-1); UTM EM89, 658 m (obs. *A. Golubović* 06.06.2013., Rufford project 20507-B); Donji Kozji Dol (v.), UTM EM88, 717 m (obs. *A. Golubović* 06.06.2013., Rufford project 20507-B); okolina, UTM EM89 (obs. *G. Džukić* 15.05.1977.); **Vlasina Plateau:** Gradska (v.), UTM FN14, 750 m (obs. *G. Džukić, M. Kalezić* 22.06.2007.); Kalna (v.), UTM FN14 (obs. *B. Jovanović*); Mlačišće (v.), Mlačiške Mehane, UTM FN03, 1268 m (obs. *G. Džukić, M. Kalezić* 15.06.2006.); **Vlasotince:** okolina, UTM EN95 (obs. *A. Pauunović*); **SW Gazivode Lake:** Ribariće (v.), Ibar Canyon, Zlo Mesto, UTM DN55, 750 m (obs. *I. Krizmanić*); **Jadovnik Mt.:** Milošev Do (v.), Četanica, UTM DN09 (obs. *A. Simović* 23.07.2012.); Kašanj, UTM DN09 (obs. *A. Simović* 17.07.2011.); Prisoje Hamlet, UTM DN09 (obs. *A. Simović* 16.07.2011.); Vrata, UTM DN09 (obs. *A. Simović* 17.07.2011.); Sopotnica (r.), UTM CN99 (obs. *A. Simović* 28.07.2012.); Sopotnica (v.), Crvene Stene, UTM CN99 (obs. *R. Ajtić*); UTM CN99, 779 m (obs. *M. Maričić* 21.07.2016.); 813 m (obs. *S. Ivković* 21.07.2016.); 1016 m (obs. *M. Maričić* 04.05.2017.); 1153 m (obs. *M. Maričić* 09.07.2015.); **Kamena Gora Mt.:** Šajnov Kraj, UTM CN89 (obs. *A. Simović* 07.06.2012.); **Mokra Gora Mt.:** Crna Reka Canyon, Crna Reka Monastery, UTM DN55, 883 m (obs. *Lj. Tomović, A. Simović, S. Marić, A. Golubović, M. Krstić, I. Krizmanić, S. Đorđević* 14.06.2014., MEP "DNA" project); **Draga** (v.), UTM DN44 (obs. *B. Nadaždin* 07.07.2019., BIOLOGER); Ibar Gorge, Mehov Krš, UTM DN45, 793 m (obs. *Lj. Tomović, A. Simović, S. Marić, A. Golubović, M. Krstić, I. Krizmanić, S. Đorđević* 12.06.2014., MEP "DNA" project); **Nova Varoš:** Kokin Brod, Zlatarsko Lake, UTM DP01 (obs. *Z. Cuparić* 20.04.2018.); **Ozren Mt.:** Dubočica Gorge, Gostun (v.), UTM CN98 (obs. *A. Simović* 24.07.2011.); **Pešter Plateau:** Đalovića Gorge, UTM DN17 (obs. *A. Simović* 03.08.2014.); Gornje Lopiže (v.), UTM DN19, 1130 m (obs. *Z. Cuparić* 09.05.2019.); Medare (v.), UTM DN28, 1047 m (obs. *Z. Cuparić* 20.05.2019.); Ugao (v.), UTM DN26 (obs. *R. Ajtić*); Vapa (r.), Vape (r.), mouth, UTM DN19 (obs. *G. Džukić* 24.05.1988.); **Priboj**, UTM CP82, 882 m (obs. *E. Kljajić* 25.05.1982.); **Prijepolje:** Gračanica (r.), UTM CN99 (obs. *R. Ajtić*); Hisardžik Hill, UTM DP00 (obs. *R. Ajtić*); Jerinim Grad, UTM CP90 (obs. *R. Ajtić*); Karoševina (v.), UTM CN89 (obs. *A. Simović* 27.07.2014.); Lim (r.), Petkovača, UTM CP80, 660 m (obs. *I. Krizmanić*); Mileševka Canyon, Mileševa Monastery, UTM CP90 (obs. *A. Simović* 24.07.2005.); Ratajska River Gorge, Pustinja Monastery, UTM CP80 (obs. *A. Simović* 25.07.2011.); Seljašnica (v.), Seljašnica (r.), UTM CP80 (obs. *R. Ajtić*); Zavinograđe (v.), UTM CN98 (obs. *R. Ajtić*); **Rogozna Mt.:** Crni Vrh, UTM DN66 (obs. *D. Bauk* 08.06.1978.); **Sjenica:** Bare (v.), UTM DN07 (obs. *A. Simović* 03.08.2014.); UTM DN19 (obs. *D. Mijajlović* 15.08.1976.); **Sjeničko Lake**, UTM DP10 (obs. *A. Simović* 30.07.2011.); **Uvac** Canyon: Puljci, UTM DP11 (obs. *Z. Cuparić* 07.07.2018.); Veliki Vrh, UTM DP10 (obs. *Z. Cuparić* 01.07.2018.); **Zlatar Mt.:** Veljušnica Canyon, Miševići (v.), Miševski Stream, UTM DP10, 1110 m (obs. *K. Bajić* 20.07.1991.); **Š. Arandelovac:** Risovača hill, Risovača Cave, UTM DQ60, 236 m (obs. *A. Pauunović*, 28.05.2019.); **Gornji Milanovac:** Brđanska Gorge, UTM DP57 (obs. *M. Niketić* 08.06.

2013.); **Knić:** Borač (v.), Borački Krš, UTM DP66, 376 m (obs. *D. Jović*); **Kragujevac:** Donja Sabanta (v.), Žeželj Hill, UTM DP96 (obs. *A. Simović* 08.06.2012.); **Ljig:** Ba (v.), Čardak, UTM DP39 (obs. *M. Niketić* 22.06.2016.); **Belanovica** (v.), Glogovica Hill, Kačer Stream, UTM DP49 (obs. *D. Maksić* 19.06.1993.); **Diči** (v.), UTM DP49 (obs. *G. Džukić*); **Rudnik Mt.:** Mali Šturac, UTM DP68, 880 m (obs. *I. Krizmanić*); **Ramača** (v.), Ramački Visovi, UTM DP69 (obs. *R. Ajtić*); **W Ariije:** Kruščica (v.), Orlovača Hill, UTM DP14, 830 m (obs. *I. Medenica*, 28.05.2019.); **Čačak:** Jelen Do, Krš, UTM DP26 (obs. *M. Niketić* 2009); **Ovčar Banja** (v.), Kablar, UTM DP36, 313 m (obs. *M. Maričić* 29.07.2016.); 754 m (obs. *M. Maričić* 29.07.2016.); **Vrnčani**, UTM DP36, 519 m (obs. *M. Maričić* 27.07.2016.); **Čemerno Mt.:** stream between Grobovi and Čiče Hills, UTM DP52 (obs. *A. Golubović* 07.07.2007.); **Jelica Mt.**, UTM DP44, 733 m (obs. *I. Krizmanić*); **Ovčarsko-kablarska Gorge:** Kablar Mt., Turčinovac, UTM DP36, 800 m (obs. *M. Niketić* 2010); **Ovčar, Sretenje Monastery**, UTM DP36, 480 m (obs. *I. Krizmanić*); **Požega:** Roge (v.), Veliki Rzav Canyon, UTM DP14, 430 m (obs. *M. Maričić* 22.09.2018.); 704 m (obs. *M. Maričić* 23.09.2018.); UTM DP24, 656 m (obs. *M. Maričić* 22.09.2018.); **Tučkovo** (v.), UTM DP36, 433.1 m (obs. *J. Čorović* 11.04.2017.); **Tara Planina Mt.:** Derventa Canyon, Aluga Hamlet, UTM CP66 (obs. *M. Anđelković & studenti BID-a* 22.07.-01.08.2019.); Kamenjača Hamlet, UTM CP66 (obs. *M. Anđelković & studenti BID-a* 22.07.-01.08.2019. [3 individuals]); UTM CP66 (obs. *M. Anđelković & studenti BID-a* 22.07.-01.08.2019. [2 individuals]); **Kotroman** (v.), Beli Rzav Gorge, UTM CP74 (obs. *M. Niketić* 09.05.2014.); **Kršanje** (v.), Beli Rzav Gorge, UTM CP74 (obs. *M. Niketić* 09.05.2014. [2 individuals]); **Mali Rzav** (r.), UTM CP93 (obs. *R. Ajtić*); **Strmac** (v.), Karačica Gorge, UTM CP85 (obs. *M. Niketić, G. Tomović* 10.05.2014.); **Šljivovica** (v.), UTM CP86, 900 m (obs. *I. Krizmanić*); **Troglav Mt.:** Borošnica (r.), UTM DP53 (obs. *A. Golubović* 10.07.2007.); **Užice:** Đetinja (r.), Omar, UTM CP95, 630 m (obs. *I. Krizmanić*); **Đetinja Gorge, Rajski Otoci**, UTM DP05 (obs. *A. Simović* 23.08.2009.); UTM DP05 (obs. *D. Jović*); **Stapari** (v.), UTM CP95, 520 m (obs. *I. Krizmanić*); **Stari Grad, fortress**, UTM DP05, 443 m (obs. *A. Urošević, J. Pavlović* 01.07.2015.); UTM DP05 (obs. *A. Simović* 23.08.2009.); **Zabuče** (v.), UTM DP05 (obs. *A. Simović* 08.04.2007.); **Zlatibor Mt.:** Borova Glava, UTM CP93 (obs. *A. Simović* 21.08.2009.); **Čigota**, UTM DP03 (obs. *M. Niketić* 20.05.2014.); **Gostilje** (v.), Katušnica Gorge, Jelaš, UTM DP03, 760 m (obs. *I. Krizmanić*); **Mokra Gora** (v.), Glibetići Hamlet, Kamišina (r.), UTM CP84, 600 m (obs. *D. Jović* 11.05.2017.); **Murtenica**, UTM DP02 (obs. *U. Aleksić* 16.02.2014.); **Uvac Canyon, Krvavac Stream**, UTM CP92, 620 m (obs. *I. Krizmanić*); **Uvac Monastery**, UTM CP82, 600 m (obs. *I. Krizmanić*); **Zvijezda Mt.:** Bilješka Stena, Topli Do, UTM CP67, 880 m (obs. *I. Krizmanić*).

### *Vipera berus* (Linnaeus, 1758)

**Bt Vršac:** Malo Središte (v.), UTM EQ39, 270 m (obs. *I. Krizmanić*); **Mesić** (v.), Dumbrava, UTM EQ39, 186 m (obs. *G. Džukić, M. Kalezić, M. Marković*); UTM EQ39 (obs. *A. Simović* 26.03.2011.); (obs. *M. Krstić*); **Sočica** (r.), UTM EQ39 (obs. *M. Krstić*); **Vršački Breg Mt.:** Đakov Vrh, UTM EQ29 (obs. *M. Krstić*); UTM EQ39 (obs. *M. Krstić*); **Gudurički Vrh**, UTM EQ39, 620 m (obs. *I. Krizmanić*); (obs. *A. Simović* 03.04.2011.); **Široko Bilo**, mountain house, UTM EQ29, 325 m (obs. *A. Urošević, N. Preradović* 29.04.2012.); (obs. *M. Krstić*); **mountain house "Vršačka kula"**, UTM EQ29, 370 m (obs. *A. Urošević* 26.06.2011.); **Vršačka kula**, UTM EQ29, 330 m (obs. *I. Krizmanić*); **Vršačka Glavica**, UTM EQ29 (obs. *M. Krstić*); **C Kopaonik Mt.:** Barska Reka (r.), UTM DN89, 1370 m (obs. *T. Vučić, M. Ajduković, M. Mirč, M. Anđelković, T. Vukov, M. Cvijanović, A. Urošević*, 07.08.2019., NP "Kopaonik" project); **Bečirovac, Srebrnac farm**, UTM DN89, 1578 m (obs. *D. Jović* 19.08.2009.); **Nebeske Stolice**, UTM DN88, 1784 m (obs. *A. Urošević, M. Anđelković* 04.07.2018., NP "Kopaonik" project); **Oštri Krš**, UTM DN89, 1687 m (obs. *Lj. Janković* 01.07.1957.); **Pančičev Vrh**, UTM DN89, 1940 m (obs. *I. Krizmanić*); **Suvo Rudište, Krčmar**, UTM DN89, 1810 m (obs. *I. Krizmanić*); **E Bukovik Mt.**, UTM EP54, 1200 m (obs. *S. Marinković*, 23.03.1988. [doubtful record]); **Stara Planina Mts.:** Arbinje, UTM FN49, 1700 m (obs. *I. Krizmanić*); (obs. *A. Simović* 13.07.2008.); **Babin Zub**, UTM FP30 (obs. *A. Simović* 11.07.2009.); **Bratkova Strana**, UTM FN49 (obs. *A. Simović* 13.07.2008.); **Jabučko Ravnište**, UTM FP20 (obs. *A. Simović* 17.07.2012.); **Kopren, Šošina Vunija**, UTM FN49, 1860 m (obs. *G. Džukić* 02.07.2008.); UTM FN49, 1800 m (obs. *I. Krizmanić*); (obs. *A. Simović* 15.07.2009.); **Krvave Bare**, UTM FN49 (obs. *A. Simović* 15.07.2009.); **Midžor**, UTM FP30,

1851 m (obs. *M. Maričić* 27.09.2019.); 2119 m (obs. *M. Maričić* 27.09.2019.); Ponor, Lokve, UTM FN49, 1460 m (obs. *I. Krizmanić*); Stara Karaula, UTM FN49, 1700 m (obs. *I. Krizmanić*); Senokos (v.), towards Srebrna Glava, UTM FN68, 1576 m (obs. *M. Anđelković* 04.08.2016.); Srebrna Glava, UTM FN57 (obs. *A. Simović* 10.07.2011.); Stražna Čuka, Šošina Vunija - Kopren, UTM FN49, 1779 m (obs. *G. Džukić, M. Kalezić, D. Jović* 02.07.2008.); UTM FN49 (obs. *A. Simović* 15.07.2010.); Topli Do (v.), UTM FN49, 1190 m (obs. *I. Krizmanić*); Vražja Glava, UTM FP40 (obs. *A. Simović* 15.07.2009.); Zavojsko Lake, Pakleštica (v.), UTM FN48, 950 m (obs. *I. Krizmanić*); Žarkova Čuka, UTM FP30 (obs. *A. Simović* 10.07.2009.); **Suva Planina Mt.:** Kozja Padina, UTM EN98, 1650 m (obs. *M. Niketić* 15.06.1993.); **K Kopaonik Mt.:** Belo Brdo, UTM DN88, 1260 m (obs. *I. Krizmanić*); **Šar Planina Mts.:** Brezovica, above, UTM EM07, 2200 m (obs. *A. Paunović* 29.07.1995.); Ošljak, Mušnikovo (v.), Bivoli, UTM DM96, 1890 m (obs. *I. Krizmanić*); Popovo Prase, UTM DM97, 1760 m (obs. *I. Krizmanić*); Virovi, UTM DM97, 1650 m (obs. *I. Krizmanić*); Pavlov Kamen, UTM DM96, 2000 m (obs. *I. Krizmanić*); Piribeg, Stojkova Kuća, UTM EM06, 1700 m (obs. *V. Stevanović* 30.05.1977.); 2300 m (obs. *I. Krizmanić*); Štrpce, Kaluđerska Reka (r.), UTM EM07, 1400 m (obs. *I. Krizmanić*); UTM EM07, 975 m (obs. *G. Pasuljević* 22.05.1968.); **M Koritnik Mt.:** Rapča (v.), UTM DM65 (obs. *M. Hajredinić*, 20.05.1980.); **Mokra Gora Mt.:** Savina Voda, UTM DN64, 1650 m (obs. *I. Krizmanić*); **Prokletije Mts.:** Bogičevica Mt., Prilepske Planine Mt., UTM DN21, 2100 m (obs. *I. Krizmanić*); Đeravica Mt., Erenik (r.), UTM DN30, 1690 m (obs. *I. Krizmanić*); Nedžinat Mt., Veliko Nedžinatsko Lake, UTM DN22, 1850 m (obs. *I. Krizmanić*); Žljeb Mt., Rusulija, UTM DN33, 1870 m (obs. *I. Krizmanić*); **Šar Planina Mts.:** Kodža Balkan Mt., Ostrovnica, UTM DM97, 1800 m (obs. *M. Niketić* 1989); Konjuška Mt., Moravica, UTM DM96, 1950 m (obs. *M. Niketić* 19.08.2011.); Veljin Beg, Gorni Def, lake, UTM DM73, 2075 m (obs. *I. Krizmanić* 28.07.1995.); **NE Đerdapska Gorge:** Štrbac, Veliki Štrbac, UTM FQ03 (obs. *I. Krizmanić*, 20.04.1994. [doubtful record]); **SE Besna kobila Mt.:** vrh, UTM FN00, 1924 m (obs. *Lj. Tomović, A. Golubović, S. Đorđević*, 07.06.2014., MEP "DNA" project); **Čemernik Mt.:** Veliki Čemernik, Bela Voda, UTM FN03, 1447 m (obs. *M. Maričić* 04.09.2016.); Troskač, UTM FN03, 1566 m (obs. *I. Tot* 23.07.2018.); **Vlasina Plateau:** Crna Trava - Brod (v.), UTM FN04, 959 m (obs. *S. Marić* 20.07.2015.); Gradska (v.), Bukurovac, UTM FN14, 1543 m (obs. *G. Džukić, M. Kalezić* 22.06.2007.); Čuka, UTM FN14, 1350 m (obs. *G. Džukić, M. Kalezić* 22.06.2007.); Mlačišće (v.), Mlačiške Mehane, UTM FN03, 1270 m (obs. *G. Džukić* 27.09.2008. [extinct population]); UTM FN03, 1268 m (obs. *G. Džukić* 19.03.2007. [extinct population]); Topli Do, Pandžin Grob, UTM FN02, 1531 m (obs. *M. Maričić* 05.09.2016.); Vlasina (r.), Livađe Hamlet, UTM FN04, 1000 m (obs. *G. Džukić* 23.09.2007.); Vlasina Rid (v.), Gramada, UTM FN03, 1301 m (obs. *I. Tot* 29.05.2018. [extinct population]); UTM FN03, 1293 m (obs. *I. Tot* 22.07.2019.); **Sr Fruška Gora Mt.:** Čortanovci (v.), UTM DR20 (obs. *Đ. Mirić*); Slankamenački Vinogradi (v.), Koševac Hill, UTM DR30 (obs. *N. Aleksić* 15.05.1974.); **Pećinci:** Donji Tovarnik (v.), UTM DQ16 (obs. *R. Ajtić* 2013); Obrež (v.), Obedska Bara, Matijevica, UTM DQ15, 80 m (obs. *I. Krizmanić*); **SW Golija Mt.:** Kladnica (v.), Javor Peak, UTM DP20 (obs. *S. Marinković*); **Jadovnik Mt.:** Božov Potok (v.), UTM DN09 (obs. *N. Milić* 17.08.2018., BIOLOGER); **Kamena Gora Mt.:** UTM CN89 (obs. *M. Milićević* 02.08.2016., BIOLOGER); **Mokra Gora Mt.:** Bandera, Vučje Jame, UTM DN44, 1604 m (obs. *Lj. Tomović, A. Simović, S. Marić, A. Golubović, M. Krstić, I. Krizmanić, S. Đorđević* 12.06.2014., MEP "DNA" project); Ponor, UTM DN54, 1536 m (obs. *Lj. Tomović, A. Simović, S. Marić, A. Golubović, M. Krstić, I. Krizmanić, S. Đorđević* 13.06.2014., MEP "DNA" project [doubtful record]); Strašnik, Crvene Vode, UTM DN54, 1880 m (obs. *Lj. Tomović, A. Simović, S. Marić, A. Golubović, M. Krstić, I. Krizmanić, S. Đorđević* 13.06.2014., MEP "DNA" project); **V Javor Mt.:** Ljepojevići (v.), Jankov Vrh, UTM DP21, 1492 m (obs. *S. Marinković*); **Zlatibor Mt.:** Mokra Gora (v.), UTM CP74 (obs. *D. Čirović* 17.07.1993.).

### *Vipera ursinii* (Bonaparte, 1835)

**M Šar Planina Mts.:** Čemerička Planina Mt., Čemerište, Čemeričko Lake, UTM DM73, 2050 m (obs. *I. Krizmanić, M. Kalezić, G. Džukić*, 28.07.1995.); **SW Mokra Gora Mt.:** Bandera, UTM DN44 (obs. *Lj. Tomović, A. Simović, S. Marić, A. Golubović, M. Krstić, I. Krizmanić, S. Đorđević*, 11.06.2014., MEP "DNA" project); UTM DN54 (obs. *R. Ajtić* 2013).

### Analysis of taxa and records

We collected a total of 770 records of vipers in Serbia, of which literature data constitute 49.4% ( $n = 380$ ) and unpublished field data made as much as 50.6% ( $n = 390$ ) of the records. As expected, *V. ammodytes* was the best-represented species, accounting for 614 records (79.8%), followed by *V. berus* with 145 records (18.8%), and *V. ursinii* with 11 records (1.4%). In total, vipers were recorded in 304 of 1,408 10×10 km UTM squares within the territory of the Republic of Serbia (21.6% of the country area).

The nose-horned vipers were recorded in 270 10×10 km UTM squares: 90 new field records, 70 reconfirmed published records and 110 literature data (Fig. 1). The adders occur in 52 10×10 km UTM squares: 23 new field records, 16 reconfirmed published records and 13 literature data (Fig. 2). The meadow vipers exist in seven 10×10 km UTM squares: two new field records, one reconfirmed published record and four literature data (Fig. 3). In the territory of Serbia, there are 1,104 (78.4%) UTM cells without any records of vipers. This was actually quite expected since in many areas these snakes are naturally not present (major parts of the Pannonian and Peripannonian regions) and their secretive lifestyle often makes chance observations impossible, but also because systematic research is still lacking in some large regions (e.g. Pomoravlje, south-western Serbia and Kosovo).

Results of this study showed that in four 10×10 km UTM squares in Serbia all three species of vipers occur: two of them are in Metohija (Koritnik Mt. – DM65, Prokletije Massif, Žljeb Mt. – DN33) and two others are in south-western Serbia (Mokra Gora Mt. – DN44, DN54) (Figure 4).

We also found 25 10×10 km UTM squares with sympatry of two species of vipers. Co-existence of *V. ammodytes* and *V. berus* is the most frequent in Serbia (22 UTM squares), and it was recorded in the following regions/locations: Metohija: Prokletije Massif – Junička Mt. and Đeravica Mt. (DN30); Kosovo: the Šar Planina Massif – Ošljak Mt. and Kodža Balkan Mt. (DM96, DM97), Piribeg and Brezovica (EM06, EM07); western Serbia: Zlatibor Mt. (CP74), Javor Mt. (DP21); south-western Serbia: Kamena Gora Mt. (CN89), Jadovnik Mt. (DN09); central Serbia: Kopaonik Mt. (DN88, DN89); eastern Serbia: Suva Planina Mt. (EN98), Stara Planina Mts. (FP30, FN48, FN49, FN57); south-eastern Serbia: Dukat Mt. (FM19), Besna kobilica Mt. (FN00), Milevska Planina Mt. (FN11), Čemernik Mt. (FN03) and the Vlasina plateau (FN04, FN14) (Figure 4).

Sympatry of *V. berus* and *V. ursinii* was recorded in two UTM squares (Metohija: Paštrik Mt. – DM67, the Šar Planina Massif – Veljin beg and Čemerička Mt. – DM73), while co-occurrence of *V. ammodytes* and *V. ursinii* was the rarest, with only one UTM square recorded (Metohija: the Šar Planina Massif – Ošljak Mt. and Kobilica Mt. – DM86) (Figure 4).



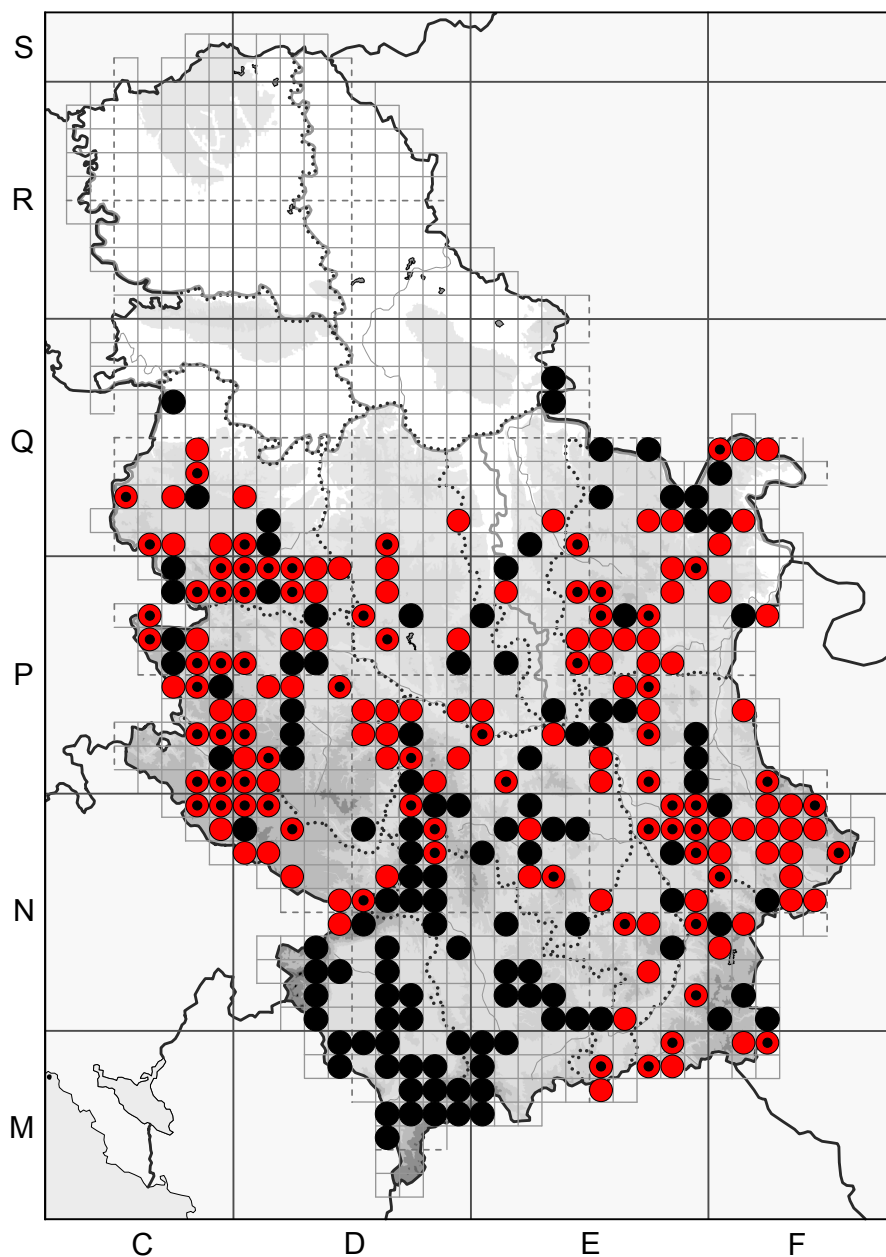


Fig. 1. – Records of *Vipera ammodytes* (Linnaeus, 1758) in the Republic of Serbia. Red dots – new data; red-black dots – reconfirmed published data; black dots – previously published data.

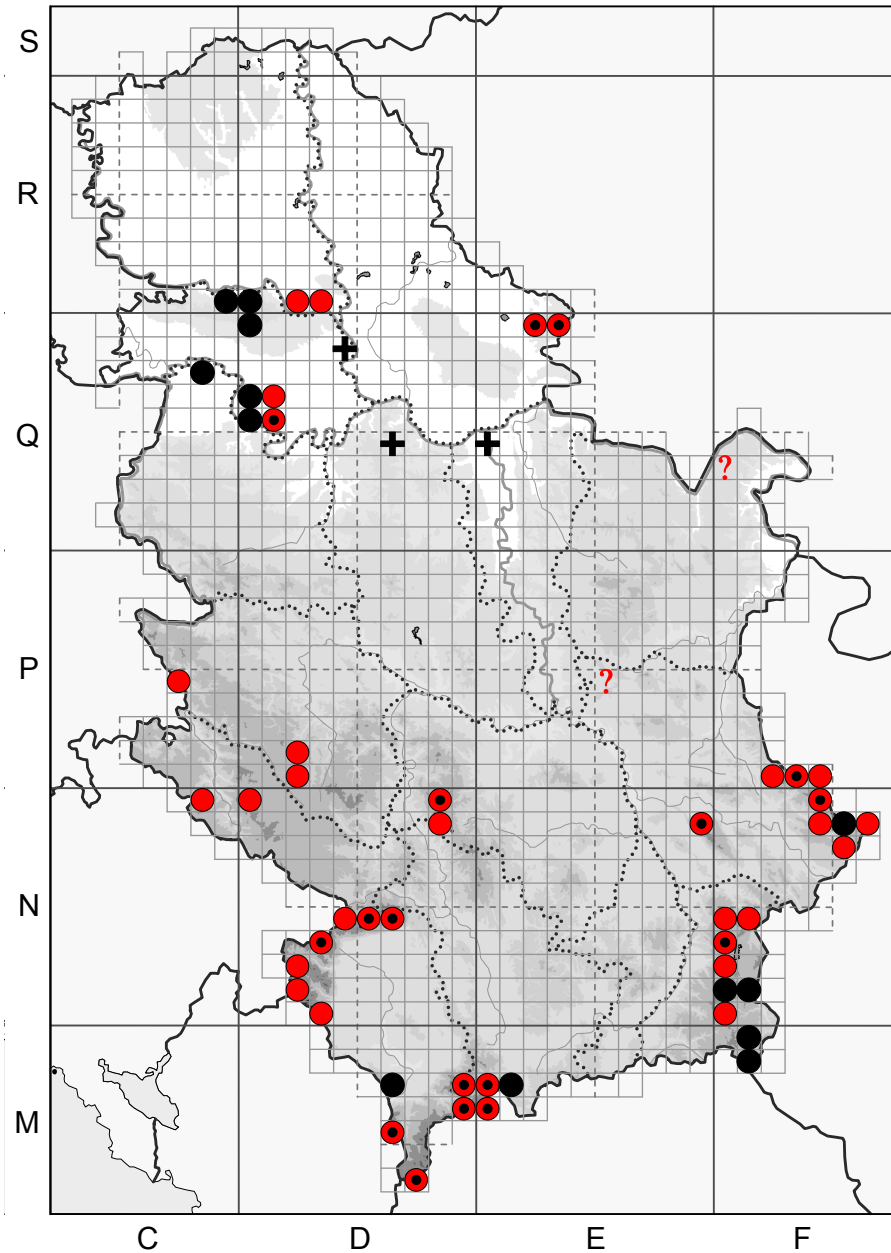


Fig. 2. – Records of *Vipera berus* (Linnaeus, 1758) in the Republic of Serbia. Red dots – new data; red-black dots – reconfirmed published data; black dots – previously published data; crosses – extinct populations; question marks – doubtful records.

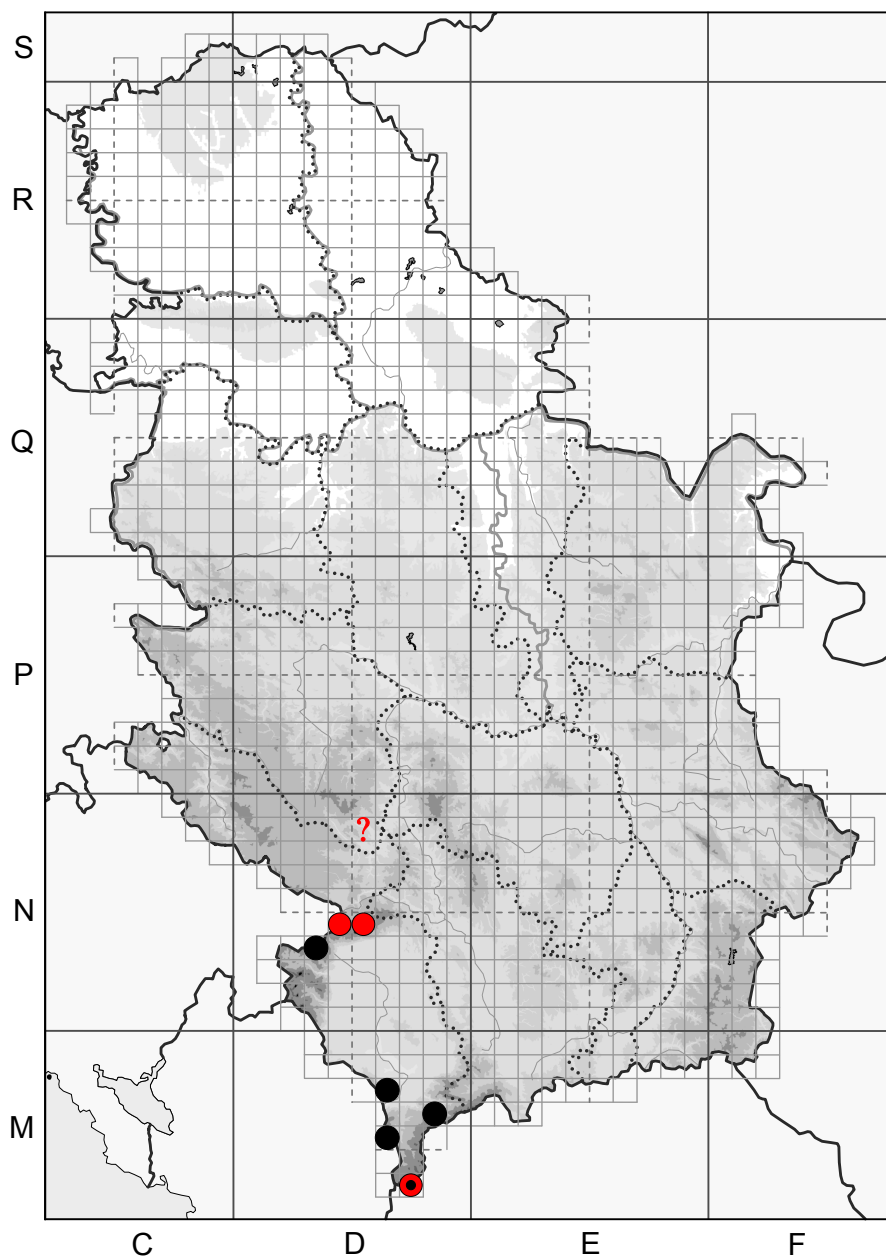


Fig. 3. – Records of *Vipera ursinii* (Bonaparte, 1835) in the Republic of Serbia. Red dots – new data; red-black dots – reconfirmed published data; black dots – previously published data; question marks – doubtful records.

## DISCUSSION

Although the distribution of *V. ammodytes* was already well-known from the previous publications (e.g. Jelić *et al.* 2012, Tomović *et al.* 2018), the results of the present study increased the current knowledge on its distribution by app. 33%, in terms of addition of unpublished data (90 of 270 UTM squares). As observable from Figure 1, there are still relatively large gaps in the distribution of the nose-horned viper in the Peripannonian region (Pomoravlje and Šumadija), as well as in the south-western part of Serbia. Therefore, more systematic faunistic research is needed in these particular regions.

Concerning distribution of *V. berus*, some doubtful records (CQ73, CQ83, DP70, DQ62, DQ64, DP49, DP59) presented in the Red Book of Fauna of Serbia II – Reptiles (Ajtić & Tomović 2015) were excluded due to unreliable sources, but two data from north-eastern and eastern Serbia (FQ03, EP54) still remain to be verified in the future. Several very old unpublished (DR20, DR30) and published records (CR90, DR00, DQ09 – Živković 1956, Radovanović 1957, 1964, Prša 1959, Popović *et al.* 1999) for the Fruška Gora Mt., together with the fact that no specimens were found there in the last 20 years, indicate that populations of the adder are very small and rare on this mountain. Populations from the following localities should be regarded as extinct: surroundings of Belgrade (village Stari Banovci, DQ48 – Anonymous 1932), the Avala Mt. (village Ripanj, DQ64 – Anonymous 1890, Karaman 1939), and mouth of the Velika Morava River (Godominsko polje, EQ04 – Karaman 1948), since there are no records/findings, except for the 70 years old literature data. Loss of the adequate habitats due to the urbanization, industrialization or agriculture could be a reason for the loss of some populations. For instance, the habitat around Velika Morava river mouth (i.e. Godominsko polje) was severely degraded in 1967 and 1970, by land reclamation and filling of the Jezava riverbed in order to construct an industrial zone (Tasić 2014, Urošević 2018). Adder presence in the Peripannonian region, south-western and south-eastern parts of Serbia could be expected, hence future faunistic research should be conducted in these regions.

The very old record of *V. ursinii* from the surroundings of Novi Pazar (village Vranovina, DN58 – Schwarz 1936, Kramer 1961) should be regarded as doubtful since in this area there are no suitable high mountain habitats (Jelić *et al.* 2012). Future studies should be focused on the south-western part of Serbia, where new localities of meadow viper could be expected.

According to the study of Jelić *et al.* (2013), the only Important Viper Area in Serbia was the Šar Planina Massif. However, results of the present study showed that in our country there are three additional areas crucially

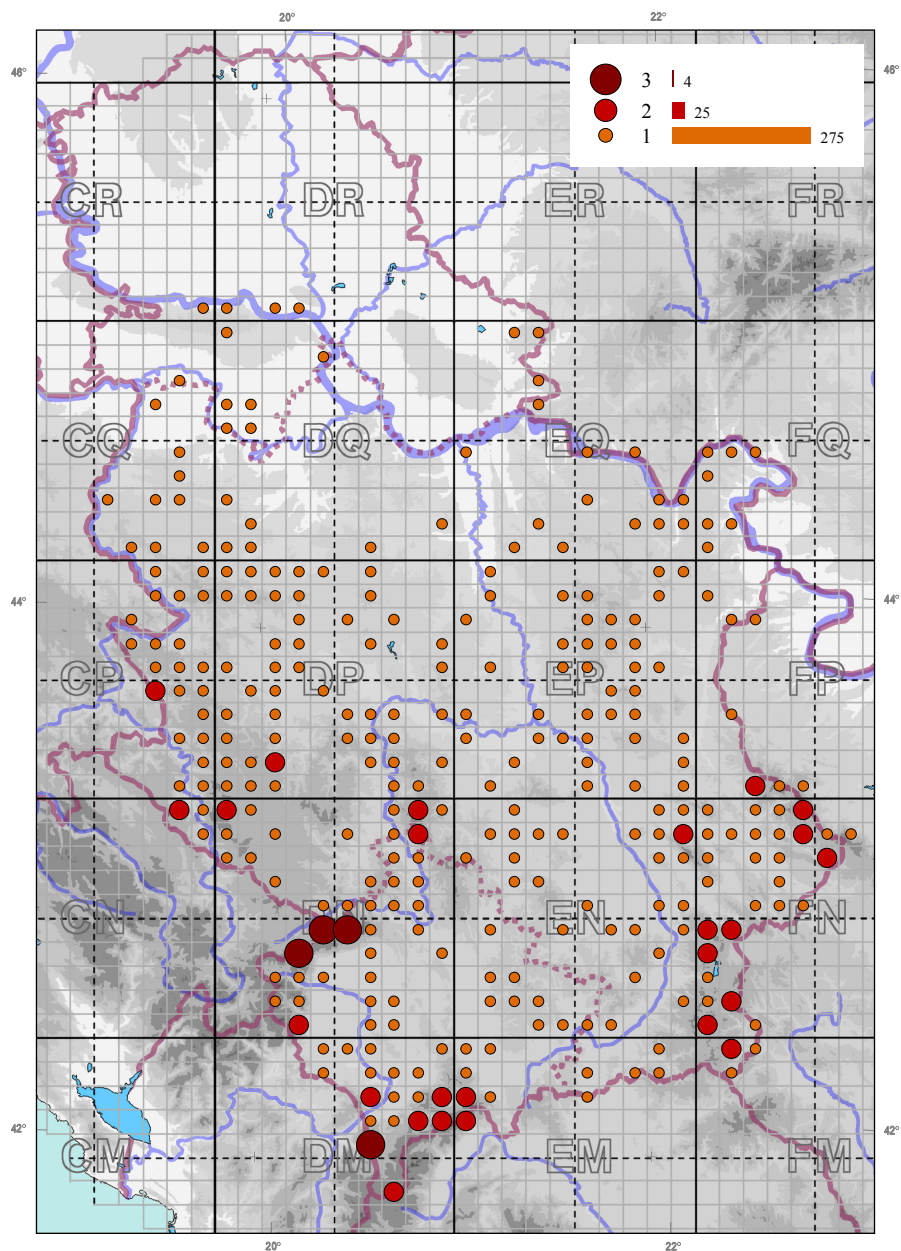


Fig. 4. – The number of species of the genus *Vipera* on the 10×10 km UTM National Grid Reference with the number of squares.

important for the diversity of vipers, with all three species present: Koritnik Mt. and Žljeb Mt. in Metohija, as well as Mokra Gora Mt. in south-western Serbia. We strongly recommend to the policymakers in the government institutions that these mountains should be recognized and included in different types of legally protected areas (e.g. National Parks and/or Natura 2000 sites). In addition, sympatry of two species of vipers was also recorded in 25 locations, most of which are already included in the protected areas in the Republic of Serbia (e.g. Stara Planina Mts., Kopaonik Mt., Suva Planina Mt., Zlatibor Mt., Vlasina Plateau). However, some other mountains should also be considered as important areas for vipers and included in the protected sites (e.g. Dukat Mt., Besna kobilica Mt., Kamena Gora Mt.).

The conservation status of the vipers was given in the Red Book of Fauna of Serbia II – Reptiles (Tomović *et al.* 2015a). According to the IUCN criteria, *V. ammodytes* was considered as the least concerned species (LC), while *V. berus* and *V. ursinii* were considered as vulnerable (VU) and endangered (EN), respectively. Although both *V. berus* and *V. ursinii* are strictly protected, and *V. ammodytes* is protected by law in the Republic of Serbia (Anonymous 2010a, 2010b), the designation of areas of special importance for vipers should be one of the priority actions for improvement of their conservation statuses in our country.

All the data compiled in this study, as well as those which will be collected within the two national projects (Ecological Networks and Natura 2000) shall be presented to the national authorities and institutions responsible for the designation of appropriate protection upon areas which are proven to be important for the existence of vipers. These snakes should be seriously taken into consideration as the species which can properly indicate the state of entire habitats. However, to achieve the sound, long-term preservation of the viper species and their habitats, in addition to prescribing formal conservation measures, both strict control in the field (rangers, inspectors) and well-designed educational activities must be undertaken, from schoolchildren (see Ballouard *et al.* 2013) and laypeople to decision-makers and judiciary.

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## SUPPORTING INFORMATION

### Online Appendix:

**Appendix I** – Literature distribution records of three *Vipera* species in the Republic of Serbia with regions, broad locations, exact localities, toponyms, UTM 10×10 km squares, longitudes, latitudes, altitudes, dates of observations, literature sources; r – river, v. – village.

**Appendix II** – New distribution records of three *Vipera* species in the Republic of Serbia with regions, broad locations, exact localities, toponyms, UTM 10×10 km squares, longitudes, latitudes, altitudes, dates of observations, names of observers; r – river, v. – village. For conservation reasons, precise geographic coordinates of some locations are omitted.

## РАСПРОСТРАЊЕЊЕ ТРИ ВРСТЕ РОДА *VIPERA* У РЕПУБЛИЦИ СРБИЈИ

ЉИЉАНА ТОМОВИЋ, МАРКО АНЂЕЛКОВИЋ, ИМРЕ КРИЗМАНИЋ,  
РАСТКО АЉТИЋ, АЛЕКСАНДАР УРОШЕВИЋ, НЕНАД ЛАБУС,  
АЛЕКСАНДАР СИМОВИЋ, МАРКО МАРИЧИЋ, АНА ГОЛУБОВИЋ,  
ЈЕЛЕНА ЂОРОВИЋ, АНА ПАУНОВИЋ, ДАНКО ЈОВИЋ, МИЛИВОЈ КРСТИЋ,  
МАРГАРЕТА ЛАКУШИЋ, ГЕОРГ ЏУКИЋ

### РЕЗИМЕ

Литературни подаци о дистрибуцији рода *Vipera* на подручју западног и централног дела Балканског полуострва, показују да је у Србији забележено 210 налаза (146 УТМ поља) за све три врсте овог рода (*Vipera ammodytes*, *V. berus* и *V. ursinii*). Током последњих осам година, интензивна фаунистичка истраживања у оквиру националних конзервационих пројеката (нпр. Еколошке мреже и Natura 2000), допринела су значајном повећању броја података о дистрибуцији ове три врсте, чиме се указала потреба за објављивањем нових фаунистичких података. У овом раду, укупно је сакупљено 770 података о распрострањењу представника рода *Vipera* у Србији, од чега литературни подаци чине 49.4% ( $n = 380$ ), а нови фаунистички подаци представљају 50.6% ( $n = 390$ ). Очекивано, највећи број података се односи на врсту *V. ammodytes* (614 – 79.8%), док је много мање података за врсте *V. berus* (145 – 18.8%) и *V. ursinii* (11 – 1.4%). Резултати овог рада су показали да на територији Републике Србије постоје три подручја од највећег значаја за диверзитет рода *Vipera*, на којима су присутне све три врсте: планине Коритник и Жљеб у Метохији, као и планина Мокра гора у југозападној Србији. Такође, забележено је укупно 25 УТМ 10×10 km квадрата у којима по две врсте рода *Vipera* живе у симпатрији. Проглашење заштићених подручја од посебног значаја за отровнице (нпр. Мокра гора, Дукат, Бесна кобила, Камена гора), требало би да буде приоритет за побољшање конзервационог статуса врста рода *Vipera* у нашој земљи.