NATURA SLOVENIAE
Online First (2026): 26242

FIELD NOTE /
TERENSKA NOTICA

DOI: 10.14720/ns.26242
Objavljeno na spletu / Published online: 2. 7. 2026

Received / Prejeto: 17. 2. 2026
Accepted / Sprejeto: 9. 6. 2026

Contribution to the knowledge of the distribution of the Balkan whip snake *Hierophis gemonensis* (Laurenti, 1768) in the inland Balkan Peninsula

Katja KNEZ[1,2*]
Maj KASTELIC[1,2]
Edi FRCOVSKI[1,3]
Urban DAJČMAN[1,4]

[1] Herpetološko društvo – Societas herpetologica slovenica, Večna pot 111, 1000 Ljubljana, Slovenija

[2] Univerza v Ljubljani, Biotehniška fakulteta, Jamnikarjeva ulica 101, 1000 Ljubljana, Slovenija; E-mails: katja.knez@bf.uni-lj.si, mk09679@student.uni-lj.si

[3] Biology Students' Research Society, Arhimedova 3, 1000 Skopje, North Macedonia; E-mail: edifrcovski@gmail.com

[4] Department of Organisms and Ecosystems Research, National Institute of Biology, Večna pot 121, 1000 Ljubljana, Slovenija; E-mail: urban.dajcman@nib.si

* Korespondenčna avtorica / Corresponding author

ABSTRACT

The Balkan whip snake (*Hierophis gemonensis*) is found along the Adriatic coast from northern Croatia to the south of the Balkan Peninsula, while its inland range remains poorly understood. We report on three new records: the first record for Kosovo and two juveniles from south-eastern North Macedonia. This suggests that the species' distribution range extends further inland than previously documented.

IZVLEČEK

Prispevek k poznavanju razširjenosti belice *Hierophis gemonensis* (Laurenti, 1768) na celinskem delu Balkanskega polotoka

Belica (*Hierophis gemonensis*) je razširjena vzdolž jadranske obale od severne Hrvaške do južnega dela Balkanskega polotoka, medtem ko je njena razširjenost v notranjosti polotoka še vedno slabo poznana. Predstavljamo tri nove podatke o pojavljanju vrste: prvo potrjeno najdbo na Kosovu ter dve najdbi juvenilnih osebkov na jugovzhodu Severne Makedonije. Ti podatki kažejo, da se območje razširjenosti belice razteza globlje v notranjost Balkanskega polotoka, kot je bilo znano doslej.

KEY WORDS:
Hierophis gemonensis, new records, Balkan Peninsula

KLJUČNE BESEDE:
Hierophis gemonensis, novi podatki, Balkanski polotok

The known distribution of the Balkan whip snake (*Hierophis gemonensis* (Laurenti, 1768)) is limited to the western part of the Balkan Peninsula, from northern Croatia along the Adriatic coast to the Peloponnese. The species is also present on most Croatian islands and several Greek islands, including Crete (Speybroeck et al. 2016). New records continue to be reported (e.g. Kalogiannis & Stefanopoulos 2024), which underscores that the distribution of *H. gemonensis* is not yet fully characterised.

The Biology Student Society at University of Ljubljana in Slovenia organises yearly research camps across the Balkan Peninsula. Multiple groups of students, focused on different taxonomic groups, conduct field surveys and collect new occurrence data. Through this approach, important distributional data on plant, fungal and animal species are collected, often in very undersurveyed regions. Relevant for this contribution, the camps were held in Prizren, Kosovo, in 2018 (Tivadar 2020) and in Demir Kapija, North Macedonia, in 2024. Permits for field research were acquired from the local authorities and all handling was conducted in accordance with ethical standards of handling herpetofauna (Dodd 2016; Speybroeck et al. 2016).

No confirmed records of *H. gemonensis* from Kosovo were reported in the literature, although its occurrence was expected to be recorded by future field surveys (Tomović et al. 2018). In North Macedonia, *H. gemonensis* was first documented in 1999 (Petkovski et al. 2001), when two juvenile individuals were collected in Debarska Banja near the village of Banjište. At that time, the authors proposed that new findings of the species in the country were probable but disagreed on how far inland the species extends from the Adriatic coast region. Later, additional distributional data was provided from Stenje (Lake Prespa region), Čepigovo (Prilep region), and Tumba (Kavadarci region) (Sterijovski et al. 2014). However, the latter two records were later considered misidentifications of the Caspian whip snake (*Dolichophis caspius*), as juveniles of the species exhibit a similar pattern (Arsovski & Sterijovski 2022). *Hierophis gemonensis* therefore remains the snake species with the smallest known distribution in North Macedonia, occurring only in river gorges

Izdatajelj/Issued jointly by: Biotehniška fakulteta Univerze v Ljubljani in Nacionalni inštitut za biologijo / Biotechnical Faculty at University of Ljubljana and National Institute of Biology
Založila/Published by: Založba Univerze v Ljubljani/University of Ljubljana Press

of Crn Drim and Radika, on the coastline of Lake Ohrid, in Prespa fields and on Galichica Mt. (Arsovski & Sterijovski 2022).

Considering climate changes, it can be anticipated that the Mediterranean species of snakes that are adapted to dry and hot environments will expand their ranges due to increasing aridity and milder winters (Deschepper 2025). Here we present the first finding of the species for Kosovo, as well as additional distributional data of *H. gemonensis* for North Macedonia, extending the known range further into the continent (Fig. 1). On 29. 4. 2018, an adult *H. gemonensis* was observed on the roadside near Zhur in Kosovo at approximately 650 m a.s.l. (WGS84 coordinates: N 42.164293°, E 20.660747°). The snake was caught and identified based on its morphology (Fig. 2).

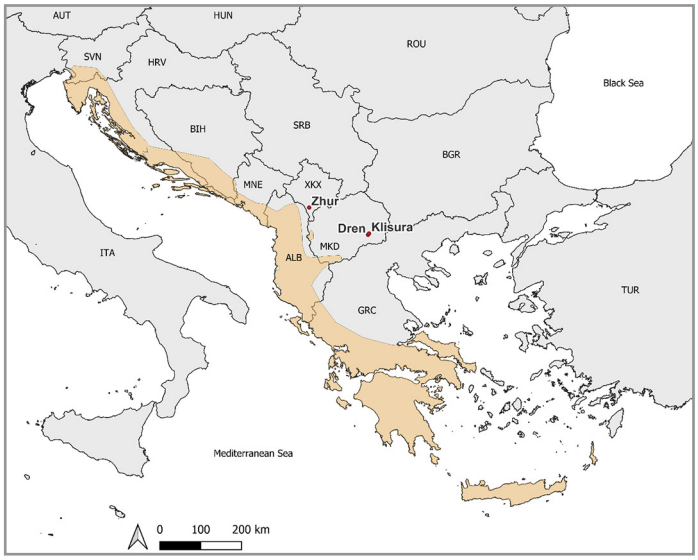

Figure 1. The map shows the currently known distribution of *H. gemonensis* (orange; Petkovski et al. 2001; IUCN 2023) and the new records reported in this field note (red dots).

Slika 1. Zemljevid prikazuje trenutno znano razširjenost belice (*H. gemonensis*) (oranžno; Petkovski et al. 2001; IUCN 2023) ter nove najdbe, predstavljene v tej terenski notici (rdeče pike).

It was brown coloured with dark patches and white bars on the dorsum, with a row of smaller black dots on the sides on the first part of the belly, consistent with identification notes (Speybroeck et al. 2016).

On 29. 4. 2024, a juvenile *H. gemonensis* (Fig. 3) was found inside a pile of trash in the middle of a meadow near Dren in North Macedonia (WGS84 coordinates: N 41.359444°, E 22.254722°). A second juvenile (Fig. 4) was found on 2. 5. 2024 near Klisura in North Macedonia on the road bank (WGS84 coordinates: N 41.383338°, E 22.290745°). Both individuals were caught, photographed and identified as *H. gemonensis* based on morphological characteristics, after consulting with several experts from the Balkan Peninsula. The dorsal markings are present only on the anterior part of the body, the dorsal scales have white edges and there are dark spots on the sides of the ventral scales, which are absent in *D. caspius* (Speybroeck et al. 2016).

Although *H. gemonensis* had previously been reported from the southwest of North Macedonia and its occurrence in Kosovo was anticipated, these findings indicate that the inland Balkan Peninsula remains insufficiently surveyed, particularly

Figure 2. An adult *H. gemonensis* recorded near Zhur in Kosovo (photo: Urban Dajčman).

Slika 2. Odrasla belica (*H. gemonensis*) najdena blizu mesta Zhur na Kosovem (foto: Urban Dajčman).

Figure 3. A juvenile *H. gemonensis* from the vicinity of Dren, North Macedonia (photo: Katja Knez).

Slika 3. Mlad osebek belice (*H. gemonensis*) najden blizu vasi Dren, Severna Makedonija (foto: Katja Knez).

Figure 4. A juvenile *H. gemonensis* from the vicinity of Klisura, North Macedonia (photo: Katja Knez, Edi Frcovski).

Slika 4. Mlad osebek belice (*H. gemonensis*) najden blizu vasi Klisura, Severna Makedonija (foto: Katja Knez, Edi Frcovski).

regarding this species and its potentially expanding range due to climate change (Deschepper 2025). We emphasise that further systematic field research is required to better delineate the inland distribution of this species.

ACKNOWLEDGEMENTS

We would like to thank multiple experts that helped us confirm the identification of the juvenile individuals: Dr Marko Anđelković, Dr Jelka Crnobrnja Isailović, Bálint Halpern, Ilias Strachinis and Dr Aleksandar Urošević.

UD was partially funded by the ARIS research programme P1-0255. KK was partially funded by the ARIS research programme P4-0022.

REFERENCES

Arsovski D, Sterijovski B. 2022. Reptiles: Red Data Book of Fauna of North Macedonia. Skopje (MK): Macedonian Ecological Society.

Deschepper P. 2025. Snakes in Europe under climate change: Is it getting too hot for the cold-blooded? Biological Diversity. 2(2-3): 73-84. https://doi.org/10.1002/bod2.70005-

Dodd CK. 2016. Reptile Ecology and Conservation: A Handbook of Techniques. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198726135.001.0001

[IUCN] International Union for Conservation of Nature. 2023. Balkan Whip Snake. The IUCN Red List of Threatened Species. Version 2025-2. [accessed on 14. 5. 2026]; https://www.iucnredlist.org/fr/species/61510/137851210

Kalogiannis S, Stefanopoulos P. 2024. Like pieces in a puzzle: First record of *Hierophis gemonensis* (Laurenti, 1768) (Reptilia Colubridae) on Skiathos island (Northern Sporades, Greece). Biodiversity Journal. 15(4): 957-62. https://doi.org/10.31396/Biodiv.Jour.2024.15.4.957.962

Petkovski S, Sidorovska V, Dzukic G. 2001. The biodiversity richness of the Macedonian snake fauna (Reptilia: Serpentes). Macedonian Journal of Ecology and Environment. 7(1-2): 41-54.

Speybroeck J, Beukema W, Bok B, Van Der Voort J. 2016. Field Guide to the Amphibians and Reptiles of Britain and Europe. London (UK): Bloomsbury publishing.

Sterijovski B, Tomović L, Ajtić R. 2014. Contribution to the knowledge of the reptile fauna and diversity in FYR of Macedonia. North-Western Journal of Zoology. 10(1): 83-92.

Tivadar N. 2020. Ekosistemi Balkana 2018: Zbornik. Ljubljana (SI): Društvo študentov biologije.

Tomović L, Timotijević M, Ajtić R, Krizmanić I, Labus N. 2018. Contribution to the herpetofauna of Serbia: Distribution of reptiles in Kosovo and Metohija province. University Thought - Publication in Natural Sciences. 8(2): 1-6. https://doi.org/10.5937/univtho8-16981