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New Distributional Records and Another Case of Winter Activity of *Malpolon insignitus* (Geoffroy Saint-Hilaire, 1827) (Reptilia: Psammophiidae) in South-Western Bulgaria

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Abstract. Six new localities of *Malpolon insignitus* have been recorded lately in south-western Bulgaria, which supplement its known distribution. One of the observations is the second case of winter activity of the species in the country.

Key words: Eastern Montpellier Snake, seasonal activity, new localities.

Introduction

Hibernation of amphibians and reptiles is a direct response to cold temperatures and secondarily to changes in resource availability during changing seasons. As winter approaches in temperate zones, most amphibians and reptiles seek shelter where the minimum environmental temperatures will not fall below freezing (Vitt & Caldwell 2014). In Bulgaria these animals fall into prolonged hibernation in the late autumn, winter and early spring. Nevertheless, there were numerous records of active species in this period (including in the middle of winter) when the weather was warm, and calm (Beshkov 1977). Observations of winter activity (December, January or February) of snakes in Bulgaria have been very rare. In most cases active individuals were registered on separate winter days without paying particular attention to this activity. Most of these registrations were made a long time ago and their number was low. Till 2011, when Stojanov *et al.* (2011) published their summary work on the Bulgarian herpetofauna winter activity had been registered for 5 species of snakes (from 18 distributed in the country). There were reported winter records of *Dolichophis caspius* (Gmelin, 1789) (Buresch & Zonkov 1934; Beshkov 1964; two in total), *Telescopus fallax* (Fleischmann, 1831) (Stojanov *et al.* 2011; two records), *Natrix natrix* (Linnaeus, 1758) (Undjian 2000; one record), *Natrix tessellata* (Laurenti, 1768) (Buresch & Zonkov 1934; one record), *Vipera ammodytes* (Linnaeus, 1758) (Buresch & Zonkov 1932; Beshkov 1993; four in total). Recently Pulev *et al.* (2018b) published one winter record of *Malpolon insignitus* (Geoffroy Saint-Hilaire, 1827) (on 14.02.2016, maximum daytime air temperature +19.5 °C), so the number of the Bulgarian snake species with registered winter activity becomes six.

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According to Vitt & Caldwell (2014) temperature is the main limiting factor in the distributional and diversity patterns of amphibians and reptiles. One of the Bulgarian snake species – *M. insignitus* is a Mediterranean faunal element which inhabits only the warmest areas in the southern part of the country, in south-western Bulgaria - the valleys of Struma and Mesta Rivers (Pulev 2016; Pulev *et al.* 2018b). Literature data about its distribution in these valleys were summarized and mapped by Pulev *et al.* (2018b), and supplemented by subsequent publications by Manolev *et al.* (2019), and Dyugmedzhiev *et al.* (2019).

Material and Methods

In the majority of cases, *M. insignitus* was recorded incidentally during car journeys and once during a field trip in south-western Bulgaria. All new distributional records are from 2019.

The locations of the species (new and published) were grouped according to their affiliations to the squares of the Universal Transverse Mercator (UTM) grid with a resolution of 5×5 km. The grid-cells were indicated by the codes of the 10-km quadrates of Military Grid Reference System (MGRS; spatially identical with UTM). Capital letters (A-D) were used to denote the separate 5×5 km squares within every 10×10 km square (A indicates the south-western square, B – the north-western, C – the south-eastern, and D – the north-eastern). Mapping and map visualization were done in the projection coordinate system "WGS 84 UTM 35N" by means of ArcGIS v. 10.1 (ESRI, Redlands, CA, USA).

Results and Discussion

An adult individual of *Malpolon insignitus* was recorded by Georgi Gogoushev at 12:20 *p.m.* on 05.02.2019 SW of the village of Oshtava (N41°46'14" E23°12'25", 578 m, UTM: FM82B) (Fig. 1). The site was open, with sparse shrub vegetation and south-eastern exposure. The weather was sunny and comparatively warm for the beginning of February – the air temperature was +12.5°C (similar to the previous 2-3 days). The observed individual was sunbathing and very lazy and slow (in semi-torpid state) after being frightened.

Compared to the first winter registration of *M. insignitus*, the new one was done earlier in February and at lower air temperatures. Probably (as in the first case) the individual temporarily left the hibernaculum, because of the sunny and relatively warm weather. In general, the species tolerates lower temperatures well – it is the first species (out of seven) to emerge from hibernation in the vicinity of the town of Kresna (Dyugmedzhiev *et al.* 2019).

Despite the second case of winter record of *M. insignitus* in Bulgaria, the identified winter activity of the species as *unusual* by Pulev *et al.* (2018b) seems to be correct. Winter observations of the Bulgarian snakes are extremely rare, unlike of some lizards (for example the genus *Podarcis* species, especially *P. muralis* (Laurenti, 1768)). The winter activity of *M. insignitus* (as well as of other reptiles in Bulgaria) is probably related to the character and geographical location of the places of hibernation, the exposure of the wintering grounds, the altitude, the weather conditions, and not least to the ecological requirements of the species.

Several recently road-killed individuals of *M. insignitus* have also been registered. The new records are: N of Zheleznitsa Village (N41°55'59" E23°06'12", 311 m, UTM: FM74A), 24.05.2018, 6:15 *p.m.*, 1 ad.; SE of Zheleznitsa Village (N41°55'09" E23°06'57", 303 m, UTM: FM74C), 15.10.2018, 2:45 *p.m.*, 1 subad.; NE of Strumyani Village (N41°38'36" E23°12'47", 209 m, UTM: FM81A), 24.05.2018, 3:30 *p.m.*, 1 ad.; E of Zlatarevo Village (N41°23'53" E22°59'10", 193 m, UTM: FL68C), 27.05.2018, 5:05 *p.m.*, 1 ad.; W of Parvomay Village (N41°24'04" E23°05'44", 151 m, UTM: FL78D), 25.05.2018, 8:05 *a.m.*, 1 ad. (Fig. 1).

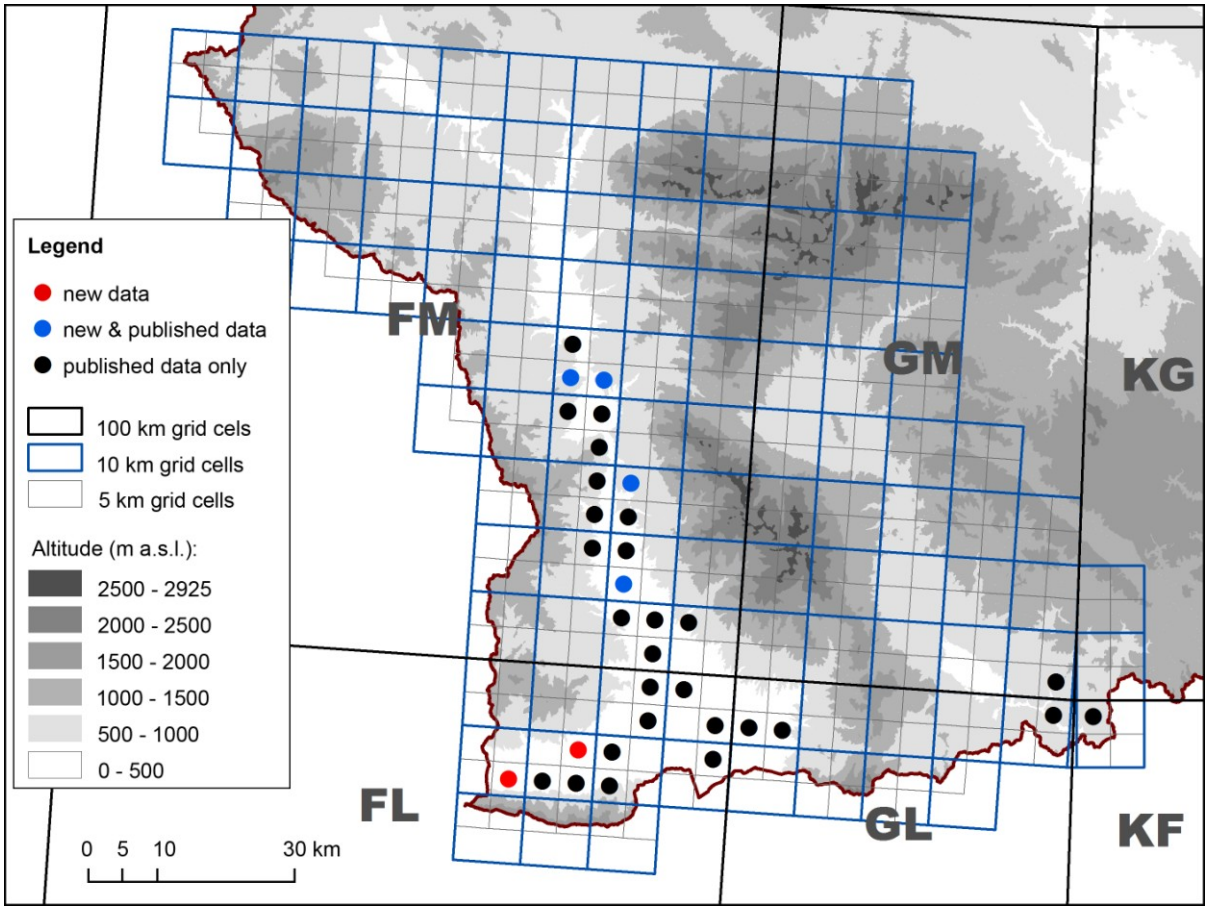

Fig. 1. Distribution of *Malpolon insignitus* in south-western Bulgaria, based on a 5 km UTM grid.

The known localities of *M. insignitus* in south-western Bulgaria fall into 33 squares of a 5 km UTM grid. The published localities refer to 31 squares (for 4 of them new data are presented here as well), and the new ones fall in other 2 squares (Fig. 1). The new data supplement the already known distribution of the species in the research area and confirm its presence in Oranovo Gorge (two records). They also show that a large number of the recorded individuals have been victims of traffic. Beshkov & Nanev (2002) stated that according to its abundance the snake was found as road-killed much more often in comparison with other snakes inhabiting the same areas.

The mapped species distribution (Fig. 1) visualizes pretty well the area with the Mediterranean influence on the territory of south-western Bulgaria. It shows the spread of Struma and Mesta Mediterranean areas (part of Mediterranean biogeographic subregion) suggested by Pulev *et al.* (2018a) in this part of the country.

References

Beshkov, V. (1964) Smotsite v Balgaria (Colubrid snakes in Bulgaria). *Priroda i Znanie*, 9: 16-18. (in Bulgarian)

Beshkov, V. (1977) Zimnite kvartiri na zemnovodnite i vlechugite (Winter shelters of the amphibians and reptiles). *Priroda i Znanie*, 28(1): 9-11. (in Bulgarian)

Beshkov, V. (1993) On the Seasonal and Diurnal Activity of the Sand Viper *Vipera ammodytes* (L.) in Bulgaria. *Herpetology*, 1: 3-13. (in Bulgarian, English summary)

Beshkov, V. & Nanev, K. (2002) *Zemnovodni i vlechugi v Balgaria* (*Amphibians and Reptiles in Bulgaria*). Pensoft Publishers, Sofia, 120 pp. (in Bulgarian)

Buresch, I. & Zonkov, J. (1932) Die Verbreitung der Giftschlangen (Viperidae) in Bulgarien und auf der Balkanhalbinsel. *Travaux de la Société Bulgare des Sciences Naturelles*, 15-16: 189-206. (in Bulgarian, German summary)

Buresch, I. & Zonkov, J. (1934) Untersuchungen über die Verbreitung der Reptilien und Amphibien in Bulgarien und auf der Balkanhalbinsel. II Teil: Schlangen (Serpentes). - *Mitteilungen aus den Königlichen naturwissenschaftlichen Instituten in Sofia – Bulgarien*, 7: 106-188. (in Bulgarian, German summary)

Dyugmedzhiev, A., Slavchev, M. & Naumov, B. (2019) Emergence and dispersal of snakes after syntopic hibernation. *Herpetozoa*, 32: 149-157.

Manolev, G., Philipova, L., Pulev, A. & Sakelarieva, L. (2019) A Checklist of the Herpetofauna in the Bulgarian Part of Hadzhidimovo Gorge (South-Western Bulgaria). *Ecologia Balkanica,* 11(1): 17-26.

Pulev, A. (2016) *Zoogeographical subdivision of Bulgaria based on the distribution of herpetofauna*. Autoreferat of PhD thesis, South-West University Neofit Rilski, Blagoevgrad, 41 pp. (in Bulgarian, English summary)

Pulev, A., Domozetski, L., Sakelarieva, L. & Manolev, G. (2018a) Distribution of the Eurasian Blind Snake *Xerotyphlops vermicularis* (Merrem, 1820) (Reptilia: Typhlopidae) in South-western Bulgaria and its Zoogeographical Significance. *Acta Zoologica Bulgarica*, Supplementum 12: 41-49.

Pulev, A., Naumov, B., Sakelarieva, L., Manolev, G. & Domozetski, L. (2018b) Distribution and Seasonal Activity of Eastern Montpellier Snake *Malpolon insignitus* (Geoffroy Saint-Hilaire, 1827) (Reptilia: Psammophiidae) in South-western Bulgaria. *Acta Zoologica Bulgarica*, Supplementum 12: 51-58.

Stojanov, A., Tzankov, N. & Naumov, B. (2011) *Die Amphibien und Reptilien Bulgariens*. Chimaira, Frankfurt am Main, 588 pp.

Undjian, E. (2000) *Die Lurche und Kriechtiere des Lomtales und des Naturparkes „Russenski Lom", Bezirke Russe und Razgrad Nordostbulgarien.* NP „Russenski Lom", Russe, 88 pp. (in Bulgarian, German summary)

Vitt, L. J. & Caldwell, J. P. (2014) *Herpetology: An Introductory Biology of Amphibians and Reptiles: Fourth Edition*. Academic Press is an imprint of Elsevier, 757 pp.