

Distribution and Seasonal Activity of Eastern Montpellier Snake *Malpolon insignitus* (Geoffroy Saint-Hilaire, 1827) (Reptilia: Psammophiidae) in South-western Bulgaria

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Abstract: The study aims at supplementing and summarizing data about the spread and seasonal activity of the Eastern Montpellier Snake (*Malpolon insignitus*) in south-western Bulgaria. Many new localities have been recorded in this part of the country. The distribution of the species in the Struma River valley has been specified. Northwards, it occurs throughout Oranovo Gorge. The highest altitude locality in the country has been recorded (820 m). The largest specimen of *Malpolon insignitus* in Bulgaria, with a total length of 167 cm, has been registered. An attempt has been made to characterize the species activity during the year in south-western Bulgaria. For the first time, a winter activity of the species in the country has been recorded (14 February 2016).

Key words: *Malpolon insignitus fuscus*, distribution, high altitude, large specimen, winter activity, SW Bulgaria.

Introduction

The Eastern Montpellier Snake *Malpolon insignitus* (Geoffroy Saint-Hilaire, 1827) is one of the two species representing the family Psammophiidae in Europe. The range of the species includes SE Europe, SW Asia and N Africa: N Italy, Croatia (including some islands), Bosnia-Herzegovina, Montenegro, Albania, Macedonia, S Bulgaria, Cyprus, Turkey, Greece (including many islands), Armenia, Azerbaijan, SW Russia, N Iraq, Iran, E Morocco, Algeria, Tunisia, N Libya, N Sudan, N Egypt, Israel, Jordan, Lebanon and S Syria (WALLACH et al. 2014). The subspecies *Malpolon insignitus fuscus* (Fleischmann, 1831) occurs in the northern part of the range (including the Balkans). The species is distributed in the southern part of the country: the valleys of Struma and Mesta rivers in south-western Bulgaria, the eastern Rhodope

Mts., the valleys of Maritsa and Tundzha rivers, Derventski heights, Strandzha Mts., the southern Black Sea coast (BESHKOV & NANEV 2002, NAUMOV 2007a, STOJANOV et al. 2011, DOMOZETSKI 2013, BALEJ & JABLONSKI 2006-2017).

The Eastern Montpellier Snake was recorded relatively late from the territory of south-western Bulgaria, only in 1960, being the latest recorded snake of the local herpetofauna. Data about its distribution in this part of the country are reported by BESHKOV (1961, 1964, 1974), BESHKOV & NANKINOV (1979), BESHKOV & GERASIMOV (1980), BESHKOV & DUSHKOV (1981), KANTARDZHIEV (1992), BISERKOV (1995), PETROV & BESHKOV (2001), DOMOZETSKI (2013), TZANKOV et al. (2013), PULEV et al. (2014), POPGEORGIEV et al. (2016) and BALEJ & JABLONSKI (2006-2017). The northern boundary of the species

range in the Struma River valley spreads to Kresna Gorge (PETROV & BESHKOV 2001) or to the town of Simitli (BESHKOV 1974, BESHKOV & NANEV 2002).

Various data about the altitudinal distribution of the Eastern Montpellier Snake in Bulgaria were reported: up to about 425 m (BESHKOV & NANEV 2002), up to about 500 m (NAUMOV 2007a), up to about 700 m (STOJANOV et al. 2011, DOMOZETSKI 2013).

The longest specimen of *M. insignitus* found in Bulgaria so far was 156.8 cm (BESHKOV & NANEV 2002). It is considered, that in the territory of the country the species is active from late March or early April to mid or late October (STOJANOV et al. 2011).

The aim of the study is to supplement and summarize data about the distribution and the seasonal activity patterns of *M. insignitus* in south-western Bulgaria.

Materials and Methods

The species was registered during herpetological surveys (field trips) conducted in south-western Bulgaria, mainly in the Struma River basin south of the town of Blagoevgrad, and in the Mesta River basin south of the town of Gotse Delchev, from 1988 to 2017. These parts of the country have specific climate conditions influenced by the Mediterranean Sea. The observations have been made in different seasons, day and night, in different weather conditions. Active and dead specimens and shed skins have been recorded as well as specimens hidden in their shelters. The latter have been sought by turning stones, trunks, building waste, etc. The specimens killed on the road passing through the Kresna Gorge (E79) were registered every week from the beginning of March to the end of November 2003 (a total of 39 weeks). The vast majority of the road-killed and all dead (killed by people) specimens found were fresh and killed dead within 24 hours. Some of the specimens were road-killed more than 24 hours prior to their registration. All alive, road-killed and dead specimens have been included in the analysis of the seasonal activity pattern (without the shed skins).

Most of the new records have been done by the authors of the paper: A. Pulev [AP], B. Naumov [BN], L. Sakelarieva [LS], G. Manolev [GM], L. Domožetski [LD]. Some of the data have been collected separately or in collaboration with the authors by other biologists, ecologists and geographers: Nevena Malakova [NM], Lilia Philipova [LPh], Nelina Alexieva [NA], Rayka Ivanova [RI], Boris Nikolov [BNi], Maria Naumova [MN], Bogoljub Sterijovski [BS], Hristo Peshev [HP], Atanas Grozdanov [AG], Krasimir Donchev [KD], Martin

Stanchev [MS], Nikolay Karaivanov [NK], Mario Langourov [ML]. Data on geographic coordinates and altitude of the localities, time of observation, and the observed individuals have been collected. The sex of the specimens has not been recorded due to the impossibility to be determined in the majority of cases (the specimens have not been captured, the poor condition of the road-killed specimens).

The collection of the Regional Historical Museum in the city of Blagoevgrad (RHMB) was also inspected. All data are summarized in tables and the localities are marked on a map.

Results

The total number of the localities of *M. insignitus* that have been registered in south-western Bulgaria until now is 72; 25 of them are published (Table 1, Fig. 1) and 47 are reported now (Table 2, Fig. 1). There are only three known records of the species in two localities from the Mesta River basin (Table 1, Fig. 1). All the other records are from the basin of Struma River. All published (23) and most of the new localities (40) are south of the town of Simitli. For the first time, the species has been registered north of this town in 7 localities (Table 2, Fig. 1).

The altitudinal distribution of the new records is from 87 to 820 m. The highest locality is situated 1400 m northeast of the village of Gorna Breznitsa (Table 2). It is an open place with xerothermic shrubs and grasses and it is the highest locality reported for the country. Most of the records are from sites at altitudes less than 300 m.

The number of the new specimens recorded is 49, including 4 shed skins (Table 2). Half of the individuals have been found road-killed (20) or dead (4). The largest specimen of *M. insignitus* in Bulgaria with a total length of 167 cm has been registered in Oranovo Gorge (on the road E79, 70 m south of Tserovski Rid ridge tunnel).

In total, 76 specimens (live, road-killed or dead published and new records) have been included in the analysis of the seasonal activity pattern. Most of the records are from May and June but specimens have been registered from February until November (Fig. 2). For the first time, a winter activity of the species in the country was recorded 450 m east/northeast of Oranovo residential area, the town of Simitli on 14.02.2016 (Table 2, Fig. 2). A freshly killed adult individual was found in dry, sunny and warm weather (maximum daytime air temperature in the region was + 19.5°C). The latest records in autumn were of two specimens (freshly road-killed) found in the beginning of November (03.11.2003).

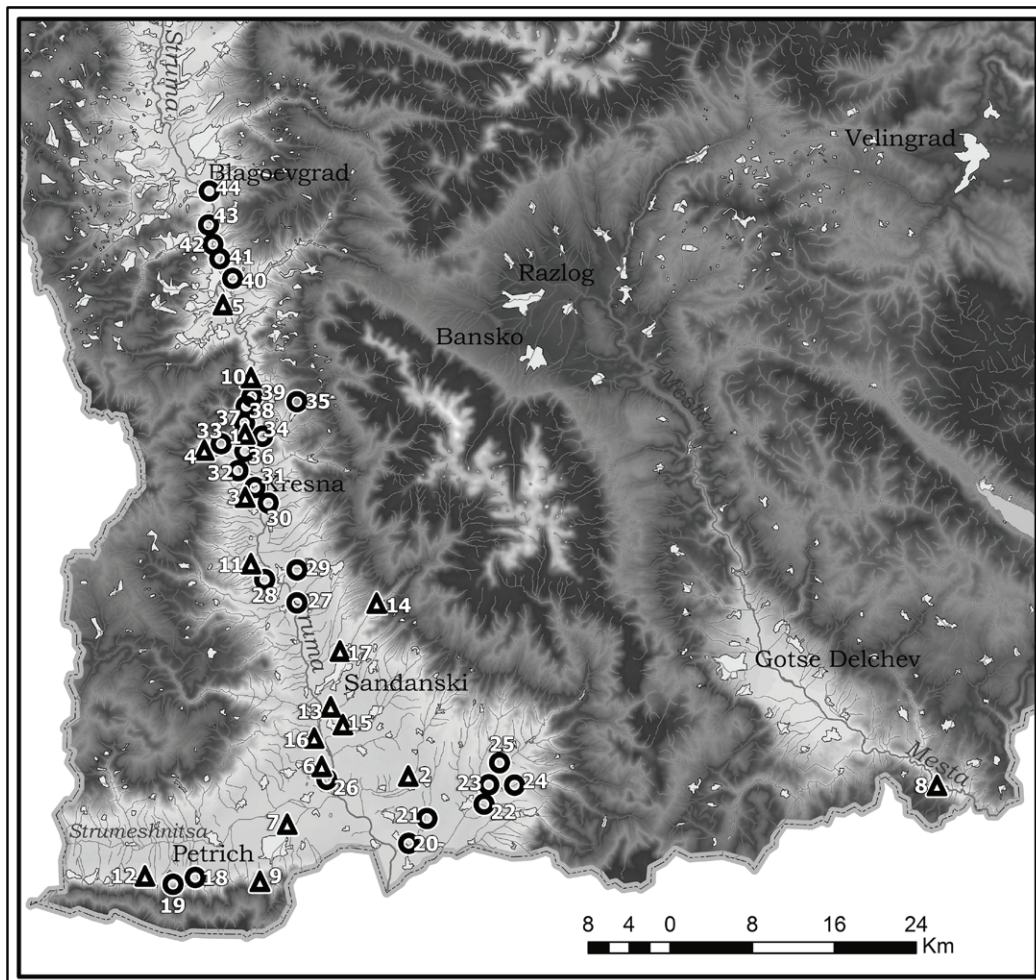


Fig. 1. Distribution of *Malpolon insignitus* (Geoffroy Saint-Hilaire, 1827) in south-western Bulgaria: Δ – published localities; \circ – new localities.

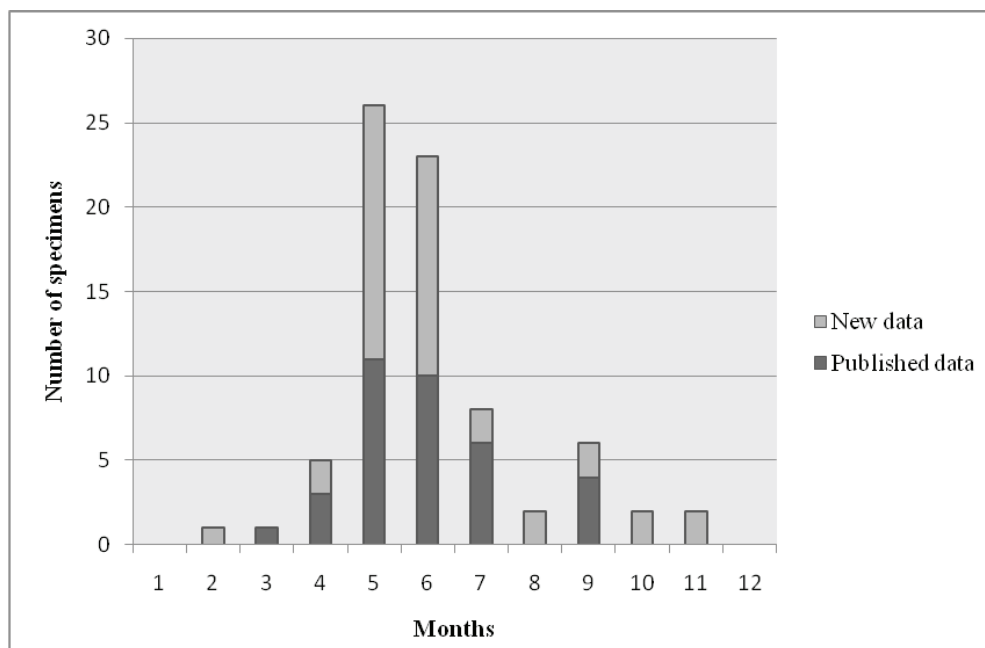


Fig. 2. Number of observations per month of *Malpolon insignitus* (Geoffroy Saint-Hilaire, 1827) recorded in the basins of Struma and Mesta Rivers, south-western Bulgaria.

Table 1. Published records of *Malpolon insignitus* (Geoffroy Saint-Hilaire, 1827) from south-western Bulgaria.

No.	Locality	Altitude (m a.s.l.)	Time of observation	Specimens observed	Data source	No. in Fig. 1
1	Western slope of Kresna Gorge, on the road, 5000 m north of the town of Kresna		17.06.1960		BESHKOV (1961)	1
2	Petrich-Sandanski kettle		04.1964	several	BESHKOV (1964)	
3	Near the village of Kapatovo		15.04.1964	1	BESHKOV (1964)	2
4	Right bank of Struma River, at the southern outskirts of the town of Kresna		No data	1	BESHKOV (1974)	3
5	At the southeastern outskirts of the village of Gorna Breznitsa		No data	1	BESHKOV (1974)	4
6	Next to Breznishka Reka stream, north-west of the village of Gorna Breznitsa		No data	1	BESHKOV (1974)	4
7	Right bank of Struma river, opposite the mouth of Sheytan Dere (Dyavolska Reka) River		No data	1	BESHKOV (1974)	1
8	Kresna Gorge, Gabrovitsa area		No data	1	BESHKOV (1974)	1
9	Near the southern part of the town of Simitli	280	16.07.1971	1	BESHKOV (1974)	5
10	Maleshevska Planina Mts.		May	3	BESHKOV & NANKINOV (1979), BESHKOV & GERASIMOV (1980), BESHKOV & DUSHKOV (1981)	
			June	5		
			July	2		
11	North-eastern slope of Kozhuh Volcanic Ridge		No data		KANTARDZHIEV (1992)	6
12	Rupite area, opposite the north-eastern slope of Kozhuh Volcanic Ridge		No data		KANTARDZHIEV (1992)	6
13	Near the town of Petrich		No data	3	BISERKOV (1995)	7
14	Kresna Gorge		No data		PETROV & BESHKOV (2001)	
15	Right bank of Mesta River, northeast of the village of Beslen	443	07.09.2012	1 juv.	DOMOZETSKI (2013)	8
16	In the village of Beslen	704	08.09.2012	1 juv.	DOMOZETSKI (2013)	8
		642	08.09.2012	1 shed skin (subad.)	DOMOZETSKI (2013)	
17	The northern slopes of Belasitsa Mts. near Belasitsa Hut	692	18.07.2012	1 juv.	DOMOZETSKI (2013)	9
18	Maleshevska Planina Mts., Kresna Gorge (N41°48'52.51" E23°09'26.58")	268	No data		TZANKOV et al. (2013)	10
19	Southeast of the village of Kamenitsa	180	11.08.2003	1 shed skin	PULEV et al.(2014)	11
			03.09.2004	1 ad. dead	PULEV et al. (2014)	
			08.05.2010	1 ad.	PULEV et al. (2014)	
20	Northeast of the village of Yavornitsa, on the road		03.06.2009	1 ad.	POPGEORGIEV et al. (2016)	12
21	Near the village of Damyanitsa	100	15.09.2007	1 subad. road-killed	BALEJ & JABLONSKI (2006-2017)	13
		120	21.05.2013	1 ad. road-killed	BALEJ & JABLONSKI (2006-2017)	
22	Near the village of Lilyanovo	450	26.03.2005	1 male	BALEJ & JABLONSKI (2006-2017)	14
		490	23.05.2013	1 juv.	BALEJ & JABLONSKI (2006-2017)	
		420	22.05.2013	1 road-killed	BALEJ & JABLONSKI (2006-2017)	
23	Near the village of Novo Delchevo		19.06.2012	2 road-killed	BALEJ & JABLONSKI (2006-2017)	15
			21.06.2012			
			19.06.2012	1 dead	BALEJ & JABLONSKI (2006-2017)	
24	Near the village of Ribnik		05.05.2015	2 road-killed	BALEJ & JABLONSKI (2006-2017)	16
			07.05.2015			
25	Near the town of Sandanski	300	25.07.2011	1 ad. road-killed	BALEJ & JABLONSKI (2006-2017)	17
		140	27.07.2011	1 ad. road-killed	BALEJ & JABLONSKI (2006-2017)	
		350	22.05.2013	1 juv. road-killed, 1 dead	BALEJ & JABLONSKI (2006-2017)	

Table 2. Unpublished and new records of *Malpolon insignitus* (Geoffroy Saint-Hilaire, 1827) in south-western Bulgaria.

No.	Locality	Geographic coordinates	Altitude (m a.s.l.)	Time of observation	Specimens observed	No. in Fig. 1
1	Near the village of Kolarovo, museum number RHMB 7.3/4. 68 (collected by A. Avramov)			10.04.1984	1 ad.	18
2	Belasitsa Mts., south of the village of Samuilovo, on a dirt road [AP, NM, LPh, NA]	N41°21'46" E23°05'14"	532	09.06.2014 2:30 pm	1 ad., road-killed*	19
3	The exit of the village of Chuchuligovo towards the village of Dolno Spanchevo [AP, LS, KS, MI]	N41°24'14" E23°21'43"	87	04.05.2017 5:55 pm	1 ad., road-killed	20
4	The exit of the village of Dolno Spanchevo towards the village of Vrania [AP, LS, KS, MI]	N41°25'28" E23°22'53"	129	04.05.2017 5:45 pm	1 subad., road-killed	21
5	On the road, 370 m from the village of Dolno Spanchevo towards the village of Vrania [ML]	N41°25'36" E23°22'57"	130	03.06.2003	1 ad., road-killed	21
6	On the road, 1160 m from the village of Katuntsi towards the village of Yanovo [AP, LS, KS, MI]	N41°26'28" E23°26'54"	230	04.05.2017 4:50 pm	1 ad., road-killed	22
7	On the road, 950 m after the road fork to the village of Kalimantsi [BN, MN]	N41°27'26" E23°27'08"	204	04.05.2003 3:20 pm	1 ad.	23
8	St. Ilia hill, 280 m east/southeast of the village of Kalimantsi [BN, MN, MS]	N41°27'30" E23°28'55"	339	09.05.2002	1 subad.	24
9	Near the road fork to the village of Chereshnitsa [ML]	N41°28'34" E23°27'50"	231	05.07.2009	1 ad.	25
10	On the road, 300 m from the village of Kromidovo towards the village of Harsovo [ML]	N41°27'34" E23°22'06"	200	14.05.2008	1 ad., road-killed	2
11	Rupite area, 190 m northwest of a railway bridge over an irrigation canal [AP]	N41°27'15" E23°15'55"	87	23.09.2003 7:05 pm	1 subad.	26
12	Rupite area, 200 m south of St. Petka of Bulgaria church complex, next to an irrigation canal [LD]	N41°27'25" E23°15'53"	87	03.06.2013 10:00 am	1 subad.	26
13	Northeastern slope of Kozhuh volcanic ridge [LD]	N41°27'49" E23°15'36"	122	03.06.2013 11:30 am	1 ad.	6
14	The foot of the northwestern slope of Kozhuh volcanic ridge [BN, MS]	N41°27'51" E23°15'14"	127	1989	1 ad.	6
15	Next to the main road E79, 600 m north/northwest of the road fork to the village of Ploski [LD]	N41°36'37" E23°13'22"	119	14.10.2012 4:30 pm	1 ad. dead	27
16	Next to the road E79, 1390 m north/northwest of the road fork to the village of Ploski [MN, MS]	N41°37'02" E23°13'12"	132	29.05.2017 7:30 pm	1 ad.	27
17	On the road, 1000 m northwest of the village of Mikrevo [LD]	N41°38'04" E23°11'01"	129	08.05.2010 3:05 pm	1 ad. dead	28
18	Between the villages of Strumyani and Ilindentsi, near the ruins of the Prehistoric settlement Ilindentsi-Masovets [RI]	N41°38'40" E23°13'10"	243	15.06.2014 1:40 pm	1 subad. dead	29
19	The foot of the southern slope of Melo ridge, 700 m southeast of Kresna railway station [AP, GM]	N41°42'30" E23°10'51"	179	11.08.2013	1 shed skin (ad.)	30
20	South of Melo ridge, 1100 m east of Kresna railway station [AP, GM]	N41°42'37" E23°11'12"	224	11.08.2013	1 shed skin (ad.)	30
21	The eastern outskirts of the town of Kresna, the foot of the southwestern slope of Melo ridge [BN]	N41°43'14" E23°10'22"	198	1990	1 subad.	31
22	The northwestern outskirts of the town of Kresna, on the road towards the village of Gorna Breznitsa [LD]	N41°43'56" E23°08'49"	215	26.08.2013 4:45 pm	1 juv., road-killed	32
23	1400 m northeast of the village of Gorna Breznitsa [BNi]	N41°45'20" E23°07'40"	820	25.05.2014 9:20 am	1 juv.	33
24	On the road, 2880 m after the road fork to the village of Stara Kresna [ML]	N41°45'42" E23°09'59"	418	03.06.2003	1 ad., road-killed	34
25	On the road, 3300 m after the road fork to the village of Stara Kresna [LD]	N41°45'49" E23°10'13"	452	01.07.2014 7:25 pm	1 ad., road-killed	34
26	180 m north of Rusentsi neighbourhood, the village of Oshtava [BN]	N41°47'51" E23°12'38"	734	03.09.2008	1 shed skin (ad.)	35
27	On the road E79, 330 m north of Peyo Yavorov railway station [AP, RI]	N41°45'09" E23°09'09"	198	03.11.2003 12:40 pm	1 juv., road-killed	36
28	500 m north/northeast of Peyo Yavorov railway station [AP, LD]	N41°45'15" E23°09'21"	276	11.05.2003 5:05 pm	1 ad.	36

Table 2. Continuation.

29	Kresna Gorge, Gabrovitsa area, 390 m north of the road fork to the village of Stara Kresna [BN, MN, BS]	N41°46'05" E23°09'09"	217	25.05.2002	1 shed skin (ad.)	1
30	Kresna Gorge, left valley slope of Divilsko Dere stream, 930 m west/southwest of Kresna inn [GM]	N41°46'51" E23°08'40"	401	1994	1 ad.	37
31	Kresna Gorge, 550 m south/southwest of Kresna inn [BN, MN]	N41°46'41" E23°09'15"	223	29.04.1997 11:50 am	1 juv.	37
32	Kresna Gorge, 410 m south/southwest of Kresna inn [HP, AG]	N41°46'46" E23°09'14"	240	19.06.2016 11:45 am	1 ad.	37
33	Kresna Gorge, 310 m south/southwest of Kresna inn [BN]	N41°46'49" E23°09'15"	242	23.05.1999 08:55 am	1 ad.	37
	Same locality [BN]			07.05.1998	1 ad.	
	Same locality [BN]			09.05.1998 5:10 pm	1 ad.	
34	Kresna Gorge, 240 m south of Kresna inn [BN, KD]	N41°46'51" E23°09'18"	225	13.05.2014 12:15 pm	1 ad.	37
35	Kresna Gorge, 180 m south of Kresna inn [BN, MS]	N41°46'53" E23°09'18"	231	10.08.1992 7:10 pm	1 ad.	37
36	Kresna Gorge, next to the road E79, 930 m north of Kresna inn [BN, MS]	N41°47'25" E23°09'23"	258	1988	1 ad.	38
37	370 m southwest of Stara Kresna railway station [NK]	N41°48'07" E23°09'38"	256	05.06.2014 10:40 am	1 ad., road-killed	39
38	Kresna Gorge, 280 m north/northwest of Stara Kresna railway station, on the road E79 [AP, RI]	N41°48'24" E23°09'44"	262	23.06.2003 10:30 am	1 subad., road-killed	39
39	Kresna Gorge, on the road E79, 280 m northwest of the petrol station [AP, RI]	N41°48'54" E23°09'26"	269	03.11.2003 9:45 am	1 juv., road-killed	10
40	On the road E79, 1500 m south of the town of Simitli, next to a bridge over Struma river [AP, NM, LPh, NA]	N41°52'28" E23°07'19"	294	10.06.2014 7:40 pm	1 ad., road-killed	5
41	450 m east/northeast of Oranovo residential area, the town of Simitli [LD]	N41°53'45" E23°07'57"	390	14.02.2016 6:20 pm	1 ad. dead	40
42	Oranovo Gorge, on the road E79, about 2000 m north of the town of Simitli [AP, NM, LPh, NA]	N41°54'48" E23°07'00"	303	10.06.2014 7:55 pm	1 subad., road-killed*	41
43	On the road, 510 m from the village of Zheleznitsa towards the town of Simitli [GM]	N41°55'04" E23°06'51"	309	21.05.2017 2:15 pm	1 ad., road-killed	42
44	Oranovo Gorge, on the road E79, about 300 m south-east of the village of Zheleznitsa [AP, GM]	N41°55'16" E23°06'48"	304	13.09.2015 5:20 pm	1 ad., road-killed*	42
45	Oranovo Gorge, on the road E79, 250 m south of Tserovski Rid ridge tunnel [AP, LD, GM]	N41°55'55" E23°06'13"	308	30.06.2014 10:30 pm	1 subad., road-killed*	43
46	Oranovo Gorge, on the road E79, 70 m south of Tserovski Rid ridge tunnel [AP, NM, LPh, NA]	N41°56'01" E23°06'12"	318	10.06.2014 8:05 pm	1 ad. (L 167 cm), road-killed	43
47	Oranovo Gorge, 480 m south of Blagoevgrad electrical substation, on the road E79 [AP, GM]	N41°57'35" E23°06'13"	317	29.10.2015 2:30 pm	1 ad., road-killed	44

*specimens killed on the road more than 24 hours prior to the registration

Discussion

The new distributional data show that *M. insignitus* occurs north of the town of Simitli in the basin of Struma River. Its range extends to the northern part of Oranovo Gorge.

It is considered that the numbers and densities of the populations of the Eastern Montpellier Snake in the Struma River valley have increased visibly over the last 3-4 decades of the 20th Century, and the probable reason for this is the human activity (loss of forest areas, increase of eroded land, depopulation of villages) and possibly the global warming and

drought (BESHKOV 1993a, BESHKOV & NANEV 2002). According to PETROV (2007), the increased population density is due to the aggressive behaviour and adaptability of *M. insignitus* and that probably leads to enlargement of its range. However, it is difficult to accept that the species could penetrate so quickly northward throughout Oranovo Gorge. The more likely explanation is that the Eastern Montpellier Snake has not been sought intentionally north of the town of Simitli. This species is rather cautious, moves very fast and it is difficult for live specimens to be recorded. The snake is found as roadkill much more often than other snakes inhabiting the same areas (BESHKOV

& NANEV 2002, SPEYBROECK et al. 2016). According to SPEYBROECK et al. (2016), this is due to the species active foraging strategies. As traffic intensifies, the number of road-killed specimens will increase.

Most of the other reptile species also occur in the territory of Southwest Bulgaria at a higher altitude compared to other parts of the country. Such taxa are *Testudo hermanni boettgeri* Mojsisovics, 1889 (1450 m, BESHKOV & NANEV 2002), *Testudo graeca ibera* Pallas, 1814 (1300 m, BESHKOV 1961), *Emys orbicularis orbicularis* (L., 1758) (1100 m, BESHKOV & NANEV 2002), *Mediodactylus kotschyii bibroni* (Beutler & Gruber, 1977) (880 m, N41°58'08" E23°13'00", unpublished data by Vladislav Ivanov), *Lacerta viridis viridis* (Laurenti, 1768) (1800 m, TZANKOV 2007a), *Lacerta trilineata* Bedriaga, 1886 (550 m, TZANKOV 2007b), *Lacerta agilis bosnica* Schreiber, 1912 (2800 m, TZANKOV 2007c), *Zootoca vivipara vivipara* (Lichtenstein, 1823) (2900 m, BURESCH & ZONKOV 1933), *Podarcis tauricus* (Pallas, 1814) (1219 m, N41°55'35" E22°55'11", unpublished data by A. Pulev, L. Sakelarieva, G. Manolev and N. Malakova), *Podarcis erhardii riveti* (Chabanaud, 1919) (1600 m, BESHKOV 1961), *Podarcis muralis muralis* (Laurenti, 1768) (2150 m, STOJANOV et al. 2011), *Ablepharus kitaibelii kitaibelii* (Bibron & Bory de Saint-Vincent, 1833) (1550 m, TZANKOV 2007d), *Anguis fragilis* L., 1758 (2114 m, TZANKOV et al. 2014), *Xerotyphlops vermicularis* (Merrem, 1820) (500 m, NAUMOV 2007b, STOJANOV et al. 2011), *Eryx jaculus turcicus* (Olivier, 1801) (500 m, NAUMOV 2007c, STOJANOV et al. 2011), *Natrix tessellata* (Laurenti, 1768) (1420 m, TZANKOV et al. 2011), *Dolichophis caspius caspius* (Gmelin, 1789) (1580 m, BESHKOV 1974), *Platyceps najadum dahlii* (Fitzinger, 1826) (900 m, NAUMOV et al. 2007), *Zamenis longissimus* (Laurenti, 1768) (2000 m, BURESCH & ZONKOV 1934), *Coronella austriaca austriaca* Laurenti, 1768 (2200 m, CYRÉN 1941), *Telescopus fallax fallax* (Fleischmann, 1831) (700 m, BESHKOV & NANEV 2002), *Vipera berus bosniensis* Boettger, 1889 (2700 m, BURESCH & ZONKOV 1934), *Vipera ammodytes montandoni* Boulenger, 1904 (1900 m, STOJANOV et al. 2011). The higher altitudinal distribution can be explained by the fact that south-western Bulgaria is the warmest part of the country (being under the strongest climatic influence of the Aegean Sea) as well as with great difference in altitude.

The seasonal activity data correspond to those reported by STOJANOV et al. (2011) about the species activity on the territory of the country as well as to the data published so far on south-western Bulgaria. As with other reptiles occurring in the country, the most active period is spring and early summer, which is related to the breeding behaviour. Due to the relatively

small total number of observations, it cannot be categorically asserted that there is a temporary decrease in activity in August.

The cases of winter activity (December, January or February) of snakes in Bulgaria are extremely rare. Up to now, activity during the winter months on the territory of the country has been registered in four species of snakes (out of 19). Several records of *Dolichophis caspius* are reported. The species was observed in the vicinity of the town of Septemvri on 18.12.1930 (BURESCH & ZONKOV 1934), and near the village of Lakatnik on 02.02.1955 (BESHKOV 1964). Winter activity of single specimens of *D. caspius* in very hot and sunny days was reported by BESHKOV (1977) without specifying the locations and the time of observations. Later, BESHKOV & NANEV (2002) reported activity of individual specimens of *D. caspius* in February, again without specific locations. *Vipera ammodytes* (L., 1758) was registered in the surroundings of the city of Blagoevgrad on 04.02.1932 (BURESCH & ZONKOV 1934). BESHKOV (1977) reported winter activity of single specimens of *V. ammodytes* on very hot and sunny days, without specifying locations and time of observations. Again, BESHKOV (1993b) published activity at the end of winter of individual specimens of *V. ammodytes* during long warm periods at noon hours on quiet sunny days (near the village of Lakatnik, 16.02.1958, near the village of Cheparlinti, 18.02.1976, and in the southern part of Kresna Gorge, 27.02.1977). STOJANOV et al. (2011) reported records of winter activity of *Telescopus fallax* from Kozhuh Volcanic Ridge on 20.12.1980 and on 13.12.1981. *Natrix tessellata* was observed only once in winter near Cherepish Monastery on 04.12.1924 (BURESCH & ZONKOV 1934).

So far, no activity of the Eastern Montpellier Snake has been recorded in the winter in Bulgaria. It can be determined as unusual. The observed case of such activity is most likely due to the unusually high temperatures in February 2016. After the 7th of February the weather started warming up. It was sunny, with transfer of warm air from the south – south-west. Most probably this case of activity is an exception, and the interruption of hibernation is not a part of the species behavioural survival strategy in winter in the territory of Bulgaria. Similar single observations can be expected at the beginning and the end of winter at unusually high temperatures.

Acknowledgements: We are grateful to Van Wallach (Harvard University, United States) and Sofia Kostadinova-Ilkova (Bela-sitsa Nature Park Directorate, Bulgaria) for providing some literature sources. We thank all the colleagues who have provided data based on their personal observations.

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Received 18.07.2017

Accepted 10.12.2017