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On the occurrence of the Italian Aesculapian snake, *Zamenis lineatus* (Camerano, 1891), in Latium (Central Italy)

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Abstract. In this note we report the first detailed notice of the presence of the Italian Aesculapian snake, *Zamenis lineatus*, in Latium region. The localities of Morolo (province of Frosinone) and Latina Scalo (province of Latina) represent respectively the new northern and the new western limits of the species. The first one is 68 km further north compared to the old one (Pannarano, Campania region), whereas the western one is 130 km far from the previous one (Roccarainola, Campania region).

Keywords. Snakes, *Zamenis lineatus*, distribution, Central Italy.

The formerly *Elaphe longissima* Laurenti, 1768 has been splitted into two species by Lenk and Wüster (1999), who used multivariate analyses of external morphological characters and colour pattern. The Aesculapian snake, *Zamenis longissimus* (Laurenti, 1768), and the Italian Aesculapian snake, *Z. lineatus* (Camerano, 1891), are distinguishable using external morphological characters (Lenk and Wüster, 1999), molecular data (Lenk et al., 2001; Utiger et al., 2002), differences in the blood proteins (Lenk and Joger, 1994), visceral organ topography, osteology and allozymes (Helfenberger, 2001). The Italian Aesculapian snake is endemic to the southern Italian peninsula and Sicily, and its occurrence in Sardinia needs to be confirmed (see Razzetti and Zanghellini, 2006).

Lenk and Wüster (1999) indicated the northern limit of *Z. lineatus* near Pannarano (province of Benevento, Campania region, southern Italy), and they established the southern limit of *Z. longissimus* near Rosello (province of Chieti, Abruzzi, Central Italy; see also Razzetti and Zanghellini, 2006). However, recently, Capula et al. (2006) revised the distribution of both species in Italy considering the Campania region as a parapatric contact area and suggesting analogous pattern for Apulia region where they recorded *Z. longissimus* for the first time. Consequently the distribution range of the Aesculapian snake was

wider than that previously suggested (Lenk and Wüster, 1999), and in some areas there appears to be sympatry between the two species.

The most evident character with which we can tell the two species apart is their iris colour: reddish in *Z. lineatus* and brown, yellowish or greyish in *Z. longissimus* (Schulz, 1995; Lenk and Wüster, 1999). By analysing our old pictures of Aesculapian snakes and by using this diagnostic character, we realized that during our previous field researches on the Volsci Chain Mountains (Latium region) we had found both the species (e.g., Corsetti and Capula, 1992; Corsetti, 2006a; Corsetti and Romano, 2007; Romano et al., 2007). The southern parts of this Chain comprises three karstic subgroups: the Lepini, the Ausoni and the Aurunci Mountains (see Corsetti and Romano, 2007 and Romano et al., 2007, and references therein for detailed information about the boundaries among the three subgroups). While distribution of *Zamenis longissimus* in Latium is largely known (e.g., Cattaneo and Capula, 2000), there are no accurate data on the occurrence of *Z. lineatus* in this region. Actually, just a popular book (Corsetti, 2006b) and a recent paper (Capula et al., 2008) reported some information on the occurrence of *Z. lineatus* in southern Latium. Corsetti (2006b) reported the occurrence of both *Z. lineatus* and *Z. longissimus* on the Lepini Mountains, while Capula et al. (2008) reported that *Z. lineatus* was present in the Ausoni and Aurunci, however without providing any detailed locality.

Here we provide accurate records of the presence of both species in the entire Volsci Chain. Italian Aesculapian snakes were observed in 7 locations, two as road kills and the others as living snakes (Table 1 and Fig. 1). The dead individual from site 3 was collected, stored in ethanol and deposited in the collection of the Museo Civico di Storia Naturale di Carmagnola, Italy (voucher MCC-R1407). It was a male 131.5 cm long, with

Table 1. Records of *Zamenis lineatus* on the Volsci chain, Latium, Central Italy. Records with "*" were road-killed snakes. The specimen from site 3 was deposited in the collection of the Museo Civico di Storia Naturale di Carmagnola, Italy (voucher MCC-R1407).

Site code	Site locality, municipality and province	Subgroup of the Volsci Chain Mountain	Altitude (m a.s.l.)	UTM	Observation date	Photo	sex
1	Morolo, Morolo, Frosinone	Lepini	450	UG41	24.05.1981	+	Male
2	Latina scalo, Latina, Latina	Lepini	15	UG30	27.09.1987	+	Juv.
3	Camposoriano, Terracina, Latina	Ausoni	360	UF58	05.08.2004	+	Male*
4	La Taverna, Campodimele, Latina	Aurunci	390	UF87	13.06.2000	+	Juv.*
5	Lombriccio, Formia, Latina	Aurunci	330	UF87	15.06.2004	-	Male
6	Cerretello, Esperia, Frosinone	Aurunci	825	UF98	18.05.2000	+	Undet.
7	Campolaloa, Itri, Latina	Aurunci	260	UF66	23.05.2008	+	Undet.

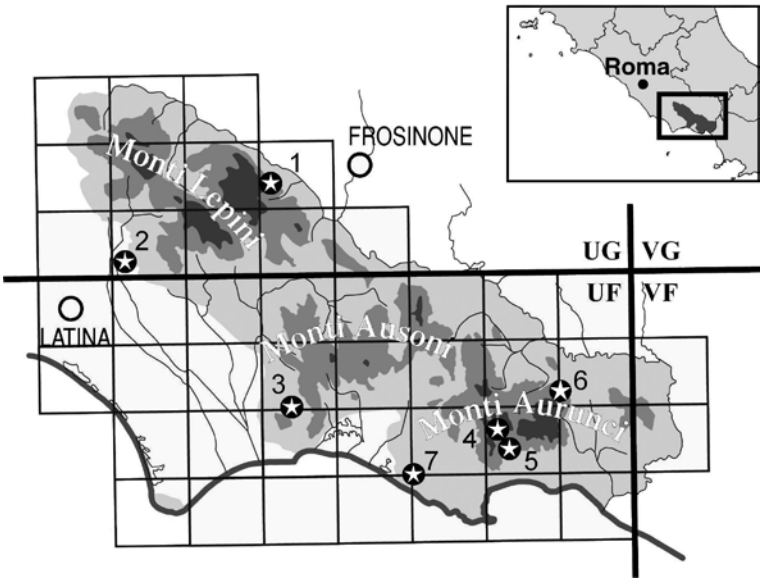

Fig. 1. Records of *Zamenis lineatus* (stars) on the Volsci Mountains (Latium, Central Italy). Numeric code as reported in Table 1. 10x10 km UTM grid is also shown.

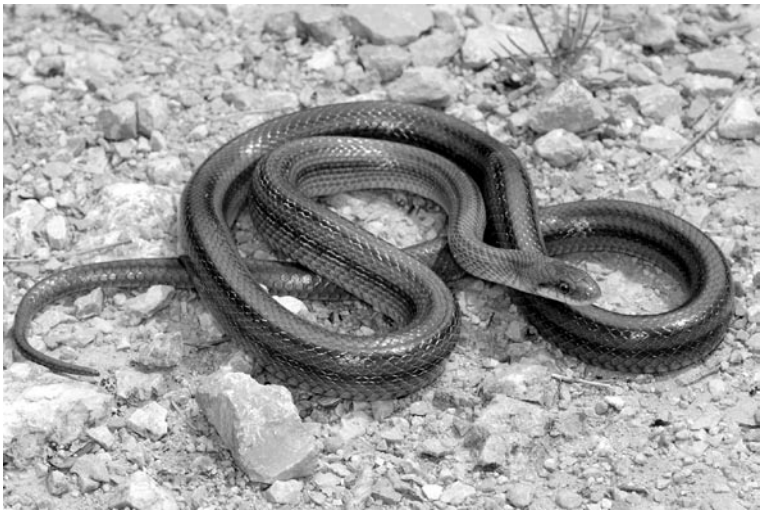

Fig. 2. Adult of Italian Aesculapian snake, *Zamenis lineatus*, from Ausoni Mountains (Latium, Central Italy). This specimen has been observed in the site 7 (see the text). Photo courtesy of Paolo Mazzei.

23 dorsal scales (at mid-body), 235 ventral scales and 72 pairs of subcaudal scales. In the other cases the snakes were always captured, sexed (except two) and photographed (with one exception; see Tab.1). All living snakes were immediately released after biometrical recordings.

The site 1 (UTM 33T 0349800, 4610000 WGS84) and 2 (UTM 33T 0328700, 4600000 WGS84) here reported are the present northern and western limits of *Z. lineatus*. On the basis of the present data, the species range appears wider than that known up to now (Capula et al., 2006; Capula et al., 2008). Indeed the northern limit extends 68 km further from the previous accurate record (Pannarano, Campania region; see Lenk and Wüster, 1999), while the new western limit extends 130 km further from the previous limit (Roccarainola, Campania region; Lenk and Wüster, 1999). Actually, available information on the findings of Italian Aesculapian snakes in Corsetti (2006b) and in Capula et al. (2008) is too vague both for a calculation of their distance from the sites of Pannarano and Roccarainola reported in Lenk and Wüster (1999), and for an accurate knowledge of the species distribution.

The Italian Aesculapian snake was recorded in two of the three administrative provinces in which the Volsci Chain falls, namely the province of Latina (LT) and Frosinone (FR), while no data are available for the portion of Lepini mountains which falls in the province of Rome. However, the administrative boundary of the province of Rome is only 3.4 km far from the site 1. Consequently the occurrence of *Z. lineatus* in the province of Rome is very likely.

As a consequence of these new findings in Latium, the parapatric area between *Z. longissimus* and *Z. lineatus* is wider than the previously known one and the two species are therefore largely overlapped. The recordings of the snakes found in the past in the province of Caserta (northern Campania) and in the Molise region are not attributable to neither of the two species (see Razzetti and Zanghellini, 2006). Furthermore, although *Z. lineatus* (as *Elaphe longissima romana*) was reported for Saepinum, in the Molise region, by Bruno (1973) and by Bruno and Guacci (1993), the presence of this species in such region has not been reconfirmed by the recent work of Capula et al. (2008). However, if we take into consideration Capula et al. (2006), that established the new southern limit in Apulia, and the data we reported here, we think it is probable that both *Zamenis lineatus* and *Z. longissimus* occur in the province of Caserta (northern Campania) and in the Molise region.

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REFERENCES

Bruno S. (1973): Gli Anfibi e i Rettili dell'Appennino abruzzese con particolare riferimento alle specie del Parco Nazionale d'Abruzzo (Studi sulla fauna erpetologica italiana, XIII). Lav. Soc. Ital. Biogeogr. (n.s.) **2** (1971): 697-783.

Bruno, S., Guacci, C. (1993): Appunti di erpetofauna molisana. Ann. Mus. civ. Rovereto **8** (1992): 249-332.

Capula, M., De Lisio, L., Cianfrani, C., Di Florio, C., Iavasile, D., Ramacciato, V., Loy, A. (2008): Recenti acquisizioni sugli anfibi e rettili del Molise. In: Atti del 1° Congresso della Societas Herpetologica Italica Sezione Abruzzo "Antonio Bellini", p. 13-21. Carafa, M., Di Francesco, N., Di Tizio, L., Pellegrini, M.R., Eds, Talea Edizioni, Atessa (Chieti).

Capula, M., Valenti, S., Loy, A. (2006): Geographic variation and distribution of *Zamenis longissimus* and *Z. lineatus* (Reptilia: Colubridae) in Italy. In: Riassunti 6° Congr. Naz. Societas Herpetologica Italica, p. 92-93. Bologna, M.A., Capula, M., Carpaneto, G.M., Luiselli, L., Marangoni, C., Venchi, A., Eds, Stilgrafica srl, Roma.

Cattaneo, A., Capula, M. (2000): *Elaphe longissima* (Laurenti, 1768). In: Anfibi e Rettili del Lazio, p. 96-97. Bologna, M.A., Capula, M., Carpaneto, G.M., Eds, Fratelli Palombi Editori, Roma.

Corsetti, L. (2006a): Distribuzione e preferenze ambientali degli anfibi Urodeli nel Lazio meridionale (Italia centrale). In: Atti 5° Congresso Nazionale Societas Herpetologica Italica, p. 7-18. Zuffi, M.A.L., Ed, Firenze University Press, Firenze.

Corsetti, L. (2006b): Lepini. Anima selvaggia del Lazio. Edizioni Belvedere, Latina.

Corsetti, L., Capula, M. (1992): The Amphibians and Reptiles of the Lepini Mountains (Latium, Central Italy): Checklist and provisional atlas. Br. Herp. Soc. Bull., **39**: 8-16.

Corsetti, L., Romano, A. (2007): Amphibians of the Ausoni Mountains (Latium, Central Italy). Acta Herpetol. **2**: 129-137.

Helfenberger, N. (2001): Phylogenetic relationship of Old World Ratsnakes based on visceral organ topography, osteology, and allozyme variation. Russ. J. Herp. (Suppl.) **8**: 1-62.

Lenk, P., Joger, U. (1994): Genetic relationships between populations and intraspecific subdivision of *Elaphe longissima* (Laurenti, 1768) as suggested by plasma protein electrophoresis and DNA fingerprint. Amphibia-Reptilia **15**: 363-373.

Lenk, P., Joger, U., Wink, M. (2001): Phylogenetic relationships among European ratsnakes of the genus *Elaphe* Fitzinger based on mitochondrial DNA sequence comparisons. Amphibia-Reptilia **22**: 329-339.

Lenk, P., Wüster, W. (1999): A multivariate approach to the systematics of Italian rat snakes of the *Elaphe longissima* complex (Reptilia, Colubridae): revalidation of Camerano's *Callopeltis longissimus* var. *lineata*. Herpetol. J. **9**: 153-162.

Razzetti, E., Zanghellini, S. (2006): *Z. longissimus* (Laurenti, 1768) / *Z. lineatus* (Camerano, 1891). In: Atlante degli Anfibi e dei Rettili d'Italia / Atlas of Italian Amphibians and Reptiles, p. 576-583. Sindaco, R., Doria, G., Razzetti, E. and Bernini, F., Eds, Edizioni Polistampa, Firenze.

Romano, A., Montinaro, G., Mattoccia, M., Sbordoni, V. (2007): Amphibians of the Aurunci Mountains (Latium, Central Italy). Checklist and conservation guidelines. Acta Herpetol. **2**: 17-25.

Schulz, K.D. (1995): A Monograph of the colubrid snakes of the genus *Elaphe* Fitzinger. Koeltz Scientific Books, Koenigstein.

Utiger, U., Helfenberger, N., Schätti, B., Schmidt, C., Ruf, M., Ziswiler, V. (2002): Molecular systematics and phylogeny of Old World and New World ratsnakes, *Elaphe* Auct., and related genera (Reptilia, Squamata, Colubridae). Russ. J. Herp. **9**: 105-124.