

# Melanism in the topotypic population of the Pannonian subspecies of the common lizard, *Zootoca vivipara pannonica* (Reptilia: Lacertidae)

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**Abstract.** Melanism in the population of *Zootoca vivipara pannonica* (Lác and Kluch, 1968) at the type locality in Boľany, Východoslovenská nížina lowland, Slovakia was recorded. The frequency of melanism in the population was 2.5% and was higher in males (5.9%) than in females (0%). We assume that the different frequency of melanism in comparison with published data from other populations of *Z. vivipara* can be linked to habitat quality, as was previously hypothesized.

**Keywords.** colouration, reptiles, Sauria, Slovakia, type locality

## Introduction

Many lacertid lizards show a great intraspecific variability in pattern and colouration. Besides normally coloured specimens, also various aberrant forms may sometimes occur sympatrically and/or syntopically. One of the most common aberrations in reptiles is melanism, i.e. unusual darkening of normal pigmentation due to increased melanin (Bechtel, 1995).

The common lizard *Zootoca vivipara* (Jacquin, 1787) displays the largest range of all extant lizards (Dély and Böhme, 1984). In contrast to a relatively low morphological variability characterizing the species throughout the range, it usually shows high intra-population pattern variation (Boulenger, 1920; Dély and Böhme, 1984). Several colour variants have been described so far, however the most common aberration appears to be melanism (Boulenger, 1907; Petzold, 1978; Cavin, 1993; Gvoždík, 1999). We report here for the first time on the occurrence of melanism in the population of the Pannonian subspecies of the common lizard, *Zootoca vivipara pannonica* (Lác and Kluch, 1968), which is, according to our knowledge, also the first record of melanism in the common lizard from Slovakia.

## Materials and Methods

In total, 80 individuals of *Z. v. pannonica* (34 males, 28 females, 18 juveniles) were captured and released at the type locality near the village Boľany, Východoslovenská nížina lowland, Slovakia

(48 28 N 22 06 E, 100 m a.s.l.) between August 2005 and May 2007. Two males were melanistic, the remaining specimens were normally coloured. Selected lizards, including both melanistic ones, were also measured and photographed.

## Results

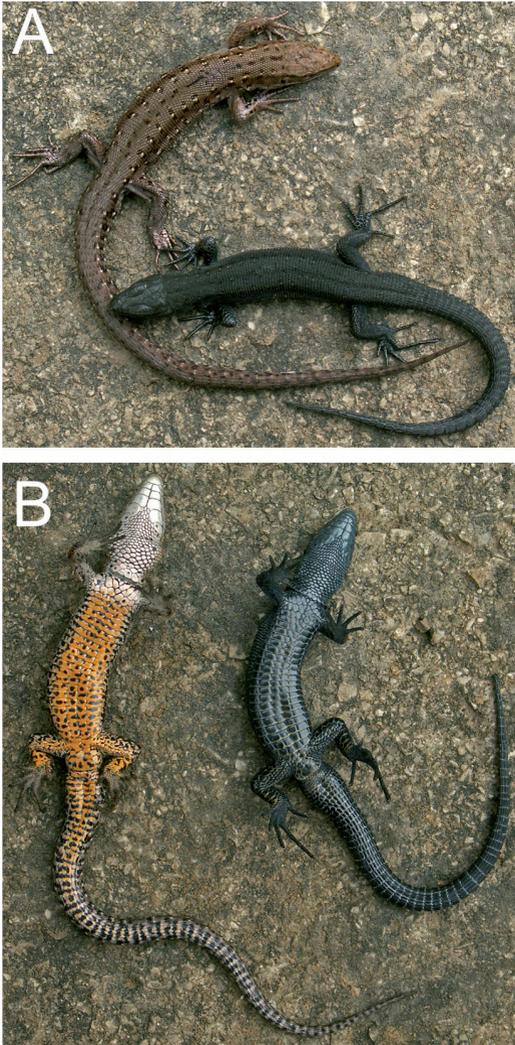
Both melanistic specimens of *Z. v. pannonica* were males, one of them adult, the other one subadult. Snout-vent length (SVL) of the adult male was 45.3 mm, head length (HL) 9.7 mm, tail length (TL) 71.0 mm, while the subadult male was much smaller, with SVL 36.3 mm, HL 8.2 mm and TL 53.0 mm. The tail length was affected by regeneration after autotomy. SVL and HL of the adult male were close to the average of adult males from the population in Boľany, which were  $47.6 \pm 1.0$  mm and  $10.1 \pm 0.2$  mm (N=22), respectively, while its TL was a bit shorter (average  $83.2 \pm 2.0$  mm, N=13), although not autotomized.

The colouration of both melanistic males was almost completely black, although parts of the pattern were still visible. This was especially true for the dark dorsolateral spots and lighter ocelli, which however were not white like in normally-coloured specimens, but rather dark grey, making it appear like seen through a dark blackish filter. The underside of both specimens was almost uniformly black, with the exception of the posterior ventral, subcaudal, femoral and tibial scale margins which were brownish-orange. The throat was dark bluish-grey and the iris was dark blackish-brown.

The melanistic specimens represented 2.5% of all observed *Z. v. pannonica* specimens from Boľany population and the melanism was recorded only in males. The within-sex frequency of melanism was 5.9% in males and 0% in females.

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**Figure 1.** Dorsal (A) and ventral (B) views of normally-coloured (upper left and left, respectively) and melanistic (lower right and right, respectively) adult males of *Zootoca vivipara pannonica* from Boťany, Východoslovenská nížina lowland

## Discussion

The observed frequency of melanism in Boťany population was more than twice higher than in a population of nominotypic species in Swiss Alps (1.13%; Cavin, 1993) and more than 100 times higher than in Pyrenees (1 per 2000 = 0.05%; San-Jose, Gonzales-Jimena and Fitze, 2008). However, Gvoždík (1993) recorded 8% of melanistic nominotypic specimens near the Jeseníky Mts. in Czech Republic, where 15% of all males were melanistic, thus more than twice than in the

*Z. v. pannonica* population in Boťany. In females of the common lizard, melanism occurs less commonly – all females found in Boťany were normally-coloured in respect to melanism and Gvoždík (1999) recorded only 2% of melanistic females (but see Boulenger, 1917). Lower melanism rate in females is explained by their higher vulnerability to predation by visual predators, mainly during pregnancy when females rely more on crypsis (Bauwens and Thoen, 1981; Gvoždík, 1999).

Melanism is believed to offer a thermoregulatory advantage, although this has been questioned in small lizards (Tosini, Lanza and Bacci, 1992) and subsequently not confirmed in the common lizard (Gvoždík, 1999). On the other hand, uniformly black colouration usually, i.e. in usual habitat of the common lizard, offers less protection via crypsis, and melanistic specimens are thus more conspicuous than are the normally-coloured ones. This may lead to a higher mortality rate of melanistic individuals (Andrén and Nilson, 1981), however San-Jose, Gonzales-Jimena and Fitze (2008) did not find any evidence of decreased body condition resulting from higher conspicuousness.

Gvoždík (1999) hypothesized that in the absence of thermoregulatory advantage the difference between-population melanism frequencies could be linked either to different levels of predation pressure or to different habitats, i.e. that in high vegetation offering more cover, the frequency is higher as the lizards are less conspicuous to visual predators. This might also be true in Boťany population as the vegetation and tree density there is higher than at five other localities of *Z. v. pannonica* in Východoslovenská nížina lowland where no melanistic specimens have been observed so far (pers. obs. of authors). The habitat in Boťany is comprised of alluvial forests (*Salicion albae*) with a poor shrub layer and herbal layer formed by nitrophilous and hygrophilous vegetation (e.g. *Rubus sp.*, *Baldingera sp.*, *Urtica sp.*, *Carex spp.*; Kluch, Lác and Lechovič, 1965; Ružičková, Halada and Jedlička, 1992). However, we do not know any other locality of *Z. vivipara* in Slovakia comparable in habitat to the one described by Gvoždík (1999), i.e. with high vegetation predominantly comprised of nettles, nor have we found any melanistic specimens of the nominotypic subspecies (among several hundred ones observed by the authors). We therefore think that these observations support the Gvoždík's (1999) hypothesis about the significance of habitat quality for the frequency of melanism occurrence in *Z. vivipara* populations.

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