



## Accessory femoral pores in *Podarcis muralis* from Southern Serbia

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### Abstract:

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Abnormalities in scalation are common in lizards. Bilateral asymmetries are frequent, as are supernumerary scales. Factors possibly responsible for such developmental anomalies are inbreeding and environmental stress. Here, we report two cases of accessory femoral pores in a *Podarcis muralis* from Southern Serbia.

**Key words:** abnormal scalation, *Podarcis muralis*, femoral pores, developmental instability, environmental stress

Developmental stability is the ability of individuals to undergo stable development of their phenotype under a range of environmental conditions (Møller, 1997). The origin of the disturbances is assumed to be genetic, environmental, or the product of a genotype-environment interaction (Markow, 1995). Deviations from developmental stability arise when organism fails to buffer such disturbances. Developmental anomalies and asymmetries in bilateral traits are common in lizards (Braña & Ji, 2000; Crnobrnja-Isailović et al., 2005). There is generally negative correlation between developmental instability and fitness components such as growth, fecundity and longevity and these relations can be either direct and indirect (Møller, 1997).

Here, we report two cases of supernumerary femoral pores in Common wall lizard (*Podarcis muralis*) from southern Serbia. *Podarcis muralis* is small lacertid lizard species, distributed in Central and Southern Europe, but its range extends to northwestern Asia Minor (Gasc et al., 1997;

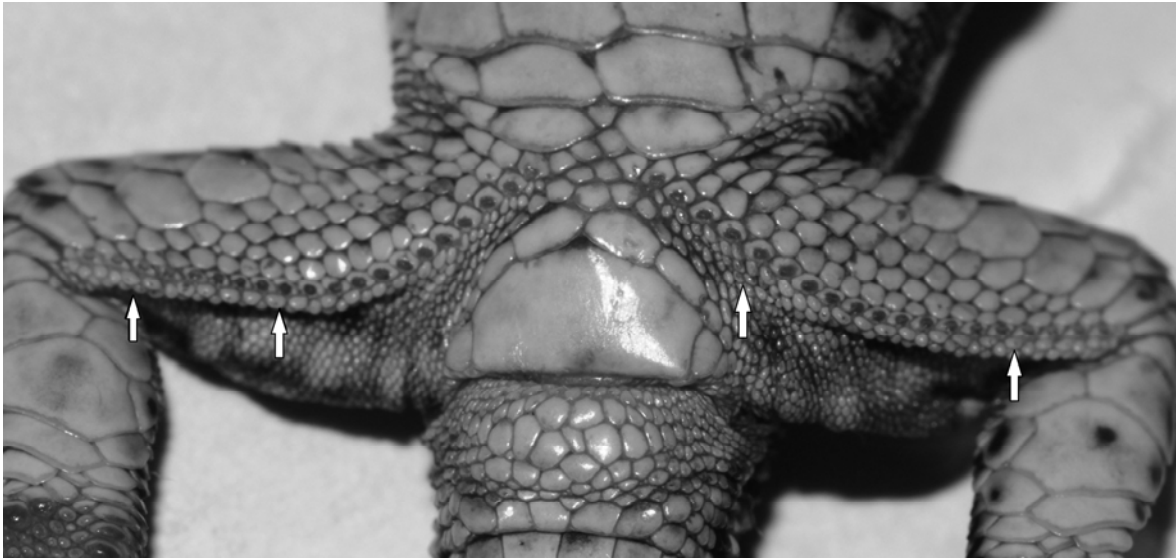
Arnold & Ovenden, 2002). It is one of the most widespread lizard species in the Central Balkans (Radovanović, 1951), and, consequently, susceptible to various kinds of negative anthropogenic impacts, as pesticide use (Guillaume, 1997).

In spring 2011, during collection of adult *P. muralis* in Southern Serbia, adult female (63.0 mm SVL) and adult male (52.3 mm SVL) with supernumerary femoral pores were sampled. Female was sampled in the Niš Fortress (N 43° 19.477' E 021° 53.864') in the center of the City of Niš. The habitat consisted of tall stone walls up to 10 meters with open grass. Accessory rows of femoral pores were noted in both hind limbs (Figure 1). The accessory pores (left N =14, right N =8) were smaller and located parallel. On left hind limb they were located along the entire length of normal series and on the right they were in a central position and posterior to the normal series (left N = 20, right N = 20). This was the only case of supernumerary femoral pores in 155 individuals examined from this population (appr. 0.64% of entire sample). Male was

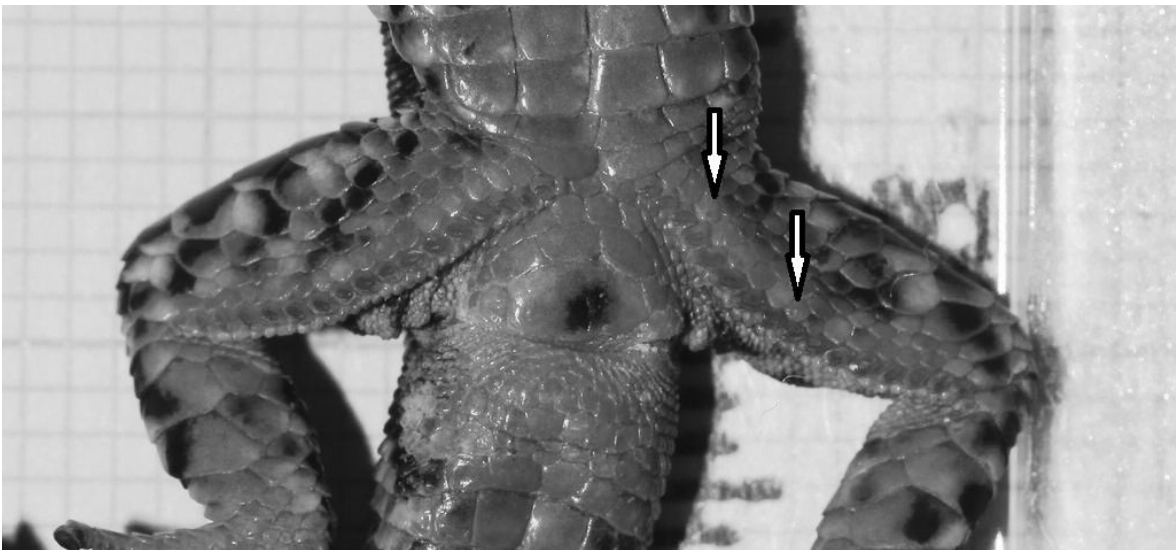
collected in Sićevo gorge, 15 km from the City of Niš (N 43° 20.307' E 022° 05.000'). Habitat consisted of stone walls up to 4 meters high, large and small piles of stones and knocked down trees. Accessory rows of femoral pores (N=4) were noted on left hind limb (Figure 2) but above the normal series, in central position and anterior of the normal series (left N=16, right N=17). This was the only one with this type of anomaly in 126 examined individuals (appr. 0.79% of entire sample). After photographing and measuring, animals were released to the site of capture.

There are few records of accessory femoral pores in lizards. In Portugal, supernumerary femoral

pores were found in adult female *Podarcis bocagei* (Kaliontzopoulou & Carretero, 2006). As in this study, frequency of occurrence was quite low, one individual from 37 sampled (2.70%). Moreover, they didn't find any such case in 380 lizards of the same species sampled from seven localities. Accessory femoral pores were recorded in the Collared Lizard, *Crotaphytus collaris* (Walker, 1980) with 63.7% of males and 36.3% of females displaying the anomaly, which was attributed to inbreeding since the population was small and isolated. These anomalies were also recorded among iguanians (Tanner & Avery, 1964).



**Figure 1.** Female specimen of *Podarcis muralis* from Niš Fortress, southern Serbia. The white arrows on each side delimit the additional row of femoral pores



**Figure 2.** Male specimen of *Podarcis muralis* from Sićevo gorge, southern Serbia. The white arrows on each side delimit the additional row of femoral pores

Two populations of Common wall lizard from Serbia analysed here are not completely isolated from the nearby ones. Both human settlements and natural habitats (rocks, gorges) are more or less connected by some sort of corridors (railways, stone piles, edges of magistral roads, traditional houses) that provide opportunities for migration. Therefore, abnormal scalation found in studied individuals is more likely to be caused by environmental stress from environmental pollution (as pesticide use), than by inbreeding. However, it is important to mention that another two population samples, collected from additional two localities (one urban and one rural), did not contain individuals with accessory femoral pores. Our preliminary analyses showed that environmental stress impact occur in another urban locality, at least (Lazić et al., submitted), but this type of anomaly was not detected.

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