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A tail where a limb should be: malformation of an adult Italian wall lizard *Podarcis siculus*

MASSIMO CAPULA[1*] & GAETANO ALOISE[2]

[1]Museo Civico di Zoologia, Via Aldrovandi 18, 00197 Roma, Italy
[2]Sistema Museale Universitario – SiMU, sezione di Zoologia, Università della Calabria, 87036 Rende, Cosenza, Italy

[*]Corresponding author e-mail: massimo_capula@yahoo.it

In reptiles, successful regeneration is usually restricted to the replacement of the tail, mainly in lacertid lizards that perform tail autotomy (self-amputation) as a defensive strategy (Clause & Capaldi, 2006; Alibardi, 2010). Unlike the tail, limb loss in a terrestrial environment is generally fatal and it appears that there has been no selection for limb regeneration during lizard evolution (Alibardi, 2021). In lacertid lizards, morphological anomalies pertain mostly to bifurcated (Kumbar et al., 2011; Tamar et al., 2013) or even trifurcated regenerated tails (Pheasey et al., 2014; Koleska & Jablonski, 2015). Here we report a case of hind limb malformation in the Italian wall lizard *Podarcis siculus*. This species is a small-bodied (snout-vent length up to 90 mm) lacertid lizard characterised by high morphological and chromatic variability (Corti et al., 2011). Its native distribution spreads through the Italian peninsula, Sicily and the north Adriatic coast. However, this species is known for its high colonising potential, and besides Europe *P. siculus* has established several thriving populations on three continents: Africa, Asia and North America (Corti et al., 2011).

The specimen with the morphological malformation was identified in the herpetological collection of one of the authors of this note (G. Aloise, collection number 051). It is an adult female with head-body length: 57 mm, and tail autotomised, weighing 32 g. It was collected on 25 October 2003 in Contrada Prato, Palmi, Province of Reggio Calabria, southern Italy: 38° 22´22´´ N, 15° 53´26´´E; 102 m a.s.l.), during a herpetological survey. Its general appearance is typical for the species, but the right hind-limb has a strange tail-like extremity (Fig. 1A). At the end of the upper hind thigh, the lower hind limb and hindfoot are replaced by a short protruding structure 8.87 mm length. The tip of this structure is similar to that of a tail (Fig. 1B), and no toes are present. The characteristic segments of the tail are well shaped. A radiographic image of the specimen revealed that the femur has an incomplete diaphysis, and the most distal bony portions of the limb are absent, so that the tail-like structure is not supported by bony parts (Fig. 1C). Such limb malformations are rather sporadic and are regarded as having environmental or genetic origin (Khan et al., 2005; Alibardi,

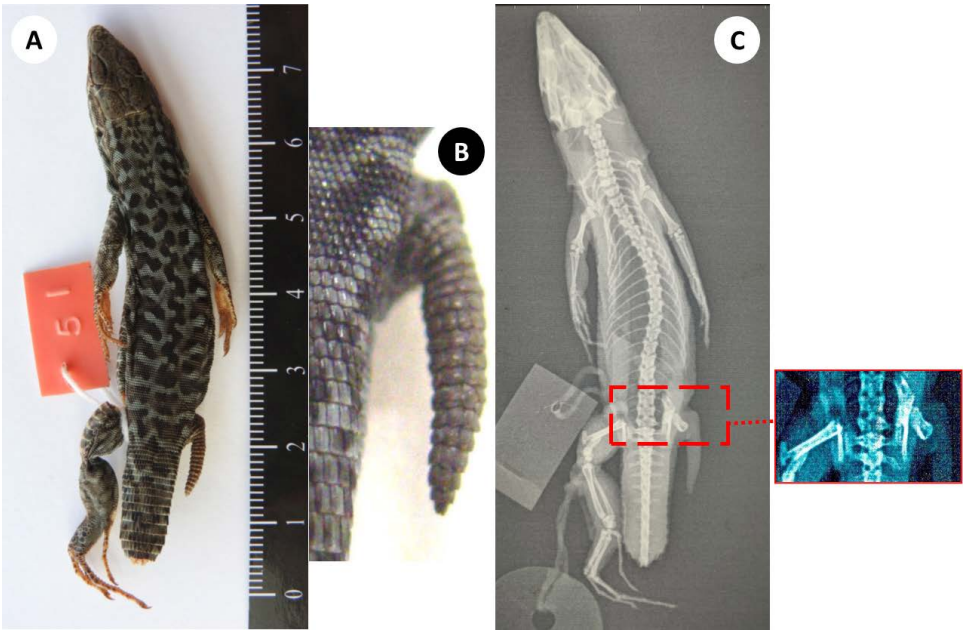

Figure 1. Female *Podarcis siculus* from Contrada Prato, Palmi, Province of Reggio Calabria, southern Italy, in which a tail-like structure has regenerated in the place of the right-hand hind-limb - **A.** Dorsal view, **B.** Close-up view of the tail-like structure, **C.** Radiograph revealing that the tail-like structure which regenerated in place of the right-hand hind-limb is not supported by bony parts

2017; Cortada et al., 2017). Hind limb malformations can occur when an initial blastema cone grows and mesenchymal cells rapidly differentiate into fibrocytes, giving place to short outgrowths or, in rare cases like this, to a tail-like appendage. A few similar cases have been reported for other lacertid lizard species: *Lacerta agilis* (Weiss, 1930; Olsson et al., 1996), *Podarcis erhardii* (Gkourtsouli-Antoniadou et al., 2017), *Podarcis lilfordi* (Cortada et al., 2017), *Podarcis muralis* (Guyénot & Matthey, 1928), *Takydromus takydromoides* (Okada, 1945), *Zootoca vivipara* (Kolenda et al., 2017) and have even been induced by experimental amputation in *P. muralis* (Guyénot & Matthey, 1928). To our knowledge the case we report here is the first documented record for *P. siculus*.

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