

# **Tail bifurcation in Common wall lizard (*Podarcis muralis* LAURENTI, 1768) from Liguria, Italy**

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## **Abstract**

*Podarcis muralis* (LAURENTI, 1768) or the Common wall lizard is a species of a lizard family Lacertidae. It is widely distributed lizard in most of Europe. It ranges from northern Spain, through France, southern Belgium, Luxembourg, west-central Germany, south-eastern Czech Republic, central Slovakia, central Hungary, most of the Balkans and northwestern Anatolia, Turkey. It occurs also on Jersey, Channel Islands (United Kingdom). It has been introduced to the United States. It is found from sea level up to 2500 m a. s. l. Herein, we report another record among Lacertidae and the first record of tail bifurcation in *Podarcis muralis* from Liguria region, Italy.

**Keywords:** bifurcation, Lacertidae, *Podarcis muralis*, Liguria

## **1. Introduction**

Tail bifurcation is relatively frequent malformation that has already been recorded among different lizard families, including Gekkonidae (De Andrade et al., 2015; Kumbar et al., 2011), Agamidae (Ananjeva & Danov, 1991), Anguidae (Conzendey et al., 2013), Gymnothalamidae (Pheasey et al., 2013), Iguanidae (Koleska et al., 2017), Lacertidae (Brock et al., 2014; Dudek & Ekner-Grzyb, 2014; Koleska et al., 2017; Tamar et al., 2013), Phrynosomatidae (Mata-Silva et al., 2010; 2013), Scincidae (Jablonski, 2016; Vergilov & Natchev, 2017), Teiidae (Cordes & Walker, 2013; Gogliath et al., 2012; Pelegrin & Leão, 2015) and Tropiduridae (Martins et al., 2013). Sometimes even trifurcation (Koleska & Jablonski, 2015) or hexafurcation (Pelegrin & Leão, 2015) of lizard's tail may occur.

The caudal autotomy is one of the anti-predation strategies utilized by many species of lizards (Bateman & Fleming, 2009). It does not have to be caused by predators only, but could occur as well during intraspecific aggression, mating or fighting over territory (Koleska et al., 2017). Lizard's tail represents a vital organ for successful ontogeny (it is used for storing nutrients, helps keeping

balance during overcoming obstacles etc.) as well as it is used during intraspecific social interactions such as mating or threatening opponents (Iverson et al., 2004).

Tail bifurcation has been recorded for genus *Podarcis* before, however so far only for *Podarcis erhardii* in Greece (Brock et al., 2014).

## 2. Materials and methods

On September 6<sup>th</sup> 2017 at 13:00 of local time, an individual (adult male) of the Common wall lizard was observed basking on the concrete barrier (coordinates: 44.253°N 8.451°E) near the road, in vicinity of Bergeggi comune, approximately 40 m from the coast of Ligurian Sea. We noticed that it had a bifurcated tail and caught this individual by hand to make a more detailed picture (Figure 1). It seemed in a good nutritional state with no visible physical injuries or other malformations. After being photographed, the lizard was released on the same spot, where it had been caught, without any physical harm.



Figure 1: An individual of *Podarcis muralis* with bifurcated tail in Liguria, Italy (photo by Lukáš Pola).

### 3. Results

This individual was approximately 160 mm long. More than half the length was formed by length of tail. In our specimen, the autotomized tail was shorter than the original tail. Several other individuals of the Common wall lizard were observed in the surroundings, but only this one had a bifurcated tail. We are inclined that the tail damage was rather caused by intraspecific aggression during mating than by a predator, due to the presence of number of other individuals at the locality. As far as we know, this is the first record of tail bifurcation in *Podarcis muralis*.

### 4. Discussion

After a tail is lost, the process of regeneration is initiated. A new tail starts to grow in the place of autotomy. However, sometimes the autotomy is not complete and additional tail (or tails) grows in its place (Tamar et al., 2013). Therefore bifurcations seem to be a result of the incomplete caudal autotomy, when the damage is extensive enough to trigger regeneration process of growing a new tail in the place of injury (Dudek & Ekner-Grzyb, 2014). We assume, that this specific case of bifurcation was caused more likely by previous mechanical injury (e. g. unsuccessful attempt of predation or fighting over territory) rather than congenital malformation.

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