

Self-cannibalism in the Aegean wall-lizard, *Podarcis erhardii*

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Autophagy - also called self-cannibalism - is a term used to describe the consumption of an animal's own body parts. Lizards, for example, may both lose and sometimes eat their own tails intentionally. Caudal autotomy or the self-amputation of the tail in lizards is an anti-predation strategy that helps these animals escape when caught by the tail. In some species, tails can also be shed in response to physical grasping during mating, as a result of male fighting (Arnold, 1984), or even in response to a stressful condition (Walter, 1962). Almost all lizards that perform autotomy can regenerate the lost tail after a short period of time (Arnold, 1984). Yet both losing a tail and regenerating it have negative consequences for the individual's locomotion (Lin et al., 2006), social interactions (Salvador et al., 1995), immune system (Arguez et al., 2018), and future body growth (Maginnis, 2006), which affect both survival and reproductive potential (Bateman & Flemming, 2009). In compensation a lizard may return and eat its own tail, to regain some of the sacrificed resources which can then contribute towards the re-growth of the tail (Maginnis, 2006).

The first case of autophagy in the family Lacertidae was recently reported as a field observation on the Iberian rock-lizard, *Iberolacerta monticola* (Iglesias-Carrasco & Cabido, 2016). Here we report autophagy in another mediterranean endemic lacertid, the Aegean wall-lizard, *Podarcis erhardii* (Bedriaga, 1882). During field-work on 21 September 2018 we collected *P. erhardii* from Naxos Island (37.037°N - 25.486°E; Fig. 1) with the use of a rubber band fired at the lizards. This can stun the animals for a short period but they are unharmed and make a full recovery (Bennett, 1999). Captured lizards were placed individually in soft and dark fabric bags and then into a plastic container to allow recovery with as little stress as possible. Lizards were processed the next day for the collection of tissue, stomach-contents and their preparation as museum specimens for the Zoological Museum of the University of Patras (ZMUP).

In this process, we found one adult male specimen (museum voucher ZMUP523) to have shed its tail, more likely during transfer. The tail was actually broken in three parts (Fig. 1) and the two smaller ones were found intact in the animal's

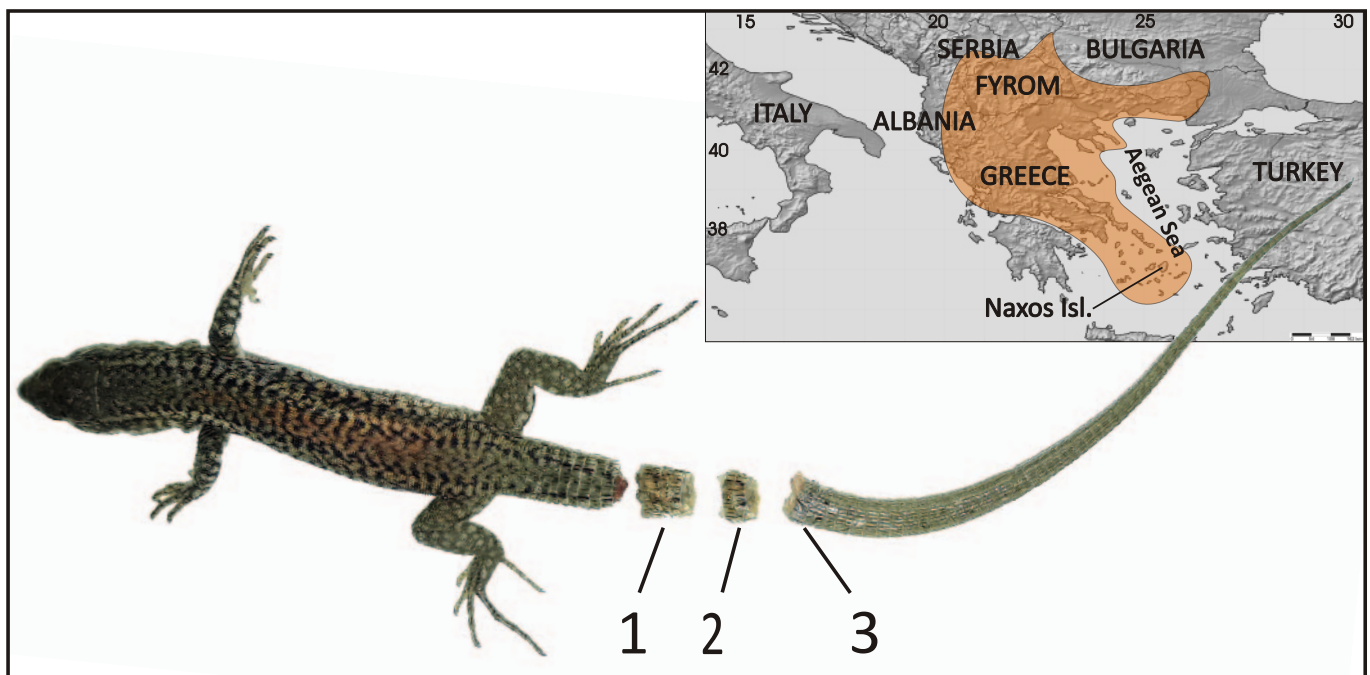


Figure 1. The *P. erhardii* specimen that exhibited self-cannibalism. There were no chewing marks on either of the two ingested pieces (marked 1 and 2) and the tail was restored to its full length when all parts (1-3) were aligned. Map shows the approximate distribution of the species and the sampling location of the specimen.

stomach. We believe our observation raises three interesting points. First, autotomy was performed without the triggering effect of physical grasping and was most probably due to the stress of captivity. Secondly, autophagy still occurred despite that stress. Third, our observation corroborates previous suggestions that the consumption of the autotomised tail might be a common behaviour in lacertid lizards, although not an easy one to observe in nature. For *I. monticola*, this behaviour was associated with adaptation to alpine habitats (Iglesias-Carrasco & Cabido, 2016). The Aegean insular populations of *P. erhardii* are also facing harsh environmental conditions, specifically prolonged drought, hot summers and a high rate of predation, and consequently are considered among those species that may readily apply autotomy as an attempt to escape predators (Pafilis et al., 2009). In these conditions, it is possible that regaining lost resources by consuming severed tails could have important survival value.

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