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Life style affects tail regeneration in lizards

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Tail autotomy is one of the main antipredator strategies in lizards. The mechanical pressure exerted by the predator induces an immediate break of the tail. Lizard escapes while the autotomized part thrashes vigorously distracting the predator. Caudal regeneration occurs rapidly in most lizard families and compensate for the disadvantages that tail loss comes with. Among the most important problems is the impaired locomotion. Tail serves as an auxiliary movement instrument and thus caudal shedding alters numerous locomotive features such as balance, speed, climbing ability etc. The quicker lizards will regenerate their tail, the faster their motion abilities will be restored. The duration of tail regeneration varies among lizard families and it seems to depend on phylogeny. In this study we aimed to clarify the impact of life style on caudal regeneration. We predicted that lizards that have a more intense movement pattern (e.g. run more and faster) would regenerate quicker their lost tail. In order to minimize the phylogenetic effect, we worked with three closely related species of the genus *Podarcis* that have different life styles, affecting the movement pattern: *P. tauricus* leaves in open areas and is a cursorial species, *P. peloponnesiacus* prefers low rocks next to flat terrains, running and climbing evenly good and *P. muralis* is found on rocks and walls and is an excellent climber. To simulate predation, we grasped with a pair of callipers the tail at a distance of 30 mm from the cloaca. Lizards were previously placed in a terrarium covered with rough cork mat, allowing them to maintain good traction. If autotomy occurred, lizards were housed in individual terraria at 30 C and



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were fed on mealworms (*Tenebrio molitor*). Tail length was recorded weekly to the nearest second decimal, using a ruler. Measurements began the first week after autotomy and were taken for 23 weeks. The weight and the length of each autotomized tail were measured. Tail regeneration was faster in the case of *P. tauricus*. *P. peloponnesiacus* grew its caudal tissues in a slower but yet comparable way whereas *P. muralis* showed the slowest regeneration rate and did not acquire the full length of the original tail. We believe that the underlying reason for these results is the different use of the tail in each species. *P. tauricus* is a swift runner and uses its tail as a counterbalance. The other two species are more climbing-oriented and tail is less important. It seems that according to their particular life-style, lizards regenerate their tails in a different rate.

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