

Learning with lizards: problem-solving skills in Lacertids from different environments

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While reptiles have long been regarded as slow and inflexible learners, the last decade has witnessed a renewed interest in reptile cognition. Lizards and snakes are now known to show significant learning abilities, problem-solving skills and high behavioural flexibility. Nevertheless, basically nothing is known about the environmental forces driving the evolution of reptile cognition. In addition, there is currently a lack of standardized cognitive tests, making comparisons among species or taxa difficult.

It is often postulated that higher cognitive abilities evolve in response to more complex and more variable environments, in order to allow species to better exploit these complex environments. Indeed, a link between cognition and environmental complexity has already been demonstrated in fish, birds and mammals, but so far not in reptiles.

We compared the problem-solving abilities of two lacertid species: *Acanthodactylus boskianus*, a typical open-desert species, and *Podarcis muralis*, an inhabitant of densely vegetated or rocky habitats. Lizards from both species were given three cognitive tests: 1) the inhibitory control task, during which lizards had to eat from a transparent petri dish, 2) the lid-removal task, where lizards had to learn how to remove an obstacle to get a food reward, and 3) the escape box task, where lizards learnt to escape from a box by opening a door. Since *P. muralis* inhabits structurally more complex habitats than *A. boskianus*, we predicted that *P. muralis* would show better cognitive performance in all tasks.

Our study might contribute to a better understanding of how cognition, both in reptiles and in general, evolved in response to environmental complexity, and might stimulate further research on more reptile species using standardized cognition protocols.