Habitat related differences in morphology, locomotion and bite force performance in the generalistic lizard *Podarcis bocagei*

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If morphological variation is tightly related with habitat use, then differences in morphology should affect fitness through their effect on performance within specific habitats. In this study, we investigated intraspecific ecomorphological variation in the generalistic lacertid *Podarcis bocagei* by examining two habitat types: agricultural wall vs. dunes where we expected to reflect saxicolous vs. ground-dwelling habits. We collected lizards from four populations of *P. bocagei*: two from wall habitats and two from dune habitats. In the laboratory, we recorded morphological traits, potentially relevant for locomotion and bite performance. We also quantified locomotor performance by measuring sprint speed, climbing capacity and maneuverability. Finally, we measured bite force for each animal. Based on these measurements, we used univariate and multivariate statistics to examine whether lizards inhabiting the two habitat types differed in morphology and whole-animal performance, while taking variation across populations into account. Our results indicated that lizards from walls and dunes differed in total body size, as well as relative head high, trunk length and hind limb length. Confirming previous observations we also observed highly significant differences between sexes in almost all morphological traits examined. Contrary to ecomorphological predictions, habitat-related differences in morphology were not reflected in locomotor performance, where we only found differences in sprint speed across populations, which were not related to habitat variation. Finally, bite force was significantly different both between habitats and sexes. Our results suggest that the differences between lizards of the two habitats derive from natural selection constraints involving refuge use. Further studies on habitat use preferences and behaviour should support this conclusion.

Habitat use, locomotion, morphometrics, bite force, ecomorphology, Lacertidae.