



Herpetologica

O1.

Disentangling the effects of anthropogenic and climatic factors on the distributions of two insular lizards

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The geographic distribution of a species is the result of many factors, among which the anthropogenic habitat alteration has become more and more important. A direct evaluation of its effect may become critical for conservation policy, particularly in insular context, where resources and animal dispersal are limited. In the present study we used species distribution models (SDM) to assess the influence of habitat alteration on the Sardinian distributions of the Tyrrhenian wall lizards (*Podarcis tiliguerta* - endemic) and the Italian wall lizard (*P. siculus* - introduced in historical or protohistorical time). SDM were built using Maxent under three scenarios: the distribution is guided i) only by climate and topography (model CT); ii) only by anthropization (An); iii) by both factors (AnCT). Sensitivity and specificity of the models was computed after applying a threshold to the Maxent output, while the Akaike Information Criterion (AIC) was used to identify the best model. Finally, a variation partitioning approach was used to disentangle the contribution of each factor. For both species, AnCT model showed the best performance (best AIC, best sensitivity and specificity). Anthropization weighs as much as climate and topography for the endemic wall lizard, whereas the weight is far lower for *P. siculus*. Climate and anthropization showed interaction in *P. tiliguerta*, whereas they are independent in *P. siculus*. Our results show that: i) the endemic lizard is more vulnerable to human impact than the non-endemic one; ii) the tolerance of *P. tiliguerta* towards anthropization varies with the climatic suitability, while it appears constant for *P. siculus*. These conclusions focus the attention on the potentially problematic situation of *P. tiliguerta*, situation that may be worsened by the suspected competition between the two species: where habitat alteration is increasing, competition may be exacerbated, favouring the Italian wall lizard and penalizing the Tyrrhenian wall lizard.

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