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**O19.****Condition dependent sexual dimorphism in the common wall lizard: a geometric morphometric study in the Tuscan Archipelago**

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Sexual dimorphism is a widespread phenomenon among animals and is generally interpreted as the result of both natural and sexual selection. When sexual dimorphism evolves through sexual selection, theory predicts the exaggeration of male ornaments and/or armaments, and only males in better condition or with high genetic quality can sustain the costs for their expression. Sexual selection on male traits is expected to result in a condition-dependent sexual dimorphism (CDS) if the variability of environmental factors affects the quantity and quality of metabolic resources that can be actually allocated to secondary sexual characters by males. Most evidence supporting CDS came from insects, and few studies have been performed on vertebrates, mainly because of troubles in carrying out experiments under captivity. In this scenario, islands offer a unique opportunity to compare how the environment affects the expression of sexual dimorphism, since they represent a "natural experiment" in which different populations of the same species experience environmental constraints differing for both quality and intensity. We investigated the occurrence of CDS in head shape of common wall lizards (*Podarcis muralis*) inhabiting the Tuscan Archipelago using a geometric morphometric approach. Our sample included 209 lizards (125 males and 84 females) from seven islands and two paleo-islands. Data consists of x and y coordinates of 32 landmarks located at the intersections of the head scales and four semi-landmarks. Shape variables were obtained through generalized procrustes superimposition, and seven alternative models were formulated accounting for as many alternative hypotheses. H<sub>0</sub>, assumes that the sexual dimorphism is uninfluenced by islands, H<sub>1</sub>, assumes the effect of only phylogeny, H<sub>2</sub> and H<sub>3</sub> account for the phylogeography of the Tuscan archipelago, H<sub>4</sub> and H<sub>5</sub> combine phylogeny and phylogeography, while H<sub>6</sub> assumes island specific effects on sexual dimorphism. Models were compared using Akaike informative criterion adjusted for multivariate analyses. All hypotheses performed better than H<sub>0</sub>, suggesting that sexual dimorphism in common wall lizards is actually affected by phylogeny, phylogeography and local environmental conditions. However, H<sub>6</sub> largely outperformed all other alternative hypotheses, indicating that local environmental conditions are the most relevant factor affecting the variability of sexual dimorphism of head shape. A variance partitioning analysis confirmed that sexual dimorphism actually differs among island. In conclusion our results support the hypothesis of the occurrence of CDS in common wall lizards.

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