



# Dual function of blue belly patches in the mesquite lizard

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## Abstract

The armament–ornament model suggests that females may benefit from exploiting signals that indicate status or are used in male–male aggressive interactions as such traits may impose costs. Here, we investigated whether the blue belly patches displayed by mesquite male lizards, *Sceloporus grammicus*, are used during male–male and female–male interactions. In the first experiment, males interacted with another male of similar size whose blue belly patches were manipulated to appear dull or bright, or remained unmanipulated. In the second experiment, females observed two males paired by size featuring either unmanipulated, dull, or bright blue belly patches. We found that males were less aggressive toward males with brighter and bluer patches, and females displayed more behaviors toward brighter males than toward males with unmanipulated blue patches, although it remains unclear whether females courted or rejected these males. Our results suggest that the ventral blue belly patches have a dual function in mesquite lizards, influencing antagonistic interactions among males and interactions between females and males.

## Significance statement

The armament–ornament model suggests that females may benefit from exploiting signals that indicate male status or are used in male–male aggressive interactions, because such traits may impose costs if faked. Accordingly, we show that brighter males in mesquite lizards, *Sceloporus grammicus*, are less likely to be attacked by opponents and are the target of more display behaviors from females. In mesquite lizards, the brightness of males' ventral blue belly patches has a dual function, influencing antagonistic interactions among males and between males and females.

**Keywords** Visual signals · Sexual selection · Armament–ornament model · *Sceloporus grammicus* · Male–male competition

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## Introduction

Intrasexual competition and intersexual choice are the primary mechanisms of sexual selection driving the evolution of sexual traits, which ultimately influence male and female fitness (Darwin 1871; Andersson 1994). Intrasexual competition, typically male–male competition, favors the evolution of sexual traits that function as armaments, or status badges used directly when competing for access to mates (Rico-Guevara and Hurme 2019). Intersexual choice, typically female mate choice, favors the evolution of sexual traits or ornaments that are usually honest indicators of the quality of the bearer (Zahavi 1975; Hamilton and Zuk 1982; but see Prum 2012). Hence, females who prefer more ornamented mates may gain direct or indirect benefits when these sexual traits are indicators of good genes or material benefits (Cuervo et al. 1996; Mays and Hill 2004; Griggio