

## EVOLUTION, ECOLOGY, & GENETICS RESEARCH SCHOOL OF BIOLOGY

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### The function of temperature-controlled colour change in the chameleon grasshopper *Kosciuscola tristis*

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Colour change and sexual signals are rarely linked directly to temperature. Yet, in the chameleon grasshopper (*Kosciuscola tristis*), males, but not females, change colour in response to ambient temperature. Males are black when their body temperature is below 10°C and turquoise to blue when 25°C or hotter. Colouration across the male population is variable at any given temperature. We have shown that they do not use this colour change for thermoregulation or to deter predators so we tested the hypothesis that temperature-controlled colour change is important in sexual signalling. From the female perspective, we asked if females choose to mate with more brightly coloured males, and if bright males win fights for mates over more drab-coloured males. From the male perspective, we set up semi-natural mating arenas with groups of five males with a single virgin female to ask if males with brighter colour win access to females. We measured male mating success and aggressiveness and compared those traits to male brightness and the size of various body parts likely to be under selection. We described the nature of male combat and the aggressive behaviours males use to fend off or attack each other. Our results suggest that brighter males do not necessarily win fights, but that the brightness of contestants is correlated. We suggest that brightness may indicate fighting ability or willingness to escalate fights and discuss these results in the context of contest escalation theory.

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