

## *Title*

Handicap principle implies emergence of dimorphic ornaments

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## *Abstract*

Species spanning the animal kingdom have evolved extravagant and costly ornaments to attract mating partners. Zahavi's handicap principle offers an elegant explanation for this: ornaments signal individual quality, and must be costly to ensure honest signaling, making mate selection more efficient. Here we incorporate the assumptions of the handicap principle into a mathematical model and show that they are sufficient to explain the heretofore puzzling observation of bimodally distributed ornament sizes in a variety of species.