

# Scorpions use strongest defense mechanisms when under attack

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This photo shows one of the studied species, a thin-pincered scorpion, *Androctonus bicolor*. Credit: Arie van der Meijden

Scorpions tend to use their strongest defense mechanisms, according to new research published November 13 in the open-access journal *PLOS ONE* by Arie van der Meijden and colleagues at Centro de Investigação em Biodiversidade e Recursos Genéticos (CIBIO) in Vairão, Portugal.

When attacked by a predator, a scorpion can choose to use either its pincers or its venomous stinger to defend itself. The performance of either the pincers (pinch force) or the stinger (venom strength) can depend on scorpion [physical characteristics](#), like size and shape. But the actual mechanism that the scorpion chooses to use when defending itself—it can use the pincers, the stinger, or both—can depend on other evolutionary adaptations, so it's not clear whether their behavioral responses are actually correlated with maximum performance ability.

The authors here tested this hypothesis by comparing [behavioral responses](#), performance measurements of pincers and stingers, and scorpion physical characteristics in individual [scorpions](#). They found that pinch force and venom strength were highly variable but did correlate with specific physical characteristics of pincers and stingers. Scorpion behavioral defense responses were also highly variable, but importantly, also correlated with both the physical characteristics and performance measurements of pincers and stingers. Scorpions usually selected their strongest defensive behavior; for instance, species with strong pincers more often used their pincers in defense.



This photo shows one of the studies species, a thicker-pincered scorpion, *Iurus dufourei*. Credit: Arie van der Meijden

The researchers conclude that in situations when survival calls for maximum performance, scorpion behavior is correlated with performance. Van der Meijden sums up: "We found clear relationships between shape, performance, and behavior, even when taking their evolutionary history into account. When it comes to defense, it seems scorpions choose their best weapons. I managed to not even get stung once during this research."

**More information:** van der Meijden A, Lobo Coelho P, Sousa P, Herrel A (2013) Choose Your Weapon: Defensive Behavior Is Associated with Morphology and Performance in Scorpions. *PLOS ONE* 8(11): e78955. [DOI: 10.1371/journal.pone.0078955](https://doi.org/10.1371/journal.pone.0078955)

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