

Sand fiddler crabs have home advantage in competition for breeding burrows

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Sand fiddler crabs that reside in a burrow usually prevail if challenged by another, intruding crab, provided their claw pinching strength is similar to that of the competing crab, a study suggests.

The features of sand fiddler crabs that determine the outcomes of competition between intruders and residents of breeding burrows are identified in a paper published in the Springer journal *Behavioral*

Ecology and Sociobiology. Dr. Denson McLain and colleagues at Georgia Southern University found that when a resident sand fiddler crab was challenged by an intruder, it took refuge inside its burrow, forcing the intruder into a prolonged fight that was twice as long as other contests. These lengthy contests require the intruding crab to display stamina alongside pinching [strength](#), while the resident crab only needs strength. The mismatch provides the resident crab with a competitive advantage, according to the new study.

Dr. McLain, corresponding author of the study said: "Strength and stamina have long been associated with victory in contests between males for breeding territories. However, territory owners may utilize features of their territories to gain an advantage over rivals who possess greater fighting ability. We found that greater claw pinching force leads to victory for burrow owners but that among intruders it only leads to an additional requirement for victory, the display of stamina."

The researchers observed contests between resident and intruder sand fiddler crabs competing for breeding burrows on a beach in Florida. They analysed competitions between 159 pairs of crabs and measured their claw pinching strength, stamina (measured by the number of pinches delivered at a high level of force), and resilience (the ability to return to former strength and stamina after being pinched). Despite being stronger, intruder crabs only won around 40% of contests.

Dr. McLain said: "An intruder crab can only win if it pinches with a high force and also has the energy to endure a long, physically taxing contest. The difficulty of evicting another crab from a burrow may be the reason why residents guard burrow entrances very diligently and why they are quick to retreat when challenged by a strong intruder."

The researchers explained that when the resident crab retreats into the burrow, the intruder cannot fully open his claw, rendering any advantage

in strength held by the intruder ineffective. The [intruder](#) may enlarge the burrow tunnel to enable greater access to the retreated resident, but this approach also requires stamina.

The authors found that resilience did not play a role in contest outcome. However, higher resilience enabled intruders who lost contests to challenge more residents, which increased their odds of winning a burrow. Being resilient was also found to be favourable for resident [crabs](#), as it enabled them to engage in multiple contests in short periods of time.

More information: McClain. et al (2019). The importance of strength and stamina varies with ownership status in sand fiddler crab contests for breeding burrows, *Behavioral Ecology and Sociobiology* [DOI: 10.1007/s00265-019-2635-6](#)

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