
WASTEBOOK

THE FARCE AWAKENS

33 SHRIMP FIGHT CLUB

North Carolina
National Science Foundation/Smithsonian
\$707,000

Float like a butterfly, sting like a bee, and hit like a shrimp?

The mantis shrimp (Stomatopoda) may be a shrimp but judge him not by his size.

While just two to seven inches in length, the mantis shrimp boasts “two super-sonic bludgeons powerful enough to dismember” a crab or break through the shell of a clam.⁴⁹⁰ Fishermen call mantis shrimp “thumb-splitters,” for obvious reasons.⁴⁹¹

“The mantis shrimp has evolved this extreme weapon, which for its size is probably the most potent in the animal kingdom,” says biologist Roy Caldwell of the University of California at Berkeley.⁴⁹² “The force created by the impact of the mantis shrimp’s club is more than 1,000 times its own weight-- so powerful that David Kisailus who studies the shrimp at UC Riverside’s Bourns College of Engineering “needs to keep the animal in a special aquarium in his lab so it doesn’t break the glass.”⁴⁹³

Boxing is a way of life for mantis shrimp. These aquatic contenders exchange punches and blows in ritualized fighting called “telson sparring.”⁴⁹⁴

So what is a winning strategy for a mantis shrimp with its eyes on the championship belt in the world’s lightest weight class?

A shrimp fight club was created to find out.

Sixty-eight different Panamanian mantis shrimp were pitted in 34 separate contests to fight over an artificial burrow.⁴⁹⁵ Videos were recorded of the fights and a Duke University graduate student watched the matches.⁴⁹⁶ The winner was “defined as the individual that resided in the burrow after the other made a clear, directed retreat toward the edge of the arena.”⁴⁹⁷

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The effort was paid for as part of a \$706,800 grant from the National Science Foundation, researchers at Duke University.⁴⁹⁸ Additional support was provided through the Smithsonian's Tropical Research Institute.⁴⁹⁹



Duke University researchers created a shrimp fight club to observe the punching power of mantis shrimp, which engage in ritualized fighting with powerful hammer-like claws.

The researchers' initial theories ironically ignored the characteristic that makes the mantis shrimp so unique in the first place, which is that its size doesn't equal its power.

"Theoretical and empirical findings in aggressive behaviour research suggest competitors should resolve conflicts using signals before escalating to dangerous combat," postulated the researchers. They, therefore, predicted most contests would be resolved when the two shrimp sized each other up or with the larger combatant clobbering his opponent if a fight ensued.⁵⁰⁰

"When two mantis shrimps square off, they flare their arms to the side, in a threatening display called the meral spread."⁵⁰¹ The researchers "predicted that most conflicts should end there. The meral spreads should show off the size of each combatant's clubs, the size of the clubs should correlate with how forcefully they can strike, and the strength of those blows should be the deciding factor in any battle. With all that information readily available, the animals shouldn't ever need to escalate to actual blows. These predictions were wrong on every count."⁵⁰²

When pitted against each other, "the mantis shrimps almost always laid into each other, whether they used meral spreads or not. What's more, the spreads turned out to be terrible signals because the dimensions of the club don't accurately predict how hard its owner can hit."⁵⁰³

But Doug Emlen, a professor at the University of Montana and author of the book *Animal Weapons*, points out a flaw in the study that could have affected the findings—the mantis shrimp pitted against each other by the researchers were roughly the same size. "If the

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match-ups had been more random, the displays would have allowed larger males to deter smaller ones without needing to spar,” Emlen contends.⁵⁰⁴ “Lots of ‘fights’ never really turn into fights” in the wild, he notes.⁵⁰⁵

The researchers also found “strike force doesn’t correlate with victory. Instead, it’s the *number* of blows that matter. The winners aren’t the ones that hit the hardest, but those that keep on hitting.”⁵⁰⁶

The student and his biology professor concluded “it wasn’t the shrimp who hit hardest who won the bout, but the one who hit the most frequently.”⁵⁰⁷

They conceded “we predicted that (i) most contests would be resolved by meral spreads, (ii) meral spreads would reliably signal strike force and (iii) strike force would predict contest success. The results were unexpected for each prediction. Contests were not resolved by meral spreads, instead escalating to striking in 33 of 34 experiments. The size of meral spread components did not strongly correlate with strike force. Strike force did not predict contest success; instead, winners delivered more strikes. Size-matched *N. bredini* avoid deadly combat not by visual displays, but by ritualistically and repeatedly striking each other’s telsons until the loser retreats. We term this behaviour ‘telson sparring’, analogous to sparring in other weapon systems. We present an alternative framework for mantis shrimp contests in which the fight itself is the signal, serving as a non-lethal indicator of aggressive persistence or endurance.”⁵⁰⁸

In the movie *Fight Club*, Tyler Durden played by Brad Pitt asks “how much can you know about yourself if you’ve never been in a fight?”



This question can certainly be applied to the research on the shrimp fight club. To know and understand them requires observing their ritual fighting. But perhaps the more appropriate quote from the movie that puts federal funding for this study into perspective may be “we buy things we don’t need with money we don’t have.”

This quote from the movie Fight Club sums up the government spending profiled in Wastebook.

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