

'Junk' science? For some crabs at least, size does matter

January 16 2019, by Sara Hussein



Hermit crabs appear to have evolved longer members so they can stay in their shells to protect their homes during sex

Size does matter, at least when it comes to some hermit crabs, who appear to have evolved longer penises so they can stay in their shells to protect their homes during sex.

The so-called "private parts for public property" theory posited by the research published on Wednesday tackles the question of how penis size relates to home size, for crabs anyway.

Crabs that live in shells face the risk that interlopers will try to steal their homes while they are otherwise distracted by mating.

That risk is even more pronounced for certain types of hermit crabs, who "remodel" their shells by removing some internal structures.

The renovations make the shells more spacious and desirable, but also more difficult to cling onto, particularly in the throes of passion.

As a result, Mark Laidre, an assistant professor of biological sciences at Dartmouth University, began exploring whether the crabs most vulnerable to theft might have evolved longer penises "to facilitate safe sex".

"In theory, longer penises could enable individuals to reach out to [sexual partners](#) while simultaneously maintaining a safe grip on their property with the rest of their body, thus safeguarding property against thieves while having sex," Laidre wrote in the study in *Royal Society Open Science*.

To test the theory, Laidre set about the unenviable task of measuring members—specifically, seeing how the penises of 328 specimens of various types of hermit crab stacked up.

If his theory was correct, he expected to find that crabs with the

remodelled and most covetable shells would have the longest penises, while those with unmodified shells would have slightly shorter ones, and hermit crabs with no shells would be the least generously endowed of all.

He also wanted to rule out other possibilities, including that penis length was based on whether crabs were land or sea-based, or correlated with their overall body size.

Intimate study

And after a series of intimate examinations of museum specimens, Laidre found the results bore out his theory.

The [hermit crab](#) with the largest penis relative to [body size](#) was the *Coenobita* species, the only one occupying the remodelled and more vulnerable shell homes.

Crabs with unremodelled homes presented the next longest penises, while those who shed their shells as adults were found to have the shortest of all three types.

"All other hypotheses for these penis size patterns came up short," Laidre wrote.

And the crabs might not be the only ones, with Laidre positing that the [theory](#) could apply to other animals "including those with valuable but non-portable property."

He suggested further research could focus on examining the different types of "remodelling" [crabs](#) do to their [shell](#) homes, to see if variation in renovation is reflected in penis size.

And he posited that for animals who have to defend territory that can't

be carried around on their backs, a different trend might hold: smaller penises but larger "fighting structures" like claws.

Further research could "explore such trade-offs by examining relative weapon and penis size in relation to private property value," Laidre wrote.

More information: Private parts for private property: evolution of penis size with more valuable, easily stolen shells, *Royal Society Open Science*, [rsos.royalsocietypublishing.org ... /10.1098/rsos.181760](https://rsos.royalsocietypublishing.org/doi/10.1098/rsos.181760)

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