

Study finds that ancient penis worms invented the 'hermit crab' lifestyle

November 8 2021



The penis worm *Eximipriapulus* inhabiting a hyolith shell. Credit: Prof Zhang Xiguang, Yunnan University

A new study by researchers from Durham University and Yunnan University reveals that penis worms (Priapulida) invented the 'hermit' lifestyle, some 500 million years ago, at the rise of the earliest animal ecosystems in the Cambrian period.

Hermit crabs are well known for employing [snail shells](#) as shelters against predators, but researchers have now found that penis worms invented the 'hermit' lifestyle hundreds of million years before [hermit crabs](#) first evolved.

Researchers studied collections of the Guanshan fossil deposits—famous because they preserve soft tissue (such as the bodies of worms) alongside the shelly material that makes up the conventional fossil record.

Four specimens of the penis worm *Eximipriapulus* were found inside conical shells of hyoliths, a long-extinct fossil group.

"The worms are always sitting snugly within these same types of shells, in the same position and orientation", explains Dr. Martin Smith, co-author of the study.

The researchers established that Cambrian predators were plentiful and aggressive, forcing the penis worms to take permanent shelter in empty shells.

Dr. Smith expands: "The only explanation that made sense was that these

shells were their homes—something that came as a real surprise. Not long before these organisms existed, there was nothing alive more complex than seaweeds or jellyfish: so it's mind-boggling that we start to see the complex and dangerous ecologies usually associated with much younger geological periods so soon after the first complex animals arrive on the scene."

The research indicates the key role of predators in shaping ecology and behavior in the very early stages of animal evolution.

The study findings will be published in the journal *Current Biology*.

A "hermiting" lifestyle has never been documented or observed in living or fossil penis [worms](#); nor has it been directly observed in any organism living earlier than the 'Mesozoic Marine Revolution' in the age of dinosaurs.

The fact that it evolved independently in the immediate aftermath of the "Cambrian explosion", which marked the rapid rise of modern animal body plans, highlights the remarkable speed and flexibility of the evolutionary process.

More information: "A 'hermit' shell-dwelling lifestyle in a Cambrian priapulid worm", Yang, Xiao-yu, Smith, Martin R., Yang, Jie Guo, Qinghao, Li, Chun-li, Wang, Yu & Zhang, Xi-guang, *Current Biology*. [DOI: 10.1016/j.cub.2021.10.003](https://doi.org/10.1016/j.cub.2021.10.003)

Provided by Durham University

Citation: Study finds that ancient penis worms invented the 'hermit crab' lifestyle (2021, November 8) retrieved 24 April 2024 from <https://phys.org/news/2021-11-ancient-penis-worms->

[hermit-crab.html](#)

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.