

Thermal limit for animal life redefined by first lab study of deep-sea vent worms

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Forty-two may or may not be the answer to everything, but it likely defines the temperature limit where animal life thrives, according to the first laboratory study of heat-loving Pompeii worms from deep-sea vents, published May 29 in the open access journal *PLOS ONE* by Bruce Shillito and colleagues from the University Pierre and Marie Curie, France.

The worms, named *Alvinella pompejana*, colonize black smoker chimney walls at deep-sea [vents](#), thrive at extremes of temperature and pressure, and have thus far eluded scientists' attempts to bring them to the surface alive for further research. Many previous studies conducted at these sites has suggested the worms may be able to thrive at temperatures of 60 C (140 F) or higher. As Shillito explains, "It is because several previous papers had come to this conclusion that *Alvinella* had become some sort of thermal exception in the scientific world. Before these studies, it was long agreed that 50 C was the limit at which animal life survived."

In this new study, researchers used a technique that maintains the [extreme pressure](#) essential to the worms' survival during their extraction, allowing them to bring Pompeii worms to their labs for testing. They found that prolonged exposure to the 50-55 C range induced lethal tissue damage, revealing that the worms did not experience long-term exposures to temperatures above 50 C in their natural environment. However, their studies found that the temperature optimum for survival of the worms was still well over 42 C, ranking them among the most heat-loving animals known.

More information: Ravaux J, Hamel G, Zbinden M, Tasiemski AA, Boutet I, et al. (2013) Thermal Limit for Metazoan Life in Question: In Vivo Heat Tolerance of the Pompeii Worm. PLOS ONE 8(5): e64074. [doi:10.1371/journal.pone.0064074](https://doi.org/10.1371/journal.pone.0064074)

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