

Seal lice can survive the pressure found 4000 metres under the sea

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By [Richard Sima](#)



The lice that live on elephant seals can survive the pressures of the deep sea

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Seal lice – blood-sucking marine insects that live on seals, sea lions and walruses – can survive the crush of the deep ocean, withstanding the equivalent of pressures found 2000 metres deep for several minutes. One louse even survived the pressures found at 4000 metres deep.

Seal lice (*Lepidophthirus macrorhini*) live out their entire lifecycle on their marine hosts, and previous research has shown that these [insects](#) survive being submerged in seawater for days by entering an immobile, low metabolism state to withstand the frigid cold, high salinity, and lack of oxygen.

To find out how much pressure the lice could handle, Maria Leonardi at the Institute of Biology of Marine Organisms in Argentina, and her colleagues captured 15 elephant seal pups and collected lice from them with tweezers.

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The team then submerged the lice in seawater and placed them into a chamber where they were subjected to two rounds of varying [hydrostatic pressures](#) ranging from about 3 to 20 megapascals (MPa) for ten minutes at a time – that is about how long elephant seals spend on deep dives, some of which reach more than 2000 metres deep.

All the adult lice and 89 per cent of nymphs survived pressures up to about 20 MPa, which you'd find 2000 metres beneath the surface of the water. During equipment calibration in the lab, one louse had the lousy luck of being accidentally subject to just over 44 MPa – equivalent to being more than 4000 metres underwater – for several minutes. It survived.

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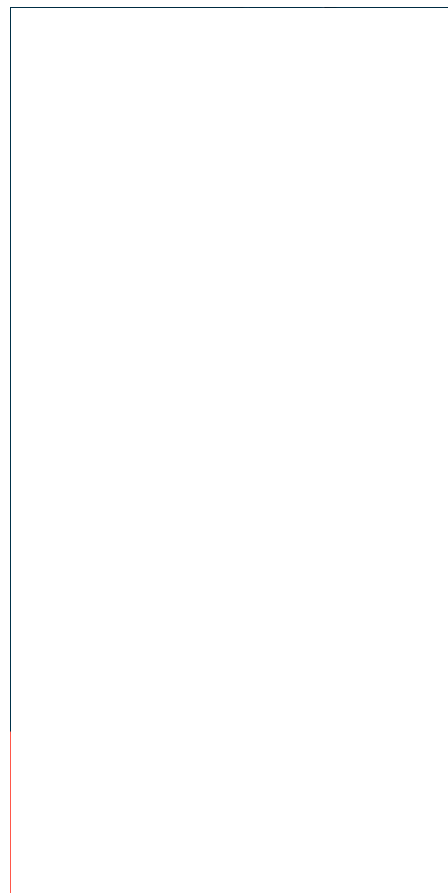
“Here we have an example of an insect with nothing particular or special, with the build of any other insect, that is able to adapt to this condition,” says Claudio Lazzari at the University of Tours in France, who worked on the study.

“The host is its environment,” says Katherine Moon at the University of California, Santa Cruz in the US who was not involved in the research. “Adaptation to the host or the way the host functions is exactly the way it’s going to go. Otherwise it won’t survive.”

We still don’t know the limits of a seal louse’s ability to withstand pressure. So, could these lice survive the pressures of another ocean world, like [Jupiter’s moon Europa](#)? The pressure at the seafloor there is estimated to be 130 to 260 MPa, so they may only survive up to a certain depth – but these lice are parasitic and evolved alongside their hosts, so they might not last long without an elephant seal to ride around on.

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