

Warming driving Eastern Mediterranean species collapse: study

January 6 2021, by Patrick Galey



The waters off the coast of Israel are among the hottest in the Mediterranean and they have already warmed 3C within four decades

Populations of marine molluscs have collapsed in recent decades in parts of the eastern Mediterranean as warming waters have made conditions unsuitable for native species, new research showed Wednesday.

The waters off the coast of Israel—among the hottest in the Mediterranean—have already warmed three degrees Celsius within four decades, with [water temperatures](#) regularly topping 30C (86 Fahrenheit) in summer.

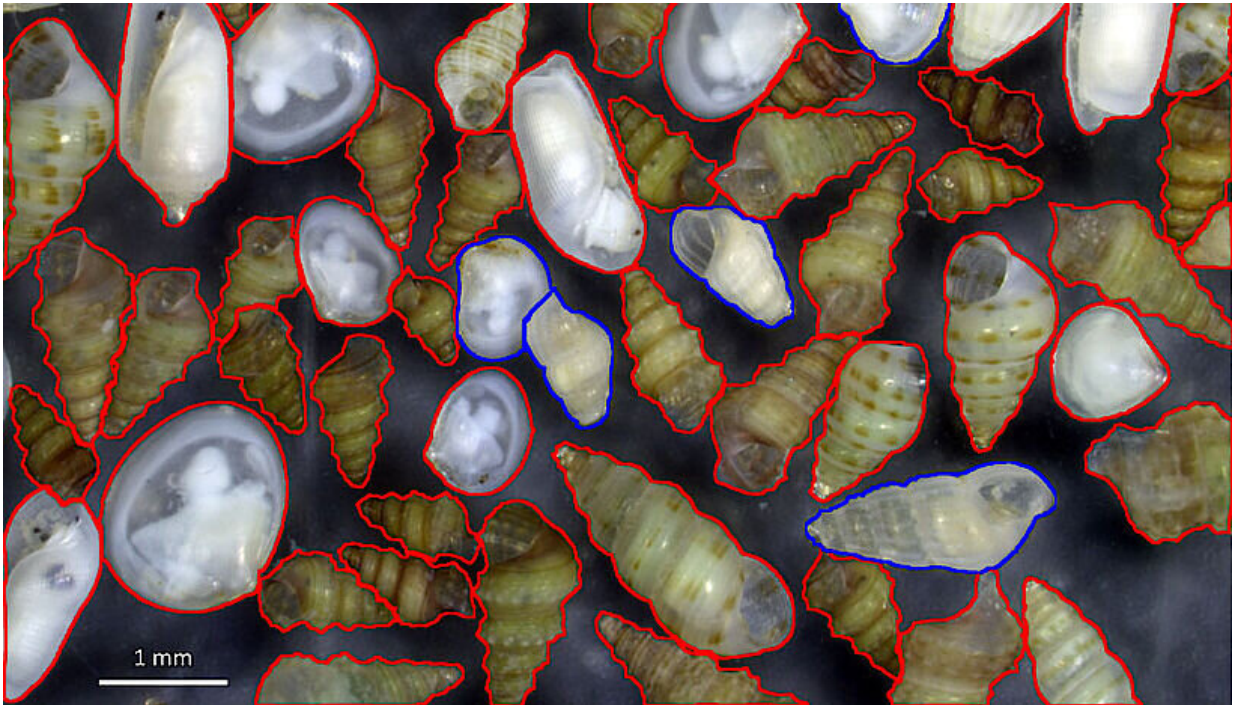
An international team of researchers, writing in the journal *Proceedings of Royal Society B*, investigated the effect these warmer waters was having on local populations of marine molluscs, as well as the arrival of invasive species from the Red Sea via the Suez Canal.

Paolo Albano, from the University of Vienna's Department of Paleontology, initially set out to contrast populations of local and non-[native species](#) along the Israeli shelf in the eastern Mediterranean.

But he quickly realised the extent to which local [mollusc](#) populations had declined.

"My expectation was to find a Mediterranean ecosystem with these 'newcomers'," he told AFP.

"However, after the first dive, I immediately realised that the problem was another one: the lack of the native Mediterranean species, even the most common ones that you would find everywhere in the Mediterranean."



Molluscs of a sample from Southern Israel: in red, those belonging to species of Red Sea origin, in blue, those of Mediterranean origin. Native species are very few, whereas tropical ones are dominant, marking the transformation of the ecosystem. Credit: © Paolo Albano

Local 'eradication of species'

Albano and his colleagues compared mollusc populations identified from more than 100 seabed samples with historical records, finding that only 12 percent of the molluscs historically present in shallow sediment were still there.

On rocky reefs, that figure stood at just five percent.

The team also estimated that 60 percent of the remaining mollusc populations studied do not reach reproductive size, rendering the region

a "demographic sink" for some species.

Albano said that while other factors could be playing a role in these [population](#) collapses, not least the impact of non-native species and pollution, the overall trend was likely caused by warming seas.

"Tolerance to temperature is what really matters here and most of the native Mediterranean species are in the easternmost Mediterranean Sea at the limits of their tolerance to temperature," he said.

In contrast to local molluscs, populations of tropical species entering the Mediterranean through the Suez Canal were thriving.

This species turnover is causing the onset of a "novel ecosystem", the authors said, and the massive loss of native species is likely too significant to rectify.

Albano said the Eastern Mediterranean was "paradigmatic of what is happening in marine ecosystems due to global warming: species respond to warming by shifting their ranges and in some areas this means local eradication of [species](#)."

More information: Paolo G. Albano et al. Native biodiversity collapse in the eastern Mediterranean, *Proceedings of the Royal Society B: Biological Sciences* (2021). [DOI: 10.1098/rspb.2020.2469](https://doi.org/10.1098/rspb.2020.2469)

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