

Last Reef in the World Likely to Be in Israeli Waters

'Tough' corals in Gulf of Aqaba could survive the longest in warming seas, but only if pollution doesn't kill them first

Ruth Schuster Jun 18, 2017, Haaretz (Israel)



Corals in the Gulf of Aqaba are oddly resistant to global warming. As their brethren around the world bleach, crumble and die, these hardy cnidarians are likely to be the last reef in the world to survive as the oceans heat up – unless pollution kills them first, observes Prof. Maoz Fine of Bar-Ilan University and the Interuniversity Institute for Marine Sciences in Eilat.

Global warming has been causing reefs to “bleach” – a euphemism for stressed coral cells expelling the algae cells that live symbiotically within them, and turning white. Coral cells can eke out a living without algae, but it will be a meager one as the photosynthesizing plant cells provide nutrients to the corals. Without algae, the corals slowly die.

The corals at the northern tip of the Red Sea are strangely resilient to temperature stress, reports the team in Royal Society Open Science. But Fine pooh-poohs the notion of the hardy Israeli corals being used to reseed the world’s reefs in the future. It wouldn’t work, he warns, in conversation with Haaretz.

The last two years have brought pan-tropical bleaching. During the last year, two-thirds of the 2,300-kilometer (1,430-mile) Great Barrier Reef went white. Water quality and fishing pressure were not the reasons, scientists concluded – and they also realized that local measures to protect reefs won’t help if water temperatures continue to rise, which they will.

The scientists stressed their test corals over a six-week period. The corals did not bleach, though under such conditions most corals elsewhere in the world would have, says scientist Thomas Krueger, from Switzerland’s École Polytechnique Fédérale de Lausanne. If anything,

he says, “Most of the variables that we measured actually improved, suggesting that these corals are living under suboptimal temperatures right now.”

It bears noting that the paper hailing the hardy coral relates to exactly one species, *Stylophora pistillata*. But their findings are not some aberration of this single species, Fine stresses. They checked six species and found much the same – they had just finished the work on *pistillata* first.

Survival of the fittest polyps

Why would Gulf of Aqaba corals be peculiarly resilient to warming – and ocean acidification, another ramification of climate change?

As the last ice age wound down over 10,000 years ago, corals began to recolonize the Red Sea through the Gulf’s southern connection to the Indian Ocean, explains the team from Bar-Ilan University and Switzerland’s EPFL.

The Red Sea is like a big bathtub with a temperature gradient. The water at its mouth in the south can reach 32° Celsius (nearly 90° Fahrenheit) in the summer. Up in the Gulf of Aqaba, the water is cooler.

Only coral polyps that could survive hot water could survive as they swam through the Red Sea mouth. And only individuals that could survive that and also thrive in cooler water would survive in Aqaba. What you get is natural selection for tough coral.

“Corals in the Gulf of Aqaba are pre-acclimated to thermal tolerance due to the special geography and recent history of the Red Sea,” notes Fine.

Acid fine, sewage not fine

The Red Sea corals are also remarkably resilient, relatively, to ocean acidification, which has been hampering mollusk development and growth, and other corals too, Fine explains. How is that? Like mollusks and other corals, they have chalky external skeletons that are vulnerable to acid. But, unlike the others, *pistillata*’s skeleton is covered in cellular tissue – and the coral creates a homeostasis that keeps its internal acidity level (pH) tolerable.

While they may stand strong to temperature stresses, the Aqaba corals are just as vulnerable as any other sea creature to stresses like pollution – including local oil pollution, nutrients from fish farms and herbicides from gardening.

There is another potential problem that could kill the tough Israeli corals just as surely as effluent from Eilat and Aqaba. “Ecological effects could kill them off well before physiological effects – for instance, if algae grow faster in acid oceans, and they may,” says Fine. “They are the strongest competition over substrate [resources] to corals. Also, not only do algae grow faster in warmer water. They contain compounds that deter grazing predators: the fish won’t eat them, the sea urchins won’t eat them. What do they eat? The coral polyps.”

“This reef should receive international recognition as a natural site of great importance, because it might very well be one of the last reefs standing at the end of this century,” says Anders Meibom of EPFL and UNIL. “I would like to encourage the countries around the Gulf of Aqaba – Saudi Arabia, Egypt, Jordan and Israel – to get together and create a strong protection environmental program,” he adds.

The state of the Gulf isn't bad now, especially since fish-farming cages were removed for ecological reasons eight years ago. So, if Israel and Jordan have the horse sense to reduce other anthropogenic stresses on the Gulf – stop the polluting, divert the occasional sewage spill away from the sea – and if the algae eschew proliferating to the point of choking off our coral, it could continue to thrive as all others die.

But they can't serve to reseed the world when all other corals die. "I don't believe in that at all," says Fine, noting the vast areas in question and the enormous technical difficulty. "I do say it might be the last coral to survive in the world of climate change."