Resilient coral in New Caledonia

With climate change comes acidification and warming of the oceans, and if this increases, the consequences for coral reefs could be dramatic.

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Mangroves in the Bouraké Lagoon, New Caledonia.

Around ten years ago, French and Australian scientists identified an astonishing coral reef in the Bouraké mangroves in New Caledonia: it thrives in extreme conditions of heat, pH and deoxygenation. This environmental context is similar to conditions predicted by the end of the century, which, according to experiments conducted in aquariums, would sound the death knell for coral reefs. But perhaps that is not the case after all...

Since the discovery, scientists have been analysing this unique site. They are studying the ability of coral reefs to adapt to changes in the environment. To date, around 60 species of coral have been identified in this acidic, warm, low-oxygen environment. Surprisingly, these same species are the first to succumb to extreme heat in other parts of the world.

... Some hardy corals can survive in completely unexpected physicochemical conditions, offering a way to restore parts of coral reefs ...

During the high temperatures of 2016, only 20% of the coral at the Bouraké "laboratory site" was bleached, compared with the vast majority of coral in the rest of New Caledonia. This unexpected capacity for resistance could be linked to symbiosis with a special heat-resistant single-cell alga. But it could also be explained by the high level of nutrients in the rich mangrove waters.

Various experiments were carried out and the coral's genetic material analysed. A comparison of the genetic make-up of coral at Bouraké with coral at other sites produced the most surprising results: the Bouraké coral is no different from the others. This means it has not been selected by the hostile environment, acting as a filter. In fact, the population is the same as at other sites.

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Palau International Coral Reef Centre (PICRC)

International CO_2 Natural Analogues Network (ICONA)

"Giving coral ecosystems a chance in the face of global change is an ecological and socioeconomic imperative. Through their heritage value, coral reefs provide a living for 500 million people in tropical areas. Results of studies carried out in New Caledonia on the Bouraké site underline the urgent need for action. I hope these results encourage decision-makers to take the necessary measures in order to strike the right balance between profit and sustainable environmental management."

Claude Payri, IRD, New Caledonia

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Research into the effects of ocean acidification at the Palau International Coral Reef Centre.

This suggests that most corals may have a pool of individuals capable of withstanding these conditions and therefore of surviving climate change. So there is hope, to a certain extent... However, these resilient corals would not be enough to repopulate entire reefs; as it stands, they could only be used to save or restore parts of coral reefs. Only a drastic and sustainable reduction in greenhouse gas emissions will ensure the survival of certain existing reefs.

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