Breeding coral larvae in the lab

Something hopeful is happening in the aquaria on the Wageningen campus: for the first time, a coral from the waters off Curacao is producing larvae. 'Now we can find out what makes corals tick and use that information to lure them to artificial reefs.'

TEXT ROELOF KLEIS **PHOTOGRAPHY** TIM WIJGERDE

It is hot in the climate chamber at the Marine Ecology Group. There is an aquarium along the wall of the narrow room. A yellow tang fish catches the eye, but the star role in this tank is reserved for the coral on the floor. Centre-stage is F11, the first generation of home-grown Favia fragum, a coral from the waters off Curaçao.

'F11 is our first coral that was born and bred here and has already produced its own babies,' says marine biologist Robbert-Jan Geertsma proudly. He personally picked the parent coral off the reef and brought it to Wageningen. 'Just in a couple of coolers in my hand luggage', he says. It was all perfectly legal, though. 'Ploughing through all the paperwork resulted in a five-hour delay.'

DIVING FOR CORAL EGGS

Corals consist of polyps that reproduce sexually by releasing millions of sperm and egg cells. These float to the surface and look for gametes from other coral colonies.

> 'You don't see any as lovely as these in the wild nowadays'

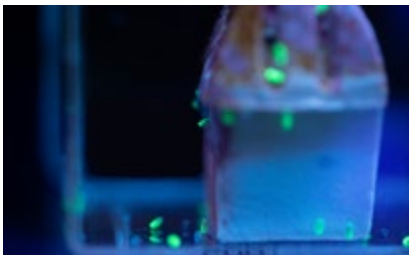
Geertsma: 'Normally, you had to dive for coral eggs for months in order to then fertilize and grow them in the lab. This is no longer necessary; in the Covid period we managed to complete the entire life cycle in the lab.'

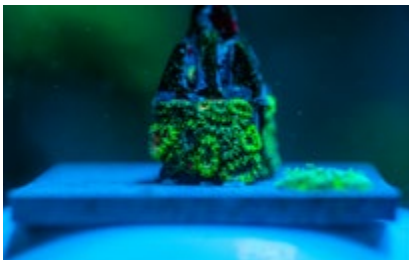
According to Geertsma, this breeding line is the only one in the Netherlands and one of the few in Europe. Alongside F11, there are dozens more of these tiny 'golf balls' lying on the aquarium floor. 'We now have a steady production line, which allows us to experiment all year round.'

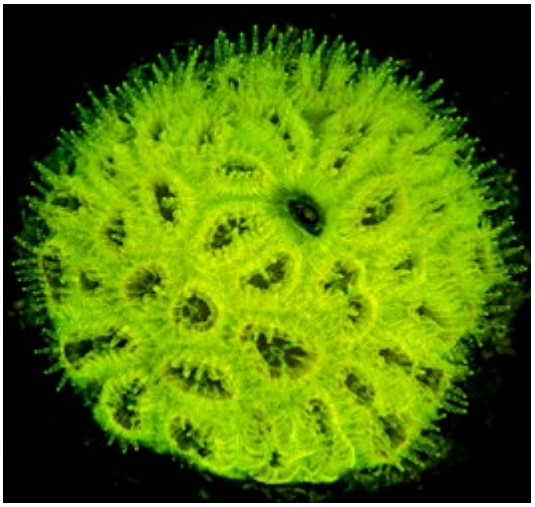
So the Wageningen offspring are doing their bit to expand our understanding of the life of corals. With the exception of a few locations, the world's coral reefs are in a bad way. Research might be able to offer tools for recovery.

COLOUR RETURNS

'Our corals are much healthier than those in the wild,' says Geertsema. 'When you pick them off the reef, they are very white and sometimes have large holes in them. Once here in the lab, their colour returns and their wounds heal. In the wild, they are very stressed. You won't find lovely ones like these out there anymore. It is frustrating to swim over a coral reef and see that corals you saw last time are gone. But when you succeed in breeding the first larvae in the lab and you see that they are thriving and that there is already a second generation, it gives you hope.'







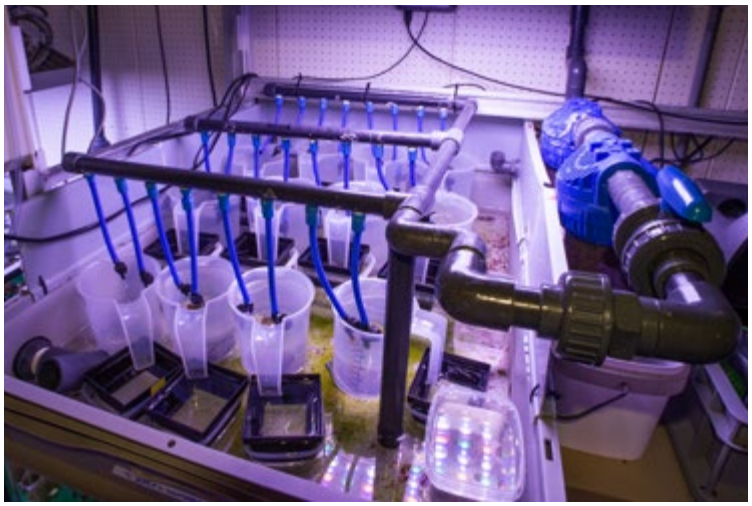


PHOTO ANP

Researchers in the coral lab in Wageningen have succeeded in getting a golf ball coral to produce larvae. Below right: the larvae are collected. Top right: the larvae establish themselves. The fluorescent pigments in the coral light up in green under blue light.

The larvae are choosy about where they live, says Geertsema. They see colours, smell odours and feel the ground. They are about one millimetre in size and are hard to see with the naked eye. The research group is therefore working on an optical system to track individual coral larvae for hours or even days. The system, Favia Vision, makes good use of the fact that the larvae contain a protein that lights up. 'This allows us to chart the selection process of the larvae. In a short time, we can test for a lot of substances to see whether they attract or repel larvae.'

This knowledge is useful for coral restoration, says Professor Tinka Murk. 'In the lab, we can now find out what makes larvae tick, and use that knowledge to lure them to artificial reefs. That gives reef recovery a kind of kick-start.' There will soon be another lab, in which research will be done on climate adaptation in coral. The researchers also have the mechanism behind coral bleaching in their sights. In some parts of the world, warming seawater is causing coral to bleach and eventually die. But in the warm Persian Gulf, for example, that is not happening. Murk suspects that some symbiotic combinations of corals and algae are more robust than others. 'Cultivating them in the lab will enable us to figure out why that is so. Which is hopeful, because it potentially opens the door to boosting native corals by offering them the right algae.' ■

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