

Coral fragments being nurtured at in-situ nurseries in the waters off Lazarus Island, one of Singapore's southern islands. In-situ nurseries mean that the fragments are reared not in tanks on shore, but in the ocean itself, under the supervision of marine biologists who tend to them by ensuring that they are not smothered by sediment stirred up by ocean currents. PHOTOS: REEF ECOLOGY LAB

# Underwater nurseries nurture corals and more

They also provide shelter and food for organisms that need corals for survival

**Audrey Tan**  
Environment Correspondent

In the waters off Singapore's southern coast, underwater gardens are being coaxed back to life.

Coral fragments have been "planted" in places that were previously devoid of sea life, such as areas with damaged coral, or man-made structures such as sea walls.

As the fragments bloom and grow, forming a coral reef, the reef structure becomes a beacon for fish and other marine creatures – a rich tapestry of life in places where barely anything grew before.

But new research by marine biologists from the National University of Singapore's (NUS) Reef Ecology Lab has shown that the nurseries the coral fragments are reared in are more than just a source of "potted corals" for future transplanting.

Marine creatures, including brittle stars, crabs and sea slugs called nudibranchs, can also be found within live corals in the nursery itself.

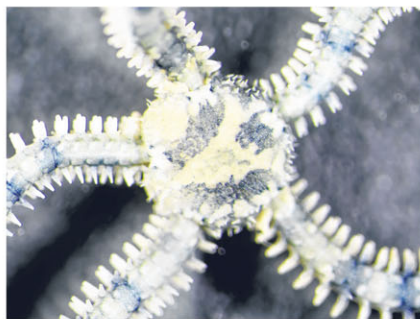
Many of these creatures are obligate coral dwellers – meaning that they depend on the corals for survival, as the structures provide them with food or shelter, for example.

Live coral colonies provide marine organisms with many food sources, including mucus and nutrient-rich tissues.

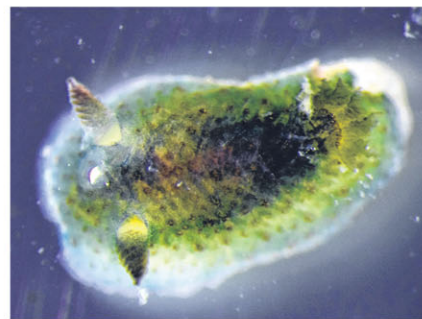
Lead researcher Crystle Wee said the findings show that nurseries may not just be a way to generate coral material for reef restoration projects.

"The fact that there are organisms using the nurseries for food and shelter shows that the nurseries can also provide important

## Some marine creatures that can be found within live corals in the nurseries



BRITTLE STAR



NUDIBRANCH



HAIRY CORAL CRAB



CORAL GUARD CRAB

functions beyond coral propagation," said Ms Wee, who worked with eight other researchers on the study as part of her final-year project as an undergraduate.

Their findings were published in the *Journal for Nature Conservation*, a scientific journal, last August.

Such nurseries are known as in-

situ nurseries, which mean that the fragments are reared not in tanks on shore, but in the ocean itself.

Coral fragments about the length of a human finger are first sourced from healthy coral reefs.

The latest study used fragments from corals growing off Kusu Island.

The fragments are then placed on

mesh nets or plastic pipes and allowed to grow under the supervision of marine biologists. The biologists tend to them by ensuring that the fragments are not smothered by sediment stirred up by ocean currents, for example.

When the fragments grow to about 15cm long – a process that could take up to a year – they are

suitable for transplantation onto degraded reef sites.

This is a method that is commonly used around the world, including Singapore.

Earlier research conducted by Emeritus Professor Chou Loke Ming and Dr Toh Tai Chong – both marine biologists from NUS who co-supervised Ms Wee's work – had yielded success in this area.

The project, funded by the Maritime and Port Authority of Singapore (MPA), had given corals lying in the path of the Tuas port development works a second lease of life.

In 2013, coral fragments from Sultan Shoal, located south of Tuas, were grown in nurseries and transplanted onto sea walls on Lazarus Island, one of the Republic's southern islands.

Dr Toh said the coral colonies transplanted to Lazarus Island were doing well – with some of them spawning last year – and Ms Wee's study went one step further by showing the value of nurseries in nurturing not just individual corals, but entire marine communities.

Prof Chou said the findings from the latest study could provide insights for future reef restoration projects. "Instead of transplanting individual coral colonies out onto the reef, there is the potential to move the entire nursery structure out onto the transplant site."

A spokesman for MPA told *The Straits Times* that the agency is aware of the latest study.

She said: "MPA started the coral relocation and conservation programme in 2013 to safeguard the coral reefs in Sultan Shoal in response to an environmental impact assessment."

"With the success and completion of our programme... we hope it will continue to inspire others. MPA will continue to develop our port in a sustainable manner."

audreyt@sph.com.sg



OTHER FUNCTIONS

The fact that there are organisms using the nurseries for food and shelter shows that the nurseries can also provide important functions beyond coral propagation.



LEAD RESEARCHER CRYSTLE WEE, who worked with eight other researchers on the study as part of her final-year project as an undergraduate.