

Rapid recruitment of corals on top shell snail aquaculture structures

Received: 27 December 2005 / Accepted: 28 December 2005 / Published online: 14 March 2006
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Fig. 1 Coral community in the top shell aquaculture boxes in 2003

In 1996, concrete box structures (2.1×2.1×0.6 m— $W \times L \times H$) were installed in shallow water at Miyako Island, Okinawa (24°55'45"N 125°15'55"E) for rearing the commercially important top shell, *Trochus niloticus*. Corals quickly attached on the quartz sand-coated fiberglass reinforced plastic latticed substrata on the bottom of the box. Corals were allowed to grow on five of the boxes. In 1998 corals in the boxes and on the adjacent reef suffered heavy mortality following extensive bleaching, but by 2003 the lattice was covered by a total of 26 species of 16 coral genera, dominated by colonies of *Acropora* spp. up to 40–65 cm in diameter (Fig. 1). Coral cover inside the boxes was over 90%, compared to 20% on the surrounding reef.

The design of these boxes appears to have created an ideal environment for promoting coral recruitment and growth compared to the surrounding reef. We suggest some factors that may have contributed: (1) coral eggs and larvae may have been trapped in the box and lattice substrate because of alterations in the local water flow, (2)

the structures may have protected the corals from wave damage and sediment, and (3) the grazing of top shells within the boxes may have reduced fleshy algae cover and created a more suitable substrata for coral recruitment.

Recruitment mechanisms of corals still remain elusive and many artificial restoration strategies remain only marginally successful. Quite by accident, these aquaculture structures seem to have created an ideal environment for coral recruitment and growth.

Acknowledgements Author MO thanks the Nippon Foundation and the Research Institute for Subtropics for financial support and S Walsh for critical reading and comments.

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