A novel substrate (the “coral peg”) for deploying sexually propagated corals for reef restoration

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At a workshop of the Restoration and Remediation Working Group of the Coral Reef Targeted Research & Capacity Building for Management Program (CRTR/RRWG: www.gefcoral.org) at Bilinao, Philippines, in August 2006, there was a suggestion that juvenile corals reared with sexual propagation on tiles for transplantation (Omori et al. 2008) could be reared either on a plastic pin or wall-plug so that they can be easily transported and stuck directly into the reef after drilling. Accordingly we developed the “coral peg” (hereafter referred to as the peg) and tested its result at Akajima Marine Science Laboratory in Okinawa. The peg is 60 mm in total height; the head (cement mixed with quartz sand) is 18 mm in diameter and 10 mm in height, and the shaft (plastic) is 10 mm in diameter and 50 mm in height (Fig. 1).

The pilot experiment started on June 12, 2007, using an opportunity when we were producing planula larvae of Acropora tenuis in the laboratory. Beforehand, 200 pegs were placed on shallow sea bottom for one month for preconditioning to enhance larval settlement. These pegs were immersed in a water tank (80 L) containing 6 day-old planula larvae for 2 days (10,000 individuals of the larvae for the first day and another 10,000 individuals were added next day), and we have confirmed that an average of 62.5 larvae (17 to 156 larvae; S.D. 32.7) settled and metamorphosed on the peg (N=40). The pegs were then set vertically in a cage and cultured with juvenile top-shell snails to reduce algal growth at 1.5 m depth in the sea. In December 2008, 18 months after settlement, corals on 76 out of 100 pegs survived (Fig. 2). 162 colonies tended to grow from the side of the head and grew up to 66 mm in diameter (average 29.2 mm; S.D. 10.7 mm).

We suggest that this pilot experiment demonstrates the potential of the peg for assisting reef restoration using sexually reared corals. We intend to maintain the cultured corals in cages for another few months before transplanting them on bommies at Akajima.

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References