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Tube extension and reproduction of Lamellibrachia satsuma inhabiting a whale vertebra under laboratory condition

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The vestimentiferan tubeworm Lamellibrachia satsuma, which is a dominant species at seeps in Kagoshima Bay, was shown to inhabit whale vertebrae that were experimentally deployed beside the L. satsuma habitats in Kagoshima Bay. More than 300 individuals were kept well in an aquarium for more than one year at atmospheric pressure with one vertebra that was retrieved 3 years later from the deployment (named the individuals as WF L. satsuma).

The tube extension of the WF L. satsuma at both anterior and posterior ends was measured by use of a tube-staining method. Tube-forming processes were observed using a time-lapse imaging system. Tube extension rate of posterior end was one order of magnitude faster than that of the anterior. Tube forming processes were different between anterior and posterior ends. The posterior ends grew continuously but the anterior showed resting phases. The total tube extension rate of the WF L. satsuma in this study was estimated as 42.6 cm yr^{-1} , which was much faster than that in previous study (0.7 cm yr^{-1}).

The WF L. satsuma occasionally spawned, and more than 150 individuals were newly settled on the vertebra under aquarium condition. Many eggs and cleaving embryos were collected from the aquarium, which were identified as L. satsuma by using molecular techniques. Elongated male pronucleus was observed in most eggs. These results strongly indicated its successful reproduction under laboratory condition.

Keywords: tubeworm, vestimentifera, whale-fall, growth, reproduction