

Adaptive significance of secondarily reduced features of the soft anatomy of *Vitularia salebrosa* (Neogastropoda: Muricidae): Experimental, geochemical, and anatomical evidence

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The feeding ecology of the muricid neogastropod *Vitularia salebrosa* from the tropical eastern Pacific is examined in the field and lab to shed light on the adaptive significance of its unusual soft anatomy, which includes a highly simplified buccal mass, radula, and gut. *Vitularia* predators feed on sessile or cemented molluscs leaving traces suggestive of a parasitic association. These include a foot scar on the prey's shell surface and a feeding tunnel. The tunnels themselves are formed by the prey as it deposits new sheets of shell material over the intruding proboscis, but predators are able to maintain distal and proximal openings through movement of the proboscis. Evidence is presented that *Vitularia* parasitizes blood vessels or digestive glands of its prey.

Feeding experiments in laboratory aquaria confirm that *Vitularia* is capable of long-term, non-lethal associations with prey. Attacks on individual vermetids lasted up to 69 days before prey were killed and on oysters up to 104 days (oyster prey still alive when experiment terminated). Stable isotope sclerochronology of growth lines on feeding tunnels of two field-collected oysters indicates that natural interaction times with oysters may exceed 4 months without death of the host. Conceivably, predators may feed on as few as 2 to 3 prey per year and never use their radula. The specialized ecology of *Vitularia*, which is unusual within the Muricidae, suggests that the simplified alimentary system of *Vitularia* is a highly derived condition rather than plesiomorphic.