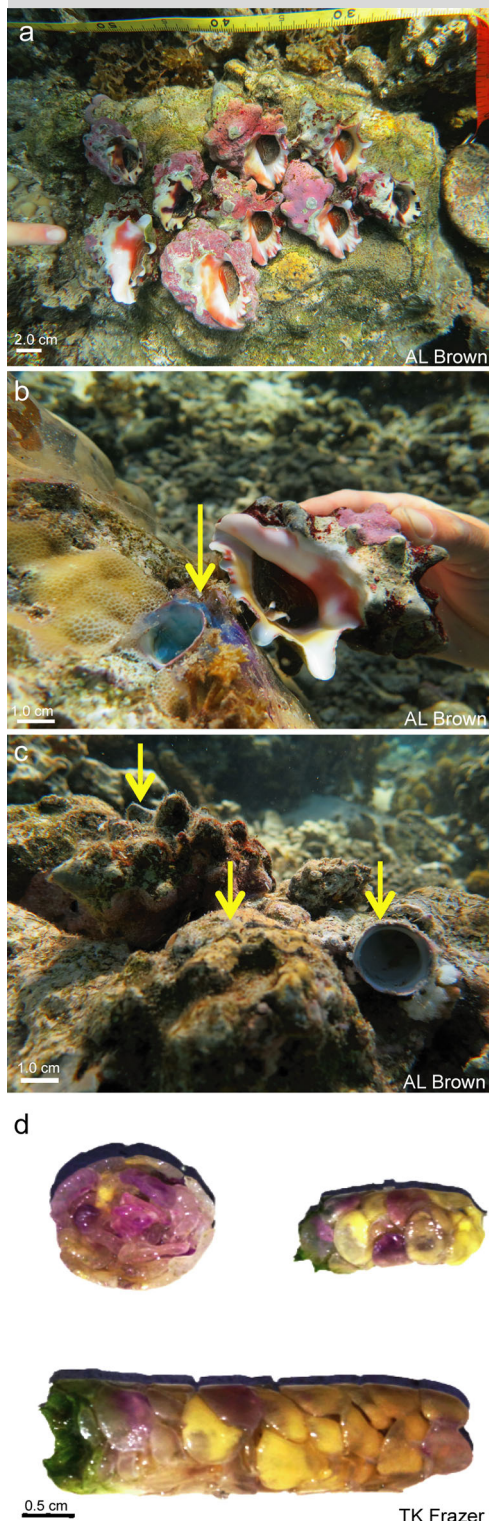


Reef sites

Death and life: Muricid snails consume the vermetid gastropod, *Dendropoma maximum*, and use empty shells for reproduction



Dendropoma maximum, a large sessile vermetid gastropod, is abundant on shallow coral reefs and can reduce the growth and survival of corals (Shima et al. 2010). Despite high densities and detrimental effects, little is known about vermetid ecology, particularly their interactions with predators. In the austral winter, we observed two species of muricid gastropods, *Mancinella armigera* (Link, 1807) and *Menathais tuberosa* (Röding, 1798; Fig. 1a) feeding on the vermetid gastropod, *D. maximum*, in the shallow lagoon of Moorea, French Polynesia (17.28°525–645'S, 149.47°335–535'W). Until now, vermetid predation had not been documented in French Polynesia, although *M. armigera* had been reported to consume vermetids in other areas of the South Pacific (Taylor 1976). On five occasions, we observed *M. armigera* with its proboscis inserted into a shell of *D. maximum*. When the muricid was removed, a blue substance was observed in the empty vermetid shell tube (Fig. 1b), along with the operculum of the *D. maximum*. In addition to these field observations, we placed live vermetids and muricids in lab aquaria together and observed an additional five predation events. In the field, we found a greater number of *D. maximum* recently killed (Fig. 1c) within 1 m of a *M. armigera* than in nearby (within 3 m) control plots lacking *M. armigera* ($t_4 = -3.06$, $p = 0.02$, 4 ± 2.3 ; vs. 0.2 ± 0.4 , mean \pm 95 % confidence interval, $n = 5$), suggesting that the predator may represent a significant source of mortality for vermetids.

During our surveys, we also discovered egg masses from muricids deposited into vermetid shells (Fig. 1d). In one instance, we observed recently deposited egg cases when removing a *M. armigera* from atop a *D. maximum*. In all other instances, the egg cases were found near pairs of *M. armigera*, suggesting that those snails deposited the eggs. The use of shells of recently killed vermetids for reproduction has not been reported previously. This interaction represents a novel use of a prey resource, in which the consumption of a prey also facilitates the predator's reproduction by creating a new microhabitat for eggs.

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◀ **Fig. 1** a *Mancinella armigera* (rosy aperture) and *Menathais tuberosa* (black stripes on aperture) collected within 3 m of recently consumed vermetids. The *M. armigera* in the lower left of the group (see finger) was found feeding on a vermetid and is also shown in b *M. armigera* with a vermetid shell. The arrow points to the blue material that emerged when the predatory snail was removed from the vermetid. c Two muricids (left-most arrows) near a recently killed vermetid (right arrow). d Top and two side views of two out of the four egg masses found inside a vermetid shell that was near two live *M. armigera*