

The Harrowing Dilemma of a Female Pea Crab by Bill Merilees

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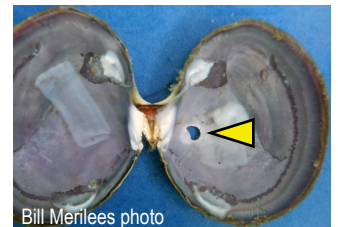


Pea crabs, living within a clam, where food and shelter are provided by your host, might be regarded as a fairly idyllic life style, possibly even better than that of the clam itself. Being "as happy as a clam at high tide" is an old expression with the alleged meaning "free from the attention of predators" (Google). This may be so, but what happens when your host gets into the grips of a moon snail, bent on securing another meal?

On April 30th, 2010, at Midden Bay, Newcastle Island, a blemish on the surface of the beach indicated a moon snail had been moving underneath. Scooping away 5 cm of sandy gravel revealed the snail's bulbous shell. A modest pull extracted the extended animal from its lair. As it retracted into its shell copious amounts of water were expelled from its foot.

Expanding the depression left by the snail reveal a 4 cm Varnish Clam, with a neatly countersunk hole, the characteristic mark indicating moon snail predation (photo). The hole was not quite completely circular but the clam remained tightly closed. With a Swiss Army Knife, what remained of the clam's adductor muscles were severed, revealing parts (siphon tips) of the recently living clam (photo), and one very active (agitated ?) female Pea Crab with a carapace about 6 mm in diameter.

Since this clam's accidental introduction to British Columbia waters in the 1980's (Merilees & Gillespie, 1995) pea crabs have found this clam to be a most attractive host. At Departure Bay in Nanaimo, it is not unusual for 60 to 70% of the varnish clams to have pea crabs living inside them. These crabs settle from their pelagic stage into the clam between late spring and early summer, where they appear to remain for one, possibly two years (personal observations). At this point they are believed to exit the varnish clam and seek out horse clams or geoducks where they complete the reproductive stage of their life cycle.



For a crab imprisoned inside a clam locked in the grip of a moon snail, it would be similar to being trapped in a locked room where a hole was being drilled through the ceiling. Then having a long, flexible, toothed belt inserted through the opening that starts flaying around, rasping away the flesh of your host. No wonder the crab was active! In addition to rasping, the moon snail also appears to secrete an unknown weak solution of pH 8.9 (Bernard, 1967) that assists the drilling process. This chemical possibly also assists the digesting process as the disarticulated siphon tips inside the clam were a different texture and of a transparent colour, (visible in the photo) quite different from living clams. Also, the usual shiny internal (nacreous) surface of the clam's shell, appeared chemically etched, losing its lustre.

Upon completing its meal the moon snail moves on, but the author wonders if the imprisoned crab could escape? Even if the clam's adductor muscles were completely devoured, the pressure of the substrate would keep the valves from opening. As the hole drilled through the shell was too small to afford the crab an exit, the only other escape route would appear blocked. Under these circumstances the crab would likely slowly starve to death. The pea crab found on this occasion however was released to seek out a new host.

Bibliography:

Bernard, F.R., 1967: Studies of the Biology of the Naticid Clam Drill *Polinices lewisi* (Gould), Fisheries Research Board of Canada, Biological Station, Nanaimo, B.C.

Merilees, B, and G. Gillespie, 1995: Two New Exotic Clams in Georgia Strait. Discovery, Vol. 24. No 2. Vancouver Natural History Society.

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