

Shell-boring worms: anything but a dull subject

Summarized from “Evaluating treatments for shell-boring polychaete (Annelida: Spionidae) infestations of Pacific oysters (*Crassostrea gigas*) in the US Pacific Northwest; Martinelli et al., Aquaculture, 2022.” [Find the full paper at ScienceDirect.](#)

What are shell-boring polychaetes, and how do they affect shellfish?

Shell-boring worms are pervasive aquaculture pests found on shellfish farms worldwide. The term shell-boring worms is commonly used to refer to marine polychaetes in the family Spionidae, including the genera *Polydora*, *Dipolydora*, *Boccardia*, and *Boccardiella*. These parasitic polychaetes are thought to use a mucus acid to dissolve the host’s shell and create aesthetically unappealing blisters which can lower marketability of oysters.

In addition to aesthetic impacts, shell-boring worm infestations can compromise bivalve growth, survival, and shell strength. Burrows and blisters cannot be reversed, but the worms within blisters can be killed, which may reduce the overall burden of parasite infestation on an oyster farm and prevent future burrows and blisters from developing on healthy oysters.

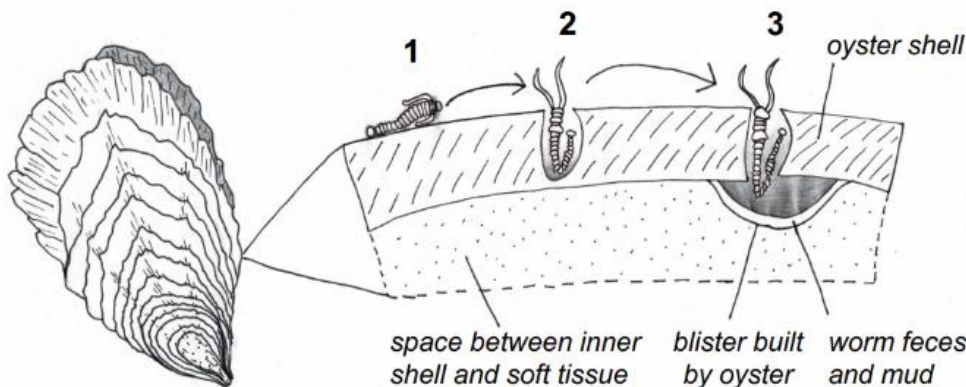


Figure 1. Diagram showing the infestation process by shell-boring worms on oysters. Juvenile larvae settle on the oyster shell and undergo metamorphosis (1). The juvenile or post-metamorphic worm slowly starts dissolving and burrowing into the shell (2). Over time, as worms grow larger, they penetrate the inner layer of the oyster shell (3) and start accumulating mud, feces, and debris. In response, the oyster creates a blister, or added layers of shell, to separate the worm and other contents from the oyster’s soft tissue. Scientific illustration by Dr. Danielle Claar.

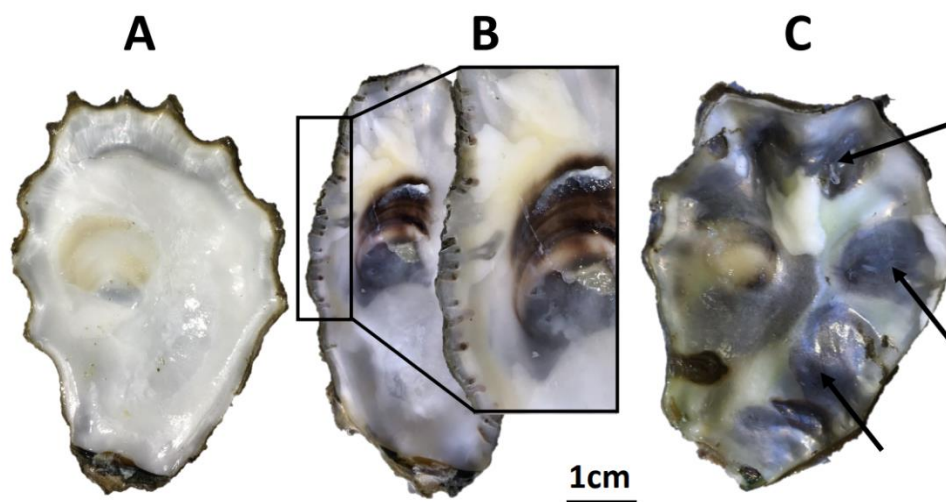


Figure 2. Cultured Pacific oyster shells showing different stages of infestation by shell-boring polychaetes. (A) Healthy oyster shell. (B) Oyster shell with burrows along the edge created by shell-boring polychaetes; note the U-shaped tracks on the expanded image. (C) Oyster shell with advanced infestation, showing multiple blisters filled with feces and detritus (Martinelli et al., 2022).

Effective methods for dealing with infestations

Several effective methods for dealing with worm infestations have been co-developed by researchers at the University of Washington, Washington Sea Grant, and various Washington oyster farmers. These include:

- Placing oysters in shellfish grow-out bags and leaving them to dry on top of a table in a room with open air circulation for two days at ambient temperature (50-59°F; 10-15°C).
- Holding oysters in a bucket of fresh water (62.6±7.2°F; 17±2°C) at room temperature for one hour, followed by air drying for two days (50-59°F; 10-15°C) in a room with open air circulation.
- Placing oysters in shellfish grow-out bags inside of a refrigerator (39±.9°F; 4±.5°C) for three days.

Treatment type	Temperature	Time	Description
Dry	(50-59°F; 10-15°C) air temperature	48 hours	Place oysters in a shellfish grow-out bag in a room with open air circulation at 50-59°F; 10-15°C.
Fresh - Dry	(62.6±7.2°F; 17±2°C) freshwater temperature, (50-59°F; 10-15°C) air temperature	One hour freshwater soak, followed by 48	Place oysters in a shellfish grow-out bag in a bucket of fresh water at a room temperature of 62.6±7.2°F; 17±2°C for one hour. Follow by drying oysters in a shellfish grow-out bag placed on top of a table in a room with open air circulation at 50-59°F; 10-15°C.

		hours air drying	
Refrigeration	(39 ±.9°F; 4±.5°C) air temperature	36 hours	Place oysters in a shellfish grow-out bag inside a refrigerator kept at 39±.9°F; 4±.5°C.

All three methods have demonstrated 98-100% worm mortality, with no oyster mortality seen for the fresh-dry or refrigeration methods and minimal oyster mortality (4%) for the dry method. Air drying alone may be the most cost-effective and easiest for Washington oyster farmers to implement.