

Shell-Boring Polychaetes

I. Causative Agent and Disease

Segmented polychaete worms belong to the phylum Annelida, class Polychaeta and family Spionidae. These worms utilize the shells of bivalve molluscs as a substrate by constructing burrows on the shell surface or burrowing into the shell to form tunnels lined with compacted mud. Hence, the name of the condition is known as “mud blister”. The species *Polydora websteri* and *P. ligni*, among others, are commonly associated with mud blisters in bivalve molluscs causing unsightly internal shell surfaces and, in severe cases, causing formation of debilitating pustules or abscesses in soft tissues that can result in substantial bivalve mortality and economic losses.

II. Host Species

Shell-boring polychaetes occur worldwide causing mud blisters in various species of bivalve molluscs including oysters, mussels and scallops. In Alaska, mud blisters have only been observed in weathervane scallops from Shelikof Strait and may have been associated with mortality in the population.

III. Clinical Signs

Gross clinical signs include mud blisters on the inner surface of the shell and possibly yellow pustules in soft tissues contacted by the burrows. Severely infested bivalves may show gaping valves and an overall poor body condition. *Polydora ligni* does not bore directly into shell but builds tubes on the bivalve shell surface and secretes thick mucus that retains sediment, oyster feces and rejected material. Decomposition of this material produces hydrogen sulfide easily detected by odor that can also cause massive bivalve mortality.

IV. Transmission

The abundance of shell boring polychaetes is largely influenced by the presence of a mud bottom. Host infestation is from a simple direct life cycle. Juvenile worms settle on the edge of the shell and begin burrowing or, in the case of *P. ligni*, build their tubes on the surface of the shell. Hermaphroditic adults produce egg capsules in the burrow that hatch into larvae released into seawater which disperse to a new host.

V. Diagnosis

Diagnosis is based on gross observation of 2 mm diameter sinuous burrows or 1 cm diameter patches of mud and debris in or on the shell matrix when held next to a bright light. “Muscle pearls” or nacreous excrescences in the muscle scar of the shell is evidence of healed abscesses in the muscle tissues. A polychaete may be removed by breaking the shell along the burrow path and submerging the shell fragments in seawater to extract the worm with forceps and needle. Species identity is based on the morphological characteristics of the worm, particularly the armature of the setae.

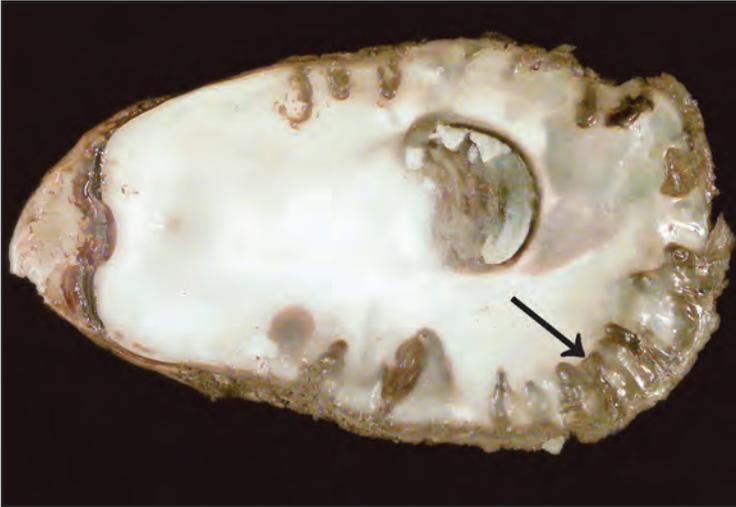
VI. Prognosis for Host

Mortality of infested bivalves is generally rare when prevalences and intensities of mud blisters are low, but the half-shell marketability may be reduced. In the majority of cases oysters are able to better tolerate infestation by walling off the burrows with newly secreted shell nacre. Scallops are more seriously affected because they are less able to produce nacre towards the interior of the shell where burrows may damage the attachment of the adductor muscle. Violent

contractions of the valves can pull the damaged adductor muscle loose resulting in eventual scallop mortality. Prevalences and intensities of mud blister may be reduced by off-bottom bivalve culture techniques.

VII. Human Health Significance

There are no zoonotic human health concerns regarding polychaete infestation of bivalve molluscs except for the reduced aesthetic quality of meats consumed in the half-shell market.



Eastern oyster shell with *Polydora* tunnels (arrow) on inner surface of valves (Photo: Dorothy Howard, NOAA Cooperative Oxford, MD Laboratory)



Another eastern oyster with *Polydora* tunnels (arrow) on inner surface of valves (Photo: Dorothy Howard, NOAA Cooperative Oxford, MD Laboratory)