Infection with *Perkinsus marinus*

Also known as perkinsosis and dermo disease
From *Aquatic animal diseases significant to Australia: identification field guide*, 5th edition

Figure 1 American oyster (*Crassostrea virginica*) showing gross signs of infection with *Perkinsus marinus*

Note: A healthy oyster (left). The infected oyster (right) is thin and watery, typical gross signs of infection with *P. marinus*.
Source: E Burreson

Signs of disease

Important: Animals with this disease may show one or more of these signs, but the pathogen may still be present in the absence of any signs.

Disease signs at the farm, tank or pond level are:

- gaping
- retarded growth
- poor condition or emaciation
- increased mortality.

Gross pathological signs are:

- shrinkage of mantle away from the outer edge of the shell
- occasional lesions in soft tissue
- pale digestive gland
- thin, watery tissue.

Microscopic pathological signs are:

- large, multifocal lesions in the gut epithelium or connective tissue of organs containing *P. marinus* cells
- haemocyte infiltration and phagocytosis of *P. marinus* cells
- destruction of the gut epithelium.

Disease agent

Perkinsosis (or dermo disease) is caused by infection with *Perkinsus marinus*, an alveolate protest in the family *Perkinsidae*. *P. marinus* has been placed nominally in the order Dinoflagellida, but its higher taxonomy is subject to scientific debate. Several other species of the genus *Perkinsus* infect molluscs such as oysters, mussels, clams and abalone worldwide.

Host range

Table 1 Species known to be susceptible to infection with *Perkinsus marinus*

Common name	Scientific name
American eastern oyster[a]	*Crassostrea virginica*
Baltic macoma	*Macoma balthica*
Blue mussel	*Mytilus edulis*
Cortez oyster[a]	*Crassostrea corteziensis*
Mangrove oyster[a]	*Crassostrea rhizophorae*
Pacific oyster[a]	*Crassostrea gigas*
Soft shelled clam	*Mya arenaria*
Suminoe oyster[a]	*Crassostrea ariakensis*

a Naturally susceptible. Note: Other species have been shown to be experimentally susceptible.

Presence in Australia

Exotic disease—not recorded in Australia.

Map 1 Presence of *Perkinsus marinus*, by jurisdiction

Epidemiology

- Water temperatures above 20°C encourage proliferation of the parasite. This results in systemic disruption of connective tissue and epithelial cells and leads to high mortalities.
- Reduced salinity levels (below 9ppt) can prevent clinical disease resulting from *P. marinus* infection, even in warm water (above 20°C).
- Cumulative American oyster mortalities of up to 95% have been observed in the first summer following transfer of naïve stock to an area where the disease is known to be present.
- Transmission is horizontal.
- Infection levels increase during spawning and under the stress of oxygen depletion.
- Prevalence and intensity of infection are greatest in oysters more than 1 year old and at depths greater than 90cm.
- Exposure to pollutants will increase the prevalence of infection.

Differential diagnosis

The list of similar diseases in the next section refers only to the diseases covered by this field guide. Gross pathological signs may also be representative of diseases not included in this guide. Do not rely on gross signs to provide a definitive diagnosis. Use them as a tool to help identify the listed diseases that most closely account for the observed signs.

Similar diseases

Infection with *Perkinsus olseni.*

The clinical signs of infection with *P. marinus* are similar to those of infection with other species of *Perkinsus*. These include occasional pustules in soft tissue, pale digestive gland, poor condition, emaciation, shrinkage of mantle and retarded growth. It is therefore difficult to make a presumptive diagnosis based on gross signs alone. Any presumptive diagnosis requires further laboratory examination.

Sample collection

Only trained personnel should collect samples. Using only gross pathological signs to differentiate between diseases is not reliable, and some aquatic animal disease agents pose a risk to humans. If you are not appropriately trained, phone your state or territory hotline number and report your observations. If you have to collect samples, the agency taking your call will advise you on the appropriate course of action. Local or district fisheries or veterinary authorities may also advise on sampling.

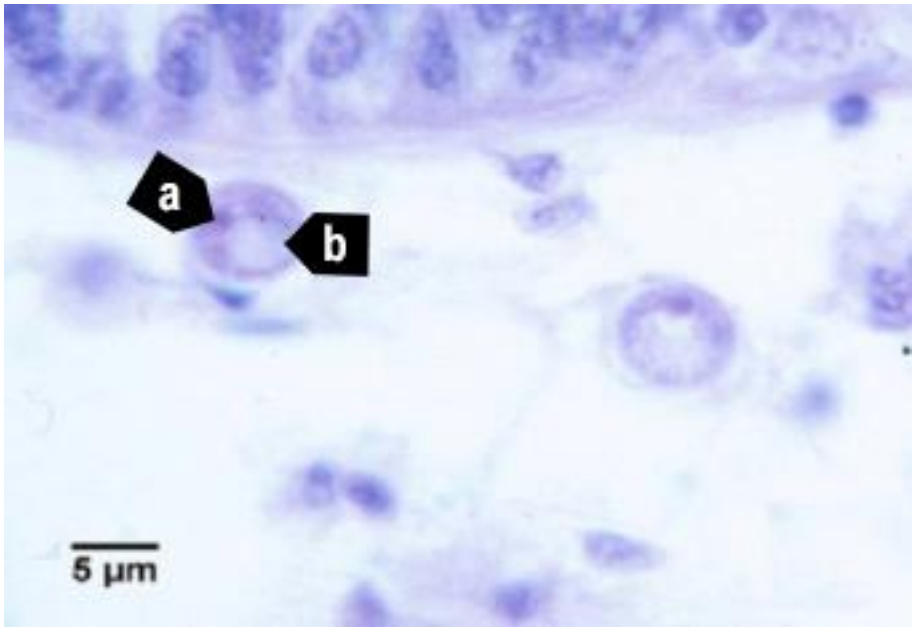
Emergency disease hotline

See something you think is this disease? Report it. Even if you're not sure.

Call the Emergency Animal Disease Watch Hotline on **1800 675 888**. They will refer you to the right state or territory agency.

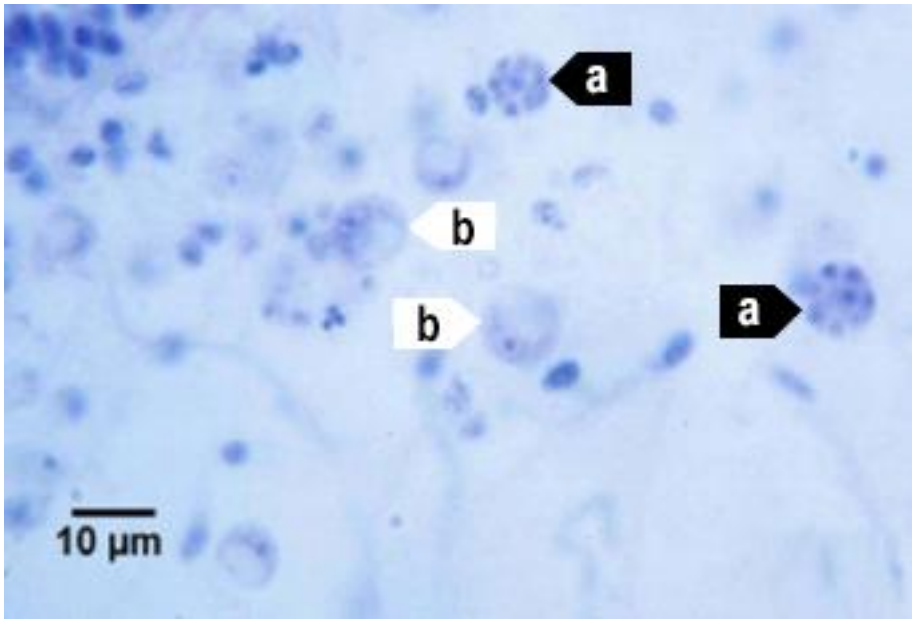
Microscope images

Figure 2 Histopathology of American oyster (*Crassostrea virginica*) infected with *Perkinsus marinus*



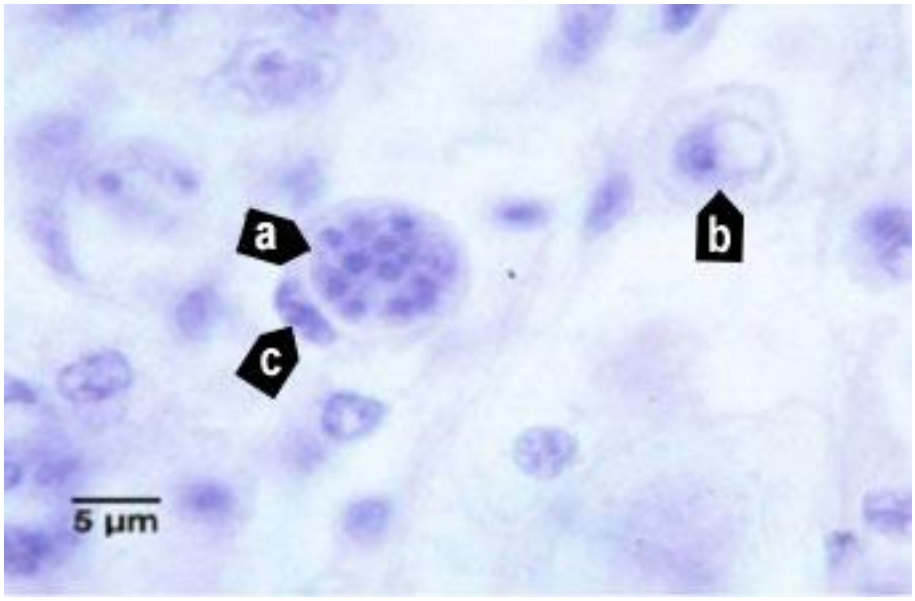
Note: Trophozoite of *P. marinus* with nucleus (a) and distinctive eccentric vacuole (b). Scale bar = 5µm.
Source: E Burreson

Figure 3 Histopathology of American oyster (*Crassostrea virginica*) infected with *Perkinsus marinus*



Note: *P. marinus* 16-cell tomont (a) stages containing immature trophozoites. Maturing trophozoites (b) are also visible. Scale bar = 10µm.
Source: E Burreson

Figure 4 Histopathology of American oyster (*Crassostrea virginica*) infected with *Perkinsus marinus*



Note: A 16-cell tomont (a) of *P. marinus* containing developing trophozoites. This tomont is contained within a haemocyte (c indicates the nucleus of the phagocytic cell). A maturing trophozoite (b) is nearby. Scale bar = 5µm.
Source: E Burreson

Further reading

CABI Invasive Species Compendium Infection with 'Perkinsus marinus'

CEFAS International Database on Aquatic Animal Diseases Infection with 'Perkinsus marinus'

World Organisation for Animal Health Manual of diagnostic tests for aquatic animals

These hyperlinks were correct at the time of publication.

Contact details

Emergency Animal Disease Watch Hotline 1800 675 888
Email AAH@agriculture.gov.au
Website agriculture.gov.au/pests-diseases-weeds/aquatic

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