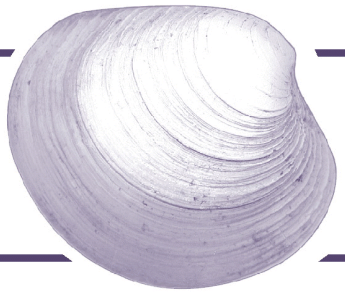
Aqua Info
AQUACULTURE NOTES



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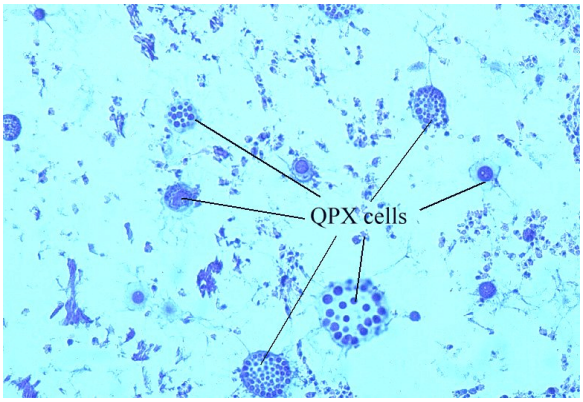
Quahaug Parasite Unknown ("QPX")

Background

Quahaugs (quahogs or hard-shell clams) (*Mercenaria mercenaria*) have been fished in Atlantic Canada extensively over the last 60 years. In PEI alone in 2000 they generated over $2.7M in landed value. Quahaugs support both commercial and recreational fisheries. Recent interest in developing quahaug aquaculture in the Maritimes has led to increased monitoring of health in hatcheries, at grow out sites, and in relation to movement of stocks from one area to another. The first report of Quahaug Parasite Unknown "QPX" in Canadian waters was in the late 1950's following transplants of quahaugs from PEI to Neguac, NB. At the time, it was described as a "Chytrid- like fungus. Since 1989, quahaug broodstocks on PEI, have experienced occasional significant mortalities associated with infection by QPX. An identical parasite was responsible for mass mortalities of open-water quahaugs in the eastern US. No mortalities have been found in wild Canadian quahaugs since its original discovery in NB. The reason for this apparent contradiction in infection severity in Canadian and US clam populations is currently under investigation.



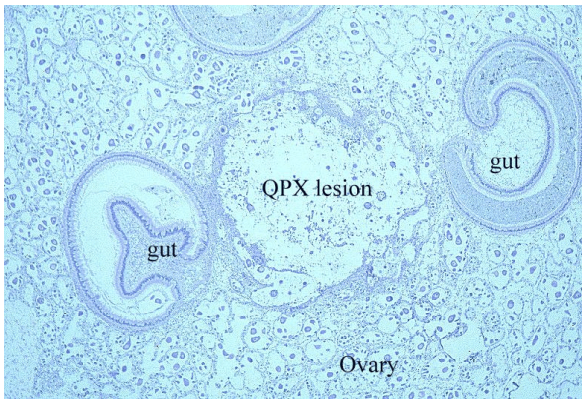
A stained histology section of QPX cells (20-40 µm diameter) in the gonadal tissue of a quahaug, viewed at high power (25x) under a light microscope.

Does QPX Affect Consumers?

There is no effect on humans or mammals eating infected quahaugs. Heavy infections of QPX may weaken the quahaugs and cause 'gapers' that are usually rejected during processing.

Can you tell if Quahaugs have QPX?

In Atlantic Canada there are no visible clues to tell infected from uninfected clams. Quahaugs from Massachusetts, however, may have chipped shells and yellow/tan nodules in the mantle. The chipping appears related to the clams being unable to keep sand out of the shells. Scientists need to look at quahaug tissues using a microscope in order to clearly see the QPX. Even without visible clues, clam fishers and aquaculturists can play an important role in detecting and reporting clam beds that show high levels of weak or dying quahaugs. Beds full of



A stained histology section of QPX cells (10-25 µm) in a lesion in the gonad (ovary) of a female quahaug, viewed at low power (4X) under a light microscope.

empty intact shells (as opposed to crushed or drilled) may be an important clue to tracking the cycle of this parasite. Any findings should be reported to the federal or provincial fisheries departments.

How does QPX affect the Quahaug?

Usually, infections are light with little tissue damage, however in advanced or severe infections, QPX can cause serious destruction and displacement of tissues, such as the gills and gonads. This may weaken and kill the clam. In some cases, very light infections have also been associated with mortality. This reinforces the observations from hatcheries and densely stocked beds - where other stresses may make the infection worse.

Are any other Shellfish Affected?

QPX has only been found in quahaugs and there is no evidence that other species can be infected. A similar parasite of abalone from British Columbia caused mass mortalities in the late 1980's, but was never found in other species.

What work is being done on QPX?

Surveys

A PhD study was conducted on quahaugs throughout the Maritimes between 1996 and 1997. Material from this, in addition to material collected from DFO between 1991-98, was examined for QPX. Results show that light and moderate levels of QPX occur in quahaugs throughout the Gulf of St. Lawrence and Bay of Fundy. Only quahaugs larger than 18mm (>1.5 yrs old) are infected.

Challenge Experiments

Infection challenges using injection of QPX into non infected quahaugs, as well as in the same tanks, revealed that direct infection from clam-to-clam is not simple. Many closely related or identical parasites were found on the surface of the clams but few penetrated the soft-tissues. This indicates, once again, that other factors may be necessary to trigger serious infections (e.g. water temperature, salinity or overcrowding).

Conclusions

Certain aquaculture practices, such as hatchery spawning or densely stocked grow out, appear to make quahaugs susceptible to QPX. This means that to optimize quahaug culture production, we need to know more about what factors trigger serious infections. Hopefully answers from direct research and refinement of culture techniques will furnish the clues we need to better avoid unnecessary losses of quahaugs to QPX disease.

This information sheet was made possible by the following partners:

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