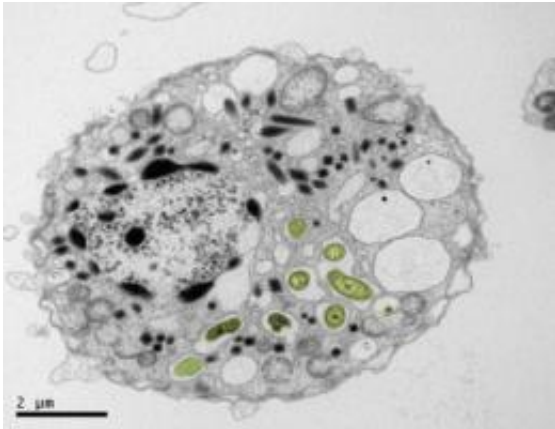


Lifestyle of a killer

September 6 2012



Parasitic dinoflagellates of the genus *Hematodinium* are a big problem for crab, prawn and shrimp fisheries across the world. Credit: Dr. Grant Stentiford

Parasitic dinoflagellates of the genus *Hematodinium* are a big problem for crab, prawn and shrimp fisheries across the world. New research published in BioMed Central's open access journal *Aquatic Biosystems* has found that, in wild European brown shrimp (*Crangon crangon*), these parasites have bacteria-like endosymbionts. The presence of these endosymbionts indicates a previously unknown side to the lifecycle of *Hematodinium*.

Hematodinium sp. and its sister species *H. Perezi* are a real problem for blue crab fishers, causing 'bitter crab' disease, and are thought to be responsible for the decline of [blue crabs](#) in [Chesapeake Bay](#). But they are not fussy. Over 40 species of crustaceans are known to be infected

by these nasty parasites.

A collaboration between researchers at the European Union Reference Laboratory for Crustacean Diseases (CEFAS) and the Virginia Institute of Marine Sciences (VIMS) identified the parasite responsible for causing sickness in wild European brown shrimp, collected from the North Sea, as *Hematodinium* sp.. These shrimp had lost carapace transparency and their blood (haemolymph) had lost the ability to clot. The invading *Hematodinium* had also infiltrated the muscles, destroyed [internal organs](#), and the infection had damaged the shrimp's ovaries, affecting their ability to reproduce. Adding insult to injury the shrimp were also infected with *Crangon crangon* bacilliform virus (CcBV).

Further investigation revealed that two of the lifestages of the parasite were present in these shrimp, trophont (the adult, mobile stage) and dinospore (the infectious stage). However, for the first time, the dinospores were themselves seen to be infected with bacteria-like cells both in the cytoplasm and inside the nucleus.

Dr Grant Stentiford from Cefas explained, "The [symbionts](#) inside *Hematodinium* sp. appeared to make no difference to the ability of the parasite to infect shrimp. However, for these relationships to survive the endosymbiont must supply an evolutionary advantage. It seems most probable that the endosymbiont in some way increases the chance of the dinoflagellate to survive outside the shrimp, and successfully transfer to a new host. One of the problems with *Hematodinium* infection is that we do not yet fully understand their lifecycles. The role of this endosymbiont to its survival may be the key to controlling infections in species of farmed crustaceans."

More information: *Hematodinium* sp. and its bacteria-like endosymbiont in European brown shrimp (*Crangon crangon*) Grant D Stentiford, Kelly S Bateman, Michelle Pond, Hamish J Small and Anette

Ungfors, *Aquatic Biosystems* (in press)

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