Investigating the impact of crab biology and sampling season on variation in microparasite infections in velvet crab (*Necora puber*)

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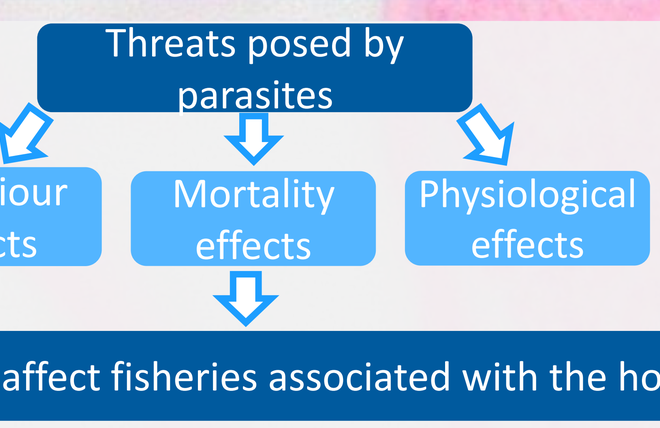

Introduction

Crustaceans are a valuable resource commercially, and velvet crab are important especially to smaller inshore fishers. The decline in a velvet crab fishery in Ireland and findings of a high prevalence of *Paramarteilia* sp. highlighted the lack of knowledge on the stocks. *Paramarteilia* sp. is a protistan parasite, found also in brown and spider crabs. Not much is known about how they may impact crabs, though another paramyxid parasite, *Marteilia refringens*, has been associated with mass mortalities in oyster.

Methods

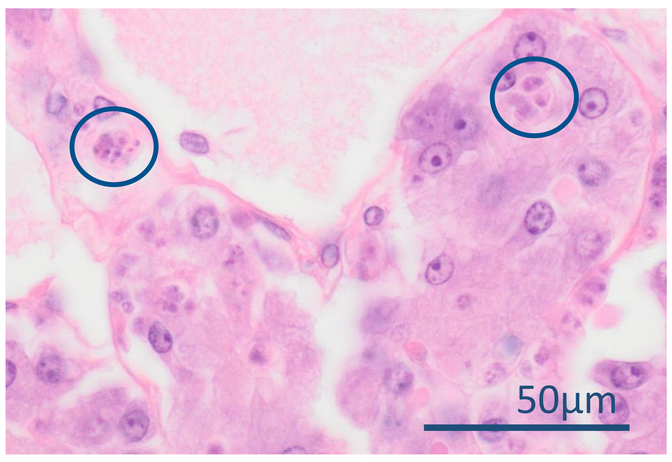

Figure 1. *Paramarteilia* sp. in the gill tissue of velvet crab

Crabs were sampled from Galway Bay over twelve months. Six different tissues were sampled and processed using histological methods. Tissues were diagnosed for microparasite presence by slide reading. Data was analysed using logistic regression in R.

Results

Size

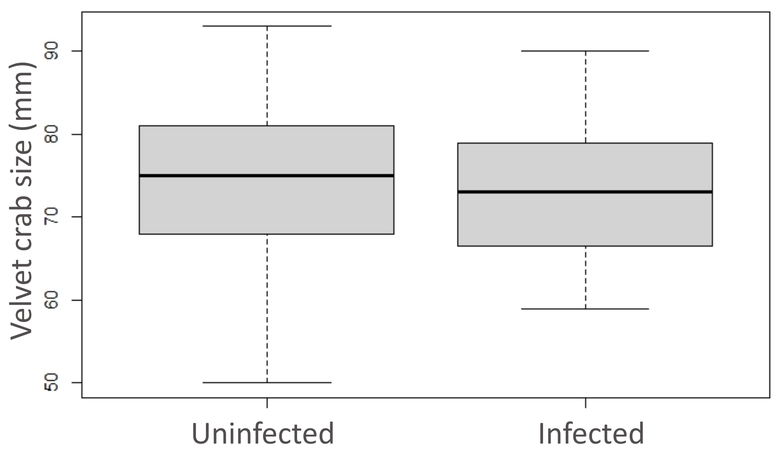

Figure 2. Size range of crabs infected and uninfected by *Paramarteilia* sp.

The size of crabs did not affect infection levels significantly (z=-0.151, p=0.880). There was slight evidence for smaller crabs to be infected more often.

Overall infection prevalence of *Paramarteilia* sp. = 49% (n=104)

Sex

Figure 3. Females and males infected by *Paramarteilia* sp.

Velvet crab infection levels did not differ significantly between males and females (z=0.665, p=0.506).

Season

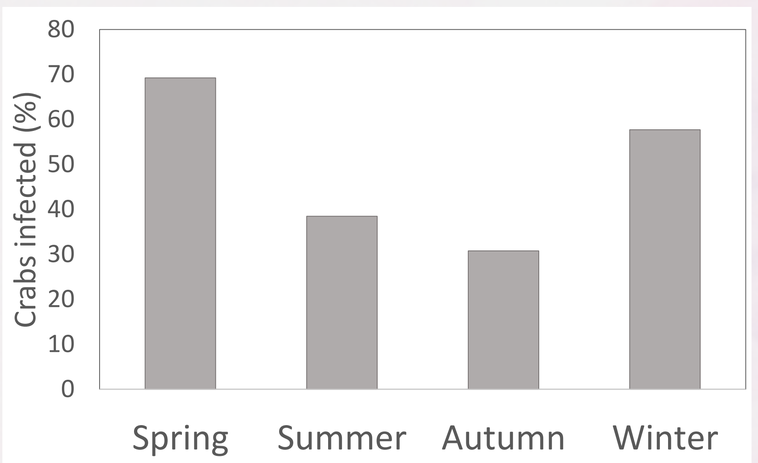

Figure 4. Percentage uninfected and infected crabs in each sampling season

Infection levels were significantly higher in Spring (z=2.310, p=0.021). A similar trend towards higher infection was seen in Winter (z=1.939, p=0.0553)

Conclusions

A high prevalence of *Paramarteilia* sp. were found in velvet crab and presence was highest in Spring. Crabs can be more vulnerable to infection during moulting when their shell is softer. A study from 1995 suggested that the moulting period of velvet crab in Ireland was mainly in Spring. However, more research would be needed to confirm this. In crabs infected with *Paramarteilia* sp., we noticed that in lighter infections only one or two out of six tissues were positive for the parasite. In these lighter infections, the cuticular epithelium was most often infected. Noting these patterns may help us understand more about transmission. *Paramarteilia* sp. has been found to vertically transmit in a Gammarus species and I will also test crab eggs for the parasite. The results from this project will contribute to identifying whether monitoring programs for parasites are needed for velvet crab and other crustaceans.

Future plans:

Analyse 16 months of crab samples
Confirm infections, diagnosed by histology, molecularly
Describe the pathobiome of velvet crab associated with *Paramarteilia* sp. infection
Sample additional crustaceans

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