Foraging behaviour of *Eriphia ferox* on Hong Kong rocky shores, now and under future warming

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Background

- Ocean warming is altering the fundamental biology of organisms and ecological interactions.[1]
- Predation behaviour of many rocky shore species are linked to environmental temperature.[2]
- *Eriphia ferox* shelter within crevices on exposed rocky shores, emerging, mainly at night to forage on the mussel *Septifer virgatus.*[3]
- Increased temperatures may change foraging intensity or prey choice as energetic needs of *E. ferox* increase.
- Therefore rising temperatures have the potential to impact this important predator-prey relationship.

Materials & Methods

- Crabs acclimatised to present day (29 °C), and two future temperature regimes (31 °C and 33 °C) in laboratory.
- Prey choice experiments were designed after (Jackson and Underwood, 2007; Underwood and Clarke, 2005).
- Mussels divided into 4 size classes (10-15 mm, 20-25 mm, 30-35 mm and 40-45 mm) as prey.
- Crabs were first given no choice in size class, followed by choice of all size classes - 24 hrs for each feeding trial.

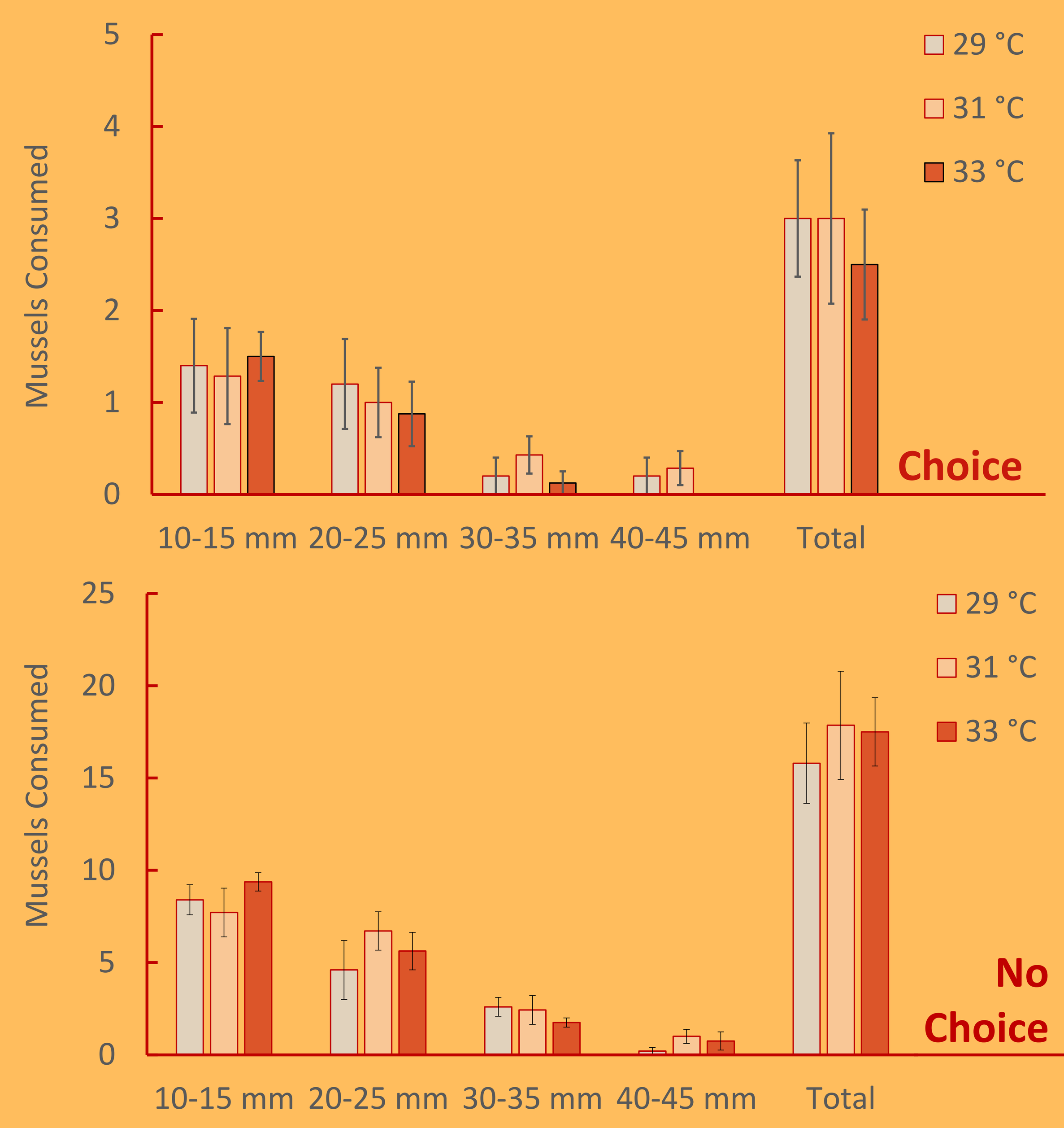

Figure 1. Number of mussels of different size classes consumed by *E. ferox*. Mean (± s.e.). Crabs were first given no choice in size class, followed by choice of all size classes - 24 hrs for each feeding trial. (29 °C n = 5, 31 °C n = 7, 33 °C n = 8).

Results

- *E. ferox* showed no change in preference for size of prey with increased temperature (χ^2 tests between "no choice" and "choice" trials).
- Contrary to metabolic theory, temperature did not affect amount of prey consumed (two-factor ANOVA, all p > 0.6).
- Prey size did effect the number of prey consumed by *E. ferox*; less prey were consumed as prey size increased (Figure 1)
  (two-factor ANOVA: No Choice: $F_{3,68} = 51.95$, $p < 0.001$; Choice: $F_{3,68} = 10.71$, $p < 0.001$).

Discussion & Conclusion

- Even though crabs can, and do eat larger prey, they more often consume the smallest prey.[4,5,6]
- Efficient energy intake is imperative for intertidal species; therefore, reduced handling time may drive a preference for smaller prey.[5 & refs therein]
- When larger mussels are selected the cost of longer handling time may be offset by increased energy content.
- It is estimated that each individual *E. ferox* can remove up to 1700 mussels from the shoreline annually.[5]
- Therefore rising temperatures, coupled with size selective predation pressure could adversely affect this important rocky shore prey, which is already living close to its thermal limits.[7]

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