

Seasonality, seduction and foul play: the hydroid fauna of Port Phillip Bay



Isla Fitridge, University of Melbourne, Victorian Marine Science Consortium

i.fitridge@pgrad.unimelb.edu.au

Hydroids (Cnidaria : Hydrozoa)

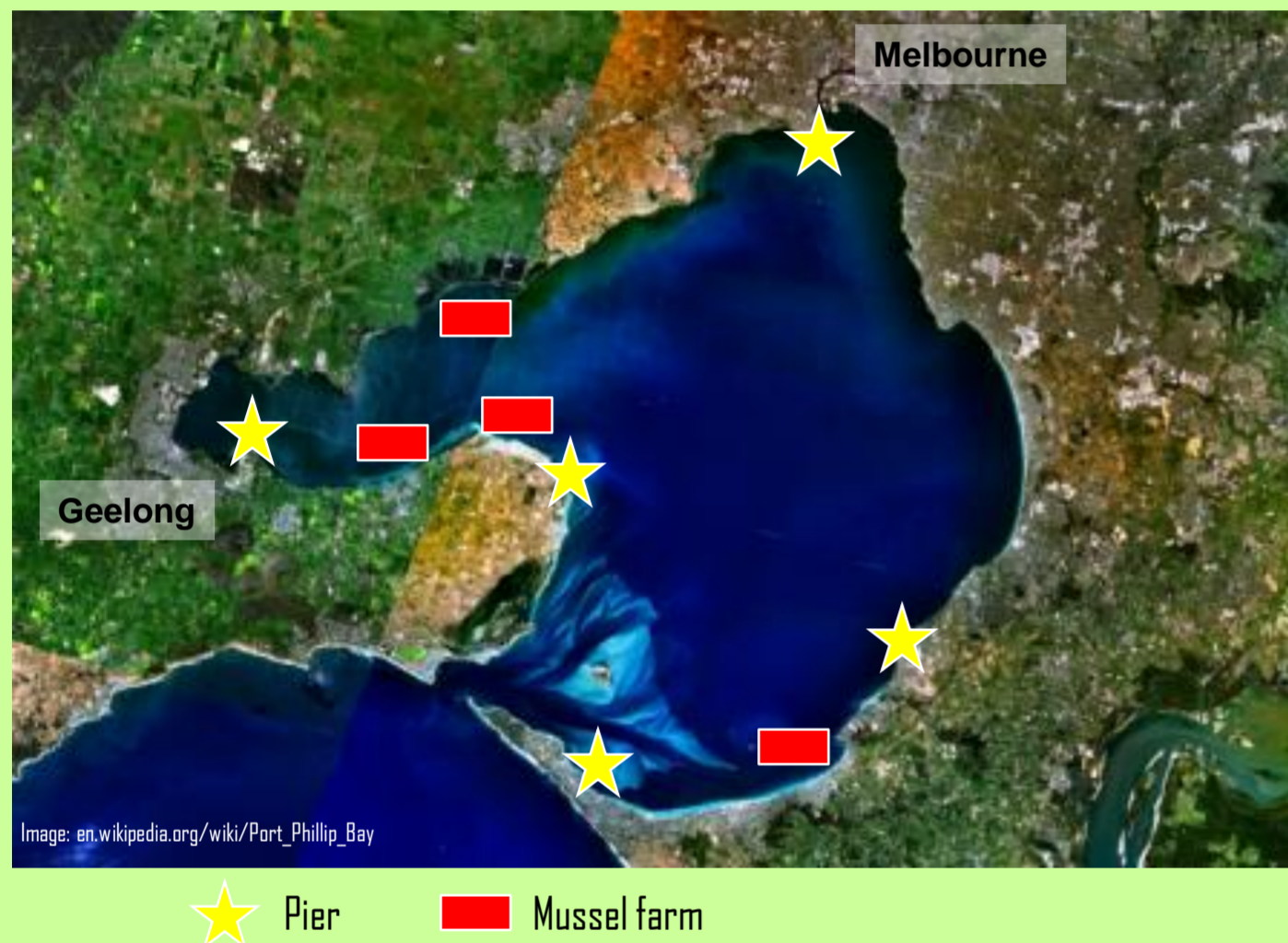
- Plant-like, colonial suspension feeders
- Present in many benthic sessile marine communities
- Common fouling species in man-made marine habitats e.g. piers, aquaculture facilities
- Economically important in terms of their fouling capacity
- Often overlooked in ecological work. Ecology-based hydroid studies generally neglected in comparison to those on faunistics, systematics and biology

Aims of this research

Port Phillip Bay has a widespread and diverse hydroid fauna but surprisingly there has been no comprehensive study investigating the life history of Port Phillip Bay hydroids, their distribution or their effect within local mussel culture operations, where they are noted fouling species. The main aims of my PhD research are:

- To document how the hydroid communities of Port Phillip Bay (Victoria, Australia) change temporally and spatially in terms of their presence/absence, recruitment, growth and fertility
- To examine the role of hydroids as fouling species and their impact within mussel culture operations in Australia (and possibly New Zealand)

Study sites: Port Phillip Bay



Data collection: field

- Recruitment of hydroid larvae onto PVC plates
- Presence/absence of hydroid colonies on man-made structures
- Growth of colonies
- Species fertility
- Physical variables

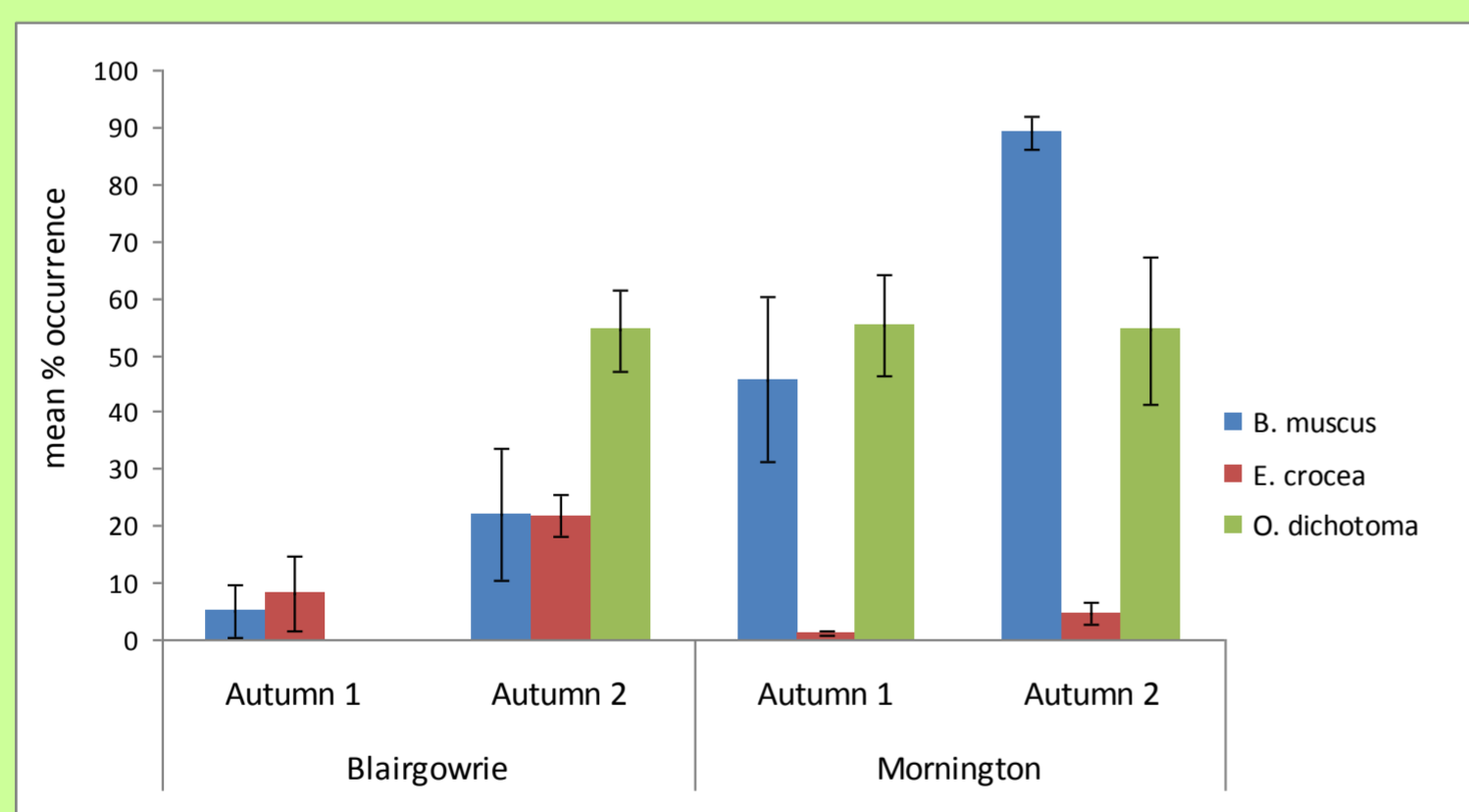
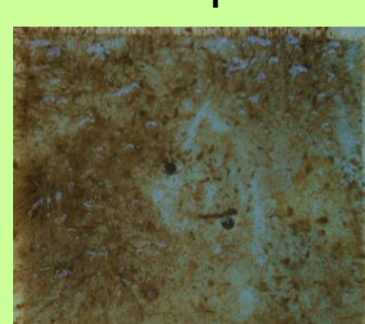
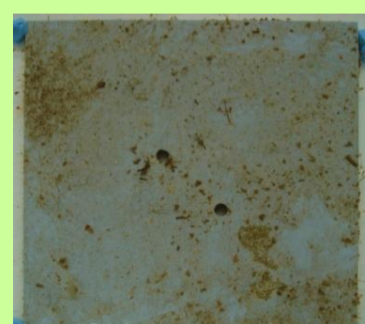


Data collection: lab

- 'Attractiveness' of structurally different hydroid species and mimics to spat
- 'Site specificity' of hydroid growth on mussel shells, and effect on mussel growth and productivity
- Larval studies to learn more about hydroid life history
- DNA analysis of selected 'invasive' hydroid species commonly found in mussel farms, to determine true status

Results so far

Larval recruitment



The above chart summarises the mean percentage occurrence of three hydroid species (\pm SEM) recruiting onto PVC plates at Blairgowrie and Mornington piers (eastern Port Phillip Bay), during Autumn 1 and Autumn 2 sampling events. Sampling took place at 6-weekly intervals. At both sites coverage on the plates was lower during Autumn 1 but increased during Autumn 2. This is also evident from the plate images to the left of the chart, which show typical plate coverage of hydroids recruiting during each time.

Other possible research: New Zealand

The hydroid *Amphisbetia bispinosa*:

- Detrimental to the NZ mussel industry by heavily fouling mussel shells
- Relatively little known about its life history and effect on mussel productivity

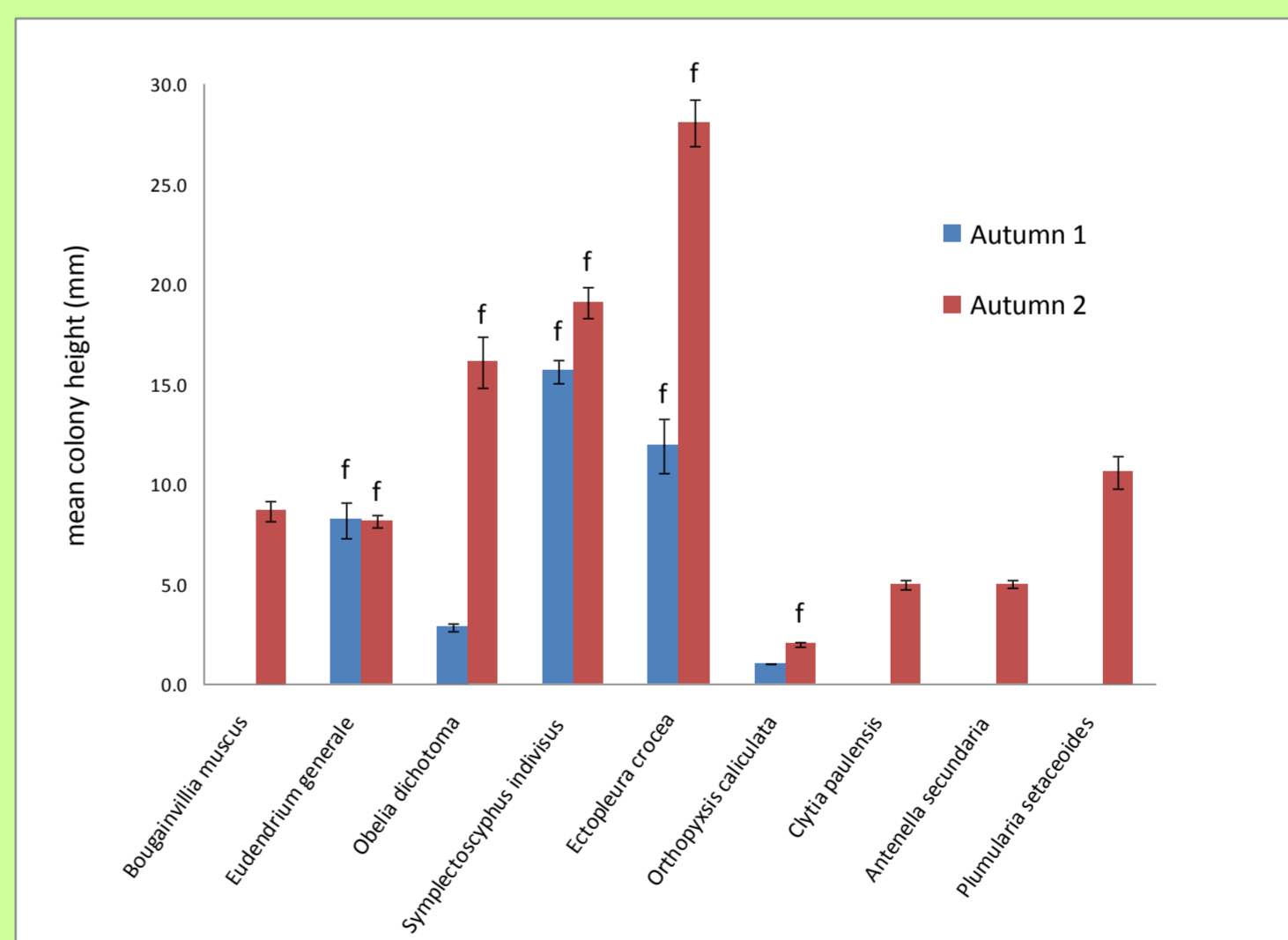
If I can obtain funding, I hope to conduct some research on this species in New Zealand mussel farms, providing mussel farmers and the industry with essential biological and ecological information in order to better manage 'problem' hydroids such as this in their farms.

Potential data collection would include:

- Life history studies of hydroid colonies in NZ farms
- Recruitment patterns of hydroid larvae and mussel spat
- Effects of hydroid growth on mussel productivity



Colony growth and fertility



This chart displays the mean hydroid colony height (\pm SEM) during Autumn 1 and Autumn 2 sampling events, from pile scrapes at Mornington pier. Between sampling events, colony height increased for many species, and new species appeared. Presence of fertile colonies (as shown below) is indicated by 'f'.



Hopeful outcomes of my PhD research

The opportunity to investigate the hydroid ecology of Port Phillip Bay, how their population changes with time and the nature of the relationship between hydroids and mussels, both in Port Phillip Bay and in other parts of the world, will go some way towards addressing the knowledge gaps within this field. My research will provide greater ecological understanding of the hydroid fauna of Port Phillip Bay through the first documented assessment of the hydroid fauna of this region, and gather important knowledge both in Australia and New Zealand in order to better manage hydroids within the mussel culture industry.

Acknowledgements

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Except where otherwise credited, all images generously provided by Andrew Newton, Geelong, Australia. Visit his website at www.anewton.net for other amazing photographs of southern Australian sea life