

Harmful zooplankton & gill health



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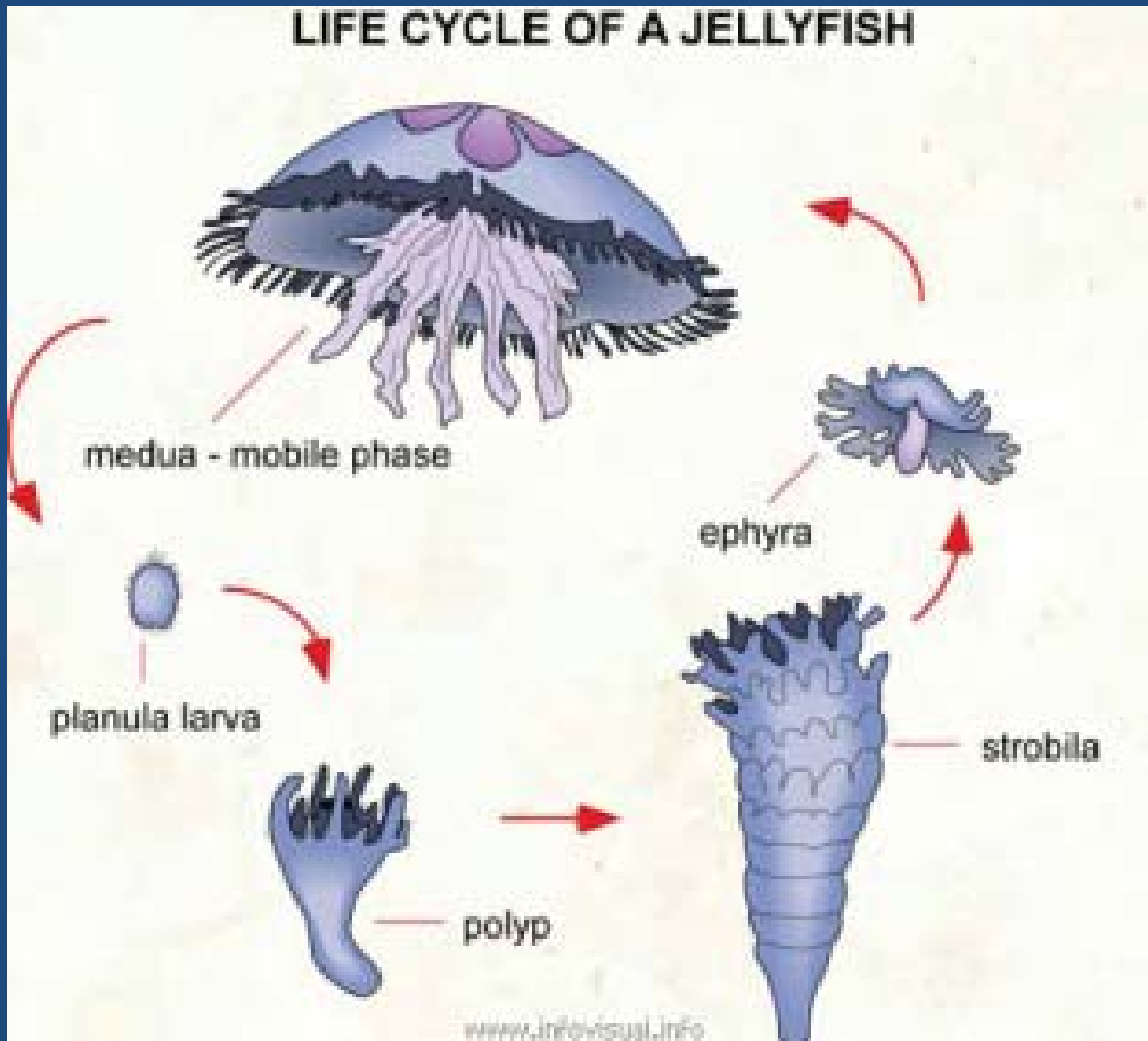
7th November 2012

Outline

- Background & history
- Harmful zooplankton pathologies
- Research update
- Future



Background & history



Harmful jellyfish or zooplankton pathology

Jellyfish/siphonophore pathology & signs

Behaviour changes, feeding response, mortalities

Solmaris corona (Shetland 1997)

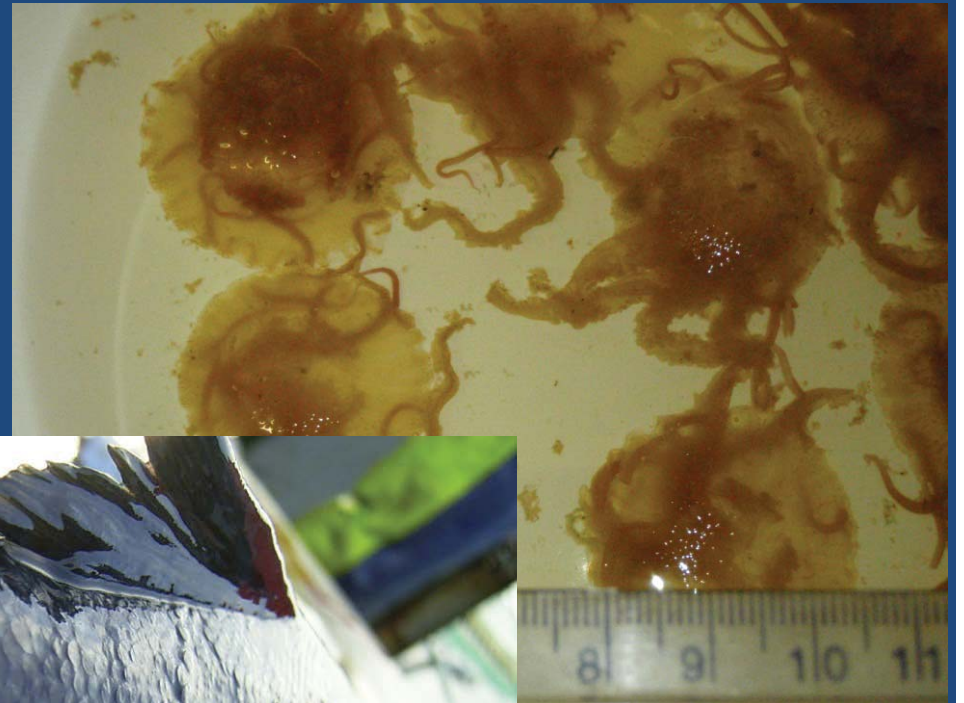
Cyanea capillata (Loch Fyne 1995)



Photo: Emily Baxter

Harmful zooplankton pathology

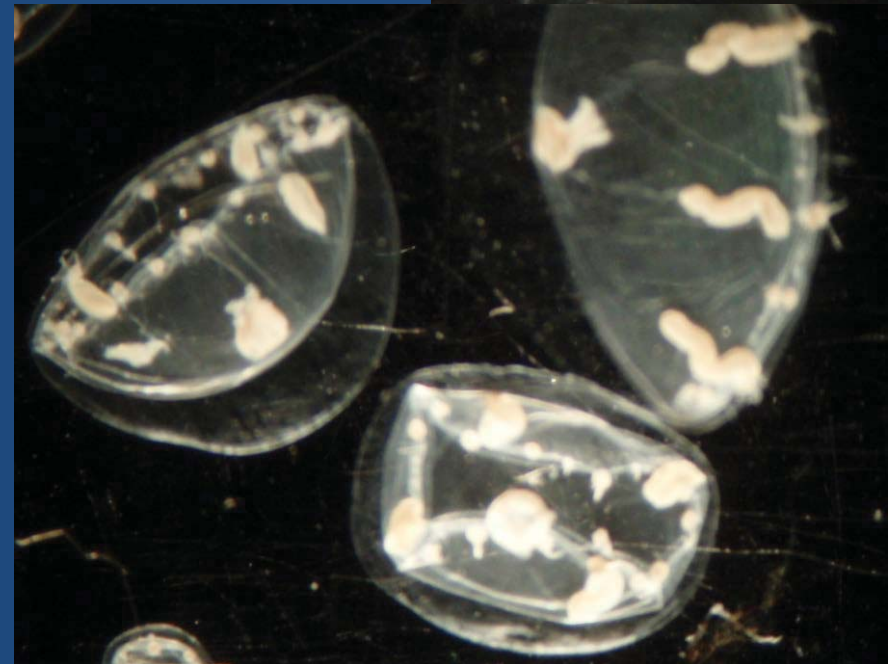
Pelagia noctiluca gill and skin pathology



Jellyfish pathology

Mixed population (Ireland 2010)

Muggiaea atlantica & *Phialella*
sp.



Siphonophore pathology

Muggiaea atlantica (250 –
300/m³)



Jellyfish pathology

Common moon jelly



Photo: Dr. Emily Baxter

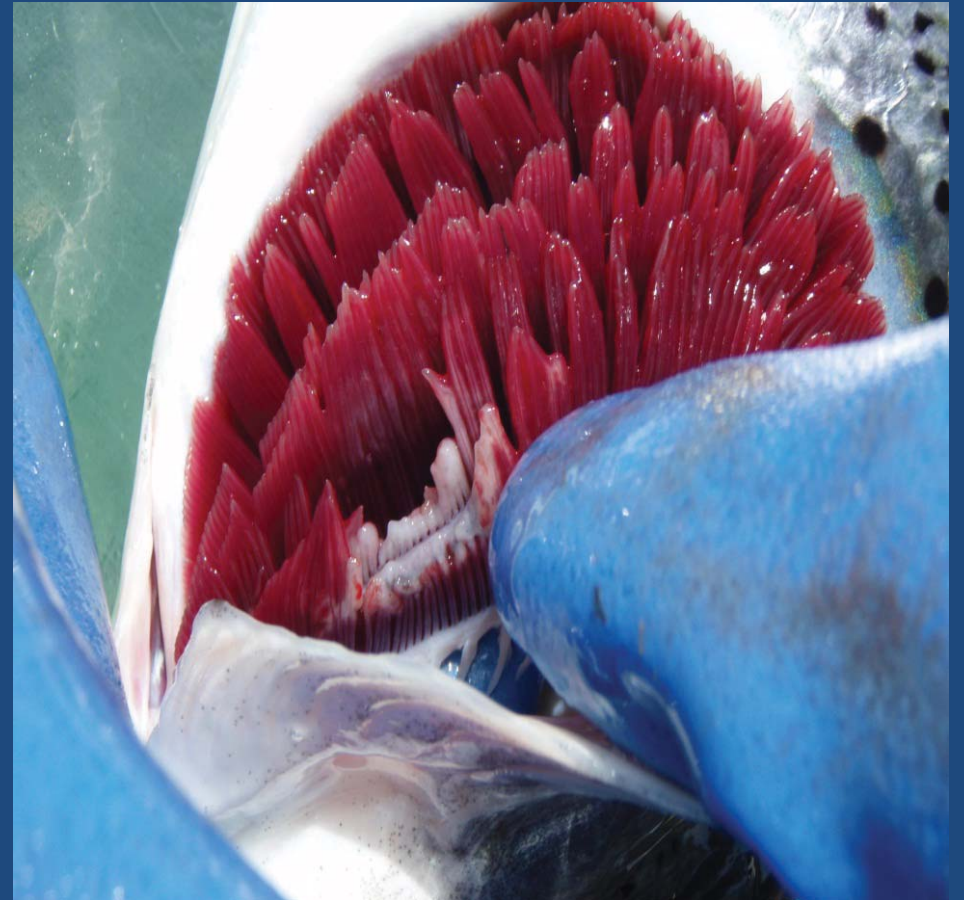
Aurelia aurita (Donegal 2010)



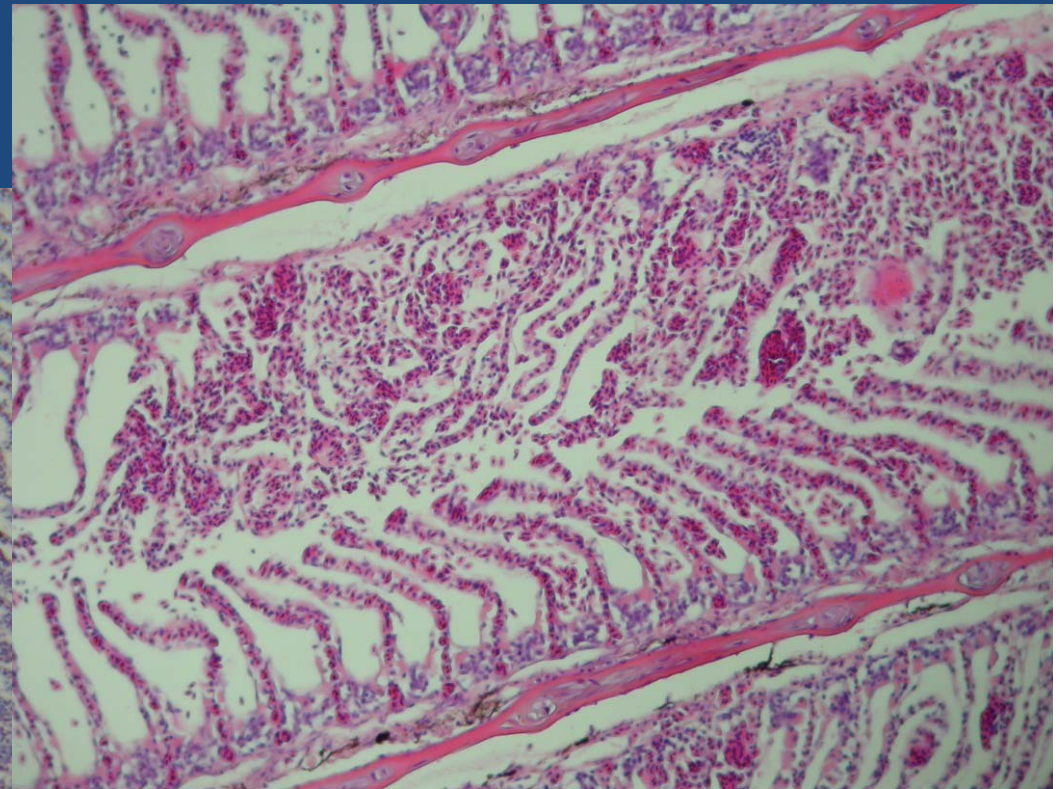
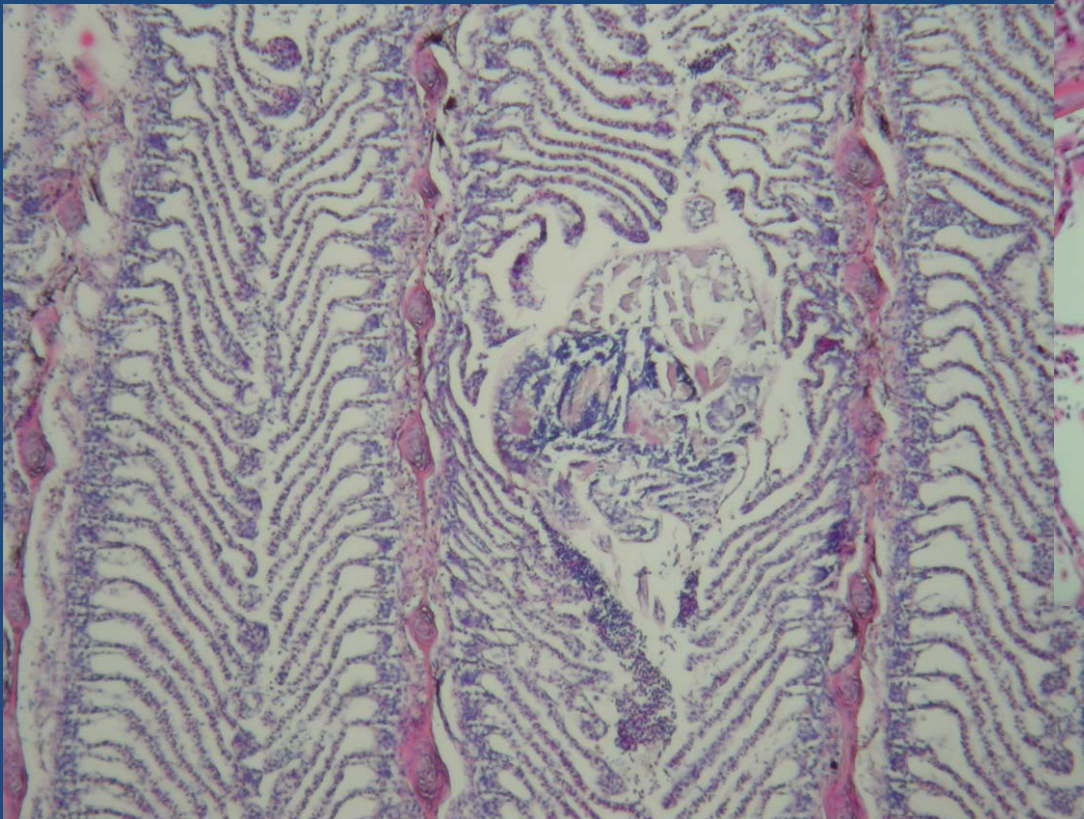
Apolemia uvaria



Jellyfish/siphonophore chronic/recovery stage pathology

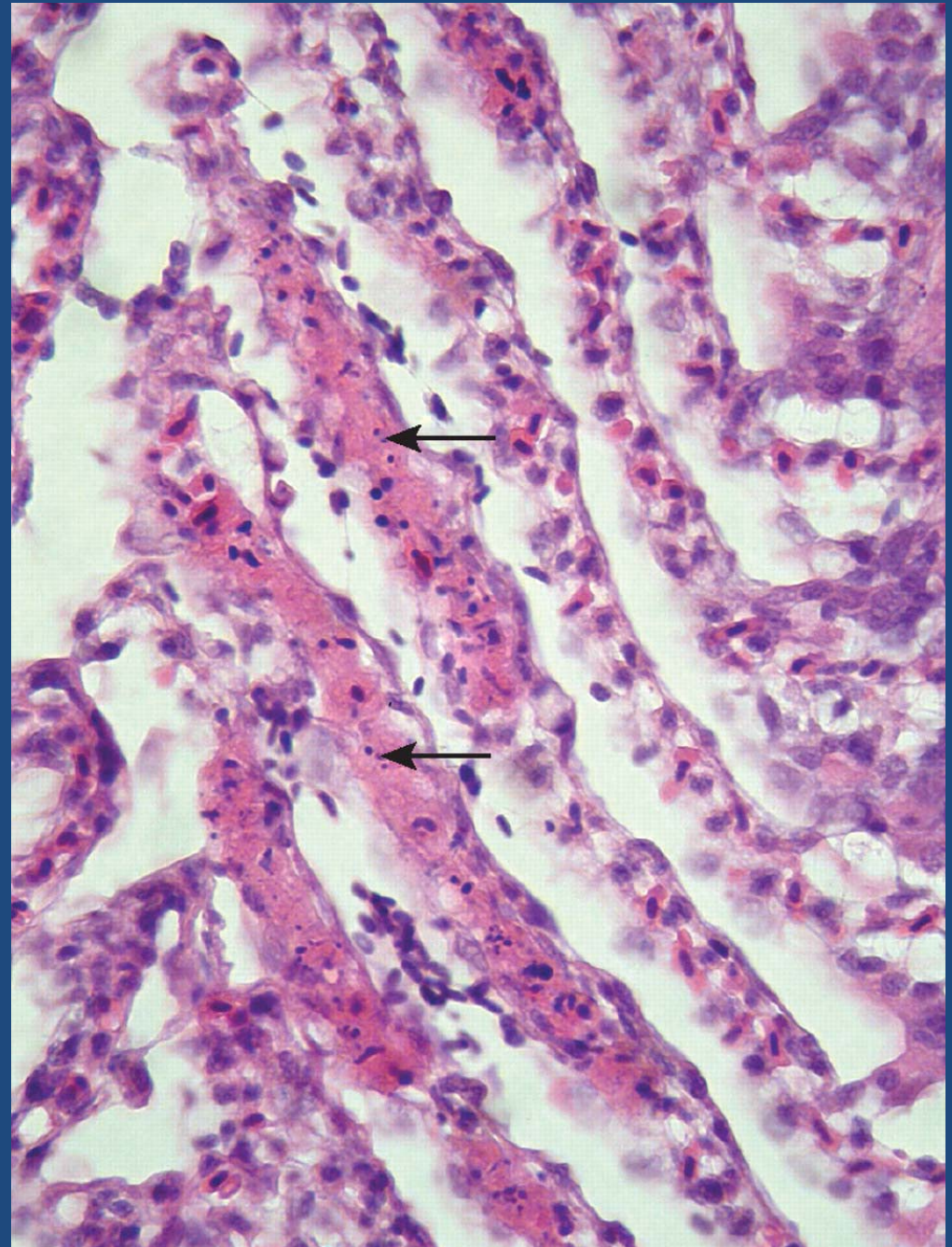


Harmful zooplankton histopathology

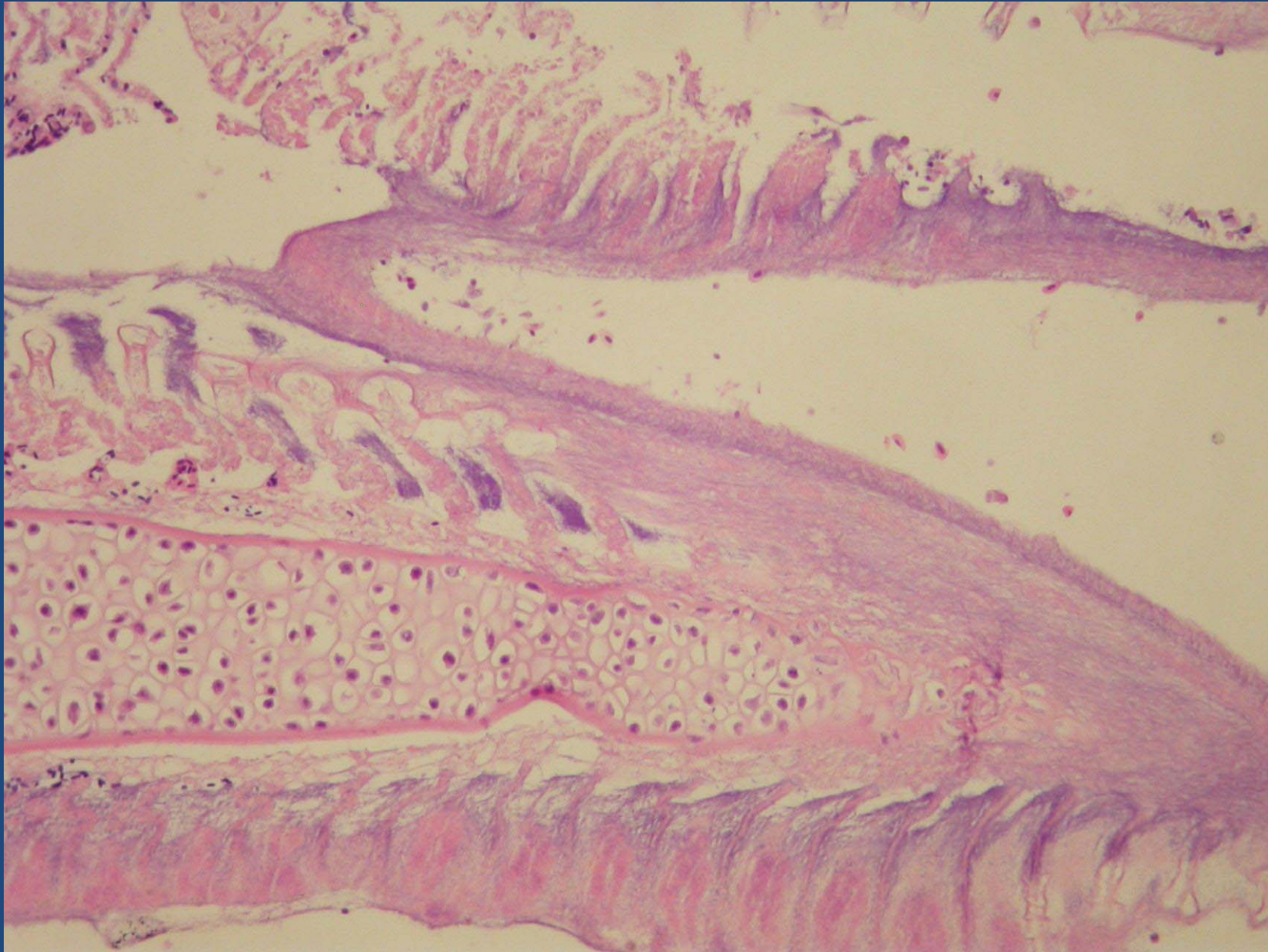


Harmful zooplankton histopathology

- Focal epithelial necrosis, sloughing and haemorrhage or haemolysis



Tenacibaculum sp. infection after jellyfish exposure

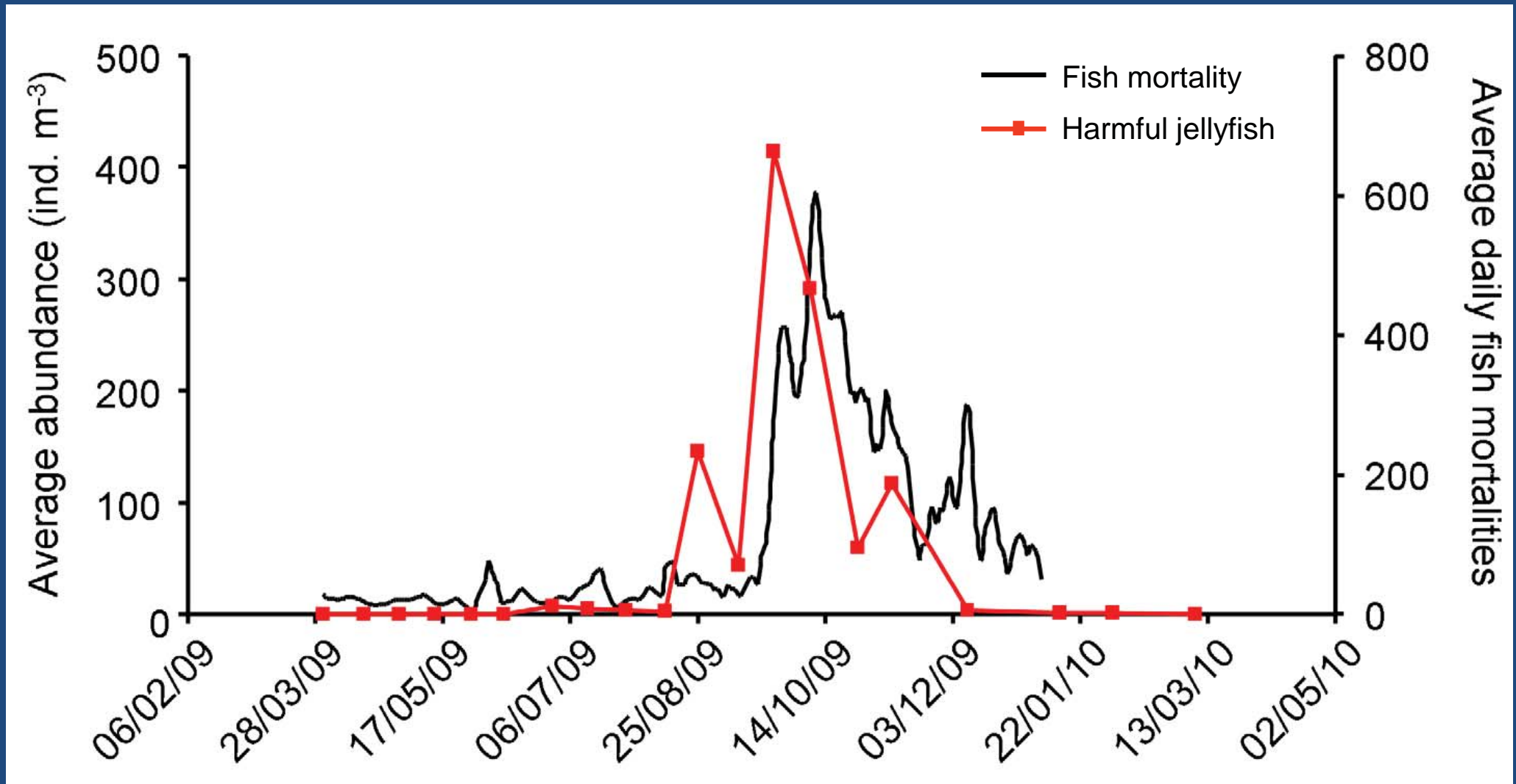


Gill health & zooplankton research - Ireland

Research

- Longitudinal studies of zooplankton & gill health (two farms)
- Challenge experiments (*Aurelia aurita* & hydroids)
- Screening of zooplankton for pathogens
- Reviews of literature
- Observation reports & epidemiology

Mortality — Bantry Bay, Ireland



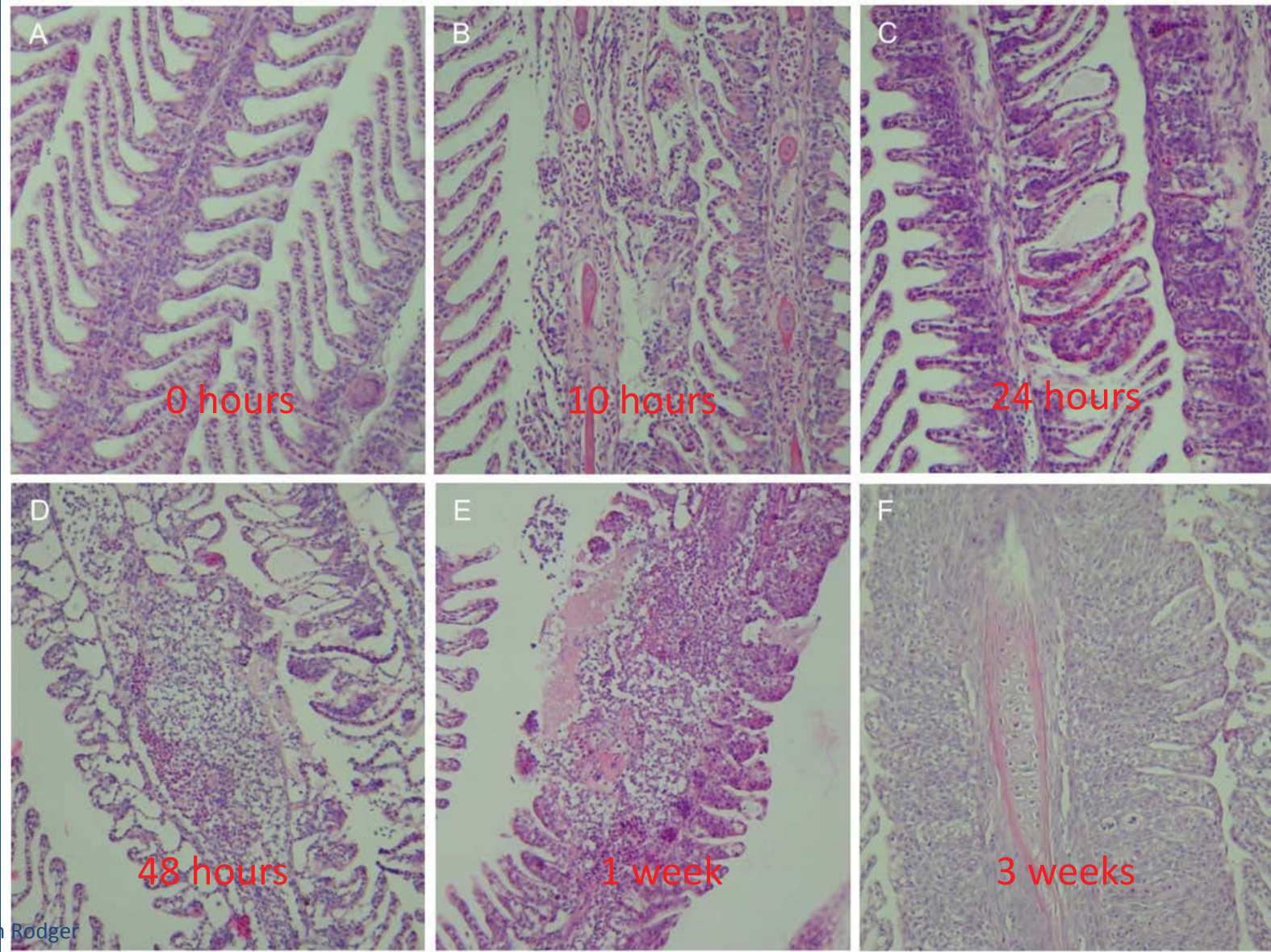
Baxter, E. J. *et al.* (2011) Gill disorders in marine-farmed salmon: investigating the role of hydrozoan jellyfish. *Aquaculture Environment Interactions*, 1, 245 – 257

Challenge experiments: common jellyfish (*Aurelia aurita*)



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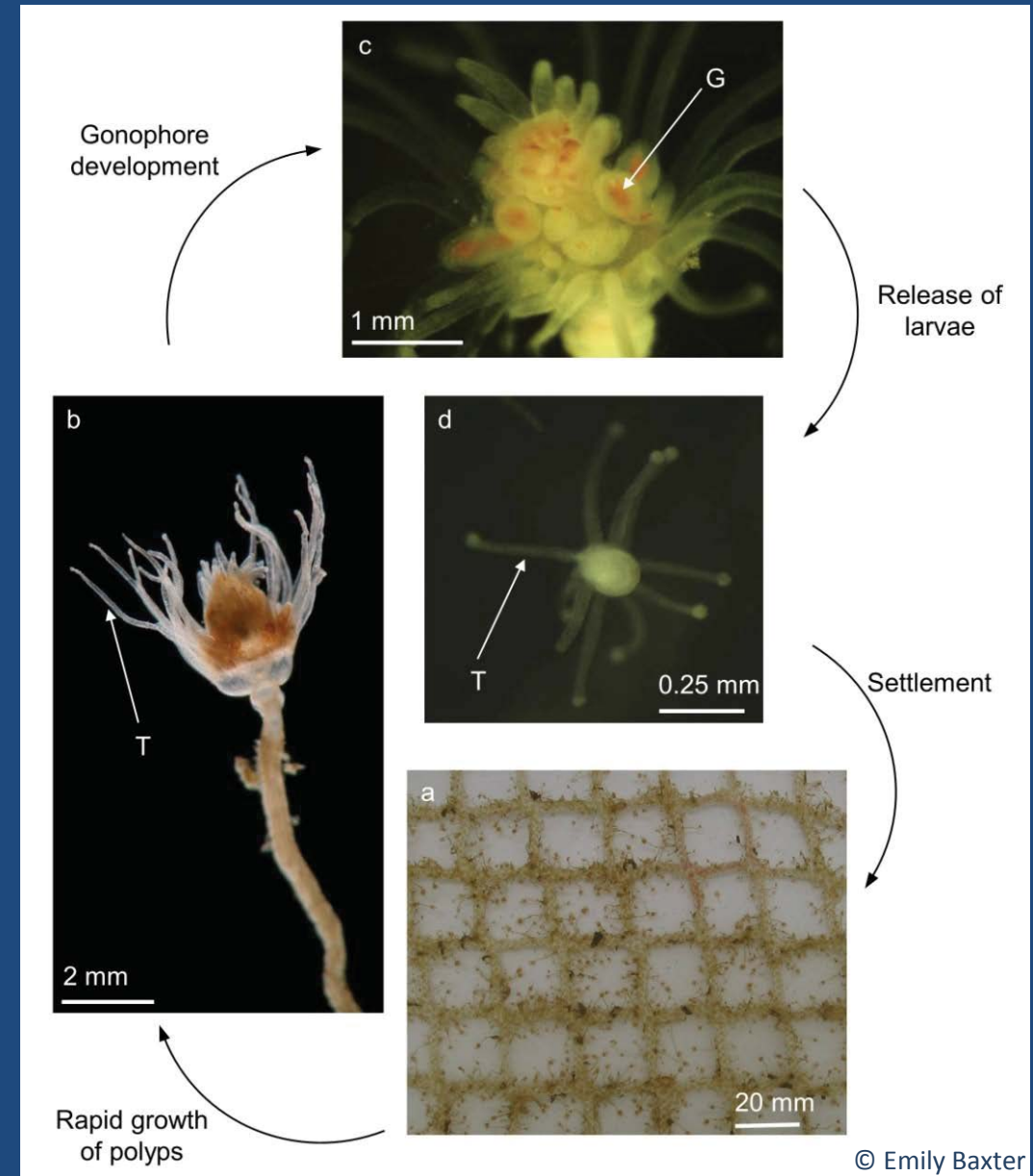
Gill histopathology



HYDROID (*ECTOPLEURA LARYNX*) CHALLENGE STUDIES

Net washing

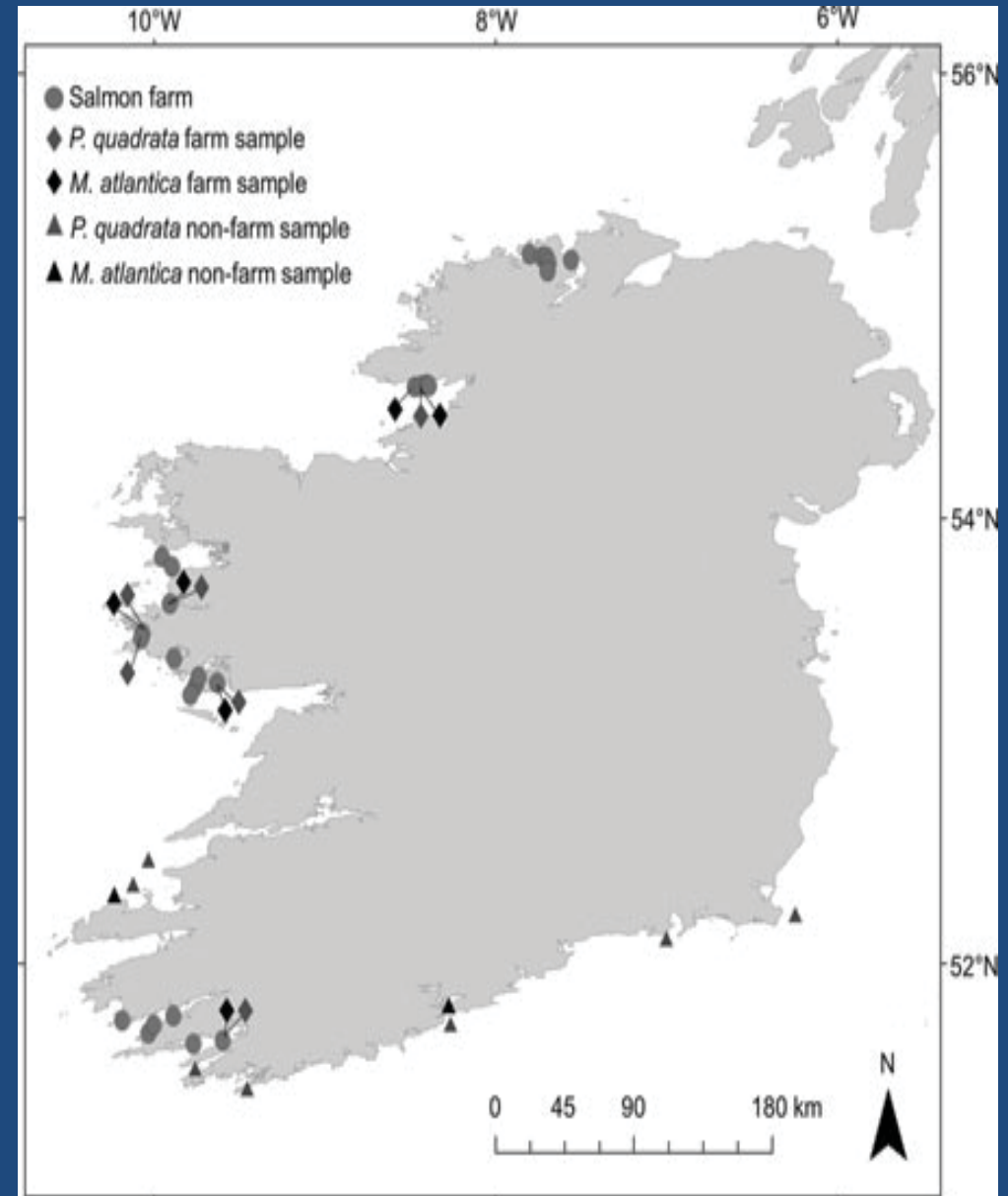
- Releases hydroid polyps & larvae
- Easy settlement for larvae
- Does not remove fully



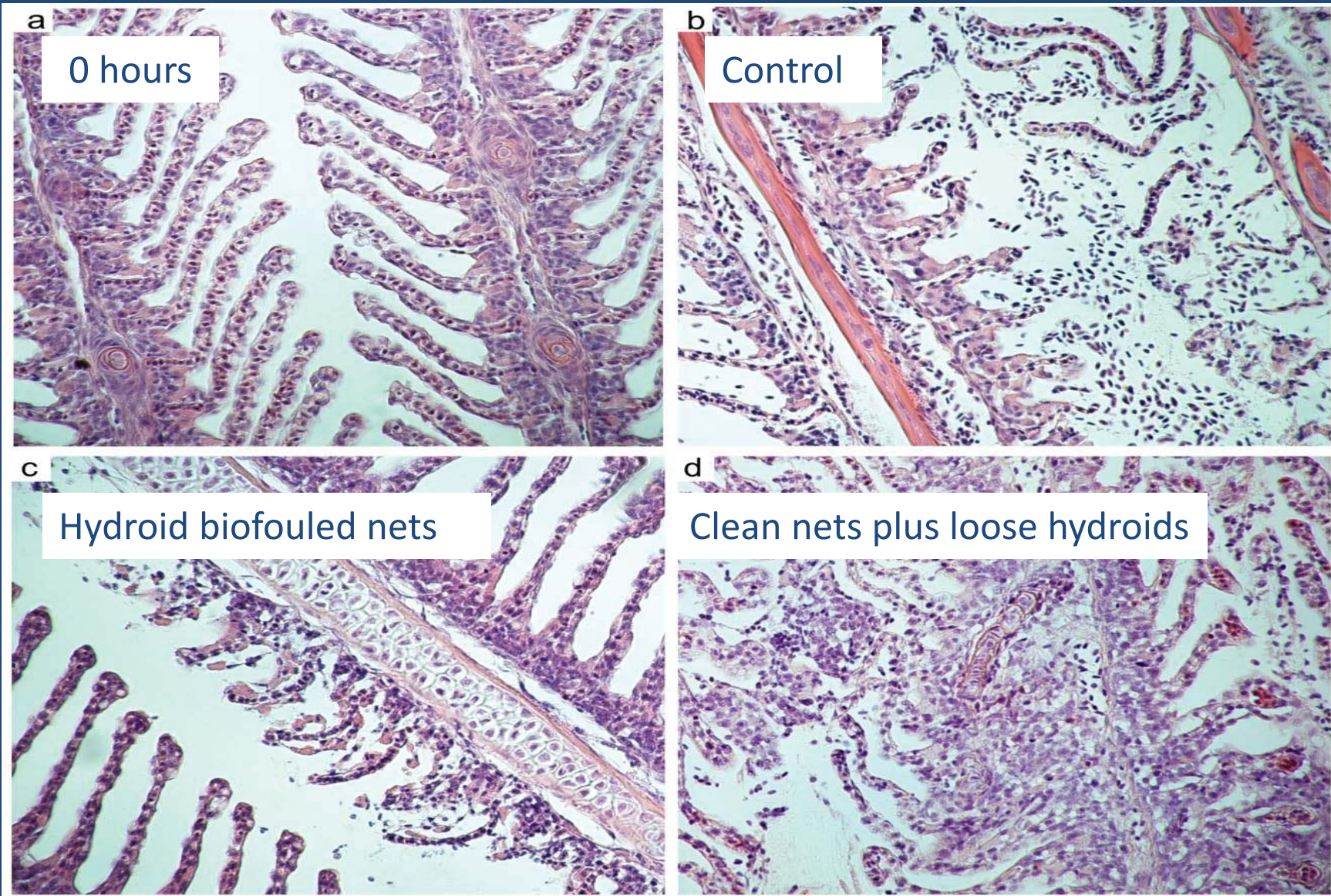
Screening of zooplankton for pathogens

- *Tenacibaculum maritimum* detected in 4/26 jellyfish samples (low level)
- One positive sample remote from farms (>150km)

Fringuelli, E. *et al.* (2012) Development of a quantitative real time PCR for the detection of *Tenacibaculum maritimum* and its application to field samples. **Journal of Fish Diseases**, 35, 579 - 590



Histopathology



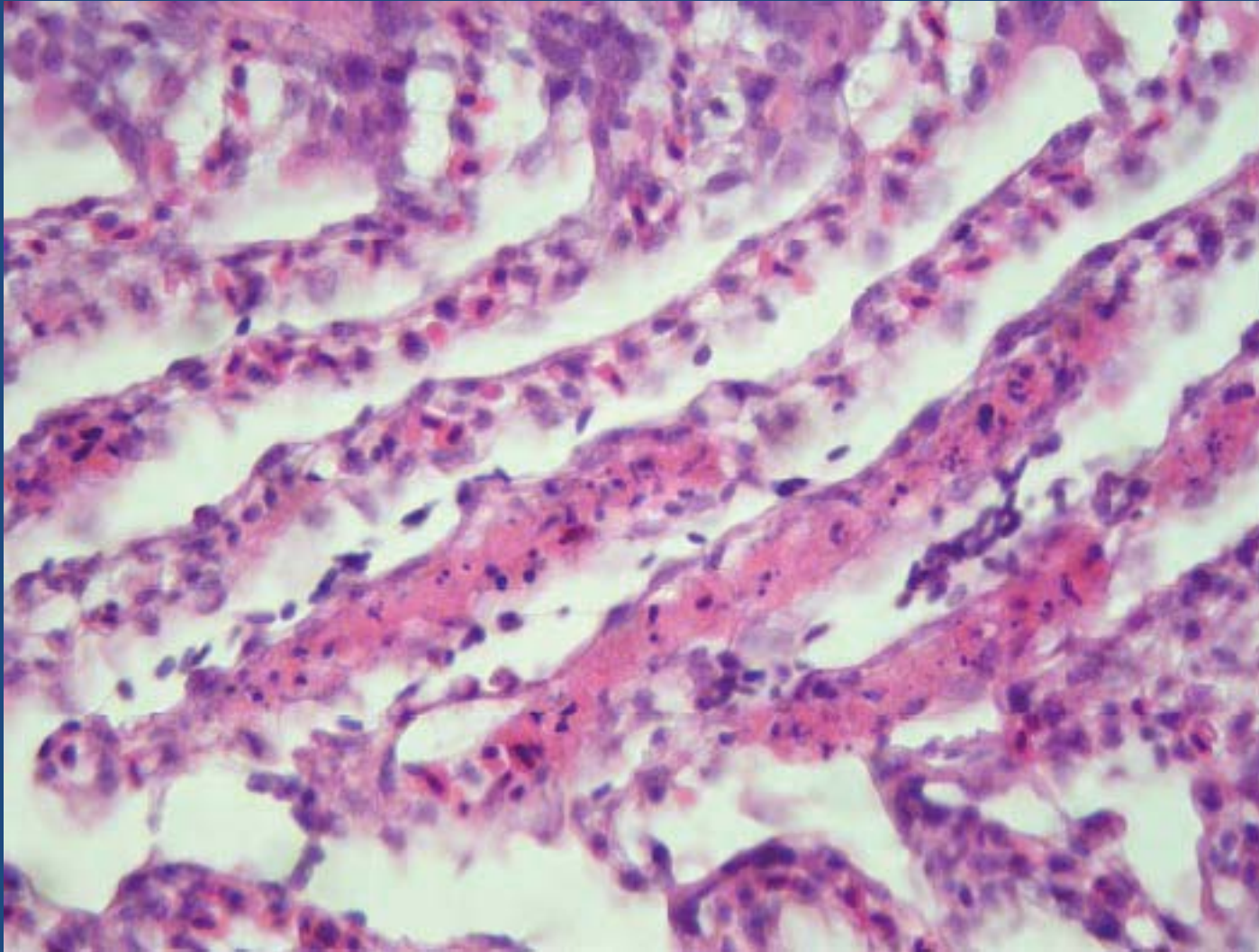
Baxter, E. J. *et al.* (2012) Biofouling of the hydroid *Ectopleura larynx* on aquaculture nets in Ireland: implications for finfish health. **Fish Veterinary Journal** (in press)

Reviews of literature

- Rodger, H. D., Henry, L. & Mitchell, S. O. (2011) Non-infectious gill disorders of marine salmonid fish. **Reviews in Fish Biology and Fisheries**, 21, 423 – 440
- Mitchell, S. O. & Rodger, H. D. (2011) A review of infectious gill disease in marine salmonid fish. **Journal of Fish Diseases**, 34, 411 – 432

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Case report: *Aurelia aurita* in Co. Donegal



- Intravascular haemolysis
- Necrosis
- Lamellar fusion
- Irregular epithelium

3000 mortalities (0.5% stock)

Case report: *Aurelia aurita* in Co. Donegal

Chronic lamellar proliferation, approx. 6 to 8 weeks later



Monitoring

- Zooplankton sampling during high risk periods
- Training of staff
- Communication
- Early warning system/s
- Research on when swarms will occur & how they will move



Zooplankton training



- Sampling methods
- Screening, identification & quantification of species
- Dr. Emily Baxter
- Identification service



Mitigation

- Stop feeding
- Aerate/oxygenate? (bubble curtains?)
- Move pens? RIBS?
- Enclose pens (?) but early warning required
- Functional feeds
- Contingency plan/s
- Research needed...

Summary – harmful zooplankton

- Significant threat to marine salmonids
- Cause gill (and skin) pathology
- Can carry pathogenic bacteria
- Monitoring
- Mitigation
- Research



Acknowledgments

- Dr. Emily Baxter (Cumbria Wildlife & Vet-Aqua Inter.)
- Dr. Susie Mitchell (Vet-Aqua Inter.)
- Dr. Elena Fringuelli (AFBI)
- GILPAT project (NDP funding through Marine Institute)
- www.vetaquainter.com