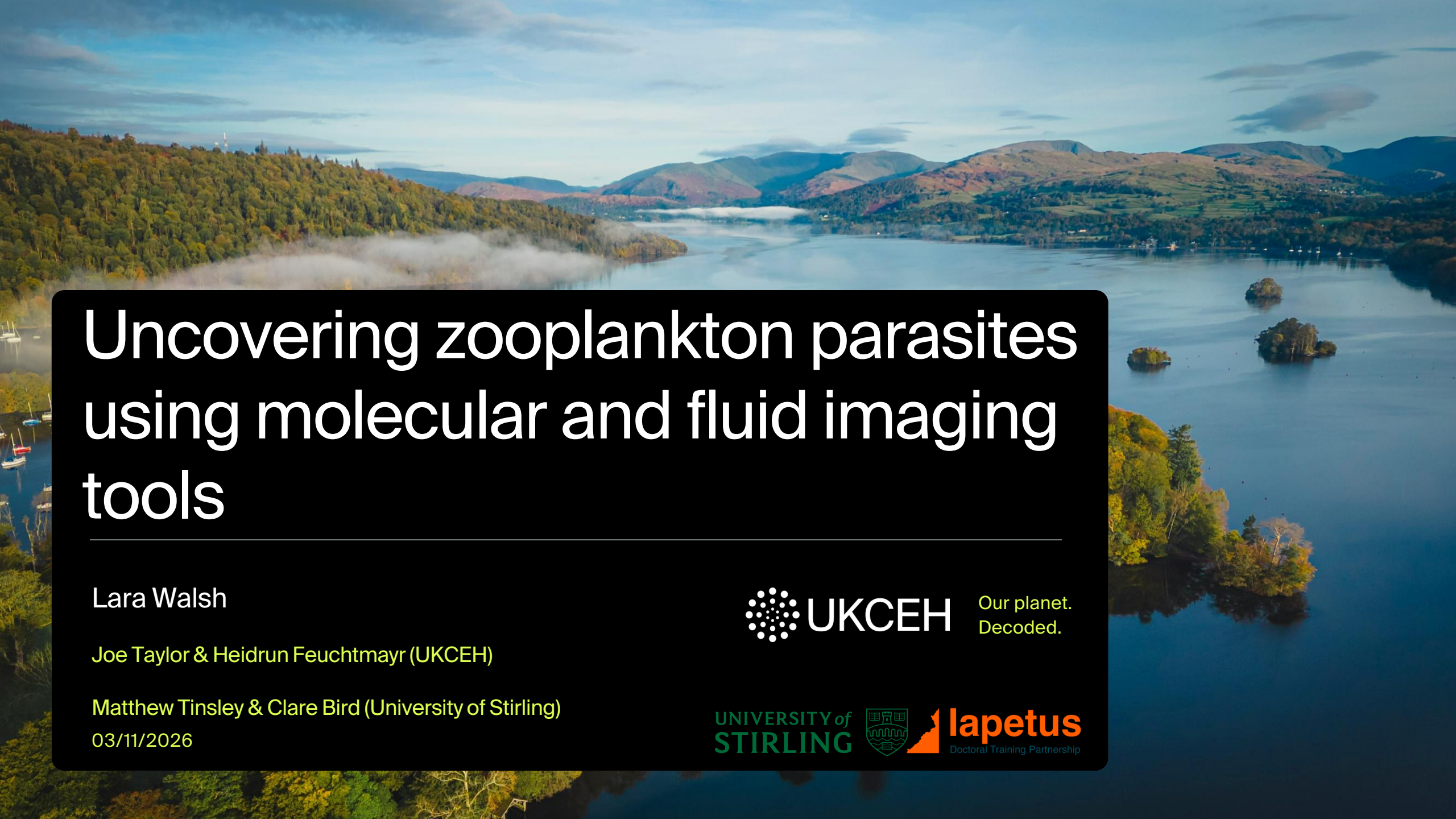


Uncovering zooplankton parasites using molecular and fluid imaging tools

Lara Walsh

Joe Taylor & Heidrun Feuchtmayr (UKCEH)

Matthew Tinsley & Clare Bird (University of Stirling)

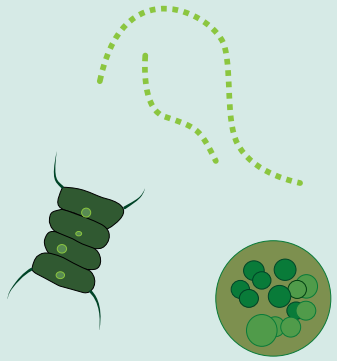
03/11/2026

UKCEH Our planet. Decoded.

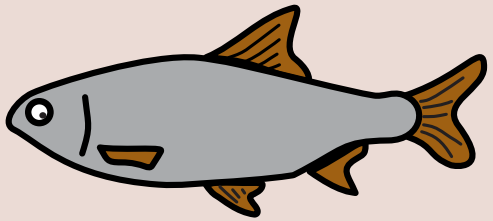
UNIVERSITY of STIRLING

lapetus Doctoral Training Partnership

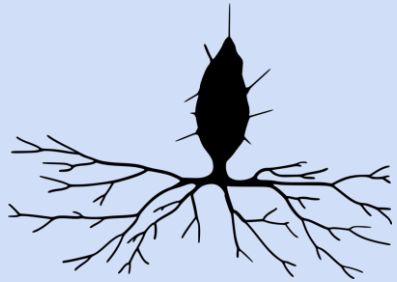
Food



Predation

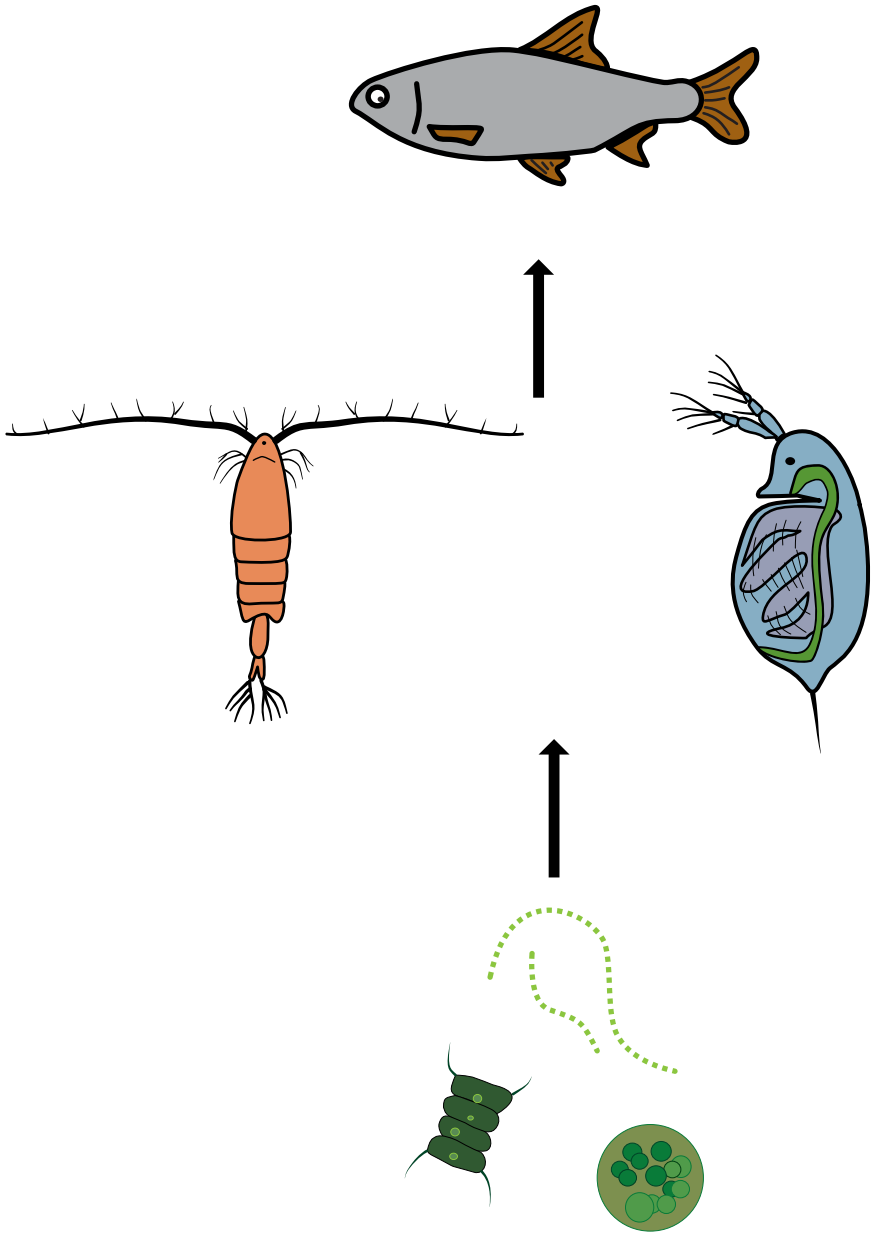


Parasites?

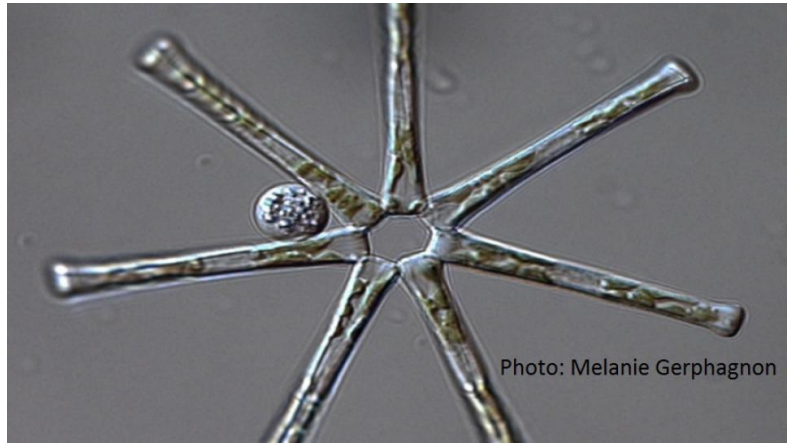


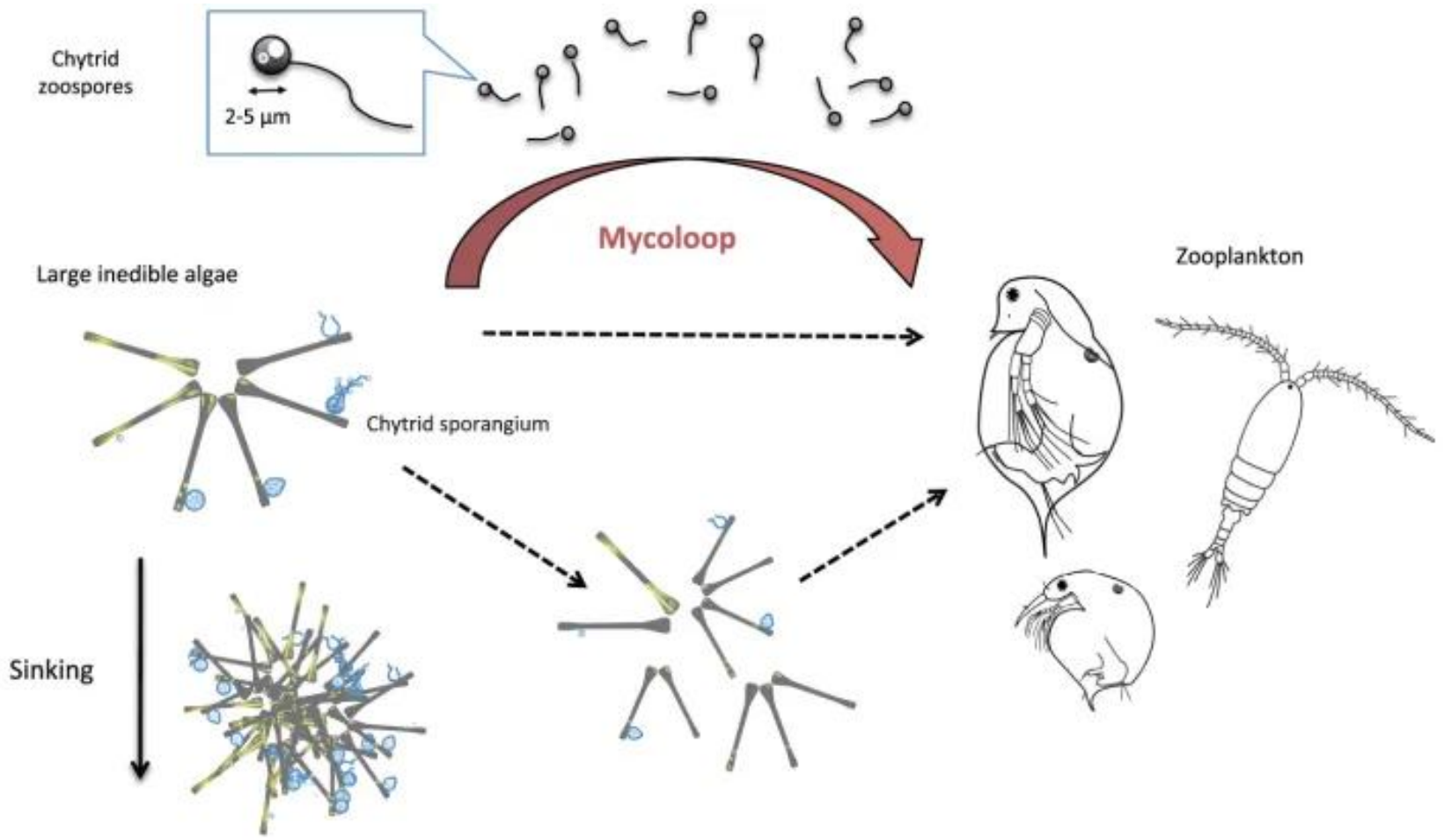
- Zooplankton form a key trophic link in the aquatic food web

- Consequently, their parasites can have wider ecological significance



The Mycoloop





Kagami et al. (2014)

Study Lake

- Fortnightly sampling of Windermere is carried out as part of the Cumbria Lake long-term monitoring program by UKCEH

- This includes a vertical tow of zooplankton which is fixed in formalin



FlowCam

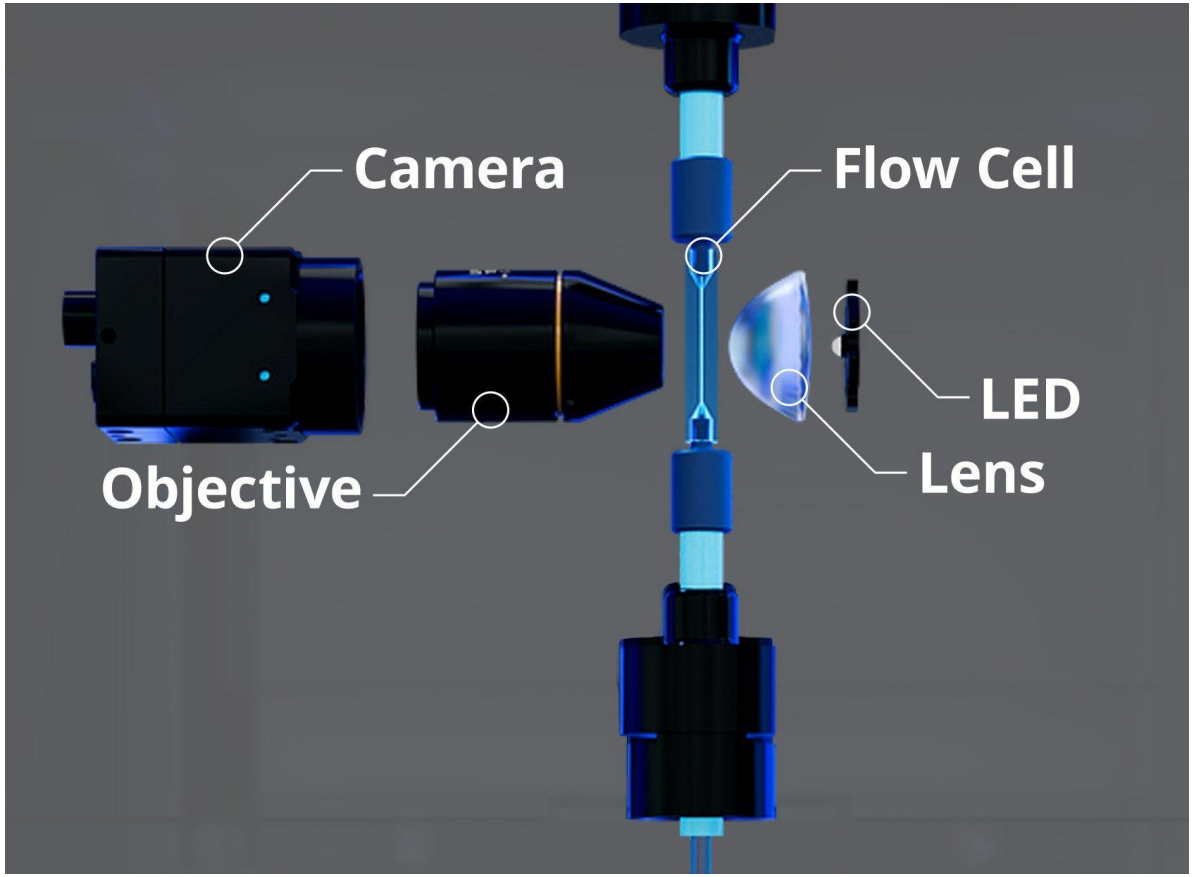
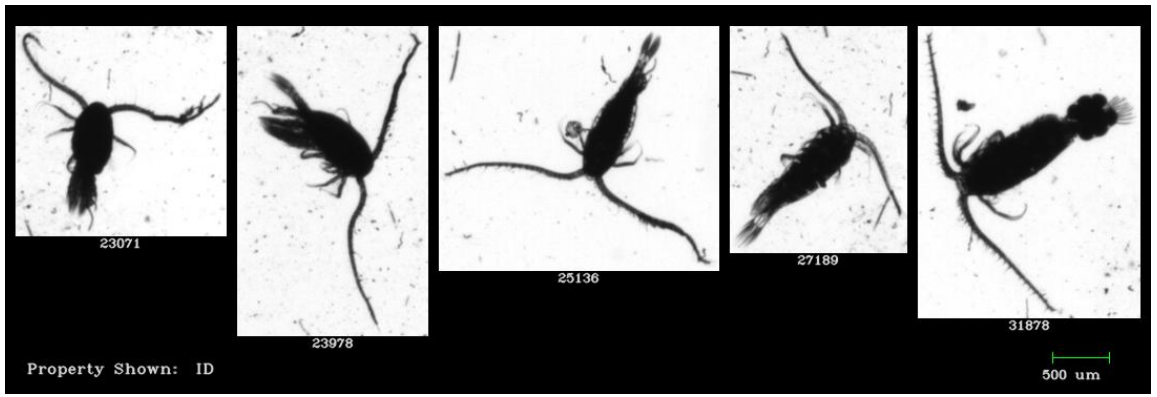
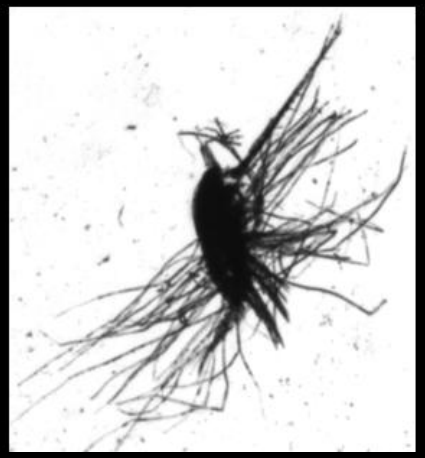


Diagram of FlowCam from fluidimaging.com.

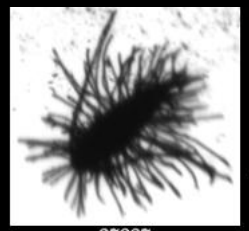


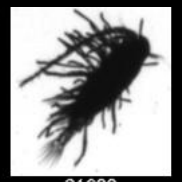








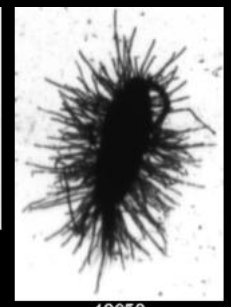


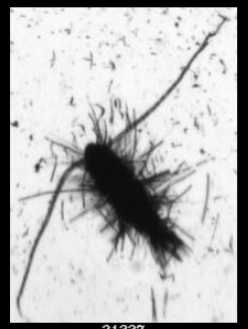




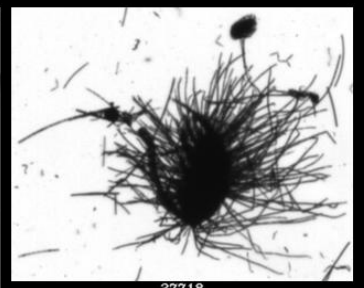


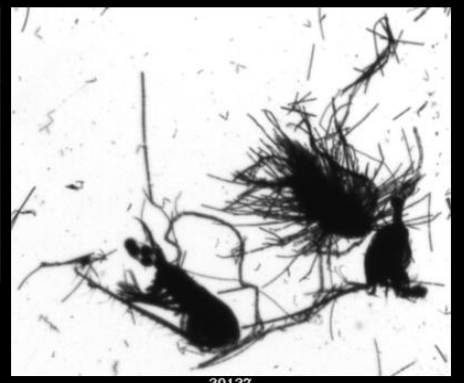








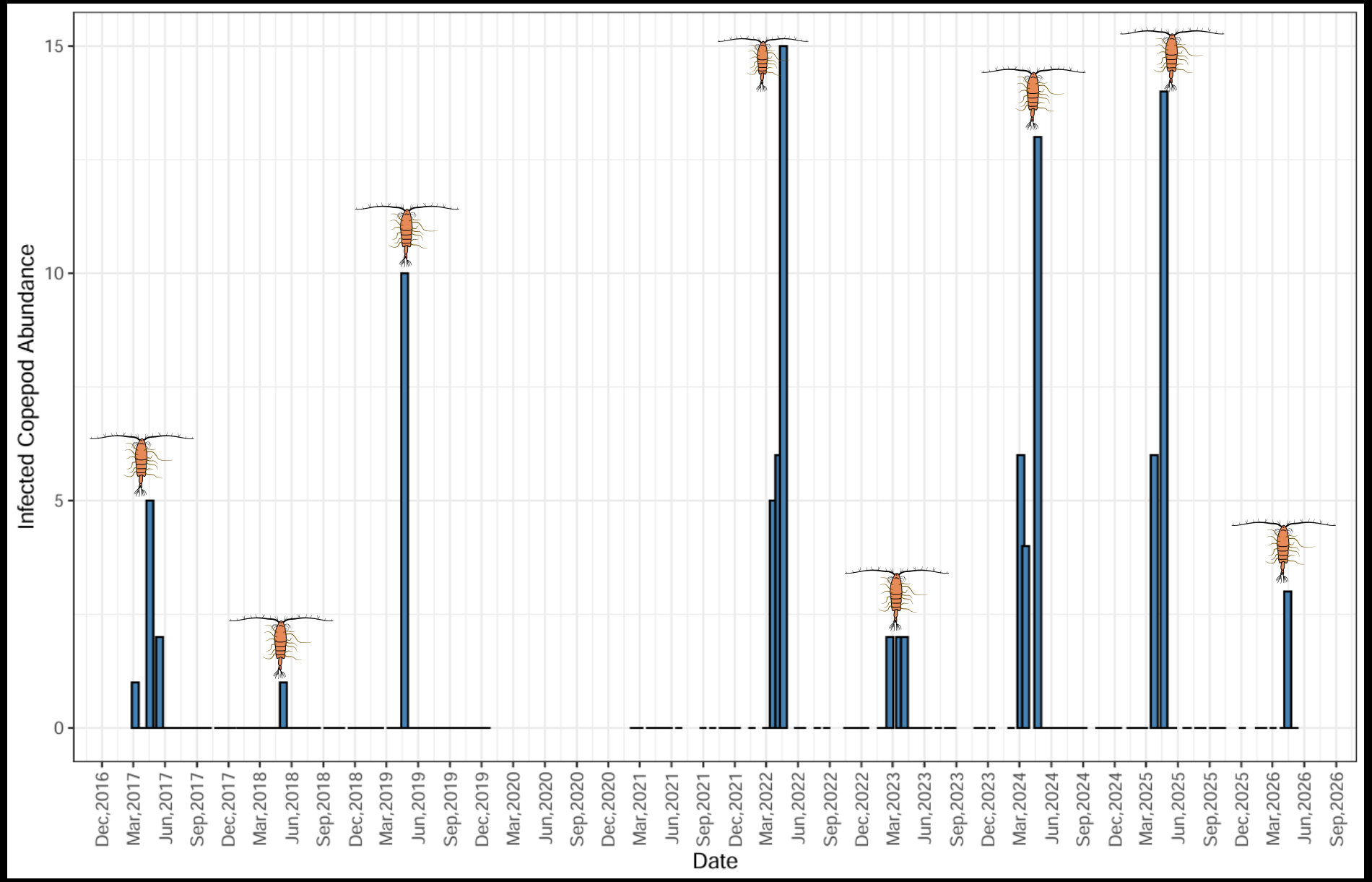




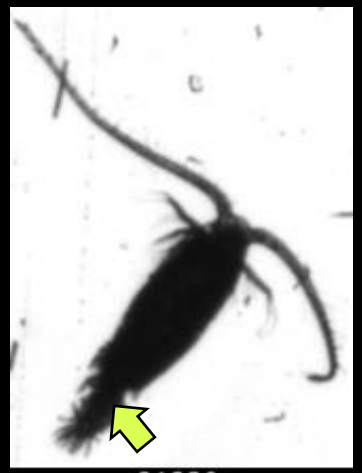


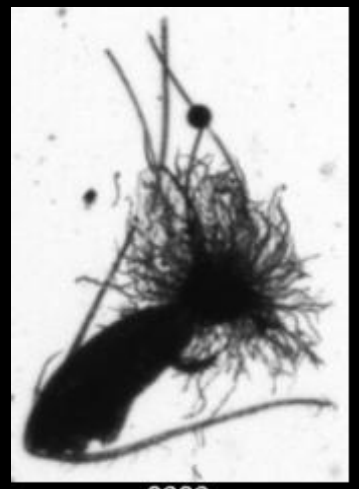
Are these copepods just having a bad hair day?

Infected copepod abundance from 2017-2026




40861


31306



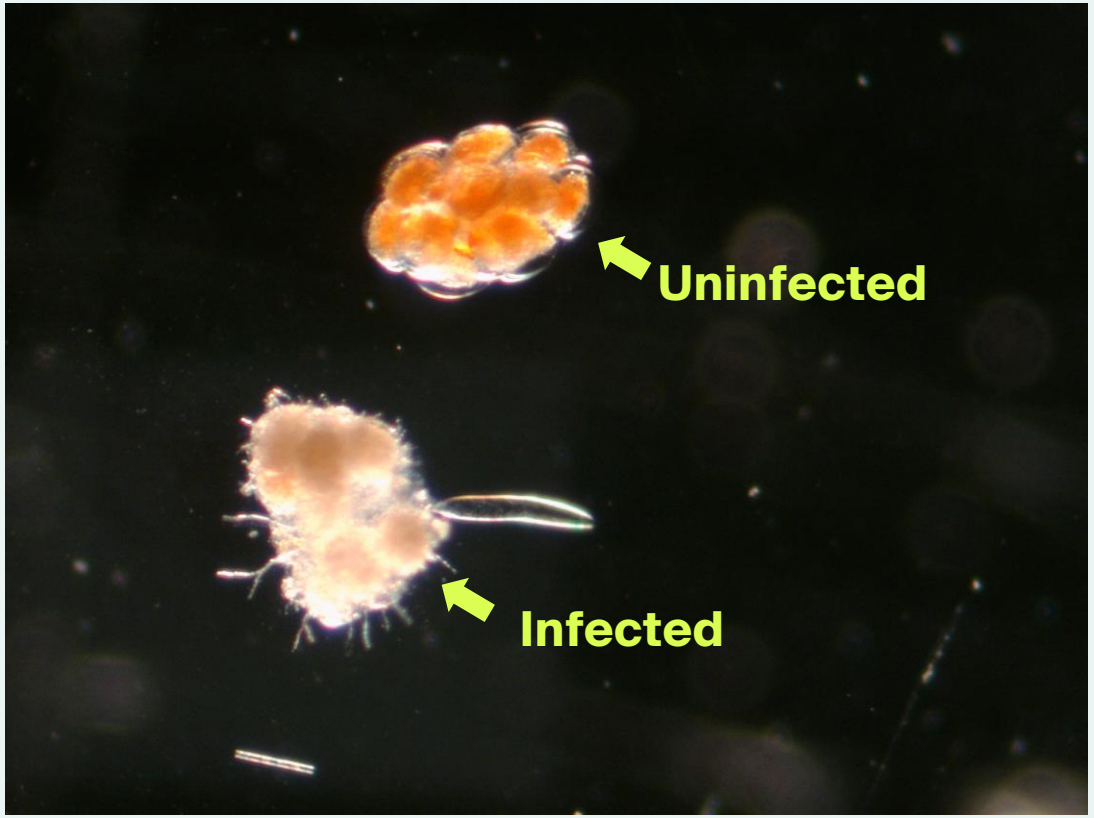

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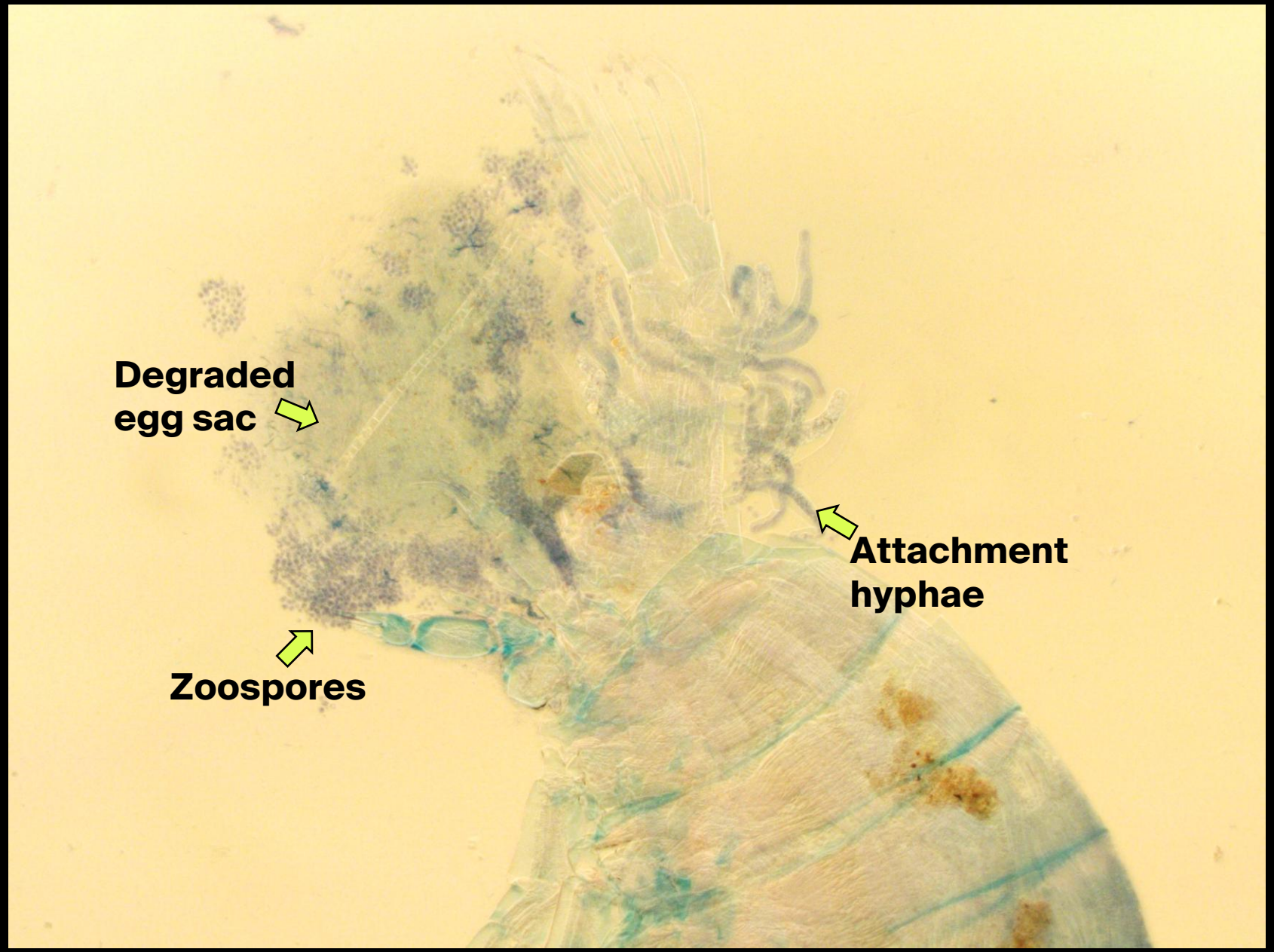






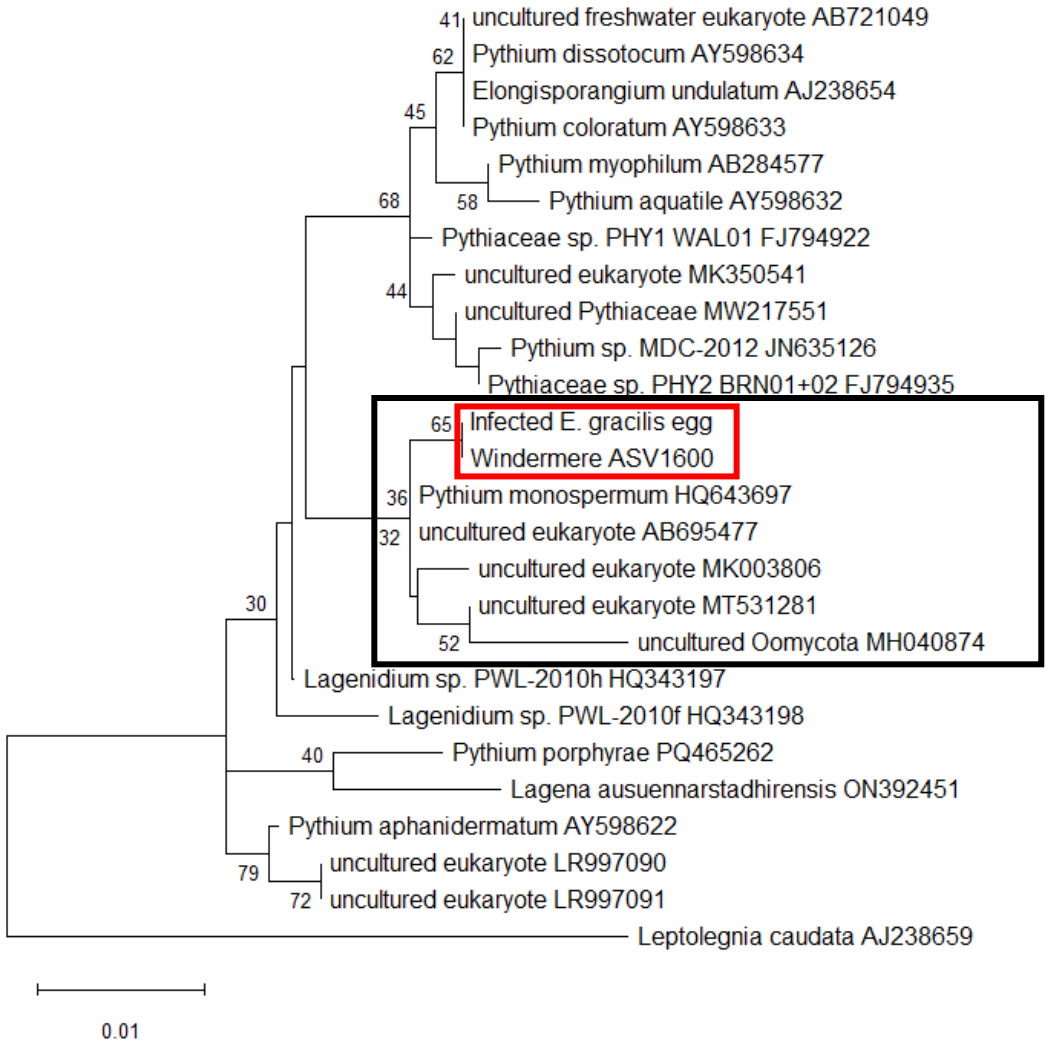



Uninfected
Infected


Degraded
egg sac
Attachment
hyphae
Zoospores

The suspect revealed!





A novel environmental clade?

What on earth is an oomycete?

Oomycetes

- Oomycetes are responsible for some devastating aquatic diseases, such as crayfish plague and saprolegniosis in fish ('winter kill')

- Some aquatic oomycetes have a very broad host range, capable of infecting insects, fish and amphibians...and zooplankton!



Astacus astacus infected with *Aphanomyces astaci*, causing melanisation and erosion of the exoskeleton. Image: Julissa et al. (2014).

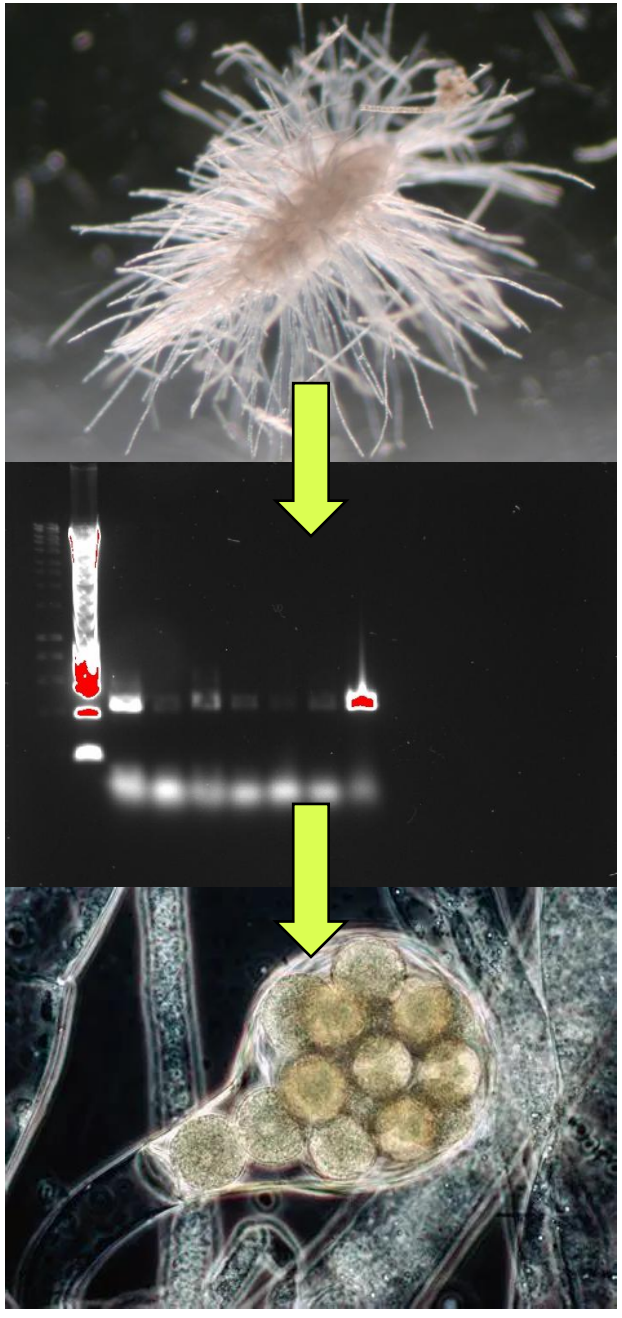


Farmed salmon with severe *Saprolegnia* infection. Image: Herbert van den Berg and Rodrigo Belmonte.

Next Steps

- Develop and test method to extract and sequence DNA from formalin-fixed samples

- Apply the FlowCam to search for parasites in older samples and those from different lakes



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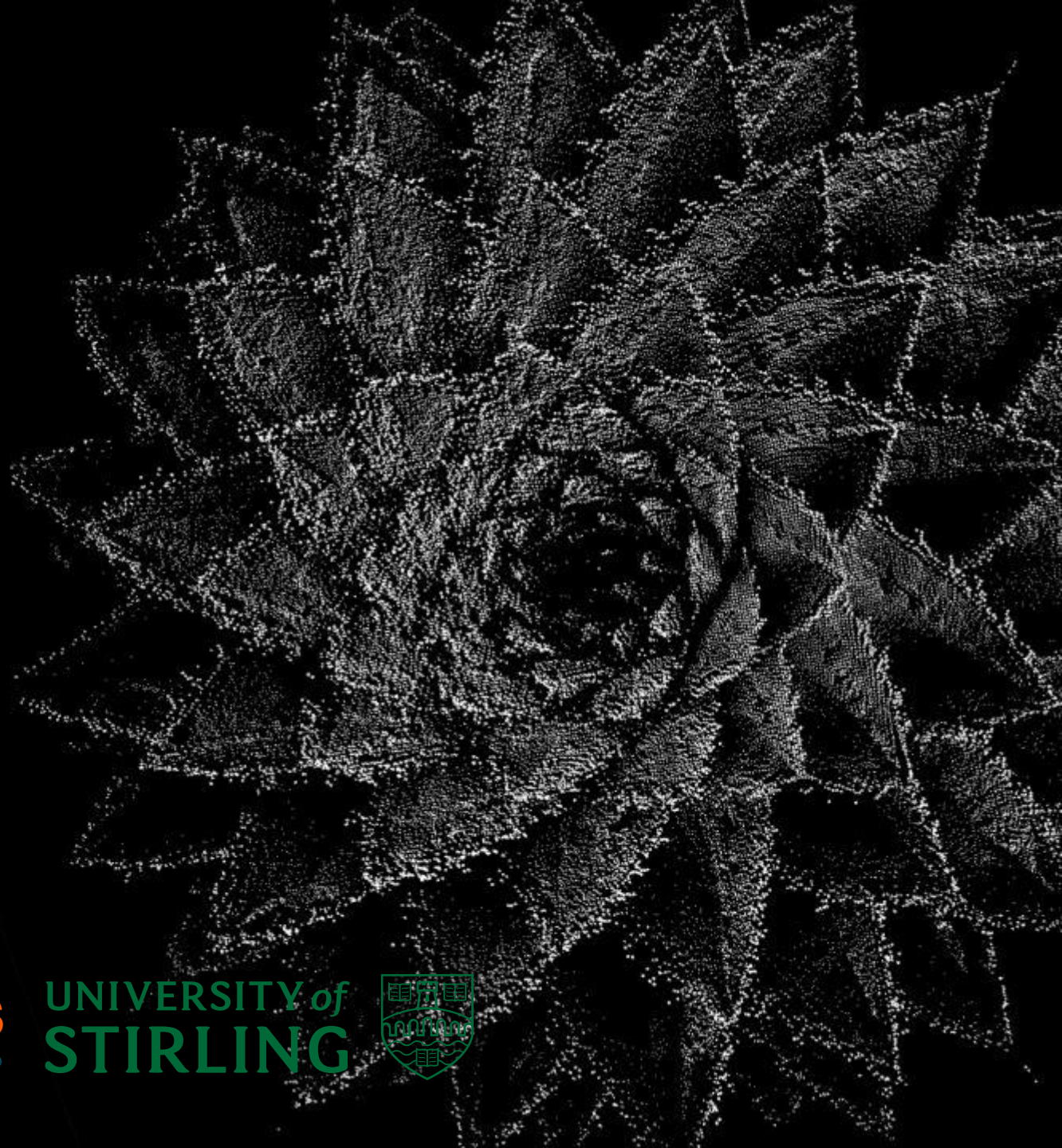
UKCEH Molecular Ecology Group:
Lindsay Newbold



Thank you.

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