

# Algal Crop Protection When It's Your Stock At Stake



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# Algal Biosecurity Is In Its Infancy

- Young Industry
- Limited Knowledge Base
- Limited Funding
- Negative Publicity
- Commercial Advantage



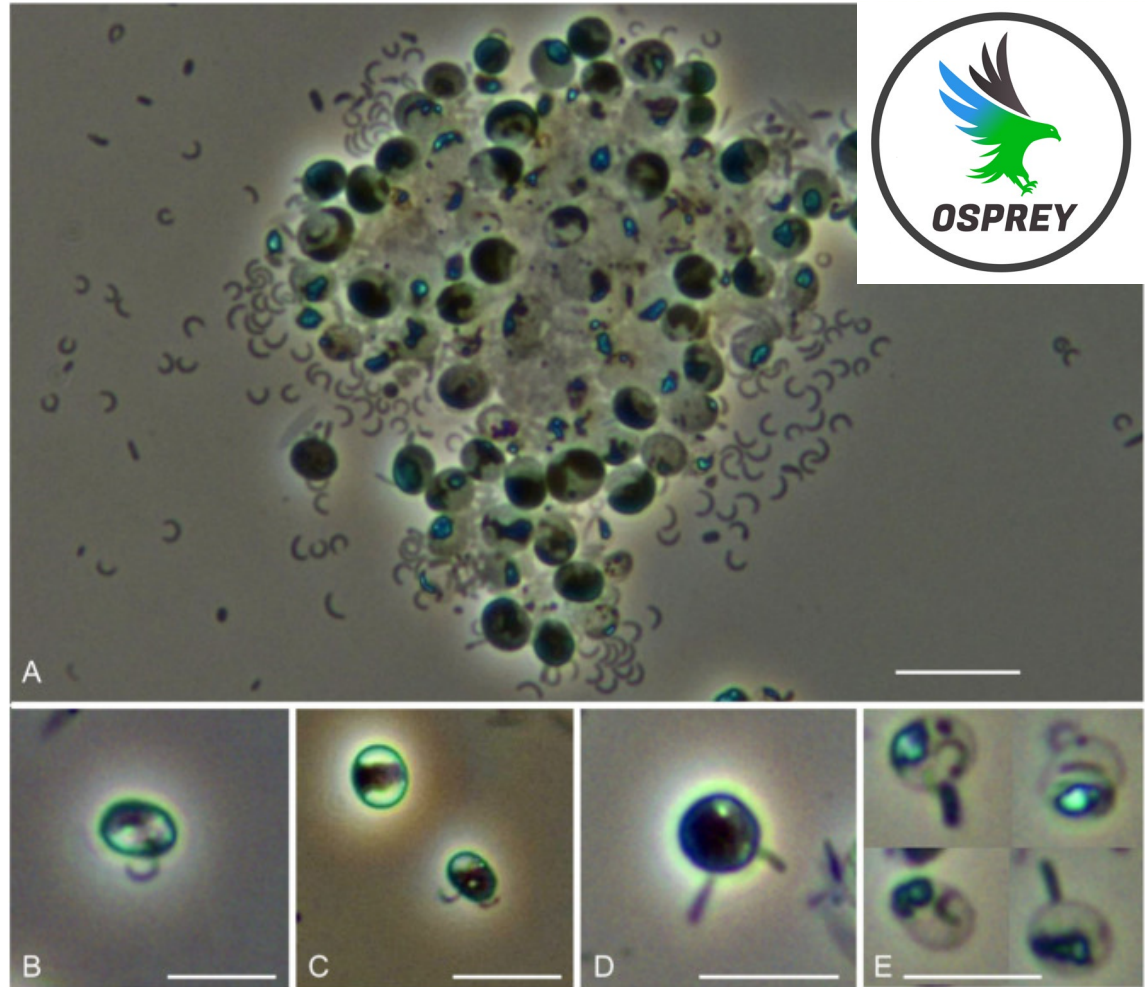
# Key Questions

- What is it?
- How bad is it?
- Where is it coming from?
- How do we get rid of it?



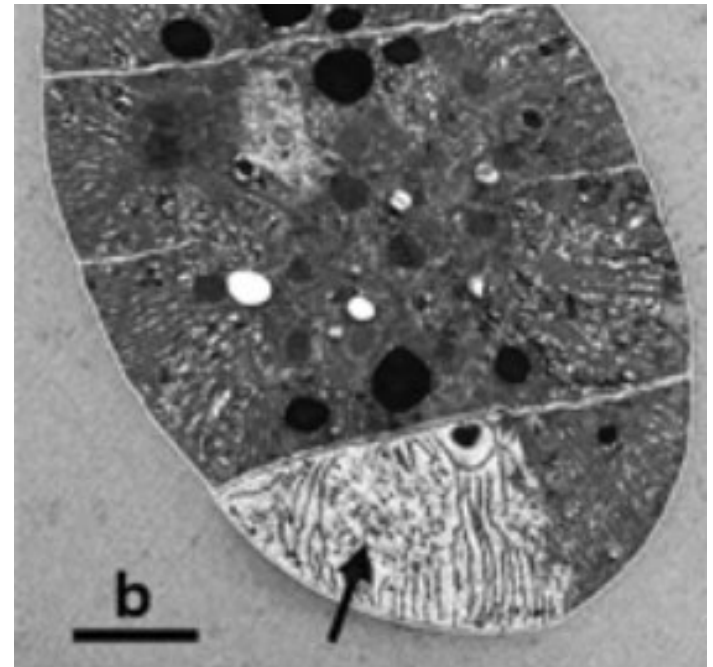
# What is it?

- “New to science”
- No prior art
- Limited understanding of nature



## What is it?

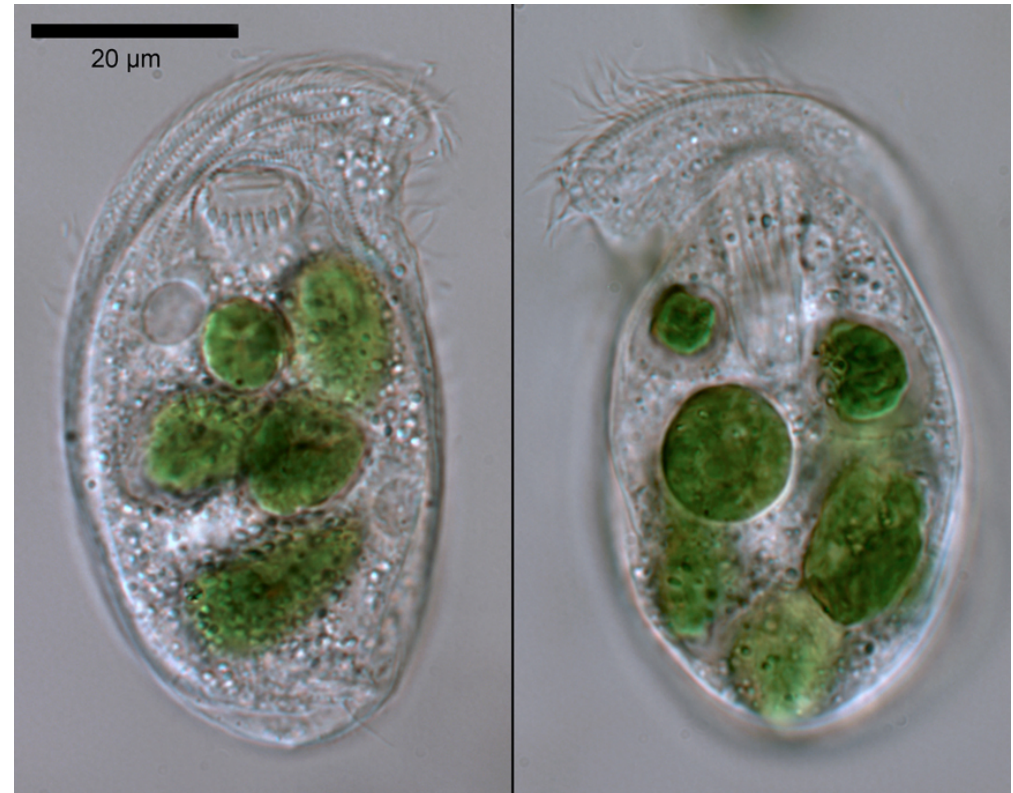
- Extraordinarily high virus abundance in East African lake causing *Limnospira* (commercial Spirulina) to crash
- ONE described virus species



Peduzzi et al. ISME  
Journal 8: 1346, 2014

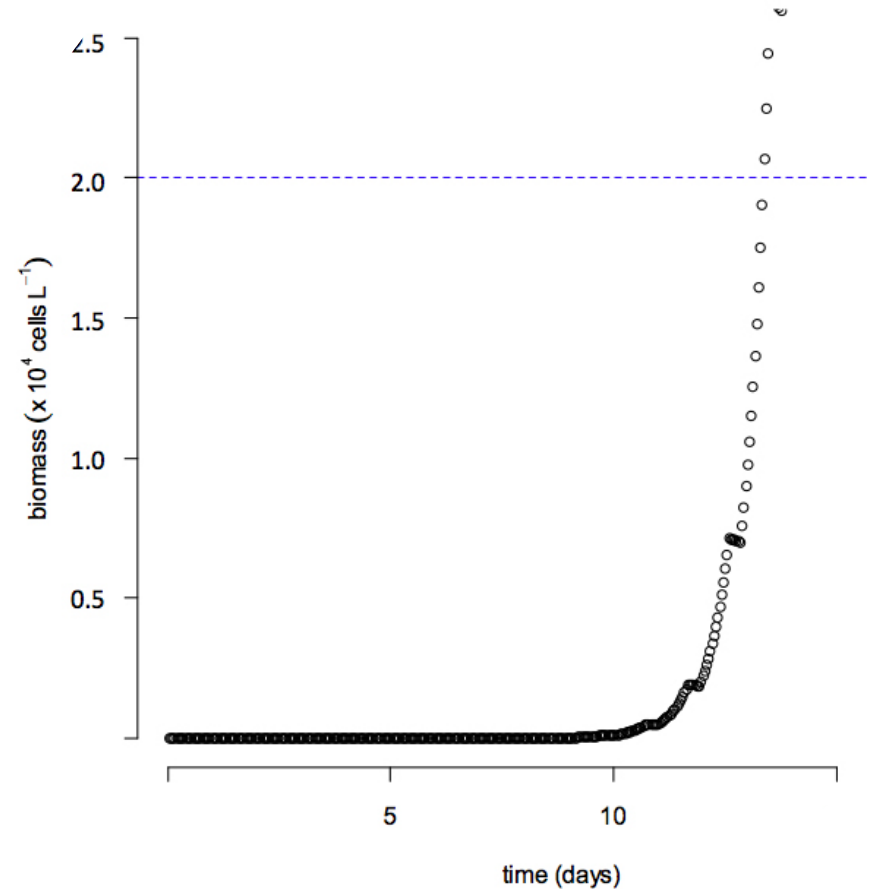
## How bad is it?

- “Not every cell with an alga in it is bad”
- Grand larceny vs petty thievery
- Biology of pest in the commercial system



# Where did it come from?

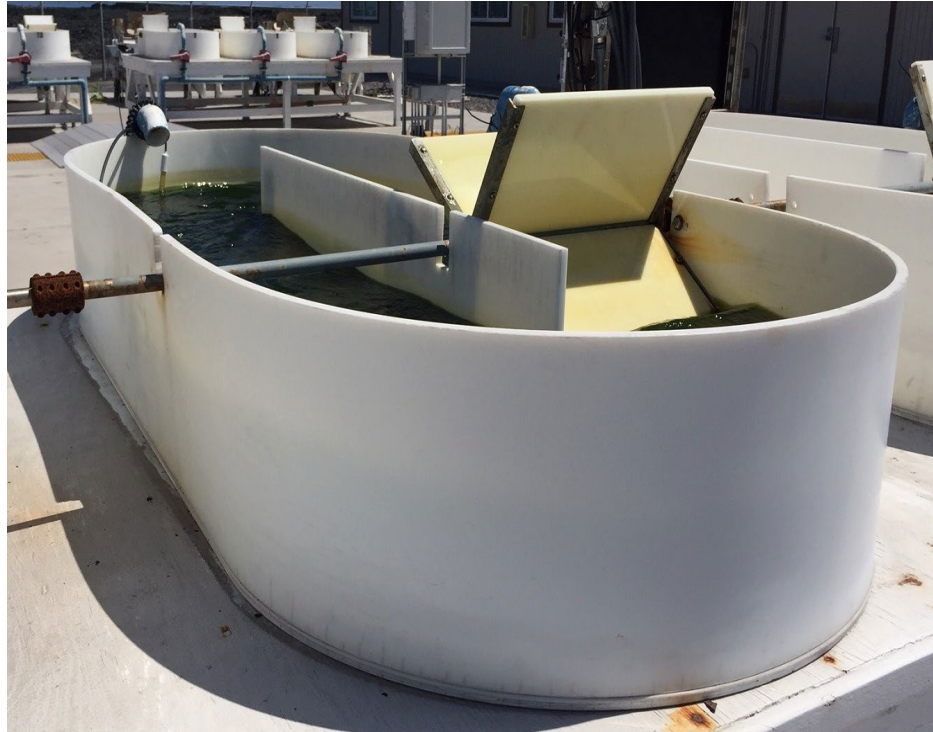
- **Vector** – how it enters the system
- **Reservoir** – how it stays in the system
- **Latency** – how long before you see it



Forehead H, O'Kelly CJ, *Bioresource Technology* 129: 329, 2013

# How to get rid of it?

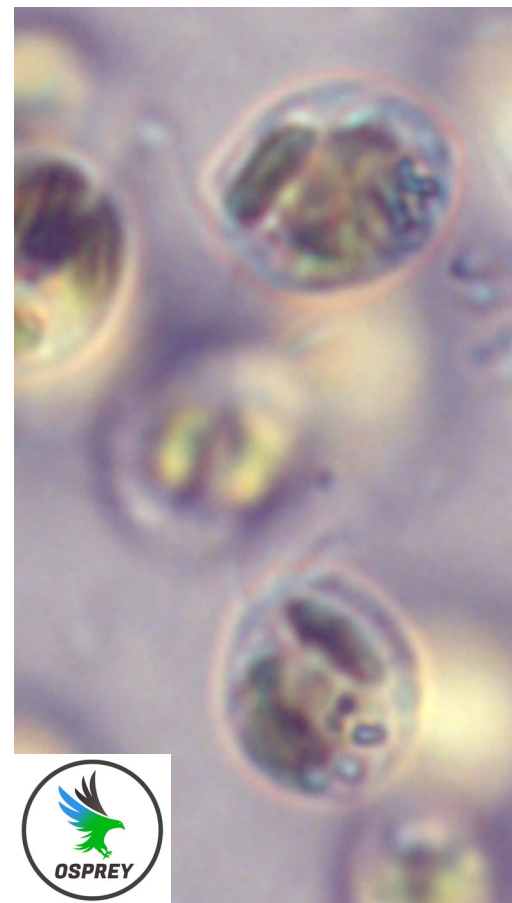
- **Direct** – e.g. chemical treatment
- **Indirect** – manipulate biology or engineering





## Case study in progress

- **What?** *Poteroochromonas* (DNA confirmation pending)
- **How bad?** Devastating
- **Where?** Widespread in nature (prior art exists, for once) – freshwater organism in saltwater system?



# Case study in progress

- **Fix?** Monitor/adjust medium salinity



- Much broader and deeper investigations into microbiome (including pests) of crop algae
- Overcome barriers to participation by commercial growers
- Complex investigations yield simple solutions

## How to help



Watson: “How absurdly simple!”  
Holmes: “Quite so ...”



# THANK YOU

Results! Why, man, I have gotten a lot of results! I know several thousand things that won't work. – *Thomas A. Edison*

