

Biofuels >

Volume 4, 2013 - Issue 5

194 25

Views CrossRef citations to date Altmetric

0

Editorial


# Grazers: the overlooked threat to the sustained production of future algal biofuels

John G Day

Pages 459-461 | Published online: 09 Apr 2014

🗨️ Cite this article 🔗 <https://doi.org/10.4155/bfs.13.29>

Sample our  
Engineering & Technology  
Journals



>> **Sign in here** to start your access  
to the latest two volumes for 14 days

📄 Full Article

🖼️ Figures & data

📖 References

🗨️ Citations

📊 Metrics

📄 Reprints & Permissions

Read this article

🔗 Share

## We Care About Your Privacy

We and our 880 partners store and access personal data, like browsing data or unique identifiers, on your device. Selecting I Accept enables tracking technologies to support the purposes shown under we and our partners process data to provide. Selecting Reject All or withdrawing your consent will disable them. If trackers are disabled, some content and ads you see may not be as relevant to you. You can resurface this menu to change your choices or withdraw consent at any time by clicking the Show Purposes link on the bottom of the webpage. Your choices will have effect within our Website. For more details, refer to our Privacy Policy. [Here](#)

We and our partners process data to provide:

Use precise geolocation data. Actively scan device

I Accept 

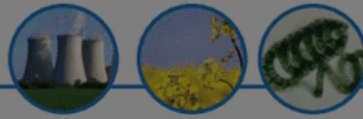
Reject All

Show Purpose



## Grazers: the overlooked threat to the sustained production of future algal biofuels

*Biofuels* (2013) 4(5), 459–461



“ We are currently at an exciting and dynamic phase in the development of new biofuels, with algae being seen as a realistic, commercially viable option. However, there are clearly still significant biological constraints to their commercialization, with grazing being largely overlooked by most researchers. ”

John G Day\*



Keywords: algal biofuel ■ amoeba ■ biological constraints ■ ciliates ■ grazers

A brief search on the internet will provide any reader with sufficient information and misinformation to convince them that microalgae are clearly the answer to future transport fuel poverty, and simultaneously that algal biofuels are not practicably feasible. What is true is that algae, a hugely diverse group of organisms, include taxa that: are capable of very high levels of productivity/solar energy conversion [1]; can produce oils and other products with biofuel potential [1,2]; do not need to compete with potable or irrigation water supplies; and, importantly, have a proven track record of upscaling and commercialization [3,4]. The author is convinced that algae will in the future be a major platform for the production of a wide range of biotechnological products and that they have, in the longer term, huge potential as biofuel producers. Irrespectively of the product, economics will drive processes towards large-scale production plants and for relatively cheap products such as fuels lower cost open-pond-based systems are inevitable. If one makes a 'back of the envelope' calculation using *Nannochloropsis oculata* with 10 pg of lipid cell<sup>-1</sup> [5] as a starting point, then based on cell densities routinely obtained in the author's laboratory ( $\sim 5.0 \times 10^7$  cells ml<sup>-1</sup>) and a pond system with a depth of

10 cm, assuming no significant harvesting or extraction/processing losses, approximately 2000 l of algae/20 m<sup>2</sup> of pond need to be harvested to produce 1 kg of oil. Clearly, even with enhanced lipid levels per cell and higher cell densities at harvest, future microalgal biofuel production facilities will have very large geographical footprints. Such large open-pond facilities make the likelihood of 'contamination' by other microorganisms an inevitability, not a probability.

### Interactions of biofuel algae with other microorganisms

*In vivo*, even in uni-algal cultures, complex microbial interactions are the norm, with algae providing sources of fixed carbon through leakage from healthy cells for commensal bacteria providing the algae with vitamins, for which many photo-autotrophic algae are auxotrophic [6]. There are a variety of other advantageous bacterial/algal relationships including facilitation of iron uptake by the production of extracellular iron-binding siderophores, by specific bacteria associated with phytoplankton [7]. However, not all interactions are positive, as in terrestrial crops 'disease' is a significant threat. Many phytoplankton are susceptible to fungal



# Log in via your institution

> [Access through your institution](#)

# Log in to Taylor & Francis Online

> [Log in](#)

# Restore content access

> [Restore content access for purchases made as guest](#)


## Purchase options \*

[Save for later](#)

### PDF download + Online access

- 48 hours access to article PDF & online version
- Article PDF can be downloaded
- Article PDF can be printed


EUR 56.00

 Add to  
cart

### Issue Purchase

- 30 days online access to complete issue
- Article
- Article

EUR 2

 Add to  
cart

\* Local tax



Related

Information for

- Authors
- R&D professionals
- Editors
- Librarians
- Societies

Opportunities

- Reprints and e-prints
- Advertising solutions
- Accelerated publication
- Corporate access solutions

Open access

- Overview
- Open journals
- Open Select
- Dove Medical Press
- F1000Research

Help and information

- Help and contact
- Newsroom
- All journals
- Books

Keep up to date

Register to receive personalised research and resources by email

 Sign me up



Copyright

Accessib

Registered  
5 Howick Pl

or & Francis Group  
orma business

