



Article

Temperature affects the size-structure of phytoplankton communities in the ocean

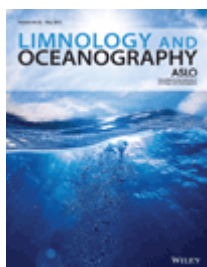
1. Ángel López-Urrutia^{1,*} and
2. Xosé Anxelu G. Morán^{1,2}

Article first published online: 5 MAR 2015

DOI: 10.1002/lno.10049

© 2015 Association for the Sciences of Limnology and Oceanography

Issue



Limnology and Oceanography

Volume 60, Issue 3, ([/doi/10.1002/lno.v60.3/issuetoc](https://doi.org/10.1002/lno.v60.3/issuetoc)) pages 733–738, May 2015

Additional Information

How to Cite

López-Urrutia, Á. and Morán, X. A. G. (2015), Temperature affects the size-structure of phytoplankton communities in the ocean. *Limnology and Oceanography*, 60: 733–738. doi: 10.1002/lno.10049

Author Information

1

Centro Oceanográfico de Gijón, Instituto Español de Oceanografía, Gijón/Xixón, Asturias, Spain

*Correspondence: alop@gi.ieo.es (<mailto:alop@gi.ieo.es>)

See related article [Resource supply alone explains the variability of marine phytoplankton size structure](http://onlinelibrary.wiley.com/doi/10.1002/lno.10138/full) (<http://onlinelibrary.wiley.com/doi/10.1002/lno.10138/full>)

Publication History

1. Issue published online: 14 MAY 2015
2. Article first published online: 5 MAR 2015
3. Manuscript Revised: 10 DEC 2014
4. Manuscript Accepted: 5 DEC 2014
5. Manuscript Received: 29 SEP 2014

Funded by

- Predicting the metabolic balance of the oceans. Grant Number: METOCA, CTM2009-13882-MAR
- Coastal Ocean Microbial communities and Temperature. Grant Number: COMITE, CTM2010-15840
- Spanish National Investigation+Development+Innovation (I+D+I) Plan
- Abstract
- [Article \(/doi/10.1002/lno.10049/full\)](http://onlinelibrary.wiley.com/doi/10.1002/lno.10049/full)
- [References \(/doi/10.1002/lno.10049/references\)](http://onlinelibrary.wiley.com/doi/10.1002/lno.10049/references)
- [Cited By \(/doi/10.1002/lno.10049/citedby\)](http://onlinelibrary.wiley.com/doi/10.1002/lno.10049/citedby)

[View Full Article \(HTML\) \(/doi/10.1002/lno.10049/full\)](http://onlinelibrary.wiley.com/doi/10.1002/lno.10049/full) [Enhanced Article \(HTML\) \(http://onlinelibrary.wiley.com/enhanced/doi/10.1002/lno.10049\)](http://onlinelibrary.wiley.com/enhanced/doi/10.1002/lno.10049) [Get PDF \(216K\) \(/doi/10.1002/lno.10049/pdf\)](http://onlinelibrary.wiley.com/doi/10.1002/lno.10049/pdf)

Abstract

The strong inverse correlation between resource availability and temperature in the ocean poses a challenge to determine the relative effect of these two variables on the size-structure of natural phytoplankton communities. Marañón et al (2012) compiled a dataset of concurrent temperature and resource level proxies that they claim disentangled the effect of temperature from that of resource supply. They concluded that the hypothesis that temperature per se plays a direct role in controlling phytoplankton size structure should be rejected. But our reanalysis of their data reaches a very different conclusion and suggests that they failed to separate the effects of temperature from the effects of resources. Although we obviously concur with Marañón et al (2012) in the long-known predominance of small phytoplankton cells under oligotrophic conditions, from our point of view this should not deter us from considering temperature as an important explanatory variable at a global scale since we show that, for the vast oligotrophic areas of the world's oceans where chlorophyll concentrations are below $<1 \mu\text{g L}^{-1}$ temperature explains a high proportion of the variability in the size distribution of phytoplankton communities, a variability that can not be explained on the basis of the resource level proxies advocated by Marañón et al. (2012).

[View Full Article \(HTML\) \(/doi/10.1002/lno.10049/full\)](http://onlinelibrary.wiley.com/doi/10.1002/lno.10049/full) [Enhanced Article \(HTML\) \(http://onlinelibrary.wiley.com/enhanced/doi/10.1002/lno.10049\)](http://onlinelibrary.wiley.com/enhanced/doi/10.1002/lno.10049) [Get PDF \(216K\) \(/doi/10.1002/lno.10049/pdf\)](http://onlinelibrary.wiley.com/doi/10.1002/lno.10049/pdf)

More content like this

2 de 3

Find more content:

29/09/15 12:40

Find more content written by:

- [Ángel López-Urrutia \(/advanced/search/results?searchRowCriteria\[0\].queryString="%C3%81ngel L%C3%B3pez-Urrutia"&searchRowCriteria\[0\].fieldName=author&start=1&resultsPerPage=20\)](#)
- [Xosé Anxelu G. Morán \(/advanced/search/results?searchRowCriteria\[0\].queryString="Xos%C3%A9 Anxelu G. Mor%C3%A1n"&searchRowCriteria\[0\].fieldName=author&start=1&resultsPerPage=20\)](#)
- [All Authors \(/advanced/search/results?searchRowCriteria\[0\].queryString="%C3%81ngel L%C3%B3pez-Urrutia" "Xos%C3%A9 Anxelu G. Mor%C3%A1n"&searchRowCriteria\[0\].fieldName=author&start=1&resultsPerPage=20\)](#)