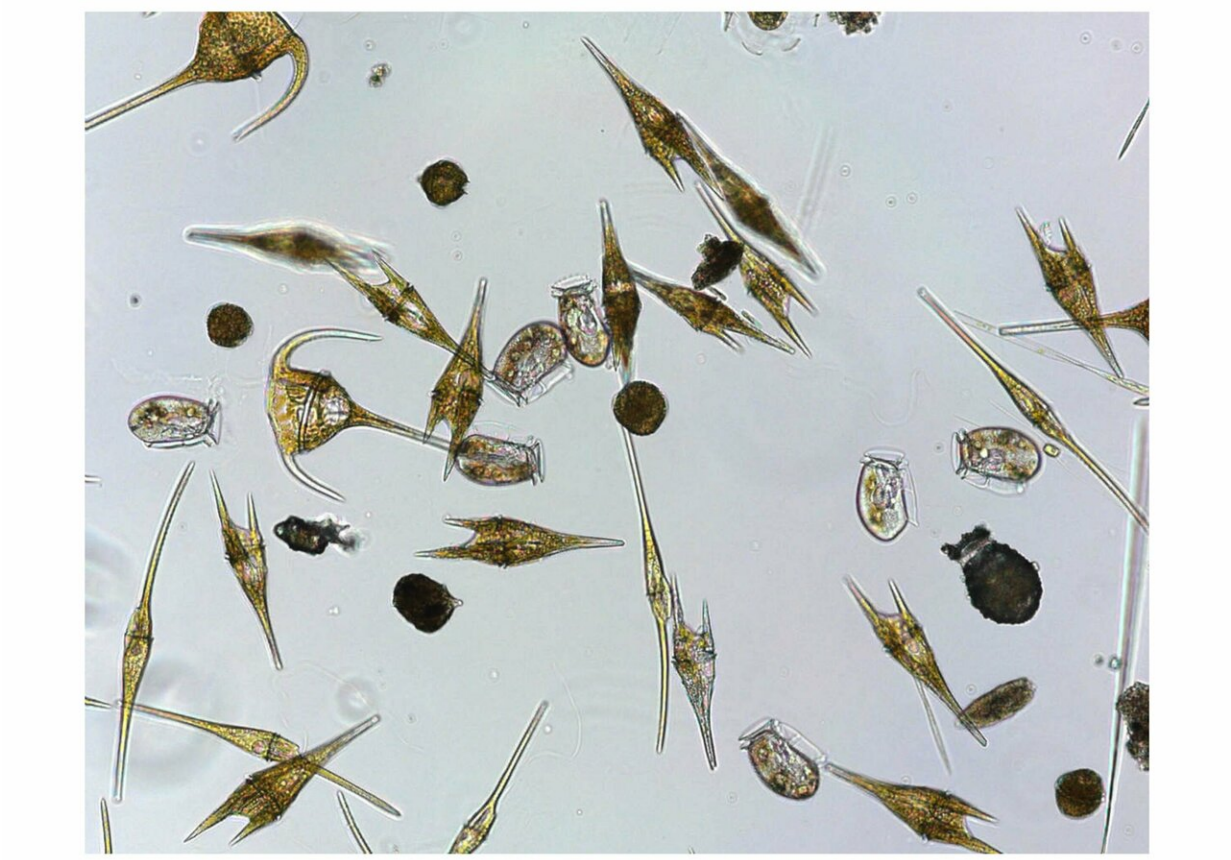
Novel methodological tool helps detect synergistic phenomena in phytoplankton growth

March 28 2019



Microscope view of a phytoplankton assemblage. Credit: Gustaaf Hallegraeff, University of Tasmania.

Researchers have developed a new model allowing them to observe the key drivers of phytoplankton growth (blooms) patterns in the seas surrounding the United Kingdom, according to a study in *PLOS Computational Biology*, by Lawrence W. Sheppard, from University of Kansas, USA, and colleagues.

The size of a bloom may vary in size over time, with different areas of the same ocean having synchronized fluctuations in phytoplankton growth- a phenomenon known as spatial synchrony. However, the primary mechanisms of phytoplankton spatial synchrony are not well understood. To better understand the spatial synchrony of phytoplankton blooms, the researchers developed a new statistical tool allowing them to observe the interaction among different variables influencing phytoplankton abundance over time.

Sheppard and colleagues identified a synergistic effect between the variables (water temperature and phytoplankton predation) influencing spatial synchrony. The statistical model they developed for the study also provides a new tool applicable in a range of ecological contexts. According to the authors, "The wavelet-based statistical modelling approach we used can be applied anywhere that different drivers with their own timescales are acting on an important natural variable, to quantify and disentangle their combined effects."

Although further research is needed to better understand the complex impacts of climate change on the spatial synchrony phenomenon, the authors are confident their new modelling approach provides a new method for analyzing the individual factors driving the synergistic effects occurring in different natural systems. The authors suggest, "This is the first time that such a reinforcement mechanism has been observed but it is reasonable to believe that it may be widespread in ecology and natural systems. Until our new methods were developed the statistical tools to detect this phenomenon did not exist."

PHYS.ORG

More information: Sheppard LW, Defriez EJ, Reid PC, Reuman DC (2019) Synchrony is more than its top-down and climatic parts: interacting Moran effects on phytoplankton in British seas. *PLoS Comput Biol* 15(3): e1006744. doi.org/10.1371/journal.pcbi.1006744

Provided by Public Library of Science

Citation: Novel methodological tool helps detect synergistic phenomena in phytoplankton growth (2019, March 28) retrieved 23 May 2024 from https://phys.org/news/2019-03-methodological-tool-synergistic-phenomena-phytoplankton.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.