

## Author's Accepted Manuscript

Micro-scale variability enhances trophic transfer and potentially sustains biodiversity in plankton ecosystems

Anupam Priyadarshi, Sandip Mandal, S. Lan Smith, Hidekatsu Yamazaki



[www.elsevier.com/locate/jtbi](http://www.elsevier.com/locate/jtbi)

PII: S0022-5193(16)30336-8  
DOI: <http://dx.doi.org/10.1016/j.jtbi.2016.10.005>  
Reference: YJTBI8838

To appear in: *Journal of Theoretical Biology*

Received date: 27 January 2016  
Revised date: 10 October 2016  
Accepted date: 14 October 2016

Cite this article as: Anupam Priyadarshi, Sandip Mandal, S. Lan Smith and Hidekatsu Yamazaki, Micro-scale variability enhances trophic transfer and potentially sustains biodiversity in plankton ecosystems, *Journal of Theoretical Biology*, <http://dx.doi.org/10.1016/j.jtbi.2016.10.005>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Micro-scale variability enhances trophic transfer and potentially sustains biodiversity in plankton ecosystems

Anupam Priyadarshi<sup>a</sup>, Sandip Mandal<sup>a,b</sup>, S. Lan Smith<sup>c</sup>, Hidekatsu Yamazaki<sup>a\*</sup>

<sup>a</sup>Department of Ocean Sciences, Tokyo University of Marine Science and Technology, Minato-ku, Tokyo 108-8477 Japan

<sup>b</sup>Public Health Foundation of India, Delhi NCR 44, Gurgaon 122002 India

<sup>c</sup>Marine Ecosystem Dynamics Research Group, Research and Development Centre for Global Change, Japan Agency for Marine-Earth Science and Technology, 3173-25 Showa-machi, Kanazawa-ku, Yokohama 236-0001 Japan

\* Corresponding author

Email address: AP: anupam240@gmail.com, SM: sandipccmb@gmail.com,

SLS: lanimal@jamstec.go.jp, HY: hide@kaiyodai.ac.jp

- Highlights:
- A new NPZ closure model is developed using the moment closure approach, which considers mean and a fluctuating components
- Micro-scale variability enhances trophic transfer from phytoplankton to zooplankton
- There exists a minimum threshold micro-scale variability for biologically feasible solutions
- The coefficient of variation ( $CV_p$ ) of phytoplankton is greater than 1 for stable solutions
- The parameter domain of stability, and hence potential biodiversity, increases with the level of micro-scale variability

Download English Version:

<https://daneshyari.com/en/article/6368802>

Download Persian Version:

<https://daneshyari.com/article/6368802>

[Daneshyari.com](https://daneshyari.com)