ROYAL SOCIETY OPEN SCIENCE

rsos.royalsocietypublishing.org

Research

Check for updates

Cite this article: Zupo V, Alexander TJ, Edgar GJ. 2017 Relating trophic resources to community structure: a predictive index of food availability. *R. Soc. open sci.* **4**: 160515. http://dx.doi.org/10.1098/rsos.160515

Received: 14 July 2016
Accepted: 10 January 2017

Subject Category:
Earth science

Subject Areas:
ecology/environmental science

Keywords:
food webs, trophic groups, feeding guilds, abundance, resources

Author for correspondence:
Valerio Zupo
e-mail: vzupo@szn.it

Electronic supplementary material is available online at https://dx.doi.org/10.6084/m9.figshare.c.3677065.

THE ROYAL SOCIETY PUBLISHING

Relating trophic resources to community structure: a predictive index of food availability

Valerio Zupo[1], Timothy J. Alexander[2,3] and Graham J. Edgar[4]

[1]Stazione Zoologica Anton Dohrn, Integrative Marine Ecology Department, Benthic Ecology Center, Punta San Pietro, Ischia 80077, Italy
[2]Department of Fish Ecology and Evolution, Centre of Ecology, Evolution and Biogeochemistry, EAWAG Swiss Federal Institute of Aquatic Science and Technology, Seestrasse 79, Kastanienbaum 6047, Switzerland
[3]Division of Aquatic Ecology and Evolution, Institute of Ecology and Evolution, University of Bern, Baltzerstrasse 6, Bern 3012, Switzerland
[4]Institute for Marine and Antarctic Studies, University of Tasmania, GPO Box 252-49, Hobart, Tasmania 7001, Australia

VZ, 0000-0001-9766-8784; TJA, 0000-0002-6971-6205

The abundance and the distribution of trophic resources available for consumers influence the productivity and the diversity of natural communities. Nevertheless, assessment of the actual abundance of food items available for individual trophic groups has been constrained by differences in methods and metrics used by various authors. Here we develop an index of food abundance, the framework of which can be adapted for different ecosystems. The relative available food index (RAFI) is computed by considering standard resource conditions of a habitat and the influence of various generalized anthropogenic and natural factors. RAFI was developed using published literature on food abundance and validated by comparison of predictions versus observed trophic resources across various marine sites. RAFI tables here proposed can be applied to a range of marine ecosystems for predictions of the potential abundance of food available for each trophic group, hence permitting exploration of ecological theories by focusing on the deviation from the observed to the expected.

1. Introduction

1.1. The importance of trophic resources

Nutrient supply and productivity gradients can strongly influence the diversity of natural communities through trophic linkages