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THEME SECTION

Primary production in seagrasses and macroalgae: closing the GAP between concepts and measurements

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CONTENTS

Introduction

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Accurate determination of gross carbon photosynthetic fixation, respiration and other loss processes from primary producers in aquatic environments is fundamental towards understanding how these ecosystems function. Advances in technology provide new possibilities for measuring the complex impacts of rising atmospheric CO_2 concentrations and global warming from molecular to global scales, and challenge us to modify and refine our concepts of aquatic systems.

The Group for Aquatic Primary Productivity (GAP) is a working group of the International Society for Limnology (SIL) and the International Association for Ecology (INTECOL). GAP workshops bring scientists and students of disparate backgrounds and experience together to work in diverse aquatic environments and to share innovative ideas and expertise. The workshops involve hands-on, joint field and laboratory experiments to which participants contribute state-of-the-

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art equipment and methodology to investigate primary productivity in different environments and organisms.

The 8th GAP International Workshop held at Eilat, Israel, in April 2008 had over 90 registered participants from across the globe. The first 2 days of the meeting were dedicated to invited keynote presentations and to the planning of experiments, after which the workshop shifted into 'experimental mode'. There were 7 workgroups focusing on: (1) the open ocean; (2) phytoplankton primary production and respiration; (3) photosynthesis and respiration in saltern ponds; (4) coral reefs; (5) bioreactors; (6) macroalgae; and (7) seagrasses. Papers from the first 5 groups are published in a Special of Aquatic Microbial Ecology, Vol. 56(2–3), 2009; available at: www.int-res.com/articles/suppl/a056p109.

The present Theme Section (TS) of Aquatic Biology (AB) features a keynote presentation and 2 contributed papers based on the experimental work of the seagrass group. Silva et al. (2009, this Theme Section) review available and emergent methodologies for measuring photosynthesis in seagrasses and point out gaps in our understanding of seagrass photosynthesis. Runcie et al. (2009, this Theme Section) applied some newly developed techniques during the GAP workshop to determine how irradiance energy absorbed by PSII is allocated to photochemistry versus non-photochemical processes in the seagrass *Halophila stipulacea* (a species that is common in the Gulf of Aqaba) along an extended depth gradient, and how the allocation to these processes varies during the onset of irradiance stress and recovery. A parallel study by Sharon et al. (2009, this Theme Section) examined the acclimation responses of *H. stipulacea* transplanted from shallow water to >30 m depth.

The experimental work of the macroalgae group is featured in 2 contributions by Figueroa et al. (2009a,b, this Theme Section), who studied varying photosynthetic acclimations to solar radiation in red, green and brown macroalgae collected from the oligotrophic Red Sea. This group also examined the influence of nutrient supply on photosynthesis and pigment production in the economically important green macroalga *Ulva lactuca*, which is cultivated in effluents from commercial mariculture ponds. These studies highlight the complexities of macroalgal photosynthetic responses under differing environmental conditions, both natural and induced.

LITERATURE CITED

- Figueroa FL, Martínez B, Israel A, Neori A and others (2009a) Acclimation of Red Sea macroalgae to solar radiation: photosynthesis and thallus absorptance. Aquat Biol 7: 159–172
- Figueroa FL, Israel A, Neori A, Martínez B and others (2009b) Effects of nutrient supply on photosynthesis and pigmentation in *Ulva lactuca* (Chlorophyta): responses to short-term stress. Aquat Biol 7:173–183
- Runcie JW, Paulo D, Santos R, Sharon Y, Beer S, Silva J (2009) Photosynthetic responses of *Halophila stipulacea* to a light gradient. I. *In situ* energy partitioning of non-photochemical quenching. Aquat Biol 7:143–152
- Sharon Y, Silva J, Santos R, Runcie JW, Chernihovsky M, Beer S (2009) Photosynthetic responses of *Halophila stipulacea* to a light gradient. II. Acclimations following transplantation. Aquat Biol 7:153–157
- Silva J, Sharon Y, Santos R, Beer S (2009) Measuring seagrass photosynthesis: methods and applications. Aquat Biol 7:127–141