MARTINO EDOARDO MALERBA

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Coexistence by nitrogen partitioning and asymmetric dispersal using microalgae cultures

Martino moved to Townsville at the age of 18 to study Marine Biology at JCU, where his honours research led to the design of a new model able to capture the couple dynamics between phytoplankton nitrate and nitrite utilization.

Microalgae are an important part of many ecosystems, being amongst the most prolific primary producers and representing the base of most aquatic food chains. Understanding the principles shaping phytoplankton communities will help detect changes in the environment; predict future assemblages; and improve our efficiency in rearing species in aquaculture settings.

Martino's research interest is in community ecology and species interactions. His current research focuses on analysis of the main mechanisms determining species assemblages in microbial aquatic environments. His PhD combines theoretical contributions from process-based models with empirical observations from field and laboratory settings. This will develop a novel approach to integrate both present and historical nutrient regimes to fully understand and explain phytoplankton dynamics in artificial or natural systems.

Current models on resource-driven phytoplankton dynamics assume that only present external nutrient concentrations determine rates of uptake and growth of a species. Martino's research has found how nutrient history is also important when analysing phytoplankton dynamics.

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Publications

Malerba, M.E., Connolly, S.R. & Heimann, K., 2012. Nitrate-nitrite dynamics and phytoplankton growth: Formulation and experimental evaluation of a dynamic model. *Limnology and Oceanography*, 57(5), pp.1555–1571. Available at: http://www.aslo.org/lo/toc/vol_57/issue_5/1555.html

Martino E. Malerba, Sean R. Connolly, Kirsten Heimann 2013 A new dynamic model for analyzing coupled nitrate-nitrite dynamics in phytoplankton communities. Poster presentation in *AIMS@ JCU Seminar*. Available at: http://aims.jcu.edu.au/ckfinder/userfiles/files/Seminar-Days/2013/Malerba_Poster_AIMS%40JCU_17Jun2012_2.pdf