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TITLE: Estuarine nutrient loading affects phytoplankton growth and microzooplankton grazing at two contrasting sites in Hong Kong coastal waters

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ABSTRACT:

MEPS Marine Ecology Progress Series Contact the journal Facebook Twitter RSS Mailing List Subscribe to our mailing list via Mailchimp HomeLatest VolumeAbout the JournalEditorsTheme Sections MEPS 379:77-90 (2009) - DOI: <https://doi.org/10.3354/meps07888> Estuarine nutrient loading affects phytoplankton growth and microzooplankton grazing at two contrasting sites in Hong Kong coastal waters Bingzhang Chen¹, Hongbin Liu^{1,2,*}, Michael R. Landry³, Mianrun Chen², Jun Sun⁴, Loklun Shek¹, Xihan Chen¹, Paul J. Harrison¹ ¹Atmospheric, Marine, and Coastal Environment (AMCE) Program, Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong ²Department of Biology, Hong Kong University of Science and Technology, Clear Water Bay, Hong Kong ³Scripps Institution of Oceanography, University of California at San Diego, La Jolla, California 92093-0227, USA ⁴Key Laboratory of Marine Ecology and Environmental Science, Institute of Oceanology, Chinese Academy of Sciences, Nanhai Road 7th, Qingdao 266071, P. R. China *Corresponding author. Email: liuhb@ust.hk ABSTRACT: To investigate the effects of enhanced nutrient loading in estuarine waters on phytoplankton growth and microzooplankton grazing, we conducted monthly dilution experiments at 2 stations in Hong Kong coastal waters with contrasting trophic conditions. The western estuarine station (WE) near the Pearl River estuary is strongly influenced by freshwater discharge, while the eastern oceanic station (EO) is mostly affected by the South China Sea. Growth rates of phytoplankton were often limited by nutrients at EO, while nutrient limitation of phytoplankton growth seldom occurred at WE due to the high level of nutrients delivered by the Pearl River, especially in the summer rainy season. Higher chlorophyll a, microzooplankton biomass, phytoplankton growth and microzooplankton grazing rates were found at WE than at EO. However, the increase in chlorophyll greatly exceeded the increase in phytoplankton growth rate, reflecting different response relationships to nutrient availability. Strong seasonality was observed at both stations, with temperature being an important factor affecting both phytoplankton growth and microzooplankton grazing rates. Picophytoplankton, especially *Synechococcus*, also exhibited great seasonality at EO, with summer abundances being 2 or 3 orders of magnitude higher than those during winter. Our results confirm that in eutrophic coastal environments, microzooplankton grazing is a dominant loss pathway for phytoplankton, accounting for the utilization of >50% of primary production on average. KEY WORDS: Phytoplankton · Microzooplankton · Grazing rates · Pearl River estuary · Picoplankton Full text in pdf format PreviousNextCite this article as: Chen B, Liu H, Landry MR, Chen M and others (2009) Estuarine nutrient loading affects phytoplankton growth and microzooplankton grazing at two contrasting sites in Hong Kong coastal waters. Mar Ecol Prog Ser 379:77-90. <https://doi.org/10.3354/meps07888> Export citation RSS - Facebook - Tweet - linkedIn Cited by Published in MEPS Vol. 379. Online publication date: March 30, 2009 Print ISSN: 0171-8630; Online ISSN: 1616-1599 Copyright © 2009 Inter-Research.

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