

國立臺灣海洋大學  
海洋環境與生態研究所 專題討論#

題目: Different impact of nanoflagellate grazing and viral lysis on *Synechococcus* spp. and picoeukaryotic mortality in coastal waters

作者: An-Yi Tsai, Gwo-Ching Gong, Chih-Ching Chung, Yi-Ting Huang

出處: Estuarine, Coastal and Shelf Science (2018), 209, 1-6

報告人: 朱智宇 碩一

指導教授: An-Yi Tsai

報告日期: 11/20/2019

### Abstract

Flow cytometry was used to follow the diel variations in abundance of *Synechococcus* spp. and picoeukaryotes in subtropical western Pacific coastal waters in June 2017. A modified dilution method was also used to estimate diel changes in the effect of nanoflagellate and viruses on *Synechococcus* spp. and picoeukaryotes. Obvious diel patterns were found in changes in abundance in both *Synechococcus* spp. and picoeukaryotes, the highest values recorded at night. *Synechococcus* spp. and picoeukaryotic growth decreased significantly in more highly diluted samples incubated during the daytime, suggesting that picophytoplankton production is partially dependent on grazing- and virus-mediated nutrient cycling during the daytime. At nighttime, nanoflagellate grazing and viral lysis were responsible for *Synechococcus* spp. mortality at rates of  $0.02 \text{ h}^{-1}$  and  $0.04 \text{ h}^{-1}$ , respectively, and nanoflagellate grazing was responsible for all picoeukaryotic mortality. The most important finding of this study was that nanoflagellate grazing exerts great control over picoeukaryotes at night in these subtropical western Pacific coastal waters.

### 中文摘要

本研究於亞熱帶西太平洋沿海水域 2017 年 6 月期間使用流式細胞儀計數 *Synechococcus* spp. 和 picoeukaryotes 的日夜數量變化，並使用改良後的稀釋培養法來量測日夜間微細鞭毛蟲攝食和病毒裂解對 *Synechococcus* spp. 和 picoeukaryotes 移除率的影響。實驗結果清楚發現 *Synechococcus* spp. 和 picoeukaryotes 有明顯的日夜數量變化，且兩者數量最高值都在夜間出現。在白天的培養實驗，可以清楚發現在稀釋比例較高的培養瓶中，*Synechococcus* spp. 和 picoeukaryotic 的淨生長速率會顯著下降，作者建議此結果主要是白天期間 picophytoplankton 的生長所需的營養鹽應該來自於微細鞭毛蟲攝食和病毒裂解細菌所產生的再生性營養鹽。而在夜間，微細鞭毛蟲攝食和病毒裂解分別造成  $0.02 \text{ h}^{-1}$  和  $0.04 \text{ h}^{-1}$  *Synechococcus* spp. 的死亡率，而微細鞭毛蟲攝食影響是主要造成晚間 picoeukaryotic 數量減少的原因。本研究最重要的發現是在亞熱帶西太平洋沿海水域中，在夜間 picoeukaryotes 數量減少主要是微細鞭毛蟲的攝食所控制。