

國立臺灣海洋大學

海洋環境與生態研究所

碩士學位論文

指導教授：蔣國平 博士

探討馬祖夜光蟲數量變化與潮汐之關係

The relationship between the red tide
dinoflagellate *Noctiluca scintillans*
abundance variation and the tide in Matsu

研究生：陳采玉 撰

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dinoflagellate *Noctiluca scintillans* abundance
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研究生：陳采玉

Student : Tsai-Yu Chen

指導教授：蔣國平 博士

Advisor : Dr. Guo-Ping Chiang

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摘要

夜光蟲(*Noctiluca scintillans*)是一單細胞異營性渦鞭毛藻，大小介於 200-2000 μm 之間。屬廣域性分布種類，大多出現在沿岸及湧昇流水域，並為一種赤潮(red tide)生物。每年 4-6 月會大量出現於馬祖周邊海域。由於夜光蟲受到海水擾動等外力干擾時會發出藍色生物冷光(bioluminescence)，夜晚無光害時，海中呈現整片藍色生物冷光現象，造就了馬祖藍眼淚旅遊風潮。馬祖海域潮差約 4-5 公尺，當地居民認為夜光蟲大都出現在漲潮期間，潮汐可能是影響夜光蟲出現與否的關鍵因素。為了解潮汐與夜光蟲的關係，本研究在馬祖夜光蟲好發期間進行採樣實驗，於福澳港外 3 個測站進行 48 小時觀測，每站各採 5 個深度，並隨著潮汐的高潮及低潮時間採樣。結果發現夜光蟲有垂直移動的現象，白天上升至表層 2 m，夜晚向下沉降至 10 m。以東西向水流作為主要影響因子，進一步分析夜光蟲與潮汐間的關係，結果顯示兩者間並沒有很好的關係存在。此結果顯示夜光蟲數量變化不受東西向的流影響，而可能是受南北向的流影響，或是來自閩江口的淡水流向混亂等其他因子影響所致。

Abstract

Noctiluca scintillans, a heterotrophic dinoflagellate with a size between 200 to 2000 μm in diameter, is a widespread red tide organism, mostly found in coastal and upwelling waters. A large number of *N. scintillans* randomly appears in the surface waters around the coasts of Matsu from April to June. *Noctiluca scintillans* emits bioluminescent light when being disturbed by external forces, such as seawater disturbance, showing fantastic blue sparkles in each dark night. The phenomenon, named as blue tears, promotes the sightseeing in Matsu for tourists and travelers. In order to study the relationship between the tidal current and the abundance of *N. scintillans* during the bloom period, a 48-hour observation at 3 stations outside Fuao Port was proceeded, in which samples at 5 depths of each station were took following the time series of high tide, inter-tide and low tide. The result showed a routine vertical movement of *N. scintillans*, rising to 2 m in depth during the day time and falling to 10 m in depth at night. There was no relationship between the abundance of *N. scintillans* and the tidal current by using east-west water flow as the main influencing factor, i.e., the abundance of *N. scintillans* is not affected by the east-west flow, but may be affected by other factors, such as the north-south flow, or the fresh water from the Minjiang Estuary.