

國立臺灣海洋大學
海洋環境與生態研究所 專題討論

中文題目：夜光蟲在北海的動態、尺寸測量以及與小型浮游生物之間的關係

英文題目：*Noctiluca scintillans*: Dynamics, Size Measurements and Relationships
With Small Soft-Bodied Plankton in the Belgian Part of the North Sea

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Abstract

Climate driven changes and anthropogenic pressures on the marine environment have been shown to favor the increase in certain potentially harmful species. Among them, *Noctiluca scintillans*, a common dinoflagellate, often blooms during warm summers and is known to affect plankton communities. In this study, we assessed the dynamics in abundance and cell size of *N. scintillans* as well as the relationship between *N. scintillans* and small soft-bodied zooplankton in the Belgian part of the North Sea (BPNS), since negative correlations between these plankton groups have been previously reported for nearby regions. This study is the first to present consistently counted *N. scintillans* cell numbers and measured cell lengths, through the analysis of ZooScan images from samples taken monthly at stations throughout the coastal zone of the BPNS. The results show that *N. scintillans* demonstrated clear seasonal dynamics with both high densities and large cell sizes in spring/summer (May-July). The occurrence of *N. scintillans* in the analyzed plankton samples and the abundance of *N. scintillans* at the observed peak intensities nearly tripled over a period of 5 years. A zero-inflated model showed a correlation of *N. scintillans* abundance with temperature as well as with phosphate concentrations, suggesting that anthropogenic influences such as climate change and riverine nutrient inputs could affect the temporal dynamics of the species. The results, on the other hand, did not show any negative impact of *N. scintillans* on the soft-bodied plankton community.

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中文摘要

氣候驅動的變化和人類對海洋環境的壓力已被證明有利於某些潛在的有害物種增加。其中，一常見的渦鞭毛藻 *Noctiluca scintillans*，通常在溫暖的夏天發生大爆發，並且已知會影響浮游生物的群落。在這項研究中，我們評估了北海比利時部分地區(BPNS)的 *N. scintillans* 數量和細胞大小(尺寸)的動態，以及 *N. scintillans* 和小型軟性(soft-bodied)浮游動物之間的關係，因為過去在附近海域已描述過這些浮游生物群落之間呈負相關。本研究是第一個藉由分析 BPNS 沿岸地區每月各測站取樣的 ZooScan 圖像，呈現連續計數 *N. scintillans* 的細胞數量和細胞長度。結果顯示，*N. scintillans* 表現出明顯的季節性動態分布，在春夏季(5月至7月)密度和細胞大小均較高。在分析的浮游生物樣本中 *N. scintillans* 的出現和在觀察到的高峰期強度下的豐度，在五年多的時間幾乎增加了三倍。零膨脹模型(zero-inflated model)顯示，*N. scintillans* 豐度與溫度以及磷酸鹽濃度有關，暗示氣候變化和河流養分輸入等人為影響可能會影響該物種的時間動態分布。另一方面，結果並未顯示 *N. scintillans* 對小型軟性(soft-bodied)浮游動物群落的任何負面影響。

參考資料

Ollevier, A., J. Mortelmans, A. Aubert, K. Deneudt, and M. B. Vandegheuchte. 2021 *Noctiluca scintillans*: Dynamics, Size Measurements and Relationships With Small Soft-Bodied Plankton in the Belgian Part of the North Sea. *Frontiers in Marine Science* 8: 777999.