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題目: The Effect of Typhoon Maria (2018) on the Primary Production of southern East China Sea

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Abstract

Typhoon plays an important role in bringing nutrients from the seabed to the surface. However, the sea circumstances before and after a typhoon passes through are very bad, so ship survey data are difficult to obtain. Reports on the impact of typhoons on marine primary productivity (PP) and percent extracellular release (PER) are scarce. In order to determine the changes in PP (including particulate primary production, PPP, and dissolved primary production, DPP) and PER affected by Typhoon Maria (July 9-10, 2018), data from two sampling periods: pre-typhoon (July 6-8, 2018) and post-typhoon (July 14-17, 2018), were compared. After the passage of Typhoon Maria, phytoplankton production increased, resulting in an increase in chlorophyll (increased by 42.54%). In general, compared to pre-typhoon, the total PP post-typhoon increased by 86.24%, the PPP increased by 75.10%, the DPP increased by 99.50%, and the PER is remained stable. The result of this study showed that occasional typhoon events leading to chlorophyll concentration increase significantly in south East China Sea.

颱風是將海底營養鹽帶至表層的重要機制之一，然而颱風過境前後海況皆非常惡劣，因此船測資料難以取得。颱風對海洋初級生產力 (primary productivity; PP) 和細胞外釋放百分比 (percent extracellular release; PER) 的影響程度的報告更是十分稀少。為了確定東海受瑪麗亞颱風 (2018 年 7 月 9 日至 10 日) 影響的初級生產力 (包括顆粒態初級生產力和溶解態初級生產力) 及 PER 的變化，比較了 2 個採樣期: 颱風前 (2018 年 7 月 6 日至 8 日) 和颱風後 (2018 年 7 月 14 日至 17 日)。瑪麗亞颱風通過後，浮游植物大量繁殖，導致了葉綠素的增加 (增長了 42.54%)。結果表明，與颱風前相比，颱風後總初級生產力增長了 86.24% 顆粒態初級生產力和溶解態初級生產力分別增長了 75.10% 及 99.50%。PER 的狀態是穩定的。研究證實，颱風引起的葉綠素增加是顯著的 ($p=0.048$)。