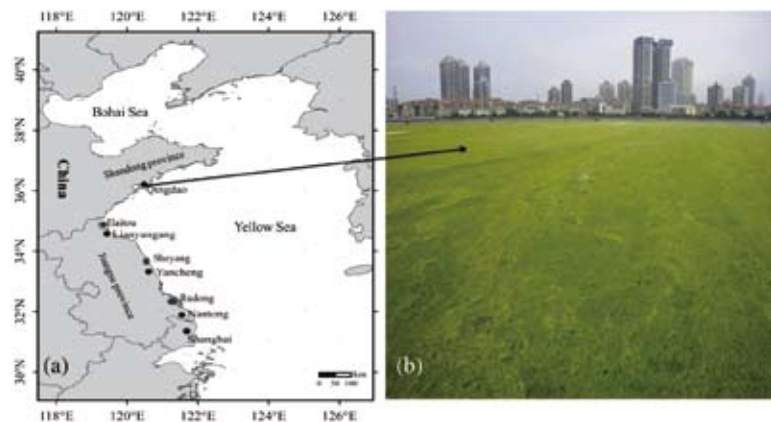


Discharge of Organic Nutrients May Have Worsened Green Tides in Yellow Sea

Starting from the year 2008, the southern Yellow Sea of China has been suffering from large macroalgal blooms, which have caused great economic losses and the deterioration of local coastal ecosystem. Previous studies have shown that *Ulva prolifera* is the most dominant green-tide-forming species by rapidly assimilating dissolved inorganic N and P. However, its uptake of organic P and N has not been sufficiently studied in the laboratory.

A research team led by Prof. ZHANG Yongyu from the Qingdao Institute of Bioenergy and Bioprocess Technology, CAS has lately made important progress in identifying the mechanisms of those macroalgal blooms. By studying the growth responses of *Ulva prolifera* to varied inorganic and organic nutrients, the researchers revealed several implications for macroalgal blooms in the southern Yellow Sea.

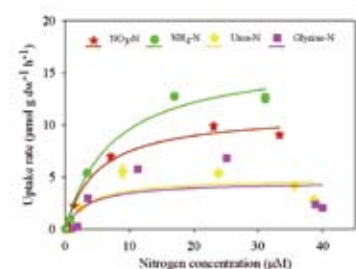
As the discharge of nutrient-rich wastewater from rivers and aquaculture ponds supply organic and inorganic nutrients to near shore coastal waters, these nutrients play a key role in the rapid development of green tides. Using different species of nutrients (such as urea or glycine from aquaculture feed), they found that organic nutrients may



Green tide in the Yellow Sea, summer of 2008. (a) Geographic location of Qingdao; (b) Photo taken on June 27, 2008 shows the green tide outbreak along Qingdao coast.

have contributed to the outbreak of macroalgal blooms in the region. It means that controlling the discharge of organic nutrients such as unused feed and organic excreta from rivers and mariculture ponds may reduce the annual occurrence of harmful green tides.

This study is a collaboration between Prof. ZHANG and Prof. SHI Xiaoyong from the Ocean University of China and the National Marine Hazard Mitigation Service, Prof. Richard B. Rivkin from the Memorial University of Newfoundland, and Prof. Louis Legendre from UPMC Université Paris. Prof. Rivkin and Prof. Legendre were financially supported by the CAS President's International Fellowship Initiative.



Concentration-dependent uptake rates of the four nitrogen substrates by *U. prolifera* during the first eight days (192 h) of the experiment. Dots: uptake rates.



A child plays on a beach covered by green algae in Qingdao, June 9, 2013. (Photo: Xinhua)