Effect of Vertical Distribution of Organic Phosphorus in Shallow Lake Sediments on Phosphate Photo-released During Resuspension

GUANGLONG LIU[1]*, XIAOLU LI[1]

[1]College of Resources and Environment, Huazhong Agricultural University, Wuhan 430070, China

Resuspended sediments exposed to sunlight could release dissolved phosphates, which could influence the concent of dissolved phosphate in the shallow lakes. However, this process is significantly affected by the vertical distribution of organic phosphorus in the sediment. In this study, the relationship between the vertical distribution of organic phosphorus in the sediment of Lake Miao and phosphate photo-released was determined.

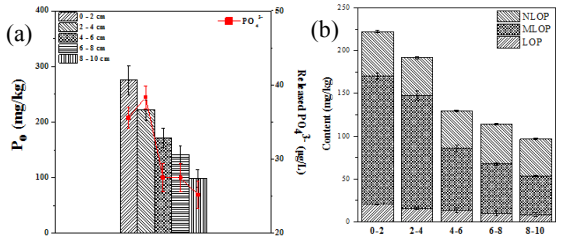

Fig. 1. (a) The relationship between photo-released phosphate and the content of organic phosphorus. (b) The content of different forms organic phosphorus in the different depth of sediment.

As shown in Fig. 1a, the content of organic phosphorus was the largest in the surface sediments (0-2 cm). As the depth of sediments increased, the content of organic phosphorus decreased. However, the maximum relase amount of phosphate in the resuspension appeared in the subsurface sediment (2-4 cm). The results of sequential extraction showed that the content of MLOP in the sediments was the highest among the 5 layers of sediment, and the maximum content of MLOP was the highest in the 2-4 cm of sediment (Fig. 1b). Our previous study found that MLOP is the main contributor of phosphorus photo-released, which may be one of the reasons for the highest phosphorus photo-released in subsurface sediments (2-4 cm). This work has deepened the understanding of the phosphorus cycling in shallow lakes.

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