



“Gheorghe Asachi” Technical University of Iasi, Romania



DISTRIBUTION OF ADDED PHOSPHORUS IN SEDIMENT UNDER INTERMITTENT RESUSPENSION CONDITIONS

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Abstract

The incorporation of phosphorus (P) into sediments and the changes in its bioavailability under intermittent P input and sediment resuspension conditions were investigated via laboratory experiments. The sediments were disturbed daily for 10 min and then allowed to settle for 1430 min after each disturbance to simulate the intermittent sediment resuspension conditions. The removal of soluble reactive P from the overlying water under sediment resuspension was greater than that under static conditions. Sequential fractionation indicated that most of the incorporated P (71%) was accounted for in the Fe/Al-P fraction under sediment resuspension conditions, whereas its value was up to 99.6% under static conditions. Bioavailable P (BAP) could be accurately estimated using the algal available P (AAP) and loosely associated P (NH₄Cl-P). The contribution of the added P to BAP was 47.3% under sediment resuspension conditions, whereas the contribution was up to 76.4% under static conditions, which can be attributed to the formation of AAP. Less than 47% of the incorporated P into the sediments was accounted for in AAP under sediment resuspension conditions, whereas over 70% was accounted for under static conditions. The results suggest that intermittent resuspension can inhibit the incorporation of added P into AAP, which can be attributed to the binding of added P to crystalline iron oxides, aluminum oxides, and Ca.

Key words: adsorption, phosphorus, pollution, precipitation, remediation, sediments

Received: February, 2012; Revised final: June, 2012; Accepted: July, 2012

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