

Abstract

Different phosphorus fractions and metal element composition of surficial sediments were measured on three occasions in 2005 and 2006 along a transect between Nyanza Gulf and offshore Lake Victoria, in order to assess the potential for sediments to contribute to the water column P concentrations in Lake Victoria. Total phosphorus (TP), apatite phosphorus (AP), inorganic phosphorus (IP) and organic phosphorus (OP) increased in sediments along the gulf towards the main lake while the non-apatite inorganic phosphorus (NAIP) increases were less defined. The longitudinal gradient of sediment TP and its fractions in Nyanza Gulf is a result of high rates of terrigenous input and resuspension and transport of the light, phosphorus rich inorganic and organic matter towards the main lake. TP in the sediment ranged from 812.7 to 1,738 mg/kg dry weight (DW) and was highest in the Rusinga Channel, the exchange zone between the gulf and the main lake. AP was the most important TP fraction, contributing between 35 and 57.3% of TP. Ca content in the sediment was strongly associated with TP and AP in the sediment ($r^2 = 0.92$ and 0.98 , respectively) in the gulf and the channel, indicating the importance of apatite in controlling P availability in these zones. In the gulf and the Rusinga Channel, the less bioavailable apatite phosphorus dominated, whereas in the deeper main lake OP was the major fraction illustrating the importance of anaerobic release of P from sediments and acceleration of internal P loading in the main lake.