A SEQUENTIAL EXTRACTION TO DETERMINE PHOSPHORUS FORMS IN THE RIVERBED, LAKE AND MARINE SURFACE SEDIMENTS

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The sediment plays an important role in the overall nutrient dynamics of water resources science. It is now widely accepted that the accessibility of the various elements for biota uptake depends strongly on their specific chemical forms and binding sites. A commonly used technique for identification of the phase associations of elements in solid phases is based on the application of sequential extractions. The determination of phosphorus species in environmental matrices provides essential data for assessing the health of ecosystems, investigating biogeochemical processes and monitoring compliance with legislation. The aim of this study is to investigate the distribution of phosphorus bioavailability (total phosphorus, organic and inorganic phosphorus) in the surface sediments from three water resources: Asi (Orontes) riverbed (Hatay, N Anatolia), Lake Hazar (Elazig, E Anatolia), NE Mediterranean Sea Cilician Basin (Tasucu; S Anatolia of Turkey). The Asi (Orontes) River, which originates in Lebanon and Syria, and flows to the Mediterranean Sea from Turkey’s Hatay province used mainly for irrigation. Agriculture, fisheries, industry and tourism along the Orontes River are polluting the water and in some parts killing marine life. It can be assumed that in those samples collected in March, organic matter originated from fall blooms of the previous year, and that by the time samples were collected, the phosphorus was mineralized to a large extend. Lake Hazar formed tectonically with faulting of Eastern Anatolia Fault is one of the largest and deepest lakes in Eastern Anatolia. Some of the beaches around the lake have been awarded with blue flag by the European Environmental Education Foundation. The lake also has a great potential for fisheries. The eastern Mediterranean Sea is one of the most extreme oligotrophic oceanic regions on earth in terms of nutrient concentrations and primary productivity. Speciation of inorganic phosphorus was carried out using a method based on sequential extractions of the sediments each releasing of four forms of inorganic phosphorus: loosely sorbed phosphorus, phosphorus bound to aluminium (P-Al), phosphorus bound to calcium (P-Ca) and phosphorus bound to iron (P-Fe). For the phosphorus concentrations are in good agreement with the reference values. Calcium bound phosphorus is the dominant form of inorganic phosphorus in the surface sediments. Speciation of phosphorus in surface sediments using ICP-AES has reported here.

References