

High concentrations of phosphate in streams of hilly areas, which stimulate high primary production by benthic algae on pond soils

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Phosphate is an essential mineral nutrient for all life forms. However, little phosphate is present in river waters, because it is strongly adsorbed on particulates such as oxides and hydroxides of iron and aluminum. Wakamatsu et al. (2006) reported low concentrations of phosphate in many headwater streams in Japan, which was presumed to vary depending on geological features. Here, we report high concentrations of phosphate in streams of hilly areas, which are created through a topographical feature of hilly areas. The reduction of Fe under humid soils resulted in the release of phosphate, which could act as a prime source of phosphate in a watershed. Moreover, we report an occurrence of significant primary production by benthic algae on sediments of a shallow pond, which may be stimulated by phosphate released from sediments.

Keywords: phosphate, hilly area, primary production, river, reduction