

Availability of natural attenuation of persistent organic compounds in acid sulfate soils distributed in a coastal area

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Coastal acid sulfate soils are naturally generated sediments, mainly containing iron sulfides. When this soil exposure to air, they undergo leaching of sulfuric acid due to the oxidation of iron sulfides. The oxidation has an undesirable influence on plants and ecosystems, and serious damaged sites are artificially remediated. However, iron sulfides also have the potential to degrade toxic VOCs (Volatile Organic Compounds) and persistent organic compounds. These remediation properties have only been observed in laboratory experiments. This study investigated the natural distribution of acid sulfate soils at the mouth of a river, and their remediation ability. These soils are distributed a small scale in southern Japan; Iriomote Island was used as the study site. Coastal acid sulfate soils were found from the surface in the downstream portions and decreased the distribution in the upstream. The surficial acid sulfate soils in upstream areas had already oxidized and leached sulfuric acid. The degradation rate of sampled acid sulfate soils for dieldrin was found to increase with iron sulfide content, and was not affected by organic carbon clearly. The decomposition of dieldrin are controlled by the chemical reactivity of iron sulfides in natural systems, independent of microbial activity.

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