Analysis of arsenic speciation in ornithogenic sediments

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Arsenic is a toxic element found throughout the natural world. Seabird guano is one of the main sources of nutrient fertilizers in remote coastal island areas, but guano-derived contaminants such as Hg, Cd may cause serious threats to local ecosystems and public health issues. In order to well understand the biotransformation and accumulation mechanisms of arsenic in seabird habitats, we analyzed total arsenic and arsenic speciation distributions in guano and ornithogenic sediments from the Ross Sea of East Antarctica and the Xisha Islands of South China Sea, using high performance liquid chromatography coupled to hydride generation atomic fluorescence spectrometry (HPLC-HG-AFS). The results showed that the guano input is a major factor controlling total arsenic distribution in the ornithogenic sediments, and the initial diagenesis process after the excretion of guano might have a significant influence on the arsenic speciation. Distribution of arsenic species is largely different in the different ornithogenic sediments.Two sediment profiles strongly influenced by Antarctic penguin droppings are mainly composed of As(V), but in one profile As(III) predominates, and the possible facotrs influencing the different distribution of As species need to be further studied.