



C-stabilization in Fe/Mn concretions upon redox-cycles

Tino Bräuer, Pieter M. Grootes, Marie-Josée Nadeau, Nils Andersen, Alexander Dreves, and Kaeko Yasuike
Leibniz-Laboratory for Radiometric Dating and Isotope Research, Christian-Albrechts-Universität zu Kiel, Germany

To investigate the potential of Fe/Mn concretions for the stabilization of SOM in the framework of the Research Unit “Biogeochemistry of paddy soil evolution” of the German Research Foundation (DFG), concretions were separated from a chronosequence of paddy and non-paddy soil profiles, developed on former estuarine sediments of the Yangtze River. The chronosequence ranges from 50 to 2000 years and is located near Cixi, Zhejiang Province, China. In addition samples of Yangtze River estuarine sediments were obtained.

It is generally assumed that the development of Fe/Mn concretions occurs preferred in the hydric horizon below the plough pan. First results disclose, however, the development of Fe/Mn concretions also in the puddled layer and plough pan. Changing redox conditions, caused by flooding and drainage, lead to mobilisation of iron and manganese and to an increase of concretion development. This is evident in a clear difference in concretion occurrence between paddy and non-paddy profiles. With increasing duration the rice cultivation yields an increasing amount of Fe/Mn concretions and an enrichment and stabilization of SOM in Fe/Mn concretions.