



Organic carbon transport in Paddy soils

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Paddy and non-paddy soils from a chronosequence of 50 to 2000 years of agricultural use, developed on former estuarine sediments of the Yangtze River, were sampled near Cixi, Zhejiang Province, China, in the framework of the Research Unit “Biogeochemistry of paddy soil evolution” of the German Research Foundation (DFG). In addition samples of Yangtze River estuarine sediments were obtained.

Results from the 50-year and the 700-year paddy and non-paddy soils reveal increases in both total organic carbon (TOC) and TOC ^{14}C concentration relative to the estuarine sediment. In the non-paddy soil, a ^{14}C gradient with ^{14}C concentrations decreasing with increasing depth is already established after 50 years, while in the paddy soil little ^{14}C increase can be seen below the plough pan. In the 700-year sites, the ^{14}C depth profiles are, however, quite similar. This indicates that paddy rice cultivation quickly leads to a plough pan, which seriously reduces, but not totally prevents, downward transport of organic matter and leads to equilibrium times for TOC and ^{14}C concentrations in paddy soil profiles in the order of centuries.