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# The effect of soil biodiversity on soil quality after agricultural reclamation at the eastern coast of China

Xiaohan Wang (1), Jianghua Yang (2), Lijie Pu (1,3), and Xinjian Chen (1)

(1) School of Geographic and Oceanographic Sciences, Nanjing University, Nanjing, China (wangxiaohan0203@163.com), (2) School of the Environment, Nanjing University, Nanjing, China, (3) The Key Laboratory of the Coastal Zone Exploitation and Protection, Ministry of Land and Resources, Nanjing, China

Large area of tidal flats in Chinese coast has been reclaimed to support agriculture and urban development because of rapid population and economic growth. Knowledge of soil development mechanisms is essential for efficient management of land resources in coastal zone. So far, most studies have focused on consequences of soil physico-chemical properties on soil quality evolution after tideland reclamation for cultivation; yet a large part of soil bioprocess drives many soil processes. The effect of organism composition on the performance of soil development remains unclear. The purpose of our work was to reveal the organism composition change and its influence on soil quality impotent.

In this study, we choose seven reclamation districts along a chronosequence in eastern coast of China, which were respectively reclaimed in 1956, 1971, 1980, 1997, 2009, 2013 and unenclosed tidal flat. The latest districts reclaimed in 2013 were left to succession fallow which were covered with halophytic vegetation and the rest districts were agriculturally managed. Soil samples at 0-20 cm were collected in each district. Soil physical, chemical and biological properties and wheat yields were measured.

The result showed after the transformation from tidal flat to cropland, longer tillage time (>5 year) lead to higher soil clay and silt, SOC contents and lower bulk density, while soil clay and C contents declined within the first 5 years after reclamation. Agricultural reclamation significantly improved SOC contents of 0-20 cm depth form 0.11±0.05% to 0.77±0.10%. It needs about 35 years to achieve stable yield level after reclamation. Meanwhile, the soil community composition changed strongly over time. More significant relationships were found among soil physicochemical properties and bacteria community. And the variation trend of soil community richness (chao1) is similar to soil C contents, dropped at first 5 years and then significantly increased. Our results indicate that the soil biodiversity growth promotes the soil quality recovery after crop cultivation. Both the soil physical environment and fertility were improved.