Effects of agricultural land use change
on fungal community composition

Minna WU*, Genshen ZHONG1, Delong MENG2, Wenxue WEI2

1 College of Basic Medicine, Xinxiang Medical University, Xinxiang, Henan, 450003, China, *e-mail: happy_minzi@163.com (corresponding author)
2 Key Laboratory of Agro-ecological Processes in Subtropical Regions, Institute of Subtropical Agriculture, Chinese Academy of Sciences, Mapoling, ChangSha, 410125, China

INTRODUCTION

As critical components of biogeochemical cycles, fungi play an important role in maintaining soil quality and productivity, through biological processes, such as soil nutrient cycling, organic matter accumulation, formation of soil structure, residue decomposition, and disease suppression ( Ownley et al. 2010, Burke et al. 2011, Cheng et al. 2012, Clemmensen et al. 2013). Soil fungi are sensitive to anthropogenic disturbances; tillage, management practices, crop rotations, chronic inputs of atmospheric nitrogen and carbon dioxide evolution have all induced shifts in the abundance, diversity and community composition of soil fungi, as well as the fungal-to-bacterial ratio ( Beauregard et al. 2010, Edwards et al. 2011, Kant et al. 2011, Tian et al. 2012). These changes in the soil fungal communities then affect functions of the soil and ecological processes ( Van der Heijden et al. 2008, Lau and Lennon 2011, Clemmensen et al. 2013).

Land use pattern changes and management practices are important factors that affect soil microbial communities, because they alter soil properties, such as the pH, carbon/nitrogen (C/N) ratio, soil organic carbon (SOC) content and nutrient availability ( Jangid et al. 2008, Jesus et al. 2009, Alele et al. 2014, Mirza et al. 2014). In southern China, rice cropping has been the traditional agriculture for several centuries. However, some paddy fields have been rapidly converted for vegetable cultivation, because of an increase in consumer demand, since the 1980s. Now more than 17.3 million hectares of land are used solely for vegetable production and China is the world leader in vegetable production.