

The spider biodiversity in long-term organic rice paddy field in subtropical China

Xueqing He^{ab}, Yuhui Qiao^{a*},¹ Lene Sigsgaard^b, Xunjiang Wu^c, Dehong Zhang^c

³ a Beijing Key Laboratory of Biodiversity and Organic Farming, College of Resources and Environmental Sciences, China Agricultural University, Beijing 100193, China.

⁴ b Department of Plant- and Environmental Science Section of Organismal Biology University of Copenhagen Thorvaldsensvej 40, 1871 Frederiksberg C

⁵ c Wanzai Organic Agriculture Office, Wanzai County 336100, Jiangxi Province, China.

Abstract:

Spiders are one of the most important natural enemies in paddy fields and their diversity has declined due to pesticides application and agricultural intensification. Organic farming is considered as a promising solution for augmenting natural enemies in the agroecosystem. However, most of these studies were done in Europe, and more information is required regarding biodiversity in farming systems in non-European regions, particularly in the tropics and sub-tropics. It was hypothesized that the effects observed of agricultural practice on beneficial organisms may depend on the duration of the agricultural practices in organic farm over years. Therefore we assessed spiders diversity of organic rice paddy field in subtropical China that had been cultivated organically for 5 (OR5), 10 (OR10) and 15 (OR15) years since conversion and compared it to conventional rice (CR). The results showed that abundance and richness of spiders in organic paddy fields were significantly higher than those of conventional paddy field. *Tetragnatha maxillosa* and *Pirata subpiraticus* were dominant in the spider assemblages in both organic and conventional paddy fields. Spider richness in OR5/OR10/OR15 was significantly higher than that in CR, and it increased with organic operation time, but the difference was not significant. There was not significant difference between Shannon Wiener index (H') of spiders in organic and conventional paddy fields. The findings of this study are consistent with most of the previous studies in showing that organic farming will improve biodiversity in comparison to conventional farming. The effect of organic farming practice on spiders' diversity over time needs further study before a clear conclusion can be made.

* Corresponding author. Beijing Key Laboratory of Biodiversity and Organic Farming, College of Resources and Environmental Sciences, China Agricultural University, Beijing 100193, China. Tel.: + 86 10 62731166; Email address: qiaoyh@cau.edu.cn