

Study on ecological engineering for natural enemies in paddy by Asteraceae flowering¹

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Abstract

Humankind has derived great benefits from ecosystem services, which emphasize the importance of biodiversity. This study focused on the impact of biodiversity and pest regulation on natural enemy habitat manipulation, by growing varieties of Asteraceae flowering plants on a paddy ridge. For the first crop in 2015, the combined seeds *Zinnia elegans* and *Tagetes patula* were sowed along the paddy ridge before rice transplantation. The invertebrates present were investigated 2 months later. In total, 56 types of invertebrates were caught in the treated area compared with 42 in the control field. The relative abundance of the function group of parasitoids was 6.4%, which was higher than the 3.7% found in the control field. Moreover, the population of *Sogatella furcifera* exhibited a smooth rate of change in the treated area compared with the control area. During the second crop, a total of 84 types of invertebrates were caught in the treated field, higher than the 70 caught in the control field. The relative abundance levels of the function group of parasitoids and predators in the treated field were 24.9% and 10.2% respectively, compared with 14.4% and 5.2% in the control field, respectively. However, the relative abundance of the function group of pests in the treated field was 42.5%, which was lower than 65.7% in the control paddy field. The major pest caught from the paddy field was *Nephotettix* spp. The peak number reached was 63.3 in the control field, significantly higher than the 40 found in the treated field. The study proved that adding Asteraceae flowering plants led to an increase in the biodiversity of invertebrates as well as an abundance of parasitoids and predators. Biodiversity in agricultural ecological systems can be of benefit to farmers to help manage pests sustainably.

Key words: paddy, ecosystem service, Asteraceae flowering plants, natural enemies

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