Sowing methods and water levels influence apple snail damage to rice and its yield in peninsular Malaysia

ABSTRACT

Rice productivity is limited by many pests, especially Pomacea spp. in Southeast Asia. Pomacea spp. damage to rice depends on sowing methods, flooded conditions, and snail densities in the field. Therefore, this study aims to evaluate the effect of different sowing methods, water levels, and snail density (1, 2, and 3 snails per plot) on the damage potential of Pomacea maculata and Pomacea canaliculata to rice and its yield. Both species caused complete loss of crop in direct seeding and 14 days old transplanted rice. The least damage by both species was recorded in 21 and 28 days old transplanted rice with no further damage after week five. Irrigation and snail density also influenced damage whereby highest damage was recorded in rice grown with 5 cm water level in comparison to 2 cm. At 2 cm water level, damage by various snail densities was trivial. However, in 5 cm water level, damage increased with the increasing snail density and the highest damage was observed at three snails per plot of either species. No difference in inflicted damage to various treatments was observed between two species, suggesting their equal damage potential on rice. Meanwhile, rice yields in 2 cm water level treatments were compatible with 5 cm control treatment. The least yield was recorded in treatments with three snails per plot of either species at 5 cm water level. Understanding the effect of sowing method and suitable water level is important as it can be further incorporated into rice cultivation practices to reduce damage of apple snails and ensure a high yield during harvest.

Keyword: Rice; Oryza sativa L.; Pomacea spp.; Southeast Asia; Apple snail; Malaysia