Utilization of crude plant extract of Imperata cylindrica as effective bio-insecticide to eradicate brown plant hoppers Nilaparvata lugens Stal in rice fields

Chavanasupitchaya, Vasu
Paibool, Natchamukda
Khotwongsa, Wanicha

Nilaparvata lugens Stal or brown planthopper is the dominant damaging pest found in rice field together with Cyrtorhinus lividipennis which is its egg predator. Using chemical insecticides eradicated both species. This project investigated the effect of Imperata cylindrica extract, a type of local grass, which was reported to have inhibitory effect on the survival and growth rates of insects. Comparative laboratory scale study on the toxicity of different types of the Gramineae showed that Imperata cylindrica extract at 0.10% w/v caused 86.00±2.24% and 18.00±2.74 % mortality on Nilaparvata lugens Stal and Cyrtorhinus lividipennis, respectively. Sun exposure of Imperata cylindrica extract resulted in high mortal effect on Nilaparvata lugens Stal only in the first few days and gradually decreased and lost in 15 days while the effect on Cyrtorhinus lividipennis lasted 1-3 days only. The result indicated that Imperata cylindrica extract was highly toxic to the Nilaparvata lugens Stal with lower effect on Cyrtorhinus lividipennis. Foliar spray study according to the life table suggested that Imperata cylindrica is influential to the death rates of both species especially in the early larval of 1 to 2 instars, with the death rate of Nilaparvata lugens Stal 45.34% higher than Cyrtorhinus lividipennis. Field study indicated that the harvest from the area treated with Imperata cylindrica extract was similar to the area treated with chemical insecticide but the production cost in the former area was 9.9% lower, resulted in 4.4% increase in net income. Thus, Imperata cylindrica extract is a potential bio-insecticide with minimal effect on the natural enemies of the brown hoppers but is harmless to humans and environment.

Awards Won:
Third Award of $1,000