Evaluation of bio-agents and botanical essential oils for the management of *Leptocorisa oratorius* (Fabricius) and *L. acuta* (Thunberg) (Hemiptera: Alydidae) in rice

**ABSTRACT**

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The evaluation of selected bio-agents and botanical essential oils for the management of *Leptocorisa oratorius* (Fabricius) and *L. acuta* (Thunberg) (Hemiptera: Alydidae) in rice was carried out during *Kharif*, 2011 – 2013 in Allahabad, UP, India. During these studies, several known insect pest species of rice, including four other ear head bugs or rice stink bugs viz. *Eysarcoris* sp., *Nezara* sp., *Euschistus* sp. and *Cletus* sp. were found. Other insect pest species were *Nilaparvata lugens*, *Sogatella furcifera*, *Nephotettix* spp, *Cicadulina* sp., *Recilia* sp. and the rice blue beetle. Two types of *Leptocorisa* species were preliminarily identified namely, *L. oratorius* and *L. acuta* with the former being the more dominating species. The total developmental period of *L. oratorius* from egg to adult ranged from 19 – 27 days with an average range of 23.2 ± 2.86 days. For the bio-agents, it was found that *Bt* @ 0.75 kg/ha was not effective against *L. oratorius*, while *B. bassiana* @ 6x10⁻³ conidia/ml was effective in causing its mortality by up to 69.05%. Out of the botanical essential oils, each @ 1%, neem and *Jatropha* were most efficient in preventing damage to the grains. Although castor oil was significantly different (p ≤ 0.05) from the control, the percent damage grain was significantly higher than neem and *Jatropha*, which suggested that it was not effective in deterring the bugs from feeding. Although, *B. bassiana* caused mortality to gundhi bugs, its use should be in combination with an essential oil where the latter will prevent feeding on the grains. The combination of *B. bassiana* with neem and *Jatropha* showed much promise in reducing damage cause by gundhi bug under laboratory, screen house and field conditions; since the percentage damage caused was significantly different to that of the control at all times. The IPM modules best identified were the combinations of neem + *B. bassiana* and *Jatropha* + *B. bassiana*, which will prevent damage and at the same time cause infection to the bugs. These findings have highlighted the importance of neem and *Jatropha*, either alone or in combination with *B. bassiana*, as strong potential candidates for the management of *Leptocorisa oratorius* and *L. acuta*. It was evident that *B. bassiana* did not perform satisfactorily as a standalone in preventing damage to the rice grains but it should be explored as a major component of an IPM program for gundhi bugs.

**Keywords:** *Leptocorisa oratorius*, *L. acuta*, gundhi bug, bio-agents, botanical essential oils, rice