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Insecticide Resistance in Rice Insect Pests– A Review

Sudhanshu Bala Nayak

Department of Entomology, MSSSOA, Centurion University of Technology and Management (CUTM), Odisha, India

Corresponding Email: sudhanshu.nayak@cutm.ac.in

Abstract

The status of insecticide resistance in different rice insect pests *viz., Chilo suppressalis, Cnaphalocrosis medinalis,* Nilaparvata *lugens* and *Sogatella furclfera* has been reviewed in countries like India, China, Taiwan, Japan and Korea. However the diversity in insect population, lack of resistance sources in cultivated rice (*Oryza sativa*) gene pool, continuous selection of virulent biotypes, want of efficient insect rearing and varietal screening protocols and inherently complex genetics basis of resistance. Resistance of agricultural pests towards chemical control is now recognized as one of the important challenges to sustaining production of food worldwide.

Keywords: Insecticide resistance, rice, insect pest

Rice (*Oryza sativa*) is the most important staple food for world's two-thirds of the human populations and nearly three billion people depend on it as a major source of their subsistence diet (Anonymous, 2012). Rice is grown worldwide in over 124 million hectares under diverse cultural conditions and over a wide geographical range. The world production of rice is 722 million tonnes and that of India is 169.50 million tonnes which ranks second after china (FAOSTAT, 2018). About 187 species of insects have been recorded on rice, almost 20 insects are considered as rice pests of economic importance that include stem borers, gall midge, defoliators and vectors like leafhoppers and plant hoppers that cause direct damages and transmit various diseases (Arshad *et al.*, 2012). The stem borer, brown plant hopper, gal midge and leaf hopper are among important pests in Southeast Asia. The intensive use of pesticides has led to the development of resistance in at least 570 arthropod species as indicated in the Arthropod Pesticide Resistance Database (Whalon *et al.*, 2010). Between these species, cases of resistance have been found to all of the major insecticides classes, including organophosphates (OP), carbamates, pyrethroids, arsenicals, cyanide, DDT and cyclodienes (Brattsen *et al.*, 1986).

Insecticide Resistance in rice stem borer

As chemical control is a major option for suppressing the rice stem borer, *Chilo suppressalis* (Walker), owing to their high toxicity and selection pressure there is an increasing resistance development in the target insect. *C. suppressalis* developed resistant to parathion and it was the first example of resistance to organophosphorus insecticides in lepidopterous insects in the world. Insecticide resistance of 14 field populations of *Chilo suppressalis* possessed low-level resistant or susceptible to monosultap, extremely high level of resistant to triazophos, and low level resistance to abamectin was examined in China

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