

Research Paper :

## Resistance to emamectin benzoate in *Plutella xylostella* collected from different geographic locations

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### SUMMARY

The baseline susceptibility study to emamectin benzoate in *P.xylostella* was undertaken at Insect Biotech Laboratory, Department of Entomology, Dr.P.D.K.V., Akola (M.S.) India. The 3<sup>rd</sup> instar larvae of *P. xylostella* collected from different locations of Maharashtra and tested with new molecule emamectin benzoate. Log dose probit analysis indicated LC<sub>50</sub> of emamectin benzoate in the range of 9.16 ppm to 39.07 ppm with maximum in Nasik strain (39.07 ppm) and minimum (9.16 ppm) was reported from Wadegaon (Dist-Akola). These results indicated that diamondback moth under selection pressure of emamectin benzoate showed higher degree of resistance. Indiscriminate use of insecticides, multiple generations of diamondback moth per annum and year round availability of host crop have contributed to the development of resistance.

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**Key words :**  
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The diamondback moth, *Plutella xylostella* L. (Lepidoptera: Yponomeutidae) is considered the most damaging insect pest of cruciferous crops worldwide. Larvae can devastate crops rapidly during major outbreaks and even mild infestation can reduce quality and marketability (Talekar and Shelton, 1993). In the past 50 yr, *Plutella xylostella* has become one of the most difficult insects in the world to control, primarily because of resistance evolution to every class of insecticide used extensively against it (Shelton *et al.*, 2000 and Sarfraz and Keddie, 2005).

Emamectin benzoate is one of the most important avermectin insecticides which is isolated from *Streptomyces avermitilis*. It is a semi-synthetic second generation avermectin insecticide, highly potent, unique foliar insecticide that controls lepidopteran pests (caterpillars and worms) in cole crops, turnip, leafy and fruiting vegetables. Extensive studies on the resistance of diamondback moth to conventional insecticides have revealed that this pest has an ability to develop high level of resistance in a short time when a new insecticide is introduced (Fahmy and Miyata, 1991). Insecticide resistance in the

diamondback moth, *Plutella xylostella* is unique because the development of resistance can take place quickly, at the same time the insect can lose resistance fair quickly if the population is freed from the insecticidal pressure.

In need of the present study, a new field population of *P.xylostella* collected from different geographical locations of Maharashtra was examined with the aim of investigating the genetics emamectin benzoate resistance in *P.xylostella*.

### MATERIALS AND METHODS

#### Insect:

A field population of *P.xylostella* was collected from the cabbage field from the different geographical locations of Maharashtra, in May, 2008 of which cabbage is major crop in these regions. Diamond back moth population had been maintained in the laboratory for ten generations without exposure to insecticide. Continuous colonies of *P.xylostella* from different geographical locations were reared in the Insect Biotech. laboratory of Department of Entomology, Dr.

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