

عنوان مقاله:

Presence of Multiple cry Genes in *Bacillus thuringiensis* Isolated from Dead Cotton Bollworm *Heliothis armigera*

محل انتشار:

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خلاصه مقاله:

Cry genes encoding Cry proteins toxic to Lepidoptera, Coleoptera and Diptera species were studied in thirty seven *B. thuringiensis* strains isolated from twelve naturally infested *Heliothis armigera* larvae. To further confirm the isolates, two groups of species-indicative biochemical tests were applied while discriminative biochemical tests being employed to figure out the repetitive strains. A PCR experiment was performed using five sets of universal primers for cry₁, cry₂, cry₃, cry₄, cry_{7/8} genes. All strains reacted appropriately, for *B. thuringiensis*, to the biochemical tests and while the reactions to the discriminative tests being varied. Based upon the results of the discriminative tests, twenty four non-repetitive strains were selected and employed in the PCR assay. Each of the selected strains presented one cry gene, at least; cry₁ being the most frequently detected one (91.7%), followed by cry₂ (87.6%), cry₃ (50%) and cry₄ (42%) but no isolate harbored a coleopteran-active cry_{7/8} gene. All the strains presented combinations of two or more cry genes: 20% presenting cry₁+cry₂, 12.5% cry₁+cry₃, 4% cry₂+cry₄, 20% cry₁+cry₂+cry₃, 20% cry₁+cry₂+cry₄, 4% cry₁+cry₃+cry₄ and 12.5% carrying all the four cry genes studied and only one strain bearing a single cry gene. The cry₁-cry₂ combination was common in many strains (72.5%). Genetic characterization of this collection provides an opportunity for selection of strains with improved and multiple insecticidal toxicity.

کلمات کلیدی:

Bacillus thuringiensis, Biochemical characters, Cry, PCR

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