GMR Genetics and Molecular Research
Online Journal
ISSN:1676-5680

Purification of the insecticidal Cry2Ad protein from a Bt-isolated BRC-HZP10 strain and its toxin assay to the diamondback moth, *Plutella xylostella* (L.)

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Genet. Mol. Res. 14 (3): 7661-7670 (2015)
Received September 15, 2014
Accepted April 6, 2015
Published July 13, 2015
DOI http://dx.doi.org/10.4238/2015.July.13.11

ABSTRACT. The present study aims to characterize the Cry2Ad toxin protein isolated from a *Bacillus thuringiensis* strain, BRC-HZP10, which have a potential insecticidal activity against larvae of the diamondback moth, *Plutella xylostella* (L.). The crude Bt toxin proteins were isolated and purified by cation exchange chromatography, then equilibrated with 0.2 M NaOH buffer, pH 4.0, followed by ultraviolet detection at 280 nm and sodium dodecyl sulfate-polyacrylamide gel electrophoresis. A refined Cry2Ad toxin protein with 88.34% purity was eventually obtained and used for a bioassay by feeding it to *P. xylostella*. The results showed conspicuous insecticidal activity towards *P. xylostella* with 50% lethal concentration of 6.84 µg/mL and

95% confidence interval of 5.77-7.91 μg/mL. At a concentration of 16.38 μg/mL, the intake of Cry2Ad protein significantly shortened the oviposition period and larval developmental duration, but significantly reduced the fecundity and egg hatchability of the population compared to those of control (without treatment with Cry2Ad protein) ($P < 0.05$). These results indicate that the Cry2Ad protein plays an effective role in controlling the population of *P. xylostella*.

Key words: Cry2Ad toxin; Ion exchange chromatography; Purification; Sodium dodecyl sulfate-polyacrylamide gel electrophoresis; Insecticidal activity

