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Investigation of *Bacillus thuringiensis* Cry1Aa toxicity to *Ephestia kuehniella* (Lepidoptera: Pyralidae)

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A comparative study of different steps in the mode of action of the individual *Bacillus thuringiensis* kurstaki BNS3 Cry1Aa and Cry1Ac δ -endotoxins on *E. kuehniella* larvae was performed in order to investigate the origin of the difference in the response of these larvae to each of the latter. Proteolytic activation was shown to be one of the main steps impaired in *E. kuehniella* tolerance to Cry1Aa. The absence of two proteinase activities as well as an altered activity level observed in the case of Cry1Aa would be the consequence of proteinase-mediated tolerance of *E. kuehniella* to this toxin. In situ binding and histopathological effect analyses allowed concluding that the binding of the toxin to BBMV receptors is the key step in *E. kuehniella* tolerance to Cry1Aa toxin. The latter was slightly bound to apical membranes of epithelial cells that remained intact, whereas Cry1Ac was tightly bound to completely damaged cells basal membranes. The potential involvement of the larval stages in Cry1Aa toxicity was studied by toxicity test and investigation of the various steps of the mode of action. The Cry1Aa δ -endotoxin induced mortality of larvae at high concentrations and at an early stage. Unlike δ -endotoxins BLB1, the δ -endotoxin Cry1Aa shows a significant difference between the LC50 of L1 and L5 suggesting that the L1 stage is more sensitive to a potential toxic effect of the δ -endotoxin. The results of the activation and inactivation kinetics of the δ -endotoxin Cry1Aa by intestinal juice of *E. kuehniella* larva as well as histopathological effects investigation, confirmed the presence of differences between the two larval stages. These data were reinforced by characterizations of protease juice content and BBMV receptors in both larval stages studied.

Biography

Souad Rouis is an Associate Professor at Centre of biotechnology of Sfax, Tunisia. She completed her PhD at Center of Biotechnology, Sfax (Sep. 2001) in laboratory of human molecular genetics Pr. H.Ayadi. She is the entrepreneur and co-founder of Biotech Startup (BiotechRDP-2008). She has more than 10 research publications.

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