Abstract

Title: *Bacillus thuringiensis*: A source of peptide antibiotics

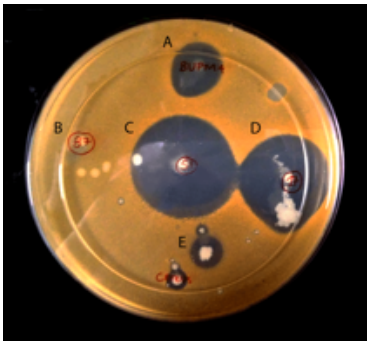
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Keywords: *Bacillus thuringiensis*, antibiotics, bacteriocins, genes, purification

I. Abstract Body (up to 250 words)

Bacillus thuringiensis (Bt) produces bioinsecticides and antibiotics that are very safe. In the present study, more than 600 Bt (QBT) strains were explored based on the proteomics of the crystal δ-endotoxins, responsible of the insecticidal activity and on the bacteriocins that are peptide antibiotics and the investigation of the corresponding genes. 25% of the strains have shown bacteriocin activities against the pathogenic bacteria such as *Bacillus cereus* and *Staphylococcus aureus* at 30ºC. Bacteriocin production was found to be dependent on media composition, type of substrate (solid/liquid), temperature, physiological state of the cells and presence of plasmids. Plasmid cured *Bt. 4Q7* produced a 100ºC thermostable glycoprotein type bacteriocin. Heat-sensitive bacteriocins specifically killed *S. aureus* cells very quickly. All these bacteriocins have novel characteristics that have not been previously reported and might have important applications as probiotics and in human microbiome.

II. Image:



Comparison of bacteriocin activity of different *Bacillus thuringiensis* strains (white) against *Staphylococcus aureus* (orange) using deferred antagonism assay.

III. Reference:

[1] Kamoun, F., Mejdoub, H., Aouissaoui, H., Reinbolt, A., Hammami A. and S. Jaoua, 2005. Purification, Amino Acid Sequence and Characterization of Bacthuricin F4, a new bacteriocin produced by *Bacillus thuringiensis* J. Appl. Microbiol. 98; 881-888

[2] Kamoun, F., Ben Fguira, I., Tounsi A., Adbelkefi-L., Sanchis, V., Lereclus L. and S. Jaoua, 2009. Generation of Mini-Tn10 transposon insertion mutant library of *Bacillus thuringiensis* for the investigation of genes required for its bacteriocin production. FEMS Microbiol. Lett., 294; 141-149

[3]Kamoun, F., Ben Fguira, I., Belguith Ben Hassen, N., Mejdoub H., Lereclus, D. and S. Jaoua, 2011. Purification and characterization of a new *Bacillus thuringiensis* bacteriocin active against *Listeria monocytogenes*, *Bacillus cereus* and *Agrobacterium tumefaciens*. Appl. Biochem. Biotechnol.165; 300-314.

[4]Nair, K., Al-Thani. R., Al-Thani, D., Al-Yafei, F., Ahmed, T., and S. Jaoua, 2018. Diversity of *Bacillus thuringiensis* strains from Qatar as shown by crystal morphology, d-endotoxins and cry gene content. *Front. Microbiol. 9, doi:10.3389/fmicb.2018.00708*

IV. Biography:

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