

**TITLE: DEVELOPMENT OF BACILLUS THURINGIENSIS OLIGOSPOROGENIC MUTANTS FOR ENHANCED BIOINSECTICIDE APPLICATIONS****FATMA AL ABED<sup>1</sup>, SELLAMI SAMEH<sup>1</sup>, ZAINAB GOUADER<sup>1</sup>, SOUAD ROUIS<sup>1</sup>**<sup>1</sup> Laboratory of Biopesticides, Center of Biotechnology of Sfax

**Abstract:** The widespread use of chemical pesticides has led to environmental concerns including the emergence of resistant pests and harmful effects on non-target organisms. This study aimed to develop a new generation of eco-friendly biopesticides by generating oligosporogenic mutants of *Bacillus thuringiensis* BLB1 strain through optimized classical mutagenesis conditions. The Taguchi design was used to improve the mutagenesis efficiency using 3 mutagenesis agents (nitrous acid, acridine orange and UV radiation).

Among of 14 oligosporogenic mutants, 7 mutants are overproducers of delta-endotoxins and one mutant is an overproducer of proteases, compared to the wild type BLB1.

The S6 mutant is a polyvalent biopesticide candidate as it is the most oligosporogenic ( $10^7$  spores/ml), overproducer of delta-endotoxins (1233,929 mg/ml) and hyperproducer of proteases (4136,363 UI) compared to the wild strain BLB1 ( $141.10^6$  spores/ml; 1231,134 mg/ml; 3554,545 UI), respectively.

Bioassays against the Mediterranean flour moth *Ephestia kuehniella* larvae demonstrated the efficiency of these mutants. S6 and S2 are the most toxic mutants (CL50 equal to 39.52 µg/g and 41.79 µg/g) respectively compared to the wild strain (CL50=73.39 µg/g).

The *Bacillus thuringiensis* S6 mutant is a potential candidate for an environmentally and friendly alternative for the control of pests in agriculture.

**KEYWORDS:** Biopesticides, *Bacillus thuringiensis* BLB1, mutants