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Abstract

### A UV Tolerant Wild-Type Strain Of *Bacillus Thuringiensis* With Antagonistic Effect Producing Melanin

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**Abstract:** *Bacillus thuringiensis* (Bt) is a Gram-positive, spore-forming, soil bacterium and the most successful biological control agent used in agriculture, forestry and mosquito control. However, one of the main disadvantages is that the insecticidal activity of Bt formulation, is little stable and rapidly lose their biological activity under field conditions, due to the ultraviolet radiation in sunlight. Melanin is known to absorb radiation; therefore photoprotection of Bt based on melanin has been studied. Several research groups have obtained Bt mutants producing melanin by successive rounds of UV radiation or by after treatment with the mutagenic agent. However, these mutants lost their toxin-encoding genes. *Bacillus thuringiensis* strains were isolated from soils of different States of Mexico and pigment extraction was followed. Pigment was characterized by some chemical tests and by IR spectrum. UV (Ultraviolet) irradiation experiment was realized to probe the melanin efficacy. ELI52 wild type strain of Bt was confirmed that naturally produces melanin. The Cry protein analysis suggests that ELI52 is probably a *B. thuringiensis* subsp. *israelensis* strain with toxic activity against diptera order of insects. The characteristics and UV protection efficacy of melanin on Bt formulations was probed after UV radiation, comparing the results with melanin non-producing strain. L-DOPA was also detected in the culture. This strain showed an antagonistic effect over some common bacteria of the environment. As conclusion, we can report that ELI52 is a good bioinsecticide, which produces melanin constitutively, so this strain can be UV tolerant with its insecticidal capacity unaffected, and that can inhibit the growth of other environment bacteria.

**Keywords:** melanin, secondary metabolites, *Bacillus thuringiensis*.

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