

Efficacy of a spray-dried formulation of *Bacillus thuringiensis* subsp. *kurstaki* (strain LIP) produced on a wheat bran-based complex medium.

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Biopesticides based on *Bacillus thuringiensis* (Bt) are a safer alternative to chemical pesticides in agriculture. Its insecticidal activity is due to the production of crystalline proteins known as Cry-toxins. Wheat bran (WB) is a low-cost industrial by-product that contains all the necessary nutrients for Btk growth and sporulation. Previously, in the context of the IPM-4-Citrus project, we successfully formulated a fluid bed-dried product. Our current European follow-up project SAFWA seeks to optimize bioproduction processes by cultivating *Bacillus thuringiensis* subsp. *kurstaki* (strain LIP) in a WB-based complex medium at Julius Kühn-Institute, Dossenheim. This work aims to develop an efficient method to formulate the active ingredient and to assess and improve its efficacy against two Lepidopteran insect pests: *Spodoptera frugiperda* and *Tuta absoluta*. The strain used was Btk "LIP" isolated from Lebanese soil. Fermentations were carried out using a five-litre fermenter (Minifors, Infors, CH). From a three-liter fermentation broth of LIP, 7 to 10 g dry weight of biomass was collected. Biomass without and with additives was spray-dried using a mini-spray dryer (S300, Buchi, CH) and bioassays were conducted against *S. frugiperda* to determine the lethal concentration (LC50). It is confirmed that the efficacy of spray-dried formulations was comparable to both fluid bed-dried formulations used in IPM-4-Citrus and reference commercial product DELFIN-WG. Based on the results of laboratory bioassays, the efficacy of the spray-dried unformulated and formulated biomass of LIP, along with the reference commercial product DELFIN-WG, will also be compared by realizing a field trial involving tomato plants against *T. absoluta* in Adana, in collaboration with Çukurova University. Field trial results will be discussed in terms of efficacy, UV resistance, and soil residual tests.