MICROENCAPSULATED FORMULATION BASED IN *Beauveria bassiana* AND *Metarhizium anisopliae* FOR THE CONTROL OF THE TOMATO FRUITWORM *Heliothis virescens* (Fabricius)

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Introduction. Cultivation of tomato (*Lycopersicum sculentum* L.) is one of the most important agricultural activities in Sinaloa, Mexico. The tomato fruit worm *Heliothis virescens* (Fabricus) (TFW) cause yield tomato reduction of 15 to 20% of the entire production. New approaches to control pests include the adoption of new technologies to make bioinsecticides, in particular the Microencapsulated formulation of entomopathogenic fungi using spray dried (SD). The active ingredients are in spores, mycelium or blastospores, which are encapsulated into a matrix with adjuvants and phagostimulants (1) to provide ability to eliminate a narrow target insects.

The objective of this research is to design two microencapsulated formulations, based in entomopathogenics fungus and biodegradable products that may be most effective to control of TFW.

Methods. The bioinsecticides were elaborated with two fungus native strains *B. bassiana* and *M. anisopliae*. A insect rearing was maintained in laboratory (25±2°C and HR of 30-50 %); individual larvae of TFW, was fed using artificial diet. For the microencapsulating process, two methods and mixtures of different polymers were used; bovine gelatin, cooked (nixtamalized) corn and corn starch with phagostimulants and ultraviolet light protectant. The active ingredient (spore and mycelium) was obtained by solid fermentation (20 ± 2 days at 25 ° C) using rice as substrate For the method of extrusion; liquid mixtures were extruded using a sieve and subsequent dehydration to obtain a powder (microencapsulated formulation). Spray drying was performed by using a Mini Spray Dryer B-290 Dryer Büchi, under 120 ° C as inlet and 70° C as outlet temperatures. A subsequent liquid formulation was prepared and process into a spray dryer to obtained two powders (4). Adhesion, moisture content, initial spore concentration, germination percentage, description of the shape, size and surface texture were determined (1).

Results and discussion. We results show one standard technique to performing preliminary experiments in the production of the active ingredient (*B. bassiana*) and microencapsulation by extrusion and spray drying assays. Aerial spores of *Beauveria bassiana* on rice grains were obtained and after its were used as an inoculum (2.3225 x 10E8 spores/100g) resulting in a yield of 5.32 x 10E10 spores /100g of rice, in 21 days. Only 43.6% of spores were produced, so will be necessary improve the extraction technique to increase the spores yield. The preliminary results about microencapsulation process were; two powders with particles sizes of less than 100 µm, with a inlet and outlet temperatures of 120 and 70°C. So far the process is ongoing to test lower temperatures to increase the % of spore germination. The SD method to produced microencapsulated based in fungus, however have a loss of 86.5% in solids. Median lethal concentration (CL50) and residual activity of the microencapsulate bioinsecticidas carried out in the short time.

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