

Starch-Based Solid Formulations for Development of *Bacillus thuringiensis israelensis* Briquettes with Slow Releasing Action for Mosquito Larval Control

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A briquette formulation was developed which is a solid block formulation with a diameter 4.5 cm. Briquettes are convenient for hand applications into aquatic environments where spray applications are not available or not functional. The briquettes were formed by mixing *Bacillus thuringiensis israelensis* (*B.t.i.* 4,500 ITU) with starch, light density inert granules and binding agents. These formulations allow timely release of individual granules and are useful for the spreading of *B.t.i.* into water. We report on the use of cornstarch and *B.t.i.* as formulation ingredients for *B.t.i.* briquette formulations. In laboratory tests, slow releasing activity was measured by a turbid meter and transformed to ppm. In the first test, each 4.0g of *B.t.i.* mixed with 0.5g, 1.0g, 1.5g and 2.0g of cornstarch. The mixtures were contained with light density inert granules for floating and binding agents at a total of 7.5-9.0g in each briquette. *Bacillus thuringiensis israelensis* with 0.5, 1.0, 1.5 and 2.0 grams of cornstarch in the briquette were continuously released from averages of 2.79, 1.26, 1.43 and 2.36 ppm at 1st day to averages of 1.30, 1.17, 1.30 and 1.00 ppm at 27th day after exposure on two liter water in a beaker, respectively. These results were over 5 times higher concentrations than that of active concentrations against various mosquito larvae. In the second test, each 1.0g of cornstarch mixed with 1.0g, 2.0g, 3.0g and 4.0g of *B.t.i.* The mixtures were contained with light density inert granules for floating and binding agents at a total of 5.0-8.0g in each briquette. *Bacillus thuringiensis israelensis* were successfully released until the end of the test period for 27 days. The briquettes containing 1.0, 2.0, 3.0 and 4.0 grams of *B. t. i.* released the active ingredient from averages of 1.43, 2.07, 3.17 and 2.58 ppm at 1st day to averages of 2.02, 1.68, 1.64 and 1.47 ppm at 27th day after exposure on two liter water in a beaker, respectively. These results were over 7 times higher concentrations than that of active concentrations against various mosquito larvae throughout 27 day period.