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Encapsulation of *Syzygium aromaticum* and *Cymbopogon citratus* Essential Oils using new technology with the Chitosan-Cholesteryl polymer and new methodology in homogenization by Ultrasound in a probe.

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Botanical pesticides are of great importance in Integrated Pest and Disease Management; they control insect pests and plant pathogens, pose no risk to natural enemies, and are environmentally friendly. However, they have some disadvantages that hinder their use in agriculture, making them poorly accepted by the agricultural community. These include a short period of activity due to their faster degradation due to their volatile nature. They are also insoluble in water. This study sought to optimize the activity of these pesticides by encapsulating the active ingredient, thereby increasing the availability of these compounds to protect plants and improving their water solubility. Previous studies with the oils *Syzygium aromaticum* and *Cymbopogon citratus*, popularly known as Clove and Lemongrass, showed promising activity against the corn pest *Spodoptera frugiperda*, so encapsulation methods for these oils were used in this study. These encapsulated formulations were produced as an emulsion using only water, the polymer, and the oil, and homogenization was performed using probe ultrasound. The polymer used was chitosan-cholesteryl, a novel molecule being tested for encapsulation of chemotherapy drugs for pancreatic cancer. After emulsion formation, they were quantified by GC-MS. The result was emulsions with excellent homogenization without precipitates or supernatants, and GC quantification demonstrated 80% encapsulation of the active ingredient.

Keywords: Insecticide, Essential oil, Encapsulation, Polymer



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