

**A NOVEL WATER-IN-OIL-IN-WATER EMULSION TO
ENCAPSULATE ANTIBACTERIAL AGENTS**

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ABSTRACT

Encapsulating bioactive compounds can protect them from adverse conditions. This study aimed to encapsulate bioactive agents in a stable multiple emulsion system using a material that can be recovered easily from a product abundant here in the country. Results of the study revealed that the method of encapsulation used is effective in encapsulating and releasing the bioactive compound encapsulated. The antibacterial activity determination showed that encapsulated chlorhexidine is effective against both *S. aureus* and *E. coli* bacteria. Further investigation was made by encapsulating aqueous guava (*Psidium guajava*) extract in the same emulsion system (water-in-oil-in-water) using recovered coconut milk protein (CMP) as a gelling agent. The evaluation of the stability of the emulsions revealed that the treatment with 40% guava extract in the aqueous phase of its primary emulsion (Emulsion 3) is the most stable among the other treatments. This treatment showed the smallest droplet size range and most uniformed droplet sizes. The creaming index of this treatment also showed the lowest values after three (3) weeks of storage. On the other hand, the treatment with 60% guava extract in the aqueous phase of its primary emulsion (Emulsion 4) appeared to be the most stable against heating. However, no antibacterial activity was observed for any of the emulsion systems both *S. aureus* and *E. coli* bacteria. Additional test revealed that the bioactive compound present in the plant extract was disrupted by the sonication process.