ABSTRACT

The mud crab (Scylla serrata) is a species with a low survival rate, particularly during the larval to megalopa stages. Vitamin C is considered a potential solution to improve larval survival; however, it is highly unstable and prone to degradation, thus requiring an encapsulation system using liposomes. Liposomes, however, are also prone to leakage; therefore, an additional coating such as polysaccharides from Caulerpa lentillifera is needed. This study aims to evaluate the potential of Caulerpa lentillifera polysaccharides as a liposome coating for vitamin C to enhance stability, encapsulation efficiency, and the growth of mud crab (Scylla serrata) larvae. The study was conducted in three stages, including the extraction and characterization of C. lentillifera polysaccharides using the hot-water extraction method, the preparation and characterization of vitamin C liposomes with and without polysaccharide coating, and application testing on crab larvae. Results showed polysaccharide yields of 16.84% (Karawang) and 25.17% (Jepara), with a molecular weight of 20.09 kDa classified as sulfated polysaccharides. The encapsulation efficiency of vitamin C reached 96.67% in liposomes (CAL) and 97.02% in polysaccharide-coated liposomes (CALL). The release rate of CALL (0.35% at 24 h) was slower than CAL (0.4% at 4 h), indicating the coating's role in delaying vitamin C diffusion. Particle size increased from 378 nm (CAL) to 636.7 nm (CALL), while both showed nearly neutral zeta potentials (~0 mV). The functional feed CALL-A (0.8 mg/L vitamin C) produced the highest larval survival rate (3.74%). Overall, C. lentillifera polysaccharides effectively enhance liposome stability and improve vitamin C performance as a functional larval feed.

Keywords: *Caulerpa lentillifera, liposome, mud crab, vitamin C*

.