

SUMMARY

Along with the increase in consumer demand for cosmetic products in Indonesia, the cosmetic industry strives to continue innovating, both in terms of formulation, quality, and the use of natural products. The use of synthetic emulsifiers in cosmetic formulations is still widely practiced, one of which is Polysorbate 80, known to easily degrade in extreme environments. The use of synthetic emulsifiers can be replaced by bioemulsifiers or natural emulsifiers. Bioemulsifiers compared to synthetic emulsifiers show excellent emulsion stabilization capabilities, are easily biodegradable, and are resistant to extreme conditions such as variations in salinity, temperature, and pH. One type of bioemulsifier known is exopolysaccharides, secondary metabolites produced by microorganisms that have the potential not only as bioemulsifiers but also possess good moisture retention properties, making them suitable for use in cosmetic formulations. *Bacillus clausii* J1G-0%B is a gram-positive halophilic bacterium capable of producing exopolysaccharides. The aim of this research is to determine the concentration and type of carbon source to produce optimal exopolysaccharide production by the halophilic *Bacillus clausii* J1G-0%B, as well as its potential as a bioemulsifier and hydrating agent.

This study was conducted with stages, rejuvenation of *Bacillus clausii* J1G-0%B bacteria, confirmation of *Bacillus clausii* J1G-0%B bacteria with gram staining, determination of the best concentration of each carbon source glucose, fructose, and sucrose using oil spreading test and emulsion activity. Extraction of exopolysaccharide by precipitation using absolute ethanol. Characterization of exopolysaccharides using Fourier Transform Infrared (FTIR) Spectrophotometer, Thin Layer Chromatography, and determination of sugar and protein content. Exopolysaccharide bioactivity test by determining emulsification index (IE24), exopolysaccharide stability test as bioemulsifier, and exopolysaccharide potential test as hydrating agent.

It is known that in the oil distribution test and emulsion activity test, the best concentration is 1% (b/v) of each carbon source. Then the best carbon source in producing exopolysaccharide is glucose with a concentration of 1% (b/v) incubated for 10 days (G10) with the largest sample yield of 5.79 g/L, the highest total sugar content as a bioemulsifier is 89.4%. FTIR results and KLT analysis on exopolysaccharide G10 showed the presence of O-H, C=O, -C-H, and C-O groups and is a homopolysaccharide. Exopolysaccharide G10 at a concentration of 40,000 ppm has the highest Emulsification Index (IE24) value against olive oil and castor oil, which is 100% and good emulsion stability. The exopolysaccharide produced by *Bacillus clausii* J1G-0%B has a high solubility index in water and a good moisture retention index, so it has the potential to be used as a hydrating agent in cosmetic products.