

ABSTRAK

UJI AKTIVITAS BIOSURFAKTAN DARI BAKTERI *Serratia marcescens* strain MBC 1 PADA MINYAK JELANTAH

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Berbagai olahan pangan di Indonesia diolah dengan minyak goreng yang tak jarang menyisakan minyak jelantah. Minyak jelantah seringkali dibersihkan dengan surfaktan sintetik sabun. Campuran minyak dan sabun biasanya dibuang langsung ke lingkungan dan mengakibatkan menurunnya kesuburan tanah dan menghambat proses degradasi oleh mikroorganisme. Karena itu dibutuhkan senyawa alami yang mampu melarutkan minyak jelantah yaitu biosurfaktan. Salah satu bakteri penghasil biosurfaktan yaitu *Serratia marcescens*, bakteri ini menghasilkan biosurfaktan berupa *Serrawettin*. Penelitian ini bertujuan untuk mengetahui aktivitas optimum biosurfaktan bakteri dari *Serratia marcescens* strain MBC 1 pada berbagai media dan pH yang berbeda. Bakteri ini ditumbuhkan di media fermentasi *tryptone water*, limbah cair jagung dan limbah cair singkong dengan pH 6,7 dan 8 untuk diambil supernatannya. Uji yang dilakukan diantaranya uji emulsifikasi, *oil displacement* dan *drop collapse*. Pada uji *drop collapse* didapatkan tetesan datar di setiap perlakuan uji. Hasil indeks emulsifikasi tertinggi didapatkan pada media limbah jagung dengan pH 7 yaitu sebesar 49.26%. Pada uji *oil displacement* zona jernih terbesar didapatkan pada media produksi *tryptone water* dengan pH 7 yaitu 5.72 cm. Data yang didapatkan dianalisis menggunakan uji non parametrik Friedman dilanjutkan dengan uji Bonferroni. Setelah dilakukan uji analisis Friedman didapatkan bahwa jenis media dan variasi pH yang digunakan berpengaruh terhadap indeks emulsi dan zona jernih yang terbentuk. Pada uji lanjut Bonferroni *oil displacement test* terdapat beda nyata perlakuan di media *tryptone water* pH 7 dengan akuades (K-). Pada uji emulsifikasi didapatkan beda nyata pada perlakuan di limbah singkong pH 6 dengan *Tween-80* (K+). Dari hasil yang didapatkan, terbukti bahwa bakteri *Serratia marcescens* strain MBC 1 mampu menghasilkan biosurfaktan yang berpotensi dalam proses biodegradasi minyak jelantah.

Kata Kunci: Biosurfaktan, *Serratia marcescens*, minyak jelantah.

ABSTRACT

BIOSURFACTANT ACTIVITY TEST OF *Serratia marcescens* strain MBC 1 IN COOKING OIL

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Various foods in Indonesia are processed with cooking oil which often leaves used cooking oil. Used cooking oil is often cleaned with synthetic soap surfactants. A mixture of oil and soap is usually discharged directly into the environment and causes a decrease in soil fertility and inhibits the degradation process by microorganisms. Therefore, natural compounds are needed that are able to dissolve used cooking oil, namely biosurfactants. One of the biosurfactant-producing bacteria is *Serratia marcescens*, this bacterium produces a biosurfactant in the form of Serrawettin. This study aims to determine the optimum activity of bacterial biosurfactant from *Serratia marcescens* strain MBC 1 on various media and different pH. These bacteria were grown in tryptone water fermentation media, corn liquid waste and cassava liquid waste with pH 6.7 and 8 to take the supernatant. The tests carried out include emulsification, oil displacement and drop collapse tests. In the drop collapse test, flat drops were obtained in each test treatment. The highest emulsification index results were obtained in corn waste media with a pH of 7, which was 49.26%. In the oil displacement test, the largest clear zone was found in the production medium of tryptone water with a pH of 7, which is 5.72 cm. The data obtained were analyzed using Friedman's non-parametric test followed by Bonferroni's test. After the Friedman analysis test, it was found that the type of media and the variation of pH used had an effect on the emulsion index and the clear zone formed. In the Bonferroni oil displacement test further test, there was a significant difference in the treatment in tryptone water pH 7 media with distilled water (K-). In the emulsification test, it was found that there was a significant difference in the treatment in cassava waste pH 6 with tween-80 (K+). From the results obtained, it is proven that the bacteria *Serratia marcescens* strain MBC 1 is able to produce biosurfactants that have potential in the biodegradation process of used cooking oil.

Keyword: Biosurfactant, *Serratia marcescens*, Used cooking oil