

MIKROEMULSI WATER IN OIL FIKOSIANIN *Arthrospira platensis* DENGAN MINYAK KELAPA SAWIT SEBAGAI FASE MINYAK

INTISARI

Penelitian ini bertujuan untuk membuat mikroemulsi *water in oil* (w/o) fikosianin *Arthrospira platensis* yang stabil dengan fase minyak berupa minyak sawit dan mengetahui stabilitasnya selama penyimpanan pada suhu ruang. Tahapan penelitian ini terdiri atas ekstraksi fikosianin *A. platensis*, formulasi mikroemulsi, pembuatan mikroemulsi fikosianin *A. platensis*, dan pengujian stabilitas mikroemulsi fikosianin selama penyimpanan. Ekstraksi fikosianin *A. platensis* dilakukan dengan metode ultrasonikasi dengan pelarut akuades. Formulasi mikroemulsi dilakukan menggunakan kombinasi surfaktan Span 80 (53%), Span 20 (36%), dan Tween 80 (11%) dengan persentase minyak sawit 10 hingga 90%. Formula mikroemulsi diuji stabilitas fisik berupa turbiditas, sentrifugasi, dan pemanasan. Formula mikroemulsi stabil berada pada persentase minyak sawit 80 dan 82,5%. Formula mikroemulsi tersebut digunakan untuk membuat mikroemulsi fikosianin *A. platensis* dengan konsentrasi 0, 50, 100, dan 150 ppm yang selanjutnya disimpan pada suhu ruang ($28 \pm 2^\circ\text{C}$) selama 28 hari dan dilakukan pengujian stabilitas berupa turbiditas, kadar fikosianin, aktivitas antioksidan, dan angka peroksida setiap 7 hari sekali. Hasil penelitian menunjukkan bahwa formula mikroemulsi tidak berpengaruh nyata pada indeks turbiditas, kadar fikosianin, aktivitas antioksidan, dan angka peroksida. Konsentrasi fikosianin berpengaruh nyata terhadap kadar fikosianin, aktivitas antioksidan, dan angka peroksida selama penyimpanan. Penambahan fikosianin meningkatkan kadar fikosianin dan aktivitas antioksidan serta menurunkan angka peroksida. Tidak terdapat interaksi antara faktor formula mikroemulsi dengan konsentrasi fikosianin. Penambahan fikosianin 150 ppm membentuk endapan setelah penyimpanan hari ke-28. Mikroemulsi dengan 80% minyak dan fikosianin *A. platensis* 100 ppm menjadi perlakuan terbaik diantara perlakuan lainnya.

Kata kunci : fikosianin, *Arthrospira platensis*, mikroemulsi, stabilitas, penyimpanan

ABSTRACT

WATER IN OIL MICROEMULSION CONTAINING PHYCOCYANIN OF *Arthrospira platensis* USING PALM OIL AS OIL PHASE

This study aims to determine the stable water in oil microemulsion containing phycocyanin of *Arthrospira platensis* with palm oil as oil phase and to determine its stability during storage at room temperature. This research consists of several stages, including phycocyanin extraction from *A. platensis*, microemulsion formulations, preparation of phycocyanin microemulsion, and stability tests of phycocyanin microemulsion during storage. *A. Platensis* phycocyanin extraction was done by ultrasonication. Microemulsions formulation was done using combination of surfactants Span 80 (53%), Span 20 (36%), and Tween 80 (11%) consisting 10 to 90% palm oil. The microemulsion formulas were tested for physical stability in the form of turbidity, centrifugation, and heating. 80% and 82,5% palm oil formed stable microemulsion. The formulas were used to make phycocyanin microemulsion with concentrations of 0, 50, 100, and 150 ppm, which were then stored at room temperature ($28\pm 2^{\circ}\text{C}$) for 28 days and underwent stability tests in the form of turbidity, phycocyanin content, antioxidant activity, and peroxide value weekly. The results showed that the formulas had no significant effect on the turbidity, phycocyanin content, antioxidant activity and peroxide value. Phycocyanin concentrations showed significant effect on phycocyanin content, antioxidant activity, and peroxide value during storage. The addition of phycocyanin increased phycocyanin content and antioxidant activity and reduced peroxide value. No interaction was found between microemulsion formula and phycocyanin concentration. Precipitate was formed in microemulsion with addition of 150 ppm phycocyanin after 28 days of storage. Microemulsion with 80% oil and 100 ppm phycocyanin showed the best result among other treatments.

Keywords : phycocyanin, *Arthrospira platensis*, microemulsion, stability, storage