

## INTISARI

### OPTIMASI EKSTRAKSI FIKOSIANIN *Arthrospira platensis* DARI LOKASI BUDI DAYA BERBEDA DAN APLIKASINYA SEBAGAI PEWARNA ALAMI KE DALAM PUDING SUSU

Mikroalga *Arthrospira platensis* berpotensi sebagai pewarna alami makanan karena mengandung pigmen fikosianin. Fikosianin yang telah diekstrak dapat diaplikasikan ke dalam aneka produk pangan, salah satunya puding susu. Ekstraksi fikosianin dapat dipengaruhi oleh metode ekstraksi, jenis biomassa, lokasi budidaya, serta pelarut. Metode *freeze-thawing* merupakan ekstraksi yang mudah dan sederhana. Penelitian ini bertujuan untuk melakukan optimasi proses ekstraksi fikosianin dengan metode *freeze-thawing* dari berbagai jenis biomassa, lokasi budidaya, dan pelarut, serta mengetahui karakteristik dan nilai preferensi konsumen terhadap puding susu fortifikasi fikosianin sebagai pewarna alami. Pada tahap 1 yaitu menentukan ekstrak fikosianin yang memiliki konsentrasi, *purity*, dan *yield* terbaik dari jenis biomassa (*pressed cake* dan bubuk kering), lokasi budidaya (PT Algaepark, PT Albitec), dan pelarut (akuades dan buffer fosfat pH 7). Ekstrak terpilih kemudian dikeringkan dengan penambahan bahan pengisi maltodekstrin 30% b/b ekstrak fikosianin. Tahap 2 yaitu fortifikasi bubuk fikosianin (0%; 2%; 4%; 6%; 8%; 10%) b/b ke dalam puding susu. Hasil analisis menunjukkan terdapat interaksi antara jenis biomassa, lokasi budidaya, dan pelarut ( $P < 0,05$ ). Biomassa dari PT Albitec memiliki stabilitas warna yang lebih baik dibandingkan PT Algaepark. Biomassa bubuk kering memberikan hasil yang lebih tinggi dibandingkan *pressed cake*. Pelarut terbaik menggunakan buffer fosfat pH 7. Rehidrasi bubuk fikosianin dengan aquades menunjukkan *purity* lebih tinggi dibandingkan buffer fosfat pH 7. Warna puding susu yang paling disukai panelis (uji hedonik) sebesar 4% ( $P < 0,05$ ). Puding susu fikosianin memiliki karakteristik aroma jagung rebus, rasa susu vanilla, dan *aftertaste* asam rebusan jagung, nilai sineresis yang rendah dibandingkan merek komersial serta warna yang stabil selama 30 hari pengamatan.

Kata kunci: fikosianin, *Arthrospira platensis*, pewarna alami, puding susu, stabilitas, sineresis

## ABSTRACT

### OPTIMIZATION OF PHYCOCYANIN EXTRACTION OF *Arthrospira platensis* FROM DIFFERENT CULTIVATION LOCATIONS AND ITS APPLICATION AS A NATURAL COLORANT TO MILK PUDDING

The microalgae *Arthrospira platensis* has potential as a natural food colorant because it contains phycocyanin pigments. Extracted phycocyanin can be applied into various food products, one of which is milk pudding. Phycocyanin extraction can be influenced by the extraction method, biomass type, cultivation location, and solvent. The freeze-thawing method is an easy and simple extraction. This study aims to optimize the extraction process of phycocyanin using the freeze-thawing method from various types of biomass, cultivation locations, and solvents, as well as to determine the characteristics and value of consumer preferences for phycocyanin fortified milk pudding as a natural colorant. In stage 1, we determined the best concentration, purity, and yield of phycocyanin extract from the type of biomass (pressed cake and dry powder), cultivation location (PT Algaepark, PT Albitec), and solvent (distilled water and phosphate buffer pH 7). The selected extracts were then dried with the addition of maltodextrin filler at 30% w/b of ficocyanin extract. Stage 2 was fortification of phycocyanin powder (0%; 2%; 4%; 6%; 8%; 10%) w/b into milk pudding. The result showed that there was an interaction between biomass type, cultivation location, and solvent ( $P < 0.05$ ). Biomass from PT Albitec had better color stability than PT Algaepark. Dry powder biomass gave a higher yield than pressed cake. The best solvent was phosphate buffer pH 7. Rehydration of phycocyanin powder with distilled water showed higher purity than phosphate buffer pH 7. The most preferred color of milk pudding by panelists (hedonic test) was 4% ( $P < 0.05$ ). Phycocyanin milk pudding had the characteristics of corn on the cob aroma, vanilla milk flavor, and corn stew sour aftertaste, low syneresis value compared to commercial brands, and stable color during 30 days of observation. Phycocyanin milk pudding had the characteristics of corn on the cob aroma, vanilla milk flavor, and corn stew sour aftertaste, low syneresis value compared to commercial brands, and stable color during 30 days of observation.

**Keywords:** phycocyanin, *Arthrospira platensis*, natural colorant, milk pudding, stability, syneresis