# ABSTRAK

Biji rosella (*Hibiscus sabdariffa*) memiliki kandungan lemak yang cukup tinggi (22%) dan berpotensi sebagai sumber minyak nabati. Namun, metode ekstraksi konvensional memiliki kelemahan waktu proses lama, konsumsi pelarut tinggi, dan *yield* yang lebih rendah dibandingkan metode ekstraksi modern. Oleh karena itu, diperlukan penerapan metode ekstraksi modern untuk meningkatkan efisiensi proses ekstraksi. Penelitian ini bertujuan untuk mengoptimasi proses ekstraksi minyak biji rosella menggunakan *Ultrasound-Assisted Extraction Probe* (UAEP) dengan R*esponse Surface Methodology* (RSM). Penelitian ini menggunakan desain eksperimen BBD dengan tiga faktor yaitu amplitudo (40 – 100%), suhu (40 – 70°C), dan rasio sampel:pelarut (1:10 – 1:30 g/mL). Hasil menunjukkan bahwa amplitudo dan rasio berpengaruh signifikan terhadap rendemen, sedangkan ketiga faktor berpengaruh signifikan terhadap angka asam pada minyak yang dihasilkan. Kondisi optimum diperoleh pada amplitudo 80%, suhu 50°C, dan rasio 1:30 g/mL. Karakterisasi minyak optimum menghasilkan angka iod 102,38 g Iod/100 g, angka peroksida 2,16 mEq/kg, angka anisidine 2,56, TOTOX 6,88, serta profil asam lemak yang didominasi asam oleat (40,47%) dan asam linoleat (35,75%) dengan total asam lemak tak jenuh 78,78%. UAEP efektif mengekstrak minyak biji rosella, tetapi diperlukan pemurnian lebih lanjut untuk meningkatkan kualitas minyak.

**Kata kunci** : Minyak biji rosella, *ultrasound-assisted extraction*, *Box-Behnken design*, *response surface methodology*

# *ABSTRACT*

*Roselle seeds (Hibiscus sabdariffa) contain a relatively high fat content (22%) and have potential as a source of vegetable oil. However, conventional extraction methods have several drawbacks, including long processing times, high solvent consumption, and lower yields compared to modern extraction methods. Therefore, the application of modern extraction techniques is needed to improve the efficiency of the extraction process. This study aimed to optimize the extraction process of roselle seed oil using Ultrasound-Assisted Extraction Probe (UAEP) combined with Response Surface Methodology (RSM). A Box-Behnken Design (BBD) experimental design was employed with three factors: amplitude (40–100%), temperature (40–70°C), and sample-to-solvent ratio (1:10–1:30 g/mL). The results showed that amplitude and ratio significantly affected oil yield, while all three factors significantly influenced the acid value of the extracted oil. The optimum conditions were obtained at 80% amplitude, 50°C, and a sample-to-solvent ratio of 1:30 g/mL. Characterization of the optimum oil resulted in an iodine value of 102.38 g Iodine/100 g, a peroxide value of 2.16 mEq/kg, an anisidine value of 2.56, a TOTOX value of 6.88, and a fatty acid profile dominated by oleic acid (40.47%) and linoleic acid (35.75%), with a total unsaturated fatty acid content of 78.78%. UAEP was effective in extracting roselle seed oil; however, further refining is required to improve the oil quality.*

***Keyword :*** *Roselle seed oil, ultrasound-assisted extraction, Box-Behnken design, response surface methodology*