

ABSTRAK

FORMULASI DAN KARAKTERISASI DETERGEN TABLET *EFFERVESCENT* RAMAH LINGKUNGAN BERBASIS EKSTRAK DAUN BIDARA (*Ziziphus mauritiana*) SEBAGAI SURFAKTAN ALAMI

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Detergen merupakan produk pembersih yang umumnya menggunakan surfaktan sintetis, namun penggunaannya berpotensi menimbulkan dampak negatif terhadap lingkungan. Daun bidara (*Ziziphus mauritiana*) mengandung saponin yang berpotensi dimanfaatkan sebagai surfaktan alami. Penelitian ini bertujuan memanfaatkan ekstrak daun bidara sebagai surfaktan alami dalam formulasi detergen tablet *effervescent* ramah lingkungan serta mengetahui pengaruh variasi konsentrasi ekstrak dan rasio *effervescent* terhadap karakteristik produk. Ekstrak diperoleh melalui metode maserasi menggunakan etanol 70% dan diformulasikan menjadi tablet *effervescent* dengan variasi konsentrasi ekstrak 18–30% serta rasio *effervescent* 3:5 dan 5:5. Karakterisasi meliputi uji fitokimia, pH, stabilitas busa, waktu larut, kadar bahan tidak larut dalam air, daya detergensi, dan toksisitas lingkungan. Hasil penelitian menunjukkan bahwa ekstrak positif mengandung saponin dan triterpenoid. Seluruh formulasi memenuhi persyaratan SNI 4594:2017 dengan nilai pH 7–9 dan kadar bahan tidak larut dalam air 1,2–2,8%. Daya detergensi dengan pembilasan berkisar 81,00–93,80%, sedangkan tanpa pembilasan 73,98–90,56%. Uji toksisitas menunjukkan tidak adanya kematian ikan selama 96 jam pengamatan. Formulasi optimum diperoleh pada F9 dengan konsentrasi ekstrak 27% dan rasio *effervescent* 5:5.

Kata kunci: Daun Bidara, Maserasi, Detergen Tablet *Effervescent*, Surfaktan Alami, Ramah Lingkungan.

ABSTRACT

FORMULATION AND CHARACTERIZATION OF ENVIRONMENTALLY FRIENDLY EFFERVESCENT TABLET DETERGENT BASED ON BIDARA LEAF EXTRACT (*Ziziphus Mauritiana*) AS A NATURAL SURFACTANT

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*Detergents generally utilize synthetic surfactants to remove dirt and stains. However, their use may cause adverse environmental impacts, creating a need for more environmentally friendly alternatives. Bidara leaves (*Ziziphus mauritiana*) contain saponins that have the potential to be used as natural surfactants. This study aimed to utilize bidara leaf extract as a natural surfactant in an eco-friendly effervescent detergent tablet and to evaluate the effect of extract concentration and effervescent ratio on product characteristics. The extract was obtained by maceration using 70% ethanol and formulated into effervescent detergent tablets with extract concentrations of 18%, 21%, 24%, 27%, and 30%, and effervescent ratios of 3:5 and 5:5. Characterization included phytochemical screening, pH, foam stability, dissolution time, water-insoluble matter content, detergency performance, and environmental toxicity testing. The results showed that the extract contained saponins and triterpenoids. All formulations complied with the requirements of SNI 4594:2017, with pH values ranging from 7 to 9 and water-insoluble matter contents of 1.2–2.8%. Detergency efficiency with rinsing ranged from 81.00% to 93.80%, while without rinsing it ranged from 73.98% to 90.56%. No fish mortality was observed during 96 hours of toxicity testing. The optimum formulation was F9, containing 27% bidara leaf extract and an effervescent ratio of 5:5.*

Keywords: Bidara Leaf (*Ziziphus mauritiana*), Maceration, Effervescent Detergent Tablet, Natural Surfactant, Environmentally Friendly.