

ABSTRAK

KARAKTERISASI DAN STABILITAS FORMULA OPTIMUM SEDIAAN NANOEMULSI EKSTRAK ETANOL 96% DAUN BAYAM MERAH (*Amaranthus tricolor* L.) (Oleh Rani Maimonah; Pembimbing: Aristha Novyra Putri, Rahmi Hidayati; 2021: 97 Halaman)

Ekstrak etanol 96% daun bayam merah (*Amaranthus tricolor* L.) memiliki daya antioksidan yang sangat kuat dengan nilai IC_{50} sebesar 8,74 ppm. Ekstrak etanol daun bayam merah (*Amaranthus tricolor* L.) diformulasikan menjadi sediaan nanoemulsi. Penelitian ini bertujuan untuk mengetahui karakteristik dan stabilitas formula optimum sediaan nanoemulsi ekstrak etanol daun bayam merah (*Amaranthus tricolor* L.). Parameter pengujian karakterisasi fisika kimia meliputi evaluasi uji organoleptis, pH, viskositas, tipe emulsi, bobot jenis, persen transmittan, ukuran partikel, zeta potensial, indeks polidispersitas, *drug loading* dan persen *entrapment*. Parameter pengujian stabilitas sediaan nanoemulsi meliputi uji sentrifugasi, uji *freeze-thaw cycle*, dan *heating stability*. Formula optimum sediaan nanoemulsi ekstrak daun bayam merah memiliki warna Hijau muda, aroma khas daun bayam merah, visualisasi yang transparan, dan tidak memisah, memiliki nilai pH 5,1 yang sesuai untuk penggunaan topikal, memiliki tipe emulsi M/A, memiliki viskositas sebesar 175,5 mPas dan bobot jenis sebesar 1,05 g/mL, memiliki nilai persen transmittan sebesar 99,26%, memiliki ukuran globul nanopartikel sebesar 18,71 nm dengan nilai zeta potensial sebesar -33,81 mV dan indeks polidispersitas sebesar 0,26. Memiliki persen *entrapment* sebesar 93,81% dengan *drug loading* sebesar 0,06 % yang sudah sesuai dengan karakteristik fisika kimia nanoemulsi yang baik serta dapat melalui uji stabilitas sentrifugasi, *freeze-thaw cycle* dan *heating stability* yang terbukti dengan tidak terjadinya pemisahan fase pada sediaan. Formula optimum sediaan nanoemulsi ekstrak daun bayam merah memiliki aktivitas antioksidan yang lemah dengan nilai IC_{50} 213,34 ppm.

Kata Kunci: Ekstrak Etanol 96% Daun Bayam Merah (*Amaranthus tricolor* L.); Nanoemulsi; Karakterisasi; Stabilitas; aktivitas antioksidan

ABSTRACT

CHARACTERIZATION AND STABILITY OF THE OPTIMUM FORMULA FOR NANOEMULSION OF 96% ETHANOL EXTRACT LEAVES OF RED SPINACH (*Amaranthus tricolor* L.) (By Rani Maimonah; Mentor: Aristha Novyra Putri, Rahmi Hidayati; 2021: 97 Pages)

The 96% ethanol extract of red spinach (*Amaranthus tricolor* L.) leaves has a very strong antioxidant power with an IC₅₀ value of 8,74 ppm. The ethanol extract of red spinach leaf (*Amaranthus tricolor* L.) was formulated into nanoemulsion preparations. This study aims to determine the characteristics and stability of the optimum formula for nanoemulsion preparations of ethanolic extract of red spinach (*Amaranthus tricolor* L.) leaves. The parameters of the physicochemical characterization test included evaluation of organoleptic tests, pH, viscosity, emulsion type, specific gravity, percent transmittance, particle size analysis, zeta potential, polydispersity index, drug loading and percent entrapment. Parameters for stability testing of nanoemulsion preparations include centrifugation test, freeze-thaw cycle test, and heating stability. The optimum formula for nanoemulsion preparations of red spinach leaf extract has a light green color, distinctive aroma of red spinach leaf, transparent visualization, and does not separate, has a pH value of 5.1 that is suitable for topical use, has an oil in water emulsion type, has a viscosity of 175.5 mPas and a specific gravity of 1.05 g/mL, has a percent transmittance value of 99.26%, has a nanoparticles size of 18.71 nm with a zeta potential value of -33.81 mV and a polydispersity index of 0.26. Has a percent entrapment of 93.81% with a drug loading of 0.06% that is in accordance with the good physical and chemical characteristics of nanoemulsions and can pass centrifugation stability test, freeze-thaw cycles and heating stability tests by absence of phase separation in the preparation. The optimum formula for the nanoemulsion preparation of red spinach leaf extract had a weak antioxidant activity with an IC₅₀ value of 213,34 ppm.

Keywords: Ethanol Extract 96% Red Spinach Leaves (*Amaranthus tricolor* L.); Nanoemulsion; Characterization; Stability; antioxidant activity