

Intisari

Kombinasi ekstrak sambiloto (*Andrographis paniculata*) dan brotowali (*Tinospora crispa*) terbukti lebih baik dalam menurunkan kadar gula darah dibandingkan ekstrak tunggalnya. Penambahan ekstrak meniran (*Phyllanthus niruri*) dan kayu manis (*Cinnamomum burmannii*) dapat memberikan efek antioksidan dan memberikan aroma khas pada kombinasi ekstrak tersebut. Sambiloto memiliki bioavailabilitas rendah, salah satu cara meningkatkan bioavailabilitas adalah membuat sistem nanopartikel. Tujuan penelitian ini adalah membuat dan menentukan karakteristik nanosuspensi kombinasi ekstrak menggunakan polimer alginat dan *crosslinker* kalsium klorida secara gelasi ionik.

Ekstraksi dilakukan dengan maserasi menggunakan etanol 70%. Nanosuspensi kombinasi ekstrak dibuat dengan menentukan formula optimum antara variasi kadar natrium alginat dan kalsium klorida. Evaluasi terhadap nanosuspensi meliputi evaluasi organoleptis, pH dan uji volume sedimentasi. Karakterisasi menggunakan *Particle Size Analyzer* (PSA) dan *Transmission Electron Microscope* (TEM). Analisis data menggunakan analisis deskriptif.

Kombinasi ekstrak sambiloto (*Andrographis paniculata*), brotowali (*Tinospora crispa*), meniran (*Phyllanthus niruri*), dan kayu manis (*Cinnamomum burmannii*) dapat dibuat nanosuspensi menggunakan polimer natrium alginat dan *crosslinker* kalsium klorida secara gelasi ionik dengan konsentrasi 0,006% natrium alginat dan 0,1% kalsium klorida. Karakteristik nanosuspensi yaitu partikel berbentuk sferis dengan rata-rata ukuran 547,3 nm dan nilai zeta potensial +2,85 mV.

Kata kunci: Ekstrak, Nanosuspensi, Alginat, Kalsium Klorida, Gelasi Ionik.

Abstract

The combination of *sambiloto* (*Andrographis paniculata*) and *brotowali* (*Tinospora crispa*) extract has a better effectiveness compared to the single use of extract. The extract of *meniran* (*Phyllanthus niruri*) and *kayu manis* (*Cinnamomum burmannii*) has an antioxidant effect and specific smell, whereas *sambiloto* has a low bioavailability. To generate the enhanced bioavailability of *sambiloto*, a nanosuspension preparation could be a promising method. Therefore, the purpose of this research is to prepare the nanosuspension of combination extract (*sambiloto*, *brotowali*, *meniran*, *kayu manis*) using the alginate as a polymer and the calcium chloride as a crosslinker with the ionic gelation method.

To prepare the nanosuspension, the extract could be obtained by maceration using ethanol of 70%. The nanosuspension of combination extracts was made by determining the optimum formula using the variation levels of sodium alginate and calcium chloride. The organoleptic, pH and volume of sedimentation of nanosuspension were evaluated. The particle size analyzer (PSA) and transmission electron microscope (TEM) were used to characterize the particle size and morphology of the nanosuspension. The data were evaluated using the descriptive analysis.

Nanosuspension of combination extract can be made using 0.006% sodium alginate as polymer and 0.1% calcium chloride as crosslinker with the ionic gelation method. The morphology of nanosuspension particle is sphere with the average size of 547.3 nm. The nanosuspension was less stable due to the zeta potensial of +2.85 mV.

Keywords: Extract, Nanosuspension, Alginate, Calcium Chloride, Ionic Gelation