INTISARI

Stres oksidatif akibat radikal bebas menimbulkan penyakit degeneratif. Penelitian terkait konsumsi antioksidan alami, seperti pegagan (*Centella asiatica*) dan bunga krisan (*Chrysanthemum indicum*) yang mengandung asiatikosida dan flavonoid dapat mencegah penyakit tersebut. Pengembangan suplemen *honey base* sirup diperkaya stevia menjadi alternatif menarik untuk meningkatkan penerimaan anak-anak. Penelitian ini bertujuan untuk mengoptimasi madu-stevia terhadap karakteristik fisik sirup, evaluasi antioksidan ekstrak dan stabilitasnya.

Sirup herbal ekstrak etanol pegagan dan bunga krisan diformulasikan dengan variasi kadar madu (65-75%) dan stevia (5-15%) menggunakan *design expert* versi 13. Uji karakteristik fisiknya meliputi organoleptis, uji hedonik, pH, densitas, viskositas, dan daya tuang dioptimasi metode *Simplex Lattice Design*. Formula optimum dan hasil prediksi diverifikasi dengan *one sample t-test (p-value*=0,05*)* pada SPSS versi 25. Uji stabilitas sirup metode *freeze thaw* 3 siklus diuji karakteristik fisiknya dan dianalisis *one-way* ANOVA (*p-value*=0,05). Uji antioksidan ekstrak pegagan, bunga krisan, dan kombinasi ekstrak pegagan:krisan (3:10) metode penangkapan radikal *2,2-diphenyl-1-picrylhydrazyl* (DPPH) menghasilkan nilai IC_{50} yang dianalisis *one-way* ANOVA (*p-value*=0,05).

Formula optimum diperoleh dengan komposisi madu 65,168% dan stevia 14,832% menghasilkan karakteristik fisik sesuai target dan stabil selama penyimpanan *freeze thaw*. Aktivitas antioksidan bunga krisan tergolong kuat sementara pegagan dan kombinasi pegagan:krisan (3:10) tergolong sangat kuat dengan nilai IC_{50} berturut-turut sebesar 67,24±0,73µg/mL; 38,44±0,53µg/mL; 48,48±0,86µg/mL.

Kata kunci: sirup, optimasi, madu, stevia, antioksidan

ABSTRACT

Oxidative stress caused by free radicals leads to degenerative diseases. Research related to the consumption of natural antioxidants, such as gotu kola (*Centella asiatica*) and chrysanthemum flower (*Chrysanthemum indicum*), which contain asiaticosides and flavonoids, can prevent these diseases. The development of honeybase syrup supplement enriched with stevia is an interesting alternative to increase children's acceptance. This study aims to optimize honey-stevia on the physical characteristics of syrup, evaluation of extract antioxidants and stability.

Herbal syrup containing ethanol extracts of *Centella asiatica* (CA) and *Chrysanthemum indicum* (CI) was formulated with varying levels of honey (65-75%) and stevia (5-15%) using Design Expert version 13. The physical characteristics test included organoleptic, hedonic test, pH, density, viscosity, and pourability optimized by Simplex Lattice Design method. The optimum formula and prediction results were verified by one sample t-test (p-value=0.05) on SPSS version 25. The syrup stability test of 3 cycles freeze thaw method tested the physical characteristics and analyzed one-way ANOVA (p-value=0.05). Antioxidant test of *Centella asiatica* extract, *chrysanthemum* flower, and combination of CA:CI extract (3:10) using *2,2-diphenyl-1-picrylhydrazyl* (DPPH) radical scavenging method resulted in IC_{50} value which was analyzed by one-way ANOVA (p-value=0.05).

The optimum formula obtained with a composition of 65.168% honey and 14.832% stevia produced physical characteristics according to the target and was stable during freeze thaw storage. The antioxidant activity of chrysanthemum flower was classified as strong while *Centella asiatica* and combination of CA:CI extract (3:10) was classified as very strong with IC_{50} values of 67.24±0.73 µg/mL; 38.44±0.53 µg/mL; 48.48±0.86 µg/mL, respectively.

Keywords: syrup, optimization, honey, stevia, antioxidant