

ABSTRACT

Antioxidants play an important role in protecting the body from free radicals that cause various diseases and increasing the body's resistance. Three herbal plants, sambiloto, ginger, and cinnamon, are known to contain phenolic compounds, flavonoids, and other bioactives that have the potential as antioxidants. These three extracts have been widely studied individually and no scientific reports have been found regarding the formulation of a combination of the three in the form of effervescent powder. This study aims to develop an effervescent formula from the three extracts to produce a supplement with strong antioxidants and meet quality standards. This study was conducted through the stages of extraction, physical characterization, and phytochemical screening, then continued with analysis of total phenolics and flavonoids using UV-Vis spectrophotometry. Four variations of the effervescent powder formula were developed based on the dose of the extract from the conversion of mice to humans, the solubility of the extract, and the combination of acids, bases, and additional ingredients. The best formula was evaluated for quality according to BPOM parameters (2023), followed by analysis of andrographolide content using TLC-Densitometry, analysis of interactions between compounds in the extract mixture and the formula chromatogram profile using HPLC, and antioxidant activity testing using the DPPH method. The results showed that the three extracts met the quality criteria and contained phenolic and flavonoid compounds that play a role in antioxidant activity. The mixture of extracts showed a synergistic effect, characterized by increased levels of phenolics, flavonoids, and antioxidant activity compared to single extracts, and without any indication of interaction between compounds. Formula III was selected as the best formula because it met all effervescent quality parameters, contained 0.22% andrographolide, and had a compound chromatogram profile that could be used as a reference to ensure production consistency. The IC_{50} value of 65.82 ppm indicated relatively strong antioxidant activity. This formula has the potential to be developed as an effective, quality, and regulatory-compliant herbal supplement.

Keywords: Antioxidant activity, medicinal plant extracts, effervescent powder, standardized herbal medicine.