

ABSTRACT

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STUDY OF ANTIOXIDANT ACTIVITY OF SILVER NANOPARTICLES SYNTHESIZED USING GREEN SPINACH (*Amaranthus blitum* L.) LEAF AND STEM EXTRACTS

(xiv + 54 pages: 21 figures + 5 tables + 12 appendices)

In recent years, the synthesis of metal nanoparticles using green synthesis method had become a major focus of researchers. Green synthesis of nanoparticles is well known as the most eco-friendly method. Green spinach had been found to have high phytochemicals compounds that may favor the green synthesis of silver nanoparticles due to its reducing power. The aim of this research was to study about the synthesis of silver nanoparticles using different phytochemicals extracted using different types of solvents, such as water, ethanol, and the combination of both and also the leaf and stem of green spinach, to evaluate the antioxidant properties, and also to evaluate the characteristics of nanoparticles. The extracts were analyzed for the amount of dry matter, total phenolic content, total flavonoid content, and the antioxidant activity to evaluate the effect of solvent types. After that, all of the extracts were used to synthesize the silver nanoparticles. The silver nanoparticles were analyzed for the yield, antioxidant activity, and physical characteristics. Silver nanoparticles that was extracted using the green spinach leaf extract with water as the solvent had the highest amount of silver nanoparticles, which was 1083.5000 ± 1.2124 mg and also had the highest amount of antioxidant activity of silver nanoparticles, which was 82.7800 ± 0.6638 %RSA with the size of 93.62 nm. After the silver nanoparticles was treated with calcination at 100, 300, and 500 °C, the antioxidant activity of the silver nanoparticles were 76.2221 ± 1.0174 , 66.1040 ± 1.3174 , and 48.0723 ± 1.0957 respectively. Moreover, the mean sizes of the silver nanoparticles after treated with calcination were 100.2 nm, 186.3 nm, and 243.5 nm.

Keywords: Antioxidant activity, green spinach, green synthesis, phytochemicals, silver nanoparticles

References: 40 (2000-2016)