



University of Zabol
Graduate School
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**The Thesis Submitted for the Degree of M.Sc in the field of Biology- Plant
physiology**

**The effect of synthesized silver nanoparticles from Saffron and Ginseng extracts
on morphological and phytochemical characteristics of *Aloe vera* L.**

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Abstract

Elicitation is One of the fields-study for increasing quantitative and qualitative of medicinal plants' secondary metabolites. Elicitors increase the production of secondary metabolites in plants by performing certain mechanisms. In this regard, in order to study the effects of the exogenous application of silver nanoparticles synthesized from saffron and ginseng plant extracts on the quantitative and qualitative characteristics of the medicinal plant Aloe Vera, an experiment was conducted in the form of a factorial design based on complete randomise blocks design with 16 treatments and three replications. The experimental treatments included silver nanoparticles synthesized from saffron and ginseng extracts, each with concentrations of 0, 125, 250, and 500 ppm. The results showed that the treatment of 500 ppm silver nanoparticles of saffron extracts incorporated with 500 ppm silver nanoparticles of ginseng extract improved most of the morphological traits. The highest content of chlorophyll a and total chlorophyll (respectively 13.42 and 17.95 mg g FW), in the treatment of 250 ppm nanoparticles of saffron extract and 125 ppm nanoparticles of ginseng extract. The highest potassium content of leaves (4.37 μ G/ g DW), in the treatment of 500 ppm silver nanoparticles from saffron extract and 500 ppm silver nanoparticles from ginseng extract and the highest percentage (012/ 0) Leaf nitrogen was obtained in the treatment of 250 ppm silver nanoparticles of saffron alone. The highest phenolic content of the leaf (336.42 mg EGA/ G DW) was obtained in the treatment of 250 ppm silver nanoparticles of saffron extract alone. Total flavonoid content, antioxidant percentage and leaf phosphorus content were not affected by the experimental treatments. Generally, the use of appropriate concentrations of biosynthetic silver nanoparticles can be an effective and promising solution to improve and increase the studied properties of *Aloe vera* medicinal plants.

Keywords: Antioxidant, Elicitor, Photosynthesis pigments, Flavonoid, Secondary metabolites.