

The effect of mycorrhizal inoculation (*Glomus mosseae*) and brassinosteroid on the amount of antioxidants in *Pimpinella anisum* l. under cadmium stress

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ABSTRACT:

Heavy metals are important environmental pollutants and their toxicity is considered as a major problem, because of ecological, evolutionary, environmental and nutritional effects. Many studies have shown that plants inoculated with mycorrhizal fungi or the use of brassinosteroids increased plants resistance to heavy metals. In this study, the effect of mycorrhiza inoculation with *Glomus mosseae* and 24-epibrassinolid (10^{-6} μ M) on *Pimpinella anisum* antioxidants against cadmium chloride stress (0, 100, 200 and 800 ppm) were investigated and compared in green house and hydroponic condition. The results showed that cadmium stress reduced shoot protein content, but amount of H_2O_2 , flavonoid, flavonol and phenolic compound increased. The activity of catalase, superoxide dismutase, peroxidase, polyphenol oxidase increased significantly in cadmium treatments. When plants were pretreated with brassinosteroid and inoculated with mycorrhizal fungi and then treated with cadmium H_2O_2 have reduced some antioxidative parameter such as flavonoid and anthocyanin content, and activity of ascorbate peroxidase, peroxidase and polyphenol oxidase increased significantly. Therefore it can be concluded that in this plant brassinosteroid application or mycorrhizal inoculation have positive effects on strengthening the antioxidant system in this plant against cadmium stress.

Keywords:

Glomus mosseae, brassinosteroid, cadmium chloride, *Pimpinella anisum*.