

Changes in Amounts of Glycyrrhizin and Phenolic Compounds of Glycyrrhiza glabra L. Seedlings Treated by Copper and Zinc Oxide

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Abstract : Glycyrrhiza glabra L. (Licorice) is one of the oldest medicinal plants in Iran and secondary metabolites present in the plant root is used in food and pharmaceutical industries. With the use of heavy metals as elicitors, plant secondary metabolite production can be increased. In this study, the effects of the concentrations of 1 and 10 μM of zinc oxide and copper oxide on the contents of reducing sugars (as precursor of secondary metabolites), proline, glycyrrhizin, total phenolic compounds, flavonoids and anthocyanin in Glycyrrhiza glabra seedlings were investigated. Also, the correlation between the content of these metabolites in the treated seedlings was examined using Pearson's test. The amount of reducing sugars at concentration of 10 μM zinc oxide was decreased. Whereas, the amounts of proline and glycyrrhizin under treatment 1 and 10 μM copper oxide and 1 μM zinc oxide compared with the control plants was increased. The content of total phenolic compounds was increased with increasing concentrations of copper oxide. The highest amount of flavonoids was observed at concentrations of 1 and 10 μM copper oxide. Anthocyanin content was increased in concentration of 1 μM copper oxide. Also, the tannin content of the Glycyrrhiza glabra seedlings at concentrations of 10 μM zinc oxide was increased. Based on the result it seemed that at concentrations of 1 and 10 μM copper oxide the amount of glycyrrhizin, phenolic compounds, flavonoids, anthocyanins were significantly increased, whereas, zinc oxide had no significant impact on the levels of these metabolites.

Keywords : zinc oxide, copper oxide, phenolic compounds, licorice (glycyrrhiza glabra L.), glycyrrhizin

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