

## عنوان مقاله:

Secondary Metabolite Contents and Antioxidant Enzyme Activities of Cichorium intybus Hairy Roots in Response to Zinc

## محل انتشار:

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## خلاصه مقاله:

Hairy root systems are formed by transforming plant tissues with the "natural genetic engineer" *Agrobacterium rhizogenes*. In most plants such as *Cichorium intybus* L., hairy root cultures have proven to be an efficient system for secondary metabolites production. The effect of Zinc ( $ZnSO_4$ ), a heavy metal, was investigated at different concentrations (0, 1, 5 and 10 mM) on some secondary metabolite contents at three time course levels (24, 48 and 72 h). The treated hairy roots of chicory were compared with control and with each other in growth rate, phenol flavonoid and chicoric acid production rate. In addition, antioxidant enzyme activities were determined. Results showed decreased hairy roots weights and increased phenol, flavonoid, chicoric acid and antioxidant enzyme activities in response to higher concentrations of Zinc at higher time courses. Also, an increase in chicoric acid release into the culture media was observed that is important for industrial uses.

## کلمات کلیدی:

hairy root, *Cichorium intybus*, Secondary metabolites, Antioxidant enzymes,  $ZnSO_4$

## لینک ثابت مقاله در پایگاه سیویلیکا:

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