ABSTRACT

The study is aimed to enhance *in vitro* production of secondary metabolites in *Genista tinctoria* L. via elicitor treatment. The different levels of elicitor concentration – selenium dioxide were utilized to affect the quantity of isoflavonoids occurred in cultures.

Experiment was perfomed in callus and suspension cultures on MS nutrient media supplemented with 10 g l^{-1} of NAA (α-naphtylacetic acid) as growth regulator. The elicitor was added in the form of solution in concentrations of 9,012.10^{-3} mol l^{-1}; 9,012.10^{-4} mol l^{-1} and 9,012.10^{-5} mol l^{-1}. It was exposed for 6, 12, 24, 48, 72 and 168 hours. The content of isoflavonoids was determined by HPLC in dry weight (DW) and medium.

The most effective production of genistin (6,20 mg. g^{-1} DW, 8,30 mg. g^{-1} DW) in callus culture was measured. It was reached in concentrations of 9,012.10^{-4} mol l^{-1} and 9,012.10^{-5} mol l^{-1} after 168 h elicitor treatment. The second most satisfactory genistin level 5,20 mg g^{-1} DW was detected after elicitor application in concentration of 9,012.10^{-4} mol l^{-1} after 6 h. The content of genistein, daidzein and formononetin in callus culture was low and in the most cases equal zero compared to control samples. The content of biochanin A was equal zero compared to control samples.

The most efficient daidzein production (37,10 mg g^{-1} DW) in suspension culture was detected after elicitor treatment in concentrations of 9,012.10^{-3} mol l^{-1} and 9,012.10^{-5} mol l^{-1} after 24 h. The second most abundant content 11,30 mg g^{-1} DW of daidzein was reached after selenium dioxide treatment in concentrations of 9,012.10^{-3} mol l^{-1} and 9,012.10^{-5} mol l^{-1} after 12 h. High production of genistin was observed in concetration of elicitor 9,012.10^{-3} mol l^{-1} (15,2 mg g^{-1} DW) after 24 h, in concentration 9,012.10^{-4} mol l^{-1} (9,5 mg g^{-1} DW) after 168 h and in concentration 9,012.10^{-5} mol l^{-1} (10,7 mg g^{-1} DW) after 48 h. The content of genistein and biochanin A was equal zero after elicitor aplication. Production of formononetin was very low.

Isoflavonoids were not released into nutrient media. Selenium dioxide can be recommended to increase efficiently isoflavonoids production – genistin in callus and suspension cultures and daidzein in suspesion cultures.