

ABSTRACT

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Title of Thesis **The effect of pyrazine derivatives on secondary metabolites production in in vitro cultures**

This work studies the possibility of influencing the production of silymarin and taxifoline in in vitro cultures of *Silybum marianum* L. using the elicitation method. The pyrazine derivate BBPS3 in three different concentrations (c1- $3.3529 \cdot 10^{-3}$ mol/l, c2- $3.3529 \cdot 10^{-4}$ mol/l and c3- $3.3529 \cdot 10^{-5}$ mol/l) was used as elicitor. Sampling took place at 6, 24, 48, 72 and 168 hours after application of the substance. Control samples were left without the use of an elicitor. At the same time, samples of the nutrient medium were taken. The analysis was performed using the HPLC method.

Thus, in order to increase the content of silymarin complex and taxifoline, it seemed more appropriate to use a callus culture, compared to a suspension culture. The statistically most significant increase in the content of silymarin complex in callus culture was achieved after 72 h of elicitor treatment with a concentration of c2 (80.7 $\mu\text{g/g}$ DW). Statistically the most significant increase in the taxifoline content occurred after 168 h of elicitation of the callus culture with a solution with a concentration of c1 (446.1 $\mu\text{g/g}$ DW).

Suspension culture medium appeared to be more suitable compared to callus culture medium. In suspension culture medium, the most significant increase in silymarin complex content was observed in a sample taken after 24 hours when a c2 elicitor (1.70 $\mu\text{g/ml}$) was used. In the case of taxifoline, there was more release into the suspension culture medium, where the statistically most significant increase in the content was observed after 24 hours of elicitor treatment with a concentration of c1 (4.30 $\mu\text{g/ml}$).