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The effect of biotic and abiotic elicitors on biochemical traits and silymarin content of milk thistle in cell suspension culture conditions

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Abstract:
Milk thistle (Silyban marianum) is a dicotyledonous plant from the Asteraceae family, which is very important in the pharmaceutical industry. The active substance of this plant is called silymarin, which is a combination of flavonolignans. This combination is effective in the treatment of various liver diseases, hepatitis, diabetes, cardiovascular diseases, cancer, blood fat. In the present research,the aim of this resarch is to optimize the tissue culture of thistle plant, increase the production of its secondary metabolites by using different elicitores in cell suspension conditions. Therefore, in thisresarch, in order to produce sterile seedling , after in disinfection , the seeds were cultivated in alfe ms medium and four weeks after cultivation from the hypocotyl and cotyledon of these seedlings to produce callus in ms medium containing growth regulation hormons(BAP and NAA). Two consecutive cultivation were done to increase the callus and the produced fibros calluses were transferred to the liqud culture medium containing the previous regulation hormons. Calluse treatment at a concentration of 40 mg/ml and control treatment showed the highest and lowest increase in total phenol content ,total flavonoid , total tanning and antioxidant activity, respectively. The content of total proline also showed the highest in crease at the concentraction of 80qg/ml, which is due to the increase in tension created by this elicitor. The mannitol elicitor showes different reaction on the traits in different content at the conservation such that total phenel content at a concentration of 120ql/ml, total flavonoids and carbohydrate content at the concentration of 240 qg/ml, tatal tannin and prolin content at content ataconcentraction of 60 qg/ml and antioxidante activity showed the highest increase in the control treatment. The amount of silymarin is also. Therefore, if the cellulase elicitor whith aconcentration of 80 micrograms prr ml is added to the suspension in the growthphase (eighth day),it will have the best result in increasing the secondary metabolites of this plant and antioxidant activity.

Keywords: marigold, silymarin, hormone tissue culture, isolated piece, flavonolignan culture.