Effect of Pyruvic Acid as a Precursor on the Production of Andrographolide in *Andrographis Paniculata* Cell Suspension Culture

Motahareh Gholami Zahedi,[1,*] **Ayatollah Rezaei**[1], **Dariush Talei**[2]

[1]*Department of Horticulture, Shahed University, Tehran, Iran.*
[2]*Medicinal Plants Research Center, Shahed University, Tehran, Iran.*
E-mail: m.gholamizahedi@gmail.com

Andrographolide is an important diterpene extracted from *Andrographis paniculata* and has properties such as the treatment of AIDS, cancer of the liver and cardiovascular diseases [1]. The synthesis of phytochemicals in undifferentiated plant cells under *in vitro* conditions can be further induced with elicitors or by feeding precursors. For this the effect of pyruvic acid to increase secondary metabolites in tissue culture of *Andrographis paniculata* was investigated. This experiment was carried out in a completely randomized design with three replications. Pyruvic acid was added to cell suspension cultures at four concentrations (0, 0.01, 0.1 and 1 mM). The parameters measured were growth, andrographolide production, antioxidant potential, phenolics content, catalase, peroxidase, polyphenol oxidase, and phenylalanine ammonia lyase enzymes activity. The results showed that pyruvic acid with the exception of cell growth had a significant effect on the production of andrographolide, antioxidant potential, phenolics content and activity of catalase, peroxidase, polyphenol oxidase and phenylalanine ammonia lyase enzymes. By increasing concentration of pyruvic acid in culture medium with the exception of cell growth the other parameters increased significantly. The highest amount of andrographolide (9.65 mg/g dry weight) was obtained at cultures treated with 1 mM of pyruvic acid, which was about 4 times that of the control cultures. According to the results, the pyruvic acid used by the cells has been involved in increasing the production of metabolites such as andrographolide.

Keywords: *Andrographis paniculata* L., Andrographolide, Precursor, Pyruvic acid

References

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