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The Effect of Different Hydroponic Nutrient Solutions on The Productivity of *Echinacea Purpurea* (L.) Moench

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ABSTRACT

Echinacea purpurea (L.) Moench is widely known for its immunomodulatory, anti-inflammatory, antioxidant, antiviral, and antifungal properties, making it one of the most widely used medicinal plants. The herb contains polysaccharides, flavonoids, phenolic acids, and a number of other biologically active substances. The aim of the research is to study the productivity of Echinacea purpurea (physiological indicators, yield, content of various biochemical compounds) in outdoor hydroponic conditions, using several well-known hydroponic nutrient solutions: Davtyan, Steiner, Chesnakov-Bazirina and Knop. It was found that the maximum mass of dry medicinal raw materials was provided by Davtyan and Knop nutrient solutions, which exceeded other hydroponic nutrient solutions by 1.1-1.4 times and soil by 1.4-1.5 times. The application of different nutrient solutions and plant growth medium did not significantly affect the total water content in plant leaves, but the lowest free water content (1.2-1.4 times) and the highest osmotic pressure of leaf sap were observed in soil plants (1.1-1.3 times). The content of water-soluble extractives in the medicinal raw material did not change significantly depending on the use of different nutrient solutions and plant growth media. Meanwhile, soil-grown plants were distinguished by the highest content of polysaccharides and flavonoids and the lowest content of phenolic acids. Thus, we come to the conclusion that hydroponic cultivation of Echinacea is more effective due to its high yield and high content of bioactive substances. It is advisable to use either Davtyan's or Knop's nutrient solutions for plant nourishment.

Keywords: soilless culture, soil, polysaccharides, flavonoids, phenolic acids

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