The Effects of Polyvinyl Alcohol (PVA) Polymer on Bioactive Compounds of Juniperus procera (L). Plant

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Juniperus (L.) is the second most prevalent genus of conifers worldwide. This study focuses on Juniperus procera (L.) because of its natural abundance of photochemical components that have potential antioxidant, insecticidal, antibacterial, and anticancer properties. Nevertheless, the abundance of bioactive chemicals in existing natural sources is limited. Therefore, the exploration of novel methods for inducing the generation of bioactive compounds from medicinal plants is an expanding field of research. This investigation suggests utilizing polyvinyl alcohol (PVA), a water-soluble synthetic polymer, to enhance the production of bioactive chemicals in Juniperus procera (L.). For the present study, explants of Juniperus procera were subjected to PVA in 0.0, 30.0, 50.0 mg/L. For each treatment, five explants, three jars per treatment, in total 45 explants, were cultured under laminar conditions for a month. Subsequently, the levels of bioactive compounds were evaluated using a UV spectrophotometer with ferruginol standard. In addition, High-Performance Liquid Chromatography (HPLC) was used to evaluate ferruginol compounds. Furthermore, (Diphenyl-2-picryl-hydrazyl (DPPH) was utilized to measure the antioxidant activity of plant extract. The findings of this investigation show beneficial outcomes regarding the effects of PVA treatment at a concentration of 50mg/L. These effects include a significant enhancement in phenol content by approximately 200%, a considerable elevation of ferruginol concentration by 115.7%, and a substantial increase of antioxidant activity in plant extracts by 128%. Thus, the results of this research hold great importance in multiple sectors such as medical, cosmetics, pharmaceuticals, agriculture, food, economics, and environment.

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