Analysis of the Effect of an Electromagnetic Field and Electrolytes as a Significant Biostimulation Factor on Plant Growth

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The electromagnetic field is the medium of electromagnetic action that possesses energy and momentum and is present in all organisms. Although its mechanisms of interaction with biological systems are not fully understood, it is known to act as a stimulant for germination and growth in different plants, which may reduce the dependence on harmful chemicals for the environment and human health. This research aims to prove the effectiveness of the electromagnetic field and electrolytic water as the main components for the electrocultivation technique in Phaseolus vulgaris. An electromagnetic field was constructed, along with the electrolytic water. The 20 samples of Phaseolus vulgaris were divided into four groups: control group (1-5), which were watered; experimental group A (A1-A5) with electrolytic water; experimental group B (B1-B5) with electromagnetic field and experimental group C (C1-C5) being the mixed use of electromagnetic field and electrolytic water. Over 14 days, the growth rate of leaves, stems, and germination were analyzed to determine if it is a significant plant growth factor. By calculating their significance using the T-test, samples A and C obtained P-values of 0.0015 and 0.0173, respectively, for growth rate and P-values of 0.0251 and 0.0189 for leaf growth. The P-values were statistically significant, indicating significant growth in the experimental group C. The use of electromagnetism can be a component in developing a technique of eletrocultivation in agriculture, a viable alternative to replace fertilizers, reduce contaminations, and create safer, healthier, and more sustainable food systems for future generations.

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