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# Impact of Different Methods Priming on Germination of Different Genotypes of Wheat (*Triticum Aestivum* L.) Under Salinity Stress

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## ABSTRACT

Soil salinization is currently a global ecological problem and is considered one of the main causes of reduced crop productivity. To enhance plant tolerance, one of the novel approaches is seed nanopriming, particularly through the application of metallic zinc nanoparticles. Soil biochar priming is also regarded as an effective means of improving soil structure and chemical properties, as well as mitigating salinity stress. The application of these materials promotes seed germination, growth, and development parameters even under stressful conditions. Accordingly, the present study aims to investigate the changes in seed germination of two genotypes (V1: Gohar; V2: Van) of *Triticum aestivum* L. under salinity stress conditions using zinc oxide nanoparticles (ZnO NPs) and biochar. Within the scope of the study, germination parameters were calculated, including germination rate (GR), germination percentage (GP), germination vigor index (GVI), mean daily germination (MDG), mean germination time (MGT), and germination energy (GE). In addition, germination stress tolerance indices (PI and GSTI) under stress conditions were assessed. Overall, the results indicate that the application of biochar and ZnO nanoparticles significantly improved the germination capacity of wheat seeds under salinity stress. Therefore, the use of nanoparticles and biochar in agriculture is advisable as a strategy to enhance crop productivity, improve the physico-chemical and biological properties of the soil, and efficiently manage agricultural waste.

**Keywords:** salinity stress, wheat, nanopriming, ZnO NPs, biochar priming, agricultural waste

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