

# Seed Germination and Seedling Growth of Tomato and Lettuce as Affected by Vermicompost Water Extracts (Teas)

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**Abstract.** Greenhouse experiments were conducted to evaluate the effects of different concentrations of vermicompost water extracts (teas) and seed soaking duration on germination of tomato (*Solanum lycopersicum*) and lettuce (*Lactuca sativa*) seeds. In the first experiment, tomato and lettuce seeds were soaked in vermicompost teas prepared from chicken manure-based vermicomposts for 9 hours. The concentrations of the extracts used were 10%, 5%, 3%, 1% (1:10, 1:20, 1:33, and 1:100 vermicompost-to-water ratio by volume), and 0% (water control). Seeds were sown in peat-perlite medium, and seedlings were harvested after 4 weeks. Soaking seeds in vermicompost teas significantly ( $P < 0.0001$ ) increased germination percentage and seedling growth of tomato and lettuce compared with control. The response to concentrations of the vermicompost tea was generally linear. In another experiment, tea produced from food waste-based vermicompost was used. Tomato seeds were soaked in 20%, 10%, 5%, 1%, and 0% teas after 24 hours of soaking and sown into a sphagnum moss-based medium. Plant responses were linear and quadratic for germination and growth, respectively, with 1% vermicompost tea increasing germination, whereas 5% vermicompost tea significantly promoted growth. A third experiment was done to evaluate the interaction of a range of vermicompost tea concentrations (20%, 10%, 5%, 1%, and 0%) and length of soaking (24, 12, 8, 4, 1 hours, and 0: no soaking) on the germination of tomato seeds. There was a significant interaction ( $P < 0.001$ ) between the concentration of vermicompost teas and lengths of soaking. Soaking duration generally had a significantly positive and linear effect on germination of tomato seeds across the concentrations of vermicompost tea. Germination rates of tomato seeds were significantly greater after 8, 12, and 24 hours of soaking. However, within each soaking duration, concentrations of vermicompost teas had variable effects on seed germination. The presence of N-indole-3-acetic acid (IAA), cytokinin, gibberellins, and humic acids in the teas could have been responsible for the faster germination of tomato seeds when soaked at lower concentrations and longer soaking times.