

# The effect of hydrogen peroxide on seed germination



First recognized as a chemical compound in 1818, hydrogen peroxide is a clear, colorless liquid most often used for cleaning or disinfecting (Britannica, 2013). Since pure hydrogen peroxide is unstable, it is found in stores as an aqueous solution. The chemical formula for hydrogen peroxide is  $H_2O_2$  which means there are two hydrogen atoms and two oxygen atoms in the compound (Liebeskind, 2013).

Seed germination is simply the process in which a seedling sprouts from a seed and begins its growth. The most important factors for seed germination are the temperature, the presence of oxygen and the exposure to water.

For a seed to germinate, the temperature must be between 60 and 75 degrees Fahrenheit. Oxygen and water must be present as well. Lastly, the seed must be exposed to light (Britannica, 2013). The hypothesis for the experiment is "If seeds are put into different concentrations of hydrogen peroxide, then the highest concentration will germinate the most amount of seeds."

What was hoped to learn was if hydrogen peroxide would be effective as a fertilizer and in the growth of plants. When an article stating that hydrogen peroxide was approved for use as a plant fertilizer, the idea of this experiment was constructed.

The first step to the experiment was to measure 250 mL of pure water in a beaker then pour it into a glass along with 5 mL of hydrogen peroxide and soak one paper towel in the solution. Next, the paper towel was gently wrung out and placed in the plastic bag folded up neatly and evenly.

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Subsequently, ten seeds were laid across the paper towel and the bag was sealed with a small layer of air left in the bag. Then the seeds were observed everyday for 7 days. Lastly, after the 7 days were over, the amount of seeds that germinated was tallied and recorded.

The graphs and tables showed that hydrogen peroxide had a very minor effect on the speed of the germination of a seed. Although each concentration of hydrogen peroxide had a faster growth average than pure water, the increase in the concentration of hydrogen peroxide showed no pattern in the speed of seed germination.

The purpose of this experiment was to find if hydrogen peroxide would be effective in plant fertilizer and in the growth of plants. The goal was to conduct an experiment that mimicked a seed in soil but made it possible to see the seed at all times.

The hypothesis was "If seeds are put into different concentrations of hydrogen peroxide, then the highest concentration will germinate the most amount of seeds in the least amount of time". In the experiment, it was found that hydrogen peroxide had no significant effect on the speed of the germination of a pinto bean and the hypothesis was rejected. It was found in previous experiments that hydrogen peroxide helps with the growth of plants because of the two oxygen molecules found in hydrogen peroxide ( $H_2O_2$ ) rather than just the one molecule found in water ( $H_2O$ ).

For example, an experiment conducted by The Department of Microbiology in Nigeria proved that hydrogen not only promotes seed germination but also kills bacteria that may form during the process of germination. The findings <https://assignbuster.com/the-effect-of-hydrogen-peroxide-on-seed-germination/>

of this experiment may be the result of the seeds not absorbing enough water due to the amount of seeds in amount of seeds placed in one bag so the seeds could have absorbed more water. Another element that may have contributed to the results was the type of seed used. The pinto beans may not react the same to hydrogen peroxide as other seeds may. Perhaps using a few different types of seeds in the experiment may have had an effect on the conclusion.

Lastly, the percentage of hydrogen peroxide in each solution may not have been enough to have an effect on the germination of the seeds. A refinement made to the experiment could be the percentages of the hydrogen peroxide in each solution.