Study on Prevention of Soil Acidification Using Hydrogen Bacteria

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Soil acidification due to imprudent use of chemical soil fertilizers has become a serious problem these days. Limestone is widely used as a solution to this problem, however it causes secondary soil contamination by soil alkalization and leaching inorganic salt. Eventually, soil is contaminated and agriculture output decreases as well. This study aims to find an environment friendly method to neutralize the soil by using hydrogen bacteria. Hydrogen bacteria survives with the energy generated by oxidizing hydrogen and produces water as a byproduct. This paper hypothesizes that hydrogen bacteria could be the long term solution by not only neutralizing the soil by removing hydrogen ions from the acid soil but also providing water to the plants. The effect of hydrogen bacteria on neutralizing the soil was confirmed by several steps. First of all, the negative effect of acid soil was confirmed by comparing the germination and etiolation rate of 1500 individual plants consisted of 10 species. Next, the cell cycle, ability to eliminate hydrogen ion and amount of hydrogen oxidation was examined in hydrogen bacteria. Series of experiments confirmed that hydrogen bacteria can adjust to 18 different kinds of soil conditions in South Korea and successfully neutralizes acid soil. 250 individual plants in various levels of growth consisted of 5 species showed that hydrogen bacteria neutralize the acid soil without any negative effects on the plant. Finally, this study suggests commercializing the hydrogen bacteria neutralizer by storing hydrogen bacteria in sterilized dry soil.

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