

## **The Relationship between the Growth of Radish Sprout Plant and Shading Time Under Low Total Pressure and the High Pressure of Carbon Dioxide**

In the future, humanity may colonize other planets. One such planet being considered already is Mars. However, reliable food production is necessary to realize this goal. We researched the white radish sprout for this objective. In particular, this research explored the relationship between white radish sprout growth and shading time (periods with no light), aiming to grow sprouts to the same sizes currently found in stores. Radish sprout seeds were germinated in no light, and then set it in vacuum desiccators at 20 kPa for a 10-day cultivation period. The set shading times during cultivation were 1, 3, 5, 9 days; one group of seeds was cultivated outside with 5 days of shading time. After cultivation, the size of the radish sprouts was measured by caliper. All cultivated sprouts were compared to store-bought ones. From the data, the longer the shading time, the more the stems and the overall masses grew; however, the opposite trend was seen for leaf sizes. The experimental results suggest the stems grew more due to the set light exposure, and the leaves barely grew because the oxygen concentration was low. From our research, we found that the stems and the overall masses can grow as big as the store-bought ones, but the leaves can't under the experimental conditions tested. Additional white radish sprout experiments should include different levels of total pressure, as well as oxygen's partial pressure. Liquid fertilizer should also be considered.