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Mitigating Drought Stress of Korean Radish and Chinese Cabbage Through the *Variovorax* sp. YNA59 TreatmentYu-na Kim¹, Jae-sung Kim¹, Kyu-hyoung Hwang¹, In-jung Lee^{1*}¹School of Applied Biosciences, Kyungpook National University, 80, Daehak-ro, Buk-gu, Daegu, Republic of Korea**[Introduction]**

Because of the recent abnormal climate, drought is severe worldwide. Drought stress causes ABA accumulation in plants, closing stomata, reducing gas exchange, and inhibiting photosynthesis. This, in turn, inhibits the growth and development of plants and leads to a decrease in yield, which has a major impact on the agricultural environment. Therefore, *Variovorax* sp. YNA59 (hereinafter referred to as YNA59), a rhizobacteria that resist to drought stress was selected and inoculated into Korean radish and Chinese cabbage. In addition, the growth regulator Dadmi (paclobutrazol 0.39% (경농), hereinafter referred to as PBZ) known to be effective in drought was compared with the YNA59 treatment.

[Materials and Methods]

Korean radish and Chinese cabbage were divided into three groups as follows control, YNA59 inoculated treatment, and PBZ treatment. After 10 days, plant growth parameters (plant height, leaf length, leaf width, root length, root thickness) and soil moisture were measured. Dried plant samples were measured for chlorophyll content using a spectrophotometer after pretreatment, and the content of plant hormone ABA was quantified using GC-MS.

[Results and Discussion]

Through the 16s rRNA identification, YNA59 was isolated from plant rhizosphere was identified as *Variovorax* sp YNA59. YNA59 was used in plant experiments because it was considered to be able to alleviate drought stress conditions as it survived 25% PEG6000 (-0.76 MPa). As a result of the plant experiment, it was confirmed that the growth of radish was almost similar to that of the control and YNA59 inoculated treatment, and that the PBZ treatment was suppressed. Soil moisture content was increased by 94.5% in the YNA59 inoculated treatment and 52.8% in the PBZ treatment under drought stress condition. In case of Chinese cabbage, the growth of YNA59 inoculated treatment was the superb and the growth of PBZ treatment was suppressed. As with similar results of the radish showed that cabbage showed YNA59 inoculated treatment showed 158% increase in soil moisture content and 91% increase in PBZ treatment in drought stress condition. In particular, Chinese cabbage showed a 54% increase in YNA59 inoculated treatment in relative water contents. As a result of quantitative accumulation of ABA content in the plant, especially in the drought condition of radish and Chinese cabbage, there was a significant decrease in ABA content in both YNA59 and PBZ treatments, and the lowest in PBZ. As a result, *Variovorax* sp. YNA59 was found to be the most effective drought mitigation and it is highly applicable to other crops susceptible to drought damage.

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