

## Development of the new salinity tolerance evaluation method for plants using dielectric relaxation spectrum

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### Summary

The objective of this research is to develop a new salinity tolerance evaluation method for plants using microwaves to nondestructively sense physiochemical changes in plants arising from adaptation responses to the environment, which appear as changes in the dielectric relaxation spectra. The physiological adaptation response to environmental stress of a plant can induce changes in physiological and physical conditions of the plant. These changes influence the dielectric properties of the plant, which can be detected by measuring complex dielectric properties of plant materials. The dielectric properties of plants leaves during salt stress at NaCl concentrations of 0 and 100 mmol L<sup>-1</sup> in nutrient solution were measured with an open-ended coaxial probe from 0.3 to 3 GHz, as well as changes in water content and water potential which reflect the physiological condition of the plant. Experimental results showed the potential of microwave sensing as a method for monitoring adaptation responses in plants under salt stress. The dynamic adaptation responses of plants to salt stress can be detected non-invasively by microwave sensing which detects the changes in complex dielectric properties of the plant.