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Mechanism of Growth Enhancement of Plants Induced by Active Species in Plasmas SATOSHI WATANABE, REOTO ONO, NOBUYA HAYASHI, Kyushu University — Plant growth enhances when seeds are irradiated by plasma. However the mechanism of the growth enhancement by plasma has not been clarified. In this study, growth enhancement of plants using various active species and variation of plant cells are investigated. RF plasma is generated under conditions where pressure is 60 Pa and input electrical power is 60 W. Irradiation period varies from 0 (control) to 75 min. Air plasma shows maximum growth of plants with irradiation period of 60 min on the other hand, oxygen plasma shows the maximum growth with irradiation period of 15 min. From change of gaseous species and pressure dependence, growth enhancing factor is expected to be active oxygen species produced in plasma. According to gene expression analysis of Arabidopsis, there are two speculated mechanism of plant growth enhancement. The first is acceleration of cell cycle by gene expressions of photosynthesis and glycolytic pathway, and the second is increase of cell size via plant hormone production.

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