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Effects of Ambient Humidity on Plant Growth Enhancement by Atmospheric Air Plasma Irradiation to Plant Seeds THAPANUT SARINONT, TAKAAKI AMANO, KAZUNORI KOGA, MASAHARU SHIRATANI, Kyushu University — Humidity is an important factor for plasma-bio applications because composition of species generated by atmospheric pressure plasmas significantly depends on the humidity [1]. Here we have examined effects of humidity on the growth enhancement to study the mechanism. Experiments were carried out with a scalable DBD device [2]. 10 seeds of *Raphanus sativus L.* were set for x= 5 mm and y= 3 mm below the electrodes. The humidity H_{air} was 10 - 90 %Rh. The ratio of length of plants with plasma irradiation to that of control increases from 1.2 for H_{air} = 10 %Rh to 2.5 for H_{air} = 50 %Rh. The ratio is 2.5 for H_{air} = 50-90 %Rh. This humidity dependence is similar to the humidity dependence of O_2^+-H_2O, H_3O^*, NO_2^--H_2O and NO_3^--H_2O densities, whereas it is different from that of other species such as O_3, NO, and so on [1]. The similarity gives information on key species for the growth enhancement.

[1] T. Murakami, et al., Plasma Sources Sci. Technol. 22, 015003 (2013).
[2] S. Kitazaki, et al., Curr. Appl. Phys., 14, S149 (2014).

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