Growth Enhancement of Plant by Plasma and UV Irradiation to Seeds.
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Recently, the growth enhancement of cell and microorganism by electrical pulses and plasma irradiations have been investigated. Growth speed of plants is increased by the plasma irradiation. If the growth enhancement of plant is elucidated, this is able to help every study of agriculture and medicine drastically.

In this study, the growth enhancement effect of plant by plasma irradiation is compared with that of the UV irradiation generated by excimer lamp. In plasma irradiation experiment, two kind of plasma irradiation are employed, atmospheric pressure plasma and low pressure plasma which produce singlet oxygen atom and exited oxygen molecule, respectively. The seed of radish sprout is used as sample plant because of its growth speed and ease of growth. In atmospheric pressure plasma irradiation, the dielectric barrier discharge (DBD) is adopted. In UV light irradiation experiment, two types of UV light with wavelength of 172 nm, 222 nm generated by excimer lamp are utilized. After each irradiation, the seeds are spread on cultivation pot and cultivated under dark condition using pure water at temperature of 24 °C. After cultivation for 72 hour, the growth enhancement of radish sprouts was evaluated by total length of sprouts and low pressure plasma irradiation is found to be most effective for the growth enhancement. The UV light by excimer lamps is able to generate large amount of ozone with the concentration of several hundred ppm. In spite of that, the total length of radish sprouts could not be brought the enhancement effect of that by each wavelength.

Above results indicate that the growth enhancement would be arisen from generation of singlet oxygen molecule by plasma irradiation.

Keywords
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