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Effect of sheath gas in atmospheric-pressure plasma jet for potato sprouting suppression S. NISHIYAMA, M. MONMA, K. SASAKI, Hokkaido University — Recently, low-temperature atmospheric-pressure plasma jets (APPJs) attract much interest for medical and agricultural applications. We try to apply APPJs for the suppression of potato sprouting in the long-term storage. In this study, we investigated the effect of sheath gas in APPJ on the suppression efficiency of the potato sprouting. Our APPJ was composed of an insulated thin wire electrode, a glass tube, a grounded electrode which was wound on the glass tube, and a sheath gas nozzle which was attached at the end of the glass tube. The wire electrode was connected to a rectangular-waveform power supply at a frequency of 3 kHz and a voltage of ± 7 kV. Helium was fed through the glass tube, while we tested dry nitrogen, humid nitrogen, and oxygen as the sheath gas. Eyes of potatoes were irradiated by APPJ for 60 seconds. The sprouting probability was evaluated at two weeks after the plasma irradiation. The sprouting probability was 28% when we employed no sheath gases, whereas an improved probability of 10% was obtained when we applied dry nitrogen as the sheath gas. Optical emission spectroscopy was carried out to diagnose the plasma jet. It was suggested that reactive species originated from nitrogen worked for the efficient suppression of the potato sprouting.

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