

Abstract Submitted  
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**Inactivation mechanism of *Penicillium digitatum* spores by atmospheric pressure argon plasma** TAKAYUKI OHTA, TAKUMI MORI, Wakayama university, MASUFUMI ITO, Meijo University, SACHIKO ISEKI, MASARU HORI, Nagoya University — Inactivation of microorganisms using a plasma processing method has attracted much attention. Inactivation factors, such as ultraviolet light, neutral and charged species, electric field, and synergic effects, have been intensively studied. O or OH radicals are important factor for the inactivation due to oxidation-decomposition of cell membrane. In this study, the spores of *Penicillium digitatum* were observed by using fluorescent microscopy in order to investigate the effect of oxidation-decomposition. The membrane of *P. digitatum* spore was successfully stained by DiI. The DiI was used as a vital fluorescence membrane dye. The spore inactivated by the nonequilibrium atmospheric pressure plasma was compared with that by the ultraviolet sterilization lamp. The cell membrane was successfully stained by DiI. The cell nucleus of some spores emits the fluorescent light by DiI in the case of the plasma treatment while the fluorescent of the cell nucleus with the UV lamp treatment was not observed. For the living cell, the DiI is not permeable because the membrane has selective permeability. Thus, these results indicate that the cell membrane was destroyed by reactive species produced from the plasma due to the oxidation-decomposition.

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