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Investigation of Sterilization Effect by various Gas Plasmas and Electron Microscopic Observation of Bacteria YOTA SASAKI, TOSHIHIRO TAKAMATSU, KODAI UEHARA, TAKAYA OSHITA, HIDEKAZU MIYAHARA, AKITOSHI OKINO, KEIKO IKEDA, YURIKO MATSUMURA, ATSUO IWASAWA, MASAHIRO KOHNO, Tokyo Institute of Technology — Atmospheric non-thermal plasmas have attracted attention as a new sterilization method. It is considered that factor of plasma sterilization are mainly reactive oxygen species (ROS). However, the sterilization mechanism hasn't been investigated in detail because conventional plasma sources have a limitation in usable gas species and lack variety of ROS. So we developed multi-gas plasma jet which can generate various gas plasmas. In this study, investigation of sterilization effect by various gas plasmas and electron microscopic observation of bacteria were performed. Oxygen, nitrogen, carbon dioxide, argon and air were used as plasma gas. To investigate gas-species dependence of sterilization effect, *S.aureus* was treated. As a result, nitrogen plasma and carbon dioxide plasma were effective for sterilization. To investigate sterilization mechanism, the surface of *S.aureus* was observed by scanning electron microscope. As a result, dimples were observed on the surface after irradiation of nitrogen plasma, but no change observed in the case of carbon dioxide plasma. These results suggest that bactericidal mechanism of nitrogen and carbon dioxide plasma should be different. In the presentation, Measurement result of ROS will be reported.

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