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Investigation of relationship between plasma gas temperature and reactive species HIDEYUKI DOYAMA, HIROAKI KAWANO, FIRST, Tokyo Institute of Technology, TOSHIHIRO TAKAMATSU, Graduate School of Medicine, Kobe University, YURIKO MATSUMURA, Tokyo Healthcare University Postgraduate School, HIDEKAZU MIYAHARA, FIRST, Tokyo Institute of Technology, ATSUO IWASAWA, Tokyo Healthcare University Postgraduate School, TAKESHI AZUMA, Graduate School of Medicine, Kobe University, AKITOSHI OKINO, FIRST, Tokyo Institute of Technology — In recent years, atmospheric non-thermal plasmas have attracted attention as a new sterilization device. In conventional plasma source, since the plasma gas temperature depends on the discharge power, influence of the plasma gas temperature on bactericidal ability by constant power has not been investigated. Therefore, we developed a new plasma source that can control the plasma gas temperature independently of the power, and it was shown that the bactericidal ability is increased with the plasma gas temperature. However, this factor has not been revealed. In this study, we investigated relationship between the bactericidal ability and the concentration of reactive species at each plasma gas temperature. Because reactive species generated by plasma are thought to affect sterilization. So, to investigate lifetime of the sterilizing factor bactericidal ability of Plasma Treated Water made by each gas temperature plasma was investigated. In both experiments, the correlation ($R^2 = 0.999$) was observed between the concentration of singlet oxygen (1O_2) and the bactericidal ability. These results show long-lifetime reactive species generated by 1O_2 affects the bactericidal ability.

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