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Development of Dielectric Barrier Discharge for Reducing Microbial Contamination in Pepper (Piper nigrum) and Sesame (Sesamum indicum Linn.) Powder

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This research is designed to determine the efficacy of DBD plasma to reduce the microbial contamination of pepper and sesame powder. The AC high voltage power supply was used with voltage up to ±20 kV and the frequency of 5.5 kHz is applied to DBD. The gap of DBD electrodes was set at 5 mm. In raw initial samples, The total aerobic count of pepper (Piper nigrum) was found at quite high level of 5.40 x105 CFU/g. Coliform bacteria were also found both in sesame (Sesamum indicum Linn.) powder and pepper. Both kinds of samples were treated with plasma for 2, 4, 6 and 10 minutes. Results indicated that plasma treatment at 2-10 minutes reduced the total aerobic count of pepper allowed to achieve the acceptable microbial level for spices. The plasma treatment times in this experiment were effective in reduced coliform bacteria both in pepper and sesame powder (MPN/g <3). Plasma from dielectric barrier charge can reduce Staphylococcus epidermidis in sesame which was artificially contaminated with 3.50 x 102 CFU/g resulting in 0.15-0.5 log cycle reduction of microbial load.

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