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Modeling of inactivation of surface borne microorganisms occurring on seeds by cold atmospheric plasma (CAP) ANINDITA MITRA, Y.-F. LI, T. SHIMIZU, TOBIAS KLÄMPFL, J.L. ZIMMERMANN, G.E. MORFILL, Max-Planck-Institute for Extraterrestrial Physics, Garching, 85741, Germany — Cold Atmospheric Plasma (CAP) is a fast, low cost, simple, easy to handle technology for biological application. Our group has developed a number of different CAP devices using the microwave technology and the surface micro discharge (SMD) technology. In this study, FlatPlaSter2.0 at different time intervals (0.5 to 5 min) is used for microbial inactivation. There is a continuous demand for deactivation of microorganisms associated with raw foods/seeds without loosing their properties. This research focuses on the kinetics of CAP induced microbial inactivation of naturally growing surface microorganisms on seeds. The data were assessed for log- linear and non-log-linear models for survivor curves as a function of time. The Weibull model showed the best fitting performance of the data. No shoulder and tail was observed. The models are focused in terms of the number of log cycles reduction rather than on classical D-values with statistical measurements. The viability of seeds was not affected for CAP treatment times up to 3 min with our device. The optimum result was observed at 1 min with increased percentage of germination from 60.83% to 89.16% compared to the control. This result suggests the advantage and promising role of CAP in food industry.

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