Microbial spoilage characterization in tomato products (III): flat-sour

SSICA Stazione Sperimentale per l'Industria delle Conserve Alimentari, V.le Tanara, 31/A - 43121 Parma

Liliana La Pietra, Giuseppe Pirone, Maria Longo, Mario Impembo, Elisabetta Manganelli

ABSTRACT

Three strains of spore-forming bacteria isolated from cases of flat sour were studied.

The three strains, of which one was catalase negative, show different phenotypic characteristics. They were identified by Real-Time PCR as Bacillus coagulans. The growth and inactivation Kinetics were assessed along with the metabolic characteristics in tomato paste at pH of 4.5, inoculated with 102-103 spores / mL, packaged either under aerobic conditions or under vacuum and incubated at 37°C. The growth parameters of microbial population, lag phase, generation time, maximum density, beginning of stationary phase, vary among the strains and, within each strain, between aerobic and vacuum conditions. Maximum growth rate are similar, except for strain 360-3c under aerobic conditions.

For all strains, the death phase is exponential. All strains grow, resulting in lowering of the pH value. In both packaging conditions carbon dioxide is also produced in such quantities as not to deform the container and reduce vacuum in the packs. Spoilage becomes evident within a maximum of 14 days. All strains use malic acid and produce, from glucose metabolism, only L-lactic acid regardless of the type of package used.

flat-sour, spoilage, tomato products, growth curves, metabolites