3.13 Microbial distributions in dried oregano batch

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Spices and herbs are non-homogenous matrices which can be naturally contaminated with large numbers of microorganisms, among them pathogenic species and toxigenic moulds. Microorganisms are often heterogeneously distributed in food matrices, which influences the results of sampling. Various sampling strategies may give different probabilities of detection of these microorganisms. In contrast, our knowledge about how microorganisms are distributed in dried powdered food products is relatively scarce. The aim of this study was to investigate the actual contamination levels and the corresponding distributions of bacteria in a powdered spices/dried herbs matrix for *Salmonella* spp., Enterobacteriaceae, sporeformers, *Bacillus cereus* and Total Viable Counts (TVC). For detecting *Salmonella* spp. the Most Probable Number method was used (10 g, 1 g, 0.1 g × 3) with selective media RV and MSRV and confirmation with XLD and BGA. To assess the concentration of Enterobacteriaceae we used selective media of VRBGA and OF confirmation method. Sporeformers concentrations (both aerobic and anaerobic) were investigated with plate counts on PCA. Our results indicated absence of salmonellas and high concentration of TVC (4.5–5.5 log CFU/g) and Enterobacteriaceae (3.5–4.5 log CFU/g). Sporeformers concentrations were at levels ~4.5 log CFU/g. *Bacillus cereus* were present in all tested samples at levels 2.5–3.5 log CFU/g. Results from the distribution fitting using obtained data provided a number of applicable distributions for each category of bacteria, for instance lognormal and log-logistic distributions showed acceptable goodness of fit with TVC at aerobic condition. The analysis of data has extended our knowledge of microbial distributions in powdered matrices and can be helpful for quantitative microbiology in risk assessment of spices and herbs and for evaluating performance of sampling plans.