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BOOK OF ABSTRACTS

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I10. Industrial and Food Microbiology and Biotechnology

P412. Peracetic Acid tolerance of MDR non-typhoidal *Salmonella* and *Enterococcus faecium* with diverse epidemiological and genetic background

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Bacteria face multiple stresses in different contexts and developed diverse mechanisms to overcome them individually or through events of cross-tolerance. Peracetic acid (PAA) is widely used in the food-chain as antiseptic/disinfectant (20-3000 mg/mL) and induces oxidative-stress in bacteria. However, data about bacterial tolerance to PAA (PAAT) and the conditions inducing such tolerance remain scarce.
Here we assess PAAT of non-typhoidal *Salmonella* and *Enterococcus faecium* from diverse epidemiological and genetic backgrounds and determine if induction with PAA and copper-Cu (also associated with oxidative-stress and widely used in food-animal production settings) increase PAAT. We included *Salmonella* (n=66; 23 serotypes) and *E. faecium* (n=74; clades A1/A2/B) recovered from human (n=54), food-animal production setting (n=20), food (n=56) and environment (n=10) (1997-2018; 6 countries). Most of the isolates were MDR (*E. faecium* 76%-n=56/74; *Salmonella* 67%-n=44/66). The MICPAA was performed by broth-microdilution (ISO20776-1:2006; range: 40-140mg/L) followed by MBCPAA determination (NCCLS:1999) (37ºC/48h; 2 replicas/isolate). Induction assays by PAA and by $CuSO_4$ were performed in 6 *Salmonella* and 6 *E. faecium* (human, food-animal production settings and food sources; with/without Cu tolerance genes: 3 *Salmonella* with *pcoD+silA* genes and 3 *E. faecium* with *tcrB+cueO* genes; diverse MIC/MBCPAA) by exposing bacteria (log-phase: 3-4h) to sub-inhibitory PAA or $CuSO_4$ concentrations (up to 10 and 100 times less the MICPAA/Cu) followed by MICPAA assay.
MICPAA= 40-60 mg/L and MBCPAA= 50-80 mg/L (MIC90= 60 mg/L; MBC90= 70 mg/L) were observed in *Salmonella*, and a MICPAA= 60-100 mg/L and MBCPAA= 80-140 mg/L (MIC90= 90 mg/L; MBC90= 140 mg/L) in *E. faecium*. No differences in MIC/MBCPAA were observed among serotypes/clades, sources or MDR/non-MDR bacteria. The induction with PAA or $CuSO_4$ did not affected the MIC/MBC of *Salmonella* and *E. faecium*.
Our data suggest that a high number of MDR *Salmonella* and *E. faecium* are able to survive to PAA concentrations used in the food-processing industries. Exposure to sub-inhibitory PAA and $CuSO_4$ concentrations, under the tested conditions, does not affect the ability to survive to PAA, in both bacteria. However, further studies are needed to better understand the environmental conditions that can challenge the efficacy of these and other antimicrobial compounds.