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IMPACT OF ANTIMICROBIAL METABOLITES PRODUCED BY *SERRATIA PLYMUTHICA* DAIRY INDUSTRY ISOLATES ON HUMAN PATHOGENS

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Antimicrobial production by bacteria is an already long acknowledged, though not fully attained, fact. Such capacity, known to be held by some species from the genus Serratia, was compared between 2 dairy industry isolates of *S. plymuthica*, designated V4 and Y.

The isolates were firstly biochemically characterized and their specific growth rates and biofilm formation potential, in Tryptic Soy Broth (TSB) and Skim Milk Broth (SMB), determined. The antimicrobial activity of V4 and Y cell-free spent media was then tested on lawns of *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Pseudomonas aeruginosa*, *Bacillus cereus* and *Escherichia coli*. The possible interference of such substances with monospecies biofilms development was analyzed by pre-conditioning, for 10 min, 96-well sterile Microtiter plates. Their effect was also assessed on 24 h biofilms, formed by the above-mentioned pathogens, by exposing them to a 30 min treatment.

These isolates were found to release siderophores and quorum-sensing inhibitor molecules, and to hold different proteolytic activity and growth rates, in both media. Droplets of isolates cell-free spent TSB presented strong positive inhibitory capacities when in contact with lawns of Gram + pathogens. V4-SMB biofilms presented similar mass and specific respiratory activity, while low mass Y biofilms were extremely active. Its biofilms in TSB showed the opposite, being V4 biofilms particularly metabolically active and thick. All cell-free SMB/TSB supernatants pre-conditioning led to a steep reduction of the respiratory activity of *S. aureus*, *E. coli* and *S. epidermidis* biofilms later formed, even though an increase in biofilm mass was observed. On the other hand, the *L. monocytogenes* biofilms established on V4 and Y –TSB – pre-conditioned plates presented not only lower mass, but also very reduced specific respiratory activity.

For all pathogens, and more strongly for *L. monocytogenes,* 24 h biofilm mass decreased after treatment regardless of the supernatant used. *S. aureus* biofilm formation was inhibited by TSB/SMB V4-spent, whereas *S. epidermidis* was only inhibited by SMB V4-spent.

Thus, it can be stated that *S. plymuthica* isolates cell-free spent TSB/SMB antimicrobial activity differed on lawns and biofilms, having different isolates also registered different biofilm formation ability. In the basis of such phenotypic variation is the known phenomenon of interstrain variability.

An understanding of the mechanisms underlying antimicrobials production and action mode in single and mixed Gram positive/negative species biofilms is now sought.