BACILLUS CEREUS-SERRATIA PLYMUTHICA TERRITORIAL INTERACTIONS

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Background and aims: Bacteria can release primary and secondary metabolites to the medium, with antimicrobial properties. It was aimed to assess the impact of such *S. plymuthica* capacity, through chemotaxis, in its co-growth with *B. cereus*, with glucose-TSB or galactose-SMB as carbon source.
Methods: Tryptic soy (TSB) and skim milk (SMB) broth single and mixed *B. cereus-S. plymuthica* cultures were allowed to grow (24h). Planktonic and biofilm species proportion was analyzed, along with biofilms mass and respiratory activity. Impact of CFU physical proximity on colony morphology and chemotaxis was assessed on 0.7% and 1.3% agar TSA/SMA.
Results: The *S. plymuthica* cell-free spent TSB, but not SMB, generated inhibition halos on *B. cereus* lawns. Such antimicrobial activity was also detected at single-CFU level, translated in *B. cereus* negative chemotaxis to the *S. plymuthica* proximity. This was dependent on both the carbon source/media and agar content, and visually more pronounced on SMA 1.3% (*B. cereus* swarming favoured). Planktonic co-growth in SMB allowed species coexistence, at levels equal to those in single culture, but in TSB no *B. cereus* colonies were detected in mixed suspensions or biofilms, with *S. plymuthica* being found at lower levels. Mixed species biofilms, in TSB, registered higher total mass and respiratory activity than both single biofilms. SMB values were maintained.
Conclusions: *B. cereus* actively responds to *S. plymuthica* antimicrobial release, with chemotactic levels of response affected by media content and water availability. Studies are being carried out for antimicrobial identification and signalling/response pathway characterization.