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Antagonistic Activity of Streptococcus Salivarius K12 Against Pathogenic and Opportunistic Microorganisms

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Abstract : Aim: To evaluate the antagonistic activity of Streptococcus salivarius K12 (SsK12) against ENT and oral cavity infection pathogens (S. pneumoniae, S. pyogenes, S. aureus), gram-negative bacteria (E. coli, P. aeruginosa) and C. albicans. Materials and methods: The probiotic strain SsK12 was isolated from the dietary supplement containing at least 1 × 109 CFU per tablet. The tablet was dissolved in the enrichment broth. The resulting suspension was seeded on 5% blood agar and incubated at 35°C in 4-6% CO2 for 48 hours. The raised culture was identified as Streptococcus salivarius with MALDI-TOF mass spectrometry method. The evaluation of SsK12 antagonistic activity was carried out using a perpendicular streak technique. The daily SsK12 culture was inoculated as heavy streaks with a loop at one side of Petri dish with the Muller-Hinton agar (MHA) and incubated for 24 hours at 350 C in anaerobic conditions. It was supposed that bacteriocins would diffuse over the whole area of the agar media. On the next day S. pneumoniae, S. pyogenes, S. aureus, E. coli, P. aeruginosa and C. albicans clinical isolates were streaked at the clear side of MHA Petri dish. MHA Petri dish inoculated with SsK12 (one part) and with the respective clinical isolates (another part) streaked perpendicularly on the same day was used as the control. Results: There was no growth of S. pyogenes on the Petri dish with SsK12 daily culture; the growth of a few colonies of S. pneumonia was noted. The growth of S. aureus, E. coli, P. aeruginosa and C. albicans was noted along the inoculated streak. On the control Petri dish with simultaneous inoculating of the SsK12 strain and the test cultures, the growth of all the testes isolates was noted. Conclusions: (1) SsK12 possesses perfect antagonistic activity against S. pyogenes and good activity against S. pneumoniae. (2) There was no antagonistic activity of SsK12 against S. aureus, E. coli, P. aeruginosa and C. albicans. (3) SsK12 antagonistic properties make it possible to use this probiotic strain for prophylaxis of recurrent ENT infections.

Keywords : probiotics, SsK12, streptococcus salivarius K12, antagonistic activity
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