Cell surface properties and adhesion potential of candidate probiotic lactobacilli of human milk origin

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Abstract

Evaluation of eleven candidate probiotic *Lactobacillus* strains isolated from human milk showed that some of the strains were well endowed with desirable cell surface and attachment attributes. The cell surface properties (hydrophobicity, auto-aggregation, attachment to collagen and HT-29 monolayer) of probiotic *Lactobacillus* species of human milk origin were compared with reference probiotic/ non-probiotic species and pathogenic strains. The bacterial adhesion to hydrocarbons (BATH) was determined using three aliphatic (Chloroform, n-Hexane and n-Octane) and two aromatic (Toluene and Xylene) solvents. Maximum affinity of *Lactobacillus* strains towards chloroform and toluene indicated the presence of low electron acceptor/ acidic surface components on cell surface of most of the strains. The highest value of percent hydrophobicity was recorded with chloroform in HM1 (*L. casei*) (97.10±3.35%) and LGG (98.92±1.24%). A moderate auto-aggregation attribute was observed in all of our *Lactobacillus* isolates. Only HM10, HM12 and HM13 exhibited comparatively enhanced precipitation rate after 7 hours of incubation period. The adhesion potential to collagen matrix was highest in LGG (26.94±5.83%), followed by HM1 (11.07±3.54%) and HM9 (10.85±1.74%) whereas, on HT-29 cells, HM8 (14.99±3.61%), HM3 (13.73±1.14%) and HM1 (11.21±3.18%) could adhere effectively. In this manner, we noticed that although the cell surface properties and adhesion prospective of probiotic bacteria were strain dependent, five of our isolates *viz*. HM1, HM3, HM8, HM9 and HM10 exhibited promising cell surface properties, which could be further targeted as indigenous probiotic.