

A study on microbial mucin utilizers from healthy Indian adult human faeces

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Abstract: The human gut is sheltered by overwhelming number of complex microorganisms, among them, mucin utilizing bacteria stand out for their pivotal role in host health and disease outcomes. It is theorized that a mere 0.9% of intestine flora is actively participate in breaking down mucin molecule. To date, the identification of these specific bacterial strains has been limited to fewer than 100, and only a handful considered as probiotic candidate. The knowledge of the bacterial community responsible for facilitating mucin degradation is still in its early stage, as a substantial portion of the microbiota residing within mucin remains uncultured and not fully characterized. In present investigation, different human derived mucolytic bacteria have been isolated and characterized. The data exhibited different mucus utilizing strains viz. *Enterococcus* (3), *Priestia* (2), *Shigella* (3) and *Escherichia* (1) via meta-genomic technique. The amido black assay implies that these isolates produce a halo around the colony that manifests the release of mucin degrading enzyme. Further, the findings of decrease in carbohydrate concentration in the range of 45-77% and protein content of 4-24% in mucin enriched spent medium confirmed the ability of strains to degrade mucin. Additionally, the enzymatic data reveal our isolated secrete inconsiderable amount of sialidase, α - galactosidase, β -galactosidase, α - glucosidase and β -glucosidase, that cleave mucin oligosaccharide chains. Further, the cell hydrophobicity results revealed all culture show low hydrophobicity (2-30%) and antibiotic susceptibility data manifested variation in antibiotic resistance profile. Safety analysis parameters such as haemolytic assay, gelatinase and, antibiotic susceptibility showed that the *E. gallinarium* KS4 and *P. flexa* KS1 lack virulence traits. Also, better acclimatization of *E. gallinarium* KS4 and *P. flexa* KS1 strain under in vitro gut conditions suggests they could act as a prominent probiotic candidate for human and amend intestinal integrity.

Keywords: Mucin, Mucin degradation, Sialidase, Glycosidase enzyme, gastrointestinal conditions