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Lactococcus lactis: A Bi-Functional Starter-Probiotic

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Works on discovery of novel probiotic candidates are under running. Commercially, having access to a probiotic that already has industrial functionality in addition to good viability during of food processing and shelf life of product is always advantages. Few studies have been reported regarding probiotic properties of *Streptococcus thermophilus* strains although this species hugely used as starter culture in the production of yogurt and other dairy products. In this study, 12 isolates of *S. thermophilus*, that were previously isolated from home-made dairy products, were evaluated with regard to resistance to artificial gastric (pH 2.5 containing pepsin) and intestinal (pH 8.0 containing bile and pancreatin) juices, adherence ability to Caco-2 and HT29-MTX-E12 cell lines, hydrophobicity, resistance to antibiotics, and epithelial barrier function (transepithelial electrical resistance (TER) measurement). Although it has been generally assumed that *S. thermophilus* strains are not resistant to stresses induces in the GIT, the results of this study revealed that susceptibility of almost all of the tested strains to simulated gastric and intestine conditions was significantly lower than for probiotic control strain *L. rhamnosus* GG under both simulated gastric and intestinal conditions. Regarding to adherence efficiency to human gut epithelium cell lines, the results showed 7 and 6 out of 12 isolates exhibited significantly superior adherence to Caco-2 and HT29-MTX-E12 than control probiotic *L. rhamnosus* GG, respectively. TER measurement showed that 3 strains were able to protect Caco-2's tight junction. Although further investigations are necessary, our results identified some of the *S. thermophilus* strains as probiotic candidates worth further analysis.

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