

Different effects of two newly-isolated probiotic *Lactobacillus plantarum* 15HN and *Lactococcus lactis* subsp. *Lactis* 44Lac strains from traditional dairy products on cancer cell lines

ABSTRACT

Lactobacillus and *Lactococcus* strains isolated from food products can be introduced as probiotics because of their health-promoting characteristics and non-pathogenic nature. This study aims to perform the isolation, molecular identification, and probiotic characterization of *Lactobacillus* and *Lactococcus* strains from traditional Iranian dairy products. Primary probiotic assessments indicated high tolerance to low pH and high bile salt conditions, high anti-pathogenic activities, and susceptibility to high consumption antibiotics, thus proving that both strains possess probiotic potential. Cytotoxicity assessments were used to analyze the effects of the secreted metabolite on different cancer cell lines, including HT29, AGS, MCF-7, and HeLa, as well as a normal human cell line (HUVEC). Results showed acceptable cytotoxic properties for secreted metabolites (40 µg/ml dry weight) of *Lactococcus lactis* subsp. *Lactis* 44Lac. Such performance was similar to that of Taxol against all of the treated cancer cell lines; however, the strain exhibited no toxicity on the normal cell line. Cytotoxic assessments through flow cytometry and fluorescent microscopy demonstrated that apoptosis is the main cytotoxic mechanism for secreted metabolites of *L. lactis* subsp. *Lactis* 44Lac. By contrast, the effects of protease-treated metabolites on the AGS cell line verified the protein nature of anti-cancer metabolites. However, precise characterizations and *in vitro/in vivo* investigations on purified proteins should be conducted before these metabolites are introduced as potential anti-cancer therapeutics.

Keyword: Apoptosis; Anticancer; Antibacterial; Antibiotic susceptibility