

Probiotic features of lactic acid bacteria isolated from a diverse pool of traditional Greek dairy products regarding specific strain-host interactions

Georgia Zoumpopoulou^{1*}, Alexandra Tzouvanou¹, Eleni Mavrogonatou², Voula Alexandraki¹, Marina Georgalaki¹, Rania Anastasiou¹, Marina Papadelli¹, Eugenia Manolopoulou¹, Maria Kazou¹, Dimitris Kletsas², Konstantinos Papadimitriou¹, and Effie Tsakalidou¹

¹Laboratory of Dairy Research, Department of Food Science and Human Nutrition, Agricultural University of Athens, Iera Odos 75, 11855 Athens, Greece

²Laboratory of Cell Proliferation and Ageing, Institute of Biosciences and Applications, National Centre for Scientific Research “Demokritos”, Patr. Gregoriou E' & Neapoleos 27, 15310 Athens, Greece

Short title: Probiotic lactic acid bacteria found in traditional Greek dairy products

***Corresponding author:** Dr. Georgia Zoumpopoulou (E-mail: gz@aua.gr)
Laboratory of Dairy Research
Department of Food Science and Human Nutrition
Agricultural University of Athens
Iera Odos 75, 11855 Athens, Greece

Summary

Triggered by the fact that traditional fermented foods can be a valuable source of novel probiotic strains, 106 lactic acid bacteria, all isolated from traditional Greek dairy products, namely Feta, Kasseri, Xynotyri, Graviera, Kefalotyri, Formaella, Galotyri cheeses as well as yogurt and milk, were studied for probiotic properties. Based on their survival at pH 2.5 and in the presence of bile salts, 20 strains were selected for further study. These strains exhibited diverse susceptibility to commonly used antibiotics, while none was hemolytic. Seven out of the 20 strains produced functional bile salt hydrolases *in vitro*. The only antimicrobial activity detected of *Streptococcus thermophilus* ACA-DC 26 towards *Streptococcus mutans* LMG 14558^T was attributed to compound(s) of proteinaceous nature. Two *Lactobacillus plantarum* strains, namely ACA-DC 2640 and ACA-DC 4039 displayed the highest adhesion capacity according to a collagen based assay and by using HT-29 and Caco-2 cells. Co-cultivation of THP-1 cells with selected strains indicated a tendency for anti-inflammatory modulation by *Lactobacillus plantarum* ACA-DC 2640, as well as *Streptococcus thermophilus* ACA-DC 26 and ACA-DC 170, as shown by an increase in IL10 mRNA levels. Moreover, milk cell free supernatants of *Lactobacillus plantarum* ACA-DC 2640 and ACA-DC 4039 exhibited strong angiotensin I-converting enzyme inhibition. To conclude, new isolates presenting interesting probiotic features were revealed and should be further investigated as health-promoting factors.