# Identification of Lactic Acid Bacteria Isolated From Human Fecal Samples and Determination of Their Some Probiotic Properties

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## INTRODUCTION

Probiotic is a culture of living microorganisms which benefically affects the health of the host when ingested in sufficient quantities (Erkkilä and Petäjä 2000). The acid and bile tolerances are two fundamental properties that indicate the ability of a probiotic microorganism to survive the passage through the gastrointestinal tract, resisting the acidic conditions in the stomach and the bile acids at the beginning of the small intestine (Prasad et al. 1999). Probiotic strains should also have desirable antibiotic resistance and sensitivity patterns.
The purpose of the present study was to identification of lactobacilli from fecal samples of humans, determination of the survival of lactic acid bacteria isolates *in vitro* when exposed to low pH, bile and antibiotics.

**Keywords:** Feces, *Lactobacillus*, probiotic

## MATERIALS AND METHODS

In this research, one hundred and seven strains of lactic acid bacteria were isolated from fecal samples of 31 adult volunteers. These strains were evaluated for some potential probiotic properties. They were examined in vitro for resistance to pH 3.5 and 0.3% bile salts. Their antibiotic resistance was also determined against to 7 different antibiotics (Oxoid) by disc diffusion method (Başyiğit, 2004). The strains were identified by 16S rRNA sequencing analyses (Başyiğit Kılıç, 2009).

## RESULTS AND DISCUSSION

The counts of lactic acid bacteria in fecal samples were ranged from $1.7x10^7$ to $3.1x10^{10}$ cfu/g. Out of 107 lactic acid bacteria, 21 *L. plantarum*, 15 *L. fermentum*, 67 *E. faecium* and 4 *E. durans* were identified (Başyiğit Kılıç, 2009). Thirty-six *Lactobacillus* strains showed a survival >80% at pH 3.5 for 3 h; moreover, most of the strains were able to grow in the presence of 0.3% bile salts. According to antibiotic results, it was shown that 6% of *L. fermentum* strains and 14% of *L. plantarum* strains were sensitive to vancomycin (30 µg). A 100% of the *L. fermentum* and *L. plantarum* strains were sensitive to chloramphenicol (30 µg), erythromycin (15 µg), penicillin G (10 units), tetracycline (30 µg). On the other hand, *E. faecium* strains were 100% sensitive to chloramphenicol, penicillin G and tetracycline. While 82% of the strains were sensitive to erythromycin, 91% of the strains were sensitive to vancomycin, 95% of the strains were sensitive to kanamycin, and all the strains were resistant to nalidixic acid.

## ACKNOWLEDGMENTS

The authors are thankful to **Danone Institute of Turkey** for their financial supports the genetically identification of the strains, this study was also supported from Suleyman Demirel University, SDU-BAP-517. Appreciations are expressed by the author to Prof. Dr. James Lee STEELE and Prof. Dr. M. Lütfü ÇAKMAKÇI for their valuable assistance in this study.

## REFERENCES

1. J. Prasad, J. Gill, J. Smart & P.K. Gopal, Selection and characterization of *Lactobacillus* and *Bifidobacterium* strains for use as probiotic. *Int. Dairy J.* 8:993-1002, 1999.
2. S. Erkkilä, E. Petäjä, Screening of commercial meat starter cultures at low pH and in the presence of bile salts for potential probiotic use. *Meat Sci.* 55:297-300, 2000.
3. G. Başyiğit, The probiotic properties of some lactic acid bacteria. Master's Thesis, 2004.
4. G. Başyiğit Kılıç, Genetically Identification Of Some Lactobacilli Strains And Determination Of Their Phage Resistances. PhD Thesis, 2009.