

# **International Journal of Probiotics & Prebiotics**

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**175-184**      **Probiotic Properties Of Some *Lactobacillus* Strains**  
**AHMED M. MABROUK, BAHER A. EFFAT, ZAINAB I. SADEK,**  
**GEHAN A.M. HUSSEIN AND MOHAMED N.I. MAGDOUB**

**ABSTRACT:** Fourteen *Lactobacillus* strains were examined in vitro for their probiotic potential. In antimicrobial activity assay, the lactobacilli tested showed inhibitory properties toward selected potential harmful microorganisms. Gram-positive indicator bacteria were most inhibited. Only a few strains were able to survive at pH 2, while all were unaffected by pH 3. The strains showed the survivability (57.15%) at high bile salt concentration (1% oxigall). Only, 50% of stains were resistant to 0.3% phenol, while, all strains were sensitive to high concentrations of phenol (0.5%). All strains showed good acidification activity and were susceptible to chloramphenicol, erythromycin and amoxicillin. Only, one strain (*L. curvatus* NBIMCC3452) produced exopolysaccharides. In conclusion, six strains, *L. johnsonii* NRRL B-2178, *L. casei* NRRL B-1922, *L. hilgardii* NRRL-1843, *L. cuvatus* NBIMCC 3452, *L. salivarius* NBIMCC-1589 and *L. reuteri* NBIMCC1587, were found in vitro, to possess desirable probiotic properties.

**185-194**      **Acid And Bile Tolerance, Adhesion Properties And Anti-Pathogenic Effects Of Three Potential Probiotic Strains**  
**A. DRAKOULARAKOU, A. L. WELLS, R. K. ROBINSON, R. A. RASTALL, G. R. GIBSON AND A. L. MCCARTNEY**

**ABSTRACT:** The probiotic properties of lactic acid bacteria (LAB) are vital in the selection, and potential application, of strains targeted to improve the health of individual consumers. Characteristics of particular interest include the ability to withstand conditions encountered during transit of the upper gastrointestinal tract and anti-pathogen activity (both inhibitory activity in relation to pathogenic growth and adhesion). The aim of the current work was to investigate the probiotic properties of *Lactobacillus acidophilus* 74-2, *Lactobacillus casei* 163 and *Bifidobacterium animalis* subsp. *lactis* 420. Overall, *L. casei* 163 was more sensitive to acidic conditions and the presence of bile, than *L. acidophilus* 74-2 and *B. animalis* subsp. *lactis* 420. However, *L. casei* 163 displayed greatest inhibition of pathogenic growth against both *Escherichia coli* EPEC 862 and *Salmonella enteritidis* NCTC5765. All three LAB strains significantly reduced pathogen adhesion to HT29 cells, whether added to the cell lines before the pathogens (exclusion assay) or together (competitive assay).

**195-202**      **Chemopreventive Effect Of Probiotic Dahi (Curd) Containing *Lactobacillus Acidophilus* And *Lactobacillus Casei* On 1,2 Dimethylhydrazine Induced Colon Carcinogenesis In Rats**  
**NIKHLESH KUMAR SINGH, ARVIND KUMAR, AND P. R. SINHA**

**ABSTRACT:** We investigated the effect of low fat (2.5%) probiotic dahi containing *Lactobacillus acidophilus* and *Lactobacillus casei* on 1, 2– dimethylhydrazine induced colon carcinogenesis in rats. Colon cancer was induced in male albino Wistar rats by subcutaneous injection of 20 mg 1, 2–dimethylhydrazine (DMH) /kg body weight, weekly during 15 weeks. At the end of 18 weeks all the rats were sacrificed and body weight, total no. of aberrant crypts (AC), total no of aberrant crypt foci (ACF) and no. of aberrant crypts per foci were recorded. The oxidative stress in terms of thiobarbituric acid reactive substances (TBARS), glutathione–S–transferase (GST), catalase (CAT) and superoxide dismutase ((SOD) in liver and colon tissues were also measured. A significant inhibition in the development of total no of ACF were observed in animals fed probiotic dahi as compared with those fed the control diets (P<0.01). In addition, total number of aberrant crypts per colon was also significantly reduced in animals fed the probiotic dahi as compared with the animals fed control diet (P <0.01). The feeding of probiotic dahi to rats significantly enhanced the activity of glutathione–S–transferase, superoxide dismutase and catalase in the liver and colon cells. Administration of probiotic dahi significantly reduced the level of TBARS as compare to DMH control rats (P< 0.01).

**[INTERNATIONAL JOURNAL OF PROBIOTICS AND PREBIOTICS, Volume 2, Number 4, pp. 203-208 \(2007\)](#)**

**203-208      Dietary Modulation And Restoration Of Immune Response By A Prebiotic,  
Fructooligosacharides: An Experimental Study  
UMA RANI AND ARUNA BHATIA**

**ABSTRACT:** The increasing side effects and the cost of allopathic medicines make the consumer incline towards alternative therapeutic agents. As dietary supplements are the most consumer acceptable therapeutic agents the present study was carried out to see the health effects of orally delivered prebiotic (fructooligosacharides) in swiss–albino mice with major focus on its effect on immune response. Nitroblue Tetrazolium (NBT) Test, Inducible Nitric Oxide Synthase Test (iNOS), Phagocytosis and Delayed Type Hypersensitivity (DTH) tests were employed to assess the cell–mediated immune response of the animals and ELISA was carried out to check the humoral immune response of the body. Results revealed that fructooligosacharides potentiated both the cell–mediated as well as the humoral immune response. Fructooligosacharides not only ameliorated the immune response but it could restore the suppressed immune response of drug–immunosuppressed mice. It is concluded that fructooligosacharides can be applied as an immunotherapeutic agents.

**[INTERNATIONAL JOURNAL OF PROBIOTICS AND PREBIOTICS, Volume 2, Number 4, pp. 209-214 \(2007\)](#)**

**209-214      Effect Of Prebiotic Lactulose On Cholesteremia, Glycemia And Antibody  
Titres: An Experimental Study  
ROOPSEE GULATI AND ARUNA BHATIA**

**ABSTRACT:** The high concentration of cholesterol in the diet leads to raised cholesterol level in blood serum and that, in turn, exposes the consumer to the risk of atherosclerosis and coronary heart disease. Similarly, the higher blood sugar level leads to the danger of diabetes. The increasing side effects and the cost of allopathic medicines make the consumer incline towards alternative therapeutic agents. Dietary supplements are the most consumer acceptable alternative therapeutic agents. The present study was carried out to see the effect of lactulose, a prebiotic, on cholesteremia and hyperglycemia. The effect of combination of probiotic and prebiotic on blood sugar level was also determined. The results revealed significant hypocholesteremic and hypoglycemic effect of lactulose.

[INTERNATIONAL JOURNAL OF PROBIOTICS AND PREBIOTICS, Volume 2, Number 4, pp. 215-224 \(2007\)](#)

**215-224**      *Enterococcus Faecalis* Cect7121 Induces Systemic Immunomodulatory Effects And Protects From *Salmonella* Infection  
MARISA CASTROA, MÓNICA SPAROB, MATÍAS MOLINAA, JOSÉ ANDINOA,  
MARCELA MANGHIA

**ABSTRACT:** In this work, the innocuousness of the bacterial strain of *Enterococcus faecalis* CECT7121 is demonstrated upon intraperitoneal administration to BALB/c mice. When administered intragastrically during 3 days, this strain implants and persists in the intestinal epithelium for 18 days without affecting the preexisting flora of enterobacteriae. Besides, *E. faecalis* CECT7121 protected a 50% of the mice challenged intragastrically with *Salmonella* serotype Enteritidis. The effect of the administration of *E. faecalis* CECT7121 on the innate immune response was also evaluated. The in vitro stimulus of heat-killed *E. faecalis* CECT7121 induced the production of IL-12, TNF $\alpha$  and IL-6 (inflammatory cytokines) by peritoneal macrophages in a concentration-dependent manner. The production of IL-10 was also stimulated but only when the highest concentration was employed. However, *E. faecalis* CECT7121 did not stimulate the proliferative level of splenocytes in culture thus showing an anti-inflammatory effect. The intragastric administration of *E. faecalis* CECT7121 modified the cytokine pattern expressed by peritoneal macrophages, inducing the synthesis of similar levels of TNF $\alpha$  and IL-12, lower levels of IL-6, whereas IL-10 was not detected. When these cells were stimulated with *Salmonella* serotype Enteritidis, higher levels of TNF $\alpha$ , IL-6, IL-10 and IL-12 were detected. These results indicate that *E. faecalis* CECT7121 modulates the innate systemic immune response by inducing the synthesis of homeostatic cytokines (IL-12 and IL-10).

[INTERNATIONAL JOURNAL OF PROBIOTICS AND PREBIOTICS, Volume 2, Number 4, pp. 225-232 \(2007\)](#)

**225-232**      *In Vitro* Evaluation Of Antimicrobial Activity Of Putative Probiotic Lactobacilli Against Oral Pathogens

**ABSTRACT:** Effect of probiotic species on oral health is gradually being understood. However, more studies are needed on the characteristics of potential strains before clinical recommendations. The aim of the present in vitro study was to assess the antimicrobial activity of different *Lactobacillus* strains against oral pathogens, thus evaluating their prospective use as oral probiotics. Agar overlay and streak line methods were employed to study 30 lactobacilli strains for their inhibitory activity against eight oral *Streptococcus* species and three periodontal pathogens: *Aggregatibacter actinomycetemcomitans*, *Porphyromonas gingivalis* and *Fusobacterium nucleatum*. The results showed a marked strain- and species-dependent inhibitory activity ranging from non-existent to strong inhibition. *A. actinomycetemcomitans* was the most susceptible of the oral species. However, no single *Lactobacillus* strain was capable of inhibiting all the oral microorganisms tested. *L. bulgaricus* strains were more active against streptococcal species and *A. actinomycetemcomitans*, whereas *L. rhamnosus* strains showed distinct inhibitory activity against *P. gingivalis* and *F. nucleatum*. Conclusion: The present study demonstrated that some *Lactobacillus* strains might indeed inhibit oral pathogens but not generally. Those particular strains are nevertheless good probiotic candidates for further investigations in oral biology.

[INTERNATIONAL JOURNAL OF PROBIOTICS AND PREBIOTICS, Volume 2, Number 4, pp. 233-238 \(2007\)](#)

233-238      **Probiotic Strain *Lactobacillus Fermentum* Ccm 7421, Canine Isolate Applied To Dogs Suffering From Gastrointestinal Disorders**

**VIOLA STROMPFOVÁ, MIROSLAVA MARCINÁKOVÁ, MONIKA SIMONOVÁ,  
ANDREA LAUKOVÁ, AND MÁRIA FIALKOVICOVÁ**

**ABSTRACT:** Increasing tendency of gastrointestinal diseases occurrence in dogs lead to study of natural and safe ways to treat them. In the present study, preliminary effect of *Lactobacillus fermentum* CCM 7421 strain (our canine isolate) with probiotic properties to help in the treatment of 14 dogs with clinical symptoms indicating acute or chronic disorders of gastrointestinal tract was investigated. The strain CCM 7421 was applied once a day at a dose of 3 ml/dog ( $10^9$ CFU/ml) for 7 days. The faeces and blood samples were collected before the beginning and after 7 days of application. After application, significant increase in the population of lactic acid bacteria – lactobacilli and enterococci in faeces ( $p < 0.01$ ) was determined and the counts of *Escherichia coli* in majority of dogs were reduced. Concerning the biochemical parameters, significant decrease of alanine aminotransferase in dogs with acute gastrointestinal diseases ( $p < 0.01$ ) was detected. On the other hand, an increase of total protein in dogs with hypoproteinemia was noted and regulative effect in cholesterol level, as well. Clinically, watery faeces was arranged to normal consistency in relatively short time in most of dogs. *L. fermentum* CCM 7421

seems to have beneficial effect in acceleration to recover from digestive disorders of dog; of course, further studies are necessary.

[INTERNATIONAL JOURNAL OF PROBIOTICS AND PREBIOTICS, Volume 2, Number 4, pp. 239-244 \(2007\)](#)

239-244      **Probiotics And Intestinal Permeability In Infants With Cow's Milk Allergy And Eczema**

**MIKAEL KUITUNEN, MIRVA VILJANEN, AND ERKKI SAVILAHTI**

**ABSTRACT:** Objective of this study was to assess whether probiotics affect the intestinal permeability of infants with cow's milk allergy and eczema. We studied intestinal permeability to mannitol and lactulose in 112 infants. Of them 87 infants had cow's milk allergy and 25 infants eczema but negative in the cow's milk challenge test. Infants were studied before and after one month of treatment with lactobacillus GG, a mixture of four probiotics or placebo. Before the intervention, permeability to mannitol and lactulose was similar in infants with cow's milk allergy and with eczema. Severity of eczema was not associated with increased permeability. Cow's milk elimination and treatment of eczema did not alter permeability. Lactobacillus GG reduced the permeability to mannitol in infants with cow's milk allergy compared to that of the placebo group: 6.179 to 1.486 vs. 4.056 to 4.426 respectively,  $p=0.04$  and was accompanied with an improvement of the eczema. Permeability to lactulose tended to decrease in the lactobacillus GG group, whereas in the placebo and the mixture groups no significant changes occurred. In infants with eczema no significant changes in permeability appeared. Our results suggest that the beneficial clinical effects of probiotics are accompanied by a decrease in sugar permeability.