EVALUATION OF GUT MICROBIAL ENZYME ACTIVITY AFTER CONSUMMATION OF LAUREL AND MYRTLE EXTRACT IN RAT

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Background: Polyphenols exhibit structural diversity, which impacts on bioavailability, metabolism, and bioactivity. The gut microbiota play a key role in modulating the production, bioavailbility and, thus the biological activities of phenolic metabolites, particularly after intake of food containing high-molecular-weight polyphenols. The main aim of this study was to investigate whether polyphenols alter intestinal microbiota and their enzymatic activity after intake of Laurel and Myrtle water extract and whether changes in intestinal enzyme activity affect the health of rats.

Methods: We investigated growth of lactic acid bacteria (LAB), β-glucuronidase, β-glucosidase, β galactosidase activity, body weight change and food effecacy ration after intragastric treatment of rats with Laurel and Myrtle extract at doses of 50 and 100 mg/kg during two weeks. The endogenous populations of colonic probiotic bacteria (Lactobacilli and Bifidobacteria) were counted on selective media.

Results: According to our data Laurel in the applied dose of 50 and 100 and Myrtle (100 mg/kg) positively affect the health of rats by increasing the number of colonies of Lactobacilli and Bifidobacteria compared to the control group, causes minor changes in enzyme activity, and in high doses Laurel increases food efficiency ratio, while Myrtle in a reduced dose.

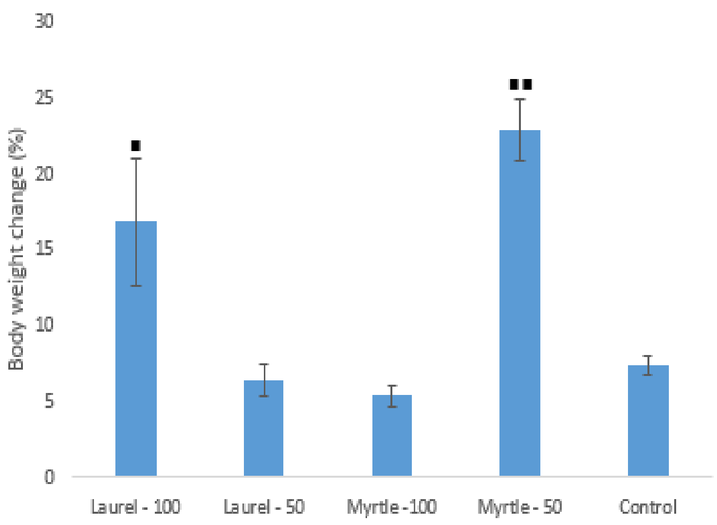

Fig. 1. The effect of Laurel and Myrtle extract on body weight change during experiment. Male rats (n=5) were administered *ig* with Laurel and Myrtle extract at a dose of 50 and 100 mg/kg once daily for 14 days. Control group was treated *ig* with saline. The results are expressed as the mean value of each experimental group ± SE of the mean of three different observations. ˙Significantly different in relation to Myrtle – 100 (˙$p < 0.05$; ¨ $p < 0.01$).

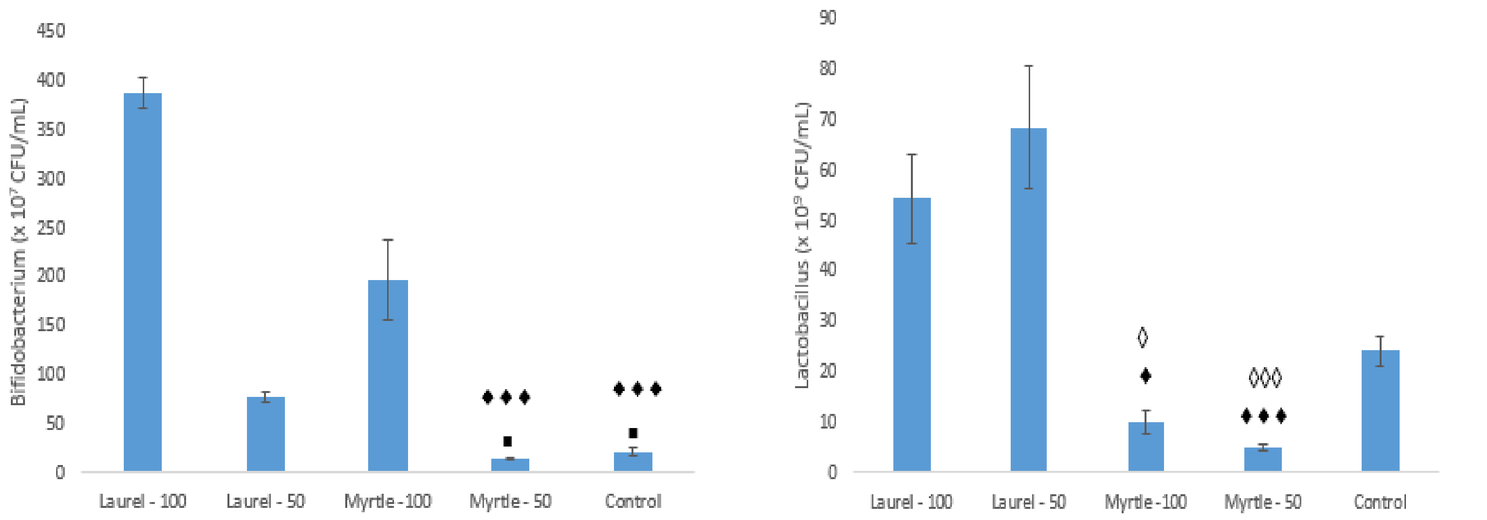

Fig. 2. The effect of Laurel and Myrtle extract on the number of colonies of Lactobacillus and Bifidobacterium formed on selective media. Male rats (n=5) were administered *ig* with Laurel and Myrtle extract at a dose of 50 and 100 mg/kg once daily for 14 days. Control group was treated *ig* with saline. The results are expressed as the mean value of each experimental group ± SE of the mean of three different observations. ♦Significantly different in relation to Laurel – 100 (♦$p < 0.05$; ♦♦♦$p < 0.001$). ˙Significantly different in relation to Myrtle – 100 (˙$p < 0.05$; ¨˙ $p < 0.01$).

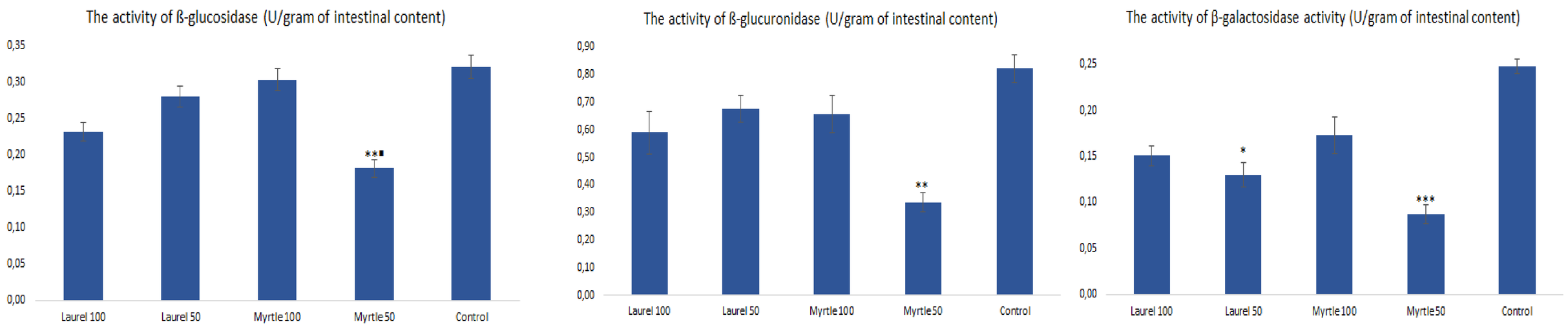

Fig. 3. The effect of Laurel and Myrtle extract on faecal bacterial enzymes β-glucosidase, β-glucuronidase and β-galactosidase activity. Male rats (n=5) were administered *ig* with Laurel and Myrtle extract at a dose of 50 and 100 mg/kg once daily for 14 days. Control group was treated *ig* with saline. The results are expressed as the mean value of each experimental group ± SE of the mean of three different observations. ˙Significantly different in relation to Myrtle – 100 (˙$p < 0.05$); *Significantly different in relation to Control (*$p < 0.05$; ** $p < 0.01$; *** $p < 0.001$).

Conclusion:

Foods with substances that promote the growth of lactic acid bacteria (LAB) play an important role in maintaing health by stimulating the immune system, protecting the host from invading bacteria, viruses and toxins, enhancing signaling in host cells to reduce inflammatory response, and aiding digestion and assimilation of food. These bacteria create conditions unfavorable for the growth of potentially pathogenic species by producing strong acids as metabolic end products (acetate, lactate), organic acids, hydrogen peroxide and bacteriocins and they play a role in synthesizing B vitamins, folic acid, vitamin K and lysozyme as well as metabolizing bile acids, sterols and xenobiotics. Metabolism and degradation of polyphenols by lactic acid acidic bacteria can also provide additional benefits through the phenol acid reduction process can participate in the re-oxidation of the reduced NADH cofactor and thus provide energy benefit through NAD regeneration.

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