

## ANALYSIS OF PROTECTOR MECHANISM OF PROBIOTICS USING DNA COMET ASSAY

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**Introduction.** Ecology affects human organism by causing breaks in DNA and, therefore, induce mutations and malignant cell formation. Comet assay is a quantitative method that allows to measure DNA damage in eukaryotic cells (Liao, McNutt, & Zhu, 2009). This method is widely used in areas, such as human biomonitoring, genotoxicology, and ecology. Comet assay is also called a single-cell gel electrophoresis. Thus, the products of electrophoresis are analyzed under the fluorescent light, which makes it similar to comets. DNA strand breaks are detected by comparing the intensity of the comet tail relative to the head (Collins, 2004). Probiotics containing *Lactobacillus rhamnosus* were used, as *Lactobacilli* probiotics were found to be safe and effective against urogenital diseases, food hypersensitivity, and dental caries (Lebeer, Vanderleyden, & De Keersmaecker, 2008). The aim of the research was to study DNA protector mechanism for three probiotic products, containing *L. rhamnosus*.

**Materials and methods.** Probiotics containing *Lactobacillus rhamnosus*, *L. rhamnosus* and aloe extract, and *L. rhamnosus* and rhodiola rosea were incubated with NT29 cancer cells to test their protective activity. Broken DNA fragments were separated and recognized using gel electrophoresis and DNA comets were analyzed using the DNA comet assay (MP 4.2. 0014 - 10). Finally, the results were interpreted with the TriTek CometScorePro program. Index of the damaged DNA was calculated using the formula: ID (Index of damaged DNA) = (% DNA tail in the experimental group) / (% DNA tail in the control group).

**Results and discussion.** Index of damaged DNA of probiotics were 0.6 for *Lactobacillus rhamnosus*, 0.9 for *L. rhamnosus* and aloe extract, and 1.0 for *L. rhamnosus* and rhodiola rosea, compared to the control (undamaged cells) that had an index equal to 0.3. This shows that all of the three probiotics are effective in protecting the DNA from being damaged. *L. rhamnosus* probiotic was found to be the most effective among the other two having the least index of damage.

**Conclusions.** DNA comets assay is a good method which allows testing the protective potential of products being produced. Our probiotics, which constituted of the *Lactobacillus rhamnosus* were found to be effective protective products. The indexes of damaged DNA were significantly low, which provides the evidence that the products have efficacious protective functions.

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### References.

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