

# SCREENING OF PROBIOTIC STRAINS OF BACTERIA WITH HIGH OXALATE-DEGRADING ACTIVITY

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**Motivation.** Excessive amounts of oxalate in the human body can be the cause of various pathological conditions, including hyperoxaluria [1]. In humans, there are no enzymes that provide the metabolism of oxalate. Human organism lack enzymes that provide the metabolism of oxalate [2]. Oxalate level can be decreased through the microorganisms that present in the gastrointestinal tract [3]. Recently, *in vivo* studies have been conducted to determine the oxalate degradation properties of microorganisms, which is a prospect to prevent kidney stone disease.

**Purpose.** Determine the oxalate degrading properties of existing probiotic drugs and newly isolated bacterial strains.

**Materials and methods.** The object of the study was newly identified strains of microorganisms from various sour-milk products (leaven, sour milk, sour cream) and probiotic drugs ("Enterogermina", "SANOFI-AVENTIS.S.p.A.", Italy; "Subalin", "BIOFARMA" LLC, Ukraine). Identification of strains was carried out using the ANAEROtest test system 23 (Erba Lachema, Czech Republic). Oxalate-degrading activity (ODA) was determined on the medium Oxalate Medium (contains sodium oxalate as the sole source of energy and carbon), MRS Broth+sodium oxalate for lactic acid bacteria and MPB+sodium oxalate for probiotic drugs "Enterogermina" and "Subalin". The ODA was determined using redoximetric titration (with KMnO<sub>4</sub>), in dynamics of 24, 48 and 72 hours. ODA expressed in %.

**Results.** From the sour-milk products, 12 strains of bacteria were isolated, among which 5 strains showed ODA. These strains were identified as *Lactobacillus nagelii* 32 (Ln-32), *Lactobacillus rhamnosus* K7 (Lr-K7), *Lactobacillus rhamnosus* K8 (Lr-K8), *Lactobacillus frumenti* K9 (Lf-K9), *Lactobacillus nagelii* C12 (Ln-C12). Strains Lr-K7, Lr-K8, Ln-C12 have not shown grows on the Oxalate Medium (OM) medium. On the MRS Broth+sodium oxalate their ODA ranged from 1-5%. The highest level of ODA showed strain Lf-K9, the percentage of ODA in the OM amounted on 24 h - 23%, 48 h - 48% and 72 h - 52%. The Ln-32 strain on the OM medium metabolized on 24 h - 17%, 48 h - 34%, 72 h - 35%. Probiotics "Enterogermina" and "Subalin" showed a moderate ODA that was higher in the OM environment and ranged from 7-24%, and on the medium MPB+sodium oxalate from 5-18%.

**Conclusions.** 1) Thus, for further study with the prospect of the creation of probiotic drugs with high ODA, two strains of *Lactobacillus nagelii* 32 and *Lactobacillus frumenti* K9 were selected. 2) Probiotic drugs "Enterogermina" and "Subalin" have a moderate ODA.

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