

## **BIOTEHNOLOGICAL POTENTIAL OF AUTOCHTHONOUS LACTIC ACID BACTERIA ISOLATED FROM RAW GOAT MILK**

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Milk and dairy products are included as important elements in a healthy and balanced nutrition because they represent an important source of protein and calcium. They contain as well many nutrients and provide an efficient and simple way of supplying these nutrients to the low calorie diet. The nutritional importance of milk reinforces the role of its consumption in order to prevent several chronic conditions like cardiovascular diseases, some forms of cancer, obesity, and diabetes. Dairy products have a great economic value and have been accepted as products contributing to the improvement of human health [1].

A significant interest represents goat milk, its chemical composition being similar to human milk. The basic nutrient composition of goat milk resembles cow milk, where both types of milk contain substantially higher protein and ash, but lower lactose content than human milk [2]. The goat milk from French-Alpine and Anglo-Nubian breeds showed higher Ca, P, K, Mg, and Cl content. Variation in the chemical composition of goat milk is, however, highly seasonal. Goat milk and its processed products are considered one of the healthiest foods and very useful functional food for young and elderly.

Nowadays there is a shortage of scientific literature on the importance of goat milk in human nutrition. Globally, the majority of the population drinks goat milk in comparison with other types of milk. Also goat milk has been recommended as a substitute for more allergenic cow milk or other food sources [3].

The importance of goats as providers around the world of essential food in meat and dairy products has been discussed and documented in many recent proceedings of national and international conferences [4,5-10]. The use of goat milk as an excellent food source is undeniable. It has beneficial effects for health maintenance and physiological condition of children and elderly people.

Goat (*Capra hircus*) milk production is of significant importance to the economy and survival of large populations of many countries in the world: in developing countries (i.e. Asia, Africa, the Middle East and Mediterranean countries and South America) as well as in developed countries (i.e. Europe, North America and Oceania) [11, 12].

Milk and its processed product represent one of the growth media for lactic acid bacteria.

Lactic acid bacteria are group of Gram-positive, anaerobic, non-spore forming cocci or rods, which produce lactic acid as the major end- product of the fermentation of carbohydrates. This group includes members of the genera *Lactobacillus*, *Lactococcus*, *Pediococcus* and *Leuconostoc*. Generally recognized as safe for human consumption, these microorganisms have been used worldwide in food fermentation process. [13, 14, 15].

In addition, they strongly contribute to the flavor, texture and nutritional value of food and feed products. In biotechnological aspect, the “wild” strains of the LAB are prospective bacteriocin producers [16].

In Republic of Moldova goat dairy products are produced in small individual farms. The aim of this work was the determination of biotechnological potential of the autochthonous lactic acid bacteria from Moldavian raw goat milk. Samples of raw goat milk were collected from farms of different region of Republic of Moldova (North – Soroca, Center – Chisinau, South - Taraclia).

Microbiological and biochemical classical tests for lactic acid bacteria in modification by V.Bogdanov [17], L.Bannikova, V. Semenihina, and N.Coroliova [18] were used, in compliance with the rules for microbiological examinations according SM ISO 7218 SR [19].

The investigation of physiological, biochemical, microbiological, sensorial and technological characteristics of lactic acid bacteria strains were undertaken in the Laboratory of Food Biotechnology.

Gram staining, cell morphology, biochemical test, sugar fermentation, growth at different temperatures and sodium chloride tolerance studies were performed for all isolated strains.

For the enrichment culture were used semi-selective media at 30°C and 40 °C. Cultures capable to coagulate the milk in 24 hours were selected. In total were selected 78 isolates, among which 8 strains were found to be species belonging to the lactic acid bacteria. Selected strains were characterized for their morphology by Gram staining and microscopy. The colony morphology on Hydrolyzed Skim Milk Agar was: cream color, round, granular, lenticular, with the size ranging from 0,1 to 0,4 mm. The microscopic examination showed that isolates are Gram-positive cocci or diplococci with arrangement in short and medium chains (Figure 1).

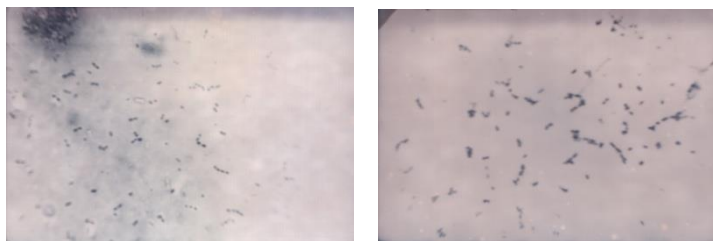


Figura 1. *The microscopic appearance of lactic acid bacteria cells*

The selected strains were able to grow exclusively at 30°C, to coagulate milk in 18 hours, to ferment such sugars as galactose, manose, glucose and lactose. All of isolates were homofermentatives, catalase-negatives that showed resistance in such conditions as: heating at 60 °C for 30 min, 2% and 4% NaCl in culture media, pH 9.2. Some cultures produced NH<sub>3</sub> from arginine that is characteristic only for mesophilic lactic acid bacteria.

Thus, the screening of 78 isolates from Moldavian raw goat milk led to the identification of 8 strains of lactic acid bacteria: 6 strains of *Lactococcus lactis subsp. lactis* and 2 strains of *Lactococcus lactis subsp. cremoris*.

The results of physiological and biochemical tests showed the high biotechnological potential of isolated cultures, so the selected autochthonous strains can be used in composition of starter cultures.

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