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SCREENING FOR TECHNOLOGICAL PROPERTIES OF CORYNEFORM BACTERIA PROMISING IN SMEAR-RIPENED CHEESE PRODUCTION

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Abstract. The technological properties (psychrotrophicity, halotolerance, and acid tolerance) of coryneform bacteria strains belonging to the genera *Arthrobacter*, *Brevibacterium*, *Corynebacterium*, and *Brachybacterium*, isolated mainly from milk and cheese, were investigated. Based on a combination of features (ability to grow at 12–15 °C, in the presence of 3–7 % NaCl, and at pH 5.5–7.0), *Brevibacterium* and *Corynebacterium* strains promising for use in smear-ripened cheese production were selected.
Keywords: coryneform bacteria, technological properties, smear-ripened cheeses.

Coryneform bacteria play an important role in the production of smear-ripened cheeses. The characteristic taste, aroma, soft texture, and edible orange smear rind of these cheeses are formed as a result of the activity of a complex surface microbiome consisting mainly of coryneform bacteria, including *Brevibacterium*, *Corynebacterium*, *Arthrobacter*, *Glutamicibacter*, *Microbacterium* and several other genera, as well as salt-tolerant yeasts (Ritschard & Schuppler, 2024). The specific ripening conditions and the biochemical and functional potential of the aerobic smear microbiota contribute to the high nutritional and biological value of these products. The ripening process of such cheeses is controlled by regular surface treatment with a brine solution inoculated with *Brevibacterium linens*, which may be supplemented by other coryneform bacteria (particularly *Corynebacterium casei* and *Arthrobacter* spp.) as well as the yeast *Debaryomyces hansenii* (Bockelmann et al., 2003). Because smear-ripened cheeses ripen at low temperatures, high salt concentrations, and moderately acidic initial pH values, pronounced psychrotrophic capacity, halotolerance, and acid tolerance are among the principal technological characteristics required of coryneform bacteria used as adjunct starter cultures.

The production of smear-ripened cheeses is mainly concentrated at small craft creameries, which actively continue their development in Ukraine despite the military action (Peshuk et al., 2025). Given that the current ripening technology for these cheeses relies on imported commercial *B. linens* starter cultures used either as monocultures or as components of multistrain starter preparations, the selection of domestic *B. linens* strains is very promising. This will allow the creation of unique, high-quality ethnic cheeses with authentic flavour profiles that can compete on the foreign market.

The purpose of this study was to screen strains of coryneform bacteria from the Ukrainian Collection of Microorganisms (UCM) whose technological properties meet the requirements for adjunct cultures used in the production of smear-ripened cheeses.

The study included 43 collection strains of saprophytic coryneform bacteria of the genera *Brevibacterium*, *Arthrobacter*, *Corynebacterium*, and *Brachybacterium* isolated from milk and dairy products. The cultures were maintained on Corynebacterium agar medium

(https://www.dsmz.de/?id=441). Strain tolerance to temperature, NaCl concentration, and initial medium pH was examined in the same medium without agar. Strain growth was evaluated after 14 days of incubation by measuring the optical density of the culture broth at 540 nm using a KFK-2MP photoelectric colorimeter; medium pH was measured with an I-160MI laboratory ion meter. Uninoculated medium served as the control. The ability of the strains to grow at different temperatures was examined at 12–37 °C; osmotolerance was evaluated at NaCl concentrations of 3–15 %; and tolerance to active medium acidity was determined in the initial pH range of 4.5–7.0. It was established that the examined strains exhibited significant thermotolerance: all of them grew at 25–28 °C, 79.0 % were capable of growth at 12–15 °C, 88.4 % at 37 °C, and 83.7 % at 42 °C. The coryneform bacteria showed a high degree of salt tolerance: all strains grew at NaCl concentrations of 3–5 %, the vast majority (91 %) were resistant to 7 % NaCl, and a significant proportion (65 %) to 10 % NaCl. The highest NaCl tolerance was observed in 53 % of the strains belonging to *B. aurantiacum*, *B. linens*, and several *Corynebacterium sp.* which grew actively at a 15 % NaCl concentration. Assessment of growth capacity at different initial pH values showed that all strains grew efficiently at pH 6.5–7.0, whereas 97 % demonstrated growth at pH 6.0. A majority of the strains (79 %) were resistant to pH 5.5, but only 21 % retained viability at pH 5.0. None of the strains grew at pH 4.5.

The study resulted in the selection of coryneform bacteria strains belonging to the genera *Brevibacterium* and *Corynebacterium* that met the main technological requirements for their use as adjunct cultures in the production of smear-ripened cheeses.

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VITASERGIA SVIDASOMA IMV F-100106 – A NOVEL ENDOPHYTIC YEAST FROM *TUBER MELANOSPORUM* AND ITS USE IN SUSTAINABLE AGRICULTURE AND RESTORATION OF MILITARY-DEGRADED SOILS

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Abstract A novel endophytic yeast fungus, *Vitasergia svidasoma* IMV F-100106 (PRJNA807518), belonging to the family *Debaryomycetaceae*, was isolated from the fruiting body of *Tuber*