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POTENTIAL PROBIOTIC PROPERTIES AND IN VIVO EFFECTS OF *SACCHAROMYCES CEREVISIAE* CL4

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Abstract. *Saccharomyces cerevisiae* CL4 was evaluated as a potential probiotic strain based on stress tolerance, safety-related properties, microbial interactions, and effects in rats. The strain grew at 37 °C and showed 71.0 % survival at pH 2.5 and 83.2 % survival under simulated gastric conditions. No hemolytic activity was detected. CL4 did not inhibit *Candida albicans*, but altered the phenotype of *Pseudomonas aeruginosa*, an effect also reproduced by cell-free culture fluid. In rats with metabolic syndrome, CL4 administration increased superoxide dismutase activity and affected other antioxidant defense parameters.
Keywords: *Saccharomyces cerevisiae*, probiotic yeast, antioxidant defense, tolerance assay, microbial interactions.

Probiotic yeasts are gaining increasing attention because of their ability to survive gastrointestinal conditions and potentially modulate host physiology. However, these properties are strongly strain-dependent, emphasizing the need for individual characterization of candidate strains (Ruchała, et al., 2026; Nenciarini, et al., 2024). Some studies using animal models also indicate the ability of probiotic yeasts to influence metabolic processes in the host organism, including carbohydrate and lipid metabolism and antioxidant defense (Egea, et al, 2023). The present study evaluated selected probiotic-associated properties of *Saccharomyces cerevisiae* CL4 and its effects on metabolic and antioxidant parameters in laboratory rats.

The obtained results indicate the tolerance of the studied strain to physiological temperatures of 28 and 37 °C, but not that of 42 °C, and to modeled conditions of the internal environment of the organism, the viability of cells being 71.0 % and 83.2 % after exposure to low pH and modeled gastric conditions respectively, compared with 45.7 % and 71.9 % for the reference strain *S. cerevisiae* BY4742.

The spot-on-lawn assay of the strain microbial interactions, no inhibition of *C. albicans* growth was observed under the tested conditions. In contrast, interaction with *P. aeruginosa* resulted in a distinct greenish-blue zone of altered bacterial phenotype. A similar effect was produced by cell-free culture fluid, suggesting the involvement of extracellular diffusible factor(s), although classical antibacterial activity was not demonstrated.

In rats with experimentally induced metabolic syndrome, administration of CL4 was associated with an 82.4 % increase in superoxide dismutase activity compared with the untreated metabolic-syndrome group, accompanied by changes in other components of the antioxidant defense system, including glutathione peroxidase activity and reduced glutathione levels.

Thus, *S. cerevisiae* CL4 combines several properties relevant to its probiotic potential, including tolerance to acidic and simulated gastric conditions and absence of detectable hemolytic activity. The observed modulation of the *P. aeruginosa* phenotype and changes in antioxidant defense parameters warrant further investigation of the mechanisms, safety, and probiotic efficacy of this strain.

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MULTIDRUG RESISTANCE AND PANDRUG RESISTANCE GENES IN CLINICALLY IMPORTANT BACTERIAL VARIANTS

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Abstract. Mine-blast injuries pose a high risk of developing purulent complications caused by ESKAPE pathogens, which are characterized by multidrug resistance and pandrug resistance to antibiotics. Resistance genes are located on plasmids or within chromosomes and are capable of horizontal transfer within biofilm resistomes. Bacterial antibiotic resistance is combined with virulence factors. For the diagnosis of the wound healing process, it is advisable to employ rapid methods for detecting bacteria and resistance genes.
Keywords: antibiotic resistance genes, ESCAPE bacteria, purulent wounds.