

FRIDAY - 728 / FRIDAY - 728 - The Combined Effects of Electromagnetic Radiation and Low Concentration of Sulfur Dioxide on Growth and Survival of Wine Lactic Acid Bacteria

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📍 Exhibit Hall D, Exhibit and Poster Hall

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Disclosures

D. Soghomonyan: None. **S. Blbulyan:** None. **M. Baghdasaryan:** None. **A. Trchounian:** None.

Abstract

Background: *Lactobacillus spp.* could contaminate wines, when malic-lactic fermentation harmful and acid levels reduced. They could produce compounds, which are affecting consumer's health and change organoleptical properties of wine. As antimicrobial agent traditionally used, sulfur dioxide (from potassium metabisulfite $K_2S_2O_5$ (E-224)) additive wine, that is protecting wine color and flavor, but is allergenic at high levels. It was shown that electromagnetic irradiation (EMI) suppress the growth and survival of lactic acid bacteria (LAB). **Methods:** In this research it was investigated the combined effects of very low concentration (~10 times lower than used in wine industry) of $K_2S_2O_5$ (24 mg/ml) and low intensity (the flux capacity of 0.06 mW/cm²) EMI at the frequencies 51.8 GHz and 53 GHz (after 1 h exposure) on bacterial specific growth rate and colony forming units (CFU) number of *Lactobacillus paracasei* spp. *paracasei*, at low pH (pH 3.7), which is closed to wine pH. **Results:** According to the results, $K_2S_2O_5$ decreased growth rate in ~2 fold and CFU number in ~2.3 fold while EMI at both frequencies decreased growth rate in ~1.6 fold and 1.8 fold, respectively, compared with the control samples. After combination of EMI of both frequencies and $K_2S_2O_5$, growth rate decreased in ~2.5 fold and ~3 fold, respectively. At the same time, the CFU number was decreased in 10² times compared with non-irradiated samples.

Conclusions: Hence, it follows that EMI enhanced the effects of $K_2S_2O_5$ even at its very low concentration. The obtained results could be useful in food, particularly, in wine industry.