

Investigations regarding the efficacy of several cosmetic preservatives

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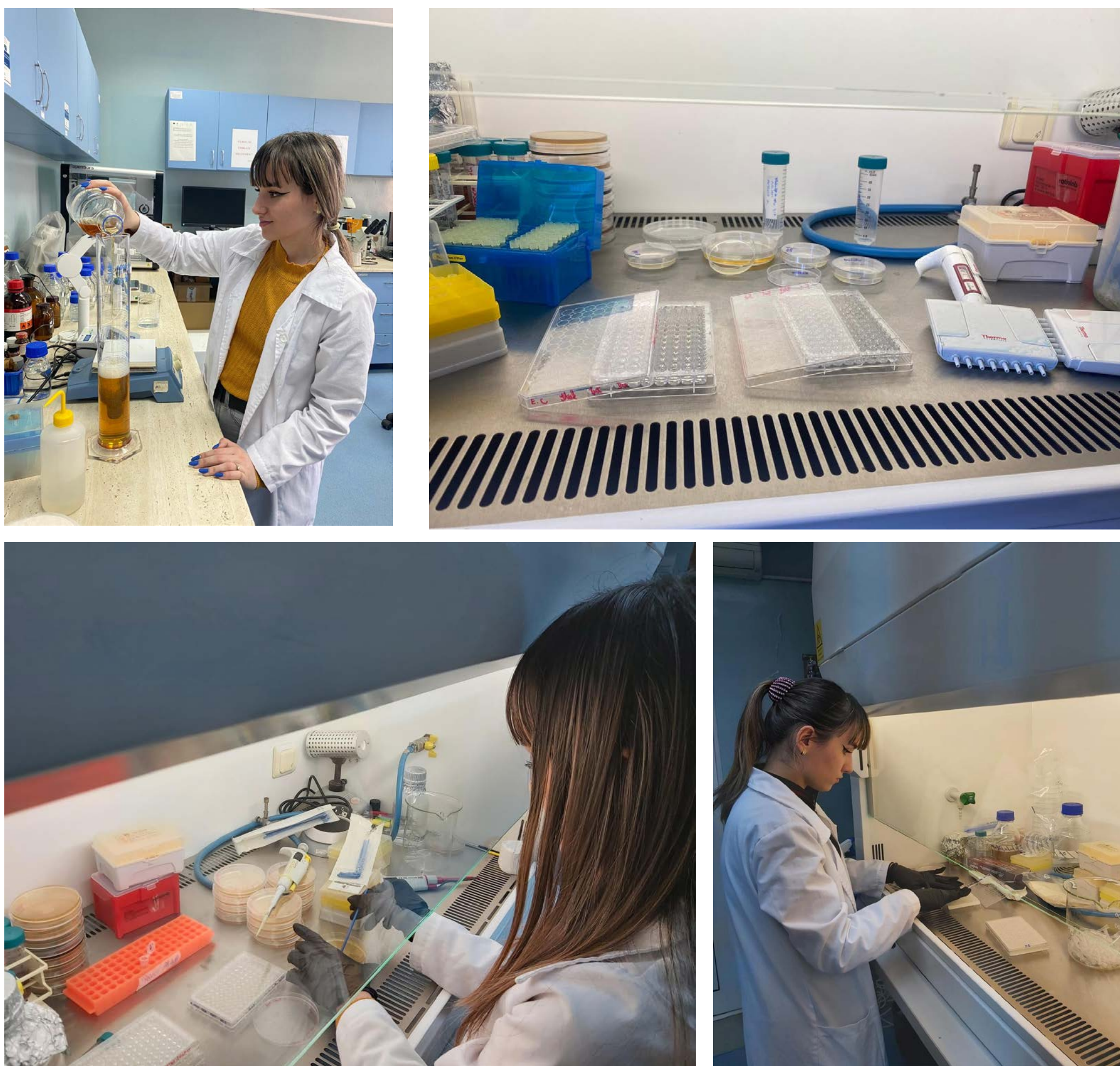
Abstract: The average adult today uses between 7 and 12 personal care products a day. The quality of cosmetics is therefore very important. The incorporation of preservatives in cosmetics is necessary to prevent the growth of various microorganisms and damage to cosmetics. In this work, the efficacy of three cosmetic preservatives: sodium metabisulphite, sodium salicylate and salicylic acid at different concentrations (0, 1, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 mM) on four bacterial strains: *Escherichia coli*, *Staphylococcus aureus*, *Enterobacter cloacae*, and *Pseudomonas aeruginosa* was investigated.

Introduction

Cosmetic preservatives are chemicals used in cosmetics to prevent or slow down the degradation of cosmetics caused by the growth of microorganisms such as bacteria, moulds and fungi. These substances are essential for maintaining the safety and stability of cosmetic products during use. The main role of cosmetic preservatives is to prolong the life of cosmetic products by preventing contamination and damage.

Material and method

Different concentrations of sodium metabisulphite, sodium salicylate, salicylic acid (0, 1, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 mM) were mixed with Luria Bertani culture medium and 1 μ L of each strain (*Escherichia coli*, *Staphylococcus aureus*, *Enterobacter cloacae*, and *Pseudomonas aeruginosa*). Optical density (OD) at 600 nm was measured initially (time 0) and after 24 hours of incubation at 35°C with agitation at 100 rpm. The change in optical density (OD) was calculated for each concentration of the chemicals by subtracting the initial OD value (time 0) from the OD value after 24 hours of incubation.



Results and discussions

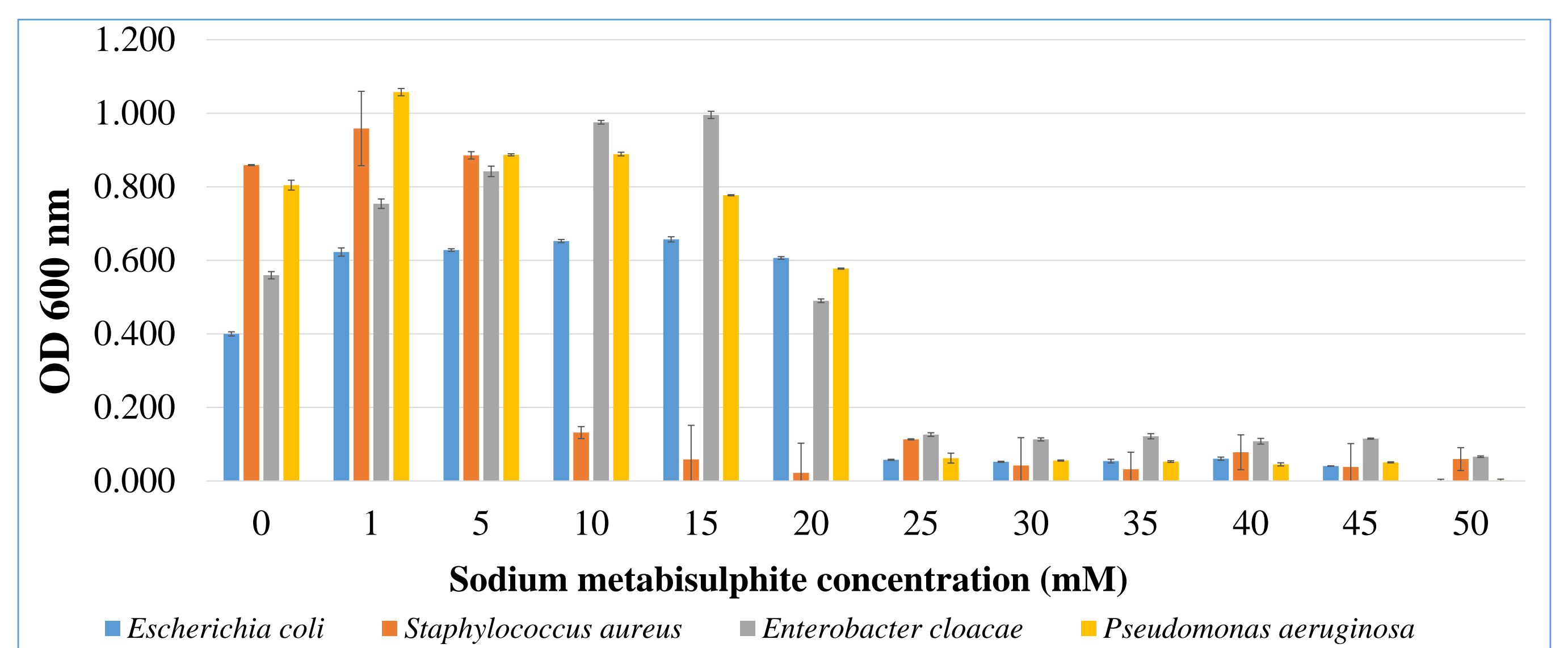


Fig. 1. Effect of sodium metabisulphite on different strains of microorganisms

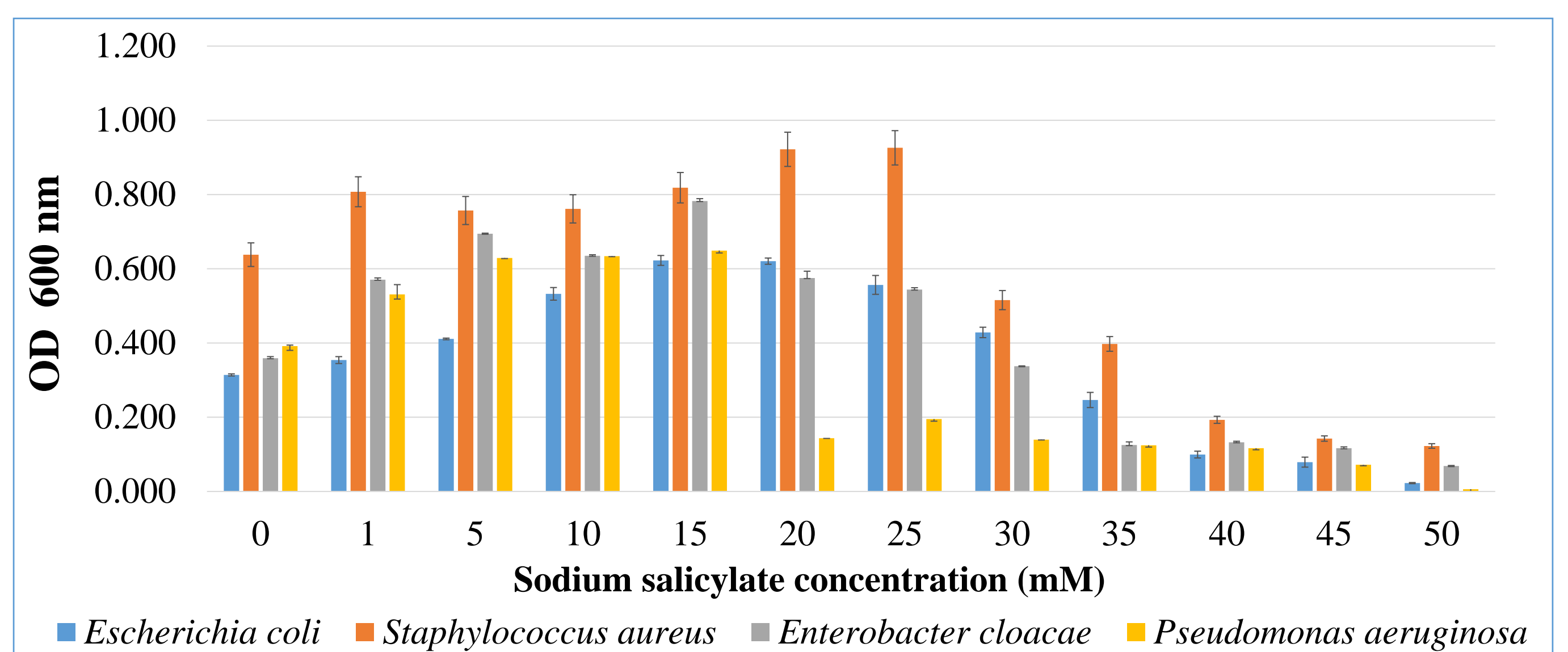


Fig. 2. Effect of sodium salicylate on different strains of microorganisms.

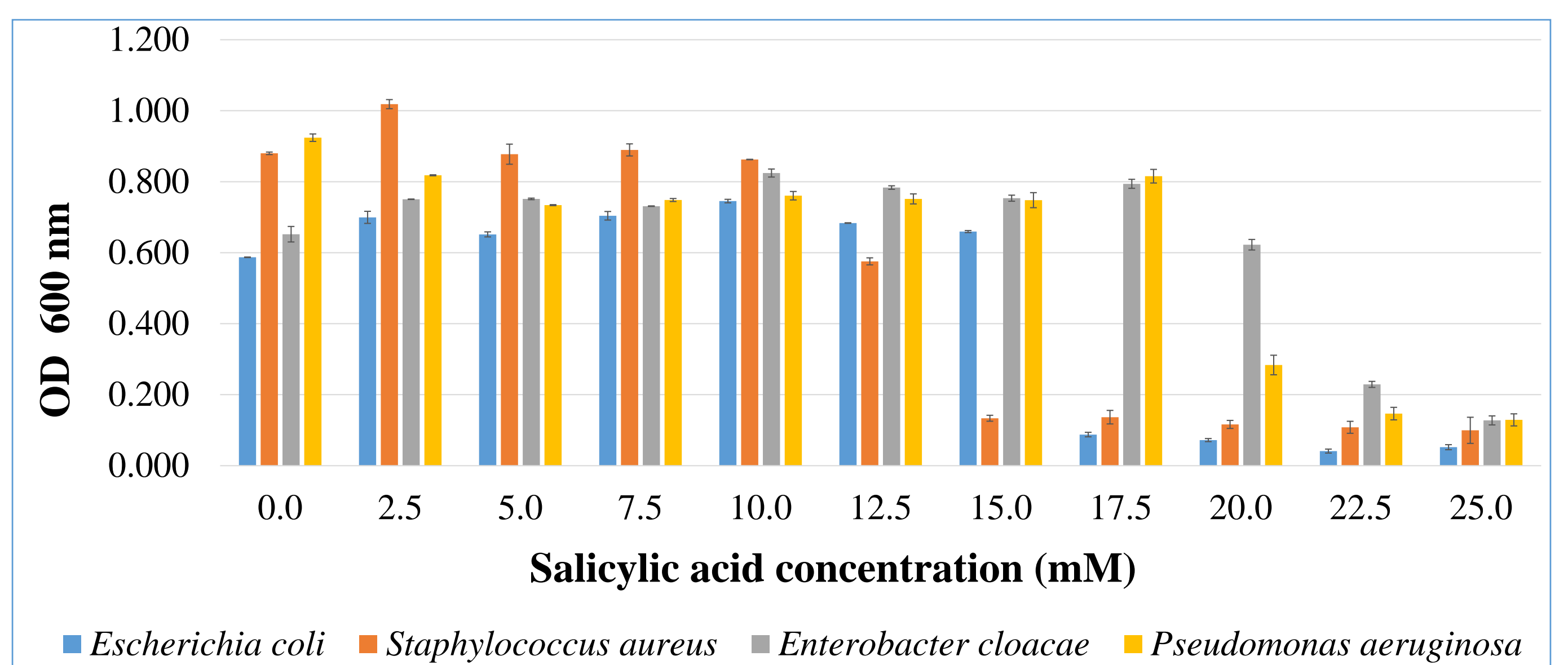


Fig. 3 Effect of salicylic acid on different strains of microorganisms

Conclusions

The results showed that the growth of the bacterial strains is different depending on the preservatives used. Sodium metabisulphite is the most effective preservative, having a bactericidal effect on all strains used. Sodium metabisulphite inhibited bacterial growth starting at a concentration of 20 mM, sodium salicylate inhibited bacterial growth starting at a concentration of 30 mM, and salicylic acid inhibited bacterial growth starting at a concentration of 20 mM. Viability tests shown that metabisulphite had a bactericidal effect, while sodium salicylate and salicylic acid had a bacteriostatic effect. Therefore, the preservatives used have an antimicrobial effect with impact on some pathogenic strains and can be considered highly effective in cosmetic products.

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