

## EXPLORING THE EFFECT OF THREE COSMETIC NUTRIENTS ON SEVERAL BACTERIAL STRAINS

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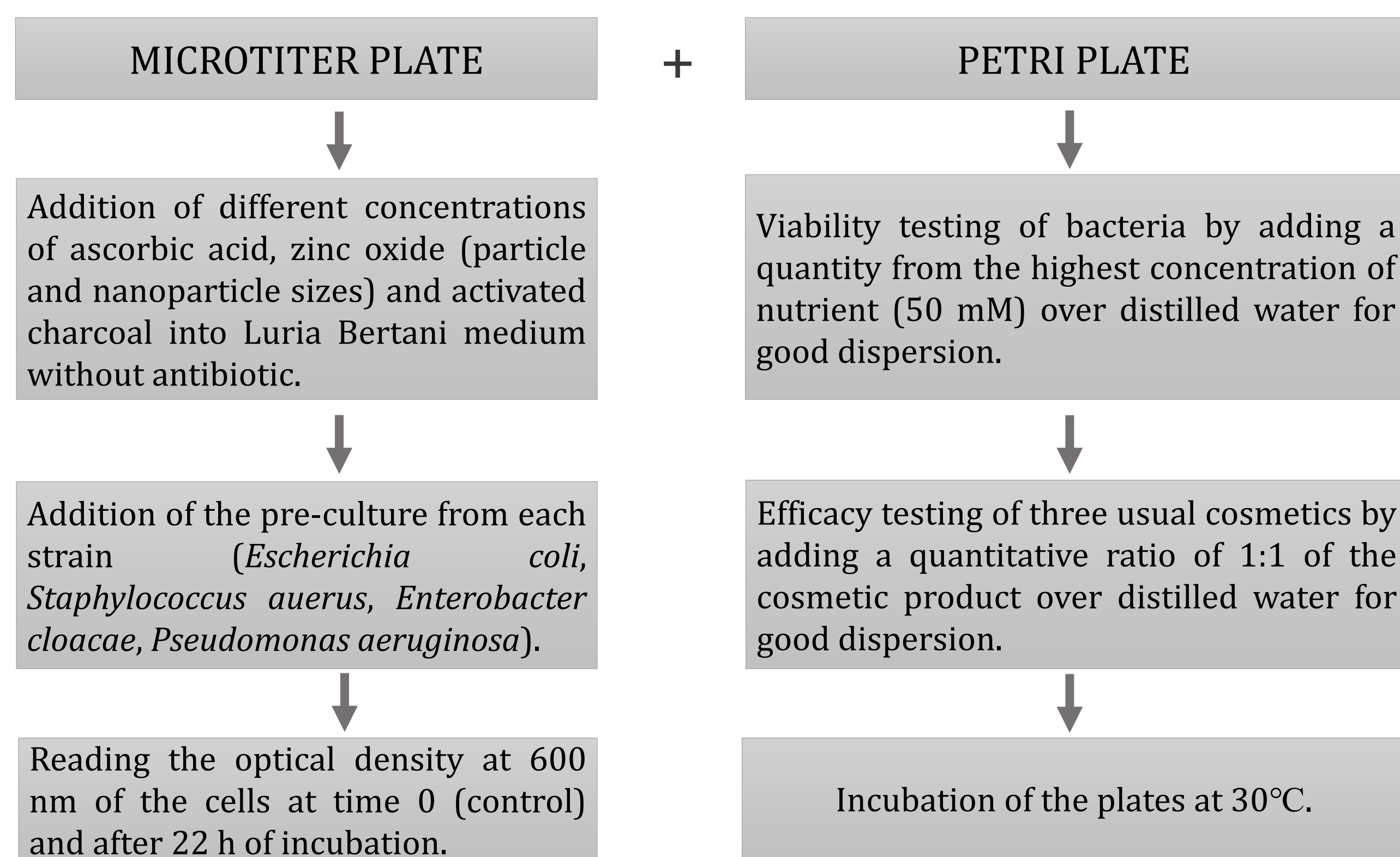
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**Abstract:** Nutricosmetics is the newest trend in the beauty industry. Nutricosmetics are products and ingredients such as peptides, proteins, vitamins, carotenes, minerals, omega-3 fatty acids, added to various cosmetics or dietary supplements to maintain the natural beauty of skin, nails and hair. This research focused on determining the effect of three cosmetic nutrients: ascorbic acid, zinc oxide (particle and nanoparticle sizes) and activated charcoal at different concentrations (0, 1, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50 mM) on several bacterial strains: *Escherichia coli*, *Staphylococcus aureus*, *Enterobacter cloacae*, and *Pseudomonas aeruginosa*. In addition, in this study, microbiological quality tests in three different cosmetic products containing several nutrients (day cream with skin protection factor, micellar cleansing water with ascorbic acid and face mask with snail extract) showed high quality.

### Introduction

Nutrition has a major impact on strengthening the skin's ability to fight off harmful factors. Nutricosmetics are defined as the intersection of nutrition and cosmetics. They are becoming increasingly popular as people become more conscious of the meals and supplements they consume, choosing natural sources that can restore and improve overall body and skin health without causing damage. The term "cosmetics" was coined to define products that were classified as cosmetics, but attempted to provide benefits more along the lines of a pharmaceutical product. Ultimately, nutricosmetics describe the synergistic use of nutritional supplements to improve the appearance of the skin. In some cases, this can mean that a skin cream is sold in the same packaging as an ingestion. Thus nutricosmetics show maximum effect when consumed in conjunction with the application of cosmetics to the skin, and *vice versa*, defining a vast beauty industry.

### Materials and methods



### Results and discussions

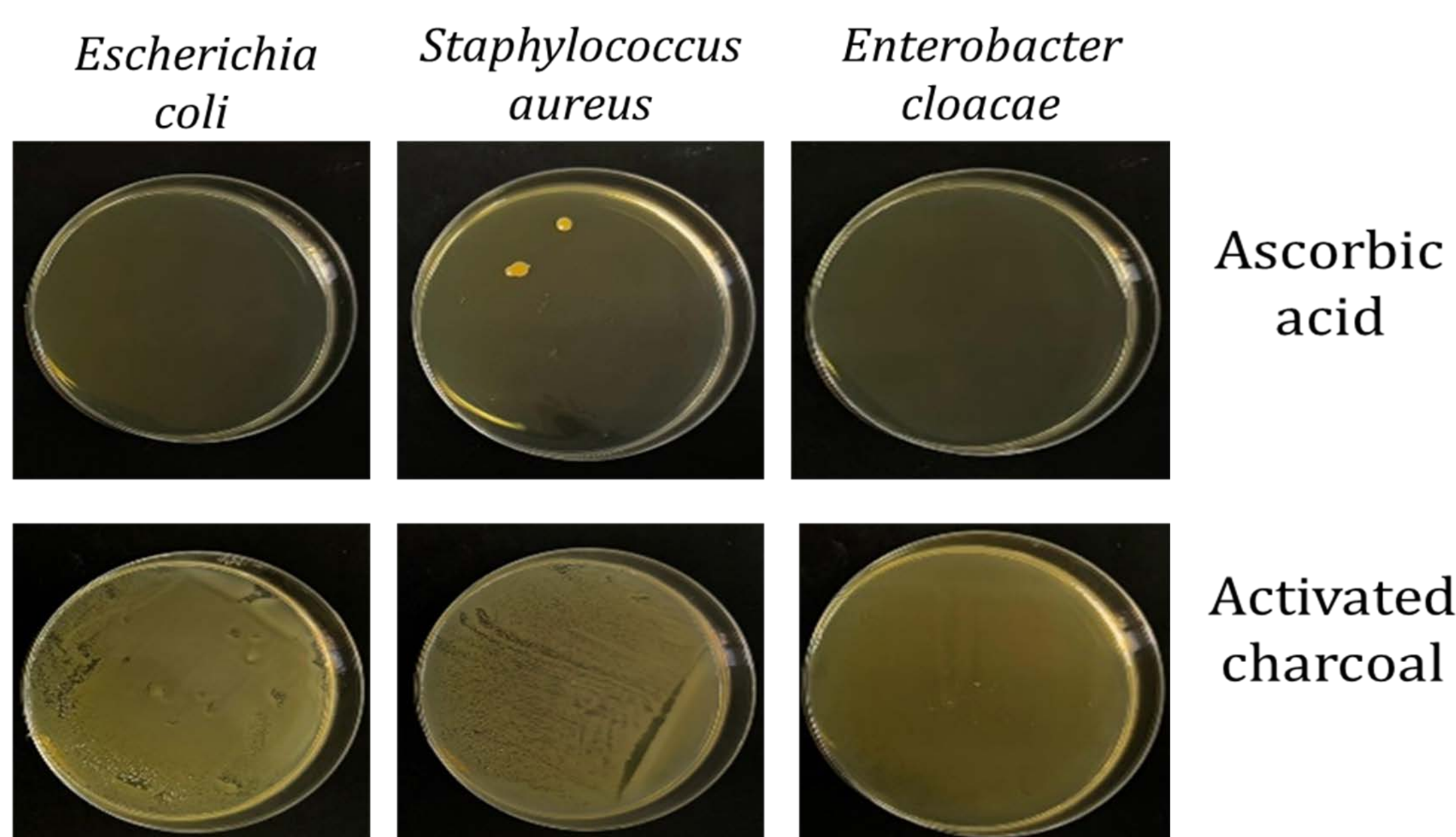


Fig. 1. Viability test of different bacterial strains, on 50 mM concentration of nutrients.

### Results and discussions

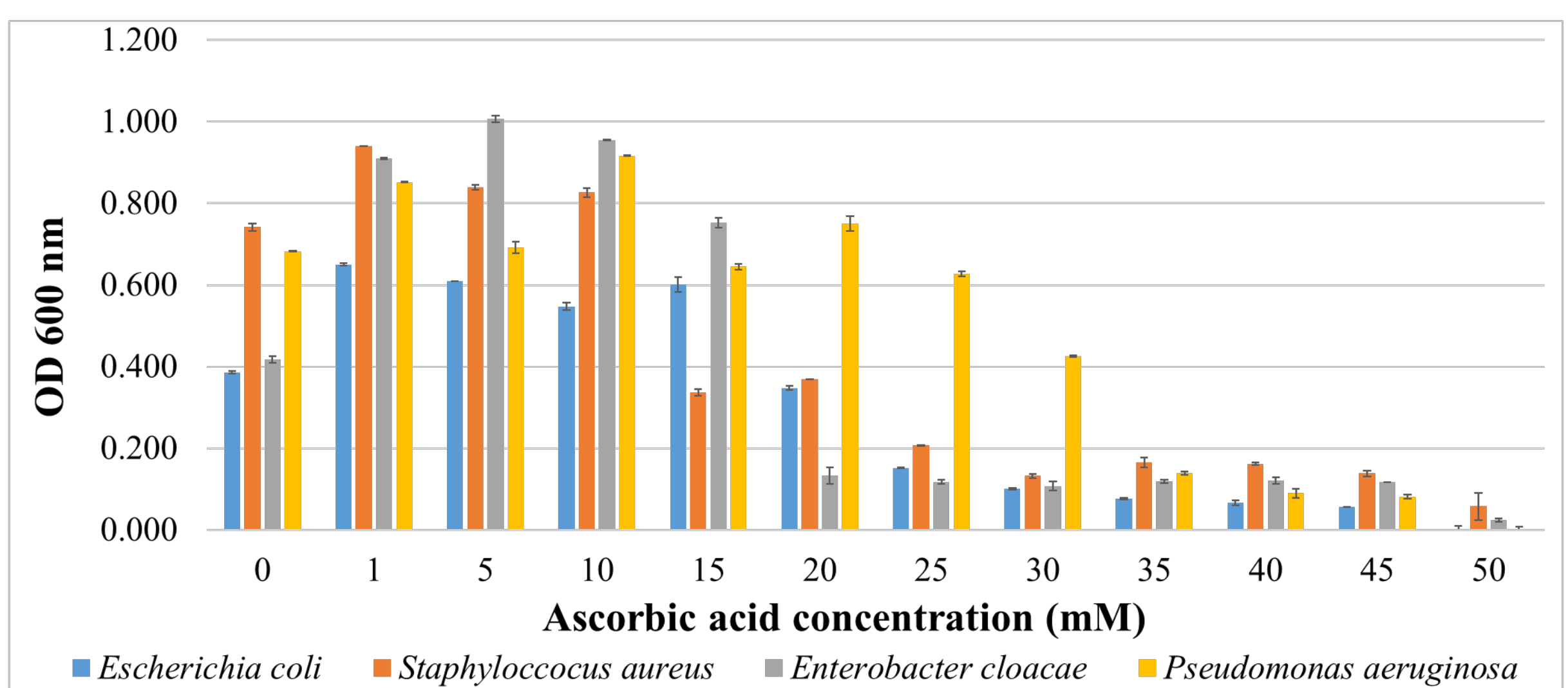


Fig. 2. Inhibitory effect of different bacterial strains in the presence of ascorbic acid

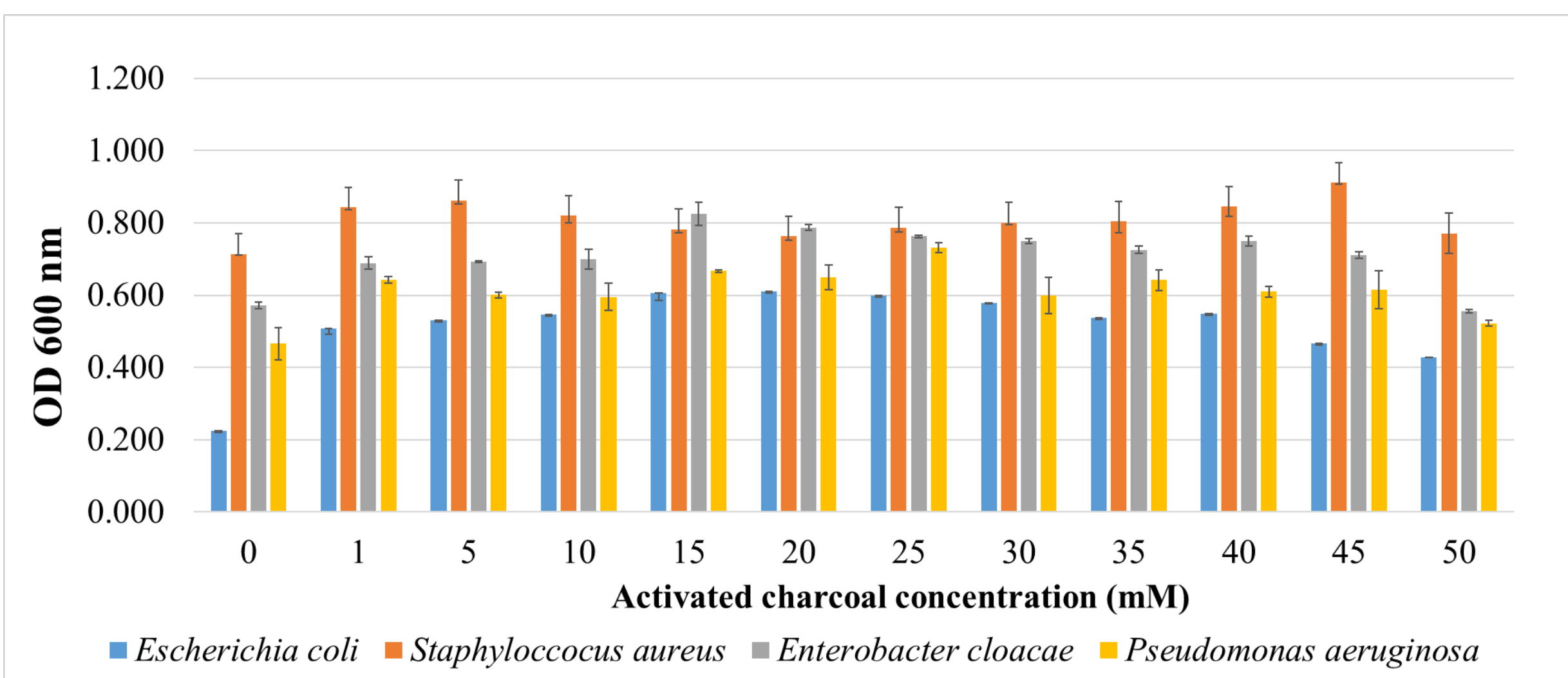


Fig. 3. Effect of activated charcoal on different bacterial strains

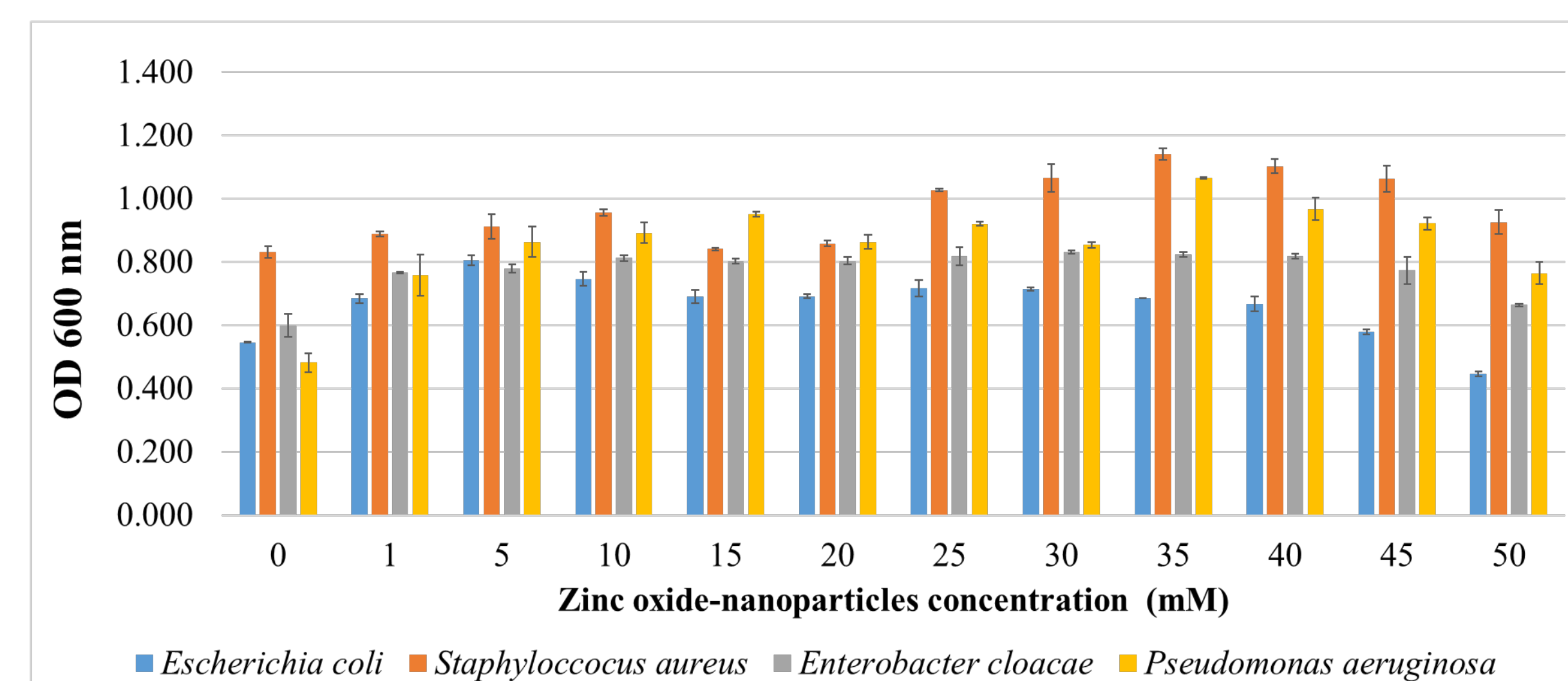


Fig. 4. Effect of zinc oxide nanoparticles on different bacterial strains

### Conclusions

The results showed that only ascorbic acid had an inhibitory effect on the growth of all bacterial strains, starting at 35 millimolar. Under working conditions, the other cosmetic nutrients had a stimulatory effect on bacterial growth. At 50 mM concentration, ascorbic acid had bactericidal effect on all bacterial strains used, except *Pseudomonas aeruginosa*. Nutrients such as activated charcoal and zinc oxide have no effect on the bacteria as they enhance their growth. Cosmetic products containing ascorbic acid also demonstrate the absence of bacteria in their composition.

**References:** Raja K Sivamani, Jared R. Jagdeo, Peter Elsner, Howard I. Maibach. 2015. Cosmeceuticals and Active Cosmetics, pp In: CRC Press, 472 pages; Usman, R., Bharadvaja, N. 2023. Nutricosmetics: role in health, nutrition, and cosmetics. *Proc.Indian Natl. Sci. Acad.* **89**, 584–599.