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Antimicrobial Action of Organic Acids Vs. Bacteria of Food Origin

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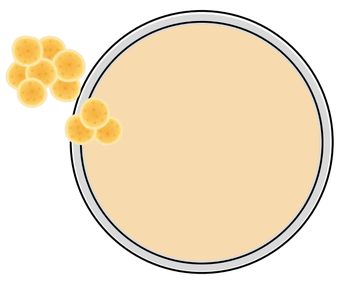
INTRODUCTION & AIM

Organic acids are antimicrobial products that act against food-contaminating bacteria, representing potential alternatives to the antimicrobials used in animal production. The growing resistance to therapeutic antimicrobials highlights the importance of evaluating new antimicrobial alternatives [1-2]. This study aimed to evaluate the antimicrobial effect of Lactic Acid P.A.—PROC9 Industry and of a mixture of organic acids, composed of lactic acid, formic acid, acetic acid, propionic acid, and copper sulphate pentahydrate against strains of *E. coli*, *Salmonella* sp., and *Staphylococcus aureus*.

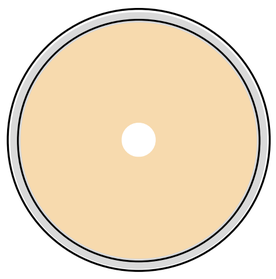
METHOD

- The disk-diffusion methodology (Kirby and Bauer method) [3] was used, as shown in Figure 1.

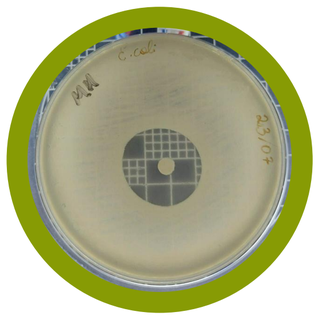


a. The isolated strains were diluted in saline solution and sown on plates with Müeller–Hinton agar culture medium.

b. Disks impregnated with 10 µL of each product tested were applied to the plates



c. The disks were placed on agar and the plates were incubated at 35°C



d. After 24 hours, the diameters of the inhibition halos were measured.

Figure 1. Stages of the experiment methodology.

RESULTS & DISCUSSION

The results obtained are shown in Table 1 .

Table 1. Microbial counts in honey samples

Microorganism	Lactic Acid (cm)	Mixture of organic acids (cm)
Salmonella sp.	1.89	2.2
Escherichia coli	2.4	2.7
Staphylococcus aureus	2.8	4.9

The results indicate that lactic acid has an excellent antimicrobial effect against these strains and that its antimicrobial action is related to the antimicrobial response of the organic acid mixture, since lactic acid is a component of this product.

CONCLUSION

The greater efficacy of the organic acid mixture observed against *Staphylococcus aureus* suggests a possible synergy between the different organic acids present in the mixture.

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REFERENCES

1.HELMY, Yosra A. et al. Antimicrobial resistance and recent alternatives to antibiotics for the control of bacterial pathogens with an emphasis on foodborne pathogens. Antibiotics, v. 12, n. 2, p. 274, 2023.

2.SCICUTELLA, Federica et al. Polyphenols and organic acids as alternatives to antimicrobials in poultry rearing: a review. Antibiotics, v. 10, n. 8, p. 1010, 2021.

3.Bauer AW, Kirby WM, Sherris JC, Turck M. Antibiotic susceptibility testing by a standardized single disk method. Am J Clin Pathol 1966; 45: 493–496