



Title: Antimicrobial effect of Eysenhardtia polystachya homemade extracts on bacteria causing urinary tract infections

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Editorial label ECORFAN:

BECORFAN Control Number: 2021-02

BECORFAN Classification (2021): 271021-0001

Pages: 13

RNA: 03-2010-032610115700-14

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Holdings

Mexico	Colombia	Guatemala
Bolivia	Cameroon	Democratic
Spain	El Salvador	Republic
Ecuador	Taiwan	of Congo
Peru	Paraguay	Nicaragua

Introduction

- Mexico has a history of the use of ethnomedicine, whose origins go back to pre-Hispanic cultures.
- Archaeological findings have demonstrated its influence and anthropological impact on Mexican culture.
- >4 000 species of plants (15% of the total flora of Mexico) to which medicinal properties are attributed



Introduction



World Health Organization

Traditional medicine is the set of knowledge, skills and practices based on the theories, beliefs and experiences of different cultures, whether explicable or not, used to maintain health and prevent diagnosing, ameliorating or treating physical and mental illnesses

Usage of medicinal plants has increased for the treatment of various pathologies or as an adjuvant in medical treatments.



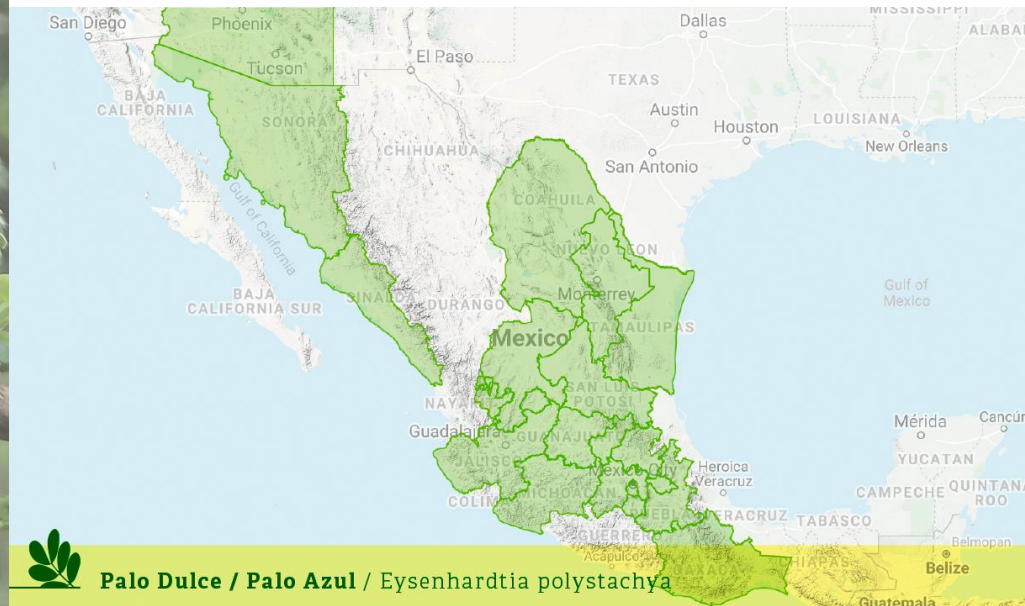


Introduction

Eysenhardtia polystachya

- commonly known as "blue wood" or "sweet wood"
- Leguminosae family
- deciduous tree or shrub
- 3 to 9 m tall
- 15 to 35 cm diameter

Eysenhardtia polystachya is distributed throughout Mexico



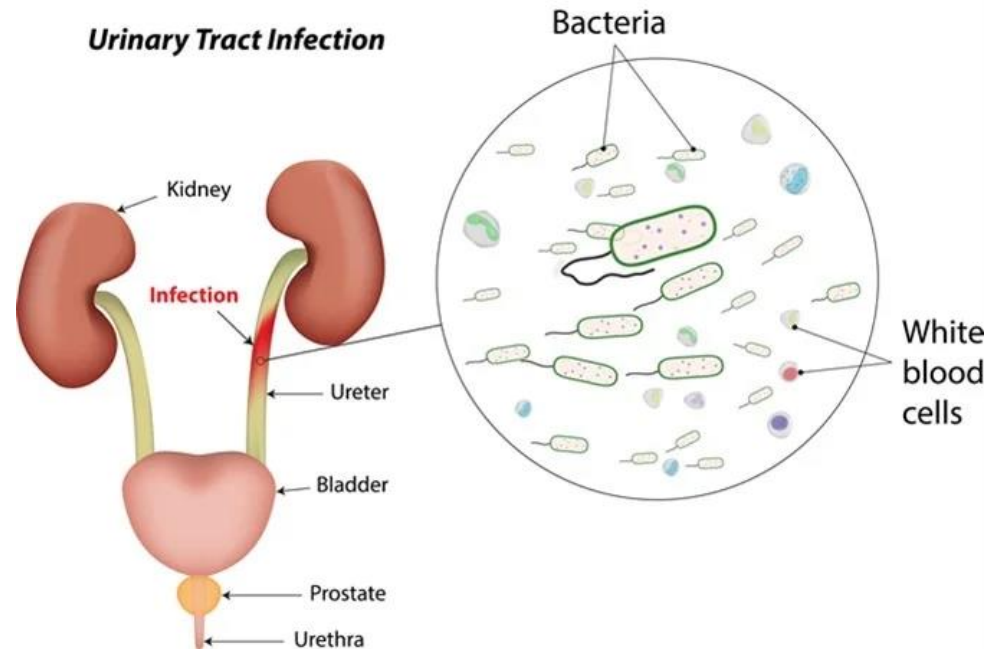
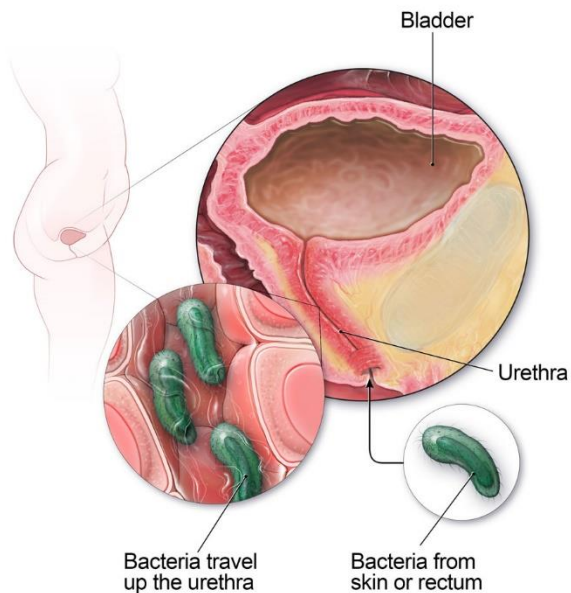
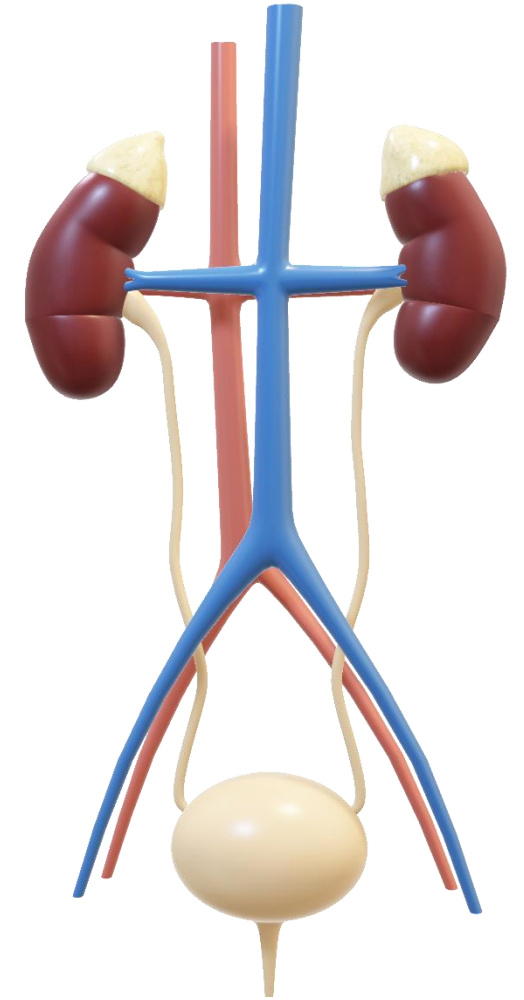
 Palo Dulce / Palo Azul / *Eysenhardtia polystachya*



Introduction

Eysenhardtia polystachya is used in traditional medicine to treat urolithiasis and other urinary diseases, such as urinary tract infections.

Urinary tract infections are a frequent problem in primary care and are among the most common infectious diseases worldwide.



Methodology



Escherichia coli (ATCC 25922)
Proteus mirabilis (ATCC 29906)
Pseudomonas aeruginosa (ATCC 27853)

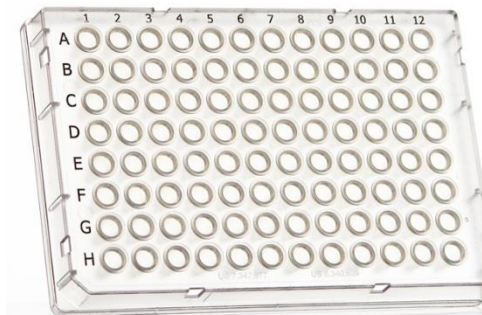
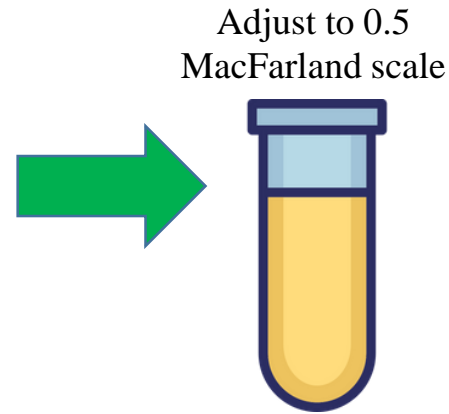
Enterococcus faecalis (ATCC 29212)
Staphylococcus aureus (ATCC 29213)



- 1) Bark macerated in 1L of purified water O/N.
- 2) 1 L of boiling purified water was added to the bark and allowed to cool to room temperature.



Commercial extract
as control



37°C O/N

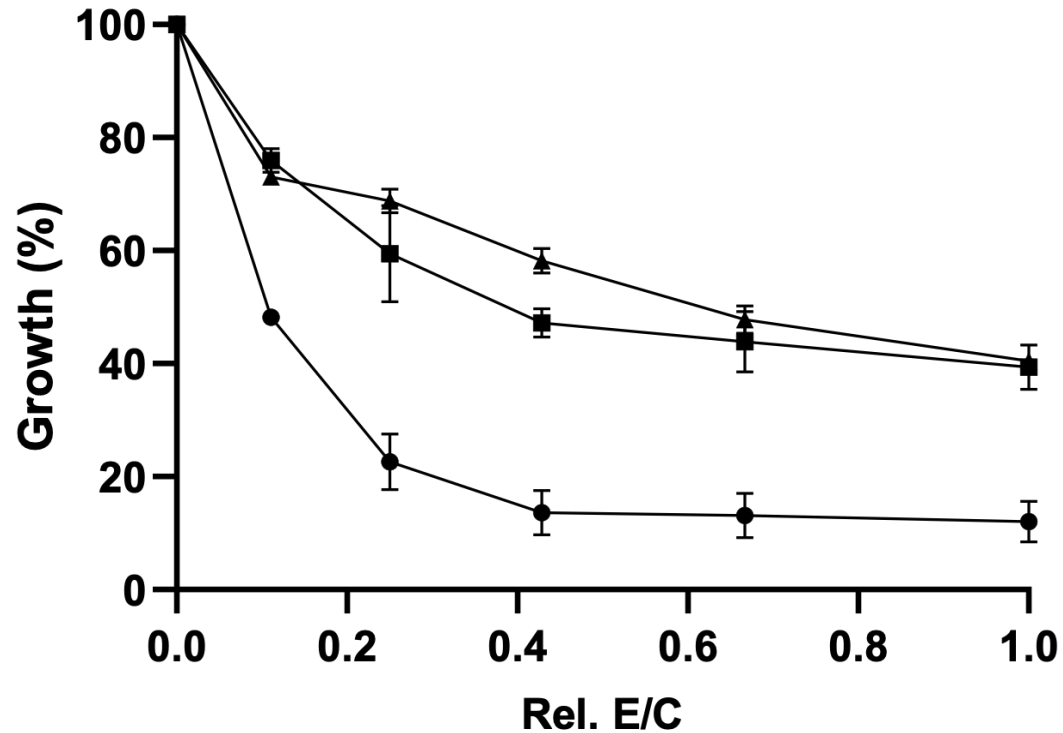


OD 600 nm



Results

Gram negative

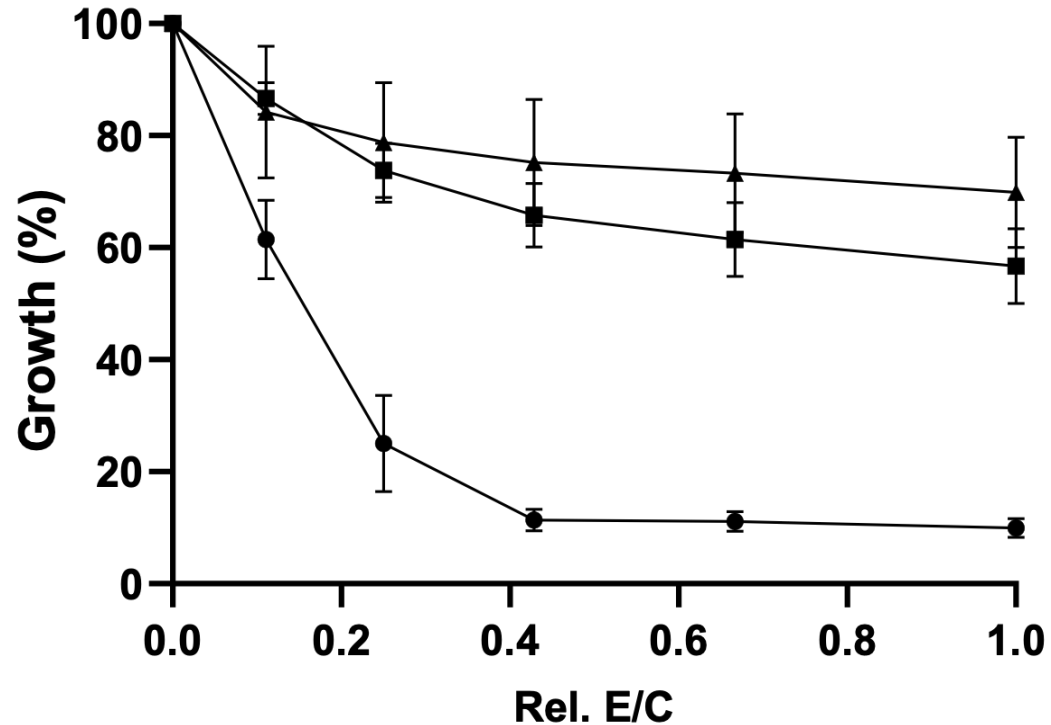


- *E. coli* + EC
- *E. coli* + EI
- ▲ *E. coli* + EM

- The highest concentrations of homemade extracts reduce nearly 60% of the bacterial growth.
- There is no significant difference in the effect of the homemade extracts among themselves ($p = 0.4146$).
- Commercial extract reduces 80% of bacterial growth.
- There is a significant difference when any of the two homemade extracts is compared with the commercial extract in the same concentration ($p < 0.0010$).

Results

Gram negative

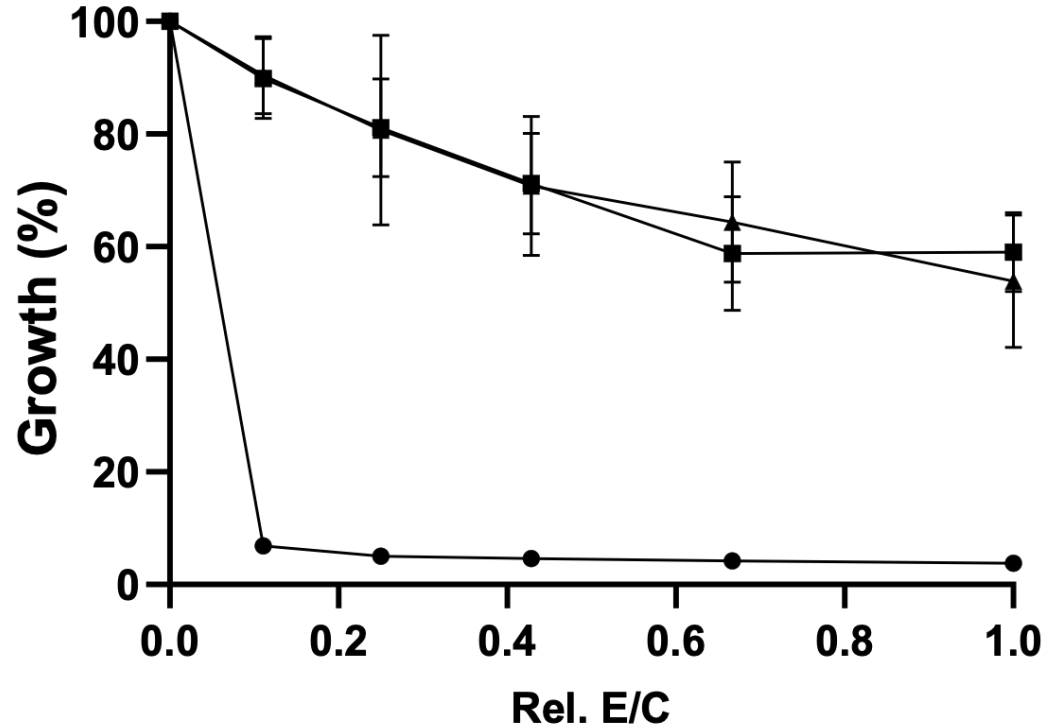


- *P. mirabilis* + EC
- *P. mirabilis* + EI
- ▲ *P. mirabilis* + EM

- Both homemade preparations reduce almost 50% of bacterial growth, with no significant difference between them ($p = 0.6192$).
- There is a significant difference ($p < 0.0001$) when comparing any of the homemade extracts with the commercial extract.
- Commercial extract reduces 90% of bacterial growth.

Results

Gram negative

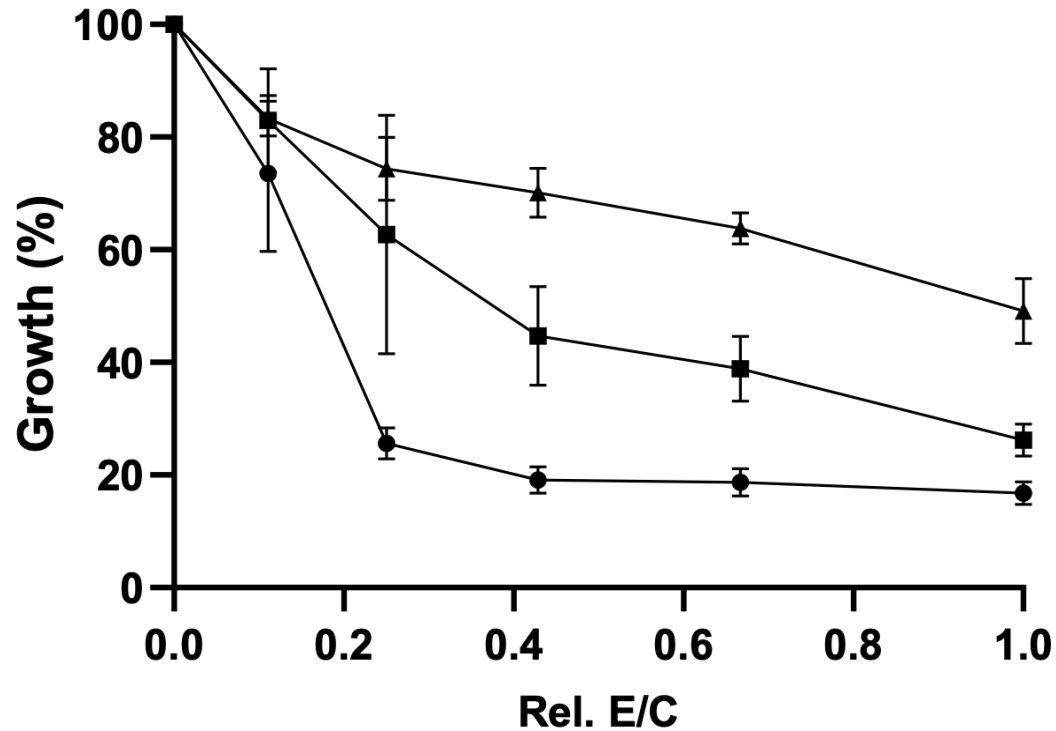


- *P. aeuroginosa* + EC
- *P. aeuroginosa* + EI
- ▲ *P. aeuroginosa* + EM

- The highest concentrations of homemade extracts reduce nearly 40% of the bacterial growth.
- There is no significant difference in the effect of the homemade extracts among themselves ($p = 0.9849$).
- Commercial extract reduces over 95% of bacterial growth.
- There is a significant difference when any of the two homemade extracts is compared with the commercial extract in the same concentration ($p < 0.0010$).

Results

Gram positive

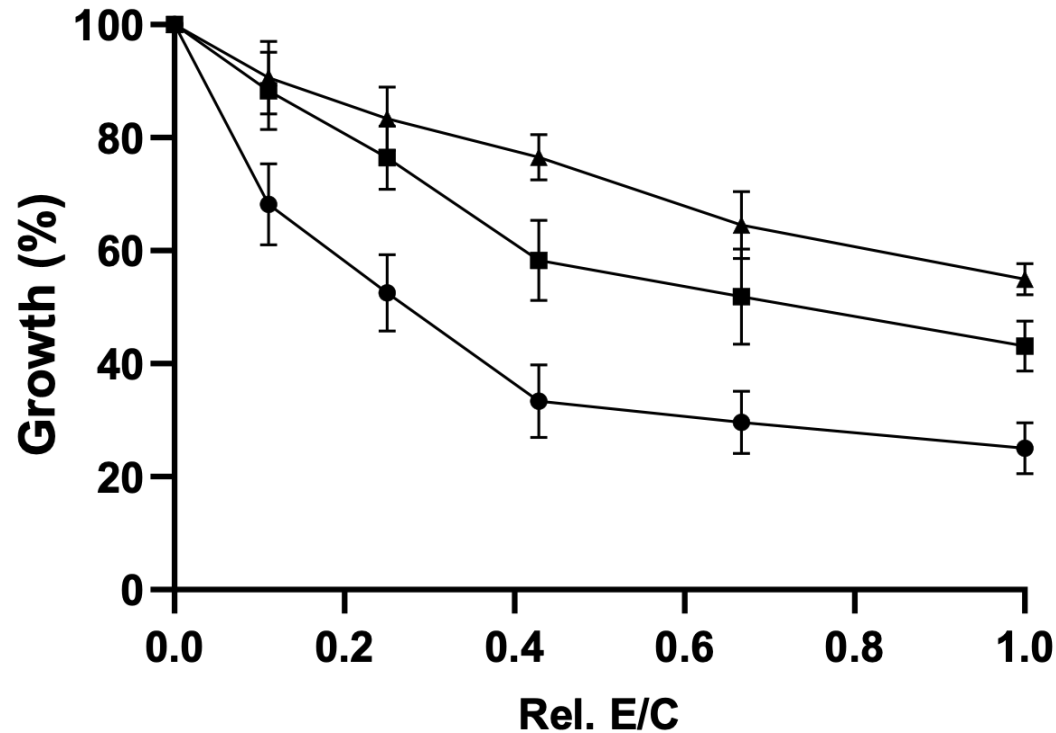


- *S. aureus* + EC
- *S. aureus* + EI
- ▲ *S. aureus* + EM

- The extract by infusion reduces the growth of *S. aureus* to levels very close to those achieved by the commercial extract (75% and 80%, respectively), both in the 1.0 extract/culture ratio.
- The extract by maceration reduced growth by 50% in the extract/culture ratio of 1.0.
- The differences in the effect between the three extracts are statistically significant ($p < 0.0008$).

Results

Gram positive



- *E. faecalis* + EC
- *E. faecalis* + EI
- ▲ *E. faecalis* + EM

- The highest concentrations of the home extracts by infusion and by maceration reduce almost 45% and 40%, respectively, of the growth of *E. faecalis*.
- There is a significant difference in the effect of the homemade extracts among themselves ($p < 0.0296$).
- Commercial extract reduced bacterial growth by more than 60%.
- There is a significant difference when comparing any of the two homemade extracts with the commercial extract at the same concentration ($0.0005 < p < 0.0120$).

Conclusions

- Homemade extracts obtained by maceration and by infusion have an antimicrobial effect on Gram-positive and Gram-negative bacteria that cause urinary tract infections.
- It was observed that the concentrations obtained in these homemade extracts are lower than those of the commercial extract.
- Therefore, although homemade extracts cannot replace pharmacological therapy, they can function as auxiliaries in the treatment of this type of infection.
- Our results corroborate the empirical use given to the extracts by infusion or by maceration of this plant.

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