

Abstract

Antimicrobial Potential and Synergistic Effect of Oregano Essential Oil (*Origanum vulgare* L.)[†]

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Introduction: Oregano (*Origanum vulgare* L.) is an aromatic plant widely used as a condiment and in traditional medicine. Its essential oil, rich in carvacrol and thymol, stands out due to its recognized antimicrobial activity. The aim of this study was to evaluate the in vitro antimicrobial activity of oregano essential oil and to investigate its synergistic effect in combination with conventional antibiotics. **Methodology:** The essential oil, obtained by steam distillation of the leaves, was tested using the disk diffusion method. Standardized inocula of *Staphylococcus aureus*, *Enterococcus faecalis*, *Klebsiella pneumoniae*, and *Pseudomonas aeruginosa* were cultured on Müller–Hinton agar and tested with discs impregnated with 10 µL of the oil. Plates were incubated at 37 °C for 18 to 24 h, and inhibition zones were measured in triplicate. For synergy analysis, the oil was combined with amoxicillin, imipenem, tetracycline, ciprofloxacin, chloramphenicol, and gentamicin. **Results:** Oregano oil demonstrated a broad antimicrobial spectrum, with inhibition zones of 10.16 mm against *P. aeruginosa*, 21.85 mm against *E. faecalis*, 24.48 mm against *K. pneumoniae*, and 35.53 mm against *S. aureus*. It also exhibited a significant synergistic effect, enhancing the action of gentamicin against *E. coli* and *S. aureus*, as well as amoxicillin, imipenem, tetracycline, ciprofloxacin, and chloramphenicol against *E. faecalis*. **Conclusions:** The results confirm that oregano essential oil has remarkable potential as a natural antimicrobial agent, being promising both in isolated use and in combination with drugs, highlighting its relevance in addressing bacterial resistance.



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