Historic Thieves oil and its antimicrobial properties

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Introduction

Rising antimicrobial resistance, reduced access to medical care, and strong family traditions have encouraged greater use of plant-derived compounds in healthcare. This study investigated the antibacterial effects of commercially available essential oils against Escherichia coli (E. coli), a clinically and environmentally significant gram-negative bacterium. Specifically, Thieves oil, cinnamon, and oregano were evaluated. Antibiotic resistance is an increasing global concern, prompting interest in alternative antimicrobial agents. As we know, natural compounds, including essential oils, have demonstrated antibacterial properties in previous studies, this study expands our previous work. The oils used in the study included blends and single oils by the company Young Living and are commonly used in wellness applications. Essential oils are concentrated plant extracts known for potential antimicrobial properties.

Research Question: What combination of essential oils and Thieves produces the greatest zone of inhibition?

Hypothesis: We hypothesized that natural compounds would inhibit bacterial growth with stronger effects at higher concentrations.

Methods

Bacterial strains: *Escherichia coli, Salmonella enterica, and Streptococcus pyogenes* were cultured for use in the disk-diffusion assay.

Essential oils: Thieve (blend of clove, cinnamon, rosemary, eucalyptus, lemon), Cinnamon, Clove, Eucalyptus, Digize (tarragon, ginger, peppermint, juniper, fennel, lemongrass, anise, patchouli), Inner Defense (Thieves, oregano, thyme, lemongrass), Rosemary were tested

Disk diffusion assay: Bacteria were placed on culture plates and spread; sterile filter disks were saturated with various oils and placed on the TSA plate.

Measurement of zone of inhibition: The diameters were measured of each zone of inhibition. Data were tabulated and averages were obtained and graphed.

Graphs produced in R.

Results

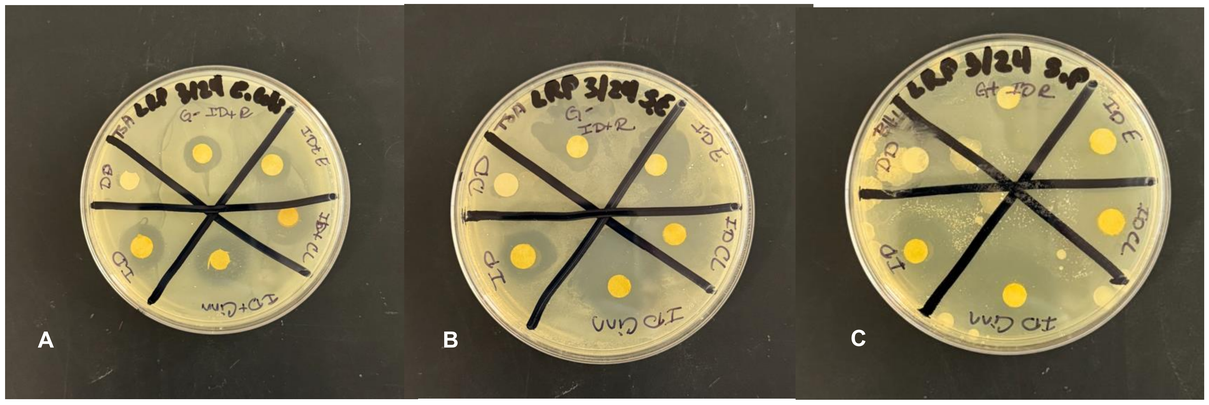

Figure 1 (A-C). Representative results from one of the trials. All plates were coated with bacteria before disks were placed. In this trial, disks were soaked in the following oils: DD = Dry Disk, representing negative control; ID = Inner Defense; ID + Cinnamon = Inner Defense and Cinnamon; ID+R = Inner Defense + Rosemary; ID + CI = Inner Defense + clove; ID + E = Inner Defense + Eucalyptus. Zones of inhibition were measured. (A) bacteria used on this plate was gram-negative *E. coli.* Largest zone of inhibition was Inner Defense plus the clove oil. (B) Gram-negative bacteria, *S. enterica*, showed susceptibility to Inner Defense and Cinnamon. C) Gram-positive *S. pyogenes* was susceptible to most of the oil combinations.

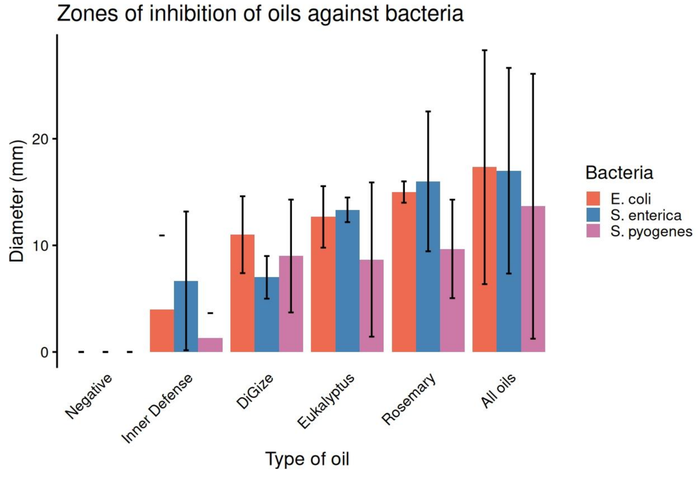

Figure 2. Based on previous results and the zones of inhibition observed in the rosemary, eucalyptus, and Inner Defense, we chose to run an additional experiment including Digize due to the fact that it is used internally. These were conducted with different combination of oils. The oils in this experiment included InnerDefense, Digize, Eucalyptus, Rosemary, and a combination of all these oils. The above results show the average zones of inhibition of individual oils plus all oils combined.

Conclusions

This study evaluated the antimicrobial effectiveness of selected essential oils and blends on bacterial growth. Oils tested include Rosemary oil, Inner Defense, DiGize, Cinnamon, and Eucalyptus. Inner Defense and DiGize both include the Thieves oil combinations. Some oils high in compounds like cinnamaldehyde and eugenol are more effective. Bacterial samples were grown on TSA and BHI plates. Oils were applied to an inoculated plate, and zones of inhibition were observed and compared once removed from the incubator, and trials were run several times. The oils that showed a more broad-spectrum antimicrobial potential were the clove and cinnamon oils. Effectiveness is linked to chemical composition, especially phenolic compounds. Dilution of any of the oils proved to be less effective.

Data from the graph showed that different essential oils produced different zones of inhibition. Bigger zones of inhibition indicate stronger antibacterial effects. Across all three bacteria tested, the combination of all the oils tested produced the largest zone of inhibition. The individual oils such as Rosemary and Eucalyptus produced larger zones on the gram negative than the gram positive. The results indicate that some compounds exhibit antibacterial properties, as demonstrated by measurable zones of inhibition. Effectiveness varied across the bacterial species and concentrations of oils suggesting both the organism specific sensitivity and dose-dependent activity matter.

Future Directions

- Test against additional bacteria
- Compare with standard antibiotics
- Reformulate the amount and combinations used
- Study human safety and dosage effects

References

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