

From Skin to Smile: The Antibacterial Strength of Manuka Honey

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Abstract

As demand for natural treatments grows, honey has emerged as a powerful therapy in **dermatology** and **dentistry** due to its antimicrobial, anti-inflammatory, and wound-healing properties. This research will investigate Manuka honey's potential against *Cutibacterium acnes* (acne) and *Streptococcus oralis* (gingivitis).

Bioactive compounds like **methylglyoxal** provide strong antibacterial effects, while honey's **anti-inflammatory properties** promote healing. Local honey samples with varying antibacterial properties from Texas beekeepers, as well as Manuka honeys, will be evaluated for bacterial inhibition. Manuka samples are expected to show greater antimicrobial activity. This study will highlight honey's versatility as a safe, natural, and sustainable alternative to conventional skin and oral health treatments.

Introduction

- Natural remedies are gaining popularity due to their antimicrobial and anti-inflammatory properties.
- Honey, especially **Manuka** honey, shows promise in treating bacterial conditions like acne and gingivitis.
- Acne vulgaris and gingivitis are widespread and linked to bacterial infections—*C. acnes* and *Streptococcus oralis*, respectively.
- This study explores honey's dual role in promoting skin and oral health.

Objective

- Assess the antibacterial effects of Manuka honey against *Cutibacterium acnes* (acne-causing bacteria).
- Investigate the antibacterial effects of Manuka honey against *Streptococcus oralis* (gingivitis-associated bacteria).
- Compare** bacterial inhibition across **Texas** honeys and **Manuka** Honey.

Materials and Methods

- Honey samples will be sourced from **local** Texas beekeepers.
- C. acnes* and *S. oralis* bacterial strains will be cultured on nutrient agar plates under optimal **anaerobic and aerobic conditions**, respectively.
- Antibacterial activity will be assessed using an agar disk diffusion method: sterile paper disks were infused with honey samples, placed on bacterial plates, and incubated for 24–48 hours.
- Zones of inhibition** will be measured in millimeters. Inhibition diameters will be compared across different samples to evaluate honey's antibacterial potency.

Expected Results

Manuka Honeys showed strong zones of inhibition:

Bar graph

- 30-26-millimeter zones of inhibition for Manuka Honey (**Strong**)
- 13-8-millimeter zones of inhibition for non-Manuka Honey (**Mild** + **Moderate**)

Affected both bacteria in a similar way

- Higher UMF ratings resulted in larger zones if inhibition in manuka honey.
- Local Texas Honey had weaker effects due to a lack of MGO properties

Figures

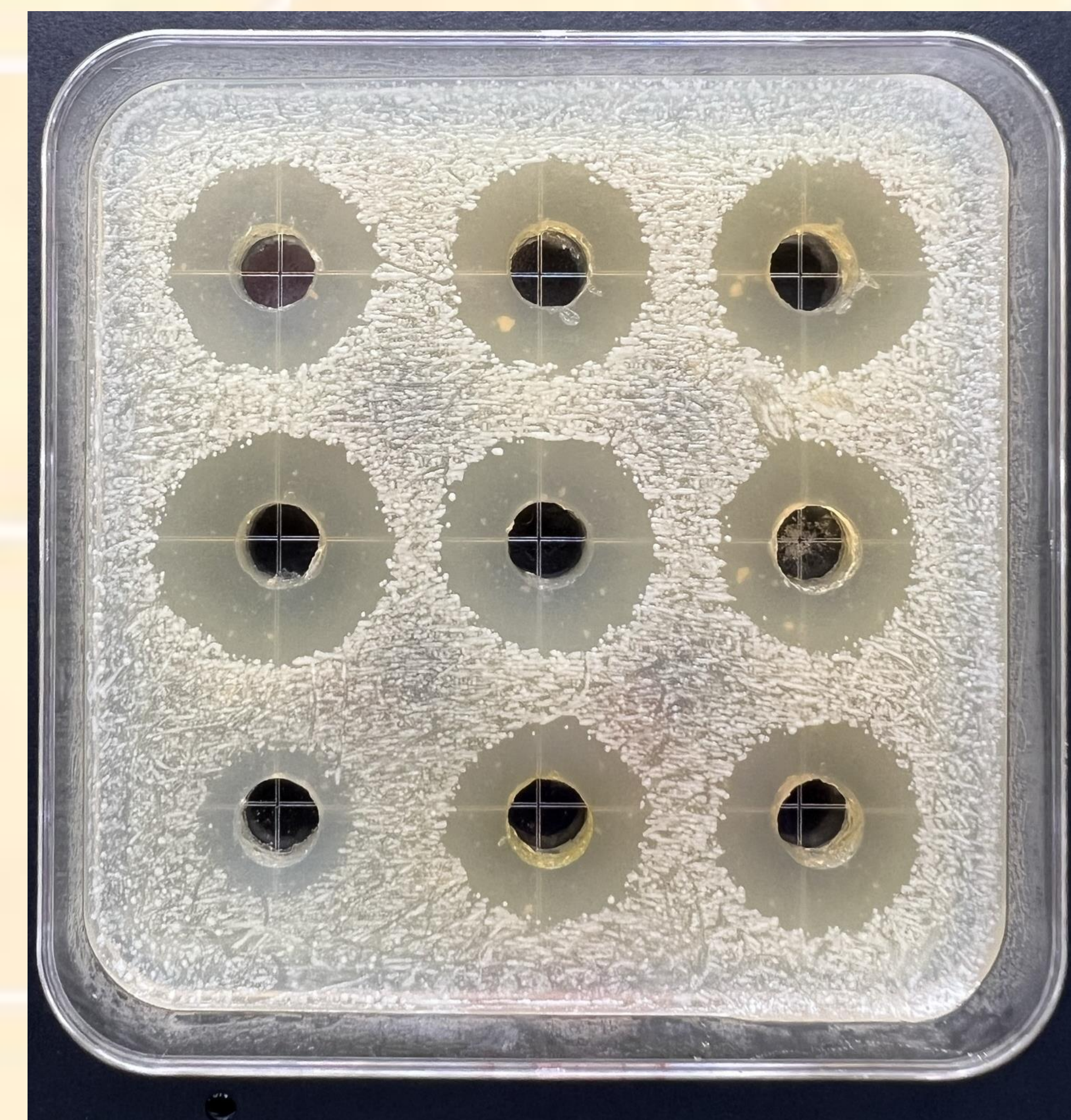


Fig. 1. Expected Zones of Inhibition. Manuka Honey's Having the Larges Zones Inhibition.

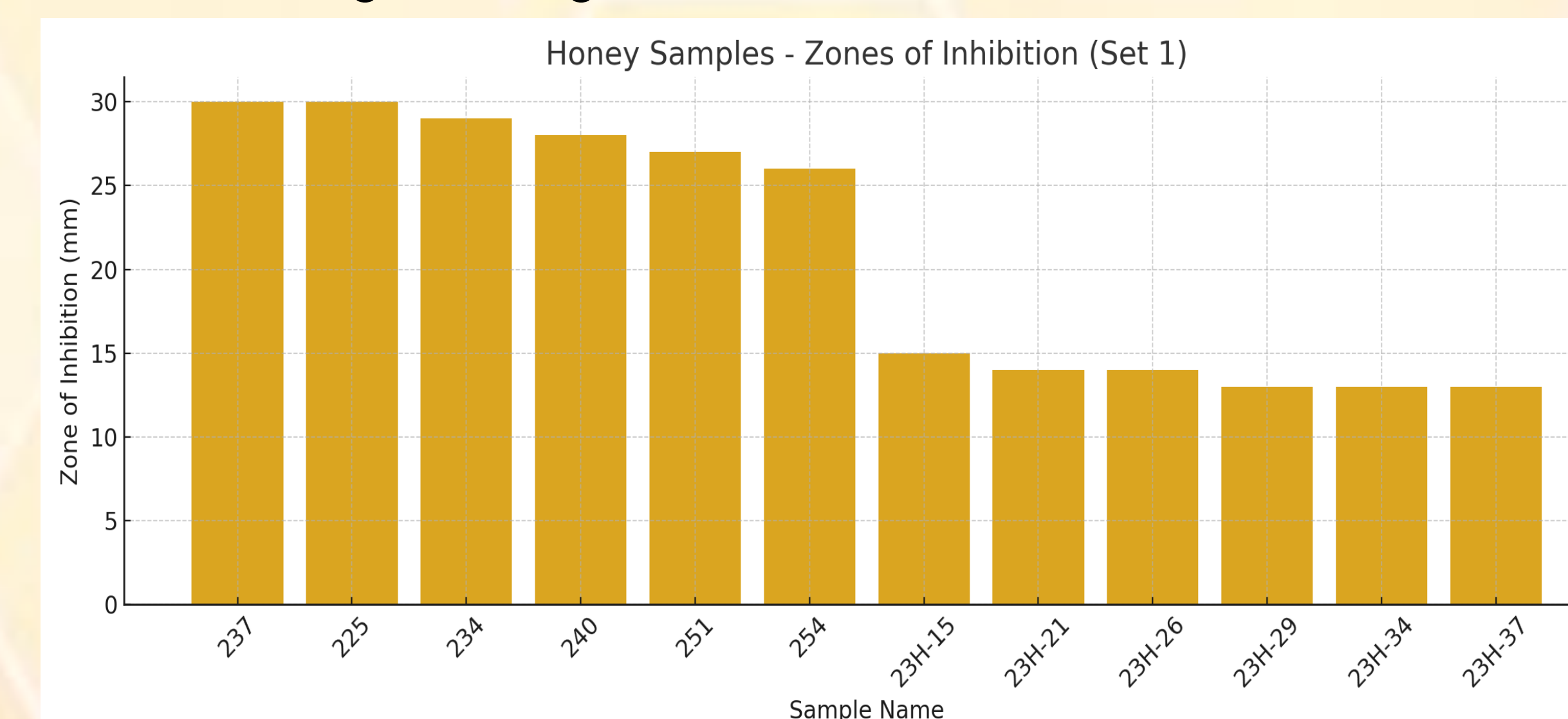


Fig. 2. Expected Zones of Inhibition Bar Graph. Manuka Honey's Having the Larges Zones Inhibition. Local Texas Honeys having Smaller Zones of Inhibition.

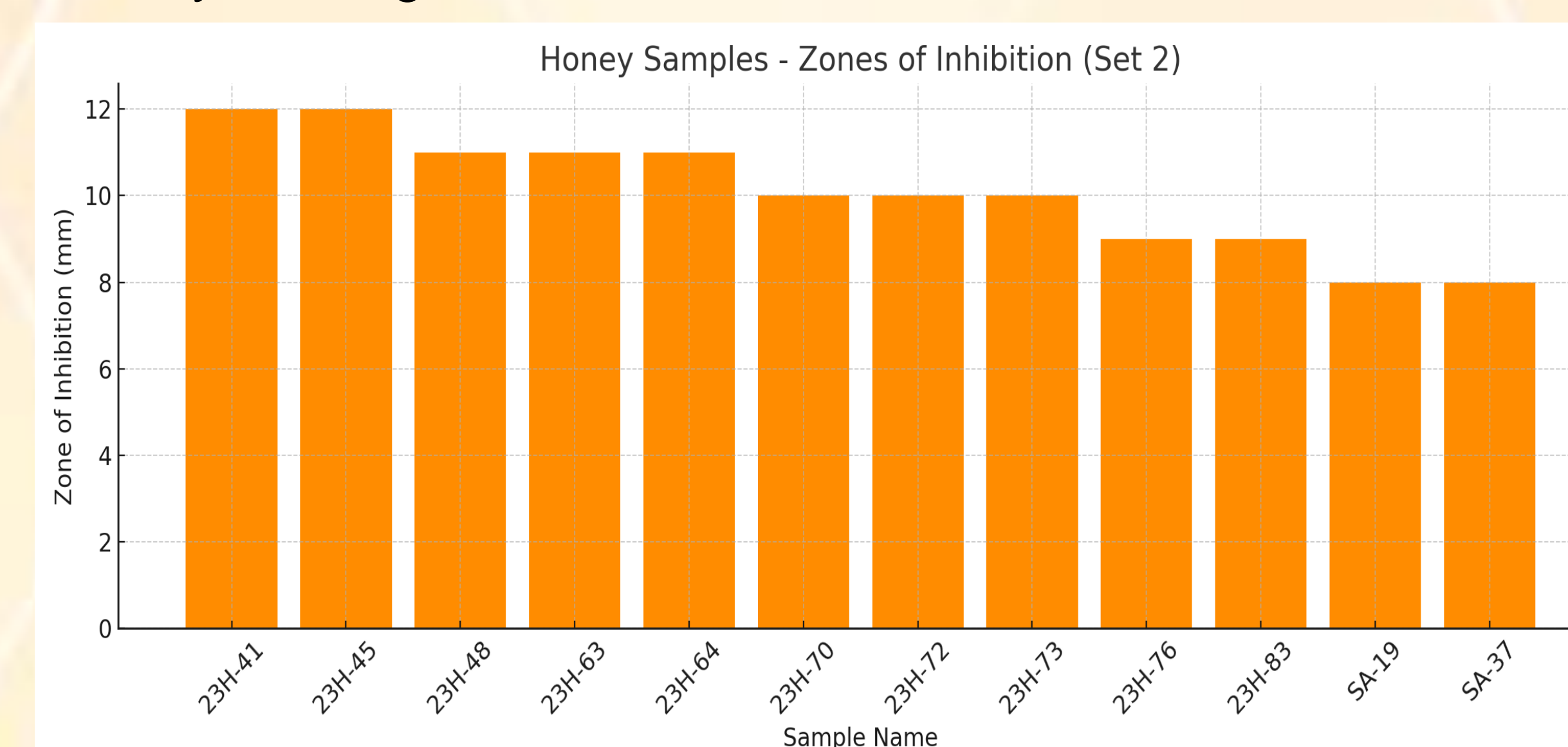


Fig. 3. Expected Zones of Inhibition. Local Honey's Having the Smaller Zones Inhibition.

Ongoing Research

- This study represents an **early investigation** into the antibacterial potential of Manuka honey against *C. acnes* and *S. oralis*.
- Final results will validate honey's therapeutic potential in dermatology and dentistry, and guide future development of natural, sustainable antimicrobial treatments.

Conclusions

- Manuka honey is anticipated to exhibit stronger antimicrobial activity against *Cutibacterium acnes* and *Streptococcus oralis* compared to local Texas honey samples.
- Findings will support the use of honey—particularly Manuka honey—as a natural adjunct or alternative to conventional antibiotics for managing acne and gingivitis.
- Results may encourage future development of honey-based therapeutic products, such as topical creams and oral care formulations.
- This research emphasizes the importance of sustainable, natural medical approaches amid rising concerns about antibiotic resistance.

References

- Burlando, B., & Cornara, L. (2013). Honey in dermatology and skin care: a review. *Journal of cosmetic dermatology*, 12(4), 306–313
- Cooper, R.A., Jenkins, L., Henriques, A.F.M. *et al.* Absence of bacterial resistance to medical-grade manuka honey. *Eur J Clin Microbiol Infect Dis* 29, 1237–1241 (2010).
- Atwa, A.-D. A., AbuShahba, R. Y., Mostafa, M., & Hashem, M. I. (2014). Effect of honey in preventing gingivitis and dental caries in patients undergoing orthodontic treatment. *The Saudi Dental Journal*, 26(3), 108–114.
- Mandal, M. D., & Mandal, S. (2011). Honey: Its medicinal property and antibacterial activity. *Asian Pacific Journal of Tropical Biomedicine*, 1(2), 154

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