Antimicrobial activity of honey

The rise of antibiotic-resistant bacteria has become a global health concern, underscoring the need for new and innovative antimicrobial agents. L-Mesitran has shown great potential as an antimicrobial agent. In this article, we will delve into the antimicrobial activity of L-Mesitran and its potential applications in combating a wide range of pathogens.

What is L-Mesitran - Medical Grade Honey?

L-Mesitran contains Medical Grade Honey (MGH).

As the name suggests, is a specialized form of honey prepared and processed to meet specific quality standards for medical and therapeutic applications. Unlike the honey found on the supermarket shelves, MGH is carefully produced, sterilized, and controlled for factors such as its origin, purity, and content of bioactive compounds. This specialized honey is primarily used in wound care and has garnered attention for its remarkable antimicrobial properties.

Antimicrobial Properties of Medical Grade Honey

Medical Grade Honey (MGH) exerts a broad-spectrum antimicrobial effect in multiple ways (**Figure 1**).

MGH is valued for its potent antimicrobial activity, which is attributed to several key factors:

1. **High Sugar Content**: Honey is primarily composed of sugars, with the main ones being glucose and fructose. This high sugar concentration creates an osmotic effect, drawing water out of microbial cells and leading to their dehydration and death.
2. **Natural Presence of Antimicrobial Molecules**: For example, the bee-derived peptide defensin-1 has been shown to have antimicrobial properties in honey. Phytochemicals, which are antimicrobial chemicals produced by plants, are also found in honey. These include flavonoids and non-flavonoids (phenolic acids) and the composition of phytochemicals in honey depends mainly on its floral origi.
3. **Low pH**: Honey's acidic pH, which typically falls between 3.2 and 4.5, creates an unfavorable environment for many pathogens, as they thrive in neutral to alkaline conditions.

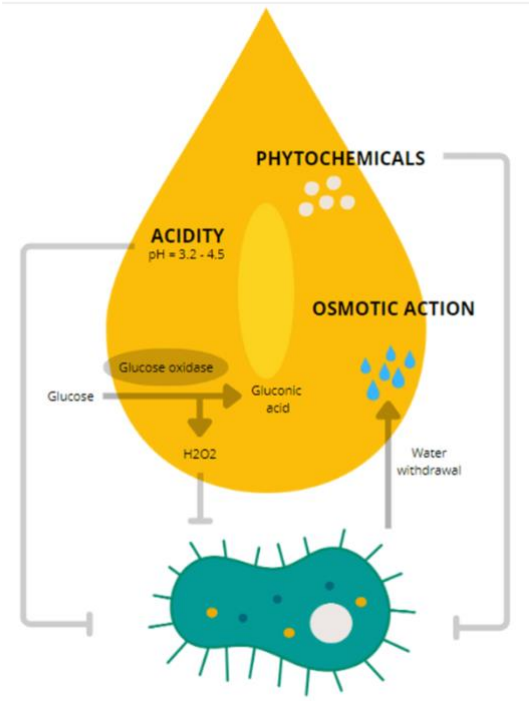

Figure 1. Antibacterial mechanisms of honey

4. **Hydrogen Peroxide Production**: Some types of honey release hydrogen peroxide, a well-known antiseptic, when exposed to moisture. This further contributes to honey's antimicrobial activity.

L-Mesitran®

Antimicrobial Activity of Honey in Practice

An 80-year-old, obese, female patient with a 40-year history of diabetes mellitus presented several wounds accompanied by swelling of the lower extremities. A culture swab confirmed infection with methicillin resistant Staphylococcus aureus (MRSA).

Starting 29 May 2018, monotherapy with L-Mesitran was implemented to address the present MRSA infection without the use of antibiotics and progress the wound towards healing. Therapy comprised a regime of daily dressing changes. A thin layer of L-Mesitran Ointment was applied to the wound and complemented by the use of the L-Mesitran Net dressing (10×10 cm) before covering it with non-woven, sterilized gauzes (10×10 cm; 10×20 cm, Zetuvit Plus, Hartmann) as the top absorptive layers. In the third week the Mesitran products were changed to L-Mesitran Soft wound gel and L-Mesitran Tulle (10x10cm).

In the second week of treatment, autolytic debridement resulted in opening the infected and heavily exuding wounds. Four days later, the infection was controlled and the wounds fully debrided and cleared of necrotic tissue. In week three, the patient announced experiencing a tingling sensation, most likely due to the infectious condition and the high osmotic effect L-Mesitran Ointment exerts. From this point, the L-Mesitran Soft wound gel was applied, restoring the patient's comfort. In week four, healthy granulation tissue of the extended areas could be observed with many wound areas reduced in size and pending towards closure. Since initiation of the treatment, oedema had decreased significantly and by week five also erythema disappeared completely which translates into the progression from inflammation towards healing. Finally, at the end of the seven-week period since the L-Mesitran products were implemented, the diabetic ulcers are deemed fully and successfully healed without reinfection.

Conclusion

Antimicrobial resistance is flagged as one of the biggest threats to global health by the World Health Organization. Medical-grade honey (MGH) forms an attractive alternative to antibiotics and other antimicrobial agents. MGH exerts broad-spectrum antimicrobial activity, including against infections caused by multi-resistant strains and pathogens considered superbugs.