



Can a medical grade honey sterilize an unsterilized honey

Amit Kumar C Jain

Amit Jain's Centre for Apitherapy, Amit Jain's Institute of Diabetic Foot and Wound Care, Brindhavvan Areion Hospital, Bengaluru, Karnataka, India

Abstract

Background: Honey has reemerged as a new antimicrobial to treat and heal wounds. However, often it is found to be contaminated with microbes.

Aim: To test whether the medical grade honey can be used as a method of sterilizing a fresh unsterilized honey.

Methods and Materials: A freshly obtained raw honey of *Apis Dorsata* species was procured from Amit Jain's Centre of Apitherapy, Amit Jain's Institute of Diabetic Foot and Wound Care, Brindhavvan Areion hospital, Bengaluru, India. A sample of it was sent to microbiology laboratory to determine any microbial growths. Subsequently, 10 ml of medical grade honey that was sterilized with gamma irradiation was added to unsterilized honey and after 1 week, this mixed honey sample was sent for microbial analysis.

Results: It was noted that the mixed honey specimen containing sterilized medical grade honey yielded growth in culture similar to unsterilized honey.

Conclusion: Medical grade honey is ineffective in sterilizing fresh raw honey and should not be used as a method of honey sterilization.

Keywords: honey, wounds, sterilization

Introduction

Chronic wounds are global health problems and even in developed countries like United States, more than 4.5 million people are affected with it ^[1, 2, 3]. It is known to affect approximately 1-2% of population globally ^[2]. The issue with chronic wounds is infection and a major matter of concern is the presence of multidrug resistant bacteria's.

Honey dressing has recently emerged as an effective option to address the problem of resistant microorganisms on wounds ^[4, 5]. However, honey contains certain microbes within it and it has to be sterilized before using on the wounds ^[6, 7]. Gamma Irradiation is today the most effective recommended method for sterilizing the honey ^[8].

However, gamma irradiation facility is not available easily and further it is also expensive ^[8]. Keeping in mind that medical grade honey is effective against most microorganisms; the author conducted a simple study to determine whether the sterilized honey is an effective method to sterilize the unsterilized freshly obtained raw honey.

Methods and Materials

We obtained a freshly prepared raw honey that was available at Amit Jain's Centre for Apitherapy at Amit Jain's Institute of Diabetic Foot and Wound Care, Brindhavvan Areion hospital, Bengaluru, in this study. The Amit Jain's Centre for Apitherapy is one of the eponymous wings within the Amit Jain's Institute of Diabetic Foot and Wound Care that deals with acquisition, sterilization, storage and use of different types of honey on different wounds apart from doing research work on the honey. This honey was from *Apis Dorsata* species and 5 ml of this was sent to lab for Aerobic, anaerobic and fungal growth culture. This

honey was inoculated onto 5% sheep blood agar, Chocolate Agar and Mc-Conkey agar.

50 ml of this raw honey was taken into a sterile container and 10 ml of sterilized honey was mixed in to it and stored. The sterilized honey was previously irradiated with gamma radiation with 20kGy dose (Cobalt 60 gamma Chamber-5000).

After one week, we sent 5 ml of this mixed honey to lab for aerobic, anaerobic and fungal culture.

Results

The unsterilized honey had grown *Aspergillum Niger* and *Diphtheroids* in culture.

The mix honey that had gamma irradiated honey in it also grew *Aspergillum Niger* and *Diphtheroids* in it.

Discussion

Honey has anti-inflammatory, antioxidant, antibacterial, antiviral and antilipid properties apart from anticancer properties ^[9]. There are various factors that contribute to the antimicrobial action of the honey ^[10]. The low PH of honey is known to restrict microbial growth ^[11]. Presence of high osmotic pressure, hydrogen peroxide and some photo chemicals are known to be crucial for antimicrobial action of honey ^[12]. However, honey is often believed to be contaminated and various microbes are found in it. The sources of contamination could be primary or secondary. The primary sources of contamination are from dust, air, digestive tract of honeybees, etc ^[13]. It is often seen that plant associated microbes that are present on flower surface, in nectars; soil, etc are the most predominant microbes in honey ^[12]. Some of the bacteria's transferred from digestive tract of bees are *Bacillus*

spp, *Streptococcus* spp, *Lactobacillus*, *Klebsiella*, *Proteus*, etc^[12]. The bees' intestine is found to have 1% yeast, 70% gram negative bacteria and 27% of gram positive bacteria's^[14]. The secondary source of honey contamination occurs from food handlers and from its equipments used to keep the honey^[12, 13].

Gamma irradiation is one of the best and also recommended methods to sterilize the honey^[7, 8, 13]. The other methods of sterilization like freezing, refrigeration, pasteurization, etc have been used but they affect the antimicrobial and the other properties of honey^[13].

The author had hypothesized that a medical grade honey could be used to sterilize other raw honey and hence perform this investigation. However, the results showed that medical grade honey was not an effective method of sterilizing other honey.

Conclusion

Honey is effective in wound healing and has distinct antimicrobial properties. It however has numerous microbes within it and it has to be sterilized before using on wounds. We noticed that medical grade honey cannot be used as a method of sterilizing a fresh unsterilized honey.

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