

Apitheraphy and Medicinal Properties and Use of Honey: A Review

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ARTICLE DETAILS

Article History

Received: 22 February 2017

Accepted: 03 March 2017

Published Online: 23 March 2017

Keywords

Apitheraphy, Disease, Honey, Propolis, Antimicrobial, Antiviral, Antibacterial.

ABSTRACT

The present review discusses about apitheraphy and medicinal importance of bee venom and honey. Apitheraphy provides a potential alternative to medicine and the treatment of various diseases such as cancer, rheumatoid arthritis, Parkinson's and oral diseases. Honey is a remarkable and valuable natural substance with a good taste that provides various benefits in the health sector, such as medicinal, nutritional and cosmetic uses. Propolis is also obtained from honey bees and exhibits therapeutic and biological properties. Propolis is utilized to treat various health problems such as pulpitis, candidiasis, aphthous stomatitis and periodontitis. Honey can be used alone or in combination with other substances to treat a variety of health problems. Honey has a wide range of laxative, sedative, anti-inflammatory, antimicrobial, antiviral and antibacterial properties. Honey contains several types of minerals, vitamins, proteins, carbohydrates, amino acids and various enzymes, including invertase, acid phosphorylase, catalase and glucose oxidase. The combination of natural remedies and honey provides good health and strong immunity to fight pathogens.

INTRODUCTION

Apitheraphy, derived from the Latin word "apis" (apis means bee or bee therapy), refers to the use of honeybee venom for medicinal and therapeutic purposes. Honey bee venom, propolis, bee wax, bee pollen, raw honey, royal jelly and bee breeds are products generally obtained from honey bees and used as a traditional and alternative form of medicine (Hegazi, A.G. 2012). In different cultures and ancient times, apitheraphy has been widely accepted as an alternative to medicine (Klobusitzky, 1971; Hider, 1988; Liu and Hong, 2003). The origin of apitheraphy can be traced back to ancient Egypt and Greece and has also been practiced in China for 3000-5000 years (Rose, 1994). Bee products, especially honey is not only important for nutritional purposes but also exhibit a broad range of value in the medicinal section and are used as a medicine for treating various diseases (Macius, 1939; Skuitauskas, 1958; Vileisis, 1958). A bee product may be used alone or in conjunction with therapeutic plants, substances of animal origin that exhibit a wide range of medicinal and clinical importance to treat various diseases. According to recent studies, honey has curative and antiseptic properties and also acts as an effective broad-spectrum antibacterial agent (Yaghoobi *et al.*, 2013). The present review deals with the apitheraphy, chemical composition, medicinal and antibacterial properties of honey.

1. Apitheraphy-

Various products of honeybees, such as bee venom, pollen, royal jelly, propolis and melittin are utilized as an alternative for the treatment of various diseases, also known as apitheraphy (Hellner *et al.*, 2008). Bee products have a variety

of biological properties including antioxidants, anti-inflammatory, anticancer and antimicrobial activities. In laboratory conditions, the melittin substance has anti-inflammatory and anti-cancer properties. According to some studies, melittin shows anticancer properties and has the ability to kill cancerous cells (Rao, 1993; Russell *et al.*, 2004). Propolis is naturally isolated from honey bees and has been shown to exhibit antitumor and antioxidant properties in early studies on animals in laboratory conditions (Chen *et al.*, 2004; Shimizu *et al.*, 2005; Li *et al.*, 2007). Propolis exhibits therapeutic and biological properties and consists of more than 180 different chemical compounds. On the basis of these properties, the application of propolis has increased in the health sector (Fearnley, 2013). Propolis is utilized in the treatment of various diseases such as pulpitis, candidiasis, aphthous stomatitis and periodontitis (Fearnley, 2013). According to recent studies, propolis has antimicrobial and anti-inflammatory activities and is currently utilized in oral surgery and the control of the antimicrobial response in oral disease (Da-Silva, 2004; Ahuja and Ahuja, 2011).

Bee venom exhibits neuro-protective benefits against Parkinson's disease in mice (Yoon *et al.*, 2013). According to Kwon *et al.* (2001a) and (2002), bee venom acupuncture provides an alternative form of medicine for the long term treatment of rheumatoid arthritis. Bee venom acupuncture provides more relief in osteoarthritis conditions as compared to needle acupuncture therapy (Kwon, 2001b). Sublingual immunotherapy (SLIT) using honeybee venom can considerably reduce allergy symptoms in sting-sensitive individuals (Moffitt *et al.*, 2004; Golden *et al.*, 2011). Propolis

has broad range of biological activity against viruses and their antiviral, antibacterial and fungicidal activities were investigated by Hegazi and Abd-El-Hady (1993, 1997, 2000b, 2001, 2003 and 2004). Propolis exhibits antibacterial activity against *Enterococcus faecalis*, *Listeria* and *Salmonella* species (Gomes *et al.*, 2011; Kayaoglu *et al.*, 2011; Pereira *et al.*, 2011).

2. Chemical Composition of Honey –

Honey is composed of proteins, carbohydrates, vitamins, minerals, amino acids and various enzymes, including invertase, acid phosphorylase, catalase and glucose oxidase (Loveridge, 2010). There are different types of minerals, including manganese, magnesium, chromium, selenium, phosphorus, potassium, iron, calcium and zinc and a little amount of the vitamin B complex, mainly vitamins B2, B4, B5, B6, B11 as well as vitamin C present in honey (Loveridge, 2010). A darker colour of honey has more antioxidants as compared to a lighter colour (Loveridge, 2010). Honey contains various antioxidants and various aromatic acids, including acetic, citric, succinic, lactic, pyroglutamic, gluconic, malic, butanoic and formic acids (Loveridge, 2010).

3. Medicinal Properties of Honey and Used in Treatment of Various Disease

Honey contains a broad range of medicinal properties, including laxatives, sedatives, antiseptics, anti-anæmic, antipyretics, anti-allergens, anti-inflammatory,

antitoxic, antioxidants, moisturizing and blood purifying properties. It is easy to digest, promotes body rehydration, and is used to treat a variety of skin diseases (Needham, 2008). Honey consumption enhances immunity and reduces stress and sleep disturbances. The regular use of a *Punica granatum* and honey mixture reduced body weakness (Jayasinghe, 1976). The combination of carrot juice and honey consumption is very useful for vision and eyesight (Krishna, 2005). A mixture of honey and ginger juice provides relief from colds and coughs (Krishna, 2005). A combination of black pepper powder, ginger juice and honey provides relief from asthmatic symptoms (Krishna, 2005).

4. Antibacterial Properties of Honey

Honey inhibited the growth of 60 different bacterial species, including gram-positive and gram-negative bacteria, anaerobes and aerobes (Olaitan *et al.*, 2007). Several studies have concluded that honey is effective against a variety of pathogens, including *Streptococcus pyogenes*, *Pseudomonas aeruginosa*, *Listeria monocytogenes*, *Serratia marcescens*, *Shigella dysentery*, *Haemophilus influenzae*, *Yersinia enterocolitica*, *Acinetobacter* spp., *Bacillus anthracis*, *Corynebacterium diphtheriae*, *Salmonella diarrhea*, *Salmonella typhi*, *Klebsiella pneumoniae*, *Streptococcus pneumoniae*, *Streptococcus faecalis*, *Streptococcus mutans*, *Staphylococcus aureus*, *Pasteurella multocoda*, *Mycobacterium tuberculosis*, *Vibrio cholerae* and *Proteus* species (Jeffrey and Echazarreta, 2008).

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