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## Sweet medicine-reverting from modern to Traditional: Approach

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### Abstract

Various natural products have been used for several years in folk. Among the natural medicated products, honey has an effective antibacterial, anti-inflammatory, antioxidant potential and tends to reduce oral pathogens and holds promising effect on the treatment of periodontal diseases, mouth ulcers, lichen planus, psoriasis, recurrent herpes labialis and other diseases of the oral cavity. Honey is the nectar that is collected from many plants and processed by honey bees (*Apis mellifera*). In this era of modernization and industrialization people are realizing that modern medicine is not the only remedy for infections today, so many of us are looking for the alternative approaches with least possible side effects. This article highlights the role of honey as a remedial approach for various oral and skin lesions and also enlightens us with its advantages over modern medicine.

**Keywords:** Honey, Ulcers, Wounds, Anti-inflammatory, Antioxidant

### 1. Introduction

Nature is the most important source for producing new medicines. During the past decade, there has been a worldwide increase in the use of traditional and complementary or natural systems of medicine [1]. The use of traditional medicine to treat infection has been practiced since the origin of mankind, and honey produced by *Apis mellifera* (*A. mellifera*) is one of the oldest traditional medicines considered to be important in the treatment of several human ailments [2,3]. In most ancient cultures, honey has been used for both nutritional and medical purposes [4]. The last prophet Muhammad (PBUH) recommended the use of honey for the treatment of diarrhea [5]. Honey was mentioned in the Holy Quran more than 1400 years ago that wherein is healing for people. "And your LORD inspired the bee, saying "Take you habitations in the mountains and in the trees and in what they erect. Then, eat of all fruits, and follow the ways of your LORD made easy (for you)". There comes forth from their bellies, a drink of varying color wherein is healing for men. Verily, it is indeed a sign for people who think [6].

### 2. Honey and its constituents

Honey is nectar collected from many plants and processed by honey bees (*Apis mellifera*). It is used by human beings as food and as medicine for the treatment of various systemic diseases (such as respiratory diseases including asthma, urinary, gastrointestinal and skin diseases including ulcers, wounds, eczema, psoriasis, seborrheic dermatitis and dandruff) [7, 8]. The composition of honey is variable, depending primarily on the floral source; however, certain external factors also play a role, such as seasonal, environmental and processing factors. Honey has been reported to contain about 200 substances. Beside carbohydrates, which are their major component (70 to 80%), honey contains low amounts of various substances such as organic acids, proteins, amino acids, vitamins, enzymes, minerals, and various other molecules (pigments, flavonoids, antibacterial factors, among others) [9-13].

### 3. Honey as a medicinal source

#### 3.1 Wound healing/Antimicrobial property

Medicinal importance of honey has been documented in the world's oldest medical literatures, and since the ancient times, it has been known to possess antimicrobial as well as wound-healing property. The healing property of honey is due to the fact that it offers antibacterial activity, maintains a moist wound condition, and its high viscosity helps to provide a protective barrier to prevent infections [14].

Honey differs from other wound dressings that provide a moist healing environment in that it has an osmotic action that draws fluid out from the wound bed. This creates a layer of fluid beneath the dressing layer - a contact with the wound surface that is a dilute solution of honey in plasma or lymph, allowing no adherence. Hence, no pain or tearing away of newly grown repair tissues occurs when dressings are changed [15].

Its immunomodulatory property is relevant to wound repair too. The antimicrobial activity in most honeys is due to the enzymatic production (glucose oxidase in honey) of hydrogen peroxide. In addition, honey is hygroscopic, which means that it can draw moisture out of the environment and dehydrate bacteria, and its high sugar content and low-level pH (average Ph of 3.9) can also prevent the microbes from growth [14].

Honey gives a fast rate of tissue regeneration and suppression of inflammation, oedema, exudation and malodour in wounds, as evidenced in clinical observations and the results of animal studies and clinical trials. White JW(1975) [9] stated that honey can be expected to have a direct nutrient effect on regenerating tissue because it contains a wide range of amino acids, vitamins and trace elements in addition to large quantities of readily assimilable sugars. Efem (1988) [16] concluded that vitamin C in honey, which is typically more than three times higher than that in serum, could be of particular importance as because of the essential role of this vitamin in collagen synthesis. In addition, the high osmolarity of honey causes an outflow of lymph which serves to provide nutrition for regenerating tissue which otherwise can only grow around points of angiogenesis (seen as granulation); healing is delayed if the circulation to an area is poor, or if a patient is poorly nourished. Also it has been suggested that the decreased turgor resulting from the application of honey may increase oxygenation of tissues. Tonks *et al.* (2003) [17] stated that honey may initiate or accelerate the healing of chronic wounds and has, therefore, have anti-inflammatory properties that may in part be related to the stimulation of inflammatory cytokines from monocyte cells when applied topically. Such cell types are known to play an important role in healing and tissue repair where it induced or stimulated the release of TNF- $\alpha$ , IL-1 $\beta$  and IL-6 from MM6 cells, along with its antibacterial properties of hydrogen peroxide. Honey also lowers plasma concentrations of prostaglandin E2, prostaglandin F2 alpha and thromboxane B2 in healthy subjects.

At present a number of honeys are sold with standardized levels of antibacterial activity. The *Leptospermum scoparium* (*L.scoparium*) honey, the best known of the honeys, has been reported to have an inhibitory effect on around 60 species of bacteria, including aerobes and anaerobes, gram-positives and gram-negatives [4].

Honey has been described in ancient and modern medicine as being effective in the healing of various infected/open wounds, burns and ulcers [4].

Antimicrobial agents are essentially important in reducing the global burden of infectious diseases. However, as resistant pathogens develop and spread, the effectiveness of the antibiotics is diminished. This type of bacterial resistance to the antimicrobial agents poses a very serious threat to public health, and for all kinds of antibiotics, including the major last-resort drugs, the frequencies of resistance are increasing worldwide [18]. Therefore, alternative antimicrobial strategies are urgently needed, and thus this situation has led to a reevaluation of the therapeutic use of ancient remedies, such as plants and plant-based products, including honey [19]. It can be ascertained that honey is itself sterile and has a broad spectrum

of antimicrobial actions inhibiting the growth of both Gram positive and Gram negative bacteria including *Staphylococcus aureus* and various strains of human pathogenic bacteria [20]. Zumla and Lulat (1989) [21] suggested that honey should be applied at regular intervals, from hourly to twice daily and that wounds can become sterile in 3 to 10 days.

### 3.2 As first aid dressing material

Honey is also an ideal first-aid dressing material, especially for patients in remote locations when there could be time for infection to have set in before medical treatment is obtained: it is readily available and simple to use. It would be particularly suitable for first-aid treatment for burns, where emergency dousing or cooling frequently involves the use of contaminated water which then leads to heavy infection of the traumatised tissue. As well as providing an immediate anti-inflammatory treatment the honey would provide an antibacterial action and a barrier to further infection of the wound [22].

Honey has been used topically on wounds over thousands of years also without gaining any reputation for adverse effects except for no more than a transient stinging sensation in some patients [23].

Generally, the topical application of honey on open wounds is reported to be soothing and relieving pain [24], be non-irritating [25], cause no pain on dressing [26], and give no secondary reactions [23]. Thus, as honey have thousands of benefits with no significant adverse effect on human health. Furthermore honey has an economical advantage over pharmaceutical medications for RAS treatment. Ashrafi *et al.* (2005) found that honey exerts comparable effects when compared to Orabase®-B in the treatment of human aphthous ulcers. However, honey is more effective in providing relief from pain associated with these ulcers [27].

### 3.3 Skin graft storage

Subrahmanyam (1993) [28] reported evidence that honey is hypertonic, sterile and bactericidal and therefore it is effective in skin grafts storage and preservation as reported in an experimental study that showed good histopathological preservation of skin grafts in honey and the uptake of grafts was 100% in the patients in whom honey-stored grafts.

### 3.4 As a treatment modality for skin diseases

Tuck and Hayball (2002) [29] advocated successful use of honey as topical application in treatment of skin diseases associated with bacterial infection and/or inflammatory mycosis without use of corticosteroid or antibiotic combinations. They stated that honey causes faster eradication of bacterial infections, reduces antibiotic used and hospital stay, accelerates wound healing, and results in minimal scar formation.

Al-Waili (2003) [30] hypothesized the mechanism of therapeutic effects of honey in skin lesions, as anti-inflammatory agent, might be attributed to reduction in the prostaglandin synthesis at site of application, elevation of nitric oxide in the lesions, inhibition of fungal or bacterial growth, inhibition of leukotriene B4, and to its antioxidant and anti-inflammatory activities.

Giustizier *et al.* (2002) [31] found that honey increased nitric oxide in saliva taken from normal individuals. Nitric oxide reduces incidence of skin infection in psoriasis.

### 3.5 In treatment of Candida infections

Wellford *et al.* (1994) [32]; Al-Waili (2004) [33] in their study showed successful treatment of candidal infections by using

topical application of honey after three weeks. They advocated that honey apparently could inhibit growth of *Candida albicans* completely. Pure honey inhibited fungal growth and diluted honey appears capable of inhibiting toxin production.

**3.6 In the treatment of Lichen Planus-** It is an inflammatory autoimmune disease that may affect both the skin and oral mucosa. OLP could represent as reticular, papular, or erosive ulcerative lesion of the oral mucosa. Oral lesions are often persistent. It is treated according to the severity of the condition, often by using topical or systemic corticosteroid drugs. Using topical honey for treatment of OLP and desquamative gingivitis dramatically reduced the inflamed areas [6].

**3.7 As a treatment modality for recurrent herpes labialis** Should be treated with topical application of acyclovir ointment within the first 24 h of the onset of the lesion; otherwise, it will be difficult for the lesion to respond to antiviral therapy. In the study conducted by Sally and Maysara (2013) [6], application of honey in the prodromal period, in one case, accelerated healing process with resolution of erythema and tingling sensation and prevented vesicular eruption. When it was applied after eruption of vesicles, in other cases, there was rapid resolution of the vesicles with no crust formation within 8 days.

**3.8 In the treatment of recurrent aphthous ulceration-** In the study conducted by Samet *et al.* (2006) [34] it was concluded that usage of honey in recurrent aphthous ulcer patient can be reduced the number of recurrences and improved the quality of life in patients who suffer from RAS. Honey adsorbs toxins from the mucous membrane and precipitate protein, so the pus and inflammatory exudates are absorbed by the natural honey, thus protecting the underlying tissues and enhanced normal healing and the epithelialization [35]. Sticky viscous properties of the natural honey, enables it adhere to the ulcer. This mechanism for coating the ulcer prevents it from secondary infection, and prevents ulcer surface from direct communication from different chemicals and microbes. No allergic mucosal reaction or toxic effects have been noted with honey usage [36].

#### 4. Conclusion

Today natural honey and bee products have an important role in nutrition and treatment. Honey and honey-based products are used as sources of energy and nutrition. Also, it is important in human health care and disease treatment. Clinical anecdotal evidence supporting the beneficial use of honey as a remedy for some common intraoral lesions, skin lesions and chronic wounds has been reported in the literature. With the use of honey, no allergic reaction is elicited and no significant side effects have been reported except slight tingling sensation on topical application. Thus the anti-bacterial, anti-inflammatory or anti-oxidant, as well as nutritional and physical properties of natural honey, makes it a logical and accepted natural agent for healing oral ulcers/wounds and skin lesions.

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