



APPLICATION OF HONEY ON SKIN PRODUCT

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ABSTRACT

A complex mixture of carbohydrates, water, a few proteins, vitamins, minerals, and phenolic chemicals make up the natural material honey, which is made by honeybees. Among the different kinds of sugars found in honey are fructose, glucose, and maltose. Historical accounts of the application of honey to the skin go back to the earliest known civilizations, demonstrating that honey has long been valued for its healing properties as well as its use as a binder or carrier. Due to enzymatic H₂ O₂ release or the presence of active ingredients, such as methylglyoxal in manuka, antimicrobial characteristics are crucial in dermatological applications. Medical-grade honey is also available. Honey is a sweet, flavourful liquid that is an organic, natural product made by *Apis mellifera* from the nectar of flowers. Throughout human history, honey has been widely employed as a medication in addition to its vast use as a popular culinary flavouring and in cosmetic science. In the pharmacy, beeswax is used to make cosmetics and ointments. Bee products could be regarded as significant ingredients in medicine and cosmetic science because of their diverse spectrum of biological activity. In order to wrap off this review, we will outline the advantages and conventional uses of honey, particularly in cosmetics.

KEYWORDS

bee products; flavonoids, phenolic acids; skin care; therapeutic properties; acacia honey; antimicrobial action; skin cells; cosmetic and dermatological formulation; skin disease and aging; traditional medicine.

INTRODUCTION

When honey and coconut acid (the fatty acids in coconut oil) react, a complex mixture of esters known as honey Cocoates is created, according to the dictionary. The Panel has already evaluated the safety of coconut acid as it is used in cosmetic products. The Panel reached the 2011 final conclusion that coconut acid is safe for use in cosmetics. [23] Bees produce honey, a natural product, from nectar and honeydew. A supersaturated carbohydrate solution with a variety of characteristics and widespread application is honey. Bees gather propolis, also known as bee glue, from the buds of trees, shrubs, and green plants. Propolis is a resinous material. [28] The present scientific literature on the biological and clinical fields is examined in this systematic review. [7] For instance, honey was

applied topically to the skin by the ancient Greeks and Egyptians to treat burns and skin wounds. A wide range of illnesses have been said to be improved by honey, but the therapeutic benefits of honey in the management of skin disorders are the main emphasis of this review. [8] Although the research on honey and skin ulcers imply that honey may be useful for the treatment of small rashes, there is no evidence provided to support the use of honey in nappy rash ointments. [20] The biggest organ on the human body and the skin's outermost layer. Because of this, preventing diseases like infections, dermatitis, or even dehydration, demands a lot of care. [26] Bees produce honey, a natural product, from nectar and honeydew. A supersaturated carbohydrate solution with a variety of characteristics and widespread application is honey. [28] One of the foods with religious importance is honey. Giving bee's honey to monks is a traditional way for Buddhists in India and Bangladesh to celebrate the festival of Madhu Purnima. This is to remember the time when Lord Buddha fled to the wilderness owing to a disagreement among his pupils and a monkey presented him with honey.[29] Only honey is an insect-derived natural product, and it has uses in industry, cosmetics, medicine, and nutrition. Honey is said to be a nutritious meal that appeals to both men and women of all ages. Honey doesn't require refrigeration, doesn't go bad, and can be kept unopened at room temperature in a dry spot.[31] Bees are fed by the flowers that enhance the forest's beauty. The types of bees that produce honey are *Apis cerana*, *Apis dorsata*, *Apis mellifera*, *Apis floria*, *Apis andreniformis*, *Apis koschevnikov*, and *Apis laborisa*. They extract floral nectar and turn it into honey. [30] Bee pollen was utilized for skin whitening and beauty in ancient China. Bee pollen has a variety of chemical components that have a lot of potential for advancement in the cosmetics industry. A few examples are vitamins, bioelements, phenolic compounds, proteins, amino acids, carbs, lipids, and fatty lipids. Methionine, lysine, threonine, histidine, leucine, isoleucine, valine, phenylalanine, and tryptophan are among the amino acids. Fibre, fructose, glucose, and sucrose are all types of carbohydrates. [32] Today, honey is mostly used to treat wounds, burns, and infections; however, as these uses are covered elsewhere, we won't discuss them in this article. [1] Also, honey contains a number of vitamins, primarily riboflavin, niacin, pantothenic acid, pyridoxine, folate, and vitamin C, as well as minerals, proteins, enzymes, flavonoids, and phenolic acids. These include catalase, superoxide dismutase, reduced glutathione, quercetin, galangin, chrysin, and hesperetin. [3] Since emergency chilling or dousing commonly uses polluted water, which then causes severe infection of the traumatized tissue, it would be especially appropriate for burn first aid. The honey would have an antibacterial effect and function as a barrier to subsequent infection of the lesion in addition to giving an immediate anti-inflammatory treatment. [11] This article's main goal was to promote the creation of new, more effective skin treatments.



FIGURE 1: HONEY COMB

Chemical Composition of Honey Bees: -

Honey includes macro- and micronutrients, the amount of which depends on a number of factors:

- 1) Bee type
- 2) A floral supply
- 3) processing and environmental variables.

In all, honey contains 200 different substances, including sugar, protein, enzymes, minerals, vitamins, amino acids, and a variety of polyphenols. Due to the different ratios of these compounds, each type of honey has a unique colour, flavour, viscosity, and therapeutic qualities. In this way, the sum of all these components works together effectively in many applications. [25] According to where the nectar comes from, the ingredients of honey might change. The basic components, however, stay consistent.

Table includes a list of these ingredients.

Component Average	%
Moisture	17.2
Fructose	38.19
Glucose	31.28
Sucrose	1.31
Disaccharides, calculated as maltose	7.31
Higher sugars	1.50
Free acid as gluconic	0.43
Lactone as gluconolactone	0.14
Total acid as gluconic	0.57
Ash	0.17
Nitrogen	0.04

How Honey is made: -

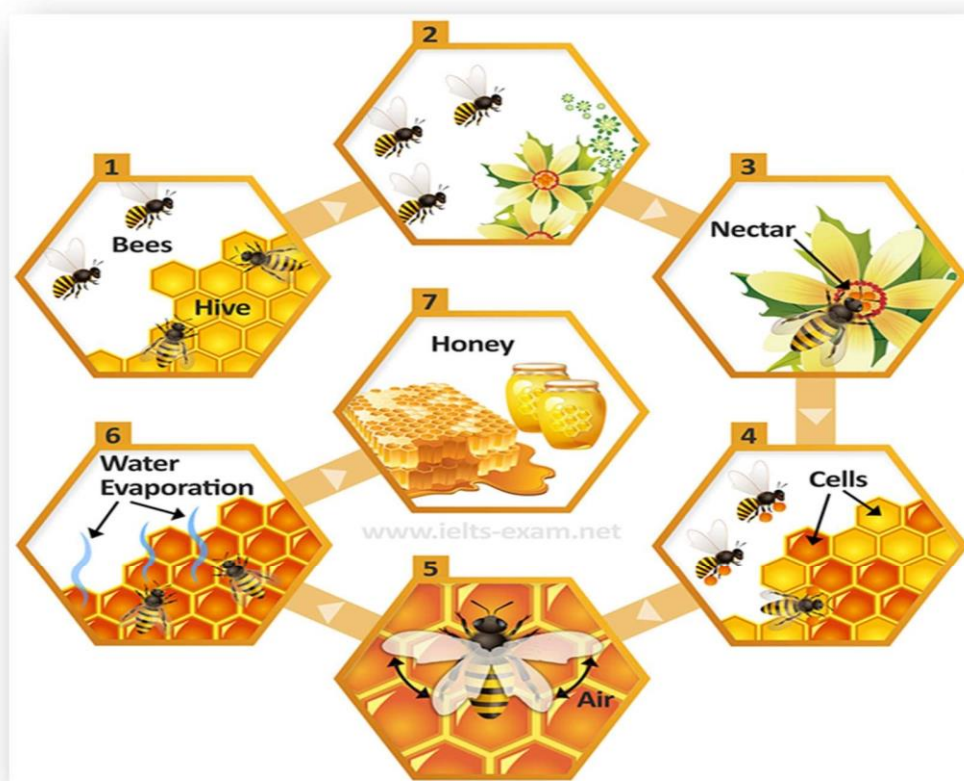


FIGURE 2: - PROCESS OF HONEY

Step 1: - Using a proboscis, an evolved tongue, a bee forages from blossoms and gathers nectar.

Step 2: - The bee stores the nectar in a unique organ known as the honey stomach in order to convey it back to the hive.

Step 3: - The nectar is starting to be broken down into simpler sugars by enzymes in the honey stomach.

Step 4: - Younger house bees receive the nectar that forager bees have obtained and bring it back to the hive.

Step 5: - By passing the nectar mouth-to-mouth from one house bee to another, the sugars are further broken down and the nectar's water content is starting to decrease.

Step 6: - The nectar is then placed into the honeycomb's hexagonal cells.

Step 7: - The bees flap their wings to evaporate the nectar, significantly reducing its water content.

Step 8: - The honey is "ripe" when the water content drops to 20%.

Honey used in Indian system of ayurveda: -

Ayurveda is a composite word made up of the words âyus, which means "life" or "life principle," and veda, which means "a system of knowledge." As a result, the name "Ayurveda" loosely translates to "knowledge of life." [36] Honey was regarded by the ancient Vedic civilisation as one of nature's most amazing gifts to humans. Ancient Ayurvedic texts state that honey typically aids those who have digestive problems. Additionally, it has been underlined how effective honey is in treating annoying coughs. Ayurvedic doctors believe that honey is beneficial for maintaining healthy teeth and gums. [34] One of the treatments suggested for treating pitta diseases is honey (Caraka Samhita, Chapter 27; Verses 243–246) [37]. Since herpes and pitta imbalance are related, it is possible that there is a rationale for using honey in ayurvedic medicine to cure herpes. [38] Honey has long been used by Ayurvedic doctors to cure a variety of eye ailments. It enhances vision when applied to the eyes on a daily basis. Honey is also proven to aid in cataract reduction. [21]

Physical Properties of Natural Honey: -

The physical characteristics of honey produce a barrier of protection and, through osmosis, a moist environment conducive to wound healing that does not adhere to the tissues beneath the wound. [18] A humectant is a substance that naturally attracts and holds moisture. Because of its natural tendency to moisturize, honey makes a fantastic moisturizing agent. Pure honey can be utilized to produce items for infants and others with sensitive skin because it doesn't irritate their skin. [21] Liquid honey can be transparent and colourless (like water) or it can be dark amber or even completely black. The various hues of honey are primarily variations of yellow and amber. In contrast to colour, which varies with botanical origin, age, and storage circumstances, transparency or clarity is determined by the quantity of suspended particles.

Dermatological Properties: -

Research investigations have supported the use of honey to treat burns and wounds since ancient times. The amazing efficacy of this old therapy has aroused interest in more modern, professional approaches to wound healing. [21] distinct honey types may have distinct antibiotic effects, which are thought to be most frequently regulated by low water activity, low pH, and the production of hydrogen peroxide by the enzyme glucose oxidase. [21] In terms of treating vaginal candidiasis, honey distillates have been shown to be comparable to over-the-counter antimycotic drugs. Athlete's foot and ringworm are examples of superficial mycoses that have been successfully treated with honey variations that either contain hydrogen peroxide or do not have peroxide antibacterial action [39].

Types of Honey: -

There are many different kinds of honey, and each one has a special flavour, scent, and set of qualities. The nectar source that bees gather determines the sort of honey that is produced. Here are a few popular varieties of honey:

1. **Wildflower Honey:** Wildflower honey is a general term for honey made from the nectar of various wildflowers. It has a diverse flavour profile and can vary in taste and colour depending on the local flora.
2. **Clover Honey:** One of the most well-liked and readily available kinds of honey is clover honey. It is light in colour and has a mild, sweet flavour. White clover and Dutch clover are common sources



FIGURE 3: - WILDFLOWER HONEY



FIGURE 4: - CLOVER HONEY

3. Orange Blossom Honey: Orange tree blossom nectar is used to make this honey. It tastes faintly fruity and has a zesty fragrance. It frequently has light colours.



FIGURE 5: - ORANGE BLOSSOM HONEY

4. Lavender Honey: Lavender flowers' nectar is used to make lavender honey. It has a distinct floral flavour with traces of lavender and a gentle, sweet scent.



FIGURE 6: - LAVENDER HONEY

5. Acacia Honey: The nectar of acacia tree blossoms is used to make acacia honey. It typically has a very light appearance and a pale, almost transparent colour. It tastes fresh and delicious.



FIGURE 7: - ACACIA HONEY

6. Manuka Honey: Made from the nectar of the manuka tree (*Leptospermum scoparium*), manuka honey is mostly produced in New Zealand and Australia. It is frequently used for therapeutic purposes and is renowned for having potent antibacterial effects.



FIGURE 8: -MANUKA HONEY

7. Buckwheat Honey: Buckwheat honey has a rich, earthy flavour and is dark and powerful. It is made from the nectar of buckwheat flowers and is generally recognized as one of the strongest honey varieties.

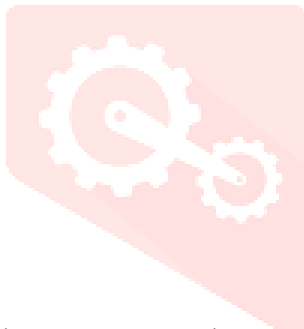


FIGURE 9: - BUCKWHEAT HONEY

8. Eucalyptus Honey: The nectar of eucalyptus tree blossoms is used to make eucalyptus honey. It has a strong, woody flavour and a faintly medicinal fragrance. Australia is where it is frequently found.



FIGURE 10: - EUCALYPTUS HONEY

9. Blueberry Honey: Blueberry bushes' nectar is used to make this honey. It tastes delicious, flowery, and has a faint blueberry undertone.



FIGURE 11: - BLUEBERRY HONEY

10. Alfalfa Honey: Alfalfa honey is made from the plant's nectar. It has a pale colour and a mellow, delicate flavour with a nuttiness undertone.



FIGURE 12: - ALFALFA HONEY

11. Heather Honey: Honey made from the nectar of heather flowers is known as "heather honey." It has a strong, slightly bitter flavour and a dark colour.



FIGURE 13: - HEATHER HONEY

12. Sunflower Honey: The nectar of sunflower blossoms is used to make this honey. Its colour ranges from light to medium amber, and its flavour is moderate and nutty.



FIGURE 14: - SUNFLOWER HONEY

13. Chestnut Honey: Chestnut honey has a powerful, slightly bitter flavour and is dark and robust in appearance. The nectar of chestnut tree blooms is used to make it.



FIGURE 15: - CHESTNUT HONEY

14. Sourwood Honey: Made in the Southeast of the United States from the sourwood tree's nectar. It tastes sweet, peppery, and slightly anise-flavoured.



FIGURE 16: - SOURWOOD HONEY

These are however a few examples; there are many more types of honey available in the world, each having unique qualities based on the plants from which bees gather nectar. Climate, soil, and beekeeping techniques are just a few examples of the variables that might affect the flavour, colour, and perfume of honey. [21] [26]

Honey For Skin: -

The human body's outermost layer and largest organ is the skin. Because of this, it takes a lot of attention to avoid illnesses like infections, dermatitis, or even dehydration. Numerous studies have revealed the many benefits of honey for both treating and preserving the skin. According to Burlondo and Cornara (2013), the composition of honey, which contains several minerals, vitamins, phytochemicals, and enzymes, is primarily responsible for this contribution.[26] According to PRISMA criteria, a systematic review was undertaken to examine the effects of honey in combination with other drugs or treatments on antibacterial activity, wound and skin infections. [7] Face

wrinkles are a very unfavourable result of intrinsic aging processes and extrinsic photodamage. The therapeutic benefits of bee-venom serum on the clinical indications of aging skin were examined in a clinical investigation. It revealed that 22 patients' facial wrinkles were clinically reduced after receiving bee venom serum treatment. [17] Honey's capacity to heal wounds on the skin has been ascribed to its antibacterial characteristics, capacity to control the immunological response of the skin, and capacity to encourage tissue restoration. [8] The high fructose and glucose content of honey contributes to its ability to hydrate the body, although other amino acids may also play a role. acids (predominantly proline, but also arginine, alanine, glutamic acid, aspartic acid, lysine, glycine and leucine) and organic acid (largely gluconic acid and, to a certain extent, lactic, citric, succinic, formic, malic, acetic, maleic and oxalic acids) that might strengthen the ability of glucose and fructose to keep the horny skin layer wet (Burlando and Cornara 2013). Unfortunately, there hasn't been much research done to accurately gauge how well honey moisturizes skin. Therefore, it is strongly advised that future studies test and evaluate how honey produces this moisturizing effect in order to understand its benefits and drawbacks when used as a moisturizer. [26]

Traditional Uses of Honey: -

1. Pimples: A paste made of one teaspoon of cinnamon powder and three tablespoons of honey. Before going to bed, apply this paste on the pores, and wash it off the next morning with warm water. if performed every day for two weeks. It cures acne from the source.
2. Skin diseases: Eczema, ringworm, and other skin infections can all be cured by mixing equal parts honey and cinnamon powder and applying it to the affected areas. [11]
3. When used as human food -Honey is a good source of high-carbohydrate food that often contains a wide variety of minor components (minerals, proteins, vitamins, and others), giving human diets more nutritional variety. [16]
4. Honey has been utilized as a traditional Ayurvedic medicine for more than 4,000 years. At that time, it was believed to be useful in balancing the body's three humors. Honey was seen by the ancient Vedic civilization as one of nature's most amazing gifts to humans. Honey was applied topically to cure wounds in ancient Egypt. [3]
5. Therapeutic use: Honey is most frequently applied topically to treat bacterial infections in a variety of different sorts of wounds. These include the following:
 - Leg ulcers
 - pressure ulcers
 - Diabetes-related foot ulcers
 - Burns that have become infected as a result of surgery or an accident. [11]

Scientific classification of bee: -

Kingdom	: Animal
Phylum	: Arthropoda
Class	: Insecta
Order	: Hymenoptera
Suborder	: Apocrita
Superfamily	: Apoidea
Family	: Apidae
Sub family	: Apinae
Tribe	: Apini
Genus	: Apis
Species	: Mellifera, cerana etc.
Binomial name	: Apis mellifera, Apis cerana etc. [30]

Effect of bee products on the skin: -

- 1) A non-adhesive tissue dressing, honey-impregnated pads provide a cleaning effect on wounds, encourage tissue regeneration, and decrease inflammation. [3]
- 2) By limiting their growth on the skin's surface, honey prevents the growth of germs and fungus. Honey has also been used in treatments for pityriasis, tinea, seborrhea, dandruff, diaper dermatitis, psoriasis, hemorrhoids, and anal fissure. It is particularly effective as a dressing for wounds and burns. [28]
- 3) Because honey kills bacteria, has the ability to penetrate bacterial biological films, lowers wound pH, reduces pain and inflammation, encourages fibroblast migration and keratinocyte closure, and encourages collagen deposition, The use of honey in tissue engineering and regeneration is possible. When creating biomaterial tissue templates for tissue regeneration, honey should be taken into consideration. Cryogels, hydrogels, and electrospun templates all included honey [41].
- 4) Meanwhile, honey promotes wound healing and controls the epithelial mesenchymal transition (EMT) process. The floral and country of origin of the honey determine its impact on EMT [40].

Application of Honey & antibiotics to bacterial cell: -

In terms of treating conditions affecting the skin, hair, and nails as well as cosmetic issues, dermatology includes both medication and surgical procedures. The majority of the theoretical groundwork for the treatment of dermatological issues has been established by earlier evaluations of possible applications of bee products. For instance, xi et al. describe the pollen components and suggest plausible applications for bee pollen in cosmetics without considering the clinical data. [17]

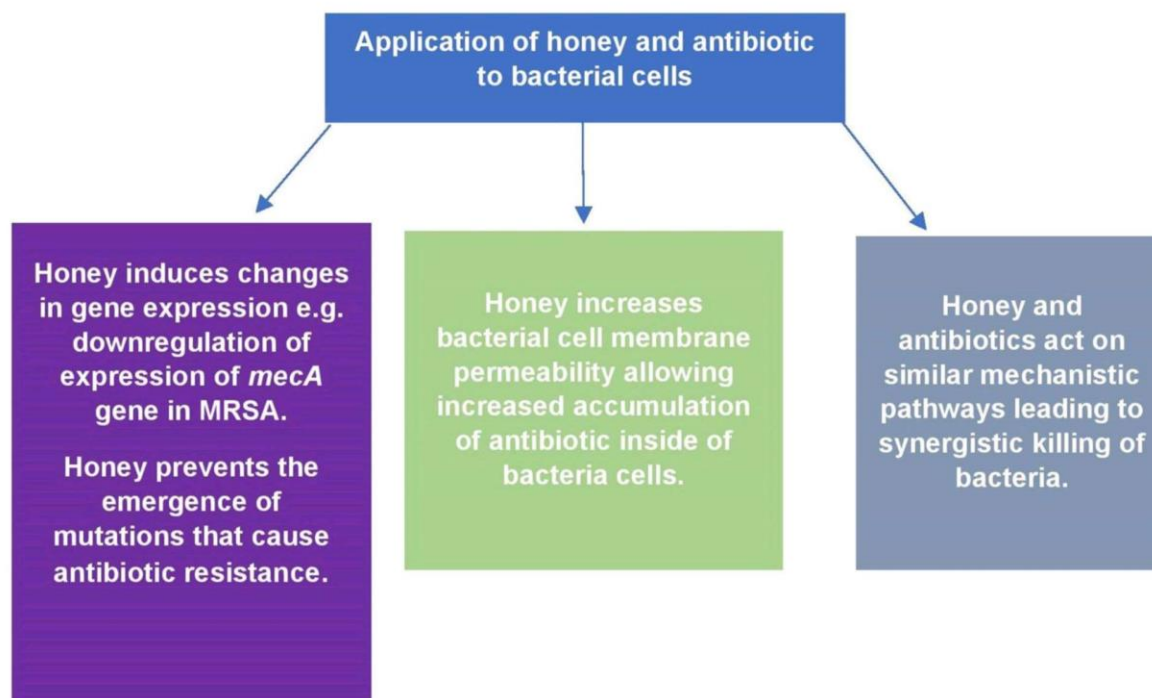


FIGURE 17: - APPLICATION OF HONEY [19]

CONCLUSION

One of nature's most well-liked remedies for skin is honey. Antioxidants in honey also have anti-inflammatory properties, which can help with tissue healing and lessen scarring. In addition to the many amino acids present, honey's high fructose and glucose content has been shown to have a moisturizing impact on the skin. This hydrating action aids in moisturizing and maintaining the skin's suppleness. Each bee product is distinguished from the others by the presence of certain active ingredients, which makes each suitable for use in treating a distinct skin condition. Numerous studies have demonstrated the benefits of bee products for skin, and the use of these items in wound healing emphasizes their therapeutic significance. We may get the conclusion that bee's honey is a priceless natural product with a wide range of applications. It may be used by individuals of all ages as a potent medication, a secure home treatment, a cosmetic, and a vitamin. To improve antibacterial activity and wound and skin healing, honey may be mixed with a variety of medicinal substances or treatments. Initially, manuka honey was used in cosmetics. Additionally, it was discovered that honey has a considerable antioxidant capacity, and features of its skin-care benefits, such as its ability to encourage skin regeneration and produce collagen, have been examined. Moreover, honey's high content of fructose and glucose is proven to give a hydrating effect to the skin besides the various amino acids present. This hydrating effect helps to moisturize the skin and keep it supple. In terms of hair treatment, honey confers abundance to the hair and also makes the hair easier to comb. Additionally, it was found that honey has a significant antioxidant capacity and aspects of honey's skin-care properties have been analysed, including its capacity to promote skin regeneration and create collagen.

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