

Honey in Cosmetic Preparations

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Pure honey, considered as a nature's ambrosia to humans, is well known for its healing and soothing powers. One of nature's wonders, pure honey rich in sugars, proteins and mineral salts, is a sweet smelling viscous liquid, holding a very honoured and esteemed position in Ayurvedic medicine and nature cure. Egyptians used honey in their medical formulas and the Greeks used it for curing skin disorders. It is a tradition in China to apply a blend of honey and ground orange seeds to keep skin free of any blemish. This ancient beauty treatment is followed even today by many Chinese men and women.

Historical facts and usage of honey

The Egyptian queen Cleopatra regularly took honey and milk baths to keep her skin young and healthy. Madame du Barry used honey as a facial mask to improve her complexion and please her master Louis XV. English Queen Anne, Sarah the Duchess of Marlborough, used honey in hair care to maintain their long hair lustrous, thick, strong, and beautiful.



Honey that has been used in beauty preparations since ancient times is just as popular today and is used in an increasing number of skin and hair care cosmetic products. Popular health and beauty products containing honey include bath and shower products, body scrubs, face creams, skin lotions and hair conditioners.

As we grow older, our skin ages, reducing its capacity to retain water making it dry and wrinkled. Additionally mental stress, solar UV radiation, exposure to chemical agents, polluted environment also contributes in damaging the skin and causing premature aging. The skin's ability to retain moisture and remain hydrated is a very important factor in maintaining its softness, suppleness and elasticity.

Natural properties

Honey is a natural humectant, which means that it has an ability to attract and retain moisture. Honey's natural hydrating property makes it an ideal moisturiser. Pure honey is non-irritant and so is suitable for preparing skin sensitive and baby products. Scientific studies have revealed that honey has significant amounts of antioxidant properties. Antioxidants are used by our body to eliminate free radicals or molecules that whiz around in healthy cells and damage them. Use of honey helps in protecting skin from damage, and also aids in skin

rejuvenation. Honey, due to its high sugar content, limits the amount of moisture available for bacterial growth. Its low pH and insufficient protein content deprives bacteria's of nitrogen vital for its growth. Natural antioxidants and hydrogen peroxide present in honey play a major part in inhibiting growth of bacteria. Hydrogen peroxide is released when honey comes in contact with human skin. Hydrogen peroxide is produced by glucose oxidase, an enzyme present in honey and introduced by honey bees.

Natural honey contains no preservatives or additives and can even be used straight, as available from nature, without processing or refining. Recent medical research documents claim honey to be an effective antimicrobial agent, as it can inhibit growth of certain bacteria, making it an useful ingredient in treating minor acne flare-ups.

Honey's prospects in scientific research

Alpha hydroxyl acids (AHAs) are important ingredients in many skin care products because of its ability to exfoliate skin. Exfoliation means surface removal of dead skin cells and aiding renewal and growth of new skin cells, giving skin a younger more vibrant look. Exfoliation can cause skin irritation in some.

Honey's natural moisturising property and non-irritant nature makes it a



perfect fit for research currently underway in developing a honey based AHA for use in exfoliating skin care cosmetics.

Honey works best on skin when used fresh, rather than from a ready to use personal care product claiming to do wonders, with honey added in infinitesimal amounts. Some typical traditional beauty recipes are listed below.

1. **Skin Cleanser:** 15 gm honey is mixed with 30 gm of finely ground almonds and 3 gm of lemon juice. The mixture is gently rubbed onto face and rinsed with warm water.
2. **Skin Clarifier:** Wash the face with warm water containing a little of edible salt. Using a cloth or cotton ball, apply salt water to soften any minor acne flare-ups. This might take a few minutes of continuous application. Using a swab apply honey on the affected portion; leave it for about 15 minutes. Rinse with water and pat dry.
3. **Skin Toner:** 15 gm of honey is mashed with a peeled cored apple. The paste obtained is applied onto the face and left for about 20 minutes. The paste is then cleaned out with cold water.
4. **Skin Conditioner:** 5 gm of honey is mixed with 5 gm of vegetable oil and 2 gm of lemon juice. Rub the mixture on dry skin, leave it for 15 minutes and rinse off.
5. **Skin Softening Bath Water:** Add honey directly to bath water and bathe.
6. **Facial Mask:** 15 gm honey, 5 gm glycerine, and 1 egg white are mixed with gram flour (Besan) to form a smooth paste. The paste is applied on skin and left for about 15 minutes. The paste is then washed off with warm water.

7. **Hair Conditioner:** Mix 50 gm honey with 25 gm of vegetable oil. Apply and coat this mix through out the hair. Leave it on the hair for half an hour, then shampoo well, rinse and dry normally.
8. **Hair Shine:** Mix 6 gm of honey in a litre of warm water. Pour this mixture in a washed and shampooed hair. Without further rinsing dry the hair normally.

Honey bees food – nectar for humans

All natural honey comes from honey bees. Many insects gather nectar from plants, but honey bees are the only ones who store it in a form suitable for human consumption. Bees collect nectar, or the sugary solution secreted by special glands (Nectaries) present in the flower blossoms, leaves and stems of flowering plants. Nectar is a thin fluid containing 50 to 80% water.



Honeybees suck the nectar out of the flowers and return to their hives. The worker bees present in the hives then suck the honey out of their stomach and chews the nectar for about half an hour. The chewing process introduces enzymes into the nectar, breaking them into simple sugars that are more digestible. The nectar is converted into honey that contains 16 to 18% water by the honey bees, stored and sealed in honeycombs of their hives to tide them over the lean patches during their life cycle.

A colony of bees can collect and carry into their hive as much as 450 kg of nectar in a year. This is achieved by visiting some 2-mn flowers to collect nectar. A large amount of labour is put up by the honey bees to produce honey, a food source for their personal use. Ironically,

humans eventually reap the benefits of their effort.

Quality types

Honey sold in the open market as natural is more likely to be adulterated with cheaper substitutes. Adulteration is rampant because of its demand and due to the fact that it is difficult to differentiate between pure honey and its impure varieties. The difficulty with honey quality is that the beekeeper does not have an absolute control over the variables encountered. Different species of flowering plants have differing types and amounts of floral secretions.

Sometimes nectar from a single plant species may also differ due to differences in soil, climatic conditions, season and other environmental factors. Cambodia cotton honey during December and January months is reddish because of meagre nectar flow, but as the season advances the colour changes to a rich, golden yellow colour.

Honey bees are not very particular in collecting nectar from flowers alone. They gather sweet juices from any available source giving undue preference to attractive smell. Some plant species like cotton (*Gossypium hirsutum*) and castor beans (*Ricinus species*) also have glands secreting sweet liquids located outside the flower petals.

Alternative source of sweet juice for the bees is the excretion of some insects like plant lice, scale insects, leaf hoppers, white flies, tree hoppers, etc which suck the juices of the various plant species.

The unutilised plant juices excreted by these insects are deposited on leaves, stems of plants and sometimes also on the ground. Bees gather this sweet 'honeydew' in a similar fashion as they

gather honey. Honeydew honey is rich in starchy gums, but is a poor food supplement for the bees during winter.

Honey and adulteration

As discussed earlier, testing the purity of honey is not easy. Various colours and different flavours only make the process more difficult. Some tips do help, but it is safest to purchase supplies in sealed containers from reliable suppliers that confirm to the standards laid down by the 'Prevention of Food Adulteration Act'.

In case of open purchase, if the honey is thin, has a weak flavour, and is offered at a comparatively cheaper price, it is most likely to be adulterated. One reliable test is to look for pieces of sealed or capped honey comb dipped in honey at the bottom of the container. Unscrupulous dishonest beekeepers however have found a way to get around this normally reliable test. Honey combs with capped cell cannot be manufactured, but empty combs are filled with sugar syrup before or during the honey season and kept in the beehives.



Since the bees are busy during the season, they do not consume the syrup readily, but seal the comb nevertheless. Such sealed comb when present in the adulterated stuff lends it a deceptive look of fresh natural honey.

Is the honey genuine?

Simpler test methods in deciding the quality of honey is by judging the colour, taste and aroma. Lighter the colour, milder the honey, although it starts darkening with age. Dark varieties, especially those derived from barberry, have good medicinal value.

The consistency of honey is also very important in judging quality. Superior grades of honey are viscous in nature, having lower water content. Unripe honey contains high amounts of water, along with yeast. High amounts of water in honey are favourable for yeast to ferment the sugars present to produce alcohol, carbon dioxide, acetic acid and water. Fermented honey becomes sour with a foamy layer on top.

Honey granulates and assumes a dark colour. Homogeneous granulation is a sign of purity. It can be restored to its sparkling liquid form by simply keeping the honey jar in a bowl containing warm water and stir until the crystals dissolve. Honey should be stored at room temperature (never in a refrigerator) and away from heat to prevent deterioration of its taste and for preserving its aroma and flavour. Honey obtained from the nectar of citrus, acacia, or linden flowers often have an unpleasant odour and so an unpleasant odour need not necessarily indicate adulteration.

If honey is left standing in a container for a long time, then the heavy sugars components settle at the bottom. The lighter water-laden portion that rises on the top has a tendency to ferment giving

out an unpleasant odour. To prevent this from happening, it is advisable to stir stored honey intermittently.

Honey stirred frequently and stored properly will remain odourless and consumable for a very long time. Honey should be preferably stored in glass containers. Metal containers and covers should be avoided as honey tends to react with metals producing dark impurities.

Beekeepers cannot direct the bees to specific flowers to collect nectar, however their experience aid them to identify plants from where nectar is largely gathered and decide the varieties. Moreover, the honey obtained has a fruity aroma of the predominant flower species from where it has been collected.

Typical types of honey

The typical varieties of honey are the following:

- ♦ Comb honey: It is honey in the absolute natural form – filled in beeswax comb by the bees in the honey comb. It is the only unprocessed form of honey.
- ♦ Liquid honey or extracted honey: When the natural wax caps are cut off and the comb is centrifuged in a honey extractor the honey stored in the comb is forced out and we get liquid honey.
- ♦ Granulated creamy honey: This is obtained when one part pure finely granulated honey is mixed with nine parts of liquid honey and stored at around 57°C, until it becomes firm and creamy.
- ♦ Chunk honey: Comb honey surrounded by liquid honey and stored in a jar is chunk honey.

Although honey can be used in its unprocessed form, as available from bees, they are generally processed to

Table 1
Specifications of quality honey

Properties	Standard Grade	A Grade
Specific Gravity at 27°C (Minimum)	1.37	-
Specific Gravity at 28°C (Minimum)	-	1.39
Moisture (Maximum %)	25	22
Reducing sugar (Minimum %)	65	65
Sucrose (Minimum %)	5	5
Fructose / Glucose ratio	1.6	1
Ash content (Maximum %)	0.5	0.5
Acidity (Maximum %)	0.2	0.2

improve its keeping quality. Unprocessed honey has better taste, but is susceptible to fermentation due to the presence of yeast. Honey is generally processed at a temperature above 160°C. Processed honey is then filtered. Filtration reduces honey's natural tendency to granulate and improves its looks. However, high temperature processing and filtration eliminates natural enzymes present.

Can honey be poisonous?

Pure honey is considered ambrosial; however some can also be downright poisonous. Indiscriminate collection of nectar from poisonous plants species can make the honey gathered poisonous and unfit for human consumption. Plants like mountain laurel (*kalmia latifolia*), tobacco (*nicotiana tobaccum*), yellow jasmine (*gelseminum simper virens*), soapberry (*sapinduo marginatus*) and rhododendron species, produce poisonous nectar.

Honey obtained from central and northern Japan often causes indisposition and minor illness. This is traced to

Table 2
Well known honey's of the world

Obtained from plant types	Country of origin
Acacia	Bulgaria/Hungary/ Romania
Apple blossom, Cherry blossom, Heather	United Kingdom
Clover	Canada/ New Zealand/ North America
Eucalyptus	Australia
Lavender, Orange blossom, Sunflower	France / Spain
Lime blossom	China / Poland
Thyme	France/Greece/ New Zealand

Table 3
Honey types based on their colour

Colour of honey	Plant	Botanical name	Time of flowering	Aroma
Watery white	Acacia	<i>Acacia sp</i>	October	Fine
	Shain	<i>Plectranthus rugosus</i>	August to October	Mild
	White colver	<i>Trifolium alexandrium</i>	May to June	Excellent
	Raspberry	<i>Rubus idasus</i>	April to July	Pleasant
Golden	Toon	<i>Cedrela toona</i>	March to April	Distinct
	Cotton	<i>Gossypium sp.</i>	August to September	Mild
	Lavender	<i>Lavandula vera</i>	Spring	Delicate
Light golden	Sage	<i>Salvia officinale</i>	April to July	Astringent
	Sunflower	<i>Helianthus annus</i>	September	Sharp
	Soapnut	<i>Sapindus detergens</i>	April to May	Excellent
	Dandelion	<i>Taraxacum officinale</i>	April	Pleasant
Amber	Maple	<i>Acer platenoides</i>	Spring	Pleasant
	Eucalyptus	<i>Eucalyptus sp.</i>	November to April	Strong
	Peppermint	<i>Menthe piperita</i>	Perennial	Pleasant
Deep red	Shisham	<i>Dalbergia sp.</i>	March to April	Charac- teristic
	Puna	<i>Ehreti acuminata</i>	April	Pungent
	Arjan	<i>Terminalia arjuna</i>	May to June	Molasses
	Barberry	<i>Berberis lycium</i>	February to June	Strong
Light green	Buckwheat	<i>Fagopyrum esculentum</i>	June to September	Strong
	Phacelia	<i>Phacelia tanacetifolia</i>	Perennial	Pleasant
	Willow herb	<i>Chaemaenerion angustifolium</i>	July to February	Delicate
Blackish	Sweet clover	<i>Melilotus alba</i>	June to September	Strong
	Honey dew	<i>Through insects and leaf hoppers</i>	May to June	Unpleasant
Dark brownish	Tobacco	<i>Nicotiana tabacum</i>	August to September	Bitter
	Heather	<i>Celluna vulgaris</i>	Frost	Astringent
Light yellow	Cruciferous	<i>Brassica sp.</i>	December to March	Pleasant
	Carrot	<i>Dacus carota</i>	October to January	Pleasant
Light red	Rowan	<i>Sorbus aucuparia</i>	Perennial	Pleasant
	Yellow poplar	<i>Liriodendron tulipifera</i>	May to June	Pleasant
	Leatherwood	<i>Cyrilla racemiflora</i>	May to July	Pleasant

Table 4
Major flowering plants of India secreting nectar for honey production

Location	Plant species	Flowering period	Colour of honey	Aroma
Bihar	Litchi (<i>Nephelium litchi</i>)	March	Amber	Good
Karnataka	Naval (<i>Syzygium spp</i>)	April – May	Light yellow	Fair
	Coffee (<i>Coffea Arabica</i>)	February – March	Amber	Fair
Kerala	Rubber (<i>Herea brasiliensis</i>)	February	Glycerine white to Golden Yellow	Distinct
Kodaikanal (Tamil Nadu)	Kumil (<i>Gmelina arborea</i>)	April	Amber	Attractive
	Pungalam (<i>Ligustrum walkeri</i>)	May – June	Amber	Fair
	Murukku (<i>Erythrina mysorensis</i>)	August – September	Light	Distinct
	Naval (<i>Syzygium cumini</i>)	April – May	Light	Fair
Kashmir	Kikar (<i>Robinia pseudo acacia</i>)	April – May	White	Distinct
	Solekanth (<i>Plectranthus rugosus</i>)	September	Water white	Good
	Teole gogul (<i>Brassica juncea</i>)	March – April	Light yellow	Fair
	Saffron Kung (<i>Crocus sativus</i>)	Late October	Light	Medicinal sweet
Mahabaleshwar (Maharashtra)	Karvi (<i>Carvia callosa</i>)	September – October	Dark Amber	Fair
	Whyati (<i>Strobilanthes ixiocephalus</i>)	November – January	Light yellow	Good
	Kharwar (<i>Strobilanthes reticulates</i>)	October – November	Light yellow	Good
	Pisa (<i>Actinodaphne hookeri</i>)	December	Dark Black	Molasses like odour
	Burambi (<i>Leucas stelligera</i>)	November – December	Light yellow	Fair
	Akhra (<i>Strobilanthes heyneanus</i>)	January – February	Yellow	Distinct
	Jambul (<i>Eugenia jambolana</i>)	March	Amber	Distinct
	Gela (<i>Randia dimetorum</i>)	April- May	Light yellow	Good
Hirda (<i>Terminalia chebula</i>)	May	Light yellow	Fair	

the nectar obtained from the plant '*hotsutsayi*' plant belonging to the heather family. Similarly, honey produced in far-eastern Russia that is yellowish in colour, rather bitter; easily crystallising is reported to be poisonous. Use of this honey produces cold sweat, shivering, nausea, vomiting and violent headache. 100 to 200 gm of honey if consumed can render a person either delirious or unconscious. The poisonous effect is traced to the nectar of bog heather (*Chamodaphne calyculate*).

Poisonous or heady honey can be rendered harmless, if it is heated for three hours between 80-90°C, stirring continuously and taking care that it does not

boil. An alternate method is to heat the heady honey at 46°C under low pressure (67-mm Hg). This prolonged, but controlled, heating is said to breakdown poisonous substances and make the honey harmless, keeping the flavour intact. However, it is to be noted the toxins in such heady honeys are not stable. The toxicity can decrease as the honey ages over time, even under ordinary storage conditions.

CONCLUSION

Lord Shri Krishna in the *Bhagvadgita* states "We are what we eat" and urges us to eat only "*Yukta Saatvik Aahaar*", i.e., eat sensibly, simple, pure and healthy food. Modern research has re-

vealed that honey has the necessary qualities to be classified as a health food.

Regular consumption of honey provides a wide array of vitamins, minerals and natural antioxidants, protecting skin from damage and destruction. In addition, honey continues to be an easily available beauty product for external application, with a potential to become the basic raw material for scientific research in the creation of speciality ingredients for cosmetic preparations.

Did I hear someone say? Wow! 'Honey, you are looking beautiful.'