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Editorial

The vulnerabilities in supply chains and depleting workforces in the agriculture sector have been at the forefront line of discussion in the present context. Besides, the current Covid- 19 pandemic is an added challenge for this sector. The pandemic hit hard the availability of labour for different farm operations during peak harvest season. Although, the concern of farmer's income has been raised at several fora and is receiving top priority not only by the scientists and the farming community but all concerned, including the Governments of different Countries. Parallelly, the present problem accentuated the need for agricultural market reforms and online platforms to connect farmers to markets. There is an urgent demand for new normal changes to the agriculture sector by relying on innovative digital solutions which can help to make supply chains function better and more efficiently. “FARMING” has been at the forefront of that response, mobilizing rapidly and always bringing new ideas in a single platform and projecting innovative thoughts of authors in a systematic way. It provides a forum for scholarly work and promotes technical competence for research in agricultural and allied subjects.

Gurpreet Singh Selopal
Chief Editor

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ARTIFICIAL INTELLIGENCE IN BEE KEEPING

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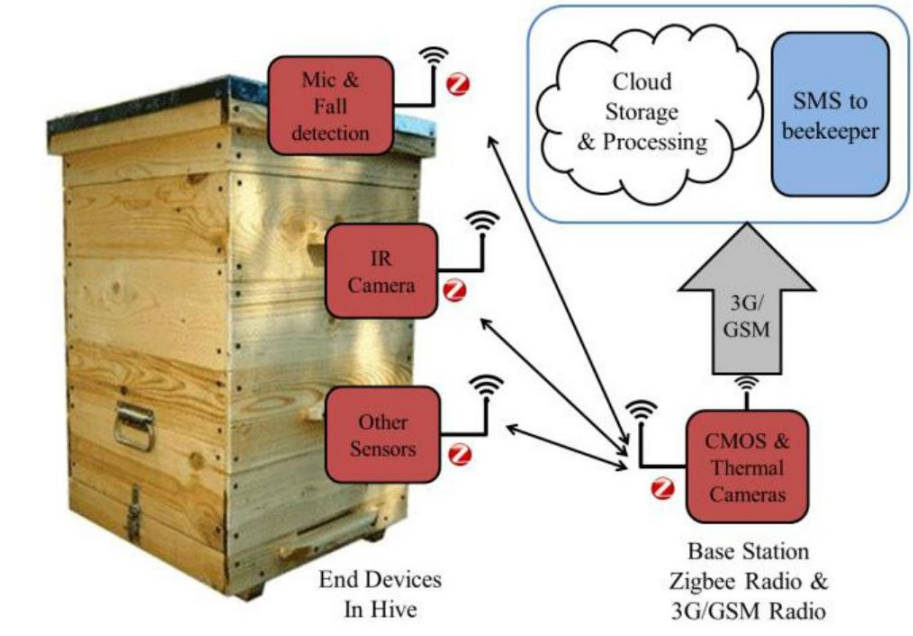
Between 1850 and 1875, the multipurpose edge hive, the radiating honey extractor, and the ground-breaking hand-held honey bee smoker were developed. These innovations significantly advanced beekeeping technology. Advanced beekeeping relies on and will continue to rely on these fundamental developments. Currently, well over a century, in the era of the internet, advanced cells, iPads, iPods, Blue Tooth, and PCs that are being incorporated into pretty much everything, beekeeping seems to be on the verge of one more revolutionary technological leap that some belief will change the essence of beekeeping as far as we might be concerned.

Artificial Intelligence (AI) and all its related forms of computer-based intelligence are being used to solve just about every problem under the sun, but stopping the disturbing decline of the honey bee population seems like something out of a fairy tale. In fact, it is a great way to use technology, and it could help both honey bees and beekeepers keep their hives in good shape. The innovative "Smart Bee Hives" data and communication modular system lets beehives gather information in real-time and analyse, imagine, and predict what might happen in the future. After comparing how well a few different calculations worked, the most accurate future calculation is chosen. After the analysis in this study, the results show that the boosted choice tree is used more often than the other calculations used in the test.

Beewise, a agtech startup, has created the first fully autonomous beehive called Beehome that comes complete with a beekeeping robot that acts as both medic and guardian to complement the natural intelligence of bees.

From the measurements, it is clear that the accuracy of the decision tree in predicting events has gone up by 88 per cent. This high level of accuracy helps beekeepers who use the "Smart Bee Hive" framework in their apiaries in a big way. The AI system is set up by putting cameras and sensors in and around colonies of bees to gather information about the bugs' movements and the conditions in the environment, such as temperature, light, air pressure, and carbon dioxide levels. The data is then sent to a place where it can be handled and where beekeepers can access it. This makes it possible to monitor processes that lead to problems, like swarming, and with an aggregated dataset based on past observations, the system can warn beekeepers. This way, they can watch their honey bee provinces from afar and spot problems before they get out of hand.



A Smart Beehive System based on Internet of Things (IoT) technology would allow beekeepers to use their mobile phones to monitor the amount of honey produced in their hives and the number of bee colonies even when they are away from their hives. This would alleviate the current difficulties that beekeepers face and make it easier for them to manage their hives.

Beewise has raised $38.7 million in funding to date. The company expanded to California in July 2021.

The fact that AI is now being used in beekeeping has changed the business in many ways. It has helped reduce irritations and illnesses caused to honey bees, save response time, and even keep an eye on a hive from a distance when no one is there. The people who made it have tried all of these cycles and liked the results, which makes it a better way to work with honey bees. The efficiency of beekeeping is improved by new technologies and modern equipment. However, if we do not switch to natural products or farms, honey bees will die or there would not be any provisional beekeeping to pollinate farming fields, which could lead to a huge loss in crop production. Step by step, innovation is moving forward. Artificial Intelligence is getting smarter as new gadgets are added to it. Because of beekeeping, it is possible to see that the use of AI will turn this trend around in terms of methods. It will change the way people work and set new standards for the beekeeping business. It will be a different time for beekeeping, where new ideas will be the norm. Also, science will learn new things, which will further the study of honey bees, about which there are still many questions to be answered. AI could be the key to finding out about new parts of this living being that were not known before.

References:

https://en.smartbeekeeper.com/

https://beemate.buzz/pages/sentinel-beehive-program

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Volume 1 | Special Issue 1 | July 2022

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PROCESSING OF HONEY

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Honey is a sweet product produced by honeybees from the nectar of plants (Blossom Honey) or from the secretion of living plants or secretion of insects (Honeydew Honey). Bees collect, deposit, dehydrate, store and leave in the honeycomb to ripen and mature. The EU directive defines honey as "The natural sweet substance produced by Apis mellifera". It possesses a range of advantageous pharmacological actions, including antibacterial, anti-inflammatory, antimutagenic, antioxidant, and prebiotic characteristics. The antioxidant properties of honey are provided by flavonoids, phenolic acids, organic acids, enzymes, and other small components. The floral sources, seasonal and environmental factors, processing procedures, and storage conditions all affect the composition and antioxidant activity of honey.

HONEY CATEGORIES

- **Blossom Honey – It is obtained predominantly from the nectar of flowers**
- **Drained Honey – It is obtained by draining decapped broodless combs.**

A single beehive can make more than 100 pounds (45 kg) of extra honey per year

- Chunk Honey - It is honey containing one or more prices of comb honey.
- Creamed Honey - It has a fine crystalline structure and may have undergone a physical process to give it that structure and to make it easy to spread.
- Extracted honey: It is obtained by centrifuging decapped broodless combs.
- Pressed Honey: It is honey obtained by pressing brood with fewer combs with or without the application of moderate heat.
- Organic honey: It is produced by apiaries with certified organic beekeeping. The composition of organic honey is the same as normal natural honey. The only difference is that such honey should not contain toxic residues of pesticides used in agriculture and beekeeping.

HONEY PROCESSING

The different unit steps of honey processing are shown in the flow diagram Fig. 1

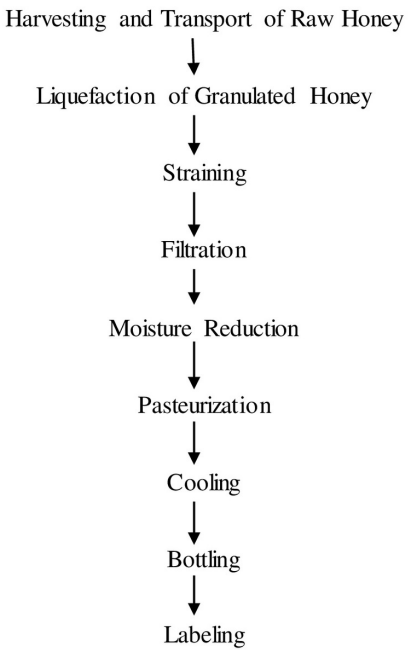

Figure: 1 Flow Diagram of Honey Processing

Honey bees are the only insects that produce a food product for humans

Harvesting and Transport of Raw Honey

Honey should not be harvested on days that are rainy or when the relative humidity is high since the honey would become moister. When harvesting, it is important to take care not to smoke the honeycombs directly; instead, use a bee smoker distance from the honeycomb frames and only use a little amount of smoke. These steps are taken in order to reduce the amount of smoke that gets incorporated into the honey. A long-handled uncapping fork is used to scrape the caps off of both sides of honeycombs that are at least two-thirds capped and place them on a capping tray. The honeycombs are placed within an extractor, a sizable drum that draws the honey out using centrifugal force. To avoid combs breaking, the extractor is started at a low speed. The honey is put into buckets or drums made of food-safe polypropylene before being transported to an industrial processor.

A hygienic procedure must be applied to the vehicle used to transfer the honey to the processing location. The vehicle must not have recently transported any materials that could have left a poisonous residue or another kind of offensive stench. Long distance transportation and leaving honey buckets outside before processing may cause quality to decline because they may cause a rise in hydromethyl furfural and a reduction in diastase activity.

Liquefaction

The majority of pure raw, unheated honey naturally crystallises over time. Some honey crystallises uniformly, while others partially crystallise and separate into two layers with the liquid layer on top and the partially crystallised layer at the bottom of the jar. The size of the crystals that form in honey also varies. Due to granulation, high viscosity at low temperatures, and the presence of yeast, heating is the most used honey processing technique.

Nectar as gathered by the honey bee contains about 70% water (Honey is about 17% water)

The Codex Alimentarius and other honey regulations state that heating honey would severely lower its quality. Liquefaction is carried out to lessen honey's exposure to heat. It depends on how much glucose is present in the honey and in crystal form. Uncontrolled heating alters the parameters such as hydroxymethyl furfural (HMF) amount and diastase activity unfavourably.

Straining and filtration

As per the European Directive, filtered honey is obtained by removing foreign inorganic or organic matter in a way that results in the significant removal of pollen. Filtered honey is defined by the Codex Alimentarius as honey that has been filtered in a manner that reduced the pollen greatly. Small-scale staining is accomplished with cotton or nylon bags that are regularly cleaned to get rid of dispersed particles. On large scale, the jacketed tank equipped with a stirrer is used combined with preheating (up to 40°C). Pressure filters are used to continue processing the strained honey. Typically, an 80-micrometre polypropylene microfilter is used as a filter. The beeswax does not melt since the honey is kept at a temperature of 50 to 55 °C. Prior to filling, large-scale processors subject honey to coarse, fine, centrifugal, and blended filtration. Filtration needs to be done properly in order to keep the required amount of pollen in the honey.

Moisture Reduction

One of the most crucial factors determining the quality of honey is moisture. Due to the extraction of unripened honey, the majority of extracted honey has greater moisture levels than the recommended norms. The amount of water in honey affects its resistance to granulation and fermentation. High water content honey readily ferments over time. Therefore, it is required to thermally process the honey in order to stop sugar-tolerant yeasts from fermenting it.

Honey is sweeter than sugar. A teaspoon of honey has 5 grams of sweet sugar, while a teaspoon of granulated sugar only has 4 grams of sweet sugar.

The equipment used to reduce moisture includes the following:
(I) Dehumidifier - Reduce relative humidity at a temperature usually 45°C.
(II) Honey Dehumidifier - is designed for small beekeepers who do not need to work on large quantities of product.

Pasteurization

Honey can be consumed pasteurised or unpasteurized. Bacteria cannot survive in honey because of its high acidity and low humidity. In the interest of quality, honey is pasteurised. The process of pasteurising honey delays granulation and lowers the likelihood of fermentation. There are several potential temperature and time combinations. The honey should be heated to 63°C for 30 minutes, 65.5°C for 30 minutes, or even temporarily raised to 77° C before being quickly cooled.

Bottling

Honey may be directly bottled into small containers for retail sale or into big barrels for storage or export to other countries, depending on the market need. Honey is packaged in a variety of sizes and styles in an effort to appeal to a wide range of consumers. Glass, plastic, honey tubs, and even squeeze bottles are examples of these. The nucleation and crystallisation of honey can be triggered by the presence of air bubbles in the container. Due to its poor viscosity, honey is typically filled into bottles at a high temperature to prevent air bubbles and air inclusion during packaging.

Labelling

The term "Honey" or perhaps a description of a floral source, such as "Mustard Honey," appears on the label of a honey jar in a retail establishment.

A single honeybee only produce approxi-mately 1/12 teaspoon of honey in her lifetime.

The net weight, the seller's name, and address must be prominently shown on the label. Additionally, it should say if the honey has been pasteurised or is creamed liquid.

VALUE-ADDED PRODUCT OF HONEY

Mead is an alcoholic beverage derived from fermented honey. Toddy and soups both contain honey. It gives the soup that is served at room temperature thickness. The cosmetic industry is well aware of the beneficial synergistic effects of honey and milk on skin care, anti-ageing, and the development of stamina. In the baking, cereal, and confectionery industries, honey has several uses. Several researchers created milk powder, honey bread, and other culinary formulations based on honey.

SUMMARY

For better product quality and shelf life, it is necessary to remove yeast, pollens, beeswax, and other unwanted components from honey that has been harvested from combs and apiaries. So, before being placed in bottles or other containers, it is important to process honey. The size of the operation, however, determines the kind of equipment employed and the processing stages taken. Filtration and heating are two crucial processes in the preparation of honey.

REFERENCES

- Subramanian R, Hebbar UH and Rastogi NK 2007. Processing of honey: A review. International Journal of Food Properties, 10(1):127-143.
- Codex Alimentarius Commission 2001. Adopting the draft revised standard for honey. Alinorm 1(25):22–24.
- Gebrehiwot NT 2015. Honey production and marketing: the pathway for poverty alleviation the case of Tigray regional state, northern Ethiopia. ZENITH International Journal of Business Economics & Management Research, 5 (6):342-365.
- Eshete Y and Eshete T 2019. A review on the effect of processing temperature and time duration on commercial honey quality. Madridge Journal of Food Technology, 4(1):158-162.

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INTRODUCTION TO ORGANIC BEEKEEPING

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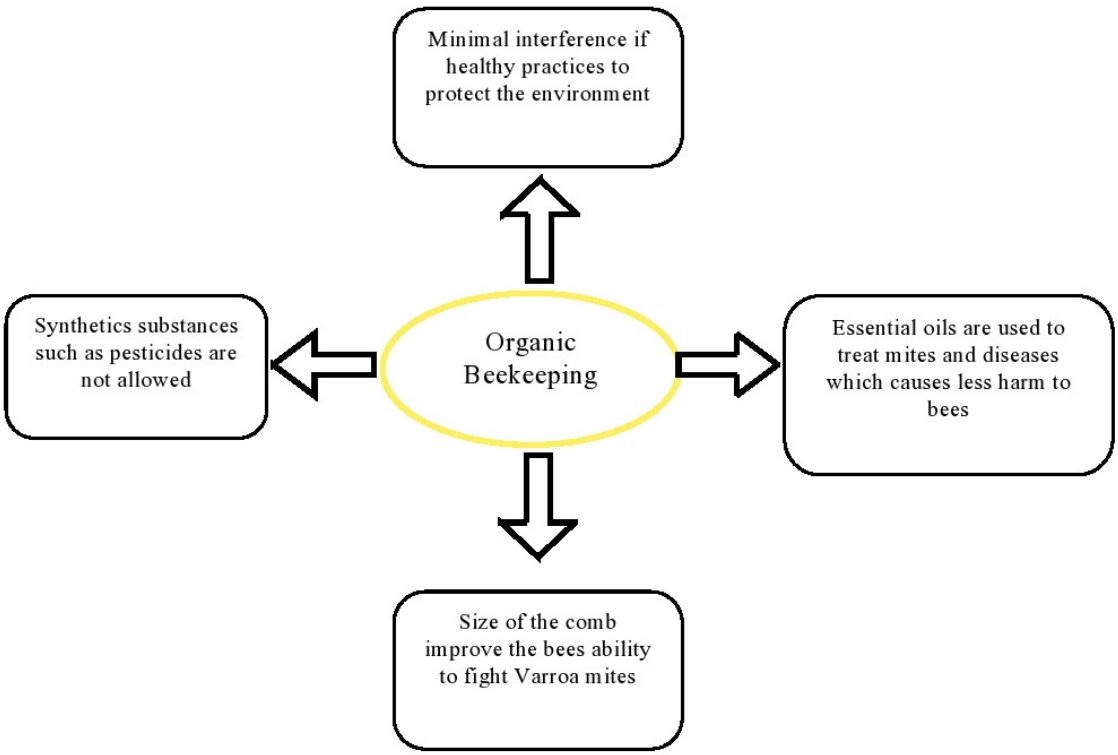
Beekeeping is not land-making revenue small commercial division is a quick evolving essential segment of present-day approaches for blended agricultural extension and off-farm work for sustainable living. The title 'organic beekeeping' was discussed initially in 'The World of Organic Agriculture. In the coming years, because of the liberalization of the businesses and proper expansion of the market, the organic sector is working in the interest of both buyers and sellers. Organic beekeeping is an outstanding event for apiculturists to fit towards organizations to enhance profits, especially for people involved in agricultural areas. As a result of the making, authentication and standard limitations that organic beekeeping involves the increasing requirement for natural bee products may not be included in the long run.

The principal objective of eco-friendly beekeeping is to acquire quality produce without the application of other replacement materials. The two major purposes beekeepers consider certified organic honey products are chiefly for economic accretion. According to reports, honey is both capital of the trade market and also considered a costly gift or offering from nature (Crane, 2004).

Honey was found in the tombs in Egypt and it was still edible! Bees have been here around 30 million years.

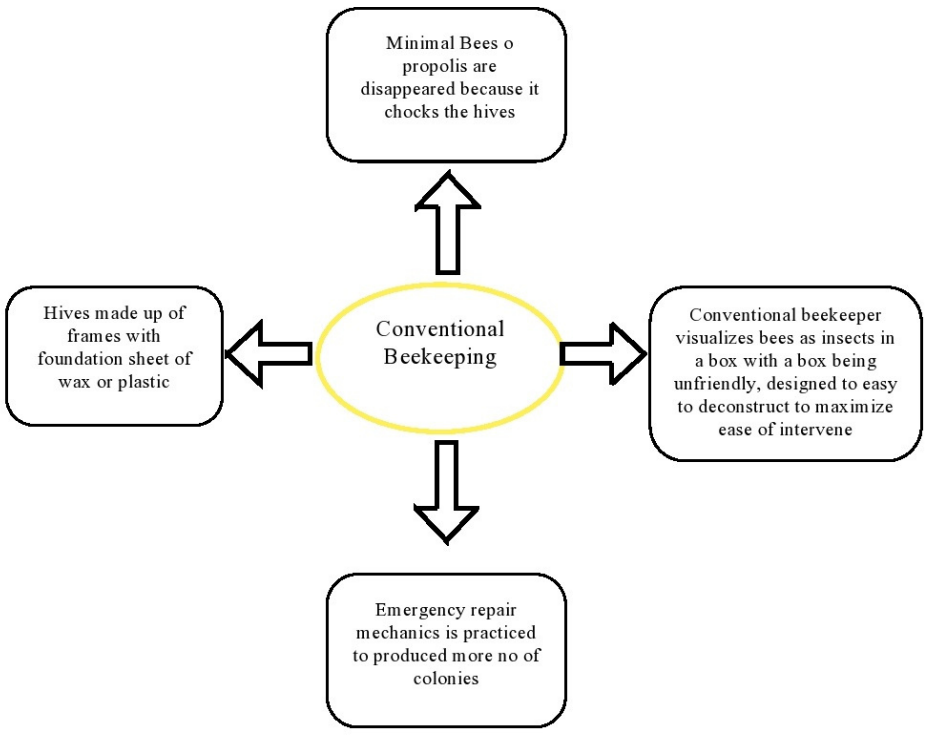
There is a great association between people and bees as time is ancient, the association depends on the truth that 80% of the flowers around the globe are fertilized by Apis species, and, also, on the very nutritional, therapeutically, and commercial value of their goods. Apiarists fascinate by changing their honey fields to natural product-making businesses that would substitute older bee hives with the natural product-making companies.

Rising attention concerning the impacts of vigorous farming practices on the field and the ecology, commonly, increased the importance of natural products, which are recognized as organic. Common concern rising in organics has created a greater need for the production of honey, and other food products in the trading of organic produce.



Ancient Greek civilizations regarded honey as a symbol of blessings, and happiness. It was also used in funerals, when honey was offered to spirits of dead people.

Promoting about rising in sustainable apiculture, principally organic methods should start with the demonstration of the beekeeping area location and its potential. This exposed a positive progression of the beekeeping sector over the last 10 years and additionally revealed that beekeepers were highly focused on sustainable applications either to address the demands of the customers or to comply with the government policies promoting the beekeeping sector. Natural apiary produce is the major component of the export strategy of the nation which comprises steps that not only aim at raising competition for natural stock of products but also the ability to trade materials amongst nations. Furthermore, it encourages multinational organic food businesses, by the means of keeping up the involvement in workshops or global seminars/presentations. For pure honey, the booming or growing requirement gives chance to the manufacturers of the honey products as it costs just ten per cent more expensive as compared to the traditional technique of honey production. there were also some positive outcomes of the hygienic crisis like an elevated requirement for high-quality honey.



Honey is the ONLY food that includes all the substances necessary to sustain life, including water.

Organic beekeeping has a few disadvantages which are faced by apiarists. There are restrictions on feeding and disease management systems. Also, accessibility of proper location of bee hives for a scope of periodic requirements is not available easily. costs correlated through authentication particularly in uniting, certification, accounting, testing, yearly participation, and customs is a major disadvantage as authorized institutions hold diverse price arrangements as countries having various organic bases. Several importing countries give less or no incentive for organic honey. Most of the sections accept intense natural honey; flavoured varieties of honey which usually have a lesser demand in sales. It takes more than a year to become certified. It is costly and time-consuming while transform a firm to become certified.

Farming
Volume 1 | Special Issue 1 |
July 2022
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BENEFITS OF HONEY FOR BEES AND HUMAN HEALTH

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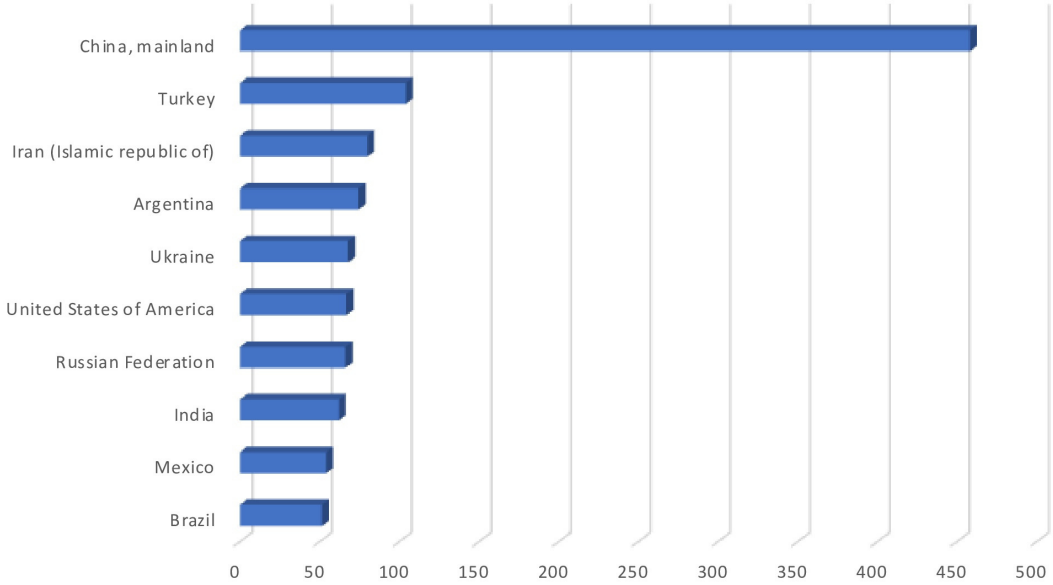
Both human and environmental health depends on bee populations. Bees are essential to produce food because of their role as pollinators and the medical benefits of honey and other goods. Over 4,000 of the 20,000 bee species that are known to exist in the world are indigenous to the United States. Few of these are managed by humans, and most of the species are wild. Bees are valued not only for their honey but also for helping to ensure food security and diversity in both plants and animals. But as urbanisation and the usage of pesticides increase, bee populations are declining, which has a negative impact on many ecosystems on Earth. Honey production would be impacted by the loss of bees, but more crucially, so would biodiversity and global food security. The world may look very different if not for them.

Royal jelly displays an assortment of pharmaco-logical exercises, including against cancer, antioxidat-ive hostile to weariness etc.

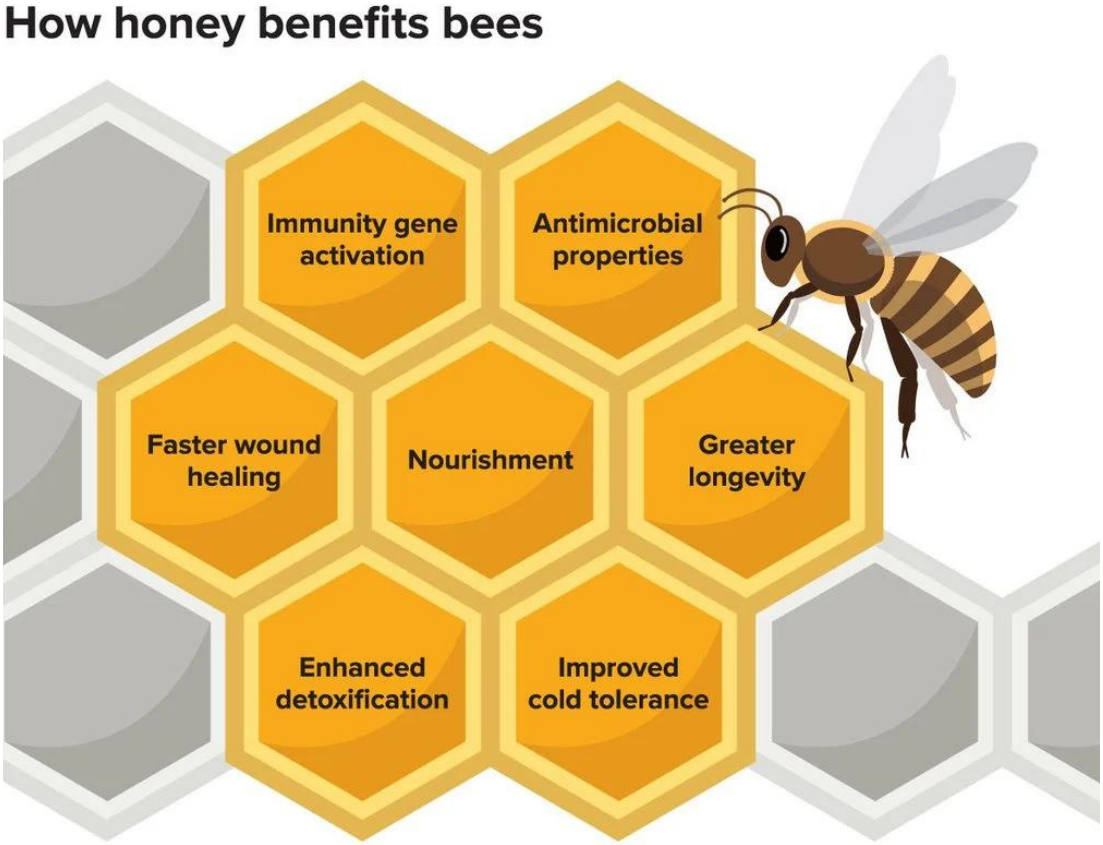


Source- Statista 2022

Leading Producers of natural honey worldwide in 2020 (in thousand metric tons)

Honey has numerous benefits for human health but there is one another side of honey which was not widely discussed by humans as compared to the health benefits of honey to human beings. A substantial amount of studies have shown that honey is packed with plant compounds that affect the health of honeybees. Components in honey can extend the life of bees, increase their resistance to extreme weather, such as bitter cold, and improve their capacity to heal wounds and fight diseases. Honey activate the immunity gene in bees, have antimicrobial properties, wound healing capabilities, nourishment, acts as a detoxifier etc.

Honey is used in many beauty treatments, especially for its moisturizing and antiseptic qualities



Honey, and the plant compounds within, impart all sorts of health benefits to bees. Reporting by B. McCoy / Knowable Magazine

Bees are important for a variety of reasons. They are significant historically, benefit human health, and support thriving ecosystems. Although not all bees make honey, it is one of the key factors in why people love bees. It is a natural sweetener with a variety of potential health benefits. Since ancient times, people have used bees and bee-related items for therapeutic purposes. Researchers have taken note of assertions that it possesses anti-inflammatory, anti-microbial, antioxidant, and anti-cancer effects. Honey is used in traditional medicine to cure a wide range of illnesses.

Honey contains mostly sugar, as well as a mix of amino acids, vitamins, minerals, iron, zinc and antioxid-ants.

Although many of these applications lack scientific support, they include:

- eye diseases
- bronchial asthma
- throat infections
- tuberculosis
- dizziness
- hepatitis
- constipation
- worm infestation
- haemorrhoids
- fatigue
- eczema
- ulcers
- thirst
- hiccups
- wounds

Farming
Volume 1 | Special Issue 1 | July 2022
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COLONY COLLAPSE DISORDER IN HONEYBEES

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Colony collapse disorder is also known as Spring Dwindle, May disease, autumn collapse, etc is the phenomenon/situation where the majority of adult worker bees are lost from the colony leaving behind the queen bee, a few other bees, along with plenty of food. Such colonies are commonly referred to as dead colonies. This was predominantly observed in European bees. Farmers in the USA have seen a downfall of 30% - 90% of bees since 2006. The recent decline in the population of bees raises concerns in the agriculture fields as the number of insect-pollinated crops is increasing with a decrease of pollinators. Recent studies suggest multiple potential causes for this CCD viz. multiple sources of radiation, diseases, pesticide uses, predators, viruses, etc or there are possibilities that the combination of two or more causal factors simultaneously has a synergetic effect on the honeybees. Globally they help to generate a revenue of 57 billion Euros. Albert Einstein once predicted that if the bees vanished from our planet, mankind would soon extinct.

Varroa mites remain the world's most destructive honey bee killer. The mites, the viruses they transmit, and the chemical treatment they require are considered possible causes of CCD

Multiple theories have been put forward about the CCD cases like invasion of varroa mite and gut parasite(Nosema) in colonies causing loss of bees, Pesticides poisoning specially Neonicotinoids, Stress caused due to multiple biotic and abiotic factors, Inadequate food sources or poor quality of food, etc. but its always not necessary that sudden death of colony is CCD.

Since bees are declining at rapid rates multiple types of research have been conducted considering multiple causal factors and according to the findings cell phone are suspected of causing a rapid decrease in the bee population, EMRs(Electro Magnetic Radiations) are causing long-term negative impacts on the bees. This effect was first published in a peer review study in 1981, to find out its effect through powerful sources of radiation like microwave radiation. However, no significant effect was observed and any concrete evidence was put forward, that can state radiation or any other aforesaid mentioned factors for direct impact on honeybees causing CCDs. Another scientific study consisting of 7 studies on honeybees was carried out, 6 of them forecasted negative effects but none demonstrated specific links. An explanatory study in 2004 was conducted to study the non-thermal effects of electromagnetic exposures at 1880-1900MHZ but the outcome/analysis didn't forecast any negative effects on the honeybee's behavioural change, however, it established that close-range EMF may affect the flight and returning back ability of the bees to their hives which could potentially lead to colony collapse disorder in bees.

Loss of natural habitat which can result in poor nutrition and increased reliance on supple-mental diets are considered possible causes of CCD

In 2007, USDA established a CCD steering committee, which came up with an action plan consisting of a survey and collection of data, analysis of samples, driving hypothesis and possible preventive measures based on the results and data received globally a conference was held in 2013 which came up with the revised drafting Action plans to tackle CCD in honeybees. Multiple countries have passed laws to control the no. of towers. For reasons yet to be discovered, the cases of CCD have been substantially decreasing since 2016. It can be prevented if trees are provided at regular intervals. In public areas such as parks, urban areas can be gardened, use of radiation shield bee boxes, use of safer non-systemic pesticides, Implementation of Integrated insect-pest management, providing suitable nesting locations, etc.

The conclusion drawn from this article is preventive methods are in use and more are considered for on-field deployment to control the effects of radiation, studies need to be conducted with more sophisticated algorithms and technologies to find out the exact reason, frequencies, and factors that are responsible for CCD. The removal of towers or the radiation sources is not a straightforward solution to control the CCD of honeybees but certain guidelines need to be met in order to control the uncontrollable increasing number of towers in the nation. All these must be taken care of as only honeybees generate roughly around 200 million USD through their pollination services only.

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MEDICINAL VALUE, ANTIMICROBIAL PROPERTY AND COSMETIC USES OF HONEY

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A honey bee is a flying insect that belongs to the bee clade genus Apis. The most well-known bee that was employed for cross-pollination and honey production was the western honey bee (Apis Mellifera). Additionally, honey bees play a crucial part in agriculture, and honey is utilised in various industries, including medicine, cosmetics, candles, lip balms, soaps, and even the production of candles. Honey has a wealth of therapeutic benefits and antibacterial qualities. The therapeutic benefits of honey are mentioned in the earliest medical writings ever written, and it has long been known that honey possesses antibacterial and wound-healing characteristics. Honey's antibacterial qualities, capacity to keep a wound moist, and high viscosity, which aid in creating a barrier of protection against infection, all contribute to its ability to heal wounds. Additionally, its immunomodulatory properties are crucial for wound healing. The hydrogen peroxide produced by most kinds of honey's enzymatic processes is what gives them their antibacterial characteristics.

Manuka honey has anti-bacterial, antiviral, anti-inflammatory and anti-oxidant properties.

Honey has been used for therapeutic, nutritional, and cosmetic purposes since ancient times. Honey may promote cell renewal, lessen inflammation, and speed the recovery of the damaged intestinal mucosa. Large amounts of flavonoids and other polyphenols found in raw honey may have antioxidant qualities. (Mandal, Mandal.S, 2011).

Manuka honey has been proven to have antibacterial action against microbial pathogens like Staphylococcus aureus and Helicobacter pylori, making it a viable protein source for the treatment of many diseases or gastrointestinal issues. Additionally, honey is used to treat allergies because it contains a small quantity of pollen, acting as a vaccination, and it also gives people more energy since it contains a lot of carbs like glucose and fructose, which provide the body with more energy. Additionally, honey supports intellectual growth by enhancing memory due to its antioxidant content, which enables the brain's cells to heal more quickly. Additionally, it functions as a sleeping aid because honey's abundant nutrients raise insulin levels, which in turn trigger the production of serotonin, which is subsequently converted into melatonin, which promotes restful sleep. Because it contains lactobacilli and bifid bacteria, which enhance stomach health, it also aids in enhancing digestion and achieving optimal intestinal health. Honey is used in a variety of cosmetic products, including facial washes, skin moisturisers, hair conditioners, and treatments for pimples and acne on the face (Ediriweera, Premarathna, 2012).

References

Ediriweera, E. R., & Premarathna, N. Y. (2012). Medicinal and cosmetic uses of Bee's Honey - A review. Ayu, 33(2), 178–182. https://doi.org/10.4103/0974-8520.105233

Mandal, M. D., & Mandal, S. (2011). Honey: its medicinal property and antibacterial activity. Asian Pacific journal of tropical biomedicine, 1(2), 154–160. https://doi.org/10.1016/S2221-1691(11)60016-6

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HEALTH BENEFITS OF ROYAL JELLY

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Royal jelly was discovered in 1933 by the German Nobel Prize Dr F. Bergius. A white and viscous jelly-like substance is a form of hypopharyngeal and mandibular gland secretion from the worker bees. It is also known as a "superfood" that is solely consumed by the queen bee. Royal jelly is also fed to the honeybee larvae upon hatching and helps to nurture the brood.

It is the exclusive nutrient offered to the immature young larvae in their first 2-3 days of maturation besides being used as a portion of food specifically for the queen bee throughout her entire life cycle. Royalactin is the main compound in royal jelly that allows the morphological change of a larva into the queen bee. This superfood is the main reason for the longevity of the queen bee compared to the other bees. Royal jelly is widely used as a dietary nutritional complex to help combat various chronic health conditions. Furthermore, it is one of the profitable remedies for human beings in both traditional and modern medicine.

Royal jelly is a milky secretion produced by worker honey-bees

ANTI-DIABETIC EFFECT

These nutrients may provide some of the royal jelly's potential health benefits, though more research on this unique substance is needed. It is a long-term metabolic condition that is triggered by aberrant insulin production and insulin resistance. It is possible for diabetics to develop several liver disorders, such as cirrhosis of the liver, hepatocellular carcinomas, hepatitis C, and acute liver failure, due to insulin deficiency in the body's tissues. A healthy blood sugar and cholesterol level depend on the liver's role as an insulin-dependent organ. Royal jelly lowered fasting blood glucose and serum glycosylated haemoglobin levels in women while increasing insulin concentration. Serum glycosylated haemoglobin levels that are lower than normal are associated with decreased risk of cardiovascular disease

NEURODEGENERATIVE AND AGING DISEASES

The majority of aged people have poor mental health and performance as a result of ageing, such as in the case of Alzheimer's disease (AD)." Royal jelly boosts the elderly's appetite and weight by stimulating their physical and mental functions. Royal jelly was found to have neuroprotective properties in Alzheimer's patients in research. In the elderly, the behavioural and neurochemical effects of royal jelly were invested chemically.

WOUND HEALING

Improvement of the wound-healing properties of royal jelly To improve sphingolipid levels, human fibroblasts were used in wound healing models in both the lab and in the field, where they were successful in migrating and decreasing collagen production. When applied to desquamated skin lesions, royal jelly reduced the healing time.

Royal jelly typically contains about 60% to 70% water, 12% to 15% proteins, 10% to 16% sugar, 3% to 6% fats, and 2% to 3% vitamins, salts, and amino acids

The royal jelly dressing is also an effective way of treating diabetic foot ulcers besides standard treatments. This is due to its vasodilation effects around the affected wound, which can help to dilate the blood vessels to enhance blood flow. It also helps to prevent infections due to its antimicrobial activities.

MAY REDUCE HEART DISEASE RISK BY IMPACTING CHOLESTEROL LEVELS

Both animal and human studies demonstrate that royal jelly may positively impact cholesterol levels and thereby reduce heart disease risk. Though the exact mechanism remains unclear, specific proteins in royal jelly may help lower cholesterol. One 12-week study found that rabbits supplemented with royal jelly significantly reduced their total and "bad" LDL cholesterol levels by 28% and 23%, respectively. Similarly, a one-month human study saw an 11% and 4% reduction in total and "bad" LDL cholesterol levels in people taking about 3 grams of royal jelly daily.

ANTIOXIDANT PROPERTIES MAY SUPPORT HEALTHY BRAIN FUNCTION

Royal jelly may boost brain function. One study revealed that stress-induced mice treated with royal jelly had lower levels of stress hormones and a more robust central nervous system than the control group. A separate study resulted in improved memory and reduced symptoms of depression in postmenopausal rats given royal jelly.
Another animal study showed that rats treated with royal jelly were better able to remove certain chemical deposits in the brain associated with Alzheimer's disease. Most of these studies attribute the protective effect on the brain and nervous tissue to royal jelly's antioxidant capacity.

Royal jelly is sold as a supplement or in skin creams to enhance collagen production, ease pre-menstrual and post-menopausal symptoms, and improve overall health.

ANTI-CANCER PROPERTIES

Chemotherapy and other cancer treatments come with significant negative side effects, including heart failure, inflammation and gastrointestinal (GI) issues.

Royal jelly may reduce some of the negative side effects associated with certain cancer treatments. One study revealed a significant reduction in chemotherapy-induced heart damage in humans supplemented with royal jelly. One very small human study indicated that topically applied royal jelly may prevent mucositis, a cancer treatment side effect that causes painful ulcerations in your digestive tract. Though encouraging, these studies don't offer definitive conclusions regarding royal jelly's role in cancer treatment.