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Comparative study of Apiculture in Vaishali District of North Bihar, India

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Abstract- This study can provide effective information about the method of apiculture of Vaishali district of Bihar. Method of honey production is also analysed in this study. Few effective challenges are faced by beekeepers of India, it is important to identify these changes. This process directly has an impact on the development of honey production. Proper tool and technologies are required in maintaining the apiculture of India which is included in this chapter. The effective medicinal role is also present in honey, which is included in this study. Along with this, cut, burns and other problems of health are maintained properly with the involvement of honey.

Keywords: apiculture, antibacterial, beekeepers, Vaishali

INTRODUCTION

India is treated as an effective honey production country. Few effected antibacterial characteristics are present in honey that can help to relieve cough. Along with this, further injection is also prevented properly with the help of honey. The cholesterol level of the body is also improvised properly with the help of honey. High levels of LDL cholesterol are a major risk factor for heart disease. Atherosclerosis, or fatty accumulation in the arteries that can lead to heart attacks and strokes, is caused by this kind of cholesterol, these all aspects are included in this study. To maintain the marketing of honey it is important to justify the packaging and transporting of honey in India. To maintain the marketing of honey it is important to maintain the labelling of honey properly. This factor directly has an impact on the economy of India. However, traders faced various problems related to the marketing of honey.

To create a proper face pack it is important to maintain the involvement of honey and lemon, honey and banana, and honey and milk.¹ Along with this, it is noticed that the antioxidant properties of honey can increase its efficiency. This factor can help honey to maintain fight toxicity in the bloodstream. This factor can help people to protect against harmful infection. Cell damaging and chronic diseases are also controlled properly with the help of honey. An effective and special antioxidant factor is present in honey, which is called flavonoid. Along with this blood, formation is also supported properly by honey, needed energy of the body is also provided by this factor. Figure 1 can provide all essential information about the nutritional benefit of honey. With the help of this figure, it is noticed that honey can play a crucial role in maintaining gastrointestinal tract disease.²

The neurological disorder is also controlled properly with the involvement of honey. Honey is conducted with anxiolytic, antinociceptive, anticonvulsant and

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antidepressant characteristics. Sharma (2020)³ stated that, it is noticed that the antioxidant status of the brain is also maintained properly with the involvement of honey neuroprotective and nootropic effect is present in honey polyphenols. Along with this, it is noticed that an anticancer role is also present in honey. Multiple cell-signalling aspects of the human body are maintained properly with the help of honey. The high-performing anti-mutagenic pathway of the human body is maintained properly with the help of honey. The immune system of the body is also improvised properly with the help of honey. With the help of a few effective research, it is noticed that effective anticancer characteristics are present in honey experimental bladder mode is also maintained properly with the help of honey. This anticancer activity of honey can play a crucial role in maintaining human breast, cervical, oral and osteosarcoma cancer. The immune system of chemo patients is also maintained properly with the help of honey.⁴

In addition, it is noticed that the reproductive system of the human body is also maintained properly with the help of honey. Poonia and Chaudhary (2020)⁵ stated that sperm quality is also improvised properly with the help of honey, which is treated as a crucial beneficial factor of honey. The toxic effect on the reproductive tract is maintained properly with the help of honey. Proper colour, flavour and fragrance can increase the authenticity of honey. On the other hand, it is noticed that honey can play a crucial role in maintaining eye disorder. The health condition of the eye is maintained properly with the help of honey. With the help of an effective survey, it is noticed that eye pressure is also reduced properly with the help of honey. The redness of the eye is also controlled properly with the help of honey.⁶

Honey used topically to the eye can help to decrease inflammation and discomfort. It can also destroy germs that might cause an infection in the eyes. Anti-inflammatory and antimicrobial properties of honey can play a crucial role in maintaining the authenticity of honey. Due to this factor honey is used increasingly for effective treatment of the eye. Several eye conditions are maintained properly with the help of honey. Sterile saline drop is used in maintaining skin and eye, this sterile drop is conducted with the involvement of honey. On the other hand, honey can play a crucial role in maintaining cardiovascular disease.⁷

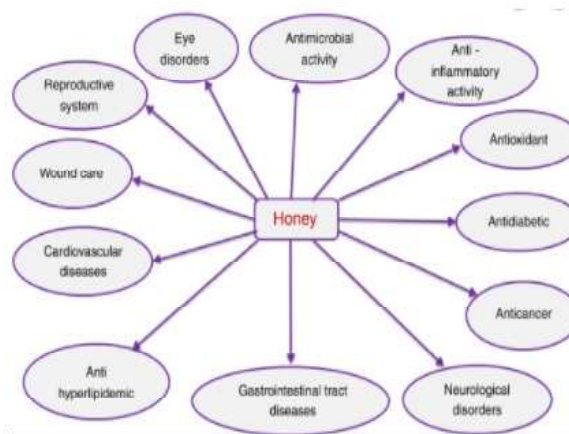


Figure 1: Benefit of honey for human health
(Source: Bhalchandra and Joshi 2021, p. 654)²

Status of Apiculture in India

Kulkarni *et al.* (2020)⁸ stated that, this initiative can play a crucial role in maintaining the efficiency of honey production economic Advisory council is involved in maintaining the development of beekeeping in India. This factor directly has an impact on the improvisation of farmer's income. On the other hand, the implementation of proper technology can play a crucial role in maintaining beekeeping. It is important to collect proper and effective information about bee pollination and crop productivity. Controlling soil degradation directly has an impact on crop productivity and beekeeping pollination. On the other hand, it is important to maintain the involvement of early beekeeping initiative that can maintain the current apiculture status of India. It is important to improvise capacity building of beekeeping, which is treated as an effective component of apiculture.⁹

Table 1: Growth of honey production

Year	In 000' MT
2001-02	10
2002-03	10
2003-04	10
2004-05	10
2005-06	52
2006-07	51
2007-08	65
2008-09	65
2009-10	65
2010-11	112
2011-12	84
2012-13	92
2013-14	76
2014-15	81
2015-16	89

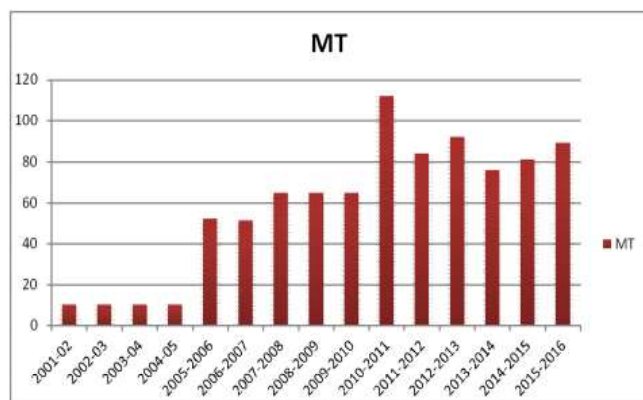


Figure 2: Honey production
(Source: Kumar 2020, p. 545)⁹

Status of apiculture in Vaishali district.

This factor can play a crucial role in maintaining viscous food substances. Monosaccharide fructose and glucose are present in honey. To maintain proper and effective homey production it is important to maintain proper and effective technologies of apiculture. Proper implementation of technology can play a crucial role in maintaining the sweetness of honey. The growth of microorganism in honey is increased with the help of these aspects. The innovative nature of beekeepers is maintained properly with the involvement of consistent and continuous effect. This factor directly has an impact on the development of this study. However, various challenges are faced by beekeepers in this region, which is described below:

- **Uncertainty where to get knowledge:** uncertainty of knowledge is treated as an effective challenge for Beekeepers, which directly has an impact on the productivity of Bee farming. Due to a lack of proper knowledge Beekeepers are unable to maintain the efficiency of apiculture. Initial knowledge about time money and effort can play a crucial role in maintaining the authenticity of apiculture. This knowledge can help to maintain the strength of bees, which can influence proper techniques of bee farming. Beekeeping is a lifelong learning experience.¹⁰ It is important to learn new things about bees and beekeeping each season. The reason for this is that no matter how much experience you have in beekeeping, you will always face problems. Something always manages to humble us (a sickness, a nectar shortage, bad weather, market problems, etc.).

- **Confusion about beehive placement:** maintaining beehive placement is treated as an effective change for beekeepers, which is important for honey

production. On the other hand, it is important to collect proper and effective information about climate change, chemical products, and economical importance. Maintenance of nectar is treated as a main and effective challenge for beekeepers. It is important to collect proper and effective information about the good floral source, which directly has an impact on the honey production of this district.¹¹

- **Lack of floral source:** Improper information about the floral source can decrease honey production properly. With the help of few resources, it is noticed that almost 20000 species of bees are present in this region. To maintain bee farming in the Vaishali district it is important to collect proper and effective information about these bees. This factor directly has an impact on the development of apiculture. It is important to collect proper and effective information about the different level of honeybees.

- **Maintaining the health of bee colonies:** maintaining the health of bee colonies is treated as an effective challenge of bee farming. It is important to collect proper and effective information about an important component of beekeeping. It is important to maintain healthy beehives that can play a crucial role in maintaining apiculture. This factor can maintain high reproductive potential. It is important to collect proper and effective information about disease and different places of Bees.

- **Honey price and market demand:** improper honey price and market demand directly have an impact on bee farming processes in Vaishali district of Bihar. Due to this factor, a lot of challenges are faced by beekeepers of this region. The traditional honey-producing system is maintained by 30% of bee farmers of this region. This factor directly has an impact on the development of honey production. To maintain this factor it is important to maintain the implementation of proper and effective technologies in maintaining bee farming. It is important to maintain the profitable activity of honey production in this region.

- **Nectar death:** with the help of few resources, it is noticed that nectar death is treated as an effective shortage of nectar-producing flowers. This risk is increased rapidly during winter. It is important for beekeepers to collect proper information about nectar death. In summer, due to draught nectar, death-related issues are increased rapidly. Low rainfall and excessive heat are the effective cause of nectar dearth.¹²



Figure 3: Challenges of Beekeepers
(Source: Shilpa Shree *et al.* 2017, p. 654)¹²

The economic value of honey and its marketing process in India

Various challenges are faced by the beekeeping sector of India, which is controlled properly with the involvement of implemented integrated beekeeping centre. The scope of the honey bee variant is maintained properly with the help of this aspect. This factor is a good sign for the beekeeping sector. Financial support is also provided properly by the Indian government, which directly has an impact on the development of honey production in India. Various breakups by flavour are noticed in honey production in India such as Multiflora Honey, Eucalyptus Honey, Ajwain Honey and Sidr Honey. On the other hand, flavour, seasonality and distribution channel of honey is involved in maintaining market segmentation of honey in India. On the other hand, various seasonality breakups also noticed in honey production such as autumn and spring season, winter season and summer and monsoon season.¹³

Honey production is also break up properly by the state in India such as Maharashtra, Tamil Nadu, Karnataka, Punjab, and Rajasthan. The authenticity of honey production is also maintained with the help of this factor. On the other hand, it is important to collect proper and effective information about the competitive landscape of honey production in India. Marketing honey directly has an impact on the international trade of India. To maintain the marketing of honey it is important to justify the packaging and transporting of honey in India. To maintain

the marketing of honey it is important to maintain the labelling of honey properly. This factor directly has an impact on the economy of India. However, traders are faced various problems related to the marketing of honey. Local business is maintained properly with the help of proper and effective honey production in India. It is important to collect proper and effective information about the feeding of nectar. Entrance to the colony is also maintained properly with the help of a proper and effective honey production procedure.¹⁴

MATERIAL & METHOD

In the present time, training and knowledge regarding beekeeping have become important as the consumption of honey has been increased in the recent few years. The training and knowledge help in transferring scientific beekeeping technology to the farmers. Proper knowledge and training help in the modernization of the traditional becoming practice. It helps in improving the economic conditions of the farmers in the Vaishali district. Proper training and knowledge regarding beekeeping help farmers to aware of the government schemes and policies related to bee farming. Trainings will help the farmers to know the effective ways of honey testing, given queen to queens less Bess, wax production and formula of feeding and management of insect pests. This training will help in increasing the efficiency and farmers can easily analyse the process involved in beekeeping.

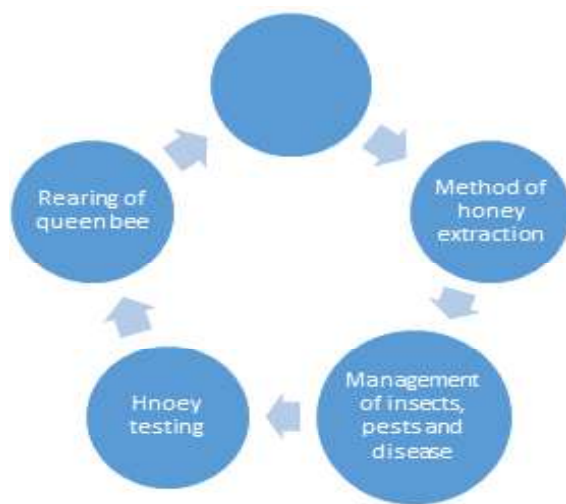


Figure 4: Types of honey practices in Vaishali district
(Source: Uchiyama 2017, p.678)¹⁵

The knowledge among the farmers is developing through the training regarding the conditioner the flora throughout the year in which they learn the appropriate time for producing honey. As per Uchiyama *et al.* (2017)¹⁵, beekeepers learn the way the management of pests and disease during beekeeping and how they can effectively feed the bees collected. The training helps in learning the various method of honey extraction. In the training, farmers are learning the formula for making honey from bees. The training will directly affect the production and income of the district as well as increase the GDP of the country.

Table 2: Training need of beekeepers of Vaishali district about apiculture practices

Practice	Beekeepers (%)		Actual score needed	Training need index	Rank
	Most needed	Not needed		100	1
Rearing of the queen bee	78.9	0	584	92	2
Hoey testing	61.23	11.43	527	88	3
Management of insects, pests, and disease	52.31	11.34	521	84	4
Method of honey extraction	54.21	7.13	518	79	5
Method of feeding	41.34	12.76	491	76	6
Training about the flora throughout the year	39.21	32.85	448	70	7

It has been clear from table 2, that in the Vaishali district, farmers need to be trained regarding honey testing and they must learn regarding the use of proper technologies in honey testing that increase the productivity of the honey.¹⁷ Along with the scientific method can play a crucial role in maintaining the authenticity of the apiculture process with the help of this process it is easy to implement proper and important technologies that can help to improvise beekeeping processes. Sharma and Das (2018)¹⁸, It is important to improvise honey extractor process properly efficiency of apiculture process is maintained properly with the help of this aspect. The apiculture approach is based on scientific facts that have been created after considerable research into bee behaviour, function, and reproductive mode. Honeybees are mostly kept for their honey. Aside from that, beekeeping provides us with beeswax. Honey is made from the sugary secretions of plants by bees. Although honey is a common component in many cuisines, beeswax has a significant commercial value.

It's utilised in cosmetics and medicine, as well as a cheese coating and as a food ingredient. It's also a key ingredient in creating candles and polishes for shoes, furniture, and other items. Proper and scientific processes can play a crucial role in maintaining the beehive process properly. Collecting nectar is treated as an effective process that directly has an impact on the development of apiculture. The proper scientific method should be used in maintaining

RESULT & DISCUSSION

Using effective technology will increase employment in the beekeeping field. Knowledge is an important factor that impacts bee production. Knowledge regarding the use of scientific technology has a great impact and it was found missing in the Vaishali district. Therefore training helps the beekeepers to understand the method to use the scientific technology helps in increasing the productivity of the honey.¹⁶

the nectar collection process. Balance in beehive is maintained properly with the involvement of roper and effective scientific technology. This factor directly has an impact on the development of honey production.³

CONCLUSION

Based on this study it is concluded honey production is depends on method of apiculture. Lack of proper training and knowledge is treated as an effective challenge for beekeepers, which is concluded in this chapter. Based on this chapter, it is concluded that the implementation of the scientific method can play a crucial role in maintaining the growth of honey production in the Vaishali district of Bihar. Honey production is also break up properly by the state in India such as Maharashtra, Tamil Nadu, Karnataka, Punjab, and Rajasthan. The authenticity of honey production is also maintained with the help of this factor. On the other hand, it is important to collect proper and effective information about the competitive landscape of honey production in India. Marketing honey directly has an impact on the international trade of India.

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