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ORIGINAL ARTICLE

EXPLORING THE CONSUMERS' ATTITUDE TOWARDS HONEY IN PRESIDENCY DIVISION, WEST BENGAL: A SURVEY BASED STUDY

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ABSTRACT

Honey is valued as a natural sweetener, health tonic and medicinal agent in India from ancient time. The Presidency Division of West Bengal (includes the districts of Kolkata, North and South 24 Parganas, Howrah, and Hooghly) is a key region for apiaries and honey production. This study presents the findings of a survey, exploring the attitudes toward honey, among the population (n = 360, age > 18 years; male = 166, female = 194) in the stated area. The awareness survey was conducted in June 2025, primarily through students participating in an internship programme on sustainable honey farming at Narasinha Dutt College, Howrah, West Bengal. The study revealed that most respondents (80%) learned about the use of honey from family culture, while 15% became aware through literature and 25% through media. It was observed that only 14% of the study population preferred honey from local sources, whereas the remaining 86% purchased branded honey available in the market at varying prices. About one-fourth of the population recommended honey primarily as a simple sweetener, 40% supported its medicinal use, 35% recognized its antioxidant properties and 15% associated it with cosmetic applications.

Most of the respondents were unaware of the usefulness of beehive by-products such as royal jelly, propolis, bee pollen, and bee venom. In laboratory, honey samples from authenticated geographical origin elicited different amount of pollen sediments, confirming the floral sources. However, the commercial honey sample tested in this case, showed no evidence of pollen sediment, indicating the possibility of adulteration. Thirty percent of the population has the opinion to check the adulteration and increase the nutritional value of honey. This preliminary study revealed the consumers attitude about honey from the study area for the first time.

Keywords: Honey, consumers attitude, awareness survey, Presidency Division, West Bengal.

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INTRODUCTION

Honey is an essential commodity in many households, used as a natural sweetener, a health tonic, and a medicinal agent (Mandal and Mandal, 2011; Palma-Morales, Huertas & Rodríguez-Pérez, 2023). Its antibacterial and antifungal properties make it a popular ingredient in traditional remedies for cough, cold, and wound healing (Oduwole *et al*., 2018; Lee, Sinno & Khachemoune, 2011).

Reference to the awareness of the use honey in India starts from the ancient scripts of Vedic civilization and traditional ethnic cultures. In pre-partition Bengal, John Douglas from Calcutta, first domesticated *Apis cerana* in portable frame hives in 1882. In 1934, first modern apiary was formed in Sodepur, West Bengal, by Satish and Khitish Dasgupta, as a part of Khadi movement, which was inaugurated by Mahatma Gandhi (Wikipedia.org).

In West Bengal, honey is an important source of income for many beekeepers and farmers, contributing to the local economy (Mukhopadhyay *et al*., 2007). In the Presidency division of West Bengal (includes the districts of Kolkata, North & South 24 Parganas, Howrah and Hooghly) is a key region for apiaries and honey production, a region known for its rich cultural diversity, the attitude towards honey is likely to be shaped by various socio-economic, cultural, and environmental factors. This article presents the findings of a survey-based study that explores the attitudes towards honey among different sections of the population in the stated area.

To understand the attitudes towards honey among the common people of Presidency division, a survey was conducted using a questionnaire. The survey aimed to gather information on the consumption patterns, preferences, and perceptions about honey among different age groups, occupations, and socio-economic backgrounds.
The survey is expected to reveal the following:
- The frequency and quantity of honey consumption among different sections of the population
- The preferred sources of honey (local markets, supermarkets, or directly from beekeepers)
- The perceived health benefits and medicinal uses of honey
- The awareness about the adulteration of honey and its impact on consumption
- The willingness to pay a premium for pure, high-quality honey.

The survey findings are expected to provide valuable insights into the attitudes towards honey among the people of Presidency division, West Bengal. The study may reveal patterns and trends that can inform strategies for promoting the consumption of pure and high-quality honey, improving beekeeping practices, and supporting local honey producers. The survey may also highlight the need for awareness campaigns to educate people about the benefits and risks associated with honey consumption.

MATERIALS AND METHODS

Study area

The survey was conducted on the population, who are from the Presidency Division of West Bengal, India. This division is one of the five administrative divisions of the state of West

Bengal, comprised with five districts: Kolkata, North 24 Parganas, South 24 Parganas, Howrah and Nadia (Figure 1).

It is located in the southern part of West Bengal, with the Ganges River flowing through it. The region experiences hot summers and mild winters, with average temperatures ranging from 26°C to 43°C in summer and 10°C to 19°C in winter. The region's vegetation is diverse, with mangrove forests in the Sundarbans delta.

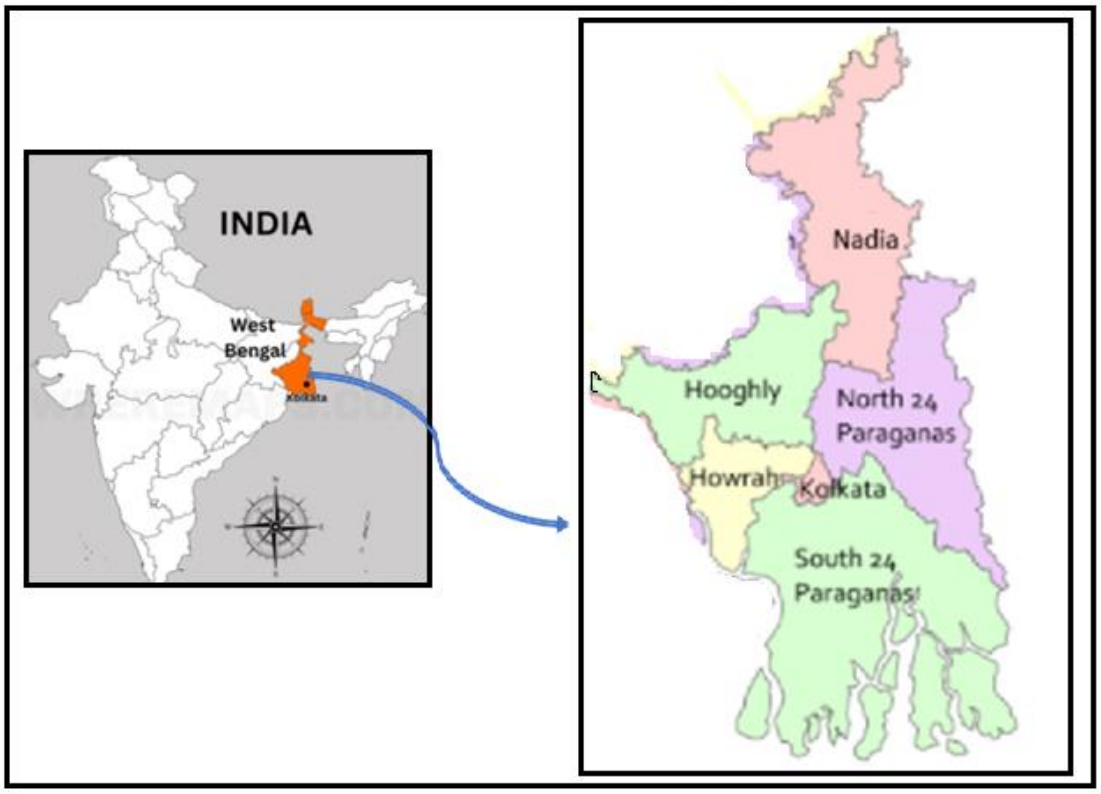

Figure 1. Location map of Presidency Division of the state of West Bengal, India showing five districts.

Questionnaire survey

The survey was conducted in June, 2025, mostly through the students participating in an internship programme on sustainable honey farming in Narasinha Dutt College, Howrah, West Bengal. The number of respondents were 360 (Age > 18 years, male = 166; female =194). The questionnaire included the following points:

1. Knowledge source about honey
2. Use of honey
3. Preference of honey (local or branded)
4. Brand of honey used by them
5. Price of honey purchased (per kilogram)
6. Geographical source of honey (if known)
7. Awareness about bee hive products (Bees wax, royal jelly, propolis, bee pollen and bee venom)
8. Recommendation of the participants for the use of honey (e.g., antioxidant, cosmetics, medicine, sweetener)

Observation of the presence of pollen grains from nectarial source in the honey samples

Honey samples, like

1. Sundarban honey from mangrove forest of South 24 parganas, West Bengal,
2. Honey from Kalyani, Nadia, West Bengal
3. Honey from Barrackpore, North 24 Parganas and
4. A commercial honey sample

Each sample (10 g each) were taken to confirm the presence of pollen grains from nectarial source, by simple centrifugation (2500 rpm) and sedimentation-decantation process and observed.

RESULTS AND DISCUSSION

The outcome of the survey about the knowledge source about honey revealed that most of the people (80%) came to know about the use of honey from family, whereas 15% people knew about honey from literature and 25% from media (Figure 1).

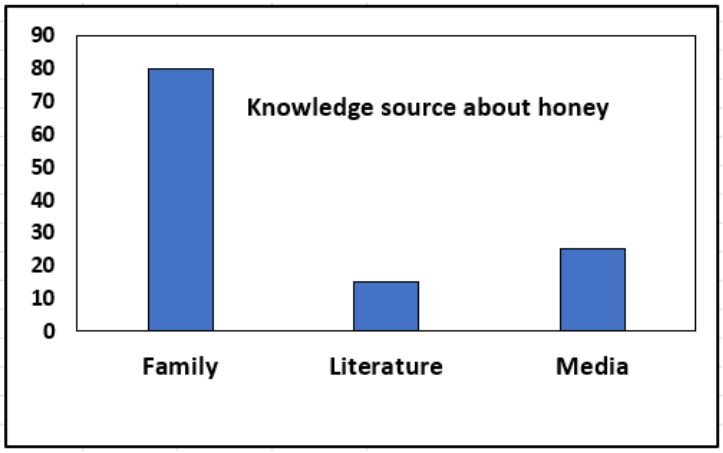

Figure 1. Source of knowledge among people (in percentage) about honey.

Among the studied population 30% use honey as consumable food, 74.4% use it for medical purpose and 15% use it for cosmetic purpose (Figure 2).

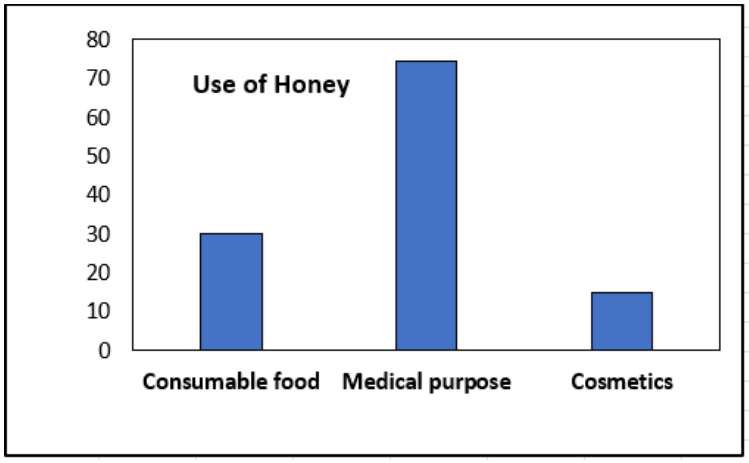

Figure 2. Percentage use of honey in study population.

According to the survey, 11.68% of the people use honey daily, 20.77% use it at weekly interval, 35.06% use occasionally and rest 32.46% use honey, when it is required by them (Figure 3), specifically for treating cough and cold. In this group of people, no one had reported about any allergic reaction of honey, sometimes allergic reaction to honey is reported (Bauer *et al.*,1996).

It was observed that 14% of the study population prefer the honey from local source, whereas rest 86% get the honey of different brands available in the market. These 86% people had reported the use of honey from different brands. It was found that 43.68% people purchase the honey of Dabur, followed by other brands, like West Bengal Government honey (21.68%), Khadi (12.29%), Patanjali (10.35%), Kesari (4.85%), Zhandu (4.2%), Apis Himalaya (2%) and Honey Veda (0.95%) respectively (Figure 4).

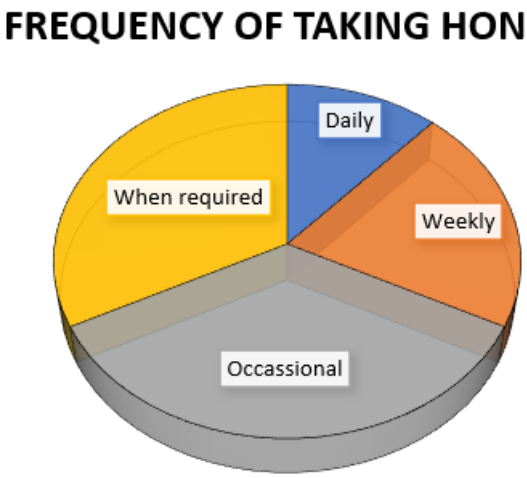

Figure 3. Frequency of taking honey in the study population.

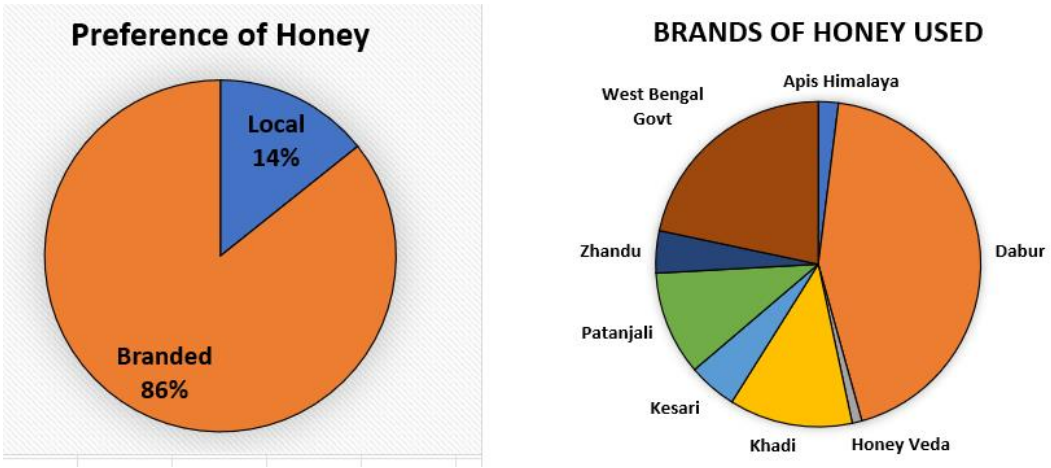

Figure 4. Preference of honey (local and branded) and percentage of purchased brands of honey in study population.

In case of the study population, the price of honey purchased had the range between INR 280 - 3500/- per kg. However, 37.41% of the people had no idea about the geographical source of

honey. When the geographical origin of honey is known (Figure 5), that was reported as Himalaya (18.36%), Sundarbans (18.36%), South India (7.48%), Aravalli (6.12%), Uttarakhand (6.12%) and Uttar Pradesh (6.12%).

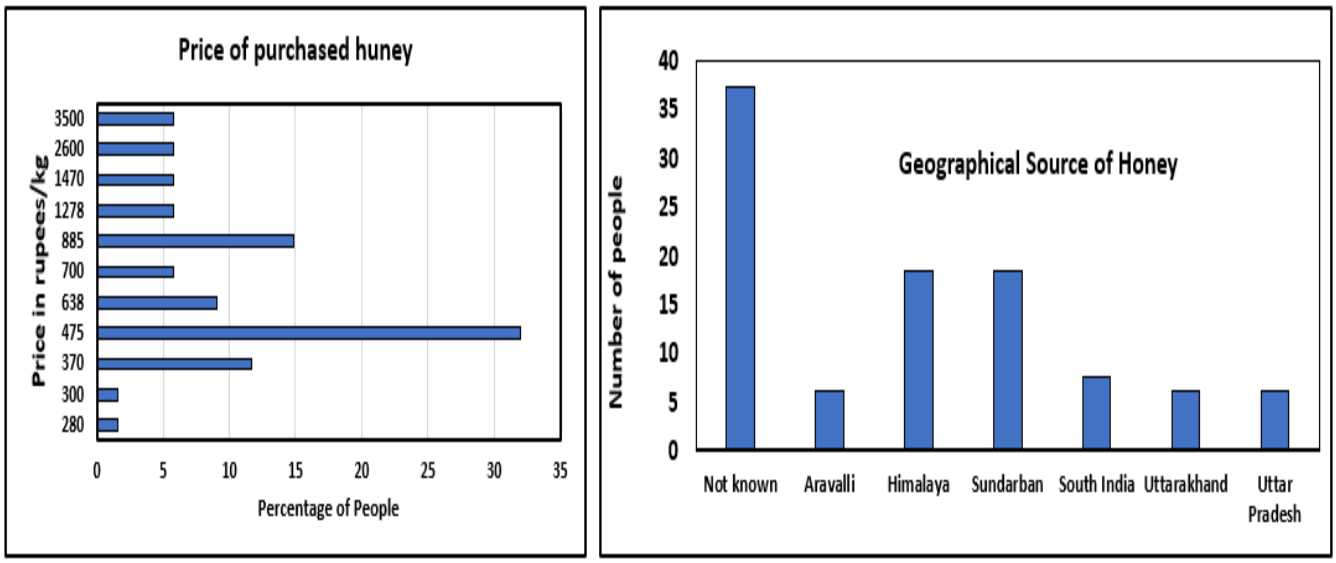

Figure 5. Price range (in INR) of honey purchased by people (left) and Geographical source of honey (right).

In addition to honey, there are a number of bee hive products as following:

1. Bees wax – waxy substance used by bees to make honey combs.
2. Royal jelly - secreted milky substance used to feed larvae and the queen bee.
3. Propolis - a mixture of beeswax with other oils and resins collected by bees for the use in construction of the bee hive and in preserving honey and other perishables.
4. Bee pollen - it is the mixture of various pollen grains collected by bees.
5. Bee venom – toxic substance produced in stings of the bees.

The survey showed that 70% of the population is aware about bees wax (Figure 6) and it use in the candle making and skin care. Regarding the previous study on bees was, it is well known for antimicrobic effect against the bacteria like *Staphylococcus aureus* and *Salmonella enterica*; fungi like *Candida albicans* and *Aspergillus niger* (Fratini *et al*., 2016).

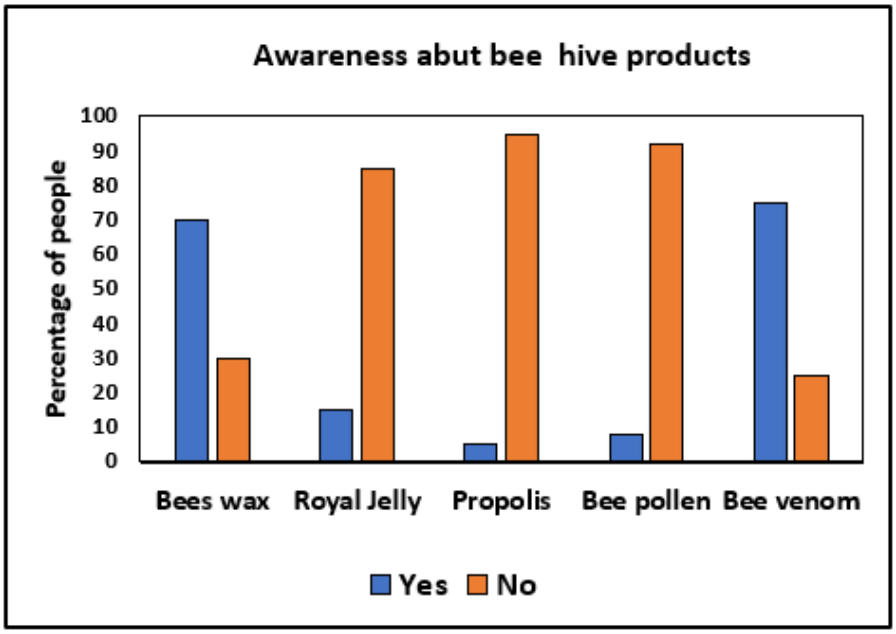

Figure 6. Awareness about bee hive products in the study population (n = 360)

Royal jelly is a mixture of different compounds, viz., flavonoids, hormones, lipids, minerals, proteins, polyphenols and vitamins which often display therapeutic potential (Oršolić & Jazvinšćak, 2024). The survey result shows that 85% people is unaware about the use of royal jelly (Figure 6).

Propolis contains essential oils, lipid, pollen and organic components like coumarins, flavonoids, phenolic compounds, polyphenols, terpenoids, steroids etc. with therapeutic potential as antidiabetic, anti-inflammatory, antioxidant, anticancer, rheumatoid arthritis, cardiac and pulmonary disorders (Zullkiflee, Taha & Usman, 2022). Surprisingly, among the study population, 92% never heard about the name of propolis (Figure 6).

Bee pollen is a mixture of floral nectar, pollen grains, enzymes produced by plant and honeybees which contains lipids, minerals, polyphenols, polysaccharides, proteins and vitamins. It is a protein-rich cost-effective food component with medicinal use for skin disease, infection, diabetes etc. (Algethami, *et al*., 2022). However, in this survey only 8% people confirmed their awareness about bee pollen (Figure 6).

Bee venom is a toxin mixture which is secreted by stingers honeybees. It is well-known for centuries for medicinal importance in the treatment of inflammation, joint pain, alopecia, vitiligo and psoriasis. Bee venom therapy is useful for treat cancer and arthritis (Zhang *et al.*, 2018; Kim, 2021). It was observed that, 75% of the study population knows about bee venom and some of its medicinal uses (Figure 6).

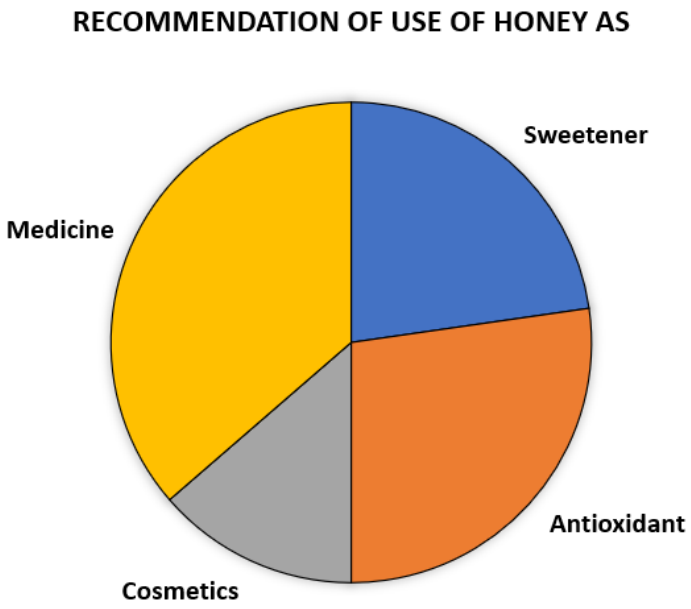

Figure 7. Recommendation on the use of honey recorded in population survey.

The population survey revealed that, one-fourth of the population recommends the use of honey as a simple sweetener, 40% stands for medicinal purpose, 35% recommends the use as antioxidant and 15% as cosmetics (Figure 7).

When suggestion on commercial honey was collected from the population, around 30% suggested about increasing the nutritional value of honey (other than sugar), 30% recommended the prevention of adulteration and around 5-6% each suggested about lowering sugar content, improved packaging, education of local honey seller, introduction of local squeezed honey and development of overall awareness (Figure 8).

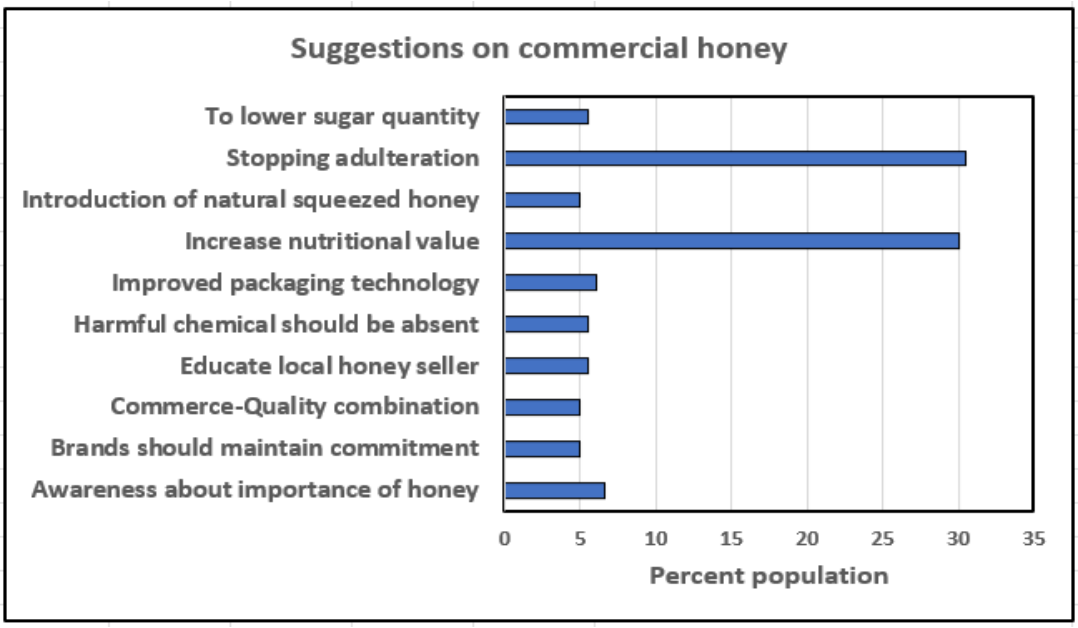

Figure 8. Suggestion on commercial honey from the population survey.

The outcome of the questionnaire survey reflects the awareness and commercial aspects of purchased honey in the study population.

Figure 9. Presence of pollen sediment found in different honey sample.

The pollen sediments, supposed to be from the nectarial sources of the honey for a particular locality, were studied for four honey samples. It was found that the authenticated honey collected from Sundarban (mangrove honey), Kalyani, Nadia and Barrackpore, North 24-Parganas have variable amount of pollen sediment, confirming the natural origin of the honey (Figure 9). However, the pollen sediment was totally absent in the studied sample of commercial honey.

Commercially available honey is often found to be adulterated (Bose & Padmavati, 2024), which is the manipulation of composition with less expensive substances, like sugar syrup, for monetary benefit. This kind of practice compromises the nutritional value and quality of honey. Sometimes, the bees are fed with sugar syrups for increasing the yield of honey, low-quality honey is produced, which is reflected with the presence of less or no pollen grains in sediment.

In the present population survey (Figure 10) about the awareness of honey in a preliminary level, it has been observed that consumer awareness about the benefits organic and natural honey and other bee-hive products is very important aspect all over the world.

Figure 10. Glimpses of the questionnaire survey about the attitude towards honey in different locations in the Presidency division, West Bengal, India.

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CONFLICTS OF INTEREST

There are no conflicts of interest among the authors.

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