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Traditional beekeeping in the Hilly districts of Himachal Pradesh in North Western Himalayas with *Apiscerana*

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Abstract

Beekeeping is a traditional practice which is being carried out since generations in the Himalayan state of Himachal Pradesh and it has been a backbone for the people of the state as it supports them socially, economically and ecologically. The objective of this study was to enquire and document about the traditional names, belief and technologies of beekeeping from most of the remote areas of Himachal Pradesh. Thus, participatory Rural Appraisal (PRA) technique was used to gather the information regarding traditional practices. Beekeeping with *Apiscerana* was the common practice among the people, with log hives being predominant in Chamba and Kinnaur district while mud, wall and rectangular hives were predominant in the Shimla, Mandi and Sirmaur districts of Himachal Pradesh. Traditional hives were mostly preferred by the people in all the districts as compared to the modern ones as they are more capable in keeping the colony intact during the harsh winters in the Himalayan region. Although with such benefits in traditional beekeeping it is suffering a lot from the rampant growth which includes development of concrete jungles and lack of scientific know how in this Himalayan region.

Keywords: Beekeeping, hives, honey extraction and rural appraisal and technology

Introduction

One of the oldest customs in India is beekeeping. The practice of harvesting honey from honeybees has been going on for a century[1]. Honeybees are a fantastic gift to mankind because beekeeping can be done for both their pollination services and their valuable products like honey, beeswax, propolis, bee venom, etc. These products are widely used by both small- and large-scale businesses in India[6]. Ancient Ayurvedic literature from India mentions honey and its healing properties. Therefore, the government has made numerous efforts to revive a number of traditional village industries, such as the Khadi and Village Industries Board (KVIB), the All India Coordinated Research Project (AICRP) on Honey bee Research and Training, which was launched by Indian council of agriculture research with the participation of Agricultural Universities, and the Beekeeping Development Board, which was also established for the purpose of organising awareness programmes and trainings. Over 1.5 million bee colonies are currently present in India, producing 55,000 tonnes of honey annually. The biggest export markets for Indian honey include Germany, the USA, the UK, Japan, France, Italy, and Spain.

Traditional *Apiscerana* beekeeping has been practised in numerous communities throughout the Himalayan Mountain range. In Himachal Pradesh, *Apiscerana* is kept in conventional wall hives of different types, sizes, and designs[5]. These antique beehives exhibit signs of prehistoric bee knowledge and are artifacts from honey collection techniques employed by highland farmers for centuries[2]. However, there is tremendous potential for the growth of beekeeping in the Himalayan region due to the diversity of the bee flora and the ideal agro-climatic conditions. *Apiscerana* beekeeping does not require a lot of management, such as feeding on sugar, preventing illness, or moving. As a result, it is easy for a rural agricultural community to put its knowledge into practise[3]. In certain remote and inaccessible areas of the state, farmers don't use fertilizers and chemicals. Making organic honey is thereby made possible. For landless persons as well as tiny and marginal farmers, beekeeping is a terrific career. Farmers in this state have created distinctive beekeeping methods that require documentation. These technologies deserve scientific examination. There is space for advancement and progress through the use of science and technology.

Material and Methods

Study area

Table 1: The skills of traditional bee

Sr. No.	Particulars	Mandi (50)	Shimla (50)	Sirmaur (50)	Chamba (50)	Kinnaur (50)
1	Beekeeping skill	(31.03%)	(11.19%)	(56.17%)	(56.17%)	(83.33%)
2	Lack of awareness of improved beekeeping practice	(25.00%)	(34.78%)	(50.00%)	(78.20%)	(78.20%)
3	To prevent pests and predators	(00.58%)	(17.39%)	(11.54%)	(28.82%)	(11.54%)
4	To catch swarm	(15.00%)	(15.00%)	(80.55%)	(79.48%)	(76.28%)
5	Marketing	(06.95%)	(67.43%)	(34.50%)	(84.78%)	(06.95%)
6	Shortage of bee forage	(30.50%)	(31.18%)	(56.04%)	(40.69%)	(56.04%)
7	Absconding and migration of colony	(10.00%)	(10.00%)	(10.00%)	(10.00%)	(10.00%)
8	Flora species availability	(03.46%)	(02.50%)	(51.46%)	(57.17%)	(51.46%)

Studies were carried out in order to establish the current status of Indigenous beekeeping technologies in Himachal Pradesh. The present study was conducted to identify, collect and document the traditional method of beekeeping practices in Shimla, Mandi, Chamba, Sirmaur and Kinnaur district of Himachal Pradesh, lies between 30º 22' 40" N and longitude 75º 45' 55" E with an altitude ranging from 350 which m (low valleys) to 6,975 m (snow-capped mountains) above mean sea level. An open-ended questionnaire was prepared for the information regarding traditional practices being followed in the study areas. Participatory Rural Appraisal (PRA) techniques such as group discussion, transect walk and direct field observation of the apiaries with the aim of verifying certain information were conducted to collect data and detailed information about the indigenous ways of beekeeping practiced by the local people in the selected villages. Beekeepers practicising these traditional practices and local names used for honeybees and bee products were also enquired from the informants.

Results and Discussion

Traditional beekeeping practices

A detailed description of the indigenous beekeeping practices of honeybees being followed by beekeepers and local names of the honeybees, hives and honey used in Shimla, Mandi, Chamba, Sirmaur and Kinnaur districts of Himachal Pradesh is presented below.

Traditional Houses in Himachal Pradesh: Traditional houses in Himachal Pradesh are made up of stone or mud and the houses have sloping roofs *(Chappar)* made of stones. which are also called as Slates or Dhok or *apathar* or *Shilla* in local language. The shape of the houses is typically rectangular or square with sloping roofs. Himachal Pradesh's traditional houses are built to withstand cold winters and heavy snowfall so it provides a great shelter for *A. cerana* in winters. These houses have speciality of being warm in winters and cold in summers, which is another reason for suitability of these houses as a shelter for honey bees.

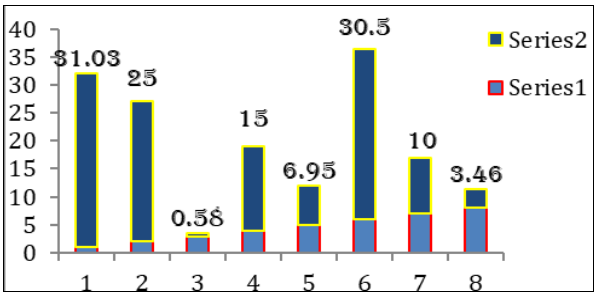


Fig 1: Distribution of Respondents in district Mandi

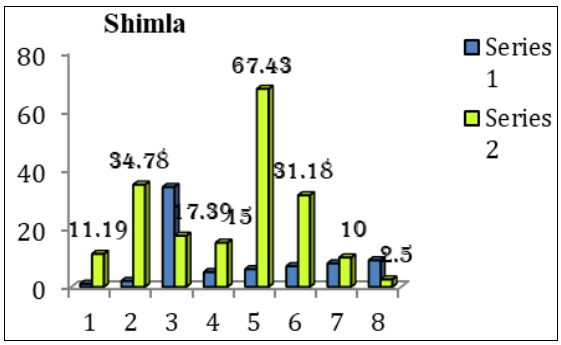


Fig 2: district Distribution of Respondents in Shimla

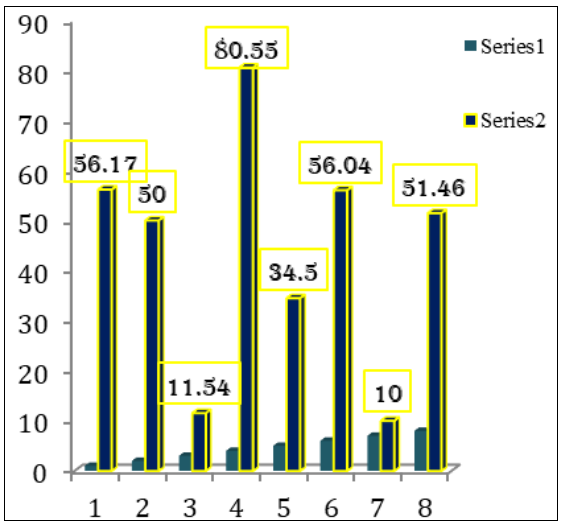


Fig 3: Distribution of respondents in Sirmaur

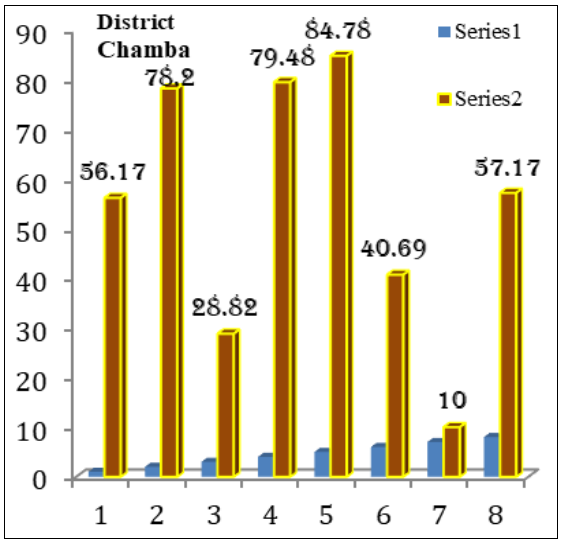
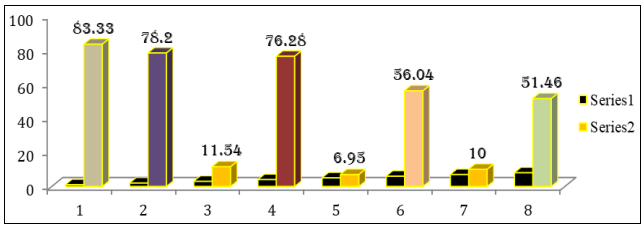


Fig 4: Distribution of respondents in Chamba

The data (Table1) presented that 83.33 per cent respondents possessed the skills of traditional bee keeping followed by 56.17 per cent were found skilled farmers in the district Sirmaur and Chamba while (31.03%) in Mandi on the statement i.e., Lack of awareness of improved beekeeping practice, etc. It is resulted that many people find beekeeping to be a low-cost activity with low initial investment and recurring expenses. In the contrary in district Kinnaur 57.17 and 51.46 per cent respondents adopted and skilled they were having the "Flora species availability". It is concluded that Beekeeping can be a good source of income. Honeybee apiaries can provide food and medicinal security. Honeybees produce wax, which is used in cosmetics, boot polish, water-proof paints, and candles. Propolis, another product of bees, has antiseptic and anesthetic properties and is used in medicines, toothpastes, and more. Nutritional, economic, and ecological balance: Beekeeping can provide a nutritional, economic, and ecological balance.



Different types of hives used in these areas are

Log Hives

It's reasonable to assume that bees consider trees to be excellent homes for their hives. Beekeepers created wood hives in an attempt to replicate this and are successful in attracting bees. Log hives are made up of hollowed-out tree logs that are covered on both ends and contain a small hole through which bees can enter in figure chart. It is regarded as a more natural and insulating style of beekeeping. Log hives are frequently located in high-altitude locations like in Chamba and Kinnaur districts. Whereas, in the district Mandi, Shimla and Sirmaur mostly wall hives and mud hives are being used.

Mud Hives

It's simple to put together, functional, and looks like the natural environment. Local materials such as dirt, dry grass, and cow dung are used to construct them. They're simple to set up and make excellent alternatives to wall or log hives.

Wall Hives

A wall hive is the most commonly used hives for honeybees in Himachal Pradesh and is a low-cost beekeeping option. In ancient time people in Himachal Pradesh use to build their houses with these kind of wall hives in the walls of their houses, in Shimla, Mandi and Kinnaur this practice is still in use and very popular. In a lot of the state's regions, wall hives are a crucial component of building. Generally speaking, square-shaped wall hives measuring 30–40 cm wide and 30–40 cm high were seen in various parts of the state. The hive's entrance is kept outside. While the floor or roof is covered with wooden boards, the side walls are plastered with mud or cow manure. Similar to log hives, the interior is sealed. Only the combs that contain honey are removed as the honey is harvested from within the hive. When compared to modern hives, wall hives have certain basic advantages. For example, they are more likely to live longer, offer more security against theft and animal damage, and may be built for relatively little money when the right materials are available. Additionally, in areas where they are employed, bees appear to winter well in them, possibly as a result of the wall's substance acting as a heat buffer.

Rectangular Hive

Rectangular wooden hives were rectangular in shape having a small rectangular entrance gate. These rectangular hives were tied with rope or a platform was made to hang them in first floor of the house.

Honey Extraction

The state of Himachal Pradesh is home to many deities. Hence, in some areas, honey bees are kept in hives inside people's houses and are revered as *MaaKali's* avatars. Therefore, a little ritual is held to honour *Maa Kali* before honey is harvested, and sweet bread (*Mitha Rote*) is offered to the goddess, only after that the honey is harvested. There will only be two or three people in the village who will extract honey from hives. Before setting the time for worship, scheduling the time for honey extraction, and making preparations for the necessary equipment for honey extraction, the honey gathering process is carried out.

Information gathering

After the spring season, the honey is primarily gathered in mountainous places. Harvesting is primarily done in the months of May and June since it is thought that in the spring, they collect excess honey as they are not able to go outdoors during monsoons and can full fill their dietary needs from stored honey.

Setting the honey extraction time

Although there is no set period for collecting honey, it is generally accepted that the full moon yields more honey than any other time of the month. Most of the time, honey extraction takes place at night, but it can sometimes happen during the day. Honey gathering is a difficult task; hence it is a cooperative activity. Usually, 2-4 people gather the honey.

Material required for honey collection

There is a specialized knife called "*Thalata''* that is made of iron with a flat surface on one side and is coupled to an iron rode specifically for cutting combs. The iron knife (*Thalata*) is primarily used by the people when collecting honey. A large container, known locally as a "*Prat,"* is used to remove honey combs from hives.

Procedure for cutting the comb

Smoke technique for cutting the comb is used. The main collector typically carries the iron knife, while another person smokes below the hive as the main collector descends the honey combs. The work is divided up among the group members. One will wield the light torch, another will supply the smoke for the hives, one will cut the combs, and one will assist in properly storing the combs in the container. The container is made up of brass and in local

language the container is called as "*Kanali*", "*Tansla*" or "*Dabbra*" as different methods shown in the images. The individual cutting the comb will drape the cloth over his face. The honey bees usually leave the hive when exposed to the smoke. During that time, the bee hives are collected quite quickly. In order for the bees to use the honey to rebuild their colony, some of the honey comb is left inside the hive. In case of being stung by the honey bees the comb cutting knife which is made up of iron is placed immediately over the affected area to get relief from the pain.

Filtration and Storage

The freshly collected honey is a mixture of wax and sometimes the young bees from the hive are also found. After that, the honey is filtered through an iron sieve (*Chalna*) and stored in a glass jar. There is a saying that states the benefits of honey increase with age. As a result, honey is being kept for a long time in case it is needed to treat a cold or a cough or any other throat infection.

Traditional Methods of Beekeeping used in Himalayan Region

Advantages of traditional beekeeping

Mountain beehives traditionally consist of clay, wood logs, and cow manure. The majority of the hives are constructed while the home is being built, which reduces the additional cost of establishing the apiary separately and no extra cost is needed. These hives are within the homes, making them less vulnerable to attacks from wild animals than apiaries that are outdoors. The lifespan of traditional wooden hives is thought to be greater than that of contemporary bee hives. These hives are simple to design and have been used for generations; therefore the maintenance of our ancient culture and tradition is done through apiculture. No additional expense is necessary for pollination as the colonies are maintained at home and additional revenue generated without spending a lot of effort or money. These are source of homemade, chemical-free, pure honey which is healthier than store-bought honey.

Conclusion

Himachal Pradesh's heritage of traditional beekeeping has been passed down through the years from one generation to the next. Traditional beekeeping offers beekeepers in difficult situations a way out and a second source of income. Honeybees are an excellent pollinator for their many horticulture and agricultural crops, earning them the nickname "fruit bowl of India." The primary barrier to traditional beekeeping is the change in lifestyle, which is causing people to move from Kaccha to pucca homes. Traditional beekeeping is not feasible in Pucca homes, and many are abandoning the practices. In order to preserve bee habitat and give them places to nest, traditional beekeeping must be maintained. There is a need to raise awareness among beekeepers and develop methods that can integrate traditional beekeeping practices with contemporary beekeeping in order to preserve traditional beekeeping and the *Apiscerana* population. Due to its purity, flavor, and unique personal touch, traditionally harvested honey commands greater costs than other brands of honey that are readily available in the market. The only issue is that because Himachal Pradesh is a hilly state, it is difficult to move products into marketplaces and beekeepers don't understand market trends. Therefore, there is a lot of room to encourage tiny honey vendors to offer honey in containers that are readily available in their community. Therefore, market knowledge, scientific interventions, training, and support of farmers and beekeepers all contribute to increased beekeeping success. Native hives still have a great deal of promise. Such hives are particularly appealing due to their inexpensive price and easy maintenance. These indigenous beekeeping practices offer an edge over contemporary beekeeping when compared to the way of life and traditions of rural and tribal groups. Issues that beekeepers encountered need to be taken seriously by the government and marginal farmers need assistance in order to keep raising honey bee. This can be accomplished by employing efficient supply chain management to maximize the profits from apiculture, a step towards a sustainable way of life (Nazim and Khan, 2022) [7]. The potential of conventional beekeeping in the region has not yet been completely realized and tapped, and as urbanization and technological advancements progress, people are losing sight of their roots. It is necessary to conduct in-depth research on traditional beekeeping, and honey as a product needs to be marketed to a larger audience.

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