

Indigenous Knowledge and Practices of Beekeeping with *Apis cerana* in Nepal

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Abstract

Economically five important honeybees' species namely *Apis cerana* F., *A. mellifera* L., *A. laboriosa* S., *A. dorsata* F., and *A. florea* F. are recorded in Nepal. To understand the farmers' indigenous knowledges and practices on beekeeping, a survey was conducted in Nepal in 2015/016. Farmers searched honeybee colonies in hollow tree around the forest and domesticated them bykeeping two-three bee hives made of traditional wood log bee hives of *A. cerana* in a house with least management practices. Majority of the farmers (74%) harvested honey two times in a year, between March to May and second September to November. The techniques of beekeeping had been handed down from generation to generation since immemorial time. Indigenous knowledge and practices could be an important basis for the development of beekeeping and maintenance of beekeeping in rural areas of Nepal.

Key words: *A. cerana*, Domestication, Traditional log hives, Indigenous knowledge

INTRODUCTION

Five different honeybee species are recorded in the Hindu Kush Himalayan region (Partap, 1997). Three important honeybee species, little bee (*A. florea*), rock bee (*A. dorsata*) and Asian bee (*A. cerana*) are commonly found in Nepal (Kafle, 1992) and the largest honeybee (*A. laboriosa*) is also found in the mountain regions. Similarly, beekeeping with *A. mellifera* started since 1993-1995 (MoAc, 2008; Entomology Division, 1999).

The indigenous hive bee of Asia, *A. cerana*, is the most valuable natural resources of beekeeping in Hindu-Kush Himalayan region and has been considered as vital component of the natural ecosystem (Joshi *et al.*, 2001). It is reported that *A. cerana* can be found throughout Nepal up to 3500 masl (Gurung *et al.*, 2012). Different studies

reported that *A. cerana* is an excellent pollinator of many crops that improves the quality and quantity (Partap and Partap, 1997; Pudasaini and Thapa, 2014a; Pudasaini *et al.*, 2014). Similarly, *A. cerana* is reported efficient pollinator as compared to *A. mellifera* and *A. dorsata* in natural condition (Pudasaini and Thapa, 2014b).

Traditional beekeeping is a part of cultural heritage in Nepal and has been practiced by rural people since ancient times (Devkota, 2000; Kafle, 1992). Many Nepalese farmers engaged in beekeeping enterprise since long times (Ranabhat, 2010). However, it is reported that population of *A. cerana* in Hindu-Kush region is declining (Verma, 1992; Partap, 1999). In the other hand, *A. mellifera* beekeeping requires more resources, capital and management which are unsuitable for subsistent rural beekeepers (Ahmad *et al.*, 2002). Similarly, the role of indigenous

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knowledge could be important for development of beekeeping sector (Saville and Upadhaya, 2002). Various studies were conducted regarding to the beekeeping in Nepal (Kafle, 1992; Saville and Upadhaya, 2002). But it lacks to collect information regarding to the indigenous knowledge and practices of beekeeping at farmers level. Hence, it is necessary to document the available indigenous knowledges and practices of beekeeping for its further improvement and development of the beekeeping sector. Therefore, this study was carried out to collect the information regarding to indigenous knowledge and practices of farmers' on beekeeping.

METHODOLOGY

A survey was conducted at Chyangli VDC, Gorkha district, Nepal from December, 2015 to May, 2016 to collect information about the indigenous knowledge and practices on beekeeping where 2~3 honeybee hives with *A. cerana* is common. Surveyed areas have longitude 84.4645⁰E, latitude 27.9836⁰N and elevation 2,674 feet with subtropical climate.

Focus group discussions (FGD) were used to collect necessary information (Krueger 1988; Etkin 1993). First model group discussion was conducted to set the objectives and questionnaire. After identifying the main objectives as to collect information on indigenous knowledges and practices of beekeeping, key questionnaire and agenda were finalized. Then the focus group discussions with stakeholder were held in different five study centres Chyangli, Gorkha (Biruwater, Majhuwa, Khatritar, Jwoithan, Purnepipal) each consisting of 10~20 stakeholders based on geographical location, ethnicity, socio-economic status, age (30 years to 65 years), interest etc. The discussions were mainly focused on the following: 1) Importance of honeybees and honey, 2) Collection of bee 3) Traditional log hives 4) Honey harvesting 5) Management of honeybee and 6) Problem of beekeeping

which were noted during discussion period.

RESULTS AND DISCUSSIONS

Importance of honeybees and honey

Majority of the respondents (72%) (N=75) were found aware about the roles of honeybees as a crop pollinator and maintaining sound ecosystem. A proverb was found famous in these regions as 'killing one bee equals the sin of killing seven cows'. As they believed cow as a goddess in Hindu culture. Similarly, importance of honey was reported as a very essence material in daily life from birth to death. They licked honey on the ceremony of 'rice feeding' at six months of child born. Honey has been used as a medicine and nutritional food since immemorial time. In the study area, they used honey as one of the constituent of immortality (called *Panchamrit*) along with other four constituents. The knowledge acquired by the farmers of study area on importance of honey and beekeeping is similar to previous studies who reported that honeybees are important pollinators (Pudasaini and Thapa, 2014a; Pudasaini *et al.*, 2014; Partap and Verma, 2010; Munawar *et al.*, 2009; Robinson and Morse, 1989). Similarly, in Hinduism, the honey (Maha/Madhu) is one of the five ingredients of *Panchamrit* (drinks of gods) (Oldroyd and Wongsiri, 2006; Joshi, 2008). Likewise, when a child is born in a Hindu family "Jatakarma" is performed to welcome the child into the new family, by putting some drops of honey in the child's mouth and whispering the name of God in the child's ear (B. B. C., 2009).

Collection of bee

Farmers searched honeybee colonies in hollow tree trunk in forest area. They sliced these trunks with the help of locally made axe (locally called *bancharo*) and transfer them in bamboo basket (locally called *dalo*) and relocated



Fig. 1. Closed opening of hive with bamboo peel tool and plastered with red soil in Nepal.

them in traditional log beehives or wall hives. Majority of the farmer (78%) (N=75) were found poured small amount of sugar syrup in hives after shifting bee in hives from bamboo basket. Very few farmers (6%) also found practiced tying queen with thread in hives for few days, to force honeybees to inhabit in hives. Sometimes they also captured swarming or absconding bee which temporary dwell openly on tree branches. They believed that if this collection process is done in Wednesday, honeybees doesn't abscond the hive and inhabit for longer time. Similarly, they also captured absconding honeybees by thronging fine soil or water in natural condition. Present finding was in the line with earlier reports in collection of bees. Joshi *et al.* (2002) also argued that people used to catch swarm bees and keep in locally designed log or wall hives. Kafle (1992) also reported that farmers in Nepal caught stray swarm bee of *A. cerana* and started new colonies.

Traditional log hives

The cylindrical hives with hollowed-out logs were common in study area. Majority of log hives were made from timber species such as *Shorea robusta* (Sal),



Fig. 2. Hanging log hives in the balcony of house with help of rope in Nepal.

Lagerstroemia parviflora (locally *Bot dhaiyero*), *Schima wallichii* (Schima), *Castanopsis indica* (Chest nut) and *Terminalia arjuna* (Arjun tree) with well seasoned parts. The months of December-January were an appropriate time for making hives, particularly on Wednesday. They believed that hives constructed at that time was both durable as well as honeybees reside for longer duration. Similarly, wood borer infestation was found least on these hives. They search hollow tree or tree trunk to make hive and cut it into hive sized logs (2 to 2.5 feet). One or two holes in the hive are positioned at the mid-point from both ends. Two openings of the hive are closed with special kind of tools (locally called '*Chitreto*') made with bamboo peel (or sometime also with plank) after transferring honeybee into hives. These *Chitreto* were plastered using red soil (Fig. 1). The *Chitreto* is porous in nature which permits circulation of air from one end of the hive to another. The length of log hives is usually about 2 to 2.5 feet with 1 foot diameter. The log hives were hung in the balcony with the help of rope (Fig. 2). They also reared honeybees in the wall hives which are locally called '*Khopa*'. These hives were recessed in the walls of houses and created at the time of building of houses. The recesses are planked and plastered with mud paste (especially red soil) from inside the house, while they are open to the outside with small round holes serving as bee entrance. But this type of hive was not common in surveyed areas. Thapa (2003) also reported similar result



Fig. 3. Harvested combs with the honey stored, pollen and brood in Nepal.

on length (2~2.5 feet) and diameter (1~1.5 feet) of hives. Similarly, according to Pokhrel (2009), farmers kept *A. cerana* in traditional log and wall hives in hilly area of Chitwan. The rearing of honeybee in wall hives and log hives were also described by Kafle (1992).

Honey harvesting

A smoker locally called 'Jhumro' is made out of old cotton cloth tied into a roll. During honey harvesting, about two-third (70%) farmer found chewed a piece of ginger. They believed ginger smell make honeybees lethargic and incapable for sting. Once the bees leave the combs, the combs sliced from the base using sharp knife or by 'panio/panyau' (rice serving flat spoon). Most beekeepers (90%) leave one comb in hive for the honeybees as the food sources and broods. They believed that if all comb harvested, bees abscond the hive. Harvested combs included the both honey stored and brood (Fig. 3). As presented in Fig. 4, majority of the farmer (74%) were found practices harvesting honey in two times in a year, once at March to May and second September to November. Similarly, less than one-fourth farmers (22%) were found practices harvesting honey three times and very less farmers (4%) harvested more than three times in a year. They squeezed honey store part of comb and stored for future use. Brood part as well as pollen store part consumed immediately sharing with family and neighbour. The priority time to harvest honey was given in full moon

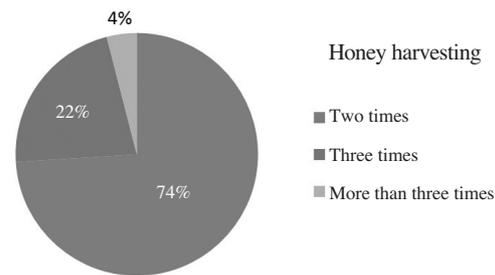


Fig. 4. Times of honey harvesting in a year at Chyangli VDC, Gorkha, 2015/016.

or new moon times because they believed harvesting at that times gives more honey. Similarly, honey was found the most important hive product. They also consumed stored pollen and brood in the comb and brood whereas generally they did not use other hive product. Thapa (2003) also reported that farmer harvest two times in a year in different parts of Nepal whereas Kafle (1992) reported that farmers harvest honey three times in a year. According to Kafle (1992) during honey harvesting the combs are cut down along with the brood. Further he reported that the brood and honey parts are separated and the honey combs are pressed to squeeze out the honey. Saville and Upadhaya (2002) also reported the almost similar harvesting procedure at Jumla, Nepal.

Management of honeybees

In surveyed areas, keeping two-three bee hives of *A. cerana* in a farmer house in traditional log bee hives with least management practices were found. Farmers were found beekeeping with *A. cerana* based on very low investment and insignificant management practices. Joshi *et al.* (2002) also mentioned that beekeeping with *A. cerana* required very low initial investment and colony management cost also very negligible as compared to *A. mellifera*. Beekeeping with *A. cerana* does not require a lot of management like sugar feeding, disease control and migration (Gurung *et al.*, 2002). Similarly, it is reported that in hilly areas *A. cerana* found rearing with no any adopted colony migration and very negligible sugar feeding system (Pokhrel, 2008). According to Kafle (1992) almost no

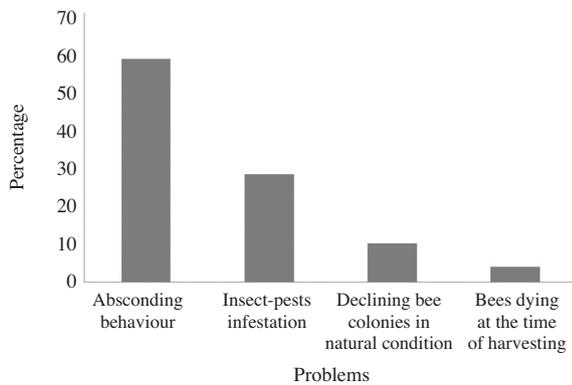


Fig. 5. Problems of beekeeping with *A. cerana* on Chyangli VDC, Gorkha, in 2015/06.

management practices were done rearing with *A. cerana* in traditional hives.

Problems of beekeeping

Among the different problems absconding was reported as the major problem. As presented on Fig. 5 majority of the respondents (58%) perceived that absconding behaviour of honeybees as the most serious problem of beekeeping with *A. cerana*. Generally honeybees did not inhabit in hive more than two year. Likewise, honeybees were found suffered by different insect pests (28%) was another problem. Among the pests different types of ants, lizards, vespa and wasps were primary. Similarly, declining of honeybee colonies in natural condition as compare to past was another problem (10%). Unavailability of nesting sides, pollen and nectar sources, over use and misuse of chemical pesticide were major causes on declining of honeybee colonies in natural condition (Pudasaini, 2014). Declining of bee colonies in natural condition causes difficulty on searching them in natural condition. Dying of mass number of bees at the time of harvesting (4%) was another problem. Thapa (2003) also mentioned two *Vespa* species (*Vespa basalis* and *V. magnifica*) as major pests in *A. cerana* in Nepal. It is reported that wasps and ants were most troublesome pest of bee colonies in the traditional hives (Kafle, 1992). Similarly, farmers perceived that due to misuse of chemical pesticide, deforestation and other many different factors, population

of honeybee is being declined than past in Chitwan condition (Pudasaini *et al.*, 2016).

CONCLUSION

It is concluded that keeping two-three bee hives of *A. cerana* in a house in traditional log bee hives with least management practices was found common. These techniques of beekeeping have been handed from generation to generation since immemorial time. The indigenous knowledges and practices could be significant basis for development of modern beekeeping in the rural parts of Nepal. Hence, further studies related to beekeeping practices are need for sustainable beekeeping development.

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