
SURVEY OF MANAGED *APIS CERANA* F. (APIDAE: HYMENOPTERA) POPULATION IN GALIAT, MURREE AND ISLAMABAD

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ABSTRACT:- A survey was conducted through a dialogue with the people of Abbottabad, Murree and Islamabad to estimate the population of honey bee *Apis cerana* Fabricius. Subsequent field visits were made to locate these bees. This study is first of its type in Pakistan to document the population density of this bee. It reveals the distribution and strength of population of *A. cerana* in mainly hilly areas of Pakistan. The objective of this study is not only useful to upscale honey production by this hill bee but also for pollination purpose. People interviewed were of the opinion that there is still some potential for these bees. Abbottabad area was having comparatively more population of *A. cerana* than other areas.

Key Words: Honey bee; *Apis cerana*; Pollination; Population; Honey Production; Pakistan.

INTRODUCTION

Bee keeping is important strategy in the development of mountain agriculture. There are several species of honey bees which are handled by inhabitant of the area for earning livelihood. One of them is *Apis cerana* F., the Asiatic hive bee. It is found in southern and southeastern Asia such as Afghanistan, Bangladesh, Bhutan, China, India, Indonesia, Japan, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Thailand and Vietnam. Bee keeping with *A. cerana* has been practiced in Asia by using traditional methods from time immemorial. This species is adapted to the local environment and its flowering plants. It is easy for an isolated farming community to practice bee-keeping with this bee species on the basis of their indigenous knowledge. A hive of this bee can produce 5-10 kg

of honey per year.

Farmers keep it in traditional fixed combed hives such as log, wall and earthen pitcher hives and movable frames wooden hives (Partap, 1999). In Pakistan, it hives in trunk of tree, termite mounds, caves of rocks etc in Azad Kashmir, Hazara and Swat (Ahmad and Muzaffar, 1985). Only 4 subspecies of this bee are recognized (Ruttner, 1987) although there may be more species even up to eight.

A. cerana is suffering precipitous decline and is threatened with extinction in entire native habitat (Sivaram and Anita, 2003). Population of *A. cerana* in the Hindukush Himalayas region is declining (Joshi et al., 2002). In Khyber Pukh-tunkhaw its population may soon attain the status of endangered species (Crane, 1992). It was reported that it had mostly disappeared in Pakistan and

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could be found only in a few villages in the north of the country. This bee can now be seen in many parts of north Pakistan. It seems that *A. cerana* is recovering from the pressures associated with the introduction of *A. mellifera* and the use of pesticides (Ahmad et al., 2002). In this background, present investigations were conducted in 2012.

This paper is a contribution of the results of a dialogue with various individuals who work with indigenous bee, *A. cerana* and is an attempt to bridge the gaps, share knowledge and experiences of several people who can depend on honeybee for their livelihood.

MATERIALS AND METHOD

The selection of this area was done on the basis that the whole mountainous belt of Pakistan was famous for *A. cerana* bee keeping. However, there are serious concerns that the population of this bee has lost and dwindled considerably due to many reasons.

A survey for *A. cerana* was conducted through dialogue with the people of the area during May-September, 2012. The people were met either in groups or individually. The respondents were asked various questions regarding the past history of beekeeping of the area. They were also asked to provide present information. After the dialogue the practical activity was also undertaken. It was done to visit actual site and take observations regarding strength of hive and type. Whenever possible the actual bee hives were also visited to see the bee hives as per their information. Abbottabad area was visited in 2nd and 3rd week of

May 2012 on different dates; Murree in 1st week of May and Islamabad in September, 2012.

The area of District Abbottabad is 9490 km² and located in the lesser Himalayan. It lies between 33° 55' - 34° 20' North latitude and 73° 20' - 73° 30' East longitude. The topography is rugged with steep slopes and narrow valleys with elevations of 1,000-3,000m. Of the surveyed villages Malkot, is located in the south-eastern part of Khyber Pakhtunkhwa and forms part of the border with Punjab province. It is mountainous with pine, plum, orange and apple trees. It is at elevation of 1630m. Darwaza is a village near Ayubia with population of about 5,000. Population of Chamb is around 1,000. Major characters of these villages resemble that of Malkot.

In Murree, Ghora Gali is at elevation of 1691m and altitude is 33°88' and the longitude is 73°36'. Apples have been grown as commercial fruit plants in different areas along with some other fruits.

Islamabad is at an elevation of 540m. Its area is 906 km² with latitude of 33°70' and longitude of 73°16'.

RESULTS AND DISCUSSION

In the surveyed villages the inhabitant kept their bees in a container locally called Toun. It is an earthen bucket shaped receptacle which is hardened in the sun light. It has the opening on the upper side and a small hole in the base.

In Abbottabad, 5 villages were surveyed. Of the contacted people 28 persons had bee hives (Table 1). They were of the opinion that there is still some potential for these bees.

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Table 1. Status of *Apis cerana* hives in Abbottabad, Murree and Rawalpindi / Islamabad

Village	Name of Respondent	Remarks
Abbottabad		
Malkot	1. Mubin	Three hives, one with bee. These are in the room where goats are also kept. He gets honey once a year. Women folk kill the hornet with broom.
	2. Haji Rasheed	Two hives in the room where goats are kept. In one, bees were present for 2 days and then they migrated. In another place the bees were also placed by him but they went away.
	3. Nasim Qadri	One bee hive
	4. Zaheer Abbasi	Two hives were previously present but now there are no bee hives.
Kallas Barian	5. Irshad	Two hives. According to him in another village 8km away there are 20 - 25 hives.
Chamb	6. Shirin Khan	Seven hives, 6 with bees.
	7. Altaf	Seven hives, three with bees.
	8. Abdul Rehman	Three hives, two with bees.
	9. Tanvir	Seven hives one with bees.
	10. Haji Taj	One hive with bees.
	11. Aurangzeb	Three hives without any bees as the bees have migrated.
	12. Ashiq Hussain	Four hives without having bees as the bees have migrated. .
	13. Mohammed Asif	One hive with bees.
	14. Irtza	Three hives without bees as the bees have migrated.
	15. Zakir Hussain	One hive without bees as the bees have migrated.
	16. Tariq Hussain	One hive without bees.
	17. Gultaj Abbasi	Seven hives, 3 with bees. The bees are in the room where goats are kept. Two days earlier these bees swarmed and went to another house. The bees were inhabitant of this place since their ancestral time. Obtained 3-5kg honey from each.
	18. Rahim Dad	Eight hives, 5 with bees. Obtained annually 15-20kg honey in June and September. Expert in catching bees.
	19. Raees Abbasi	Two hives 1 with bees.
	20. Abdul Rehman	Two new hives without bees as the bees have migrated.
	21. Mohammed Akhlaq Abbasi	Four hives without bees. The bees come to his house but run away.
	Darwaza	22. Akhlaq
23. Altaf		Two hives without bees as the bees have migrated.
24. Sana Mohammad		Two hives with bees.
Palak	25. Mohammad Mansha	One hive in his shop but without bees as the bees have migrated.
	26. Wajid	Two empty hives. Honey was harvested last year.

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Village	Name of Respondent	Remarks
	27. Khalid	In a village 5km away every house had two hives so there were about 35-40 hives.
	28. Manzoor Hussain	Four hives, 2 with bees.
<i>Murree</i>		
Mallot	1. Parvaiz	There is no hive at present though were present previously.
Vanna Sharif	2. Zakir/Wild	The hives were in the rock. Obtained 5-6kg honey from the rock. The hive were located at 1-1.25m height.
	3. Ishaq	Local bees were not found.
Kumbi	4. Sajjad Abbassi /Wild	There were no bees in the houses. One hive was seen in the mountain and three or four more hives were present in difficult terrain.
Ghora Gali	5. Afzal Abbassi	Local bees come here for one or two days and migrate. Due to cemented houses the bees do not stay.
	6. Akram	Thirty years earlier each house had a hive. People need training and guidance on bee keeping.
	7. Salam	Local bees were not found.
	8. Wild	In a small cave of the mountain on roadside. They were disturbed by the local people and migrated.
Lora maiden Havelian	9. Abdul Qaddus	Tried but could not catch the bees.
	10. Haveldar Saeed	Five years earlier, bees came under the table, which was placed in the sun in winter and inside in the summer. A swarm came in his house and later on went to another place.
	11. Aiqab	Bees came in to the kitchen and soon left the place.
Phagwari	12. Ishtiaq	Bee swarm came were placed in the tin box but they died.
<i>Rawalpindi/Islamabad</i>		
Chakshahzad	1. NARC	Six hives in buildings since 1990.
	2. Wild	It is in the cavity of the boundary of stone wall of an agricultural farm. There is another hive nearby.
F-7	3. Mirza Munir Baig	There are four hives.
Jinnah Super	4. Wild	It is in the cavity of stone wall. Honey has not been extracted. These are present since 5 years.
Margalla Town	5. Wild	One hive is present on the cover plate of manhole. since 2 years. In 2001, 4kg honey was obtained. Their swarm has been seen.
Rawal dam Islamabad	6. Wild	One hive in a water channel in stone wall since 5 years. Honey has not been obtained from this hive.
NIH. Chakshahzad	7. Wild	One hive is in cavity of Mulberry tree. since 2 years.
Faizabad	8. Wild	One hive in a cavity of Mulberry tree.
Tarlai, Markaz	9. Dr. Amjad	Every year 2 kg honey is obtained.
Golra	10. Wild	One hive in the stone wall of an old house since 2 years.

Respondent-2 of Malkot caught the swarm in a bucket and shifted them in the artificial hive. If any bee found buzzing around in the house it was caught and shifted in the bee hive receptacle. Later it was released in the air. This bee directs all other bees to the house. They caught the swarm by spraying water on it. Wife of Respondent-3 also of Malkot caught one swarm by throwing dust on it. Another swarm came but could not be caught. This area is rich of shain (*Plectranthus rugosus*) plant. According to him, if shain is rubbed at the entrance of the hive the bees start coming in to it. The bees were in the house for 6 months and then went away. According to Respondent-5 of Kalas Barian close by there is a village named Kalsa with 150 houses. Many bee hives were there. Another nearby village called Sambal also had many hives. Sail Gharbi village with about 30-40 houses had bees in their walls. Respondent-17 of Chamb had 3 hives from which 3-5 kg honey was obtained annually. In the house of Respondent-6 of Chamb bees were present since ancestral times and 4-6kg honey per hives obtained annually. They smoke the hives for obtaining honey. Honey bees are made sluggish and half honey is extracted and other half is left for their feeding. They burn fire in the room during winter to make it warm. Swarms come in mud portion of the house where tin sheets are placed on the roof.

In Murree, 6 villages were surveyed with 12 persons. The area had comparatively less bees than Abbottabad. The comparison may not be very accurate as it was not based on selection of samples on the basis of human population.

In Islamabad, 9 localities were

visited while 10 persons were contacted. At NARC hives were present but honey was never extracted. According to Respondent-4 of Islamabad bees were kept in wooden boxes since 1987. They are cared by a trained beekeeper. They were not fed sugar and live on natural flora. About 3-4kg honey was obtained by squeezing cut combs in cloth. Honey is used for home consumption. They produce their own queens by swarming. In spring swarms can be seen. Islamabad area is much more disturbed and urban therefore the hives encountered were less and these were mostly in the wild habitat.

In south India during early 90s with the attack of Thai sac brood virus *A. cerana* was wiped out. However some small beekeepers did not give up and after 5- 6 years it again revived (Keystone, 1999; Reddy, 1995). Almost same situation exists in Pakistan.

Present survey indicates that this species has declined tremendously as they can not be encountered in higher magnitude. It is evident that *A. cerana* populations are up scaling but slowly. It has been reported that the population of this species was considerable in the area. More efficient management practices are needed to be implemented with encouragement to the beekeepers. The documentation of data of the area revealed that there were some areas where activity of breeding was visible. However, this needs more encouragement through human resource building, practical logistic support and knowledge management strategy.

A special bee hive has been designed by Honey Bee Research Institute, National Agricultural Research Centre, Islamabad which

contains eight combs and honey super. It has been tested in the field with positive results. This survey also indicates that this native bee has not totally vanished rather it is surfacing well if it has declined previously. It is not certain that population has revived considerably. Inhabitants have not lost interest in its breeding. Interviews with the selected people show that they are interested in keeping this species. They need technical help and will again start beekeeping profession. The people of the area are having these bees and are enthusiastic to expand this activity.

A. cerana is vital component of natural ecosystem. Its decline may be of serious concern for insect pollinated crops. In 1981, there were 1200 apiaries in Khyber Puktunkhwa, Punjab and Balochistan but majority of them were destroyed by acarine disease. In addition to this about 35,000-45,000 hives were present in the wild (Ahmad and Muzaffar, 1985). Of these, 41 colonies of *A. cerana* were sampled and 44 % were infested with mite and perished (Muzaffar and Ahmad, 1991).

A. cerana is superior to other bees in pollination as it has longer foraging hours earlier initiation of foraging activity, short flight range, low cost of colony management during dearth periods and no foraging competition with other native species, non-*Apis* pollinator (Verma 1992). *Apis mellifera* and *A. cerana* are of good value as they can be moved in orchards. Hive bees prefer to forage close to their hives normally within 300-800m radius of the apiary. They can forage considerable distance. Maximum range of *A. cerana* is up to 2km.

A. cerana has proved its efficiency

in pollinating mountain crops and flora as compared to exotic *A. mellifera*. It is highly adaptive with the changing flowering and nectar production rhythms due to uncertain and changing climatic conditions in the mountain areas. Early flowering crops of mountain areas are pollinated more efficiently by this bee species due to its ability to work in cooler climates and longer working hours (Joshi et al., 2002). It is most practical for crop pollination because it can be managed and reared in sufficient numbers and can be transported (Partap, 1999). It has been reported to be an excellent pollinator of mountain crops that bloom in early spring, such as almonds, apples, pears, plums, and different vegetable seed crops. There are signs that across Hindukush Himalayas the overall productivity of mountainous crops is going down. It is suggested that beekeeping with this species should be encouraged by up scaling the knowledge of rearing and preserving the environment by less destruction of habitat.

Habitat destruction greatly limits the ability of honey bees to carefully choose to build nests and rear offspring and be in a particular micro-habitat in which protected from the attacks of predators. In the absence of dense vegetation, nest sites are often visible from a long distance and colonies are not able to defend themselves effectively from the predators and they became more prone to destruction (Underwood, 1992).

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