WILD HONEY BEES of NEPAL

Introduction

Nepal is a country with highly diverse agro ecological zones, ranging from terai plains to mid hills and high mountains that provide suitable habitat for diverse pollinator species including wild honey bees. Wild honey bees are species that nest in the wild. Wild honey bees of Nepal represent some of the earth's last remaining honey bee populations that have not been affected by exotic diseases and predators[1]. Unlike the European honey bee used for domestic honey production, these honey bees are able to tolerate seasonal low temparatures[2]. Despite the lower production in comparison to commercial European honey bee species, large quantity of honey and beeswax (about 70% in Nepal) are produced from indigenous honey bees (mainly *Apis dorsata* and *Apis laboriosa*)[3].

Wild honey bee diversity

Four out of eight species of Asian honey bees are native to Nepal:

- *A. laboriosa* commonly known as cliff or rock honey bee
- *A. dorsata* commonly known as giant honey bee
- *A. florea* commonly known as little bee
- *A. cerana* commonly known as Asiatic hive bee

These species have lived together sharing the same ecological niches for centuries or even longer, in mountainous cliffs. Commonly *A. laboriosa* and *A. dorsata* are referred to as giant honey bees while *A. cerana* and *A. florea* are small species living in smaller colonies. *A. laboriosa*, *A. dorsata*, and *A. florea* are single comb species whereas *A. cerana* is a multi-comb species[4]. It is only *A. cerana* of the four species that make series of parallel combs that enable them to nest inside man made containers[5]. *A. laboriosa* is found in steep cliffs and the honey produced is called Rock honey. This honey is harvested once a year[6]. Nest combs of *A. dorsata* are mostly situated in trees. These bees can forage in low light and also during full moon period[7]. *A. florea* nests in bushes building a single comb in Terai area, where they can survive in extremely dry conditions[8].

Distribution of wild honey bees

Wild honey bees of Nepal are distributed throughout the country. *A. laboriosa* enjoys the high altitudes between 1200 and 3600 masl in the northern Himalayas[9], while *A. florea* and *A. dorsata* gather nectar from Terai area up to 1200m. *A. cerana* can be found throughout Nepal up to 3500masl[10].

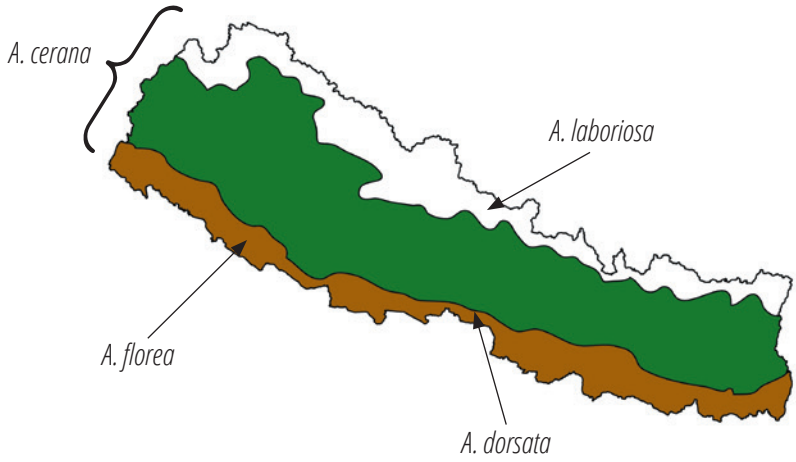


Table 1: Description of wild honey bees in Nepal

	A. laboriosa	*A. dorsata*	*A. florea*	*A. cerana*
				
Commonly known as	Largest honey bee or Rock honey bee	King of honey bees or Giant honey bee	Dwarf honey bee or Small honey bee	Eastern honey bee or Asian honey bee
Distribution	850 to 3500 masl	Up to 1200 masl	Up to 1200 masl esp. in Terai	Up to 3500 masl, in all parts of the country
Mostly found in	Rocky Cliffs	Big branches of trees, cliffs and tall manmade structures like water tanks	Small bushes	Trees and small cliffs (can be domesticated in manmade logs)
Morphology: Abdomen color	Black abdomen with white stripes on each segment	Yellow abdomen with white stripes on each abdominal segment	Orange/red abdomen with white stripes on each abdominal segment	Black abdomen with orange stripes on each abdominal segment
Subspecies (found in Nepal)	-	-	-	Apis cerana cerana Apis cerana himalaya Apis cerana indica

Importance of wild honey bees

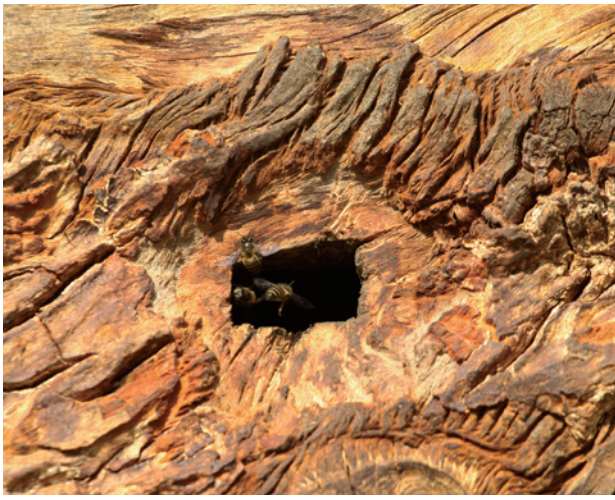
Wild bees play a vital role in pollination of mountain crops and wild flora. The pollination service ensures continuity of plant species that are restricted to high altitude virgin forests[12]. Such contribution to conservation is also good input for the eco-tourism industry that relies on biodiversity for maintaining the interest of tourists. The value added products such as pollen, beeswax and propolis can be used in apitherapy or sold as separate products[5]. As these products are niche products they have high economic value and can increase the income for vulnerable and poor mountain farmers. Honey from wild honey bees is highly nutritious and can be used as medicinal food in the Himalayan region, where medical facilities are scarce.

Threats and challenges in wild honey bee management

- The development of cash crop based farming systems increase the need for pesticides[9]. Due to lack of policies and poor implementation of existing laws and regulation in relation to the pesticide monitoring and control, extensive use of pesticides causes poisoning to honey bees during feeding and finally leads to reduction in the population[10]. This increasing trend of chemical pesticide use in farming has negative impact on the bees.
- It has been reported that an increasing trend of unmanaged harvesting of honey, and a careless type of honey hunting are also the cause of destruction of bee's nesting sites[11].
- Higher adoption of the European honey bee (*A. mellifera*) by farmers for honey production reduces the *A. cerana* population[11].
- Loss of traditional knowledge about wild bees and proper honey hunting practices with the loss of generation. This is a widespread problem especially in agriculture sector as youth do not view traditional agriculture to be remunerative enough to motivate them.
- Cyclic occurrence of some diseases and pests (e.g sac borer, tracheal mites and *Vespa basalis*)[12].

Opportunities on conserving/managing wild honey bees

- Pollination services from wild honey bees in the context of biodiversity conservation and productivity enhancement are important. This ensures the continuity for those plant species, which are now limited in high altitude forests of Nepal[4].
- Eco-tourism with the indigenous honey hunting communities can maintain traditional knowledge and practices and enhance livelihoods. This will provide a basis for promoting community-based eco-tourism industry in Nepal. Tourists who come to Nepal in a group are paying $250-$1500 to experience one honey-hunting event. If done in an eco-friendly way, such a component of eco-tourism could provide a route out of poverty, with tourists being charged to view and take part in honey hunting[3].
- Average landholding of a Nepalese farmer is about 0.5 ha, but there are many marginalized farmers in Nepal who have little or no land. As beekeeping is a non-land based farming system and requires little resources, beekeeping can add supplementary non-land based income for such households [8].
- Some wild honey bee species can be managed in small shelters, so publicly available unmanaged land can be used for rearing such honey bees and more profit can be generated[5].
- Honey bee products like pollen and honey can be promoted as a natural medicinal treatment which has high demand in the market[8].



A. cerana in a traditional bee hive
Photo: Sajal Sthapit/LI-BIRD

Recommendations for conservation of wild honey bees

- Wider awareness raising programme for honey hunters, farming communities and other relevant stakeholders about importance of wild honey bees and their conservation is needed[4].
- A bee-based tourism strategy can be established with participation of local communities, conservation advocacy groups and tour operators[4].
- Banning the use of climbing gear by tourists, local people and honey hunters for harvesting honey[4].
- Promotion of conservation activities in partnership with indigenous communities in high mountains, whose traditions and cultures include honey hunting[13].
- Producing value added products from honey and wax from wild honey bees by establishing microenterprises in different potential locations[4].
- Adding curriculum about wild honey bees at schools and universities[14].

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