



# APIS CERANA

The Domesticated Wild Honey Bee of Nepal



## Introduction

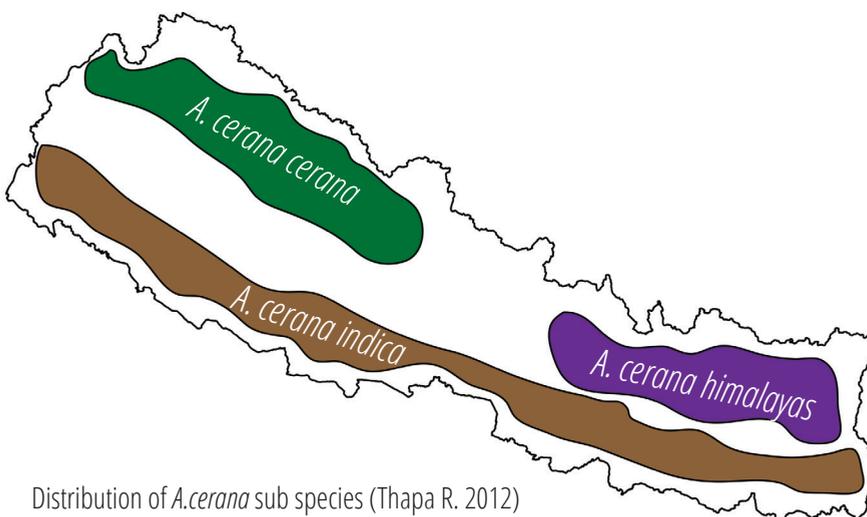
*Apis cerana* is one among the four native honey bees of Nepal. They are cavity nesting bees and produce series of parallel combs in the dark, which enable them to nest inside man-made containers. This is the only wild honey bee in Nepal to be domesticated<sup>1</sup>. The colonies are traditionally kept in logs, walls or hives<sup>2</sup>, which in average produce 4.5 kg of honey each<sup>3</sup>. Beekeepers usually harvest honey two times a year from traditional hives<sup>3</sup>, thus harvesting 9 kg of honey/hive annually. Three sub species of *A. cerana*, i.e, *Apis cerana cerana*, *Apis cerana himalaya* and *Apis cerana indica*<sup>4</sup>, have been found throughout Nepal (see figure). The main habitat of *A. cerana* is a mountainous area with a complex terrain and variable climate with fog, rain and more dispersed nectar-producing plants. Because of this complex environment, which *A. cerana* has to navigate, they have a greater learning and memory capability than *A. mellifera*<sup>5</sup>. Nest defense is extremely important for generations' survival for bees, and since *A. cerana* exhibit a superior hygienic behavior compared to *A. mellifera*, it has higher disease resistance<sup>6</sup>.

## Status of *A. cerana*

Based on rough estimates there are around ninety thousands *A. cerana* hives in Nepal<sup>5</sup>. In winter season in the hilly areas *A. cerana* colonies are small in population because of lack of floral resources<sup>3</sup>. But recent study findings show that the population of *A. cerana* is decreasing because of habitat alterations and attack of diseases<sup>5+7</sup>.

## Importance of *A. cerana* in farming

When reared in frame hives, log hives or wall hives, *A. cerana* colonies do not need any management except for honey harvesting once or twice a year. It can work as a sideline activity for many farmers that rear livestock and grow varieties of crops<sup>8</sup>. Income from *A.cerana* beekeeping accounts for almost 75% of the total annual average income (8,000 NPR) from on-farm sources for farmers with medium sized landholdings (1-2 ha)<sup>9</sup>.



Distribution of *A.cerana* sub species (Thapa R. 2012)





## Major threats to *A. cerana*

- Massive introduction and promotion of exotic *A. mellifera* by government and non-government agencies through development interventions<sup>7</sup>.
- Predators and parasites such as the wasp, *Vespa magnifica*, and the varroa mite<sup>2</sup>, which reduce the colony strength<sup>10</sup>.
- Changes in habitat and decrease in plant biodiversity reduce the forage availability<sup>7</sup>.
- Increased pesticides use due to introduction of cash crop based farming systems. The use of pesticides in Nepal is increasing with 10-20% annually and 90% of the total pesticides are used in vegetable farming<sup>11</sup>, which might be the major cause of colony collapse of honey bees.
- Changes in land use and agricultural patterns<sup>7</sup>.

## Opportunities of rearing *A. cerana* in rural communities

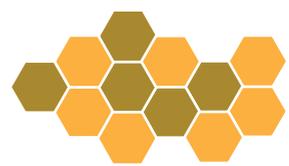
- Honey bees can be promoted as an important agricultural input by aptly using them in managed/ controlled pollination in Nepali farming<sup>12</sup>.
- Nepali honey can be promoted as plant specific honey to increase the market value. Majority of honey produced in Nepal is from multiple flowers. However there are some unifloral honey types produced from chiuri (butter tree), litchi, sunflower, buckwheat and mustard<sup>8</sup>.
- Beekeeping is a source of livelihood for poor rural people since the technology and practices don't require much capital<sup>13</sup>.
- Mountain communities have adapted themselves to the harsh mountain realities. Indigenous knowledge in this respect helps them to sustain the difficulties of mountain environment. *A. cerana* beekeeping can be an integral part of their evolved understanding about nature, diversity and practices<sup>7</sup>.



*A. cerana* in a traditional bee hive  
Photo: Mahesh Shrestha/LI-BIRD

## Actions towards proper management/ conservation of *A. cerana*

- Wider awareness raising programme for honey hunters, farming communities and other relevant stakeholders about importance of wild honey bees and their conservation is needed<sup>7</sup>.
- Harvest small amount of honey from wild nests allowing the bees to reproduce swarms and create new nests<sup>14</sup>.
- Adding curriculum about *A. cerana* beekeeping at schools and universities<sup>15</sup>.
- Initiate breeding programs to identify improved races and establish country specific centers for *A. cerana* selections and management<sup>7</sup>.
- Develop a marketing strategy of *A. cerana* bee products<sup>7</sup>.





## Advantages of keeping *A. cerana* over *A. mellifera* in rural communities

*A. cerana* does not require a lot of management like sugar feeding, disease control or migration control. It is therefore easy for an isolated farming community to practice beekeeping with this bee species on the basis of their indigenous knowledge. *A. cerana* has proved its efficiency in pollinating mountain crops and flora as compared to exotic *A. mellifera* and is serving as an engine of biodiversity conservation and productivity enhancement<sup>7</sup>.

ICIMOD<sup>7</sup> identified the following advantages in keeping *A. cerana* over *A. mellifera* in the context of mountain farming in Nepal.



*A. cerana* in Amaranth  
Photo: Sajal Sthapit/LI-BIRD

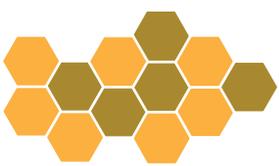
Parameters	<i>A. cerana</i> (Native bee)	<i>A. mellifera</i> (Exotic bee)
Initial investment	Very low	High
Colony management costs	Negligible	High
Risk involved	Low	High
Potential of stationary beekeeping	Highly suitable	Not suitable
Scale of beekeeping	Profitable even when operated at a small scale. It is most suitable for poor beekeepers operating in remote mountain areas	Profitable only when operated at commercial scale. It is most appropriate for commercial farmers from accessible areas
Pollination of early flowering mountain crops	More efficient	Less suitable, colony strength is low during early in the season
Indigenous knowledge	Exists	Nil
Susceptibility to mites and predators	Less Susceptible	Susceptible
Eco-services	High	Low





## References

- (1) Bradbear, N. 2009. *Bees and their role in forest livelihood*. Food and Agriculture Organization <ftp://ftp.fao.org/docrep/fao/012/i0842e/i0842e00.pdf> [accessed 10 December 2013].
- (2) Thapa R. 2012. Honeybees of Nepal: diversity, beekeeping and medical applications of bee products. *Sonsik Journal* (vol 4) p. 1-9.
- (3) Thapa, R. Himalayan honeybees and Beekeeping in Nepal, Standing Commission of Beekeeping for Rural Development
- (4) Verma, L. R. 1996. Genetic Diversity of Himalayan Honeybee *Apis cerana* F. ICIMOD, Kathmandu, Nepal
- (5) Abrol, D. P. 2013. Asiatic Honeybee *Apis Cerana*: Biodiversity Conservation and Agricultural Production. Springer. p.p. 743-760
- (6) Koetz, A. 2013. The Asian honeybee (*Apis cerana*) and its strains - with special focus on *Apis cerana* genotype, <http://asianhoneybee.net.au/wordpress/wp-content/uploads/2013/03/AHB-behaviour-lit-review-FINAL2013.pdf> [accessed 15 December 2013].
- (7) Joshi SR, Ahmad, F. and Gurung 2002. Retreating indigenous bee populations (*Apis cerana*) and livelihoods of Himalayan farmers. Presented at the "6th Asian Apiculture Association International Conference" held 24 February - 1 March in Bangalore, India. Available at: <http://www.icimod.org/?q=1509> [accessed 14 December 2013].
- (8) Joshi, S.R. 2008. Honey in Nepal - Approach, Strategy and Intervention for Subsector Promotion. German technical cooperation/Private sector promotion - Rural finance Nepal, <http://www.bee-hexagon.net/files/file/fileE/Honey/HoneyinNepal.pdf>.
- (9) Gurung, M., Ahmad, F., Joshi, S. R., and Bhatta, C. R. 2004. The value of *Apis cerana* beekeeping for mountain farmers in Nepal. *Bees for Development Journal*. <https://www.beesfordevelopment.org/uploads/BfDj69%20The%20value%20of%20Apis%20cerana006.pdf> [accessed 18 December 2013].
- (10) Neupane K.R. et al. 2012. Effect on strength of honey bee colonies (*A. mellifera*) supered in different way for maximizing honey production in Nepal. *Journal of Apicultural Science*, Vol 56, No. 2
- (11) Sharma, D.R et al. 2012. Use of Pesticides in Nepal and Impacts on Human health and Environment. *The journal of agriculture and environment*, Vol: 12
- (12) Joshi SR, Ahmad, F. and Gurung 2002. Retreating indigenous bee populations (*Apis cerana*) and livelihoods of Himalayan farmers. Presented at the "6th Asian Apiculture Association International Conference" held 24 February - 1 March in Bangalore, India. Available at: <http://www.icimod.org/?q=1509> [accessed 10 December 2013].
- (13) Gurung M.B. 2005. Improving the cash income of poor mountain households through *Apis cerana* beekeeping: An experience from Nepal. [http://lib.icimod.org/record/26442/files/c\\_attachment\\_577\\_5554.pdf](http://lib.icimod.org/record/26442/files/c_attachment_577_5554.pdf) [accessed 16 December 2013].
- (14) Crane, E. 1992. Beekeeping in mountain life-support systems. In: Verma L.R. (ed) *Honeybees in Mountain Agriculture*, Oxford & IBH Publishing Co Pty Ltd, New Delhi, pp. 17-27.
- (15) Ahmad, F., Joshi S.R. and Gurung, M.B. 2003. Indigenous honeybees and honey hunters of Himalayas: A case of *Apis laboriosa* in Kaski district of Nepal. <http://www.icimod.org/?q=1511>, [accessed 14 December 2013].





This publication was prepared by Sandesh Neupane and Camilla Sæbjørnsen, with support from Sajal Sthapit and Indra Paudel.

**Cover Photo:** Bishwa Ghimire/wikimedia.commons

**Illustration, Graphics and Layout:** Mahesh Shrestha/LI-BIRD

Financial support for this work is received from the United Nations Environment Programme - National Committee for the Republic of Korea (UNEP Natcom for Korea).



## Local Initiatives for Biodiversity, Research and Development

**P.O. Box** 324, Pokhara, Kaski, Nepal

**Tel** (977-61) 535357, 526834

**Fax** (977-61) 539956

**Email** [info@libird.org](mailto:info@libird.org)

**Web** [www.libird.org](http://www.libird.org)

