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Apiculture



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Apiculture or bee keeping

Apiculture or Beekeeping (derived from **Latin word**, '*Apis*' meaning 'bees') is an art and science of rearing and managing honey bees in a box called "beehive" for production of honey and other products like beeswax, propolis, bee venom etc.

Beekeeping/ Apiculture is an industry, which provides valuable honey, beeswax and pollination services of honey bees.

The cultivation of bees on a commercial scale for the production of honey.

The science of rearing honey bees or beekeeping is known as apiculture.

Introduction, significance, history and scope

Introduction

- Insects are dominant animals on this earth.
- Usually insects are considered harmful to man but hardly 1 percent of insect species fall in the pest category.
- Benefits of insects in maintaining economy outweigh the injury inflicted.
- Honey bees are one of the few insects directly beneficial to man.
- Honey is highly valued food produced by honey bees and it is also used as medicine.

- In addition to honey, other products like bees wax, pollen, royal jelly and bee venom are also produced by honey bees.

- More than the producers of these hive products; bees play an important role in pollination of plants while collecting their food from flowers in the form of nectar and pollen.

- Pollination is involved in a chain of complex events significant to our economy.

- Pollination by insects including honey bees is important for ecological balance.

- Visitation by honey bees between distant varieties or cultivars promotes hybridization and help sparse populations to survive.

- Their mutual dependency has resulted into great degree of co-evolution.

In the animal kingdom honey bees belong to:

Phylum-Arthropoda

Class- Insecta

Order-Hymenoptera

Superfamily-Apoidea

Family-Apidae

Genus: *Apis*

Species: *dorsata*, *laboriosa*, *florea*, *cerena*, *mellifera*

Significance

- **Honey** is very important product of honey bees. It is used as food; 200 g of honey is as nourishing as 1.135 kg of milk or 1.658 kg of cream cheese or 340 g of meat or 8 orange or 10 eggs.

- Honey has many **medicinal value**. It is used as laxative, as blood purifier, as preventive against cold, cough and fever and curative for sore eyes, sore throat, tongue ulcer, and burns and sugar substitute for diabetic and allergic patient.

- Honey can be used as a **beauty and face pack**. Applying honey mixed with almond oil on the face help to tone the skin and improve complexion.
- Honey can be used to enhance flavor of other foods.

- **Wax** is another important bee product. It is used for preparing comb foundation of artificial hives. It is used in furniture and floor polishes, in the manufacture of electrical insulators. Refined wax is used in the preparation of cosmetics, ointment, plaster and surgical dressing and making candle.

- Honey bee's **pollination** activates are worth 143 times than the value of honey and wax they produce. Bee pollination results yield increase over 50% in some crops.
- About 1/3 of our total diet comes directly or indirectly from insect pollinated crops.
- Commercial beekeeping adds between $15 and $20 billion in economic value to agriculture each year
- **Nepal:** honey earns 3.62 times more than crop farming

We can learn a lot from these little wonderful creatures. Honey bees are admired for

- Their industriousness
- Unity
- Self sacrifice
- Tolerance
- Division of labour
- Even the most feared bee stings help in healing muscular pains, rheumatism, arthritis and reduction in cholesterol level.

Composition of pure honey and royal jelly

S. N.	**PURE HONEY**		**ROYAL JELLY**	
	COMPOSTION	PERCENT	COMPOSTION	PERCENT
1	Water	17-20	Water	68.0
2	Glucose	34-36	Sugars	8.5
3	Levulose	30-40	Proteins	12.0
4	Sucrose	1.0-1.8	Lipids	5.6
5	Protein	1.5-2.0	Ash	0.8
6	Minerals	0.5-1.0		

History of beekeeping

- In Hinduism, honey is considered to be one of the five heavenly foods ‘Panchamrit’. The Bible, the Veda and the Koran all extol the virtues of honey as a valuable and nourishing food.

- Primitive man used to rob bee colonies found in the cavities of hollow trees or on rocks and in traditional mud houses and this is still being followed by some tribes.

- There was no development in beekeeping until 16th century.

- Proper beekeeping started only when man started giving protection to colonies found in the nature.

- Idea to keep bees in log hives has been reported to come from the fallen trees which were nested by the cavity nesting bees.

Contd…

- Development of modern beekeeping has its origin between 1500 and 1851 when many attempts were made to domesticate bees in different types of hives but were not successful because bees attached their combs together as well as to the walls of hive and combs required had to be cut for honey.

- The discovery of the principle of bee space in 1851 by L. L Langstroth in USA resulted in first truly movable frame hive. This bee space was 9.5 mm for *Apis mellifera.*

- This discovery was followed by subsequent innovations like comb foundation mill, honey extractor, smoker, etc., which helped in the development of modern beekeeping we see today.

Modern beekeeping

L.L. Langstroth, father of modern beekeeping, was one of first to understand bee space and patent a hive and write a book (the present text 'Hive and the Honey Bee' is successor) on how to use his modern hive – termed a movable frame hive. See Box 24 for additional information and series of articles by Gene Kritsky in American Bee Journal Oct 2003 and April 2004 for additional information.

Rev L.L. Langstroth

- In Nepal, modern beekeeping was initiated 20 years ago (Entomology Division, 1998; Shivakoti and Bista, 2000) with the introduction of moveable frame hives to rear *Apis cerana* F. (Kafle, 1992).

- Beekeeping with improved and imported crossbreed honeybee, *Apis mellifera* L. started since 1993-1995 (Entomology Division, 1999; Thapa and Pokhrel, 2001).

- Commercial beekeeping started in the region in the 1970s with the introduction of the exotic honeybee *Apis mellifera*.

- Formal courses on beekeeping for farmers using *Apis mellifera* bees and movable frame hives were started in the early 1980s in Bangladesh, India, and Nepal.

- ICIMOD has worked for two decades with partners in different countries in support of beekeepers and focusing especially on the indigenous hive honeybee.

Ten excellent reasons for beekeeping

1 Pollination

- Bees pollinate flowering plants and thereby maintain the ecosystem.
- Bees pollinate cultivated crops.

2 Honey

- People everywhere know and like honey, a valuable food and income source.

3 Beeswax and other products

- Beeswax, propolis, pollen and royal jelly.
- These products have many uses, and can be used to create income.

4 Few resources are needed

- Beekeeping is feasible even for people with minimal resources.
- Bees are obtained from the wild.
- Equipment can be made locally.
- Bees do not need the beekeeper to feed them.

5 Land ownership not essential

- Hives can be placed anywhere convenient, and so beekeeping does not use up valuable land.
- Bees collect nectar and pollen wherever they can find it, so wild, cultivated and wasteland areas all have value for beekeeping.

6 Nectar and pollen are otherwise not harvested

- Nectar and pollen are not used by other livestock: only bees harvest these resources, so there is no competition with other crops.
- Without bees these valuable resources could not be harvested.

7 Different sectors and trades benefit from a strong beekeeping industry

- Other local traders benefit by making hives and equipment, and from using and selling the products.

8 Beekeeping encourages ecological awareness

- Beekeepers have a financial reason to conserve the environment: ensuring that flowers are available and bees are protected.

9 Everybody can be a beekeeper

- Bees can be kept by people of all ages. Bees do not need daily care and beekeeping can be done when other work allows.

10 Beekeeping is benign

- Beekeeping generates income without destroying habitat. Encouraging beekeeping encourages the maintenance of biodiversity.

Scope in Nepal

- Out of nine honey bees *Apis loboriosa* (Smith, 8171), *Apis dorsata* (Fabricius, 1793), *Apis florea* (Fabricius, 1787) and *Apis cerena* (Fabricius, 1793) are the native to Nepal.
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- Nepal is rich in ecological resources and is one of the ideal places for beekeeping (Shrestha and Verma, 1992).

- Beekeeping in Nepal is recognized as a potential sector to increase the income and solve unemployment problem in Nepali communities.

- Due to the existence of suitable climatic condition for bee-keeping and possibility to start an enterprise with a small-scale investment, more and more farmers are attracted to this sub-sector.

- Realizing the importance of honey in both national and international markets, the Nepal government has recognized honey as an important high-value product and accorded priority for its development.

Figure 2.1 *Apis dorsata* (single comb on tree branch)

Figure 2.2 *Apis florea* (single comb in bushes)

Figure 2.3 *Apis cerana* (L, in log hive; M, movable frame hive; W, wall hive- note the parallel combs)

Figure 2.4 *Apis mellifera* (in movable frame hive)

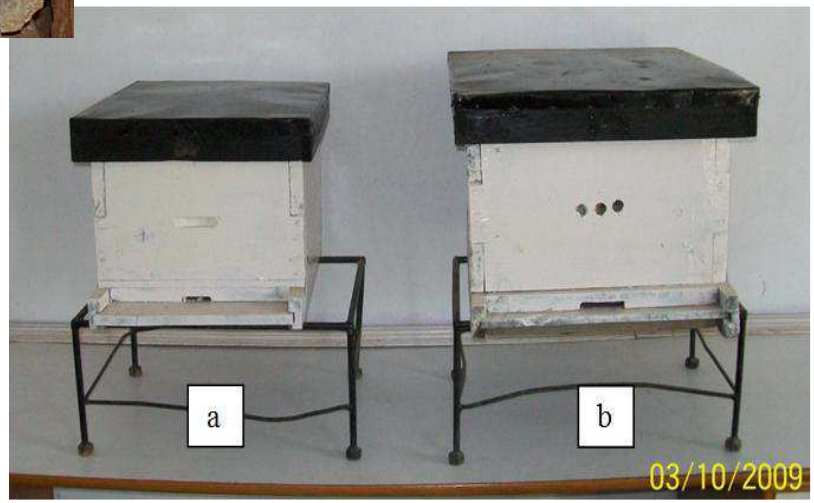
Global Trade: top 10

Honey exports

Country	Weight (thousand metric tons)	Percentage of total
China	81.3	24.2%
Argentina	65.2	18.6%
Mexico	23.4	6.9%
Germany	22.4	6.6%
Brazil	21	6.2%
Vietnam	15.6	4.6%
Hungary	15	4.4%
Canada	14	4.2%
Uruguay	13.4	4%
India	10.4	3.1%

Honey imports

Country	Money Spent (millions of US dollars)	Percentage of total
Germany	230.7	27.5%
United States	149.6	17.8%
U.K.	75.1	8.9%
Japan	65	7.7%
France	54.5	6.5%
Italy	41.6	5%
Spain	31.5	3.7%
Saudi Arabia	26	3.1%
Switzerland	23.1	2.8%
Netherlands	56	3.7%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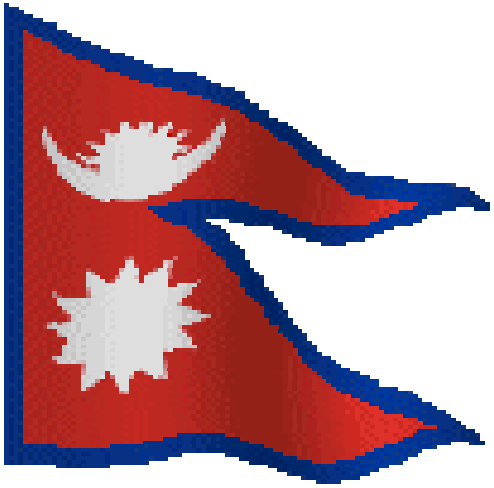

Thank you
for your attention