

# Unit 11: Apiculture

## Introduction to Honey Bee Management

Ethiopia has a significant advantage in apiculture due to its diverse flora and favorable climate, making it an ideal environment for beekeeping. With over 7,000 melliferous plant species and bimodal rainfall, honey can be harvested at least twice a year. Ethiopia hosts more than 2 million bee colonies and has the potential to produce up to 500,000 tons of honey and 50,000 tons of beeswax annually.

Apiculture is crucial to Ethiopia's agriculture, contributing to household income and the national economy. Honey bees are essential pollinators, improving the quality and quantity of crops. Out of 53 cultivated crops in Ethiopia, 33 depend on biological pollinators. Honey bee pollination services contribute approximately \$0.815 billion to Ethiopia's agricultural GDP, highlighting their importance in food security and ecosystem services.

## Honey Bee Biology and Behavior

Honey bees are social insects with a well-structured colony composed of a reproductive queen, drones (male bees), and worker bees (non-reproductive females). A single hive can contain up to 60,000 worker bees, which are responsible for various tasks depending on their age. Honey bees undergo complete metamorphosis, developing from egg to larva, pupa, and finally, adult. Worker bees perform tasks such as building nests, collecting food, and caring for the brood.

## Types of Honey Bee Colonies in Ethiopia

Ethiopia is home to five honey bee species, each adapted to different agro-ecological zones:

- ***Apis mellifera adansonii***: Found in southern and western Ethiopia.
- ***Apis mellifera jemenitica***: Inhabits lowland areas of eastern Ethiopia.
- ***Apis mellifera monticola***: Resides in the Southeast Mountains of Bale-Dinsho.
- ***Apis mellifera litorea***: Found in southwest lowlands.
- ***Apis mellifera abyssinica***: Present in the highlands of central, western, and southern Ethiopia.

## Management of Honey Bees

Beekeeping in Ethiopia is practiced using four main methods:

1. **Traditional Forest Beekeeping:** Involves managing bee colonies using traditional methods in forest areas.
2. **Traditional Backyard Beekeeping:** Similar to forest beekeeping but practiced near homes.
3. **Transitional Beekeeping:** Uses a top-bar hive, which is a single-story long box that offers some improvements over traditional methods.
4. **Modern Beekeeping:** Utilizes movable-frame hives, allowing for more efficient management and higher honey production.

## Colony Management and Queen Rearing

Effective management of honey bee colonies involves regular inspection, feeding during dearth periods, and swarm control. Beekeepers may also practice queen rearing to replace aging or ill queens and ensure the colony remains strong and productive. A healthy queen is vital for the colony's success as she lays all the eggs and produces pheromones that regulate colony activities.

## Hive Products and Processing

### Honey

Honey is a natural product of honeybees, rich in simple sugars that provide an immediate energy boost. It is easily absorbed in the intestine, making it an excellent source of energy.

### Tej Production

In Ethiopia, a large portion of honey is used to produce "Tej," a traditional fermented beverage. Around 85% of the honey brought to market is utilized for this purpose, while only 15% is consumed directly.

### Beeswax Production

Beeswax production in Ethiopia is minimal, with much of it going to waste due to a lack of awareness about its uses. However, the country has the potential to produce approximately 3,658 tons of beeswax annually.

## Bee Diseases, Pests, and Predators

### Honey Bee Diseases

Diseases like chalk brood, nosematosis, and amoeba can severely impact honeybee colonies, reducing honey production and quality.

### **Pests and Predators**

Various pests, including small hive beetles, ants, wax moths, and predators like birds and honey badgers, pose threats to honeybees. Beekeepers use traditional methods like mechanical barriers (e.g., smooth bark trees) to protect their hives.

## **Indigenous Knowledge in Apiculture**

### **Traditional Practices**

Ethiopian beekeepers rely on indigenous knowledge passed down through generations. They use local materials for making hives and equipment, and they have developed unique methods for swarm control, feeding, and honey harvesting.

### **Honey as Medicine**

Honey is traditionally used as medicine in Ethiopia. Different types of honey preparations are believed to treat various ailments, such as coughs, stomach pain, and even eye diseases.

## **Key Points for Students**

- Honey is a vital product in Ethiopia, with significant portions used in traditional practices like "Tej" production.
- Beekeeping in Ethiopia faces challenges from diseases and pests, but traditional methods are often employed to manage these threats.
- Indigenous knowledge plays a crucial role in the success of apiculture in Ethiopia, including practices for swarm control, feeding, and the medicinal use of honey.