

SHRI GURU RAM RAI UNIVERSITY

DEPARTMENT OF ENTOMOLOGY , SCHOOL OF AGRICULTURAL SCIENCES

Subject: MANAGEMENT OF BENEFICIAL INSECTS (BSAC-605)

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Q.1 : Describe important features of different species of honey bee.

Ans. : Honey bees (genus *Apis*) are social insects belonging to the family Apidae. They are essential pollinators and honey producers, playing a vital role in ecosystems and agriculture. Different species of honey bees exhibit variations in their behaviour, morphology, and adaptability.

Major Species of Honey Bees

1. *Apis mellifera* (Western/European Honey Bee)

- **Distribution:** Found worldwide; originally from Europe, Africa, and parts of Asia.
- **Size:** Medium-sized (workers ~12-15 mm long).
- **Color:** Varies from yellow to brown with black stripes.
- **Behavioral Characteristics:**
 - Highly adaptable and domesticated.
 - Produces large amounts of honey (30-50 kg per colony per year).
 - Forms large colonies with ~50,000–80,000 individuals.
 - Overwinters by clustering together.
 - Less aggressive compared to other species.
- **Significance:**
 - Most widely used in commercial beekeeping.
 - Excellent pollinators for crops.
 - Several subspecies, including *A. m. ligustica* (Italian honey bee), *A. m. carnica* (Carniolan honey bee), and *A. m. scutellata* (African honey bee).

2. *Apis cerana* (Asian Honey Bee)

- **Distribution:** Found in South and Southeast Asia (India, China, Japan, Indonesia).
- **Size:** Smaller than *A. mellifera* (~10-12 mm).
- **Color:** Dark brown with yellowish bands.
- **Behavioral Characteristics:**
 - Builds smaller colonies (~10,000-20,000 individuals).
 - Less honey production (~5-10 kg per colony per year).
 - More resistant to local pests and diseases (e.g., *Varroa* mites).
 - Absconds (abandons nest) when disturbed or attacked.
 - Can forage in a wide range of environmental conditions.
- **Significance:**
 - Suitable for traditional and small-scale beekeeping.
 - Efficient pollinators of native plants.

3. *Apis dorsata* (Giant Honey Bee)

- **Distribution:** Found in India, Sri Lanka, Southeast Asia, and parts of China.
- **Size:** Large (~17-20 mm long).

- **Color:** Dark brown with yellow bands; robust body.
- **Behavioral Characteristics:**
 - Builds large, single exposed combs on high tree branches or cliffs.
 - Highly migratory and aggressive.
 - Produces large amounts of honey (~50-80 kg per colony per year).
 - Strong fliers, travel long distances for nectar collection.
- **Significance:**
 - Major source of wild honey collection.
 - Not domesticated due to its aggressive nature.
 - Important pollinators for forest ecosystems.

4. *Apis florea* (Dwarf Honey Bee)

- **Distribution:** Found in South and Southeast Asia, Middle East.
- **Size:** Small (~7-10 mm long).
- **Color:** Reddish-brown with black bands.
- **Behavioral Characteristics:**
 - Builds small, single combs on bushes and low tree branches.
 - Less aggressive but readily absconds.
 - Produces very little honey (~300-500 g per colony per year).
 - Prefers warm and tropical climates.
- **Significance:**
 - Useful for pollination in natural ecosystems.
 - Not used for commercial beekeeping due to low honey production.

5. *Apis andreniformis* (Black Dwarf Honey Bee)

- **Distribution:** Found in Southeast Asia (Thailand, Malaysia, Indonesia).
- **Size:** Slightly smaller than *Apis florea* (~7-9 mm).
- **Color:** Black body with fine hairs.
- **Behavioral Characteristics:**
 - Builds small, exposed nests similar to *A. florea*.
 - Highly adaptable to forested regions.
 - Produces minimal honey.
 - Defensive but less aggressive than *A. dorsata*.
- **Significance:**
 - Important in maintaining biodiversity and natural pollination.

6. *Tetragonula* spp. (Dammer bees)

- **Distribution:** Found in tropical and subtropical regions across **Asia, Africa, Australia, and South America**.
- **Size:** Small-sized bees, **ranging from 3 mm to 6 mm** in length.
- **Color:** **black or dark brown**.
- **Behavioral Characteristics:**
 - Live in colonies ranging from **a few hundred to several thousand individuals**.
 - Build nests in **tree hollows, wall crevices, soil cavities, or abandoned termite mounds**.
 - **Stingless** but can bite using mandibles.
 - Honey is stored in **small resinous pots**, different from honey bee combs.
- **Significance:**

- Dammer bee honey is highly valued for **medicinal properties**, being rich in antioxidants.
- Help **maintain biodiversity** by pollinating wild plants.

Table 1: Summary & Comparison of Honey Bee Species

Species	Size (mm)	Nesting Habit	Colony Size	Honey Production	Behavior	Distribution
<i>Apis mellifera</i>	12-15	Enclosed hives	50,000-80,000	High (30-50 kg)	Docile, domesticated	Worldwide
<i>Apis cerana</i>	10-12	Enclosed hives	10,000-20,000	Moderate (5-10 kg)	Defensive, absconds easily	Asia
<i>Apis dorsata</i>	17-20	Open single comb	Large	High (50-80 kg)	Very aggressive, migratory	South & SE Asia
<i>Apis florea</i>	7-10	Open single comb	Small	Very low (300-500 g)	Less aggressive, absconds easily	Asia, Middle East
<i>Apis andreniformis</i>	7-9	Open single comb	Small	Minimal	Less aggressive, tropical	SE Asia