

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 different Products of Honey Bees

Ans. : Honey bees such as *Apis mellifera* and *Apis cerana indica* produce several valuable products that have nutritional, medicinal, and commercial importance. These products are widely used in food, pharmaceutical, cosmetic, and agricultural industries.

1. Honey

Honey is a natural, sweet, viscous substance produced by honey bees such as *Apis mellifera* and *Apis cerana indica* from the nectar of flowers. Bees collect nectar and convert it into honey through enzymatic action (invertase, diastase) **and** evaporation of excess moisture. The processed honey is stored in hexagonal wax comb cells and sealed with wax for future use. Honey is highly nutritious and easily digestible due to its simple sugars. It possesses antibacterial, antioxidant, anti-inflammatory, and therapeutic properties. The presence of hydrogen peroxide, low pH, and high osmotic pressure contribute to its antimicrobial activity. Honey also varies in color, flavor, and composition depending on floral source.

Composition of Honey:

Component	Percentage (%)	Details
Fructose	35–40	Main sugar, provides sweetness
Glucose	30–35	Quick energy source
Water	15–20	Moisture content
Sucrose	1–5	Minor sugar
Proteins & Enzymes	0.2–0.5	Includes invertase, diastase, glucose oxidase
Organic acids	0.2–0.5	Mainly gluconic acid
Minerals	0.1–0.3	Potassium, calcium, iron, phosphorus
Vitamins	Trace	B-complex, vitamin C
Others	Trace	Pollen, flavonoids, antioxidants

Uses of Honey :

Field	Uses
Food	Natural sweetener, bakery products, beverages
Medicine	Wound healing, cough relief, antimicrobial agent
Nutrition	Energy source, health supplement
Cosmetics	Used in creams, lotions, face packs
Pharmaceutical	Syrups, ointments, Ayurvedic formulations
Traditional remedies	Treatment of cold, throat infections, digestive issues

2. Beeswax

Beeswax is secreted by worker bees from wax glands located on the abdomen. It is used for constructing hexagonal comb cells for brood rearing and storage of honey and pollen. Chemically, it consists of esters, fatty acids, and hydrocarbons. Beeswax is used in making candles, cosmetics, polishes, and pharmaceuticals. It is also used in food processing and packaging.

3. Royal Jelly

Royal jelly is a milky secretion produced by nurse bees. It is rich in proteins, vitamins, amino acids, and hormones. All larvae are fed royal jelly initially, but queen larvae receive it throughout development, leading to queen differentiation. It is used as a health supplement and is believed to have anti-aging and immunity-boosting properties.

4. Propolis

Propolis is a resinous substance collected by bees from plant buds and mixed with wax and enzymes. It is used to seal cracks and disinfect the hive due to its antimicrobial properties. Propolis contains flavonoids and phenolic compounds. It is widely used in medicines, ointments, and health products for its antibacterial and antifungal properties.

5. Bee Venom

Bee venom is a toxic secretion produced by worker bees and injected through the sting. It contains compounds like melittin, apamin, and enzymes. It is used in apitherapy for treating conditions such as arthritis and inflammation. However, it can cause allergic reactions in sensitive individuals.

6. Pollen (Bee Pollen)

Pollen is collected by bees from flowers and packed into pollen baskets on their hind legs. It is rich in proteins, vitamins, lipids, and minerals. Bees use it as a primary protein source for brood development. Bee pollen is used as a dietary supplement due to its high nutritional value.

7. Bee Bread

Bee bread is fermented pollen stored in comb cells. It is formed by mixing pollen with nectar and enzymes. Fermentation improves its digestibility and nutritional quality. It serves as a major protein source for larvae and young bees. It is also used in human nutrition.

8. Bee Glue (Modified Propolis)

Bee glue is another form of propolis used to seal hive openings and fix comb structures. It helps in maintaining hive hygiene and preventing entry of pathogens. It strengthens the hive structure and provides insulation.

9. Comb Honey

Comb honey is honey stored in natural wax combs. It is consumed along with beeswax and is considered pure and unprocessed. It has high market value due to its natural form and freshness.

Importance of Honey Bee Products

Honey bee products have significant importance in:

- **Nutrition:** Rich source of energy and nutrients
- **Medicine:** Used in traditional and modern therapies
- **Industry:** Cosmetics, pharmaceuticals, and food processing
- **Agriculture:** Pollination improves crop yield