Q.1 : Describe Important Bee Behaviours

Ans. : Honey bees such as Apis mellifera and Apis cerana indica exhibit highly organized social behaviours that regulate colony functioning. These behaviours are influenced by age, hormones, pheromones, and environmental conditions, ensuring colony survival and efficiency.

1. Division of Labour

Division of labour in honey bees is based on age polyethism. Young workers clean cells, middle-aged bees nurse larvae, and older bees perform foraging. Wax secretion and comb building occur in intermediate stages. This system ensures efficient functioning of the colony. It helps in proper organization and survival of the hive.

2. Foraging Behaviour

Foraging involves collection of nectar, pollen, water, and propolis. Bees use sun position, smell, and memory to locate food sources. They exhibit floral constancy by visiting the same plant species. This improves pollination efficiency and resource collection. Foraging is mainly done by older worker bees.

3. Communication Behaviour (Dance Language)

Honey bees communicate through dance language discovered by Karl von Frisch. Round dance indicates nearby food sources. Waggle dance shows direction and distance of distant food. The angle of dance gives direction relative to the sun. This communication improves foraging efficiency.

4. Swarming

Swarming is a natural method of colony reproduction. The old queen leaves the hive with a group of workers. A new colony is formed at a different location. It usually occurs during favorable seasons like spring. Swarming helps in multiplication of colonies.

5. Defensive Behaviour

Bees defend their colony using stings and alarm pheromones. Guard bees identify and attack intruders. The sting releases chemicals that attract other bees. This results in collective defense behavior. It is more aggressive in some wild bee species.

6. Hygienic Behaviour

Hygienic behaviour involves removal of dead or diseased brood. Worker bees detect unhealthy larvae and remove them. This prevents the spread of diseases in the colony. It increases resistance to infections. It is important for colony health.

7. Thermoregulation

Bees maintain hive temperature around 34–35°C. They cool the hive by fanning their wings. During cold conditions, they cluster to produce heat. Proper temperature is essential for brood development. This behaviour ensures survival of the colony.

8. Grooming Behaviour

Bees clean themselves and other colony members. This helps in removing dust and parasites. Grooming reduces infestation by mites. It maintains hygiene within the colony. It plays a role in disease prevention.

9. Brood Care

Nurse bees take care of developing larvae. They feed larvae with royal jelly, honey, and pollen. Queen larvae receive only royal jelly. Proper feeding ensures healthy development. Brood care is essential for colony growth.

10. Orientation Flight

Young bees perform short flights near the hive. They learn the location and surroundings of the hive. These flights help them recognize landmarks. It prepares them for future foraging. Orientation ensures safe return to the hive.

11. Queen Retinue Behaviour

Worker bees surround and attend the queen. They feed and groom her regularly. They spread queen pheromones throughout the colony. This maintains social organization. It ensures proper functioning of the colony.

12. Absconding

Absconding is when the entire colony leaves the hive. It occurs due to unfavorable conditions like food shortage or disturbance. Bees migrate to a new location. This behaviour is common in some species. It helps survival under stress.

13. Robbing Behaviour

Robbing occurs when bees steal honey from other colonies. It usually happens during nectar scarcity. Strong colonies attack weaker ones. This leads to fighting and loss of bees. It can damage weak colonies.

14. Drifting Behaviour

Drifting is when bees enter the wrong hive accidentally. It happens due to similar hive appearance or environmental factors. Drifting can spread diseases between colonies. It also causes mixing of populations. It affects colony management.

15. Propolis Collection

Bees collect resin from plants to make propolis. Propolis is used to seal cracks in the hive. It also acts as an antimicrobial substance. It helps in maintaining hive hygiene. It strengthens the structure of the hive.

16. Water Collection

Bees collect water for cooling the hive. Water is also used to dilute honey. It is essential during hot weather. Foragers bring water in their honey stomach. It helps maintain colony temperature.

17. Comb Building (Wax Secretion)

Worker bees secrete wax from abdominal glands. Wax is used to build hexagonal comb cells. These cells store honey, pollen, and brood. The structure is strong and efficient. Comb building is essential for colony functioning.

18. Pollen Packing

Bees collect pollen and store it in pollen baskets on their legs. Pollen is mixed with nectar to form bee bread. It serves as protein-rich food. It is essential for larval growth. Pollen collection supports colony nutrition.

19. Trophallaxis (Food Exchange)

Trophallaxis is the exchange of food among bees. It helps in distributing nutrients within the colony. It also spreads chemical signals. This behaviour maintains social coordination. It strengthens colony unity.

20. Removal of Dead Bees

Worker bees remove dead bees from the hive. These bees are called undertaker bees. This behaviour prevents disease spread. It keeps the hive clean and hygienic. It is essential for colony health.