

DEPARTMENT OF ZOOLOGY

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SOCIAL BEHAVIOR IN INSECTS

INTRODUCTION

- The behavior of animals are adjusted to various environmental factors with the organism of the same species or different species.
- The interaction between two or more individuals of the same species is called social behavior.

SOCIAL INSECTS

- Very few insects shows social behavior.
- The live in colony and each individuals of a colony do same thing for the welfare of the colony.
- Social habit evolved in two orders of insects, viz., **Hymenoptera** and **Isoptera**.
- Hymenoptera includes the ants, bees and wasps.
- Isopteran includes termites.

CHARACTERISTICS OF SOCIAL BEHAVIOR

Following are some of the important characteristics of social insects which are due to social behavior.

1. Colony:-

- Social insect live together forming a large group called colony.
- In a colony about 10000-50000 honey bees, 6 lakh ants and millions of termites are found.
- All individuals of a colony are the offspring of the same female, so their genotype is almost same.

2. Nest:-

- Social insects build nest for protection, storage of food and rearing the young ones.
- Honey bees make a nest of wax called comb consisting of numerous hexagonal cells on the roof of buildings, trees or attached to rocks.
- Ant build their nest (**termatorium**) with the help of soil and wood which is tunnel like with a number of exits.

3. Caste system:-

- Usually division of labour is found in the social insects, so they can be divided on the basis of structure, function and behavior, which are called “**caste**”.
- Caste are of mainly two types.

(a) Reproductive caste (King and Queen)

(b) Sterile caste (Workers and soldiers)

- Males develop from unfertilized eggs **parthenogenetically** and soldiers are haploid.
- In bees and wasps the workers are sterile female but in termites and ants the workers are male and female both.
- In termites a special type of soldier is found, called “**Nasute**”.
- In insects caste is determined by a no. of factors:-

1. In bees, wasps and ants, caste is depends on genetics and nutrition e.g., males are haploid produced by **parthenogenesis** while females are diploid (2n) produced by fertilization.

2. In termites some external factors play important role e.g., the reproductive caste and soldiers produce an **ectohormone** which fed to the nymph and such nymph will not develop into reproductive caste or soldiers.

4. Parental care:-

- It is an instinctive behavior which is found in social insects.
- It includes feeding, cleaning, depositing eggs at the proper places etc.

5. Progressive provisioning of food:-

- Ants, termites and bees feed their young ones till metamorphosis, which is called **Progressive provisioning of food**, e.g., there are some species of ants which bring aphids in their nest and feed on honey dew secreted by them and protect them from predators.

- Fungus growing ants grow a type of fungi in a part of the tunnel where they also provide organic matters as fertilizers.

6. Trophallogis:-

- The exchange of food between the insects is called **trophallogis**, e.g., Ants and termites feed one another. Young are fed by the elders.
- In termites trophallogis play important role in caste determination, e.g., reproductive caste and soldiers produce an ectohormone which is fed to the nymph and such nymph will develop into workers only.

7. Swarming:-

- When number of individuals in a colony increases very much then a part of the population move to other place which is called **swarming**.
- It plays important role in distribution.
- In many insects swarming occurs due to migration and mating.
- Usually males and queen come out for mating which is called nuptial flight.

8. Protective devices:-

- There are some protective devices in social insects.
- In some insects like honey bees and wasps bear poisonous sting.
- In stingless bees, ants and termites mouth parts are well developed for biting.

9. Communication:-

- The insects use chemical, tactile, visual and sound signals for communication.
- Some insects secrete pheromone from their **exocrine gland** which provide chemical communication that controls various activities like, finding path, call for mating etc.
- Ants leave a chemical substance behind them, which act as travelling path.
- In honey bees communication takes place by a characteristics movement called “bee dance” discovered by **Von Frisch**.

CONCLUSION

In this way social insects by means of their social behavior force the adverse condition and survive as a successful group of animal.
