S. S. College, Jehanabad

Department: Zoology

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Subject: Zoology

Topic: Animal Behaviour in Social Insects

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Animal Behaviour

3)5) Social Insect

Various types of association occurs among animals. Insect societies are by far the most ancient of all societies, social insect includes ants, bees, wasps and termites. There are two main groups of social insects that is order Isoptera and the order Hymenoptera. Bees, wasps and ants belong hymenoptera.

A society is a group of individuals belonging to the same species and organized in a co-operative manner. They responsible for the society involve in obtaining food, defending and Reproduction for colony.

Different castes in society :——→

There are three castes in the colony :— Reproductive, workers and Soldiers. male as well as female responsible for reproduction but only queen is laying eggs and is only one representative on the colony. workers which is immature Perform all function. Soldiers are defensive members in termite, soldiers emitted defensive secretions but in honey bee some workers Play defensive activity.

Different insect societies :——→

These are as follows :—

Wasp → wasps belongs to Specialized one solitary and exhibit a degree of maternal care by constructing special chambers for their larvae and providing them with food. Nests are built in burrows in the ground or in holes of wood or in plant stems. The social wasp, like vespa are trimorphic form - queens, workers and males. Queens are fertile female, workers are sterile female and males develop from unfertilized.

Honey bees : → It belongs to the super family Apoidea and are grouped into six families. The majority are solitary, some are ~~fully social bees~~ sub social, while some are fully social bees exhibiting highest in social behaviour involving complex language system.

Anthophora is a solitary bee. The female bee brings food for the developing larvae.

The bumble bees belong to family bombidae so some degree of social behaviour by forming seasonal colonies. The colony has three types of members - female, male, workers. After mating the female hibernate in some hole and become active in spring season, when they lay eggs in some hole.

Honey bee belong to family Apidae form Permanent colonies in the form of beehives (मौनगृह) which are overhanging from rocks or tall buildings or branches of trees. The colonies are trimorphic with single queen, some males (drones) and a large number of workers.

Queens → Queens are stingless unable to survive alone. It is only for mating and laying eggs.

Drones → Males develop from unfertilized egg and responsible for only mating with queen.

Workers → Workers are sterile female perform certain tasks such as comb building brood feeding, Removing debris, guarding, foraging, Pollen packing etc.

Communication

Workers, bees performing information with each other as the pollen are near or far from their colony. Communication is observed as the waggle dance and round dance. When bees turn in a circles once to left and then once to right its means that sources of food is near the hive. When the source of food is

more than two mitters the bees performs waggle dance

Termites :-

The life history of termites involves the production of polymorphic castes. Complex social organization and complicated forms of nests. Termites inhabits underground galleries or huge mounds on the above surface. Some species live in wooden structures. It has been observed that some species of termites keep in their nests domesticated beetles and other insects which have greatly modified abdomen.

In a Termites colony there are three principal castes :-

(1) Reproductive castes
(2) Soldiers castes
(3) Workers.

(1) Reproductive castes :-

There are three types - Primary Reproductive, secondary R. and Tertiary R.

(i) Primary :- These are slender with normal heads, long membranous wings, Darkly pigmented Integument with Compound Eye. Male and female are sexually mature, queens abdomen becomes large with a large number of Eggs.

(ii) Secondary :- These are Pale in Color with vestigial wings, reduced eyes and heavier

bodies, usually more males than females are produced.

(iii) Tertiary :→ These are wingless unlignmentes with vestigial eye. Secondary and Tertiary forms disappear from nest at swarming time and may form new subcolonies Elsewheres.

(2) Soldiers :

These are highly specialized castes with large and heavy sclerotized ~~castes~~ heads Enormous mandibles and wingless. There are two type of Soldiers — Mandibulate and Nasute.

Mandibulate have well develop mandibles Enormously. Nasute have an Elongated Pointed frontal rostrum which Serves as a nozzle for squirting a sticky secretion at Enemies.

(3) Workers :

These are Pale Colour with Compound Eyes or only vestigial Eyes with Strong biting Jaw. Workers are majority of the Population of a Colony Performing all function Except reproduction and defence. In some groups there are no workers and the function of workers are Carried by nymphs called Pseudergates.

Development of social behaviour.

One essential Element for the development of social life is to lengthen the life span so that there is contact between old and young individuals. The aggregations formed by insects such as cockroach and Earwings contain such overlapping generation. The life span of a cockroach may be a year or more. During this Period cockroach of all stages live together in a loose aggregation near sources and shelter. In their life time young which contact with the mothe for a few hours after birth. The contact between the mother their youngs is a necessary start on a Possible road to Social life. The nutritional is a major importance and the Pheromones contribute to the success of social life in insect.

Conclusion :

Social behaviour insect clearly illustrates the involvement of division of labour and Physical differentiation towards building up of a successful society Ensuring survival of the races. In addition the helping in the differentiation of castes these Pheromones stimula te specific receptors. This chemical Communication system Plays an important role not only in regulating their behaviour but also in adaptive regulation of Population structure in the Colony.