TOPIC : SOCIAL BEHAVIOR

▶An animal society is a relatively **permanent union of individuals held together by mutual attraction of its members.**

▶Any interaction between one individual of a species with another member of the same species is known as social behavior, this includes all those behaviors that influence, or are influenced by other members of the same species.

▶A true society will involve more than a mated air i.e. adults, subadults, juveniles, infants of different age-sex classes. It will mean a stable group whose members inter-communicate extensively and bear some relatively permanent social relationship to one another.

Characteristics of social groups and behavior

(1) The first and most obvious characteristic of social behavior involves the number of animals of the same species that actively come together or remain together in a group. The minimum level of sociality or the smallest social group is found between a male and female who interact only during breeding season or between mother and infant.

(2) Social behavior depends in part on the "length of time or part o the life cycle that the group remain together."

(3) As opposed to the length of time that the members are simply in a group, that is, in physical proximity to each other, this element concerns the "energy actually spent in social behavior".

(4) **"Reciprocal communication"** is generally considered necessary as a mechanism for attracting and keeping them members of a group together.

(5) Much social behavior is marked by a division of labour and "social structure or what is frequently or what is frequently referred to as roles."

(6) A feature of social group in many species is an "overlap of generations;" that is, families or parts of families may stay together. Parents defend or protect their young ones.

(7) The last point represents the highest level of social behavior "Altruistic or aid giving behavior where there is a cost to the altruistic individual" IN most extreme forms it includes even the sacrifice of one's life and reproduction. Origin and existence of sterile or non-reproductive castes among ants, bees, wasps and termites poses a difficult problem for natural selection theory, as, such individuals are not maximizing their own reproductive potential, instead, they work for the benefit of the colony. They have probably evolved through indirect or kin selection.

Four properties of organized societies :

1. Communication. All organized societies have some form of complex communication system. The members of a social group make gestures, postures, change colour, raise hair, thev scent mark, communicate through vocalization, they may indicate messages by touching each other, or have some specialized forms like ecolocation in bats, tail and waggle dance in bees.

2. Cohesion. The individuals constituting a society tend to remain in close proximity to one another e.g. all the bees of a group live in one hive, the individuals in a herd of deer, pride of lions and peck of wolves remain in close vicinity in a given home range, the individuals in a troop of baboons while moving tend to remain in close proximity.

3. Division of labour. In organized societies, animals of different status sexes or age groups have different functions in maintaining the society. Baboon and macaque young adult males often serve as front or rear guard for group as the group moves, they are the ones to face predators. The old adult, dominant males remain in a more central place and they decide the foraging and resting areas, the function of females is to bear and bring up infants and care for young.

4. Permanence and impermeability. The individuals making up a society tend to be same. There is little migration from the group, in most mammals the core of the group is formed by females who are related to each other the males come and go, otherwise, the membership among females permanent. Most organized societies resist immigration by outsides.

Social Interactions

- **Communication, courtship mating parental care, aggressive interactions, territoriality, physical proximity (closeness), and grooming are important interactions among social animals.**

Degrees of sociality:

- **eusocial:**
  - individuals of the same species cooperate in caring for young
  - a division of labor exists in which more or less sterile individuals work on behalf of relatively few reproductive nest mates
  - at least 2 generations overlap enough for offspring to assist parents in performing colony labor during some part of their lives
  - all ants, most advanced wasps & bees, and all termites exhibit these traits
- **pre-social**
  - species characterized by 2 or fewer of the above traits
  - represented by a series of social stages:
    - **parasocial sequence**
      - adults belonging to the same generation assist one another to varying degrees (see table below)
      - may be the evolutionary pathway taken by bees

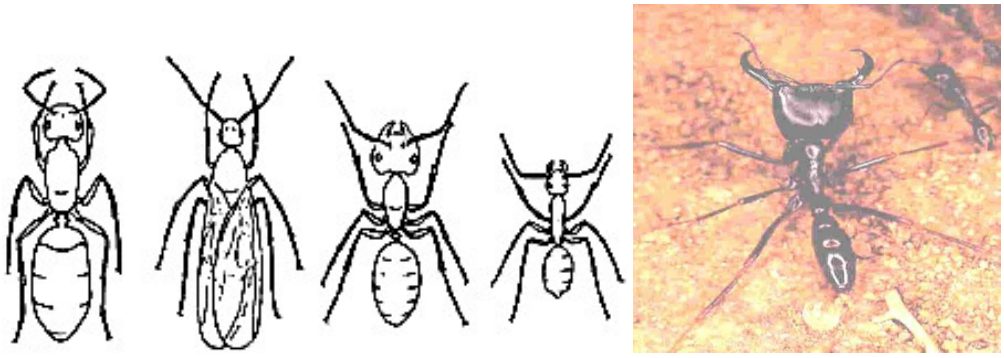
Degrees of sociality	Cooperative brood care	Reproductive castes	Overlap between generations
Solitary	-	-	-
Communal - females cooperate in constructing nest but rear broods separately	-	-	-
Quasisocial - cooperative care but each female still lays eggs	+	-	-
Semisocial - addition of 'worker' caste; some colony members never reproduce	+	+	-

- **subsocial sequence**
  - increasingly close association between mother and offspring (see table below)
  - may be the evolutionary pathway taken by ants, termites, social wasps, & some social bees

Degrees of sociality	Cooperative brood care	Reproductive castes	Overlap between generations
Solitary	-	-	-
Primitively subsocial - female provides care for a time but departs before young eclose as adults	-	-	-
Intermediate subsocial I - female present when young mature	-	-	+
Intermediate subsocial II - some of the young provide for the next brood	+	-	+
Eusocial - mature offspring remain permanently rather than leaving to rear own young	+	+	+

Caste differentiation in some eusocial insects:

- **Ants**
  - **3 basic castes - queen, major worker (or soldier), & minor worker**



From left to right: Queen, Winged male, Major worker, & Minor worker.

- **Queen - fully reproductive** female whose main function is to lay eggs and, in some species, to start new colonies after mating
- **Major workers:**
  - unfertilized females
  - principal functions are colony defense and, in some species, food storage
  - specialized forms in some species:
    - many genera - mandibles designed for cutting integument & clipping off appendages of invading arthropods
    - army ants - possess pointed or hooked mandibles designed for piercing an opponent's integument
    - many species - possess shield- or plug-shaped heads used to block nest entrances
- **Minor workers:**
  - unfertilized females
  - functions include construction, brood care, care of the queen, and foraging
  - in most ants, the division of labor is based at least in part on age:
    - about first 50 days - in the nest caring for the brood, the queen, & other workers and cleaning the nest
    - after about 50 days - shift to outside activities, particularly foraging and nest construction
- **Males - not differentiated into castes & serve only as reproductives**

- Termites
  - different order (Isoptera) but caste system is similar to that of the social Hymenoptera
  - castes comprised of both males and females (not just females as in social Hymenopterans)
  - castes include:
    - **Primary reproductives**
      - consist of a monogamously mated female (queen, below left) and male (king, below right)