INTRODUCTION :→

Reproduction is a multifaceted behaviour. In many animals such as - sea-anemones, worms, oysters and sea-urchins, it consists of merely shedding sexual products - sperms and eggs into the sea, where fertilization takes place. In higher animals, like birds and Mammals, the timing of reproduction is more complicated and fertilization involves both synchronization and Mating i.e bodily contact between the Sexes. Courtship results in animals coming together and orienting themselves so that their genital organs may come in close contact. After fertilization, the female carries the eggs for some time and in so many species the female takes a larger share than the male in feeding and protecting

the young, she is the more valuable part of the species capital.

Apart from actual insemination, therefore, synchronization, persuation, orientation and reproductive isolation are the functions of Mating behaviour.

⇒ COURTSHIP :→

"The term "courtship" refers to the behavioural interaction that occurs between males and females before, during and just after the act of mating."

"According to De-Morris, "courtship" is the hetero-sexual communication system leading to consummatory sexual act."

In some animals, courtship is brief and short but in others, it lasts for a long time and involves vigorous and elaborate displays. The male plays an active role during courtship

⇒ ROLES OF COURTSHIP :-

One of the most important obvious functions of many displays is that of locating and bringing potential mates at the right time. Mating will be only successful in the long term if it occurs between males and females of the same species.

"Courtship fulfills four major functions;

1. Mate - finding
2. Persuation
3. Synchronization
4. Reproductive isolation

1). MATE - FINDING :-

** In unisexual animals, the discovery of a suitable mate is necessary for their survival.

** Recognition of a receptive partner is the first link in the chain of events leading to fertilization.

** In higher animals, mate-finding is a highly organised process, which involves one or more of the senses such as — "sense of sight, smell, sound, touch and taste".

2. PERSUASION :-

** After recognising a potential mate, the next hurdle for the male is to bring the female into close proximity. Male performs behaviour patterns whose function is to stimulate the female until she is sexually receptive.

** The male is usually capable of fertilizing more than one female. Therefore, the female requires some persuasion and male plays more active role in courtship.

** In some cases, the female attacks the male and eats him. In these circumstances, male courtship behaviour may serve not-

simply to stimulate the female sexually but also to suppress her non-sexual behaviour.

3. SYNCHRONIZATION :-

** "The occurance of the same behaviour in different individuals at the same time is called synchronization".

** Precise synchronization of male and female courtship activities is especially important in species in which there is external fertilization.

** It occurs because both respond to external cues such as day length, lunar cycle, the presence of predators etc.

4. REPRODUCTIVE ISOLATION :-

** The role of courtship in ensuring that animals mate only a member of their species, is typically achieved because courtship displays are highly species specific.

** The signals used for attraction, persuasion appeasement and synchronization vary in different species. Thus, the partner that recieved such signals is usually responsive only to the displays of its own species.

** In most frogs, males produce calls which are species-specific in terms of their pitch and timing. Female approaches to the calls of their own species only.

** The antennae of many male moths are selectively responsive to the odours emitted by females of their own species.

** Differences in courtship and mating behaviour in different speies may be due to;

1) either the evolution of different languages which prevent hybridization

2). or Geographical separation.

** In both cases, distinctiveness has functional advantage

⇒ ORIGIN OF COURTSHIP-BEHAVIOUR:

** The great Ethologist Tinbergen saw that territorial and mating behaviour often co-incide and came to the conclusion that there might be some significance of holding territories at breeding times by the courting-animals.

** Breeding territories are common among Mammals, Aves, and Reptiles, sporadic in Amphibians and Pisces, and rare among invertebrates.

** Usually the males of a species establish themselves early in the breeding season in a separate locality, which they defend from other males of the different species.

** Males proclaim their occupancy by displaying themselves conspicuously by patrolling on the boundaries and attacking the intruders.

** Pairing, courtship and Mating occurs within territory, Since males and females often remain there together until their young ones are reared.

** Lorentz and Tinbergen see conflict Behaviour as a clue to the origin of Courtship.

** Behaviour patterns of courtship vary greatly in different groups of animals.

=> COURTSHIP IN INVERTEBRATES:

** Marine Forms :- In Marine forms Synchronization of the two sexes takes place and it is related with the tides and phases of the Moon.

** Nereis → Some species of Nereis perform Nuptial dance, in which males and females swim rapidly in a circle. The females produce a substance called Pectillium which attracts

the males and stimulates shedding of sperms which in turn excites the females and stimulates shedding of eggs.

** MATING-BEHAVIOUR AND COURTSHIP IN GRASSHOPPERS:-

***Peter-Mayer – according to him, grasshoppers are difficult to study because they are incurably romantic.

*** He recorded the song of a female grass-hopper on a cassette player and kept it in a cage full of male grasshoppers, where he found that the males fell in love with the cassette-player.

** COURTSHIP AND MATING BEHAVIOUR IN MOTHS :→

*** In many moths, females secrete odours-called pheromones, at night. These are carried by the wind to the males which have an acute sense of smell in their antennae.

*** Some females are voracious eaters and are

likely to attack the males during courtship.

*** So in a few cases, the male presents the female with insect prey wrapped in the silk-balloon for her to eat while he mates.

=» COURTSHIP AND MATING BEHAVIOUR OF DROSOPHILA;

*** Mating behaviour of Drosophila consists of species specific fixed action patterns which are accompanied by orientation movements. Such patterns are known as courtship displays and involve a number of elements or signals which are performed sequentially.

*** Male actions are of two types — those involved in male to male encounter and those of male to female encounter.

*** In most of the cases the forelegs, wings and mouthparts of the male serve as signalling structures.

*** The female signals are limited as compared

to those of the male and are produced by the wings, legs, genitalia and movements of abdomen.

*** Four types of Behaviour-patterns are found in Drosophila during Courtship and Mating;

* Male-Courtship Elements :→ Tapping, wing flicking, wing fluttering, wing Semaphoring, wing Scissoring, wing vibration, leg vibration and licking.

** Female Rejection Signals :→ Abdomen-elevation, abdomen depression, decamping, flickering, fluttering, Kicking, extrusion.

** Female acceptance Signals :→ Genitalic spreading wing-spreading and ovipositor extension.

** Stimuli involved in Mating-Behaviour :→

The role of the various stimuli such as visual, Chemical, auditory and mechanical has been identified during Courtship.

The function of these stimuli is to inform the female of species identity of the male

and to stimulate the female for accepting the male in copulation.

** During courtship, Drosophila males produce wing vibration which results in the production of the courtship songs which have been recorded and analysed. These songs consists of two elements;.

a) the sine song and

b) Pulse song.

** Both males and females are capable of receiving auditory courtship signals via their antennae.

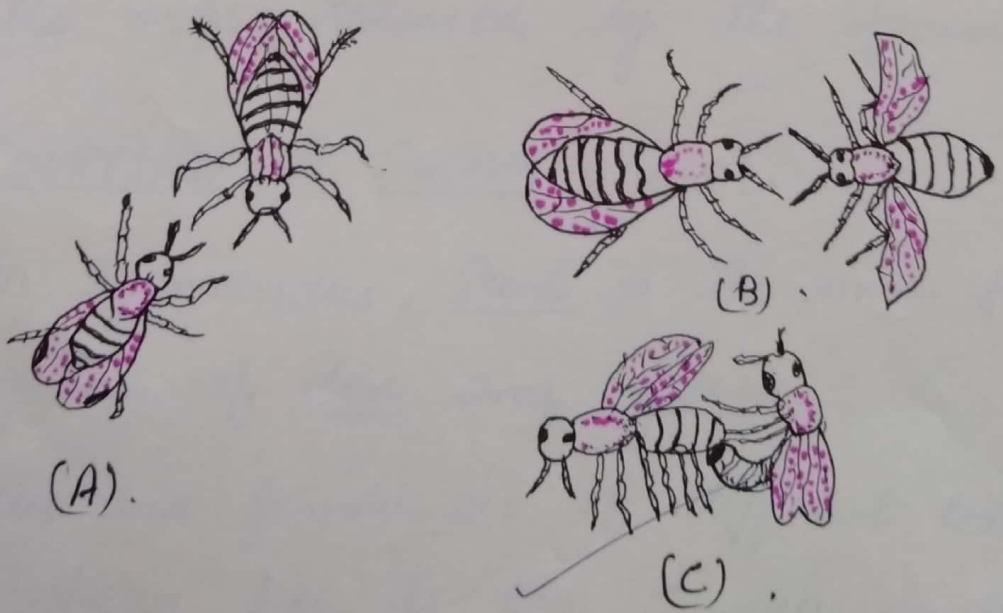


Fig- Courtship and Mating behaviour of Drosophila;

*** COURTSHIP AND MATING BEHAVIOUR IN VERTEBRATES :-

** COURTSHIP IN SPINED-STICKLEBACK :-

** The most important display of courtship is presented by the spined stickleback.

** Male adopts Sigmoid posture and swims with the female. After some time he leads her to his nest and nudges the base of her tail with his snout.

** Then she leaves the nest and the male immediately follows her shedding, his sperms on the eggs, released by the female.

** COURTSHIP IN SALAMANDERS :-

** In Salamanders, Scent is the main factor in recognition of sex and species.

** Males and females are of different colours and each species has its own peculiar smell.

** In the males, the "Hedonic glands" are located

mainly at the base of the tail and on the underside of the head.

** Although the females lack any readily differentiated glands, their skin secretion evidently possesses the odour that enables the male to identify them as to which species and sex it is.

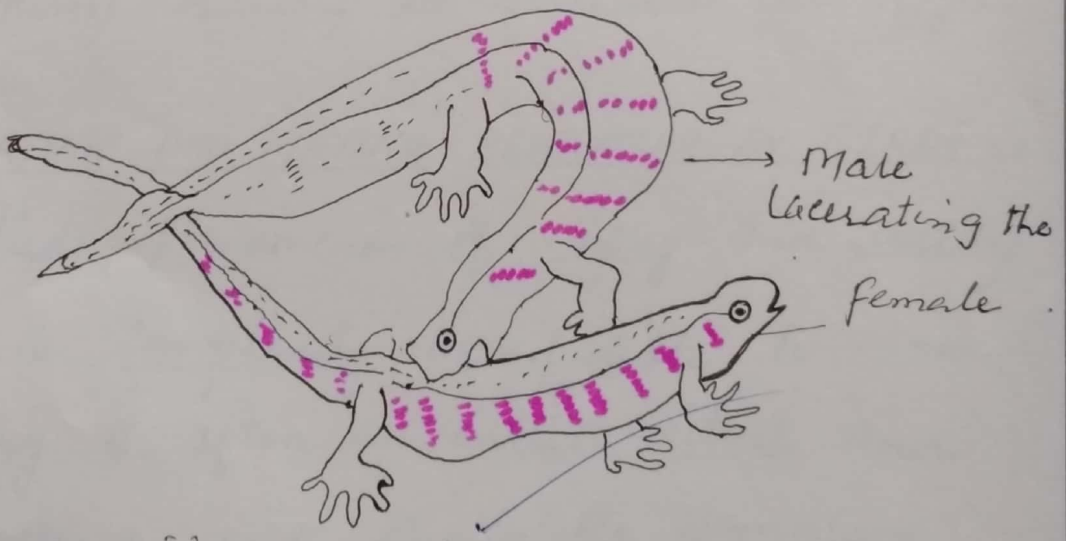


Fig. Courtship of two-lined Salmanders.

** In most Salmanders fertilization is internal but it is accomplished in a manner different from that employed by mammals, where the male feels that the female is sufficiently excited.

** Male Salamander deposits a small jelly of coated package of spermatozoa known as — spermatophores ; either on land or in water according to the habit of this species.

** Female comes and picks up one of the spermatophores with the lips of her cloaca.

** It is then placed inside her body in a special receptacle - known as spermatheca, where the sperms remain to fertilize the eggs.

** COURTSHIP AND MATING BEHAVIOUR IN BIRDS :-

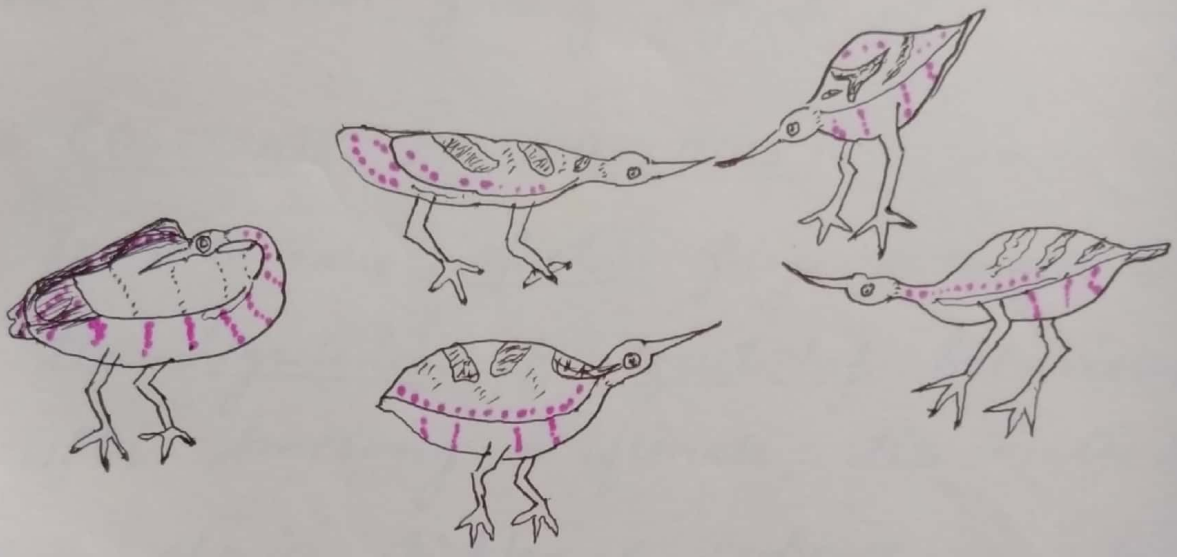
** In birds, Phenomenon of display and Courtship attain a complexity incompatible to man.

** A Song is often an initial ritual and first attracts and excites the female.

** The male sex is frequently aggressive in defense of territory.

** In Avocetes, male and female both preen their feathers in hasty fashion during courtship.

** After preening, the female adopts a characteristic flattened attitude which is the sign that she is ready to mate and only then the male mounts and couplates.



Fig→ Displacement - Preening Courtship & Group display in Avocetes.

** The courtship behaviour of Indian Peacock is very fascinating. While courting, the peacock spreads its beautiful tail whenever a peahen approaches, but as she comes near him, he takes an about turn, showing her his rear portion.

** Now, if Peahen is ready for mating, she will run swiftly around the tail to be able to

see it from the front again.

** Then peacock turns around again and this courtship game will be repeated several times. At last the peahen lies down in front of him giving signal for mating.

** COURTSHIP IN MAMMALS :-

** In Mammals, olfaction plays a major role in the regulation of courtship behaviour.

** After smelling a female, the males of many species display a response in which neck is extended and the upper lip is curled. Female often solicits mountings.

** Sometimes by approaching a male, she muzzles or licks him. often she runs away from the male when approached but appears again as solicitation behaviour starts and then she escapes.

** In the case of red-deer, the female deer

(hind) frequently runs away when approached by the male-deer (stag), but she soon stops and waits for him, licks him and then runs again only to wait once more for his approach.

** In bottle-nosed dolphins, vocalization, nuzzling of the partners genetidia, rubbing of bodies, stroking with flippers, displaying of the underside occurs during courtship.

⇒ CONCLUSION :-

Sexual reproduction is a usual feature of animals life and commonly involves the close association of a single pair of animals. There may be external fertilization, simul-taneous spawning or internal insemination. A Nervous organization must develop within the animal before sexual maturity, which

determines both the form of courtship movements and their link with significant stimuli. Courtship is not evoked in any animal with mechanical consistency. Many factors affect sexual responsiveness e.g. it may drop sharply if an enemy appears. Synchronization and orientation are the matter of co-ordinating system that determine the time pattern of mating.

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