Quadrant II – Notes

Programme : Bachelor of Science (First year)

Subject : Zoology

Paper Code : ZOG 102

Paper Title : Animal Behaviour

Unit : Social and sexual behaviour

Module Name : Sexual behaviour: Asymmetry of sex, Sexual dimorphism, Mate choice

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NOTES

SEXUAL BEHAVIOUR

Sexual behavior is also termed as reproductive behavior, which includes all aspects from the establishment of mating systems, courtship, sexual behavior, and parturition to the care of young. Sexual behavior may be tied more strongly to establishment and maintenance of complex social bonds across a population which supports its success in non-reproductive ways. Both reproductive and non-reproductive behavior can be related to expressions of dominance over another animal or survival within a stressful situation (such as sex due to duress or coercion). Natural selection plays an important role in the evolution of sexual behavior.

There are several factors that influence sexual behavior these include

- Physical environment
- Presence of mate
- Hormones
- Nutrition
- Genetic factors

- Estrous / menstrual cycle

ASYMMETRY OF SEX

The pattern of sex differences is related to a fundamental difference between the sexes, which is that males produce small sperm in large numbers and females produce large eggs, which are relatively few. The mass of an egg is still vastly greater than that of a sperm. The fundamental asymmetry of sex claims that eggs are expensive but sperm are cheap. Fusion of gametes differing in size is termed as Anisogamy. Anisogamy is common in animal kingdom.

Bateman's Principle: Due to large size, eggs are costly to produce; ensuing females have to secure the resources to make them. A female also spends time and energy in caring for the resultant offspring. Thus, a female's reproductive success is far more dependent on the quality of her partner. This results in sex differences in mating behavior, where males tend to have higher reproductive variance than females.

SEXUAL DIMORPHISM

The differences in appearance between males and females of the same species, such as in colour, shape, size and structure, that are caused by the inheritance of one or the other sexual pattern in the genetic material. Usually males are more conspicuous in form, coloration, or both, than the females.

Sexual dimorphism in size

Male and female of the same species differ in size. This is explained by Rench's rule which states that pattern wherein the degree of sexual size dimorphism increases with body size in species where males are the larger sex and conversely decreases in those species where females are the larger sex.

There are several hypotheses proposed to explain Rensch's rule:

1. Combination of genetic correlations between male and female size with directional sexual selection for larger male size will cause the evolution of larger males relative to female body size.

2. Sexual size dimorphism evolves through intraspecific competition between the sexes when foraging is related to size.
3. The pattern is due to female fecundity, where the larger female will have bigger eggs and a greater capacity to reproduce successfully.

Sexual dimorphism in shape

Male and female show differences in shape. Shape contributes to various functions such as feeding, mating, parental care and other life history characteristics. Examining the size and shape of traits together provides a much more complete quantification of sexual dimorphism. Allows deeper understanding of sexual dimorphism as different parts of the body serve multiple functions and be under distinct selective regimes.

MATE CHOICE

Mechanism of sexual selection involves two processes:

1. Intra sexual selection – male-male combat
2. Inter sexual selection – Female choice

Female mate choice

Female choses a mate based on the traits and ornaments it possess as well as the reproductive behavior it exhibits.

Direct benefit for the female: Mate chosen based on the immediate benefits it can provide such as parental care, a nuptial gift, or territory defense. Female prefers an ornament in the male that somehow indicates that the male will provide better-than-average parental care, resources, and defense.

Indirect benefits: The female's choice of males is established on having higher fitness for her offspring if she pairs with a preferred male.

There are three models that explain female mate choice.

a. The Fisherian Model

b. The Condition-Dependent Indicator Model.
c. The Condition-Independent Indicator Model