Dr. Rajesh Verma. Assistant professor and Head, U.G. Department of Zoology, D.K. College Dumraon. Note for B.Sc part 3rd, paper VII.

Q:- Write Notes on ISOLATING MECHANISM?

Ans:-

Isolating Mechanisms, isolating mechanisms the reproductive characteristics which prevent species from fusing. Isolating mechanisms are particularly important in the biological species concept, in which species of sexual organisms are defined by reproductive isolation, i.e. a lack of gene mixture.

Reproductive isolation :-

The mechanisms of reproductive isolation are a collection of evolutionary mechanisms, behaviors and physiological processes critical for speciation. They prevent members of different species from producing offspring, or ensure that

any offspring are sterile. These barriers maintain the integrity of a species by reducing gene flow between related species.

The mechanisms of reproductive isolation have been classified in a number of ways. zoologist Ernst Mayr classified the mechanisms of reproductive isolation in two broad categories: pre-zygotic for those that act before fertilization (or before mating in the case of animals) and post-zygotic for those that act after it. The mechanisms are genetically controlled and can appear (in species whose geographic distributions overlap (Sympatric speciation) or are separate (Allopatric speciation).

Pre-zygotic isolation :-

Pre-zygotic isolation mechanisms are the

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most economic in terms of the natural selection of a population as resources are not wasted on the production of a descendant that is weak, non-viable or sterile. These mechanisms include physiological or systemic barriers to fertilization

Temporal or habitat isolation

Any of the factors that prevent potentially fertile individuals from meeting will reproductively isolate the members of distinct species. The types of barriers that can cause this isolation include different habitats, physical barriers and a difference in the time of sexual maturity or flowering

Behavioral isolation :-

The different mating rituals of animal species creates extremely powerful reproductive barriers, termed sexual or behavior isolation, that

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isolate apparently similar species in the majority of the groups of the animal kingdom. In dioecious species males and females have to search for a partner, be in proximity to each other carry out the complex mating rituals and finally copulate or release their gametes into the environment in order to breed.

Multiple mechanisms :-

In general, the barriers that separate species do not consist of just one mechanism. The twin species of Drosophila, D. pseudoobscura and D. persimilis, are isolated from each other by habitat (persimilis generally lives in colder regions at higher altitudes), by the timing of the mating season (persimilis is generally more active in the morning

and pseudoobscura at night) and by behavior during mating (the females of both species prefer the males of their respective species).

Hybrid sex: Haldane's rule:-

Haldane's rule states that when one of the two sexes is absent in interspecific hybrids between two specific species, then the sex that is not produced, is rare or is sterile is the heterozygous (or heterogametic) sex. In mammals, at least, there is growing evidence to suggest that this is due to high rates of mutation of the genes determining masculinity in the Y chromosome.

see also :-

- species problem
- History of evolutionary thought

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