

EXPERIMENTAL TAXONOMY

(= BIOSYSTEMATICS)

For Short Answer Question

MBOTCC-6

Unit - III

M. Sc. Sem-II

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Experimental taxonomy (Biosystematics) deals with the processes of observation, hypothesis generation and experimentation pertaining to the evolution of diversity and the process of devising and applying 'concepts of taxa'. Currently this is more commonly known as a field of evolutionary biology. In more precise terms, it is the study of the processes by means of which we can try to understand how evolution works, and make sense of the patterns of variation that we observe at the different hierarchical levels.

Reproductive biology of plants is integral to an understanding of species limits and of the process of speciation.

In due course, Biosystematics came to be understood as including the collection of observational and experimental data on the breeding systems as part of the basis for making taxonomic decisions.

Experimental taxonomy is thus a broad and inclusive concept comprising nomenclature, phylogenetics and systematics.

It deals with the fundamental questions of phylogenetic reconstruction of taxon relationships, the evolution of characters, and on the influence of geological and ecological parameters on the stability of species and on speciation. It aims at understanding of mechanisms

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and processes of speciation, cohesion of species and the basics of ecological adaptation.

As molecular markers are found today to contribute very importantly to plant systematics, and genetic processes play a major role in speciation, biosystematics interconnects more and more with genome research. Thus evolutionary processes occurring at the levels from families to genera, species and populations, and the genomic changes accompanying these processes constitute areas of interest in experimental taxonomy.

For the analysis of speciation processes, methods of population genetics and phylogeography together with phylogenetic analysis are used. These data are supplemented by modeling the potential extant climatic niche of species as well as niche extension. Biosystematics with the interplay of its component areas may be depicted diagrammatically as below:

