Quadrant II – Transcript and Related Materials

Programme: Bachelor of Science (Third Year)

Subject: Zoology

Paper Code: ZOC-107

Paper Title: Molecular Biology and Evolution

Unit: 5

Module Name: Species categories Part I

Module No: 32

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Notes

The salient features / attributes/ general characteristics of the species can be summarised as follows:

1. A species is a MENDELIAN POPULATION or a biological unit consisting of large intercommunicating gene pool
2. The members of a species possess distinct morphological characters in common, in which they are different from all other groups.
3. Each species possesses a set of isolating mechanisms that indirectly or directly prevent exchange of genes with other species.
4. Members of the species interbreed among themselves and are reproductively isolated from other species.
5. Intermediate or transitional forms are usually not found.
6. Members of separate species do not usually interbreed, so that natural hybrids of the species are either totally absent or are very rare. Even if hybrids are produced artificially, these are usually sterile.
7. Each species fills an ecological niche not exactly utilized by another species.
8. Each species has the capacity to give rise to new species.

Two concepts are prevalent about species:

Non-dimensional or Monotypic species and Multi-dimensional or Polytypic species

Non-dimensional or Monotypic species

According to this concept, a species is a single unit consisting of just one group or one population of interbreeding individuals. If two or more populations coexist in a single locality and at the same time, these will not interbreed and the hybrids between them are not formed under natural conditions, this means each population has clearly defined limits and is sharply separated from other co-existing species.

Each such population therefore represents one distinct species and is known as monotypic species which means each species comprises of just one reproductively isolated population. This represents an oversimplification of the matter and its applicability restricted to local situations only, since each species comprises of numerous organisms which are separated into groups or local populations on account of geographic, ecological, physiological, psychological or social habitat differences.

When a species is designated as monotypic, it means that none of the organisms within the classification are divided into subspecies. Typically, members of the monotypic species classification live within close proximity to one another and share high degrees of biological similarity. Because no real distinction can be made among the population members, it is considered monotypic.

One example of monotypic species is the Hyacinth Macaw which inhabits some areas of South America. The bird is distributed in three primary habitats: The Amazon Basin of Brazil, the Pantanal region between Brazil and Bolivia and the Cerrado region of Brazil. The Hyacinth macaw belongs to the ***Anodorhynchus*** genus and ***hycinthinus*** species. As a monotypic species, this bird is the only organism within the species classification. It is a large blue bird with yellow skin around its lower beak and eyes. No subspecies have been distinguished within the species.

Multi-dimensional or Polytypic species concept: according to this concept, a species consists of two or more geographically isolated variable populations which are named as varieties or subspecies or races *i.e*. a species is a group of geographically isolated populations (allopatric populations) which are not reproductively separated but actually or potentially interbreed with each other. Such populations are unable to retain their individuality if they coexist in the same locality and at the same time. In order to remain distinct or to retain their individuality, they occupy different areas of distribution. Such a group of allopatric populations is known as a polytypic species or multidimensional species.

Occurrence: the polytypic species occur in most animal groups: mammals, birds, reptiles, amphibians, fishes, almost all groups of crustaceans, scorpions, spiders, millipedes and certain molluscs etc. These are equally numerous in the plant kingdom.

When a species contains two or more subspecies, it is called polytypic species

Examples are tiger, ***Panthera tigris*** which has 6 subspecies; such as Indian tiger, ***Panthera tigris tigris,*** The Indo Chinese tiger, ***P. t. corbetti,*** Malayan tiger ***P. t. jacksoni,*** South China tiger ***P.t. amoyensis***, the Sumatran tiger***, P.t. sumatrae,*** Siberian tiger ***P.t. altaica***.

All contemporary humans are members of same polytypic species, Homo sapiens. Humans are undoubtedly polytypic species in many ways due to geographic isolation, environmental influence and natural selection in time and space.

1.The major races of man, Black/Negroid, White/Caucasian and Mongoloid/Asian, Australoid and subsequent sub races like Mediterranean, Nordic, Indo-Aryan, Dravidian and others are all considered polytypes of man.

2. The body types of man are also polytypic as ecto (lean), meso(medium) and endomorphic (bulky) and several types in between them.

3. The height /stature of people is polytypic as short medium and tall.

4. People are polytypic in terms of eye colour (more than 12 colours), skin colour (nearly 40 shades), and hair colour (more than dozen shades)

The term race is traditional term for subspecies.

Importance

1. Polytypic species concept helps in better understanding of the process of speciation or evolution of a number of species from the parent.
2. The combination of more or less isolated and morphologically distinct allopatric species into polytypic species has improved the classification of animals and helps in explaining complex and debatable taxonomic situations.