

## **M.Sc. 1<sup>st</sup> Semester ; Course Code: Zoo-01-CR; Unit: II**

### **2.4. Intraspecific categories and their taxonomic status**

Intraspecific name is the scientific name for any taxon below the rank of species, i.e. an intraspecific taxon notwithstanding in Zoology, the International Code of Zoological Nomenclature (4th edition, 1999) accepts only one rank below that of species, namely the rank of subspecies. Other groupings or infra subspecific entities do not have names regulated by the ICZN. Such forms have no official ICZN status, though they may be useful in describing altitudinal or geographical clines, pet breeds, transgenic animals etc. While the scientific name of a species is a binomen and for subspecies, it is trinomen - a binomen followed by a subspecific name. For example a tiger's binomen is *Panthera tigris* and for a Sumatran tiger the trinomen is, *Panthera tigris sumatrae*.

#### **Variety**

It can be defined as the group of population which is different from the parent population. It refers to the collective variations of local, geographical and ecological population. This was the only subdivision of the species recognized by 'Linnaeus'. It designates any deviation from the type of species.

For example:-

*Nazara viridula* has two varieties

- i. *Nazara viridula* var. *smaragdula* Linn.
- ii. *Nazara viridula* var. *torquata* Linn.

After 'Linnaeus' this term was used indiscriminately to refer individual variations. Now this term is not used in animal taxonomy.

#### **Sub-species**

The term "Sub-species" came into general usage during 19<sup>th</sup> century was a replacement for the term "Variety". It was considered as a taxonomic unit like morphological species, but at lower taxonomic level. The sub-species can be defined as an aggregate of phenotypically similar populations of a species, inhabiting a geographic subdivision of the range of species and differing taxonomically from other populations of the species. In simple words, it is a group of population of species which are phenotypically similar but geographically isolated.

Sub-species are 'Allopatric' i.e., geographically isolated and 'Allochronic' i.e., never formed at same time & at same place. Sub-species is only valid category in Zoology e.g., *Cervus elaphus elaphus*. Usually the sub-species are reproductively isolated except in migratory species and in parasites with sympatric host sub-species e.g., *Pediculus humanus capitis* (Head louse) and *Pediculus humanus corporis* (Body louse). Due to the sharing of same host, these above mentioned sub-species overlap each other.

## Race

It is defined as a category representing geographical isolates i.e., a group of individuals which are phenotypically different but found as a distinct group in a particular geographical area. It is not a recognised taxonomic category. Races are of two types:-

1. **Biological race:-** are those races which are phenotypically similar but reproductively isolated. These are also referred as Sibling species e.g., *Anopheles maculipennis*.
2. **Ecological race:-** Those races which differ in their ecological requirements are known to be ecological races. It is a valid category in Botany e.g., Savanna sparrow has two populations found in coastal areas and dry areas.

Since no two localities are exactly identical with respect to their environment, therefore every sub-species is at least theoretically also an ecological race.

## Cline

This term was coined by J.S. Huxley in 1939 for a character gradient. It is also not a recognised taxonomic term. Cline may be defined as the group of local population of a widely distributed species, which exhibit regular or gradual stepwise modification from one part of their geographic range to another. Cline originates due to reduction in gene flow between populations of a species situated at the extremities of its geographical range due to distance. For certain species it has been shown that the population living at the extremities of the geographical range are reproductively isolated even though they are connected by a chain of interbreeding populations. When such reproductively isolated populations from the extremities migrate and occupy overlapping areas, they form a ring species. The regular or continuous variations of characters exhibit by cline are said to be the eco-geographical variation. Taxonomically cline has no significance e.g., it is very common in Butterflies because they do mimicry to protect from predators. Meadow frog, *Rana pipens* of North America is another best example.

## Deme

A deme is a community of potentially interbreeding individuals at a given locality which share a single gene pool i.e., they are genetically similar. Deme has been used to denote the local population of a single species. It has no taxonomic importance and has only evolutionary importance. So the usage of the term deme has been rejected.

## Form

It is one of the neutral terms of taxonomy which is formed due to the variation found between the individuals of the same species. The forms can't be different populations as long as interbreeding is free. This term is used when we don't know whether the phenon in question is full species or sub-species or whether it is sub-species or any individual variant e.g., Locust – it has two forms i.e., Solitaria and Gregaria, they are morphologically different. It is not a valid taxonomic category.

## Group

It is used to refer inter-specific categories. This term is more commonly applied to an assemblage of closely related taxa which one does not want to place in a separate category e.g., *Drosophila melanogaster* group, *Drosophila virilis* group. It is not a valid taxonomic category.

## Super species

It was introduced by Mayer in 1931. It is a monophyletic group of closely related and largely or entirely allopatric species. The component species of a super species were designated as semi-species. Various terms given by the eminent taxonomists regarding these categories are:-

1. Formenkeries: - It means array of forms of the same species.
2. Ressenkeries: - Rensch (a German scientist) used this term. It means array of races of same species found in different geographical area.
3. Artenkeries: - It means array of species.

In botany, an infraspecific name is the scientific name for any taxon below the rank of species, i.e. an infraspecific taxon. (A "taxon", plural "taxa", is a group of organisms to be given a particular name.) The scientific names of botanical taxa are regulated by the *International Code of Nomenclature for algae, fungi, and plants* (ICN). This specifies a 'three part name' for infraspecific taxa, plus a 'connecting term' to indicate the rank of the name. An example of such a name is *Astrophytum myriostigma* subvar. *glabrum*, the name of a subvariety of the species *Astrophytum myriostigma* (bishop's hat cactus). Names below the rank of species of cultivated kinds of plants and of animals are regulated by different codes of nomenclature and are formed somewhat differently.

## How to construct infraspecific names?

Article 24 of the ICN describes how infraspecific names are constructed. The order of the three parts of an infraspecific name is:

genus name, specific epithet, connecting term indicating the rank (not part of the name, but required), infraspecific epithet. It is customary to italicize all three parts of such a name, but not the connecting term. For example:

*Acanthocalycium klimpelianum* var. *macranthum*

genus name = *Acanthocalycium*, specific epithet = *klimpelianum*, connecting term = var. (short for "varietas" or variety), infraspecific epithet = *macranthum*

*Astrophytum myriostigma* subvar. *glabrum*

genus name = *Astrophytum*, specific epithet = *myriostigma*, connecting term = subvar. (short for "subvarietas" or subvariety), infraspecific epithet = *glabrum*

The recommended abbreviations for ranks below species are, for example: subspecies - recommended abbreviation: subsp. however "ssp." is also in use although not recognized by Art 26; varietas (variety) - recommended abbreviation: var.; subvarietas (subvariety) - recommended abbreviation: subvar.; forma (form) - recommended abbreviation: f.; subforma (subform) - recommended abbreviation: subf.

## Specifying authors

When indicating authors for infraspecific names, it is possible to show either just the author(s) of the final, infraspecific epithet, or the authors of both the specific and the infraspecific epithets. Examples:

i) *Adenia aculeata* subsp. *inermis* de Wilde

This identifies de Wilde as the author who published this name for the subspecies (i.e. who created the epithet *inermis*). Note that here it was decided not to indicate authority for the species.

ii) *Pinus nigra* Arnold subsp. *salzmannii* (Dunal) Franco

Here, Arnold is the author who gave the species, European black pine, its botanical name *Pinus nigra*; Dunal is the author who was the first to publish the epithet *salzmannii* for this taxon (as the species *Pinus salzmannii*); Franco is the author who reduced the taxon to a subspecies of *Pinus nigra*.

In Zoology, however, names of taxa below species rank are formed somewhat differently, using a trinomen or 'trinomial name'. No connecting term is required as there is only one rank below species, the subspecies. So far as cultivated plants are concerned, the *ICN* does not regulate the names of cultivated plants, of cultivars, i.e. plants specifically created for use in agriculture or horticulture. Such names are regulated by the *International Code of Nomenclature for Cultivated Plants* (ICNCP). Although logically below the rank of species (and hence "infraspecific"), a cultivar name may be attached to any scientific name at the genus level or below. The minimum requirement is to specify a genus name. For example, *Achillea* 'Cerise Queen' is a cultivar; *Pinus nigra* 'Arnold Sentinel' is a cultivar of the species *P. nigra* (which is propagated vegetatively, by cloning).