TAXONOMY – IMPORTANCE, HISTORY AND DEVELOPMENT AND BINOMIAL NOMENCLATURE - DEFINITIONS OF BIOTYPE, SUB-SPECIES, SPECIES, GENUS, FAMILY AND ORDER

Taxonomy is the process of identifying and classifying living organisms. Taxonomists study organisms and identify them based on their characteristics. These characteristics might be visible morphological characteristics or genetic differences.

The binomial naming system is the system used to name species. Each species is given a name that consists of two parts. The first part is the Genus to which the species belongs and the second part is the species name.

For example, *Apis mellifera* (the honey bee). The honey bee belongs to the Genus *Apis* and has a scientific name of *Apis mellifera*.

The binomial naming system was first uniformly used by Carl Linnaeus.

Other names for (or types of) *Binomial naming system* include:

- Binominal nomenclature

Biological classification

Biological classification is the process by which scientists group living organisms. Organisms are classified based on how similar they are. Historically, similarity was determined by examining the physical characteristics of an organism but modern classification uses a variety of techniques including genetic analysis.

Organisms are classified according to a system of seven ranks:

1. Kingdom
2. Phylum
3. Class
4. Order
5. Family
6. Genus

7. Species

For example, the honey bee (*Apis mellifera*) would be classified in the following way:

1. Kingdom = Animalia
2. Phylum = Arthropoda
3. Class = Insecta
4. Order = Hymenoptera
5. Family = Apidae
6. Genus = *Apis*
7. Species = *Apis mellifera*

   Species names are always written including the Genus in either full or abbreviated, for example, *Apis mellifera* or *A. mellifera* respectively.

BIOTYPE

A group of organisms having the same or nearly the same genotype, such as a particular strain of an insect species.

SUB-SPECIES

A sub-division of a species, usually inhabiting a particular area: visibly different from other populations of the same species but still able to interbreed with them.

A subspecies is further division of a species based on minor but constant differences in structure, appearance or biology. Individuals in different subspecies will be morphologically or genetically different from one another but still capable of interbreeding and producing viable offspring.

SPECIES

The basic unit of living things, consisting of a group of individuals which all look more or less alike and which can all breed with each other to produce another generation of similar creatures.

Species is one of the seven taxonomic ranks used to classify living organisms. A species can be defined as a group of organisms that can breed and produce fertile offspring.

Historically speaking, species are described by taxonomists and what's called a *Type specimen* is catalogued and kept in a museum or other collection where scientists can access it. The *Type specimen* can be compared with other specimens to determine if they belong to the same species.

In modern taxonomy scientists now consider a species to be a group of evolving organisms and have moved away from the idea of a historical *Type specimen* representing the form of a species.

GENUS

A group of closely related species (plural: genera). The name of the genus is incorporated into the scientific names of all the member species: *Pieris napi* and *Pieris rapae*, for example, both belong to the genus *Pieris*

Genus is one of the seven taxonomic ranks used to classify living organisms. Genus is positioned after Family and before Species.

1. Kingdom
2. Phylum
3. Class
4. Order
5. Family
6. **Genus**
7. Species

FAMILY

A taxonomic subdivision of an order, suborder, or superfamily that contains a group of related subfamilies, tribes and genera. Family names always end in -idae.

ORDER

A subdivision of a class or subclass containing a group of related families.

Order is one of the seven taxonomic ranks used to classify living organisms. Order is positioned after Class and before Family.

1. Kingdom
2. Phylum
3. Class
4. Order
5. Family
6. Genus
7. Species

There are 29 insect Orders although, like much of biological classification, this is still being discussed and changed by scientists.