Unit 2 - BIODIVERSITY

Chapter 18 - Classification
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Biologists have identified and named about 1.5 million species* so far. They estimate that anywhere between 2 and 100 million additional species have yet to be discovered.

* a species is a population of organisms that can breed with one another and produce fertile offspring

To study the diversity of life, biologists use a classification system to name organisms and group them in a logical manner.

Taxonomy is the science of classifying organisms. Scientists who carry out this work are called taxonomists.

Biological classification systems have two main purposes:

1. identifying organisms
2. providing a basis for recognizing natural groupings of living things

NOTE: Classification systems are artificial.

Artificial Classifications: The earliest systems of classification were artificial since they were based on one or few easily observable characters. These classifications did not take into account the relationship between the plants classified. For example Theophrastus, emphasizing plant morphology, classified plants into four groups on the basis of their habit: herbs, undershrubs, shrubs and trees. Another example is of Carolus Linnaeus who classified plants on the basis of number of stamens and their cohesion, (the classification is referred as Sexual System of classification). These artificial systems were easy to use, because only a few characters had to be recognized. The classification was rigid. However, the major drawback of these classifications was that often totally unrelated plants were grouped together and those that were closely related, were placed in separate groups. These classifications would change whenever new information was incorporated into the system.

Common Names

Referring to the common names of organisms is confusing.

cougar, puma, panther, mountain lion

buzzard

United Kingdom
hawk

United States
vulture

First attempts at standard scientific names often described the physical characteristics of a species in great detail.

"Oak with deeply divided leaves that have no hairs on their undersides and no teeth around their edges."

Modern Taxonomy

Carolus Linnaeus (1707-1778)

- Swedish botanist
- credited with devising the biological classification system based on an organism's physical and structural features
- the system recognized that the more features organisms have in common, the closer their relationship
- created rules for assigning names to plants and animals

Linnaeus's hierarchial system of classification includes seven levels or taxa (singular: taxon).

Kingdom
Phylum
Class
Order
Family
Genus
Species

King Phillip came over for guppy soup.

Binomial Nomenclature

Each organism is assigned a two-part Latin name, which is known as its scientific name.

Latin (and sometimes Greek) is still used today for naming species. It provides a common language for all scientists regardless of their national origin.

Homo sapiens	Homo sapiens	human
Felis catus	Felis catus	cat
Canis familiaris	Canis familiaris	dog
Castor canadensis	Castor canadensis	beaver
Acer rubrum	Acer rubrum	red maple

Homo sapiens

genus (generic name) — always capitalized

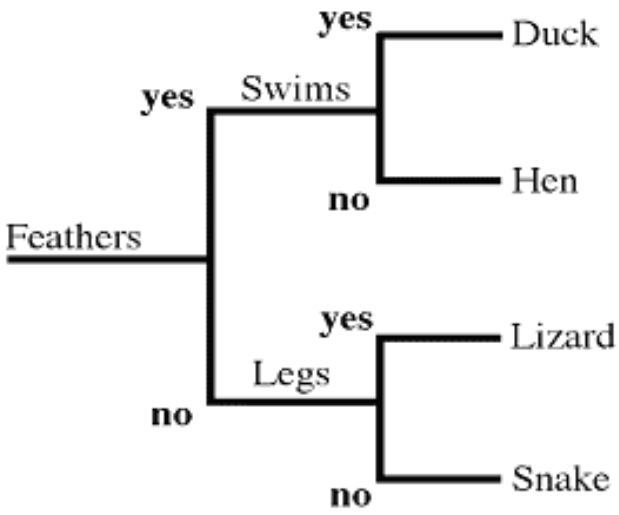
species (specific epithet) — never used alone

Many scientific names describe some characteristic of the organism (*alba*=white; *rubra*=red); many are derived from the name of the discoverer or the geographic location of the organism.

North American black bear	*Ursus americanus*
grizzly bear	*Ursus horribilis*
giant Alaskan brown bear	*Ursus arctos*
polar bear	*Ursus maritimus*
koala	*Phascolarctos cinereus*
panda	*Ailuropoda melanoleuca*

Dichotomous Keys

Dichotomous keys are two-part keys constructed so that a series of choices must be made. Each choice leads to a new branch of the key. If the choices are made accurately, the taxonomist is led to the name of the organism being identified.



exercise blas5180 on resource disc Lab Manuel A or blbs5180 Lab Man B

Dichotomous Key - Aliens