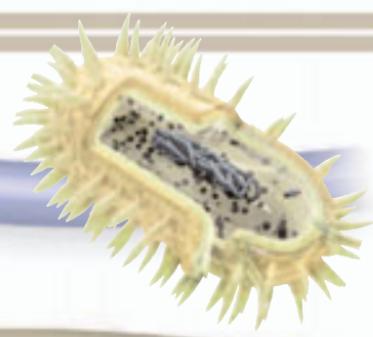


The Tree of Life

Here is a visual representation to explain how all living beings are related. Unlike genealogical trees, in which information supplied by families is used, phylogenetic trees use information from fossils as well as that generated through the structural and molecular studies of organisms. The construction of phylogenetic trees takes into account the theory of evolution, which indicates that organisms are descendants of a common ancestor.



Bacteria

Unicellular organisms that live on surfaces in colonies. Generally they have one cellular wall composed of peptidoglycans, and many bacteria have cilia. It is believed that they existed as long as three billion years ago.



COCCALS
The pneumococci are an example.



BACILLUS
Escherichia coli has this form.



SPIRILLUM
In the form of a helicoid or spiral



VIBRIO
Found in saltwater

Eukaryota

This group consists of species that have a true nucleus in their cellular structure. It includes unicellular and multicellular organisms, which are formed by specialized cells that do not survive independently.

Protista

A paraphyletic group, it includes the species that cannot be classified in any other group. There are, therefore, many differences among protista species, such as algae and the amoeba.

10,000,000

SPECIES OF ANIMALS ARE CALCULATED TO INHABIT THE EARTH IN THEIR DISTINCT ENVIRONMENTS.

Fungi

Cellular heterotrophic organisms with cell walls thickened with chitin. They carry out digestion externally and secrete enzymes to reabsorb the resulting molecules.



BASIDIOMYCETES
include the typical capped mushrooms.



ZYGOMYCETES
reproduce through zygospores.



DEUTEROMYCETES
Asexual reproduction

ABOUT **5,000**

SPECIES OF MAMMALS ARE INCLUDED IN THREE GROUPS.

Animals

Multicellular and heterotrophic. Two of their principal characteristics are their mobility and their internal organ systems. Animals reproduce sexually, and their metabolism is aerobic.

CNIDARIANS
include species such as the jellyfish and corals.

BILATERAL
Symmetrical bilateral organisms

ASCOMYCETES
Most species are grouped here.

CHYTRIDIOMYCETES
can have mobile cells.

Archaea

These organisms are unicellular and microscopic. The majority are anaerobic and live in extreme environments. About one half of them give off methane in their metabolic process. There are more than 200 known species.

Plants

Multicellular autotrophic organisms; they have cells with a nucleus and thick cellular walls that are grouped in specialized tissues. They carry out photosynthesis by means of chloroplasts.

NOT VASCULAR
No internal vessel system

VASCULAR
Internal vessel system

WITH SEED
Some have exposed seed and some have flower and fruit.

SEEDLESS
They are small plants with simple tissues.

ANGIOSPERM
With flower and fruit. More than 250,000 species form this group.

GYMNOSPERM
With naked seeds; cycadophytes were examples.



MOLLUSKS
include the octopus, snails, and oysters.

VERTEBRATES
have a vertebral column, a skull that protects the brain, and a skeleton.

ARTHROPODS
have an external skeleton (exoskeleton). Their limbs are jointed appendages.

INSECTS
The greatest evolutionary success

MYRIAPODS
Millipedes and centipedes

ARACHNIDS
Spiders, scorpions, and acarids

BONY FISH
have spines and a jaw.

CRUSTACEANS
Crabs and ocean lobsters

TETRAPODS
Animals with four limbs

AMNIOTES
Species that are born from an embryo inside an amniotic egg

MAMMALS
The offspring are fed with mother's milk.

PLACENTAL
The offspring are born completely developed.

MARSUPIALS
The embryo finishes its development outside of the mother.

MONOTREMES
The only oviparous mammals. They are the most primitive.



CARTILAGINOUS FISH
include the rays and sharks.



AMPHIBIANS
When young they are water dwellers; later they live on land.



TURTLES
The oldest reptiles



LIZARDS
Also includes crocodiles



SNAKES
Scaly and with long bodies

Relationships

The scientific evidence supports the theory that life on Earth has evolved and that all species share common ancestors. However, there are no conclusive facts about the origin of life. It is known that the first life-forms must have been prokaryotes, or unicellular beings, whose genetic information is found anywhere inside their cell walls. From this point of view, the archaea are prokaryotes, as are bacteria. For this reason, they were once considered to be in the same kingdom of living things, but certain characteristics of genetic transmission places them closer to the eukaryotes.

Amniotes

The evolution of this feature allowed the tetrapods to conquer land and to adapt to its distinct environments. In amniote species the embryo is protected in a sealed structure called the amniotic egg. Among mammals, only monotremes

continue to be oviparous; however, in the placental subclass, to which humans belong, the placenta is a modified egg. Its membranes have transformed, but the embryo is still surrounded by an amnion filled with amniotic fluid.

Cladistics

This classification technique is based on the evolutionary relationship of species coming from similar derived characteristics and supposes a common ancestor for all living species. The results are used to form a diagram in which these characteristics are shown as branching points that have evolved; at the same time, the diagram places the species into clades, or groups. Although the diagram is based on evolution, its expression is in present-day characteristics and the possible order in which they developed. Cladistics is an important analytical system, and it is the basis for present-day biological study. It arises from a complex variety of facts: DNA sequences, morphology, and biochemical knowledge. The cladogram, commonly called the tree of life, was introduced in the 1950s by the German entomologist Willi Hennig.

Humans

Humans belong to the class Mammalia and specifically share the subclass of the placentals, or eutherians, which means that the embryo develops completely inside the mother and gets its nutrients from the placenta. After birth, it depends on the mother, who provides the maternal milk in the first phase of development. Humans form part of the order Primates, one of the 29 orders in which mammals are divided. Within this order, characteristics are shared with monkeys and apes. The closest relatives to human beings are the great apes.