

Monophylogeny Encyclopedia Article

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Monophylogeny

Monophylogeny is a term used in the science of systematics to describe a group of organisms that are classified in the same taxon and share a common ancestor. The term monophylogeny comes from the Greek words *mono* meaning "one", *phylon* meaning "tribe" and *genesis* meaning "origin". Systematics is concerned with investigating relationships between groups of organisms based on their biological diversity and evolutionary history. It is related to the science of taxonomy which deals with naming and grouping of organisms depending on various physical characteristics.

Grouping organisms based on their relationship with each other has been an important part of biological studies since antiquity. Aristotle proposed one of the first systems although his groupings were mainly alphabetical. Carolus Linnaeus was the first to suggest ordering organisms in a hierarchical arrangement. When Charles Darwin proposed his evolutionary theory, some scientists began grouping organisms by their evolutionary relationships. This led to the development of systematics.

Scientists who study systematics create genealogy diagrams, called phylogenetic trees. These diagrams are designed to graphically depict evolutionary relationships. To construct them, species are grouped using a variety of data such as fossil records, comparative anatomy and molecular biological similarities. The ideal phylogenetic tree would contain only taxons that are monophylogenetic, that is, each related organism comes from a single ancestor. However, since much of the data that is currently available is conflicting, polyphylogenetic groups are created. These constructs show organisms in a single taxon with two or more different evolutionary ancestors. As additional data is collected about specific species, scientists hope to develop a unified phylogenetic tree that shows the complete evolutionary history of every organism.