

Taxonomy and the Classification of Life

- Classification is an ongoing area of research and discussion. As new findings and technologies become available they allow the refinement of the model. For example, gene sequencing techniques allow the comparison of the genome of different groups ([Phylogenomics](#)).

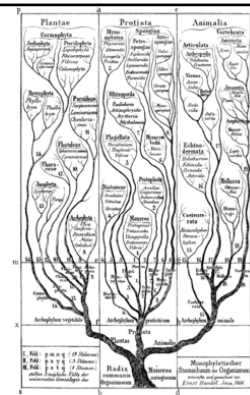
Kingdoms of Living Things

- In his classification scheme, Linnaeus (1735) recognized only two kingdoms of living things: Animalia and Plantae. At the time, microscopic organisms had not been studied in detail. They were placed either in a separate category called Chaos or, in some cases; they were classified with plants or animals.

Kingdoms

In the 1860s, the German investigator Ernst Haeckel proposed a three-kingdom system of classification. Haeckel's three kingdoms were Animalia, Plantae, and Protista. Members of the kingdom Protista included the protozoa, fungi, bacteria, and other microorganisms.

Haeckel's system was not widely accepted, however, and microorganisms continued to be classified as plants (for example, bacteria and fungi) or animals (for example, protozoa).



5 Kingdoms

- Until recently the system devised by Robert Whittaker in 1968 was widely adopted.
- Whittaker's classification scheme recognizes five kingdoms: Monera, Protista, Fungi, Plantae, and Animalia.
- It is based mainly on differences in [nutrition](#); his Plantae were mostly multicellular [autotrophs](#), his Animalia multicellular [heterotrophs](#), and his Fungi multicellular [saprotrophs](#). The remaining two kingdoms, Protista and Monera, included unicellular and simple cellular colonies.^[2]

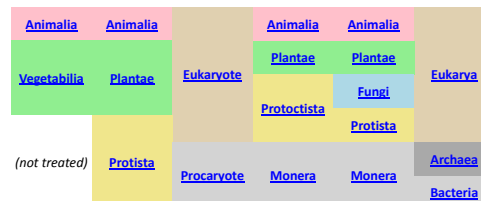
6 Kingdoms?

- Based on [RNA](#) studies [Carl Woese](#) divided the prokaryotes (Kingdom Monera) into two kingdoms, called [Eubacteria](#) and [Archaeobacteria](#). Carl Woese attempted to establish a Three Primary Kingdom (or Urkingdom) system in which Plants, Animals, Protista, and Fungi were lumped into one primary kingdom of all eukaryotes. The Eubacteria and Archaeobacteria made up the other two urkingdoms.
- The initial use of "six Kingdom systems" represents a blending of the classic Five Kingdom system and Woese's Three Kingdom system. Such **six Kingdom systems** have become standard in many works.^[3]

6 Kingdom

- 2 Empires:
- 6 Kingdoms
- **Prokaryota:**
 - [Bacteria](#)
- **Eukaryota:**
 - [Animalia](#)
 - [Plantae](#)
 - [Fungi](#)
 - [Chromista](#)
 - [Protozoa](#)

[Linnaeus^{\[5\]}](#) (1735) 2 kingdoms
 [Haeckel^{\[6\]}](#) (1866) 3 kingdoms
 [Chatton^{\[7\]}](#) (1925) 2 groups
 [Copeland^{\[8\]}](#) (1938) 4 kingdoms
 [Whittaker^{\[2\]}](#) (1969) 5 kingdoms
 [Woese^{\[9\]\[10\]}](#) (1977,1990) 3 domains



What are the 7 kingdoms of biology?

- Wikipedia: There should be only 5 kingdoms: Animalia, Plantae, Fungi, Protista and Prokaryota.

Unless you're talking about the different phyla/divisions within.

- Some USA biology faculty recognize 7 kingdoms

Geologic Time Scale

- Earth: 4.5 billion years old.
- Life: 4 billion years.
- Vertebrates: 500 million
- Mammals: 180 million
- Man: 3 million
- Fire: 500,000 years ?
- Writing: 5,000 years

Geologic Time Scale

- 12 hour clock:
 - 2:40 AM life began
 - 8:48 PM Cambrian explosion
 - 9:20 PM vertebrates arise
 - 11:02 PM mammals arise
 - 11:59:02 PM man arise
 - Last 10 seconds – fire
 - Last 100 msec – writing
 - Last nanosec – cell phones!

Geologic Time Scale

- Most of the history of life was dominated by blue-green algae (90% of 4 billion years)
- Then sexual reproduction arose as an outcome of the Cambrian Epoch (last 10%)
 - This introduced biological uncertainty
 - Rapid rates of formation of new species