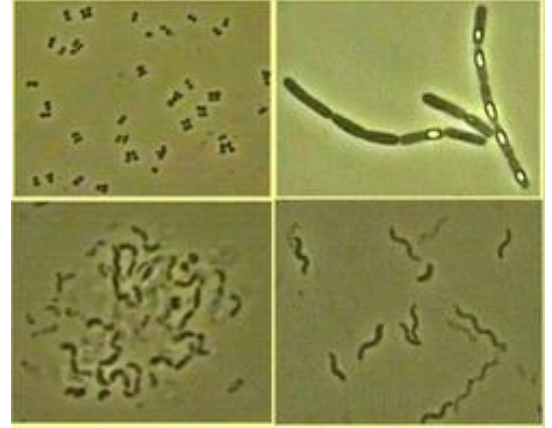


Kingdom: Monera (Archaeobacteria and Eubacteria)

By Cindy Grigg

When Linnaeus began classifying living things, he used only two kingdoms, plant and animal. With the technology of microscopes, new living things were discovered. Differences could be seen inside their cells. Two kingdoms were not enough. Most scientists today use either a five-kingdom or six-kingdom classification system.

Until recently, all bacteria were grouped together in one kingdom (five kingdom system). This was because their cell structure was similar. The five-kingdom system is divided into animal, plant, fungi, protist, and monera. The monera kingdom is made up of two groups called phyla. Both of these phyla are made up of one-celled organisms, which are all bacteria. None of them have a true nucleus. One-celled (unicellular) organisms whose DNA is not contained inside a nucleus are called prokaryotes (PRO care ee oats). They are bacteria. Bacteria mostly absorb their food. Some have chlorophyll. These bacteria can be round, rod-shaped, or spiral shaped. The other phylum is the cyanobacteria. They are often called blue-green bacteria. They can make their own food using chlorophyll and are mostly blue-green in color.



More recently, a six-kingdom classification system has been used. The six divisions are animal, plant, fungi, protist, eubacteria, and archaeobacteria. The last two divisions are used based on the type of cells the organism has, whether or not it can make its own food, and the number of cells in each organism. Because some bacteria are chemically different, the monera kingdom was separated into the two new kingdoms.

A new discovery in 1983 led to the reclassification. Scientists took a water sample from a thermal vent deep in the Pacific Ocean. Hot gases and molten rock poured out of the Earth's interior. They found archaeobacteria (ahr kee back TIER ee uh) in the water samples where no life was thought to exist. The word archaeobacteria means "ancient bacteria." Scientists think that modern-day archaeobacteria were similar to Earth's early life forms, existing on Earth billions of years before the dinosaurs lived.

Some archaeobacteria can make their own food (autotrophic). Some must get their food from other organisms (heterotrophic). Some live in boiling hot springs in Yellowstone National Park. Some can live in very acidic environments. Some may even live inside of you. Archaeobacteria have also been found in the intestines of animals, in sewage, and in swampy mud. These bacteria are the cause of the foul smells that you may think of when you think of these places. Some live in anaerobic environments, or places without oxygen. To them, oxygen is poison. These "extremophiles" who live in extremely hot, acidic, or anaerobic environments have been separated in the classification system from the eubacteria. Their cell membrane and RNA are also chemically different from the eubacteria.

Most bacteria is classified in the kingdom of eubacteria (YOU back tier ee uh). They are also one-celled prokaryotes. Some make their own food. They float on the surface of water and use the energy of the sun to make food and oxygen. These bacteria, scientists believe, added oxygen to the Earth's atmosphere billions of years ago. Even today, they still contribute oxygen to our atmosphere. Most eubacteria do not live in extreme environments. The classification system that began with Carolus Linnaeus's two kingdoms will probably continue to change as new discoveries are made.

Name _____



Date _____

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Questions

- _____ 1. In the monera kingdom, all organisms are:
- A. one-celled organisms
 - B. bacteria
 - C. both a and b
- _____ 2. What are prokaryotes?
- A. unicellular organisms who have a membrane-bound nucleus
 - B. multi-cellular organisms whose cells have membrane-bound nuclei
 - C. one-celled organisms whose cell lacks a membrane-bound nucleus
- _____ 3. The main difference between archaeobacteria and eubacteria is:
- A. chemical difference in the cell membrane and RNA
 - B. Archaeobacteria make their own food while eubacteria must find food.
 - C. Eubacteria make their own food while archaeobacteria must find food.
- _____ 4. Why do some scientists use a six-kingdom system instead of the five-kingdom system?
- A. because they needed more categories to group things
 - B. because they needed another category for viruses
 - C. because of chemical differences in bacteria
- _____ 5. Archaeobacteria and eubacteria share these characteristics:
- A. All members are prokaryotes.
 - B. All members are bacteria.
 - C. both a and b