

## 8. SAUERKRAUT BACTERIA - Stained (2000X)

The rod-shaped cells shown here are frequently found in pairs. This group of bacteria is responsible for the fermentive process that occurs in shredded cabbage leaves. In order to carry out the formation

of lactic acid, at least a partial exclusion of air is required during the fermentation process. This prevents decay from setting in. Use the key to name this bacterium.

## 9. SUMMARY

Frequently, bacterial cells cannot be identified by the use of shape alone. Far too many characteristics are not visible, so bacteriologists have developed other methods to help in the identification process. Bacteria are classified and identified not only by their visible traits but also by the type of colony they

form, the reaction to stains, metabolism, and enzyme action. The key provided here was intended to introduce you to techniques of classification used in taxonomy and therefore, made use of simplified traits that could be observed in microscope slides.

## KEY

- 1A General shape is SPHERICAL (Go to 2)  
 1B General shape is ROD (Go to 6)  
 1C General shape is SPIRAL (Go to 10)
- 2A Found in pairs (3)  
 2B Found in chains (4)  
 2C Found in clumps (5)
- 3A With heavy cover (capsule) *Diplococcus pneumoniae* - (the cause of pneumonia)  
 3B Without heavy cover - *Diplococcus meningitidis*  
 4A Large in size - *Streptococcus pyogenes*  
 4B Small in size - *Streptococcus lactis*  
 5A Clumps of four (tetrads) - *Micrococcus tetragenus*  
 5B Irregular clumps - *Staphylococcus aureus* - (the cause of "staph" infections)
- 6A Found in chains - *Bacillus anthracis* - (the cause of Anthrax)  
 6B Found in pairs - *Bacillus lactis*  
 6C Found singly (7)
- 7A Containing a spore (8)  
 7B Not containing a spore (9)
- 8A Spore near the end - *Bacillus botulinum* - (the cause of Botulism poisoning)  
 8B Spore at one end - *Bacillus tetani* - (the cause of Tetanus infection)  
 9A With flagella - *Salmonella typhi* - (the cause of Typhoid infection)  
 9B Without flagella - *Bacillus pestis* - (the cause of Plague)
- 10A Filaments - *Treponema Pallidum*  
 10B Comma shaped - *Vibrio comma*

## TAXONOMY

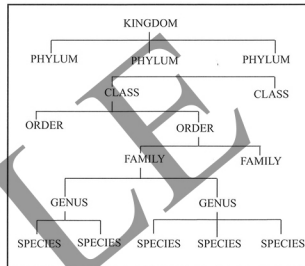
(CLASSIFICATION &amp; KEYS)

## INTRODUCTION

The branch of Biology that deals with the naming and classifying of living organism is known as TAXONOMY (taks-ON-oh-me). In this scheme, a worldwide name is provided for each kind of living organism based upon structural similarity. The present system is based upon the work of Carolus Linnaeus, a Swedish botanist. He separated living things first into very large groups called KINGDOMS. Each kingdom was then subdivided into smaller groups as depicted in the figure.

Linnaeus described each species by its GENUS (GEE-nus) name followed by only one descriptive word (both in Latin). Within each genus, no two species could be described by the same word. This two-word system of naming living things is known as "BINOMIAL (two names) NOMENCLATURE." Each organism has a two-word name; the first being the genus (Capitalized), and the second identifying the species within that genus (lower case). Man's scientific name in this system is *Homo sapiens*.

Scientists use a taxonomic tool called a "key" to identify and classify organisms. Generally, keys consist of statements that occur in pairs describing characteristics (presence or absence of structures). The key, with its paired statements, is arranged to describe smaller and smaller groupings. To learn how a key works, a key to bacterial identification



has been provided with this text folder. Examine each slide in the lesson. Begin at the top of the key for each of the slides. Choose the statement that best describes the bacterium you see on the slide. At the end of the statement you selected, you are referred to still another set of choices. Eventually, at the bottom of the key, the scientific name of the organism on the slide will be given. The magnification given, for example Slide 1 - (1200x) means that the microscope was set at that power when the photograph was taken.

## 1. BACTERIA IN PAIRS (1200X)

This particular organism can thrive in the respiratory tract of man and animals. The individual spherical cells are frequently grouped in pairs (see slide). Four of the pairs are enclosed in a delicate, well-marked capsule. In 1928, Frederick Griffith, a British bacteriologist, found that the capsule

prevented white blood cells from effectively destroying cells of this bacterial strain. Similar bacteria without the protective capsule were found to be noninfectious. Name this bacterium - use the key.