GOLD NUGGET

Diversity Of Soil Organisms

Soil is one of the most diverse habitats on Earth. ***Nowhere in nature are species so densely packed as in soil communities.*** For example, a single gramme of soil may contain millions of individuals and several thousand species of bacteria. The complex physical and chemical nature of the soil, with a porous structure, immense surface area and extremely variable supply of organic materials, food, water and chemicals, provides a range of habitats for a multitude of organisms. These range from macro- to micro-levels depending on climate, vegetation and physical and chemical characteristics of a given soil. The species numbers, composition and diversity in a particular ecosystem depend on many factors including temperature, moisture, acidity, nutrient content and the nature of the organic substrates.

Soil biota includes:
Archaea, bacteria, protists, tardigrades, rotifers, nematodes, acari (mites), collembolans (springtails), worms (enchytraeids and earthworms), macroarthropods (e.g. ants, termites, centipedes, millipedes, woodlice, etc.) and burrowing mammals.
It also includes plant roots, fungi and lichens. Root exudates attract a variety of organisms that either feed directly on these secretions or graze on the microorganisms concentrated near the roots, giving this busy environment the name 'rhizosphere'.
There are also animals, such as beetle larvae, flies and butterflies, that use the soil as a temporary habitat to reproduce or to spend their early life stages feeding on different live and dead plant materials until they reach their maturity.
Soil communities are so diverse in both size and numbers of species, yet they are still extremely poorly understood and in dire need of further assessment. Research has been limited by their immense diversity, their small size and the technical challenge of identifying them

Organisms can be classified in different ways.
Taxonomy (from Ancient Greek τάξις *taxis*, 'arrangement' and -νομία *-nomia*, 'method') is the science of defining groups of biological organisms on the basis of shared characteristics and giving names to those groups. The rank-based method of classifying living organisms we use today was originally popularised by Swedish botanist **Carl Linnaeus** (1707-1778 who used seven taxonomic ranks to classify 10, 000 species of organisms: **kingdom, phylum, class, order, family, genus and species**. Other ranks and sub-ranks have been added over the years. His system uses binomial nomenclature (i.e. the combination of a genus name and a second term), which together uniquely identify each species of organism within a kingdom. Both names use Latin grammatical forms and they must be written in italics, or underlined when handwritten. Furthermore, in modern usage, the first letter of the first part of the name, i.e. the genus, is always capitalised in writing, while the specific epithet is not. For example, the human species is identified by the name *Homo sapiens*. When the specific name cannot be identified, the abbreviation 'sp.' is used to accompany the genus name (e.g. *Lumbricus* sp.). The abbreviation 'spp.' (plural) indicates 'several species' in that particular genus (e.g. *garicus* spp.). These abbreviations are not italicised (or underlined).

When **Linnaeus** developed his classification system, there were only two kingdoms, **Vegetabilia (plants) and Animalia (animals)**. The advances in microscopy and staining techniques led to the identification of new organisms and a better understanding of cell structure and functioning. Although a general consensus has not yet been reached on how many kingdoms there are, all proposed classification schemes are based on three main criteria: cell type (prokaryote without a membrane-bound nucleus – *karyon* – or eukaryote with a nucleus and other organelles enclosed within membranes); the number of cells in the body (single cell or multicellular); and the ability to obtain food (autotroph or heterotroph).

Farming Secrets says: When We Appreciate Soil Diversity We Will Farm With Nature

Ref: A Global Atlas of Soil p 31 - 32