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Why Study Dendrology

What is dendrology?

The term dendrology (dendrología in Spanish) is a scientific and artificial word. It is derived from two Greek words meaning trees and discourse or study, or the study of trees. A review of the history of usage of the term has been made by William A. Dayton (Dayton 1945).

Dendrology, then, is a division of forestry or botany that treats of the taxonomy of trees and other woody plants, including nomenclature, classification, identification and distribution.

Dendrology is an introduction to identifying and understanding trees in the urban environment. It explains the classification of trees, naming trees and tree identification. This unit also includes information on how characteristics of the urban environment influence tree identification.

The study of tropical dendrology has five principal objectives:

1- **Nomenclature of trees:** To learn how trees are named, including scientific names, common names, and the code of botanical nomenclature.
2- **Classification of trees:** To learn how trees are classified into families, genera, and other groups according to their arrangements. To learn the names and characteristics of the common and important botanical families of trees.
3- **Identification of trees:** To be able to place an unknown tree in its family. To learn how to find the name of unknown trees or to identify trees by means of keys, manuals, and floras. To know the reference books for identification of the trees of your country. To learn how to collect botanical specimens. To learn how to maintain and use a herbarium.
4- **Distribution of trees:** To learn how trees are distributed into climatic zones and forest types. To know the geographic distribution of important forest trees.

5- **Important forest trees:** To know the important forest trees of your country, including scientific names, common names, family, distribution and abundance, and uses.

What is a Tree?

Everybody knows what a tree is, but it is not easy to prepare a precise definition. It is possible to classify seed plants, or flowering plants, into four artificial groups on the basis of size and habit of the stems: trees, shrubs, herbs, and vines. The ancient Greek Theophrastus (372 to 287 BC), disciple of Aristotle and called the Father of Botany, distinguished trees, shrubs, and herbs. These artificial groups are not related to the natural classification of botany into the botanical families.

Terminology Forestal are modified slightly here. (Gonzalez Vale 1950),

1. **Tree** (arbol): A woody plant that has a well-defined, erect, perennial trunk and a more or less definitely formed crown and that generally attains a height of at least 12 to 15 feet (or 4 to 5 m) and a trunk diameter at height (dbh) of 7 to 10 in (18 - 25 cm).
2. **Shrub** (arbusto):A perennial woody plant smaller than a tree, usually with several perennial stems branched from the base.
3. **Herb** (hierba): A plant with an herbaceous or soft stem, annual or perennial, but not woody. (An herb can be annual or perennial or, in cold climates, have a stem that dies to the ground each year).
4. **Vine** (bejuco): A woody or herbaceous plant with the stems not erect but depending on other plants or objects for support.

The Nomenclature of Trees

Nomenclature is a division of taxonomy that treats of the names of plants, including the correct names, synonyms, and rules of nomenclature. Trees, like other plants, have two kinds of names, common names and scientific names. Both are important and necessary, and both have their advantages and disadvantages.

Advantages of tree Common Names

A. They are in the language known by the people.

B. They are used by the country persons, woodsmen, people in general, and in commerce.

Disadvantages of tree Common Names

A. They change in different places, countries, and languages.

B. The same common names can be used for different species in different places, countries, etc.

C. Many species do not have their own distinct common names. There are still unknown species without names.

D. Many common names are not exac. Some species have indefinite common names that correspond only to a genus or to a botanical family.

E. There is no definite authority or code of rules governing common names and for making them uniform.

Advantages of Scientific Names

A. They are uniform in a universal system in use throughout the world.

B. They are in the Latin language, which is the language of no country does not change through the years.

C. They show the classification and relationships of the species.

D. There is an International Code of Botanical Nomenclature with rules for scientific names and for naming new species.

Disadvantages of Scientific Names

A. They are strange and long.

B. They are not used by most people.

The **Latin** language that was used by the scholars of past centuries was continued by the biologists for the scientific names of plants and animals. A few centuries ago, the botanists

were studying medicinal plants or herbs and wrote books with the descriptions and text in Latin. The Latin description of a phrase served as the name.

Carolus Linnaeus (1707 - 1778), the distinguished Swedish naturalist, established the binomial system of nomenclature in the year 1753. In that year he published in Latin his hook Species Plantarum (Species of Plants), which is the beginning of modern botanical nomenclature (Linnaeus 1753).

The binomial system of nomenclature, or system of two names, means that the name of each species of plants consists of two Latin words, the genus and the specific epithet. (The same system is used for animals).

Abbreviation of Names of Authors

The names of some authors are written in abbreviated form after the scientific names. Generally, these are botanists who have named many species or who have long names.

Complete names of these persons can be found in glossaries of some botanical references. Usually, the abbreviation stops just before the second vowel. An exception is that of Carolus Linnaeus, which is only "L." For example, *Rhizophora mangle* L., mangrove or mangle.

Double Citation of Names of Authors

Some scientific names of plants are followed by names of two authors, the first in parenthesis. For example, Delonix regia (Bojer) Raf., flamboyant-tree or flamboyán. This means that the first author gave the name of the specific epithet but in another genus or as a variety. Afterwards, the second author changed the name and put the specific epithet in this arrangement. In this case the earlier name, which also is now in use, is Poinciana regia Bojer. Some botanists regard Delonix as a genus distinct from Poinciana and others do not.

The Classification of Trees

Classification is a division of taxonomy that treats of the botanical arrangement of plants into groups, such as families and genera, in accord with the relationships.

This is the problem. There are approximately 350,000 known species of living plants. It is not possible to study and know them all one by one. How can they be arranged into groups for study, for compilation of data on the characteristics, and for organization of all this information.

There are two kinds of classifications:

Artificial classifications: An artificial classification is a simple and convenient arrangement but is not done according to the relationships. It is like compartments in a box or cabinet, one compartment for each species. The ancient Greek Theophrastus proposed the artificial classification previously mentioned. This arrangement of plants on the basis of stem habit as trees, shrubs, or herbs is useful and convenient. Foresters study mainly the trees, which form an artificial group.

Natural classifications: A natural classification attempts to group together similar plants according to their relationships. After Linnaeus, other botanists proposed natural systems of classification of plants. In these works, the species were arranged in natural groups such as families. The French botanist Antoine de Jussie devised one of the first natural systems in the year 1789.

The categories of the plant kingdom

In the natural classification, the species of trees and other plants are arranged into groups of small and large rank in a hierarchy. These groups of the plant kingdom are placed in categories. The categories are in Latin and also in modern languages. They are listed below in Latin, English, and Spanish, with examples.

Latin: Regnum Vegetable Divisio Classis Ordo Familia Genus Species (Varietas)

English: Plant Kingdom Division Class Order Family Genus Species (Variety)

Spanish: Reino Vegetal División Clase Orden Familia Genera Especia (Variedad)

Then, the most important unit in the botanical classification is the species. Each individual, tree or other plant, belongs to a species and only to one particular species. It is difficult to define a species and also the other categories. It can be said that the species is composed of individual plants (or animals) that are similar in appearance and that can reproduce or breed among themselves and produce other individuals resembling the parents.

A **genus** is a group of related species. A family also is composed of a group of related genera. An order consists of a group of related families, etc.

The **variety** is a division or minor variation of a species or a group of individuals that differ slightly from the others. The majority of species have no varieties or are not divided into varieties. Varieties are named, particularly in cultivated species.

Scientific names of families and higher categories are plural, while names of genera, species, and varieties are singular.

The name of an order ends in ales and is derived from its type family. For example, geranial's is from the family geraniaceae, which is derived from the genus Geranium. The termination of names of the botanical families is **-aceae**. However, the code permits the use of eight exceptions with endings in **-ae**, such as Guttiferae.

Classification	Loblolly Pine	Southern Red Oak
Kingdom	Planta	Planta
Division	Spermatophyta	Spermatophyta
Class	Gymnospermae	Angiospermae
Order	Coniferales	Dicotyledeae
Family	Pinaceae	Fagaceae
Genus	*Pinus*	*Quercus*
Species	*Pinus taeda*	*Quercus falcata*
Common name	loblolly pine	southern red oak

Classification	Definition
Kingdom	All living things are classified into kingdoms (e.g. plants and animals). Trees are in the plant kingdom.
Division	This is the first category of the plant kingdom and is based on the plant's means of reproduction. Trees, in the Spermatophyte division, reproduce through seeds.
Class	Trees are then divided into two classes, Gymnosperms and Angiosperms, by the method they use to develop the seeds used for reproduction. Gymnosperms, such as conifers, produce an open seed on a structure such as a cone. Angiosperms are flowering trees that have seeds enclosed in an ovary.
Order	Trees are further classified into orders according to certain other characteristics of seed reproduction. Angiosperms are divided into two major groups, monocotyledons and dicotyledons, based in part on the number of primary leaves (one or two) present in the seed plant. The *Sabal palmetto* is an example of a monocotyledon. Most trees are dicotyledons, such as members of the walnut or oak families.
Family	A group of closely related trees, usually including one or more genera (plural of genus) make up a family. The rose family, Rosaceae, is a family in the dicot group, and includes cherry, apple, and pear trees.
Genus	A collection of closely related species is a genus. The species usually are structurally similar or have common ancestry. Examples are the cherry and plum trees that are a genus, *Prunus*, of the rose family.
Species	A collection of individuals with characteristics so similar that they suggest common parentage, a species is a tree distinct and unlike others. The black cherry, *Prunus serotina,* is a species of the genus *Prunus*. Species is the basic, and probably most important (Dirr 1990) unit of taxonomy or classification of a tree.