

Taxonomy

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What is taxonomy?

- Is the science of identifying and naming of species and organizing them into system of classification.
- **Taxonomy** is a hierarchical system for classifying and identifying organisms. This system was developed by Swedish scientist Carolus Linnaeus in the 18th century.

Binomial Nomenclature

- Linnaeus's taxonomy system has two main features that contribute to its ease of use in naming and grouping organisms. The first is the use of **binomial nomenclature**. This means that an organism's scientific name is comprised of a combination of **two terms**. These terms are the **genus** name and the **species** or epithet. Both of these terms are italicized and the genus name is also capitalized.

- For example, the scientific name for humans is *Homo sapiens*. The genus name is *Homo* and the species is *sapiens*. These terms are unique and no other species can have this same name.

- The second feature of Linnaeus's taxonomy system that simplifies organism **classification** is the ordering of species into broad categories. There are seven major categories: **Kingdom, Phylum, Class, Order, Family, Genus, and Species.**

SYSTEMS OF CLASSIFICATION

- Artificial
- Natural
- Phenetic
 - Numerical
 - Cytotaxonomy
 - Chemotaxonomy
- Phylogenetic

ARTIFICIAL CLASSIFICATION

Artificial classification is the system of classification which uses only gross superficial morphological characters such as habit, colour and shape of leaves etc. They were based mainly on vegetative characters or on the androecium structure.

DRAWBACKS:

- They separated the closely related species since they were based on a few characteristics.
- They gave equal weightage to vegetative and sexual characteristics.

NATURAL CLASSIFICATION

- Natural classification systems were based on natural affinities among the organisms and consider, not only the external features, but also internal features, like ultra-structure, anatomy, embryology and phytochemistry. This classification for flowering plants was given by George **Bentham** and Joseph Dalton **Hooker**.

PHENETIC CLASSIFICATION

NUMERICAL TAXONOMY

Numerical taxonomy is carried out using computers is based on all observable characteristics. Numbers and codes are assigned to all the characters and the data are then processed.

CYTOTAXONOMY

Cytotaxonomy is based on cytological information like chromosome number, structure and behavior.

CHEMOTAXONOMY

Chemotaxonomy uses the chemical constituents of the plant to resolve confusions.

- **Classification denotes the arrangement of a single plant or group of plants in a distinct category following a system of nomenclature, and in accordance with a particular and well established plan.**
- **Some of the earlier systems of classification of angiosperms were artificial systems, since they used only certain superficial characteristics as the basis.**
- **With more and more detailed study on the morphological, physiological and reproductive aspects of angiosperms, the artificial systems of classifications were replaced by the natural systems of classification.**

George Bentham

1800-1884



Joseph Dalton Hooker

1817-1911



GENERA PLANTARUM

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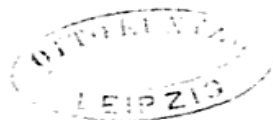
AUCTORIBUS

G. BENTHAM ET J. D. HOOKER.

VOLUMEN PRIMUM,

SISTENS DICOTYLEDONUM POLYPETALARUM ORDINES LXXXIII

RANUNCULACEAS—CORNACEAS.



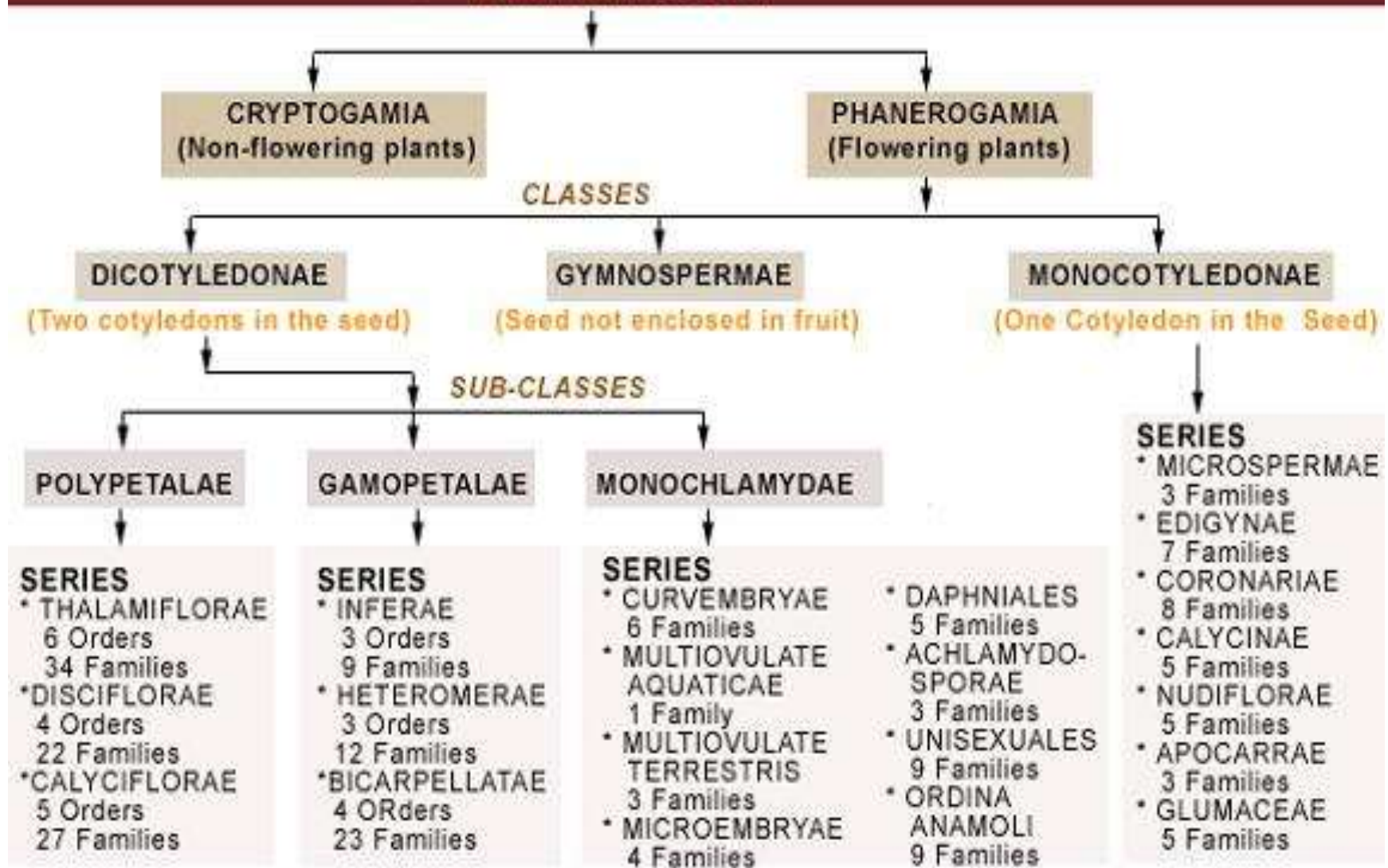
LONDINI:

VENIT APUD

REEVE & CO., 5, HENRIETTA STREET, COVENT GARDEN;
WILLIAMS & NORGATE, 14, HENRIETTA STREET, COVENT GARDEN.

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PLANT KINGDOM



Class Dicotyledonae

- This group includes angiosperms in which the seed bears two cotyledons and leaves exhibit reticulate venation. It is divided into three subclasses - Polypetalae, Gamopetalae and Monochlamydae.

Class Gymnospermae

- This group includes the gymnosperms in which seeds are not enclosed in fruits. This class is divided into three families Gnetaceae, Coniferae and Cycadaceae.

Class Monocotyledonae

- This group includes angiosperms in which the seed bears only one cotyledon. The leaves exhibit parallel venation. It is divided into the following seven series.

Sub-class Polypetalae

- The flowers contain distinct non-essential whorls calyx and corolla. In the corolla petals are free. This sub-class includes 3 series Thalamiflorae, Disciflorae and Calyciflorae.

- Series Thalamiflorae: Many stamens in the androecium. Flower is hypogynous.
- Series Disciflorae: Hypogynous flowers with a cushion-like disc around or below the ovary.
- Series Calyciflorae: Flowers epigynous or perigynous. Thalamus is in the form of a cup.

Sub-class Gamopetalae

- Flowers with distinct calyx and corolla. In the corolla petals are fused. This sub-class includes 3 series.
- Series Inferae: Flowers with inferior ovary.
- Series Heteromerae: Flowers with superior ovary. Number of carpels - more than two.
- Series Bicarpellatae: Flowers with superior ovary. Number of carpels - two.

Sub-class Monochlamydae

- The flowers are with only one non-essential whorl (perianth) or absence of non-essential whorls. It includes 8 series.
- Curvembryae: Usually single ovule, embryo coiled around the endosperm.
- Multiovulate Aquaticae: Aquatic plants with syncarpous ovary and many ovules.
- Multiovulate Terrestris: Terrestrial plants with syncarpous ovary and many ovules.
- Microembryae: Only one ovule, small, tiny embryo endospermic seed.

- Daphnales: Only one carpel and single ovule.
- Achlamydosporae: Ovary inferior, 1 to 3 ovules - unilocular.
- Unisexuales: Flower unisexual, perianth usually absent.
- Ordines Anomali: (Anomalous families) Plants with uncertain systematic position but closer to unisexuales.

Class Monocotyledonae

- This group includes angiosperms in which the seed bears only one cotyledon. The leaves exhibit parallel venation. It is divided into the following seven series.
- Microspermae: Ovary is inferior, seeds are minute and non-endospermic.
- Epigynae: Ovary inferior, seeds are large and endospermic.
- Coronarieae: Ovary superior, perianth petaloid.
- Calycinae: Ovary superior, perianth sepalloid.
- Nudiflorae: Perianth reduced or absent. Seeds are endospermic.
- Apocarpae: Carpels more than one, free, seeds are endospermic.
- Glumaceae: Perianth reduced or absent, scaly bracts present.

Gymnosperms were placed between Dicots and Monocots.

Many important floral characters were neglected.

It is not a phylogenetic scheme.

Some of the closely related families have been separated and placed under different cohorts and a number of unrelated families put together.

Some advanced families like *Orchidaceae* have been regarded as primitive by placing in the beginning.

A scenic landscape featuring a calm lake in the foreground, a dense forest of green trees along the shoreline, and a range of rugged, snow-capped mountains in the background under a sky with soft, colorful clouds. A vibrant border of various flowers, including red, yellow, and purple blooms, runs along the bottom edge of the image.

THANK YOU