

# SYSTEMS OF PLANT CLASSIFICATION

(A Brief description of important systems)

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The various systems of classification, right from Theophrastus till date, have been categorised and placed under three major groups i.e., Artificial, Natural and Phylogenetic. This categorisation is mainly based on two facts —

- (i) characters of plants i.e., structural resemblance / gross morphology taken to study and classify them according to available information / knowledge
- (ii) the concept which prevailed during that period, for example the thinking to consider gross morphology changed to study phylogenetic consideration or genetic relationship of the taxa also with the acceptance of Darwin's theory of evolution in 1858.

## ARTIFICIAL SYSTEMS:

- (a) The earliest systems of classification,
- (b) prevailed from 300 B.C. upto about 1830 A.D.,
- (c) based on the study of one or few characters
- (d) began with Theophrastus (370-287 B.C.) and continued upto Linnaeus.

## Theophrastus (370-287 B.C.):

A Greek naturalist and was the disciple of Plato and Aristotle. He is called as "the father of Botany". He classified plants into four groups on the basis of their habit i.e., Herbs, Undershrubs, Shrubs and trees.

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His monumental work was described in his de Historia Plantarum, in which about 500 plants contained with full description and names. This is considered the oldest botanical work in existence. He pointed out fundamental differences between Dicotyledons and Monocotyledons and also recognized differences between flowering and non-flowering plants, Superior & inferior ovary, free & fused petals and fruit types.

### Caius Plinius Secundus (23 A.D. to 79 A.D.):

A Roman naturalist (the decline of the Greek Empire saw the emergence of the Romans). He attempted to compile everything known about the world in an extensive 37-volume work Historia naturalis, 9 vols. of which were devoted to medicinal plants.

### Pedanius Dioscorides (62-128 A.D.):

He described about 600 medicinal plants in his book Materia Medica, written in Greek.

With the decline of the Greek and Roman civilization, there was no significant botanical progress for over 1400 years. In the 16th century several herbalists took interest revived the plant science learning - some prominent works were those of Andrea Caesalpinho (1519-1603 A.D.), Gasparol Bauhin (1560-1624 A.D.), John Ray (1628-1705), de Tournefort (1656-1708), Rudolph Camerarius (1665-1721) and Carolus Linnaeus (1707-1778).

### Andrea Caesalpinho (1519-1603 A.D.):

An Italian and the author of De Plantis (1583) which carries the description of over 1500 plants. He prepared a herbarium of 768 plants which is still preserved in the Museum of Natural History at Florence. He divided plants into two major groups based on woody and herbaceous habits. Further grouping was based on fruit, seed and embryo characters.

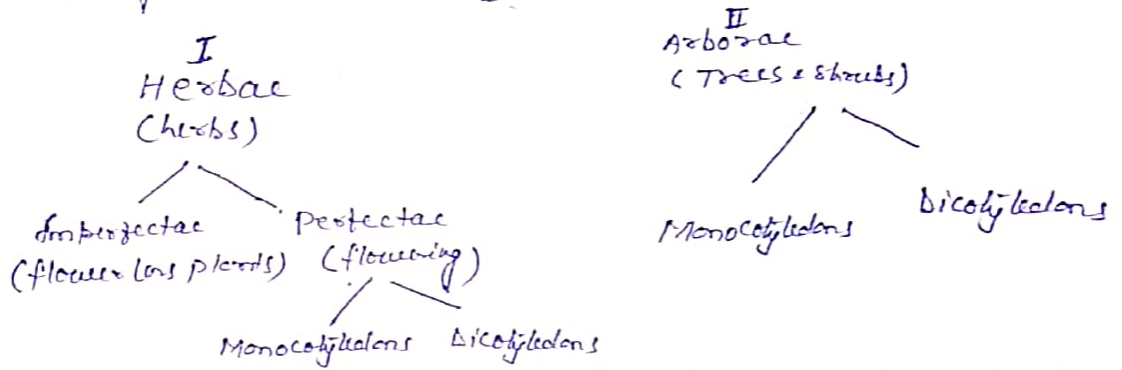


Gaspard Bauhin (1560 - 1624 A.D):

A Swiss botanist and collected plants from different places like Italy, France and Switzerland and formed a herbarium of 4000 specimens. A list of 6000 species contained in his Pinax Theatri Botanici (1623), in which he made first attempts to use a binomial system of nomenclature for several species.

John Ray (1627 - 1705):

An English botanist. His most notable contribution was Historia Plantarum (1686-1704), a three volume work, which was an improved version of his originally proposed system in Methodus Plantarum nova (1682). He was first to divide major groups of herbs and trees into Dicotyledons and Monocotyledons.



His system was the foundation stone for Natural system of classification.

Tournefort (1656-1708):

A French botanist. published Elements de Botanique (1694) which contained descriptions of 698 genera and 10146 species along with 450 illustrations. He was first to provide characterization of genera and to define them accurately (an advancement over Bauhin, who recognized genera and species but provided no such descriptions).

Rudolf Camerarius (1665-1721):

A German, first to recognize sex in plants (flowers) and established that pollen was necessary for fertilization. This was a turning point and saw renewal in botanical interests, which was later exploited by Linnaeus for classifying flowering plants.

Carolus Linnaeus (1707-78):

A Swedish naturalist, who dominated the 18th century in botanical world, known as "Father of Taxonomy". He was interested in sexuality of plants and published several research papers and few books, First paper as student came in 1729 under the guidance of Professor Olof Rudbeck. His

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famous books were Philosophia Botanica (1751), which contained revised version of his system published previously in classes plantarum (1738) and Systema Naturae (1735), and Species Plantarum <sup>(1753)</sup> were the notable contributions.

### Few facts about Species Plantarum

- About 7,300 species are described,
- Arranged according to his "sexual system of classification"
- Consistent use of binomial system system of plants naming was introduced.
  - ↳ the first word generic
  - the second one specific epithet.
- This formed the foundation for several taxonomists and taxonomists thereafter consistently used binomial namings.

### Few facts about the System

- Although his system was Artificial, he was the first to recognize of flower and fruit structure.
- He emphasized the numerical relationship of sex organs.
- The number, size and union of stamens formed the basis of classification
- He divided plants a total of 24 classes
- The 24 classes are -
 

<ol style="list-style-type: none"> <li>1. Monandria (stamens one)</li> <li>3. Triandria (stamens-3)</li> <li>5. Pentandria (stamens-5)</li> <li>7. Heptandria (stamens-7)</li> <li>9. Enneandria (stamens-8)</li> <li>11. Dodecandria (stamens 11 to 19)</li> <li>13. Polyandria (stamens 20 or more attached to the receptacles)</li> <li>15. Tetradynamia (stamens tetradynamous)</li> </ol>	<ol style="list-style-type: none"> <li>2. Diandria (stamens-2)</li> <li>4. Tetrandria (stamens-4)</li> <li>6. Hexandria (stamens-6)</li> <li>8. Octandria (stamens-8)</li> <li>10. Decandria (stamens-10)</li> <li>12. Icosandria (stamens 20 or more, attached to calyx)</li> <li>14. Diandrye (stamens dialygamous)</li> <li>16. Monadelphica (stamens monadelphous)</li> </ol>
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- 17. Diadelphía (stamens adadelphous)
- 18. Polyadelphía (stamens polyadelphous)
- 19. Syngæcia (stamens syngæcious)
- 20. Gynandria (stamens adnate to gynoecium)
- 21. Monoecia (Plant monoecious)
- 22. Dioecia (Plant dioecious)
- 23. Polygamia (Plants polygamous)
- 24. Cryptogamia (flowers concealed i.e., algae, fungi, mosses, ferns) (Non-flowering plants)

f. The system of Linnaeus remained dominant for about 75 years until it was replaced by the system of de Jussieu and de Candolle, (Emergence of Natural System).

Contd.

Books Consulted

- 1. Taxonomy of Angiosperms by V. Singh & B.K. Jain
- 2. Plant Systematics by G. Charan Singh

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