

# Bentham and Hooker's System of Classification

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Paper - VII  
Study Material - 6th  
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## INTRODUCTION

- (i) The system was given by George Bentham (1800-1884) and Sir Joseph Dalton Hooker (1817-1911).
- (ii) Both were associated with Royal Botanic Garden, Kew, England. Sir Hooker was the director there.
- (iii) They gave their classification in between 1862-1883, which was published in Genera Plantarum in three volumes.
- (iv) This was the greatest taxonomic work ever produced by British Botanists.
- (v) This monumental work comprised the description of all genera of seed plants known to science at that time.
- (vi) This is not a compilation work of earlier authors but they prepared the description by actually examining the specimens.

## DESCRIPTION

- (i) This is the most accomplished and widely accepted NATURAL SYSTEM of classification.
- (ii) The delimitation of families and genera was based on natural affinities and was pre-Darwinian in concept.
- (iii) The classification was a refinement of the systems proposed by A.P. de Candolle and Lindley, which in turn were based on that of de Jussieu.
- (iv) It contained 202 families (originally described as orders; originally 200 such orders - 2 orders added later on), 7569 genera and 97,205 species.
- (v) The seed plants or Phanerogams were divided into three classes - DICOTYLEDONES, GYMNOSPERMAE, MONOCOTYLEDONES

(VI) Dicotyledones were further sub-divided into three sub-classes - POLYPETALAE, GAMOPETALAE, and MONOCHLAMYDEAE, based on presence and absence of petals and their fusion. These were further subdivided into series, Order (called Cohorts) and families (called natural Orders).

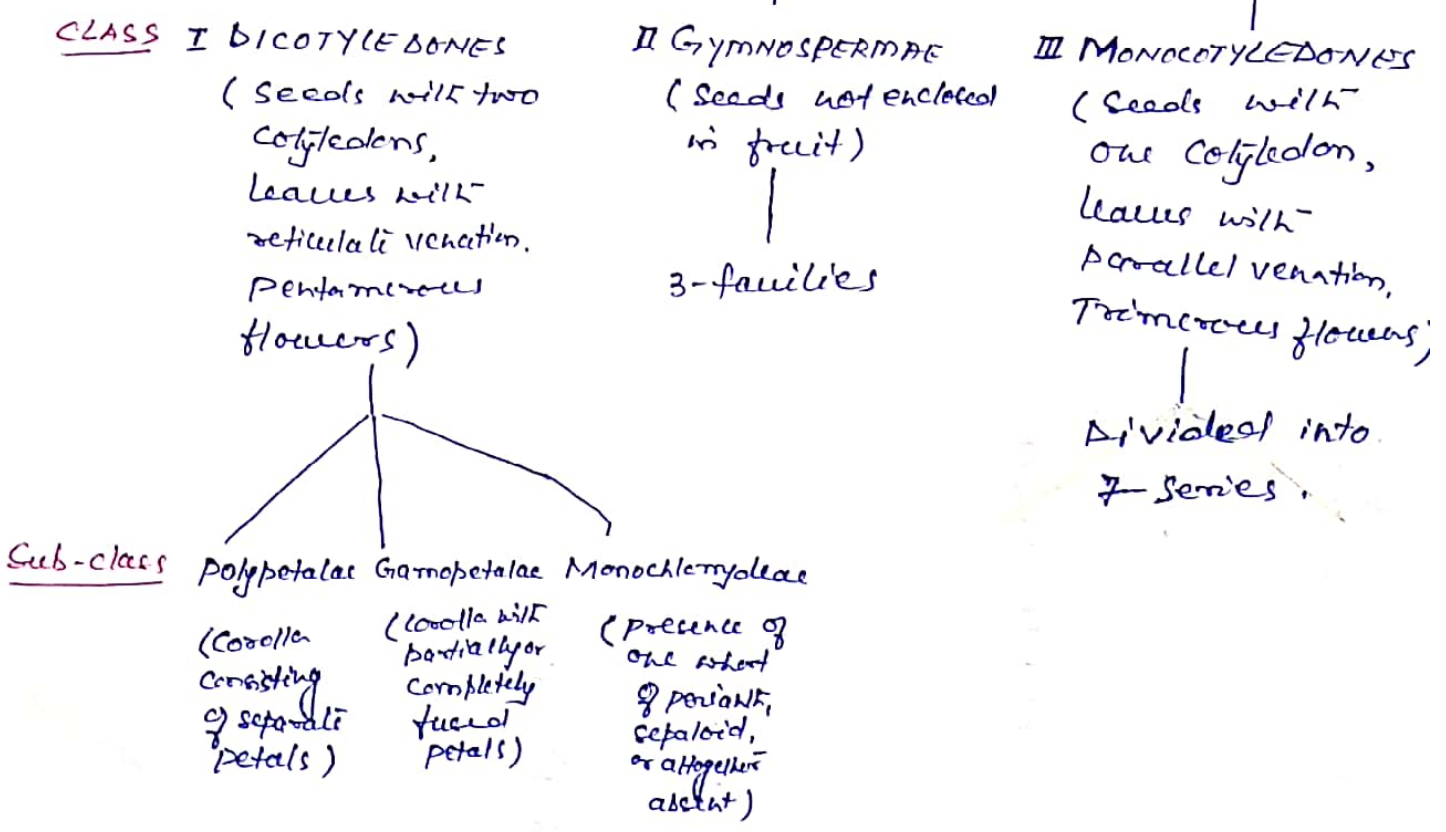
Monochlamydeae was ~~directly~~ <sup>indirectly</sup> divided into series which <sup>in turn</sup> was <sup>directly</sup> divided into families (orders).  
no cohorts.

(VII) Monocotyledones were also divided directly into series and families under the series. No orders (cohorts) were <sup>there</sup>.

(VIII) The Gymnospermae, divided into families.

Broad outline of the System

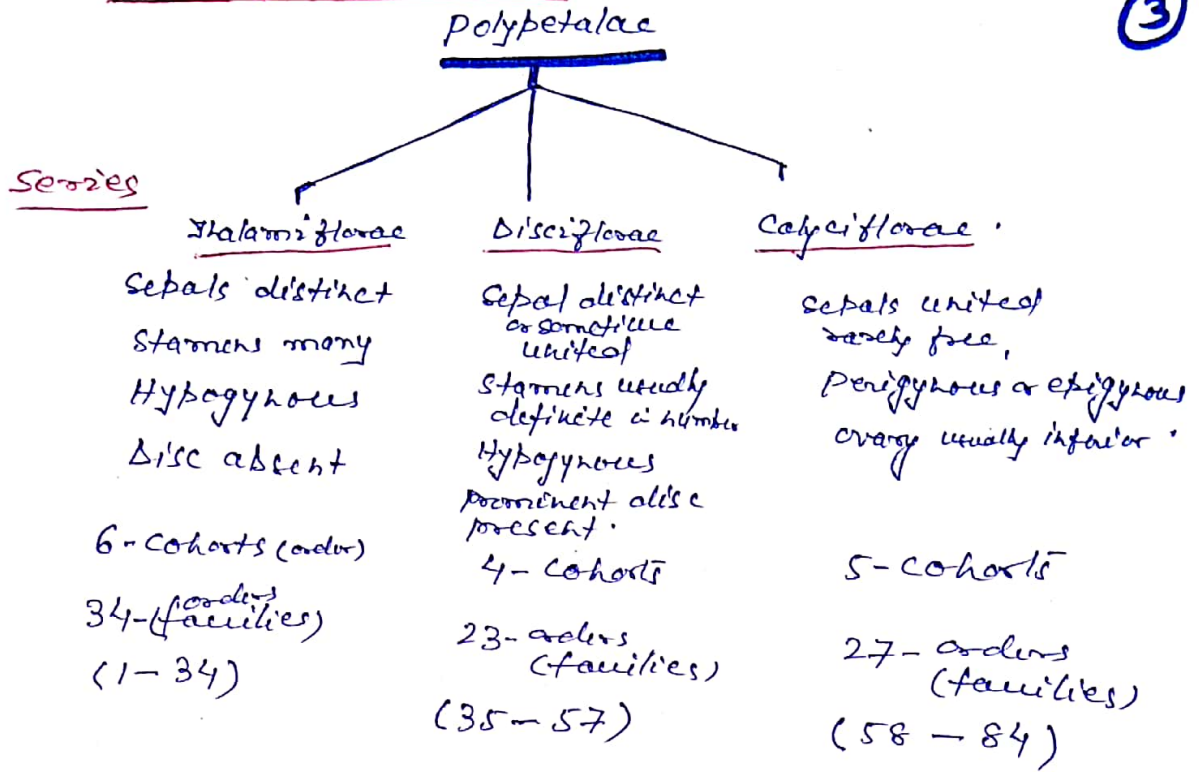
Seed Plants.



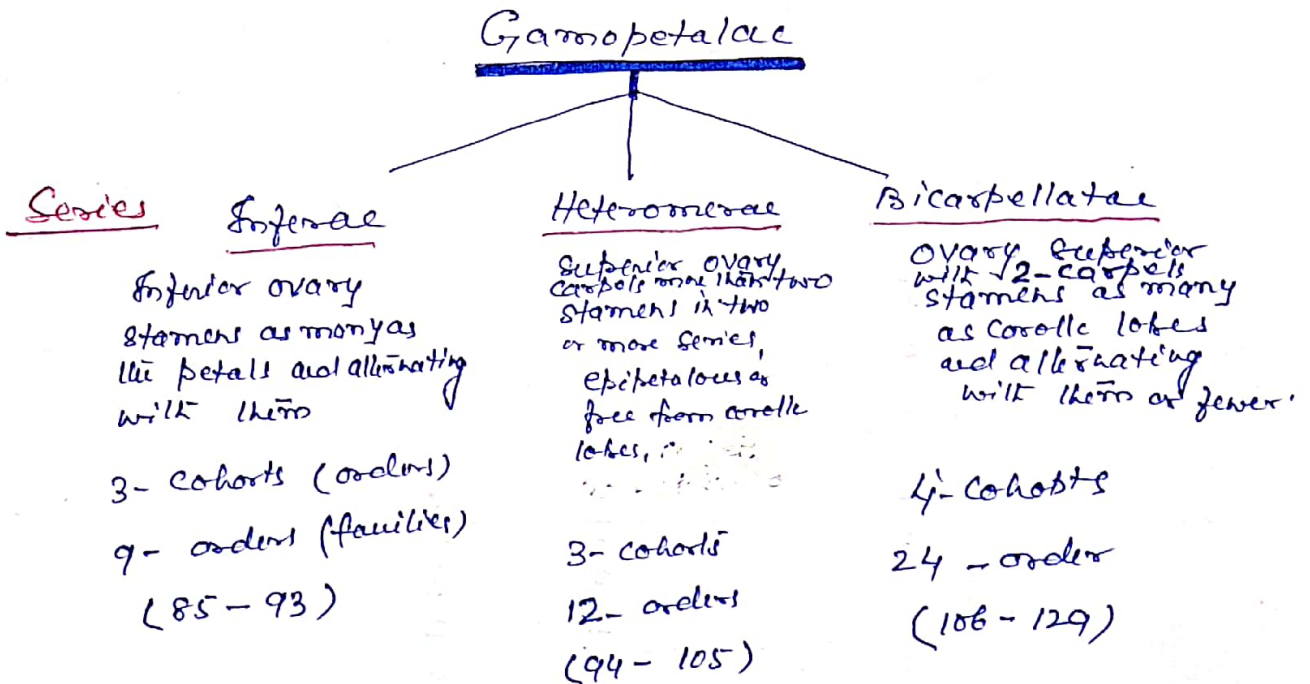
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# I - DICOTYLEDONES



Note Polypetalae contained 11 cohorts (orders) and 84 orders (families)



Note: Gamopetalae contained 10 cohorts (orders) and 45 orders (families).



## Monochlamydeae :

### Series

1. Curvembryaceae - Ovule generally one, embryo curved,  
7 - orders (families)  
(130 - 136)
2. Multi-ovulatae aquaticae - Ovules many, ovary syncarpous  
Plants aquatic  
One - order (family)  
137.
3. Multi-ovulatae terrestres - Ovules many, ovary syncarpous,  
Plants terrestrial.  
03 - orders (families)  
(138 - 140)
4. Microembryaceae - Embryo very minute, ovary apocarpous or  
syncarpous, with single ovule.  
04 - orders (families)  
(141 - 144)
5. Daphniales - Woody or herbaceous plants, Sepaloid  
Perianth, ovary with one carpel and  
2-4 ovules. 05 - orders (families)  
(145 - 149)
6. Achlamydostraceae - Usually inferior ovary, one locule,  
with 1-3 ovules  
03 - orders (families)  
(150 - 152)
7. Unisexuales - Flower Unisexual, perianth  
usually absent  
09 - orders (families)  
(153 - 161)
8. Ordines anomali - included families with  
uncertain relationship.  
04 - orders (families)  
(162 - 165)

Note: Monochlamydeae contained 36 orders (families),  
NO cohorts (orders).

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Statistics of Dicotyledones

Series - 14  
 Cohorts (orders) - 25  
 orders (families) - 165

II - GYMNOSPERMAE

3 families

- 166. Gnetales
- 167. Coniferales
- 168. Cycadales

III - MONOCOTYLEDONES

Series -

1. Microspermales - Inner perianth lobes petaloid, inferior ovary, seed miculi many, exalbuminous.  
 03 - orders (families)  
 (169-171)
2. Epigynales - Inner perianth petaloid, inferior ovary, seed large few-many.  
 07 - orders (families)  
 (172-178)
3. Coronariales - Inner perianth petaloid, superior ovary, seeds albuminous.  
 08 - orders (families)  
 (179-186)
4. Calycinales - Inner perianth sepeloid, superior ovary, seeds albuminous. 03 - orders (families)  
 (187-189)
5. Nudiflorales - perianth absent or reduced, superior ovary, seeds albuminous.  
 05 - orders (families)  
 (190-194)

6. Apocarpae - pendant in 1-2 series or absent, Superior Ovary, apocarpous, seed exalbuminous, 03 - Orders (families)
7. Gbunaceae - Minute flowers, pendant reduced, bracts large, scaly, ovary unilocular with one ovule, 05 - orders (families)

Statistics of Monocotyledones (198-202)

Series - 07  
 Cohorts - 161  
 (Orders)

orders - 34  
 (families)

MERITS AND DEMERITS

MERITS

1. The system is easy to follow and has great practical value.
2. The system is based on a careful and comparative examination of the specimens, this not a mere compilation work.
3. Gymnosperms are treated as a separate group, and not included in dicots as was done by de Candolle.
4. Dicotyledons are placed before the Monocotyledons, a position approved by many present day authors.
5. In Polypetalae, a new series Disciflorae was added in between Thalamiflorae and Calyciflorae; a refinement over de Candolle's system.
6. Although not phylogenetic system, they placed Renales in the beginning, the plants of which have regarded as primitive by most of the authors.
7. This system is still widely followed in several countries including India and Britain, and the specimens in the herbaria are arranged accordingly.

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Correct

Demerits:

1. The system does not incorporate phylogeny, although it was published after the publication of Darwin's theory of evolution.
2. The position of Gymnosperms between dicots and monocots is not appropriate. They are an independent group of plants and placed before dicots.
3. Monochlamydeae is an unnatural assemblage of taxa, which belong elsewhere. The creation of this group has resulted in separation of many closely related families. For example Caryophyllaceae, Silicaceae and Chenopodiaceae are closely related families, but they are separated in different groups.
4. Unisexuality, i.e. unisexual flowers, is considered a loose assemblage on the basis of only one character.
5. Ordines anomali is a tentative grouping of families. ~~Some of these~~ <sup>these</sup> are separated and placed under different groups by other authors.
6. The orchidaceae is an advanced family with inferior ovary and zygomorphic flower; thus its placement in the beginning is not proper.

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Books consulted & suggested further reading

1. Plant Systematics of Gurcharan Singh.
2. Advanced Plant Taxonomy - by A.K. Mondal.
3. Taxonomy of Angiosperms - by Singh & Jain.