

Engler & Prantl's Classification

Adolf Engler, Professor of Botany, University of Berlin, Germany, proposed a phylogenetic system of classification in a book entitled Syllabus (1892). Soon after, Engler in collaboration with Karl A.E. Prantl, another German Botanist, published a monumental work entitled "**Die-Natürlichen Pflanzenfamilien**" (1887-1915) having 23 volumes, Hans Melchior published the revised edition of syllabus in 1964 with a number of modifications in this system.

As a whole 303 families of flowering plants were recognised in this system.

Outline and Basis of Classification

Unisexual, naked-flowers arranged in **Catkin** and wind pollinated were considered as the lowest grade of floral organisation by Engler and as such is called **Englerian concept**. The next stage of evolution in flower is followed by the appearance of **1-seriate** perianth leading to 2-seriate condition alongwith bisexual condition.

The outline and basis of classification of **Engler** and Prantl's system are given below:

- 1) Plant Kingdom has been divided, into **XIII** Divisions but **according** to recent modifications by Melchior (1964) the total Divisions are XVI.
- 2) Division I to **XII** dealing with Bacteria, different types of Algae, Fungi, Bryophytes, and Pteridophytes.
- 3) The **XIII** Division is named as Embryophyta Siphonogamia; It is divided into 2 sub-division based on the naked **and** enclosed ovules, that is
 - i) Gymnospermae (naked ovules)
 - ii) Angiospermae (enclosed ovules)
- 4) The sub-division Gymnospermae has been divided into 7 orders, the starting one being Cycadofilicales, the most primitive one where as the ending order is Gnetales, an advanced group of Gymnosperms.
- 5) The sub-division Angiospermae has been splitted into two
 - i) Monocotyledonae, and
 - ii) Dicotyledonae

This division is mainly based on the striking differences between **Monocots** and Dicots such as the venation of leaf, 3-merous flowers in **Monocots** where as 4-5 merous flowers are present in Dicots.

6) **Monocots** are further divided into 11 Orders and 45 Families (14 Orders and 53 Families after the revision by Hans Melchior, 1964). The first or the starting Order is Pandanales which possesses naked, unisexual flowers with Typhaceae as the Starting family. The last order is Microspermae with orchidaceae as the last family.

7) Dicots are divided into 2 **subclass** namely:

i) Archichlamydeae, and

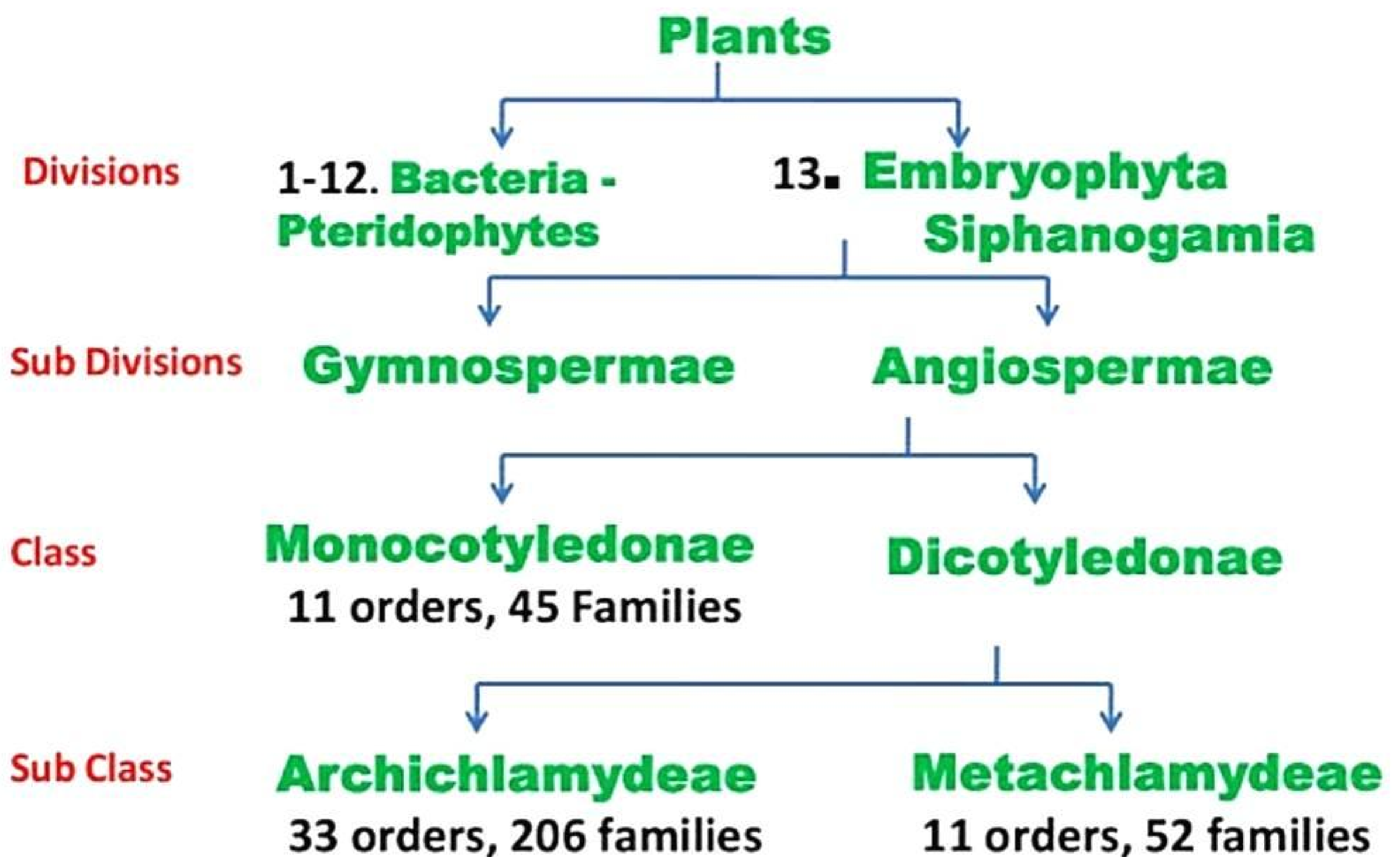
ii) Sympetalae

This division is mainly based on the condition of perianth, **1-seriate** or 2- seriate and their fusion. For example, in Archichlamydeae the flowers may be **naked** or **1-seriate** followed by 2-seriate condition but the petals are mostly free that is polypetalous condition. While in the case of syrnpetalae, as the name indicates, the petals are fused that is gamopetalous is found in this group.

8) Archichlamydeae has 33 Orders and 206 Families (37 Orders and 227 Families after the revision by Hans Melchior, 1964). The first or the starting order being Verticillatae and Casuarinaceae as the starting family, followed by some other order and **families** without perianth or reduced perianth, then **1-seriate** perianth and lastly **2-seriate** perianth. The last order being Umbelliflorae with Cornaceae as the last family.

9) Sympetalae which is also named as Metachlamydeae has 11 Orders in all with 52 Families (11 Orders and 64 Families after revision of Hans Melchior, 1964). The first or the starting Order being Ericales with Clethraceae as the starting family. The last or ending order of Sympetalae is Campanulales with Asteraceae or **Compositae** as the last or ending family and that is very rightly placed because this family is considered as the-highest evolved family among Dicot families.

Outline of Engler & Prantl Classification



The outline of the system can also be represented in the form of a chart.

**System of Classification Engler and Prantl
PLANT KINGDOM**

	Division I		
	II		
	III		
	-		
	-		
	XII Embryophyta	Siphonogamia	
Gymnospermae		Angiospermae	
1. Cycadofilicales	Monocots	Dicots	
	11 Orders	44 Orders	
	45 Families	258 Families	
	1. Pandanales		
	Typhaceae		
	2.	Archichlamydeae	Sympetalae
	3.	33 Orders	11 Orders
	4.	206 Families	52 Families
	5.	1- Verticillatae	1. Ericales
	6.	2-	- Cletheraceae
	7.	3-	
	8.	4-	
	9.	5-	
	10.	-	
	11. Microspermae-		
		-	
		-	
		-	
		-	11. Campanulales
			Asteraceae
		-	
		32 - Umbelliflorae	
		Cornaceae	

Merits

1. First major system to have organic evolution as its central idea.
2. First major step towards phylogenetic systems of classification.
3. Covers the entire plant kingdom and provides description and identification keys down to the level of family, genus and even species for large number of families.
4. Valuable illustrations and information on anatomy and geography are also provided.
5. Gymnosperms are separated and placed before angiosperms.
6. The large unnatural families of Bentham and Hooker have been split into smaller and natural families. The family Urticaceae is thus split into Urticaceae, Ulmaceae and Moraceae.
7. Monochlamydeae abolition has resulted in bringing together several closely related families.
8. The family Illecebraceae is merged with Caryophyllaceae. Chenopodiaceae and Caryophyllaceae are placed in the same order, Centrospermae.
9. Compositae in dicots and Orchidaceae in monocots are advanced families with inferior ovary, zygomorphic and complex flowers. These are rightly placed towards the end of dicots and monocots, respectively.
10. Consideration of gamopetalous condition as advanced over polypetalous condition is in line with current phyletic views.
11. Closely related families Liliaceae and Amaryllidaceae have been brought under the same order Liliiflorae.

Demerits

Engler and Prantl's concept of 'simplicity representing primitiveness' doesn't go hand in hand with angiosperms, where evolutionary reduction is a major phenomenon.

The major drawbacks of the system include:

1. The system suffers from lack of modern sense of phylogeny rendering many ideas to be outdated.
2. Angiosperms were considered a polyphyletic group although recent evidence points towards its monophyletic origin.
3. Placement of Helobiae (a primitive group) after Pandanales (an advanced group) is not correct.
4. The view that Monochlamydeous forms (single whorl of perianth) have given rise to Dichlamydeous forms (distinct calyx and corolla) is not acceptable.
5. Monocotyledons are placed before Dicotyledons was acceptable at that time but now in the recent systems, paleoherbs and sometimes Magnoliids are placed before monocots.
6. Amentiferae on the basis of its reduced floral characters was considered primitive although it is now considered advanced on the basis of anatomical, palynological and floral evidences.
7. Araceae in Monocotyledons are now believed to have evolved from Liliaceae. In this classification, Araceae are included in the order Spathiflorae which is placed before Liliiflorae, including family Liliaceae.
8. Ranales (in the broader sense) are now considered as a primitive group with bisexual flowers, spirally arranged floral parts and numerous floral members. In this classification, they are placed much lower down, after Amentiferae.