**Taxonomic evidence from Phytochemistry (Chemotaxonomy):**

The science of chemical taxonomy is based on classification of Plants on the basis of their chemical constituents. Chemotaxonomy includes investigation of compounds existing in plants, or plant parts like bark, wood, leaves, roots etc.

The phytochemicals of taxonomic significance have been classified into three main groups:

**Primary constituents:** These are proteins, nucleic acids, chlorophylls and polysaccharides.

**Secondary constituents:** These are simple phenolic or poly phenolic compounds (Flavonoids, Terpenoids, Carotenoids, Alkaloids, pigments etc.)

**Miscellaneous constituents:** These compounds include ellagitannins, iridoid compounds etc.

Development of plant natural product chemistry revealed possibility of characterizing classifying, and establishing phyletic relationships of genera, it was found that morphologically similar plants possess similar chemicals.

Primary metabolites:
(i) These are compounds present in vital metabolic pathways.
(ii) They are universal in distribution.
(iii) They are of little taxonomic value.

Chemistry of Betacyanins led to recognition of 10 families containing them. They do not occur in plants containing anthocyanins. On this basis Caryophyllaceae and Illeceberaceae is separated from Centrospermae as these two families lack betalin pigment.

Glucosinolates are widely distributed in the families kept under Capparales, members of which have specialized myrosin cells. Myrosin is enzyme involved in the formation of mustard oil. Asteraceae is divided in two tribes Tubiflorae and Liguliflorae on the presence of latex (chemical substances).

Fatty acids are primary metabolites and are not of much importance but nut oil fatty acid in Juglandaceae and Juice sac fatty acid of Citrus are of taxonomic significance.

The relative percentage of each fatty acid to the total content remains reasonably uniform e.g., John and Meiuschein (1976) studied the distribution of seed oil fatty acid in Nyssaceae and Cornaceae. Four species of *Nyssa* were analyzed and observed the percentage of Palmitic, Stearic, Linolic acid etc. and found that *Nyssa biflora* lies intermediate to *N. sylvatica* and *N. aquatica*.

Biflavonoids contain 2 flavonoid and glycones linked by a carbon-carbon (C-C) bond. These are primitive and are found in most of the Gymnosperms. Four woody genera of angiosperms are known to contain biflavonoids are Viburnum (Caprofoliaceae), Garcinia (Guttiferae), Heuea (Euphorbiaceae) and Casuarina (Casuarinaceae). The presence of biflavonoids in Casuarina supports the family to be
primitive.

Reference

- Text book of Botany. Bhattacharya, Hait & Ghosh