

## Quadrant II – Transcript and Related Materials

**Programme: Bachelor of Science (First Year)**

**Subject: Botany**

**Course Code: BOC 102**

**Course Title: Biodiversity II (Vascular Plants)**

**Unit: Classification**

**Module Name: Study of families: Asteraceae and Solanaceae**

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### Notes

#### **Asteraceae**

Asteraceae or Compositae is commonly called as 'Sunflower or Aster' family. It includes 1528 genera and 23,840 species and it is the largest family of flowering plants. Worldwide in distribution mainly in temperate and subtropical climates, in mountain regions, also common in tropics.

**Major genera:** *Senecio* (1470 species), *Vernonia* (1050), *Cousinia* (600), *Eupatorium* (590), *Centaurea* (590), *Hieracium* (470), *Helichrysum* (460), *Saussurea* (300), *Cirsium* (270), *Aster* (240), *Bidens* (210), *Chrysanthemum* (200), *Crepis* (200), *Inula* (200), *Gnaphalium* (140), *Solidago* (110), *Helianthus* (100), *Carduus* (90), *Lactuca* (90), *Taraxacum* (80), *Tragopogon* (70), *Sonchus* (50) and *Calendula* (30).

**Description:** Mostly herbs or shrubs, rarely trees (*Vernonia arborea*; *Leucomeris*) or lianas (*Vernonia scandens*), sometimes producing tubers (*Dahlia*, *Helianthus tuberosus*), usually storing inulin, laticifers usually present, rarely lacking, terpenoids usually present, usually sesquiterpene lactones, Iridoids absent. Leaves usually alternate and simple, sometimes compound (*Dahlia*, *Artemisia*), rarely opposite (*Dahlia*) or whorled, stipules absent.

**Inflorescence** is a head or capitulum, consisting of a few or large number of flowers or florets closely arranged on an axis surrounded by involucre bracts.

The whole head or capitulum is similar to a single flower because the involucre bracts perform the function of protection.

The outer or peripheral, ligulate and zygomorphic florets are called ray-florets; whereas inner or central, tubular and actinomorphic ones are called disc-florets. A capitulum may contain disc florets (discoid head - *Ageratum*, *Vernonia*), ray florets (ligulate head- *Sonchus*, *Launaea*) or both type of florets (radiate head- *Helianthus*, *Aster*). Rarely capitulum with single floret (*Echinops*) with capitula arranged into globose heads.

In capitulum or head the form of flowers and distribution of sex also varies. The flowers of a head may be all hermaphrodite, or ray-florets are female or neuter and inner one hermaphrodite, or male; rarely the complete head bears unisexual flowers.

### **Ray-florets**

**Flower** Zygomorphic, ligulate, pistillate, or neuter or sometimes also bisexual, epigynous.

**Calyx** Modified into pappus or absent or scale-like.

**Corolla** Petals 5, gamopetalous, highly coloured, ligulate, valvate.

**Androecium** Absent.

**Gynoecium** Either absent or if present then bicarpellary, syncarpous, inferior, unilocular with basal placentation, one anatropous ovule; style one; stigma bifid.

**Fruit** Absent, if present cypsela.

**Seed** Non-endospermic.

### **Disc florets**

**Flower** Bracteate, sessile, complete, hermaphrodite, actinomorphic, pentamerous, epigynous and tubular.

**Calyx** Modified into pappus or scale, persistent.

**Corolla** Petals 5, gamopetalous, tubular, coloured.

**Androecium** Stamens 5, epipetalous, syngenesious, ditheous, introrse, dehiscent longitudinally.

**Gynoecium** Bicarpellary, syncarpous, inferior, unilocular with single anatropous ovule, basal placentation; style simple, long, stigma bifid.

**Fruit** Cypsela.

**Seed** Non-endospermic.

### **Solanaceae**

The family is commonly called 'Potato family'. It includes 83 genera and 2,925 species. It is distributed both in tropics and sub-tropics, and a few members are found in temperate zone.

**Major genera:** *Solanum* (1350 species), *Lycianthus* (190), *Cestrum* (160), *Nicotiana* (110), *Physalis* (95), *Lycium* (90), *Capsicum* (50), *Hyoscyamus* (25) and *Datura* (10).

**Description:** Herbs, shrubs (*Cestrum*) or small trees (*Solanum verbascifolia*), rarely lianas, often poisonous, sometimes with prickles, underground tubers in *Solanum tuberosum*.

**Leaves** alternate, simple, rarely pinnately compound (potato), stipules absent, paired leaves adjacent on the stem are common.

**Inflorescence** cymose (*Solanum*) or of solitary flowers (*Datura*).

**Flower** bisexual, actinomorphic, hypogynous.

**Calyx** with 5 sepals, united, persistent, tubular or campanulate, sometimes enlarged and swollen in fruit (*Withania*, *Physalis*).

**Corolla** with 5 petals, united, rotate (*Solanum*) or tubular (*Cestrum*), rarely funnel shaped (*Datura*) or bilabiate (*Schizanthus*), scale or hair-like outgrowth may arise from the throat of the corolla tube.

**Androecium** with 5 stamens epipetalous, filaments inserted in the corolla tube, filaments free, ditheous, anthers introrse, dehiscence longitudinal or by apical pores.

**Gynoecium** with 2 carpels, rarely 3-5 (*Nicandra*), united, ovary superior, bilocular, axile placentation, placenta swollen, ovary obliquely placed, often further divided by false septa, in some cases ovary seated on a nectariferous disc style simple, stigma bilobed.

**Fruit** is a berry or capsule (*Datura*).

**Seeds** are many, embryo straight, endosperm present.