(B) FOOD & FODDER

(i) **Pithecolobium dulce** = **Jungle Jalebi (Aril)**
(ii) **Albizzia lebbek** = **Siris** – Pods are edible and used as fodder.
(iii) **Neptunia oleracea** = **Laja**lu - Fruits are edible.
(iv) **Parkia roxburghii** = **Khurail**
(v) **Entada phaseliodes**

(C) ORNAMENTAL

(i) **Mimosa pudica** = Sensitive plant = "Touch me not"
(ii) **Neptunia oleracea** = Lajwanti 'Kiss me quick'
(iii) **Pithecolobium dulce** = Hedge plant
(iv) **Leucaena leucophloea**

(D) OTHER USES :-

(i) **Adenanthera Pavonia** = seed – "Goldsmith's weight"
(ii) **Acacia farnesiana** = Cassie perfume is obtained from the flowers.
(iii) **Acacia concinnaaa** = Shikakai –Its pods are used for head bath.
(iv) **Acacia catechu** = **Kattha** is obtained from its heart wood.
(v) **Prosopis spicigera** = It is grown in Rajasthan as wind breaker.
(vi) Many species of **Acacia** yield gum.
(vii) Albizzia (Siris) produces special type of gum called "Sresh"
(viii) The pods of shikakai are also used as insecticides.
(xi) **Gum Arabic** is obtained from the **Acacia Senegal.**

FAMILY – LILIACEAE

[1] **SYSTEMIC POSITION**

Class	-	Monocotyledonae
Series	-	Coronarieae
Family	-	Liliaceae

Perianth is present in this family, It means there is no difference in between calyx and corolla. If perianth is green in colour then it is called **sepaloid** as in **onion.**
If perianth is coloured other than green then it is known as **Petaloid** as in **Lily.**

[2] **DIAGNOSTIC FEATURES**

(1) **HABIT :-**
Mostly Herbs some climbers
sometimes abnormal secondary growth is found in trees such as – **Dracaena, Yucca.**

(2) **ROOT**
Usually adventitious/fibrous. Fasciculated root is found in **Asparagus** (satawar) The base of roots swell. these are the modification of adventitious root.

(3) **STEM**
The aerial stem is present in few plants.
Majority of the plants have underground stem. It is of two type –

[i] **BULBS**
Example – **Onion, Garlic.**
Their stem is small, dry and disc like (reduced) which posses tunicated leaves. The under ground portion of the leaves store food material and becomes fleshy.

[ii] **CORM**

Example –**Colchicum**

Such type of stem grows vertically in the soil. [If it grows horizontally then it is said to be **Rhizome** (Aloe).]

*** MODIFICATION OF AERIAL STEM**

[i] **Phylloclade –** In **Ruscus**

[ii] **Cladode – in Asparagus**

(4) LEAVES

→ Some of the plants bear cauline leaves (present on aerial stem.)

→* Radical leaves are present in few plants such as in **Asphodelus.**

→* The leaves of monocotyledons are sessile with sheathing leaf bases i.e. clasping round the srem.

VENATION

Parallel venation.

* Reticulate venation is found in **Smilax, Paris**

The stipule of **Smilax** and leaf tip of **Gloriosa** are modified into tendrils.

(5) **INFLORESCENCE**

It is of many types as follows :-

(i) Panicle :- Compound raceme e.g. **Yucca** and **Dracaena**

(ii) **Scorpioid cyme** – e.g. Haemorocais

(iii) **Spadix –**

This is a type of Racemose inflorescence in which floral axis is thickened and fleshy. Flowers are sessile, The whole inflorescence is covered by coloured **spathe.** e.g. **Garlic**

→ In this type of inflorescence, inflorescence arises from the ground stem and on its cluster of flowers develop, this bunch of (cluster) flowers looks like a umbel. But, truly speaking it is not umbel. The flowers are arranged in compact Scorpioid cyme order.

(6) **GENERAL CHARACTERS OF FLOWER**

Bracteate, bisexual, complete, actinomorohic symmetry, Hypogynous and Trimerous epiphyllous and in some plants may be epipetalous

* The flowers in **Ruscus** and **Smila**x are unisexual and incomplete.

* Zygomorphic flower present in **Lilium**.

* Aspidiastra, **Paris** and **Mianthimum** contain tetramerous flowers.

(7) **PERIANTH**

Tepals 6 (perianth), polyphyllous, arranged in two whorls 3 + 3, imbricate aestivation, tepal of outer whorl anterior. May be polytepalous & gamotepalous.

* Eight (8) tepals are present in Paris and **Mianthimun** and arranged in two whorls 4 + 4

(8) **ANDROECIUM**

6 stamens, arranged in two whorls 3 + 3, free, polyandrous, basifixed or versatile & introrse.

* Only 3 stamens are present in **Ruscus** in innermost whorl.

* Eight stamens are found in **paris** arranged in two whorls 4 + 4.

(9) **GYNOECIUM**

Tricarpellary, syncarpous, trilocular, stigma trifid, axile placentation, superior ovary.

(10) **FRUIT**

Some have berry as in **Lily** and in some capsule as in **onion.**

(11) **SEED :-** Endospermic


FLORAL DIAGRAM

(12) **FLORAL FORMULA**

$$Br \oplus \varphi \; P_{3+3 or (3+3)} \; A_{3+3} \; \underline{G}_{(3)}$$

(13) **FLORAL DIAGRAM**

(13) **ECONOMIC IMPORTANCE**

[**A] FOOD**

(i) Onion = **Allium cepa** – Foul odour is due to an oil like organic compound of sulphur – allyl sulphides formed in Fleshy leaves of bulb.
(ii) Garlic = **A. sativum –** Antidiabetic property is due to sulphur containing AA- S – allyl – cystine sulphoxide (SACS in) Fleshy leaves of bulb.
(iii) Satawar – **Asparagus –** Fasciculated roots
(iv) **Leprogeria rosea** – Fruits are eaten.
(v) **Allium schoenoprasum**

[B] ORNAMENTAL PLANTS :-

(i) Lily = **Lilium bulbiferum**
(ii) **Tulip** = Tulip – The flowers are attractive due to infection of Virus.
(iii) **Convalaria majlis = Lily of the valley**
(iv) **Sensiviera trifasiata** – "Mother in Law's tongue".
(v) **Ruscus aculeatus** – 'Butcher's boom"
(vi) **Fritillaria fenella. ; F. melagris = snakes head**
(vii) Agapanthus americanus = African lily

(C) MEDICINAL USES :-

(i) Sarasaprilla = Smilax **zeylamicum – Its seed used in urinary troubles.**
(ii) Sudarshan = Crinum asiaticum.
The juice of leaves is used in rheumatism and ear pain.
(iii) Gvar patha = **Aloe vera** –the juice of the leaves is used as skin tonic and increase the eye sight.
(iv) **Asphodelus tennuifolius** – Its seeds are used in peptic ulcer.
(v) **Urginea** (wild onion) and Scilla A rat killer medicine is prepared from their bulb.
(vi) Lahasun = **Allium sativum** = It is very useful in heart disease, rheumatism & diabetes.
(vii**) Gloriosa superba** – It is used in leprosy and piles, it is also very useful as used in biting of snake or scorpion.

(D) OTHER USES :-

(i) Dragon plant = **Dracaena draca** – Red colour resin is obtained from the stem, that's why it is known as "Dragon's blood."
(ii) **Dragger plant = Yucca alolifolia**, Y. filamentosa – Fibres are obtained from the stem.
(iii) **Colchicum** autumnale – Colchicine is obtained this plant which is used to induce polyploidy in plants.
C. luteum = corm is laxative
(iv) **Iphigenia indica –** Red colour obtaining from the flowers.
(v) **Phormium tenax** – It is used for pr eparing oil paints and varnishes.
(vi) **Sansevieria roxburghiana** = "India Bowstring hemp" and **Sansevieria trifasciana** = " African Bowstring hemp" – fibres are obtained which are used for making ropes and nets.
(vii) Veratrum album = moth killer is prepared

SPECIAL POINTS

(1) Fabaceae is the alternative name of the **Leguminosae.**
(2) Compositae = **Asteraceas** is the largest family of angiosperms.
(3) Desmodium latifolium the member of papilionateae family which is halophyte.
(4) J.C. Bose conducted experiment of plant movement on Desmodium gyrans.
(5) Pollen grains in Mimosoideae are usually present in the form of packets.
(6) Soyabean contains more protein than meat.
(7) Aloin alkalloides are obtained from Aloe plant of Liliaceae.
(8) Smilax is a monocot, having, reticulate venation.
(9) The flowers enter into the soil after fertilization in ground nut.
(10) Pulses are rich source of proteins.

ASTERACEAE OR COMPOSITAE

SYSTEMATIC POSITION :

Class	-	Dicotyledonae
Sub class	-	Gamopetalae
Series	-	Inferae
Order	-	Asterales
Family	-	Compositae or Asteraceae

Special character : Inflorescence mostly head or Capitulum. Calyx usually represented by hairy structure called **pappus** or represented by minute **scales.** It is persistant & attached on fruit & helps in its disperse. Petals 5, gamopetalous, valvate aestivation, Stamens – 5, epipetalous, syngesious, bicarpellary, syncarpous, inferior ovary, unilocular, basal placentation, one style and two stigma or bifurcated. Fruit is **cypsela** eith hairy pappus i.e. important character of this family. In Dahlia fasciculated roots are present.

10. **FLORAL FORMULA**

(A) Rayflorest → Br % ♀ $K_p C_{(5)} A_0 \overline{G}_{(2)}$

(B) Disc florest → Br ⊕ ♂ $K_p \overset{\frown}{C_{(5)}} A_{(5)} \overline{G}_{(2)}$

(C) Sterile florest → Br Ⓘ $K_p C_{(5)} A_0 G_0$

11. **FLORAL DIAGRAM :-**

Rayflorests Discflorest

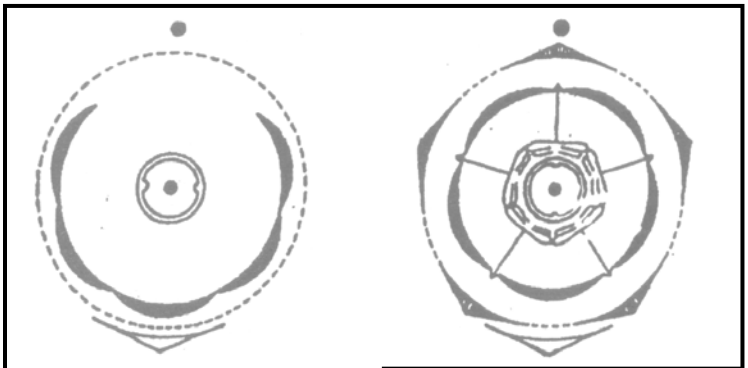


FIG. FLORAL DIAGRAM RAY FLORET | **FIG. FLORAL DIAGRAM DISC FLORET**

ECONOMIC IMPORTANCE :-

[A] **Food :-**

(1) **Lactuca sativa** = Salad (Garden lettuce).
(2) **Intybus (kasani) =** Cichorium – chicory powder is prepared which mixed with coffee powder.
(3) Helianthus tuberosus – Their tubers are eaten which contain inulin.
(4) **Helianthus annuus** = Sunflowers (Suraj mukhi) – The seeds of this yiedls valuable oil which is used for cooking purposes.
(5) **Carthamus tinctorius** = Kusum (Safflower) – Oil obtaining from these seeds which reduced thelevel of cholesterol. Orange red colour obtains from the petals of the flowers.

[B] **Medicinal plants :-**

(1) **Artemisia obsinthium –** Santonin medicine obtains from Artemisia which is useful for removal of worms.
(2) **Arnica Montana –** Arnica medicine is obtained which is used in healing of wound and as hais oil.
(3) **Eclipta alba** (Bhring Raj) – Juice is used as hair tonic.
(4) **Anthemis nobilis –** Camomile named medicine is obtained from the inflorescence.
(5) **Chrysanthemum cinerariaefolium** = Guldaudi – Pyrethrum named insecticide is obtained.
(6) Species of blumea produce "**Kapoor**" which is a useful medicine.
(7) **Taraxacum officinale** – 'Taraxacum' medicine is obtained which is purgative and diuretic.

[C] **Ornamental :-**

(1) **Helianthus annuus** = Surajmukhi
(2) **Chrysanthemum** = Gul-Daudi
(3) **Tagetes =** Genda (marigold)
(4) **Calendula officinalis** = (Pot marigold)

[D] **Other Values :-**

(1) **Ambrosia artemissifolia = Ring weed** – Hay fever is due to its pollen grains.
(2) **Parthenium hysterophorus** = Congress grsaa – skin allergy develops from its pollen grains.

[9] POACEAE OR GRAMINEAE

SYSTEMATIC POSITION :-

Class	=	Monocotyledonae
Series	=	Glumaceae
Family	=	Gramineae or Poaceae

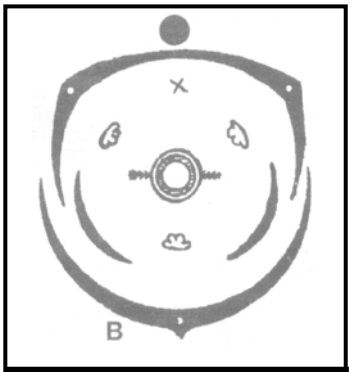
Special character : This is the largest family of the Indian flora.

Inflorescence spike of spikekets. Flowers bracteate, Fertile bracts are known as **fertile glume** or lemma. They can produce hair or awn, sessile, bracteoles is present. It is called **palet** or palea, Zygomorphic, Hermaphrodite but in Zea and coix flowers are unisexual. Flowers are Hypogynous and Trimerous. Tepals 2, free, polyphyllous, membranous and situated in antero lateral position. They are called lodicules. Stamens 3, polyandrous, Monocarpellary or Tricarpellary, syncarpous, superior ovary, unilocular, placentation is basal, two styles are present and stigma is **feathery.** Fruit is **caryopsis.**

FLORAL FORMULA :-

$$Br\ \oplus\ \varnothing\ P_2\ A_3\ \underline{G}_1 \text{ or } \underline{G}_{(3)}$$

FLORAL DIAGRAM :-



FLORAL DIAGRAM

ECONOMIC IMPORTANCE :-

[A] **Oenamental Plants :-**

(1) **Cynodon dactylon = Doob**

[B] **Cereals :-**

(1) **Avena sativa** = Jai/oat
(2) **Eleusine coracena** = Ragi

(3) **Hordeum vulgare** = Barley/jau –It is the oldest ancient crop.
(4) **Oryza sativa** = Rice
(5) **Pennisetum typhoides**
(6) **Secale cereale** = Bajra
(7) **Sorghum vulgare** = Jawar
(8) **Triticum aestivum** = Wheat
(9) **Zea mays** = Maize

[C] **Sugar :-**
(1) Saccharum officinarum = Sugar cane

[D] **Oil yielding plants :-**
(1) **Cymbopogon caesius** = ginger grass the oil is obtained from their leaves & is used in soap industry.
(2) **C. flexnosus** = Lemon grass oil is obtained from their leaves & is used for making scented materials.
(3) **Vetiveria zizanoides** = Khus
Oil obtained from their root which is used in perfumery.

[E] **Fibre Yielding Plants :-**
(1) Erianthus arunadinaceus = Sarkanda is used in making ropes.
(2) **E. munja** = Moonj – Fibres obtained from stem is used for making ropes, mats and baskets etc.

[F] **Timber Yielding Plants :-**
(1) **Bambusa balcooa** = Bamboo
(2) **Dendrocalamus giganteus.**

[J] **Other Uses :-**
(1) **Hordeum vulgare** is used for making **beer.**
(2) **Thysanolaena mexima** – It is used for making brooms
(3) **Zeamays** is used in alcohol industry.
(4) **Vetiveria zizanoides** – (Khus) – It is used for preparation non alcoholic drinks.
Its root are also used in perfumery.

CUCURBITACEAE – FAMILY

1. SYSTEMATIC POSITION :

Class	-	Dicotyledonae
Subclass	-	Polypetalae (but most of plants are gamopetalous, it is an exception)
Series	-	Calyciflorae
Order	-	Passiflorales
Family	-	Cucurbitaceae

Special character : Stem pentangular, branched, usually fistular, with Bicollateral vascular bundle. They are arranged in two circles. Infloresce- Solitary axillary, most of the plants of this family are monoecious. It means male and female flowers are present on the same plant. Flowers are ebracteate, pedicellate, incomplete unisexual, Actinomorphic symmetry, pentamerous and Epigynous. 5 Sepals, gamosepalous, valvate aestivation. Petals 5, gamopetalous, valvate or imbricate aestivation. Tricarpellary, syncarpous, inferior ovary, unilocular, parietal placentation but it looks like axile placentation due to swelling of placenta style one, stigma three and branched.

5 Stamens, usually cohesion in three groups (2) + (2) + 1 . It means four stamens present in two pairs and fifth one is free. Fruit is pepo. The **bitter taste** of the fruit is due to presence of tetracyclic triterpenes.

FLORAL FORMULA

Male flower – Ebr $\oplus\ \male\ K_{(5)}\ C_{(5)}\ A_{(2)+(2)+1}\ G_0$

Female flower – Ebr $\oplus\ \female\ K_{(5)}\ C_{(5)}\ A_0\ \overline{G}_{(3)}$

FLORAL DIAGRAM :-

Male flower Female Flower

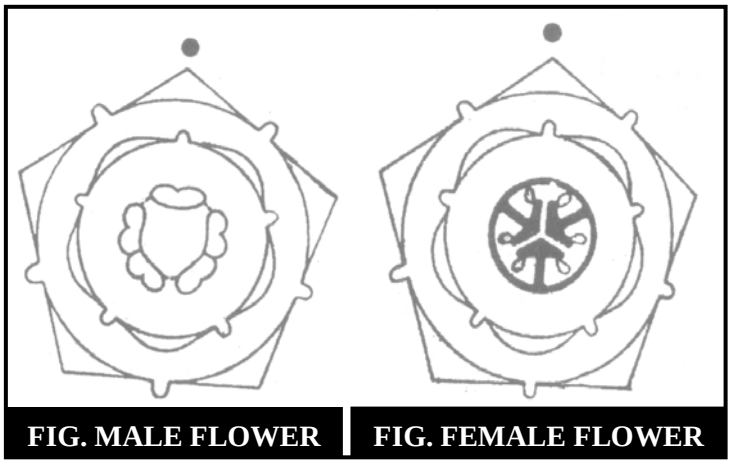


FIG. MALE FLOWER **FIG. FEMALE FLOWER**

ECONOMIC IMPORTANCE :-

[A] Vegetables and Fruits

(i)	**Kadoo**	=	**Cucurbita pepo** or **Cucurbita maxima**
(ii)	**Lauki**	=	**Lagenaria vulgaris**
(iii)	**Ridge Gourd**	=	**Luffa acutangula**
(iv)	**Muskmelon (Kharbooza)**	=	**Cucumis melo**
(v)	**Ghia tore**	=	**Luffa cylindrical**
(vi)	**Kakari**	=	**Cucumis melo var. utilissimus**
(vii)	Tarbooj (water melon**)**	=	**Citrullus vulgaris**
(viii)	Kheera	=	**Cucumis sativus**
(ix)	Karela	=	**Momordica charantia**
(x)	Tindaa	=	**Citrullus vulgaris** var. **fistulosus**
(xi)	**Ash Gourd** or White Gourd	=	**Beninxasa – hispida**
(xii)	Parval (pointed gourd)	=	**Trichosanthes dioeca**
(xiii)	Snake gourd	=	**Trichosanthes anguina**
(xiv)	Ram bel	=	**T. cucumeriana.**
(xv)	Kachari	=	**Cucumis Momordica**
(xvi)	Kundru (lvygourd**)**	=	**Coccinia cordifolia**
(xvii)	Lanku	=	**Sechium edule.**

(B) MEDICINAL PLANTS :

(i) **Ecballium elaterium** = **Eleterium** medicine is obtained, which is very useful in malaria and hydrophobia.

(ii) **Bryonia rostrata** – It is used in asthama and piles

(C) Other uses :

(i) **Careya arborea** :- Used in bidi

FAMILY RUBIACEAE

Systematic position

Class	-	Dicotyledonae
Sub class	-	Gamopetale
Series	-	Inferae
Order	-	Rubiales
Family	-	Rubiaceae
Common name	-	Madder family