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Subject - Botany

Class - B.Sc. (Subs) Part-II, Group-A (Angiosperm's & Taxonomy)
B.Sc. (Hons.) Part-II, Paper-3rd, Group-B

Topic - "Diagnostic features, Floral formula, floral diagram and economic importance of family - Euphorbiaceae."

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Family :- Euphorbiaceae

Dicotyledonae
Monochlamydeae
~~Uni~~ Unisexuales

* **Distribution :-**

Family euphorbiaceae includes 300 genera and 5,000 species, cosmopolitan in distribution except in the arctic region but they are most abundant in tropical regions.
In India the family is represented by about 61 genera and 336 species mostly in the tropical and subtropical Himalaya and mountains of South India.
Examples :- Ricinus communis (Castor bean), Euphorbia pulcherrima (Poinsettia), ~~Mahibhot~~ Manihot esculenta (Cassava), Phyllanthus emblica (Emblic myrobalan) etc., are some known examples of the family.

Habit :-

Plants are mostly shrubs (Euphorbia pulcherima, E. splendens, Jatropha, etc.) or trees (Ricinus communis).

Phyllanthus emblica, Hevea brasiliensis) and rarely herbs as some species of Euphorbia.

The species of Tragia are climbers. Several species of Euphorbia are cactus like in habit with thick and fleshy stems and leaves reduced to spines.

The plants contain a milky latex in special laticiferous vessels.

★ **Leaves:-**

Leaves are usually alternate (opposite in Choriophyllum or whorled in Mischodon), simple, entire or sometimes deeply palmately lobed (Ricinus and Jatropha) or compound (Bischofia). Stipules are usually present and they are represented by ciliate glands (Jatropha) or spines (Euphorbia).

Venation is pinnate or palmate as in Ricinus. In species of Euphorbia with Cactus-like habit, the leaves fall of early and photosynthesis is carried by green stems.

★ **Inflorescence:-**

Inflorescence is complex. The first branching is usually racemose and the subsequent branchings are cymose.

In Euphorbia and related genera the inflorescence is a cythium which appears as single flower.

In the middle of the Cyathium there is a single female flower (represented by tricarpellary gynoecium).

In the axil of each bract a number of male flowers are arranged in scorpioid cymes. The oldest flower is nearest to the centre and thus the maturation is centrifugal.

In Acalypha the inflorescence is catkin, where as in Croton and Ricinus it is terminal raceme and in Jatropha it is terminal cyme. The oldest flower is

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nearest to the centre and thus maturation is centrifugal.

In Acalypha the inflorescence is a catkin, whereas in Croton and Ricinus, it is a terminal raceme and in Jatropha it is a terminal cyme.

★ Flowers :—

Flowers are unisexual, actinomorphic, hypogynous (Perigynous in Bridelia). They show considerable variation.

In Euphorbia both male and female flowers are naked, whereas in Anthostema both have tubular perianth. In the remaining genera of the tribe the male flowers are naked and the females have rudimentary perianth.

In Jatropha both calyx and corolla are present and each have five members. In Croton corolla is distinct in male flower, while it is inconspicuous or absent in the female flowers.

In Ricinus male flowers have five sepals and female flowers have only three sepals. The petals when present are free and rarely united as in Jatropha. The aestivation of the sepals and petals is valvate or imbricate.

The number of stamens in the male flowers ranges from one to numerous. The filaments are free or united into a column as in Bruynia and Jatropha.

In Phyllanthus cyclanthera besides filaments the anthers are also united into a ring like common anther.

There are basically five stamens in Ricinus opposite to the sepals which are much branched and the anthers are borne on ultimate branches.

The anthers are monothecous (Phyllanthus, Ricinus) or dithecous (Euphorbia) erect or inflexed in bud and opening by longitudinal or transverse slits (as in Euphorbia)

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a rudimentary ovary is often present in the male flowers.

★ Gynoecium

Gynoecium is tricarpellary (bicarpellary in Mercurialis) and syncarpous with a superior (semi-inferior in Bridelia) and trilocular ovary. The placentation is axile. The styles are three, often bipartite, free or more or less united.

★ Floral formulae:-

Euphorbia

male flower - Br ⊕ ♂ K0 C0 A1 G0
female flower - Br ⊕ ♀ K0 C0 A0 G(3)

Ricinus

male flower - Br ⊕ ♂ P5 — A5 G0
female flower - Br ⊕ ♀ P3 A0 G(3)

Jatropha gossypifolia

male flower — Br Brl ⊕ ♂ K5 C5 A5+5 G0
female flower — Br Brl ⊕ ♀ K5 C5 A0 G(3)

Phyllanthus

male flower - Ebr ⊕ ♂ P3+3 A(3) G0

female flower - ~~Br Brl~~ -
Ebr ⊕ ♀ P3+3 A0 G(3)

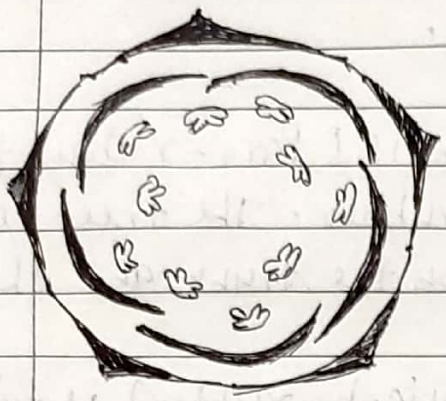

Fig:- Jatropha gossypifolia
Staminate flower.

Jatropha gossypifolia
Pistillate flower.

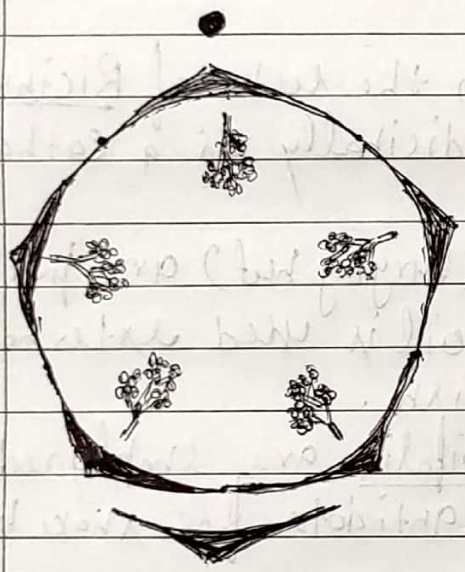

Fig:- Ricinus communis
Staminate flower.

Ricinus communis
Pistillate flower.

Figures: Floral diagram

✱ Economic Importance :-

Family Euphorbiaceae furnish several valuable commodities, such as food, drugs, rubber and oil.

(1) Edibles :- Fruits of Phyllanthus emblica (Amla) are a rich source of vitamin C. They are used as pickles and in the treatment of Scurvy.

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(ii) Roots of Manihot esculenta are rich in starch and form a valuable food stuff.

(2) Rubber: → (i) Hevea brasiliensis (Para-rubber tree) is the best natural source of rubber. The tree is tapped by making sloping cuts on the trunk and the latex is coagulated.

(ii) Tree of Manihot glaziovii (Manicoba rubber) is tapped for latex made into rubber.

(3) Medicines: -

(i) Castor oil obtained from the seeds of Ricinus communis (Arand) is used medicinally as a cathartic and mild laxative.

(ii) Seeds of Jatropha curcas (Purging nut) are purgative and anthelmintic. The seed oil is used externally for skin diseases and rheumatism.

(iii) Roots of Jatropha gossypifolia are employed against leprosy and as an antidote for snake bite.

(4) Timbers: — Wood of Aporosa dioica is useful for construction work.

→ Woods of Trewia nudiflora (False white teak) is largely used for packing cases, tea boxes and match industry.

(5) Ornamentals: -

Codiaeum variegatum (Croton)
Pedilanthus tithymaloides (Red bird cactus)
Jatropha

Euphorbia are commonly planted in hedges, shrubberies and on rockeries in gardens.

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"Cultivation of mind should be the ultimate aim of human existence." - B.R. Ambedkar

Dr. Ankit Kumar Singh.

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