

FAMILY CUCURBITACEAE (GOURD FAMILY)



Systematic Position:

Class: Dicotyledons

Subclass: Polypetalae

Series: Calyciflorae

Order: Passiflorales



Representatives: 98 genera and about 975 species

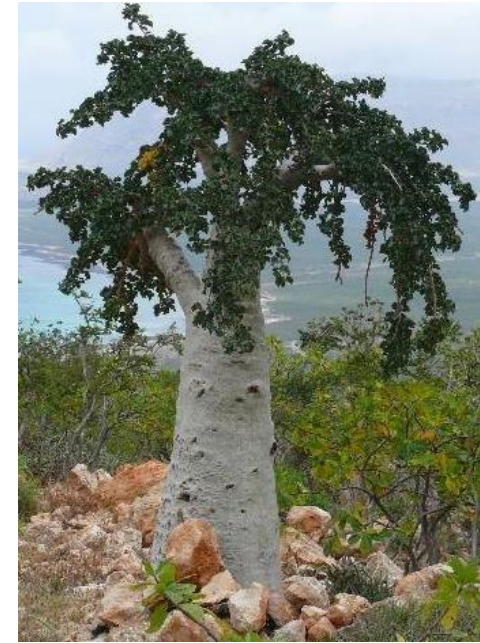
Distribution: Temperate & Tropical

Habit: Annual / perennial climbing herbs; rarely shrubs

Acanthosicyos – Spiny shrub (Leafless)

Dendrosicyos- Small tree

Ecballium – Prostrate plant without tendrils



Morphological :- Climbing with tendrils

Anatomical:- Bicollateral vascular bundles



Leaves:- Simple, alternate, exstipulate, broad, palmately lobed /divided, Long & hollow petiole.

Tendrils in leaf axil/ opposite the leaf at node

Tendrils simple- Cucumis

Tendrils branched – Cucurbita

Tendrils twist out and appear extra axillary in position

Tendrils absent in Ecballium



Morphology of tendril:-

In the leaf axil of plant – flower, inflorescence & branch seen.

Cucurbita pepo- leaf axil possess flower, leafy branch & branched tendril

Cucumis sativus – flower, leafy branch, inflorescence & tendril seen.

Views put forward to explain the morphological nature of tendrils:-

1. Braun (supported by eichler) – single flower by modification of axillary bud of leaf. 2 bracteoles modified to two tendrils on lateral side. Flowering shoot is axillary shoot of one of the tendrils, vegetative shoot is axillary branch of second tendril.

All not seen in all plants

In cases, one tendril suppressed and only one seen.

Eg:- *Sechium edule*.



Cucumis sativus- second bracteole (tendrils) with axillary shoot (inflorescence) . This absent in cucurbita pepo.

Therefore, Braun & eichler consider *tendrils as modification of bracteole*.

2. Transitional structure of leaf & tendril observed by Muller – *tendrils as modified branch*.

Twining part of tendril is leaf like, lower stiff portion is stem like, with stem reduced.

Proof- cucurbita pepo- coiled portion become flattened .

Stem portion unifacial, tip part bifacial

Supported by Hagerup.



3. Engler – *tendrils are stipular modifications*

Stipules in *Cedrosportia spinosa* & opined that one/more stipules modified as tendrils.

4. Tendril – *modification of peduncle*

5. Tendril – *by splitting of leaf petiole*

Most accepted view- Muller's view

But, none can be universally accepted to all cucurbitaceae members.

Inflorescence:- Unisexual, Solitary, axillary, large & showy female flowers.

Male flowers in cymose, panicle/ cymose subumbellate



Flower:- Unisexual, actinomorphic, bracteate, cyclic, dichlamydeous, pentamerous, epigynous. Monoecious/ dioecious; coloured white/ yellow. Female flowers with tricarpellary pistil and male flowers show synandrous nature.

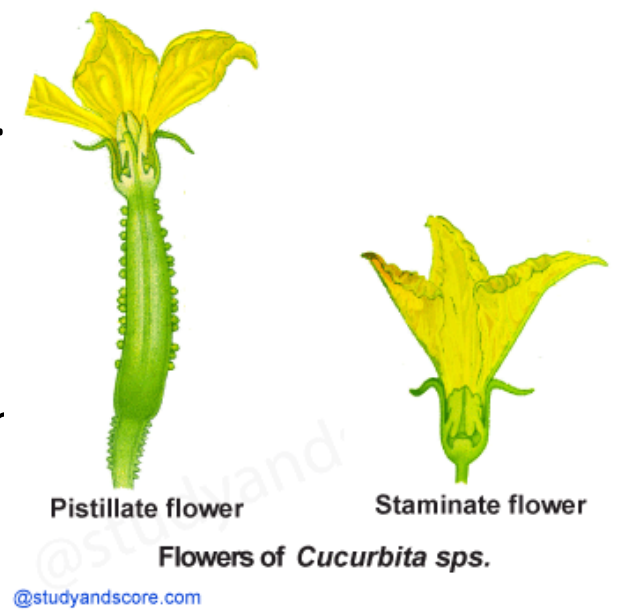
Calyx & corolla inserted on the rim of hypanthium

Male Flower:-

Calyx:- 5, pointed narrow lobes, gamosepalous, campanulate, valvate/ imbricate

Corolla:- 5, gamopetalous/ deeply 5-lobed, inserted on calyx tube, campanulate/ rotate/ salverform. Valvate/ imbricate

Fevillea- petals with appendages



Male Flower



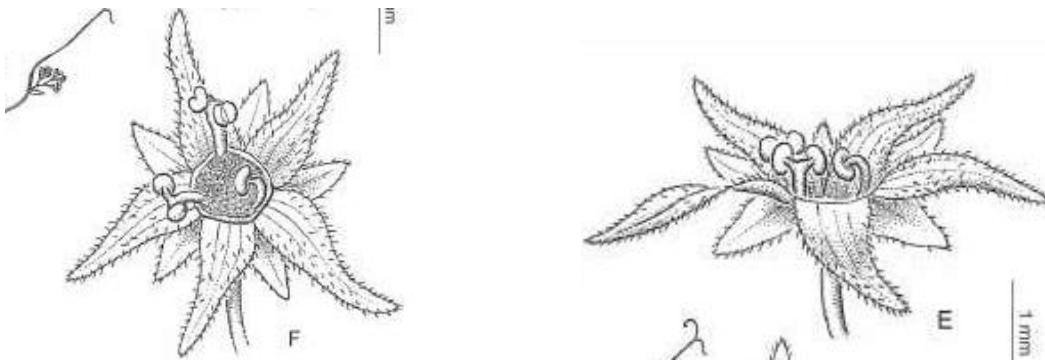
Androecium:- 5, inserted on the hypanthium, alternate with petals, bithecous, longitudinal dehiscence .

Various degrees of fusion:-

Fevillea- stamens 5, free alternating with petals

Thladiantha- 5, of which 4 united to pairs by slight cohesion at filament base. 5th free.

Sicydium – 5, fusion of filaments into 3 groups in the filament part upto 2/3rd height.



Momordica, Citrullus, Cephalandra- prominent fusion & appears as 3 stamens of which 2 large & 1 small & 2-celled.

Further fusion by curving of anther cells:-
Lagenaria, Cucurbita- anthers curved, united by connective to form central column.

Sicyos – filaments fuse together, anther shaped as sigmoid.

Cyclanthera – Stamens as complete column & anthers as two rings at top.

Pistillode in male flowers.



Female flower:-

Calyx:- sepals 5, gamosepalous, calyx tube adnate to the ovary & produced above the ovary

Corolla:- 5, gamopetalous, inserted on the rim of calyx tube, campanulate, rotate/ salverform. Aestivation valvate/ imbricate.

Androecium:- fertile stamens absent, staminodes may be seen.

Gynoecium:- Ovary inferior, tricarpellary, syncarpous, unilocular with ovules on parietal placentation. Style short & stigma branched. often 3 or entire.

The parietal placentation forked to 2 in each septa.

Sechium- ovary unilocular with single ovule.



Fruit:- Fleshy- berry/ pepo.

Cucumis, Citrullus - pepo

Momordica – Capsule breaking to 3 valves.

Seeds:- Many, flattened,
Exalbuminous with straight
Embryo.



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Diagnostic Features:-

Herbaceous annual plants , tendril climbers.

Leaves simple palmately lobed/ deeply divided, hairy with long & hollow petioles.

Inflorescence Solitary/ cymose clusters

Flower unisexual, actinomorphic, epigynous cyclic trimerous large & showy.

Calyx 5, gamosepalous with valvate aestivation

Corolla 5, gamopetalous with imbricate/ valvate aestivation.

Androecium of 5 stamens, with varying degrees of fusion / synandrous stamens

Gynoecium inferior, tricarpeal syncarpous unilocular with parietal placentation.

Ovary falsely trilocular with 6 groups of ovules on parietal placentation.

Fruit is a pepo.

Seeds many & flattened in appearance.

Economic importance:-

Cucurbita maxima/ *C. pepo* (Pumpkin) – Edible fruit, as vegetable, tender leaves cooked.

Lagenaria siceraria / *L. vulgaris* (Bottle gourd)- fruit as vegetable.

Luffa cylindrica/ *L. aegyptiaca* / *Momordica cylindrica* (Vegetable sponge)- fruit as vegetable, dried fruit used as bath sponge



Luffa acutangula / *Cucumis acutangulus* (Vegetable sponge) - dried fruit used as bath sponge, fruit as vegetable

Momordica charantia (Bitter gourd) – Fruit as vegetable, good for diabetics.

Trichosanthes anguina (Snake gourd) – Fruit vegetable

T. Cucumerina (Snake gourd) – Fruit vegetable



Cucumis sativus (Cucumber) - Fruit vegetable
Cucumis melo *var. utilissimus* - fruit in salads



Benincasa hispida/ B. cerifera (Ashgourd) – fruit vegetable, sweets from fruit pulp.



Citrullus lanatus (Water melon) – fruit edible

Cephalandra indica / *Coccinia grandis* (Ivy gourd)– fruit vegetable, leaves for diabetics.

Diplocyclos palmatus (Lollipop climber, striped cucumber) – fruit medicinal



Mukia scabrella/ *M. maderaspatana* (Madras pea pumpkin) - in folklore **medicine** as an antidiabetic plant. It is rich in phenolics.

