

# FAMILY ASCLEPIADACEAE



# GENERAL INFORMATION

- Family **Asclepiadaceae** is commonly known as milk weed family, is a former plant family which is now treated as a subfamily (subfamily **Asclepiadaideae**) in the family **Apocynaceae** (Bruyns 2000, APG IV).
- They form a group of perennial herbs twining shrubs, rarely trees but notably also contain a significant number of leafless stem succulents. The name comes from the genus ***Asclepias*** (milkweeds).
- ***Calotropis, Asclepias, Stapelia, Tylophora*** are the sole members of the family.

# DISTRIBUTION

- The family comprises of about **175 genera** and **2,200 species** all over the world, distributed in tropical and subtropical regions .
- In India the family **Asclepiadaceae** is represented by about **53 genera** and about **250 species**.

# HABIT

- The members of Asclepiadaceae family are mostly herbs (*Asclepias*) or sometimes shrubs (*Calotropis procera*) or woody climbers (*Tylophora*, *Ceropegia*), rarely small trees (*Calotropis gignata*), with milky sap or often cactus like habit (*Stapelia*).





*Calotropis procera*

P.S. Jakhi

# Stem

- The stem of a plant contain milky juice present in long branching laticiferous tubes.
- Stem is erect (*Calotropis*) or twining (*Bidaria*), branched, herbaious or woody, solid, cylindrical or angular with milky sap, rarely hairy (*Calotropis*).
- The vascular bundles in the stems are generally bicollateral .



Stem of *Calotropis procera*

# LEAF:-

- The leaves are mostly opposite decussate (*Calotropis*), rarely alternate or whorled, simple, petiolate or sessile, exstipulate, entire at margins, generally waxy on both surface (*Calotropis*).
- In xerophytic species such as *Stapelia*, the leaves are reduced to *scales* or *spines*, the leaves of *Asclepias curassavica* are petiolate, whereas they are semi-amplexicaul in *Calotropis procera*, The petiole is pulvinous in *Cryptostagia grandiflora*.



[Calotropis procera](#)



# IINFLORESCENCE

- The inflorescence is usually dichasial or polychasial cyme (*Calotropis*) arising in leaf axil or sometimes it is racemose.
- In *Asclepias* the flowers are being arranged in umbellate cymes. In *Hemidesmus*, the flowers are found to be arranged in axillary cymes.





# FLOWER

- The flowers are pedicellate, bracteate, hermaphrodite, actinomorphic, rarely zygomorphic, e.g., in *Calotropis*, complete.
- The general plan of the flower is pentamerous with three regularly alternating pentamerous whorls of calyx, corolla and androecium, however, the number of carpels is reduced to two in the gynoecium.
- Usually the flowers are small in size, but the flowers of *Ceropegia*, *Stapelia* and *Stephanotis* are quite large in size.



Calotropis flower

# CALYX

- ▶ It consists of five sepals, which are either free (**polysepalous**) or somewhat connate at the base; with the odd sepal posterior (**gamosepalous**).
- ▶ The aestivation is valvate, imbricate or quincunical.

# COROLLA

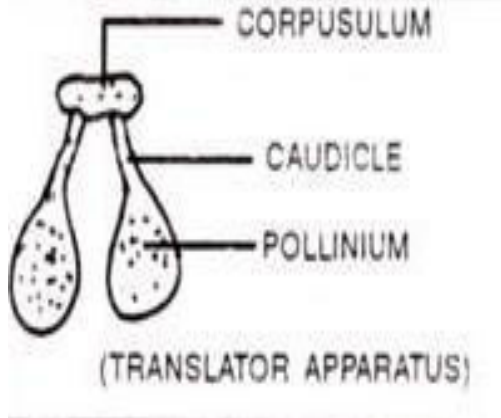
- It consists of five united petals (i.e., it is gamopetalous). The petals are spreading (i.e., rotate), but in *Stephanotis* the corolla tube is long, forming a salver-shaped corolla. In *Ceropegia* the corolla is pitcher-like in appearance (zygomorphic). The aestivation is contorted and rarely valvate.
- Sometimes the petaloid appendages arise either from the corolla or from the back of the stamens. Very often these hairs or appendages are found inside or at the mouth of the corolla forming the corolline corona.



*Ceropegia*



# ANDROECIUM:-



- The stamens are five, epipetalous and inserted near the mouth of a corolla tube .
- In some species the stamens adhere to the gynoecium to form complex structure called as gynostegium.
- Pollens are in waxy pollinia . Thus each pollen form two pollinia : attached to the surface known as corpusculum
- There are 5 such corpuscula one at each end of pentangular stigmatic disc.
- The pollinia attach to the corpusculum by connective called as retinaculae. The retinaculae and corpusculum form one structure called as translator.



# GYNOECIUM:



- It consists of two carpels. The ovaries remain free, but styles unite to form a common swollen stigma-head.
- The ovary is superior, unilocular, styles 2, stigma 1, pentagonal.
- The placentation is marginal .

# FRUIT & SEED



## **Fruit:**

- Generally it is a pair of follicles. Sometimes there is only one follicle, because of the suppression of the other.

## **Seed:**

- Usually the seeds are flat, ovate-oblong and are crowned by a fruit of hairs. These hairs facilitate the dispersal of the seeds by wind. The embryo is large.





# FLORAL FORMULA & FLORAL DIGRAM:-

Floral formula:  $\text{Br, Brl } \oplus \text{ } \underset{\text{♀}}{\text{O}} \text{ K } 5, \overline{\text{C}(5)}, \overline{\text{A}5}, \overline{\text{G}(2)}$ .



Floral diagram



*Oxystelma*



*Leptadenia*



*Ceropegia*



*Stapelia*



*Gymnema*



*Cryptostegia*



# 1. Ornamental uses :-

- Some of the species of the family like *Asclepias curassavica*, *Ceropegia woodii*, *Stapelia gigantean*, *Cryptostegia grandiflora*, etc.... are grown in gardens for ornamental purposes.



*A. Physocarpa A. curassavica*

*Ceropegia sp.*



## CEROPEGIAS of Western Ghats



*Ceropegia* (Asclepiadaceae) is a genus of climbers, herbs and rarely sub shrubs distributed in tropical and subtropical Old world. Of the 48 species in India, 39 species found in Western Ghats out of which 18 species are endemic to Maharashtra. The tubers of many *Ceropegia* species are edible. This is main threat to their survival in the nature and that's why their distribution is strictly restricted to highly protected areas. Moreover, propagation either by seed or by vegetative cutting is rather difficult. The flowers of *Ceropegia* species have highly specialized pitcher (fly trap) which shows extreme adaptation for pollination by bees and flies. They have highly elaborated fly-flowers with carrion scent, complicated petal surface pattern, vibratile hair or peculiar blobs on the corona and bizarre black glistening bodies on the corona. Most of the *Ceropegia* species are critically endangered and need to be conserved on war-footing



## 2. Medicinal uses:-

- The roots of *Tylophora indica* are used for the treatment of asthma, bronchitis and whooping cough.
- The dried roots of *Sarcostoma acidium* is emetic and an infusion of the roots is used as antidote for snakebite.
- The root bark of *Calotropis* sp. Are anthelmintic, laxative and diuretic and useful in cutaneous diseases, intestinal worms, cough, asthma .
- *Gymnema sylvestres* is stomachic, stimulant, laxative and diuretic and is useful in cough , biliousness and sore eyes.
- The dried roots of *Hemidesmus indicus* constitute Hemidesmus or Anantamul which is blood purifier. It is used in chronic rheumatism and urinary and skin diseases
- The leaves of *Cosmostigma* are used to cure ulcerous sores.
- The latex of *Oxystelma* is used to wash ulcers.



### 3.Edibles:-

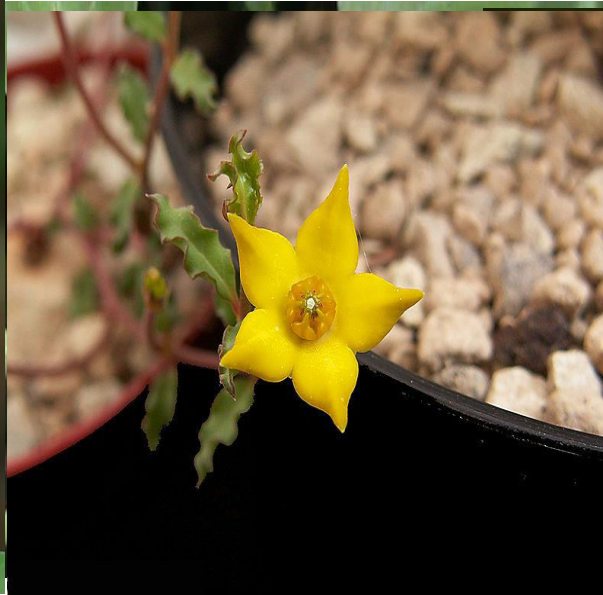
- The tubers of *Ceropegia* and fruits of *Oxystelma* are edible .
- The fruits and young twigs of *Leptadenia* are eaten as vegetables .

### 4.As a source of rubber :-

- The latex of *Calotropis* is used in tanning industry for deodorizing, for removing hair and imparting yellow colour to hides .
- The latex of *Cryptostegia* is a commercial source of rubber.



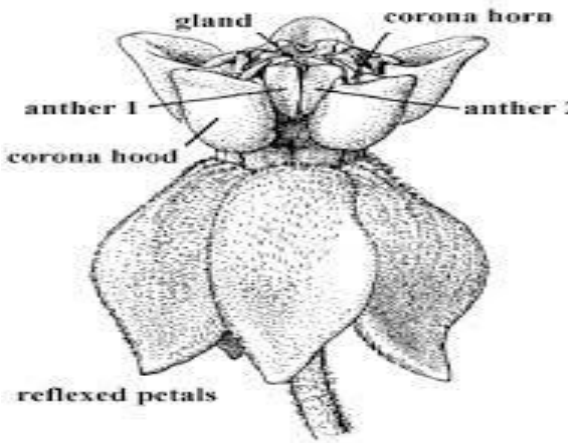
*Asclepias curassavica*



*Brachystelma cafferum*



*Pergularia daemia*



Single flower



Fruit



Gynoestegium

THANKS