

## PHENEROGAMIC PLANT PARASITES

### Introduction:

Certain flowering plants (Phanerogams) also parasitize the crop plants in addition to the microorganisms. They mostly belong to Loranthaceae, Convolvulaceae, Scrophulariaceae, Orabanchaceae, Lauraceae, Santalaceae and Balauophoraceae.

They produce flowers and seeds and parasitize their host by drawing nutrition and water. Some phanerogams have green leaves, roots and they have the ability to synthesis food materials but they obtain only the mineral constituents of food from

the host, then they are called hemiparasite/waterparasite/partial parasite. Some of the phanerogams which do not have any chlorophyll completely depend on host for water and all minerals.

They are called as holoparasite or complete or total parasite.

The phaneroganic plants are divided into.

### 1. Stem parasite -

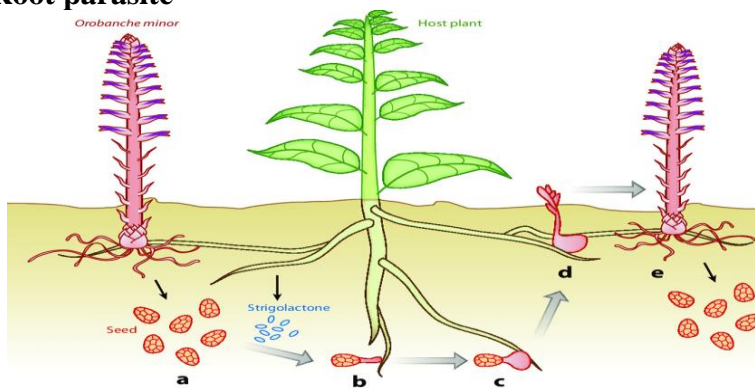


Total parasite – Cuscuta



Semi-parasite- Loranthus

### 2. Root parasite -



Total parasite – Orbanche



Semiparasite - Striga

Phanerogams have haustoria as absorbing organ, which are sent deep into the vascular bundle of the host to draw water and nutrients. The haustoria in general secrete some pectolytic and cellulolytic enzymes which soften the host tissue.

Haustoria have higher osmotic pressure than that of host tissue which facilitate easy absorption of nutrients. The affected plants show stunting, chlorosis and death.

**a) Stem parasite :**

**i) Complete/ holo/ total parasite: *Cuscuta* sp.**

*C. campestris, C. trifoli, C. planiflora* Dodder *C. indicora*

Commonly known as gold thread, hellvine, hair weed, devils hair and love vine.

- Attacks alfalfa, clover, onion, flax, sugar beet, potato, chillies many ornamentals etc.
- It is a yellow or orange vine strands which grow and twin the plant. They do not have leaves but bear only very minute scale leaves. Dodder produces flowers and fruits. Flowers are white, pink or yellowish, which form seed.
- On severe infection, they form a dense and tangled mat on the crop.
- Seeds of dodder overwinter in the infested soil, germinate to produce a slender yellow shoot, make contact with the susceptible host plant, encircle and send haustoria into the vascular bundle of the host.
- It does not produce any roots. As soon as the dodder is established with the host, base of the dodder shrivels, dries and cut off from the ground. Thus it completely depends upon the host for nutrients and water.
- Thus the affected plants get weakened and yield poorly.
- Seeds of cuscuta are mainly spread by animals, water and implements.

**ii) Partial semi / hemi stem parasite :**

**Commonly known Loranthus ,Giant mistletoe, Banda.**

*Dendrophthae flacata*

**(Order: Santalales; Family: Loranthaceae)**

- Attacks mango, citrus, apple, rubber, guava etc.
- Partial parasite of tree trunks and branches with brown stem, dark green leaves but no roots.
- Stem of the parasite is usually thick, and flattened at the node, appears in clusters at the point of attack which can be easily spotted on the trees.
- At the point of attachment with the tree, it shows swellings or tumourous growth where the haustoria are produced.
- This parasite produces flowers which are long, tubular, greenish white or red and borne in clusters.
- It produces fleshy fruits with single seed. The affected host plant become stunted in growth with few small chlorotic leaves.
- Dispersal of the seed is mostly through the birds and to some extent by animals.

**b) Root parasite / total/holo/complete parasite:**

**• Commonly known as Broom rape or *Tokra*.**

**• *O. cernuva* var . *dessertorum, O. robancre ramosa, O.minor, O. crenata***

**• (Order. *Orchidales, Family. Orabanchaceae*)**

- It is a serious parasite in tobacco, tomato, brinjal, cabbage, cauliflower etc.
- It is an annual fleshy flowering plant growing to a height of about 10 - 15" with pale cylindrical stem, thickened at base and covered with brown scaly leaves that end in spikes.

- Plants lack chlorophyll, flowers arise from axils of the scale leaves.
- Flowers have well developed lobed calyx, tubular corolla, superior ovary, numerous ovules and large four lobed stigma. Fruits are capsules containing small black reticulate and ovoid seed.
- Seeds remain dormant in the soil for many years and they germinate due to a stimulant (benzopyran derivatives) present in the root exudate of susceptible host plant Ethylene, gibberellin and coumarins also induce the seed germination.
- In tobacco it appears in clusters of 50 - 100 shoots around the base of a single plant 5 - 6 weeks after transplanting. Affected tobacco plants are stunted, show withering and drooping of leaves leading to wilting.

**ii) Hemi/partial/semi parasite.**

**Commonly known as witch weed or striga.**

***S. asiatica* parasitise sorghum, maize and sugarcane**

***S. densiflora* parasitise sorghum and sugarcane.**

- Mostly affect the monocots
- It is a small plant with bright green leaves grows upto a height of 15 - 30 cm.
- It occurs in clusters of 10 - 20/host plant.
- *S. asiatica* produces pink flowers while *S. densiflora* produces white flower with a pronounced bend in corolla tube.
- This phanerogam lack typical root hairs and root cap.
- Fruits contain minute seeds in abundance which survive in soil for many years.
- Seeds germinate after post harvest ripening of about two weeks, in response to the host stimulant viz., strigol ethylene, cytokinin, gibberellin and couma in strigol.
- This parasite slowly attach to the host root by haustoria, grow below the soil surface and produce underground stem and roots for about 1-2 months. Then it grows faster and appears at the base of the host plant.
- Severe infection of striga causes yellowing and wilting of host leaves. Sometime the host plant may die.

**Conclusion:**

A Phanerogams parasitic plant is a plant that derives some or all of its nutritional requirement from another living plant. All parasitic plants have produce flowers and seeds and parasitize their host by drawing nutrition and water. Some phanerogams

have green leaves, roots and they have the ability to synthesis food materials but they obtain only the mineral constituents of food from the host, then they are called hemiparasite/waterparasite/partial parasite. The haustoria in general secrete some

pectolytic and cellulolytic enzymes which soften the host tissue. Mistletoes cause economic damage to forest and ornamental trees. The phanerogamic plants are divided into Hemi parasite, water parasite and partial parasite.