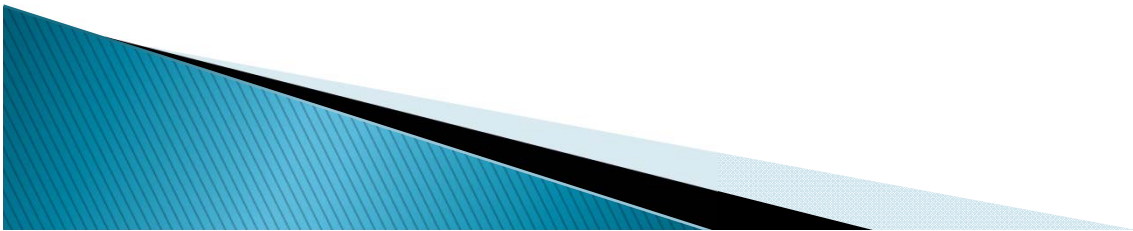


Heterotrophic Nutrition in plants

By

Dr. A.M.Shukla

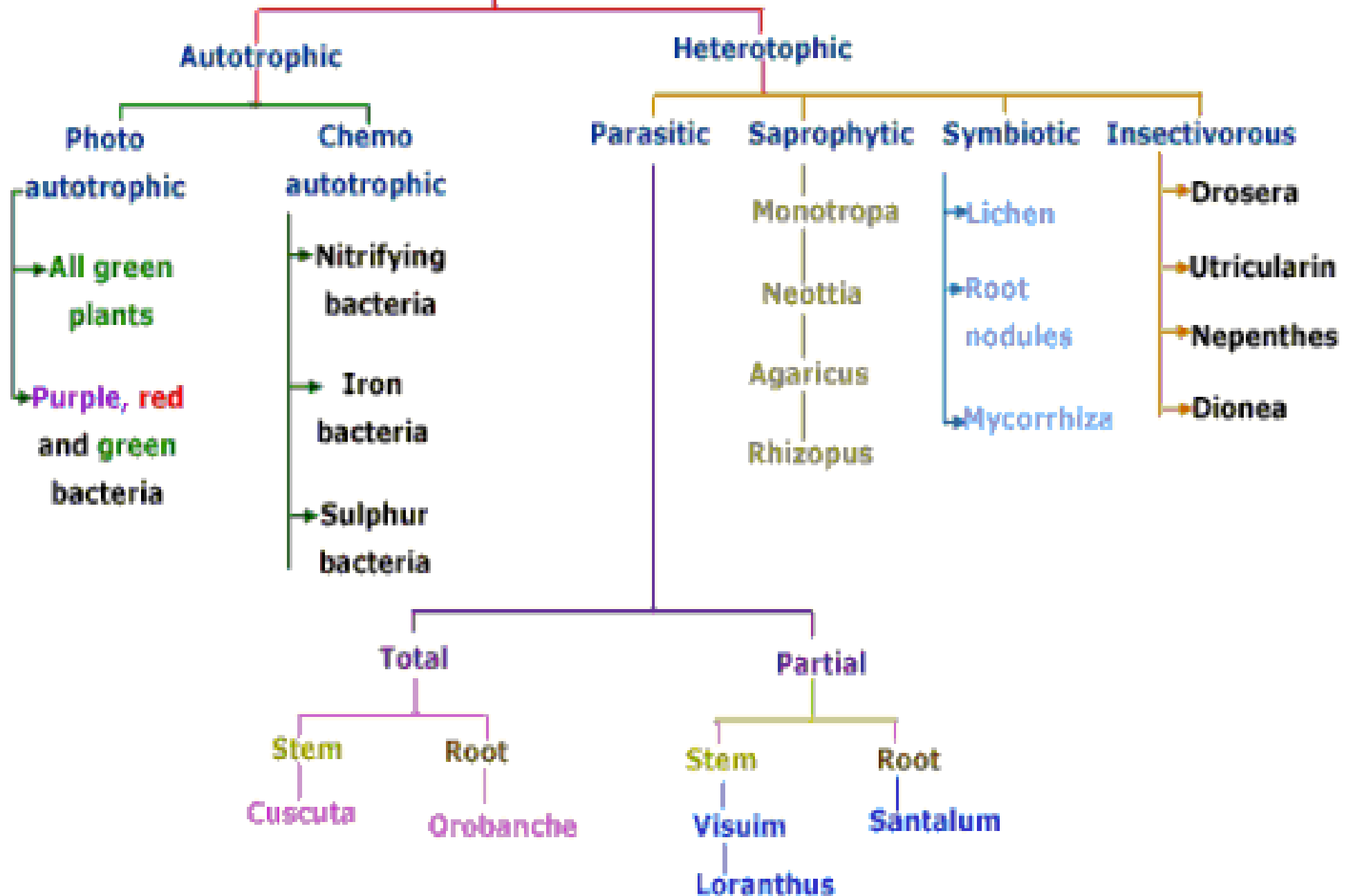


Heterotrophic Nutrition

- ▶ Nutrition– required by plants for living and carrying out various activities
- ▶ The mode of nutrition, where the organism depends on other organisms to provide its nutrition, is called Heterotrophic nutrition.



Modes of nutrition in plants



Heterotrophic plants

They are classified as follows

PARASITIC,

SAPROPHYTIC

SYMBIOTIC,

INSECTIVOROUS

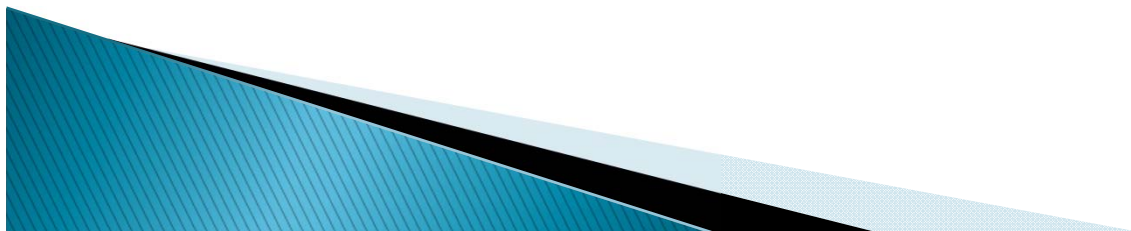
a. Parasitic plants

Obligate or total parasites

- i. Total stem parasites
- ii. Total root parasites

Partial parasites

- i. Partial stem parasites
- ii. Partial root parasites



Total stem parasites

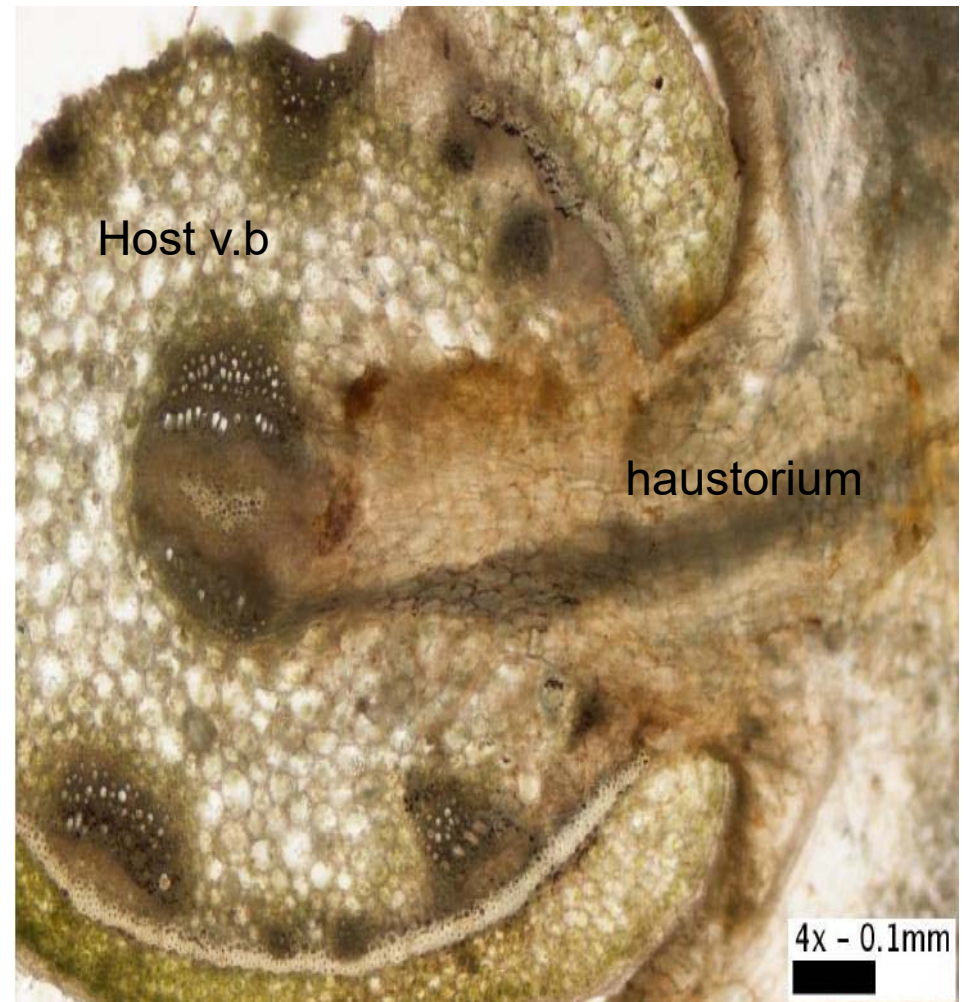
E.g., Cuscuta



- ▶ *Cuscuta* is rootless, yellow colored, slender stem plant with small scaly leaves, which twines around the host plant.

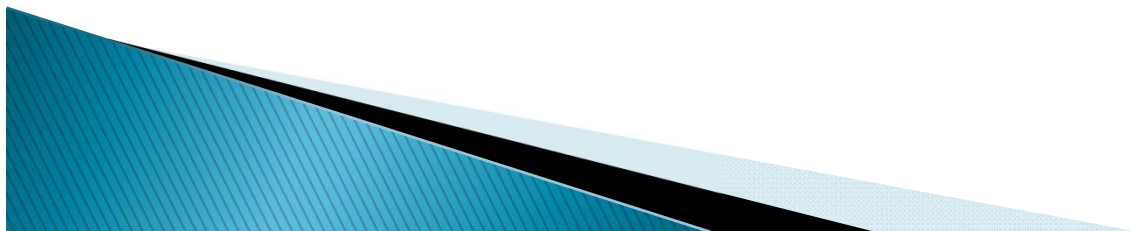


- ▶ It produces haustoria which enters the vascular bundle of host plant to absorb food and water.

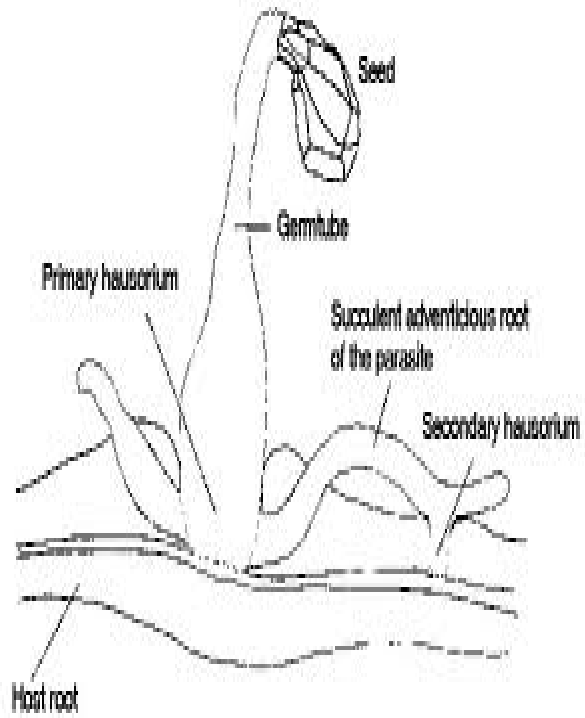


Total root parasites

- ▶ Orobanche is commonly known as broom rape.
- ▶ It has scale leaves and pinkish or bluish flowers.
- ▶ It is usually parasitic on Brinjal, Tobacco.
- ▶ E.g., Orobanche, Balanophora,



OROBANCHE



SOME SPECIES OF BALANOPHORA





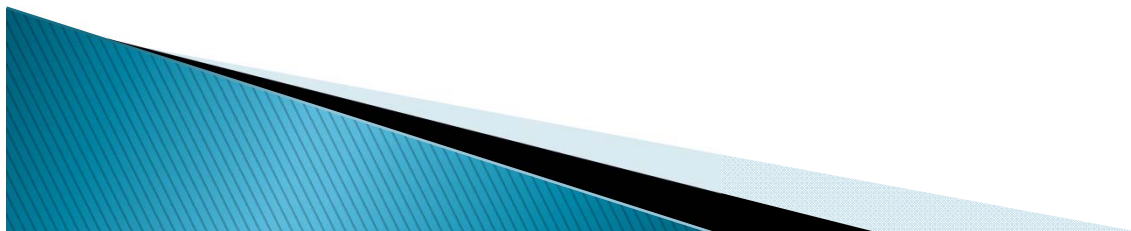
Rafflesia

Partial stem parasites



The primary haustoria reach up to the cortex of the host which runs longitudinally.

It sends secondary haustoria which make connection with the xylem of the host and absorbs water and minerals.



viscum

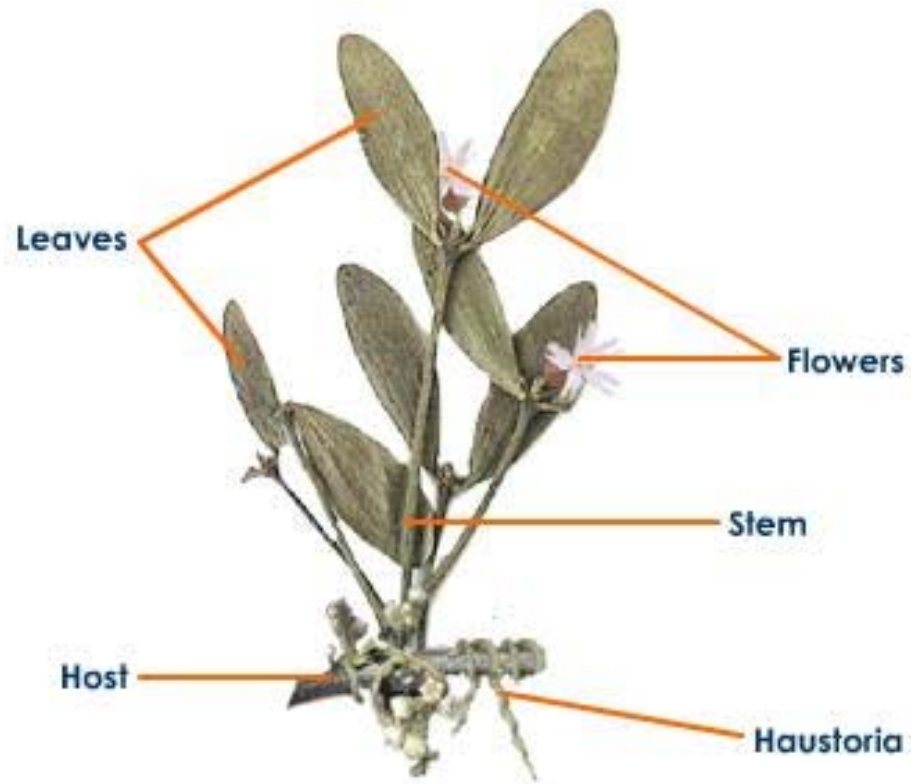
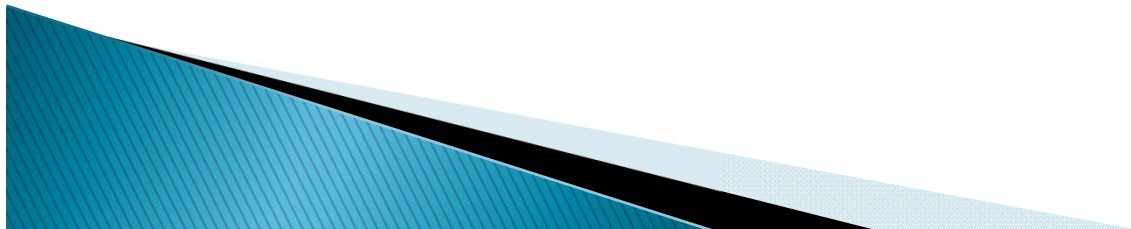


Photo: Newly germinated mistletoe (by Tony Wharton) www.uksafan.com



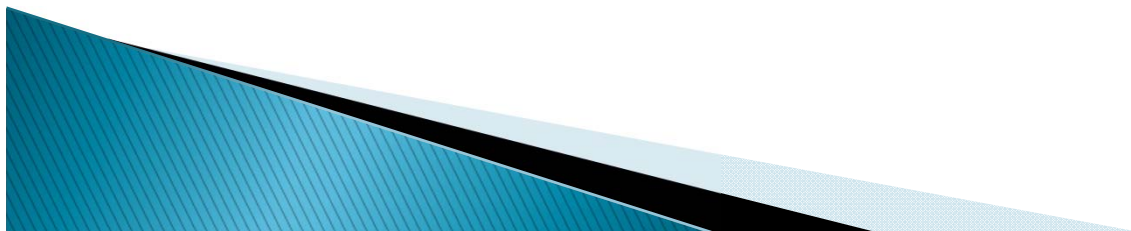
Partial root parasites

- ▶ *Santalum album* is the very popular example which grows in south India



B. Saprophytic plants

- ▶ Saprophytes are those plants which grows and lives on dead decaying organic mater of animals and plants.
- ▶ Many bacteria and fungi have this type of mode of nutrition



MUSHROOM



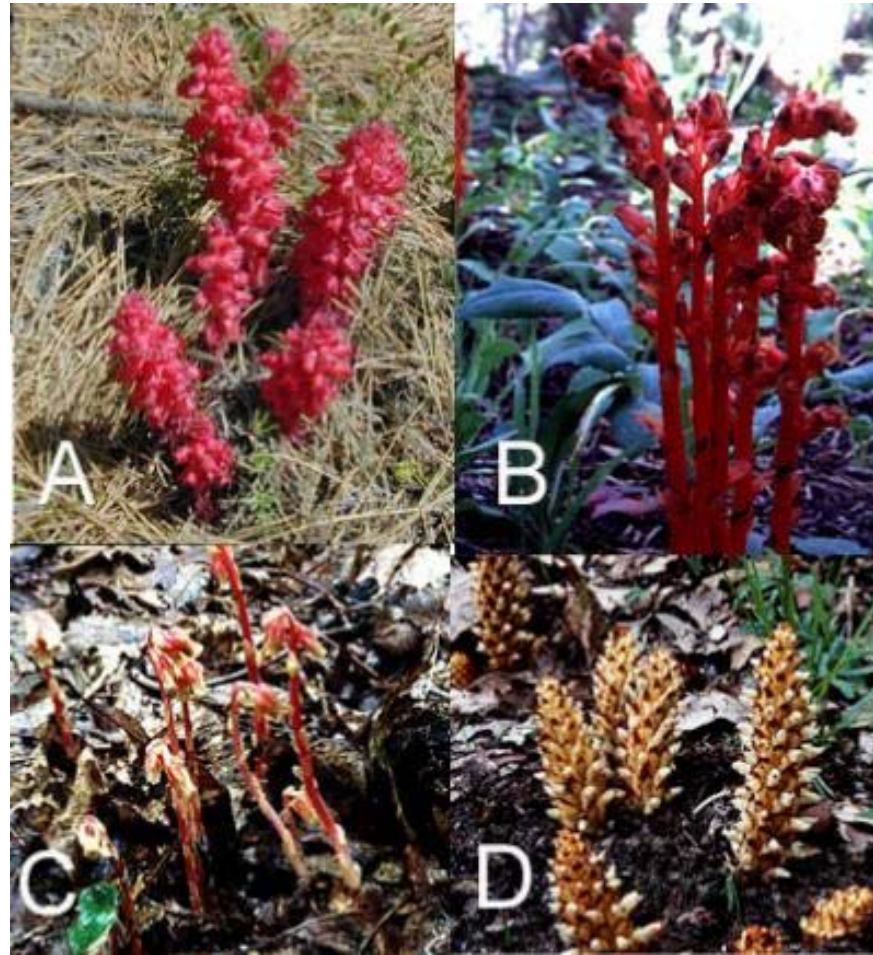
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AHMEDABAD

MONOTROPA



- ▶ Grows in humus rich soil
- ▶ Ectotrophic mycorrhiza
- ▶ Aerial shoots non-green
- ▶ Mycorrhiza help for nutrition

Parasitic plants



Inflorescence



Stem

Scales

Neottia (Bird's nest plant)

C. Symbiotic plants

- ▶ The term symbiotic refers to a partnership of two dissimilar plants in which both are mutually benefitted.
- ▶ The most common example of symbiosis is that of mycorrhiza.



CORALLOID ROOT:



- * **Specialised apogeotropic roots,**
- * **Grow on the surface of the soil,**
- * **Repeatedly dichotomously branched,**
- * **Appear as coralline masses,**
- * **Specific algal zone present,**
- * **Helpful in nitrogen-fixation.**

ROOT NODULES



LICHENS



Insectivorous plants

1. Pitcher plant.
2. *Dionea*.
3. *Utricularia*.
4. *Drosera*.

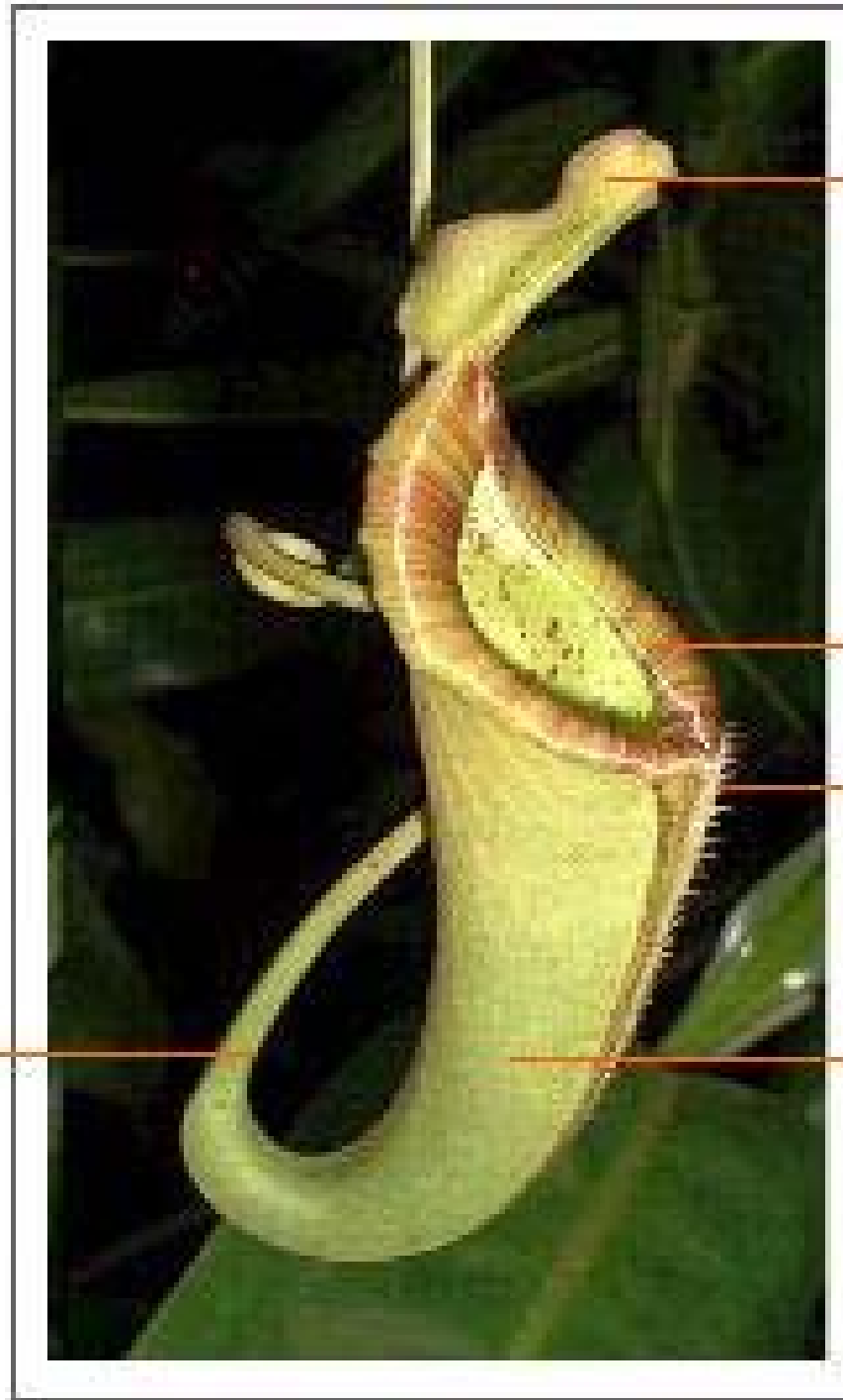




1. Pitcher plant

- ▶ The Lower Petiole is large and Flattened, upper part of Petiole is elongated and Tendrillar whereas the Lamina is modified into a pitcher

Petiole



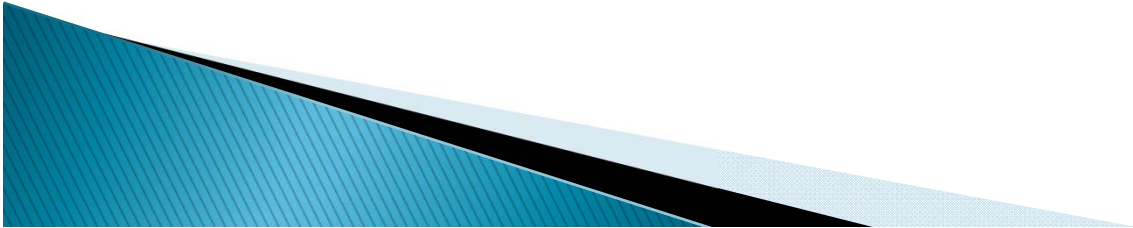
Lid

Rim

Ridge

Pitcher







Dionea



Dionea is commonly called Venus fly trap. The Plant is a herb bearing a rosette of leaves. Leaves have winged petiole and lamina modified into two toothed jaws normally open at an angle of 40–50 forming a trap.





Utricularia



- ▶ Aquatic plant
- ▶ The Plant body is rootless with much branched slender stem which bears dissected leaves



UTRICULARIA





UTRICULARIA



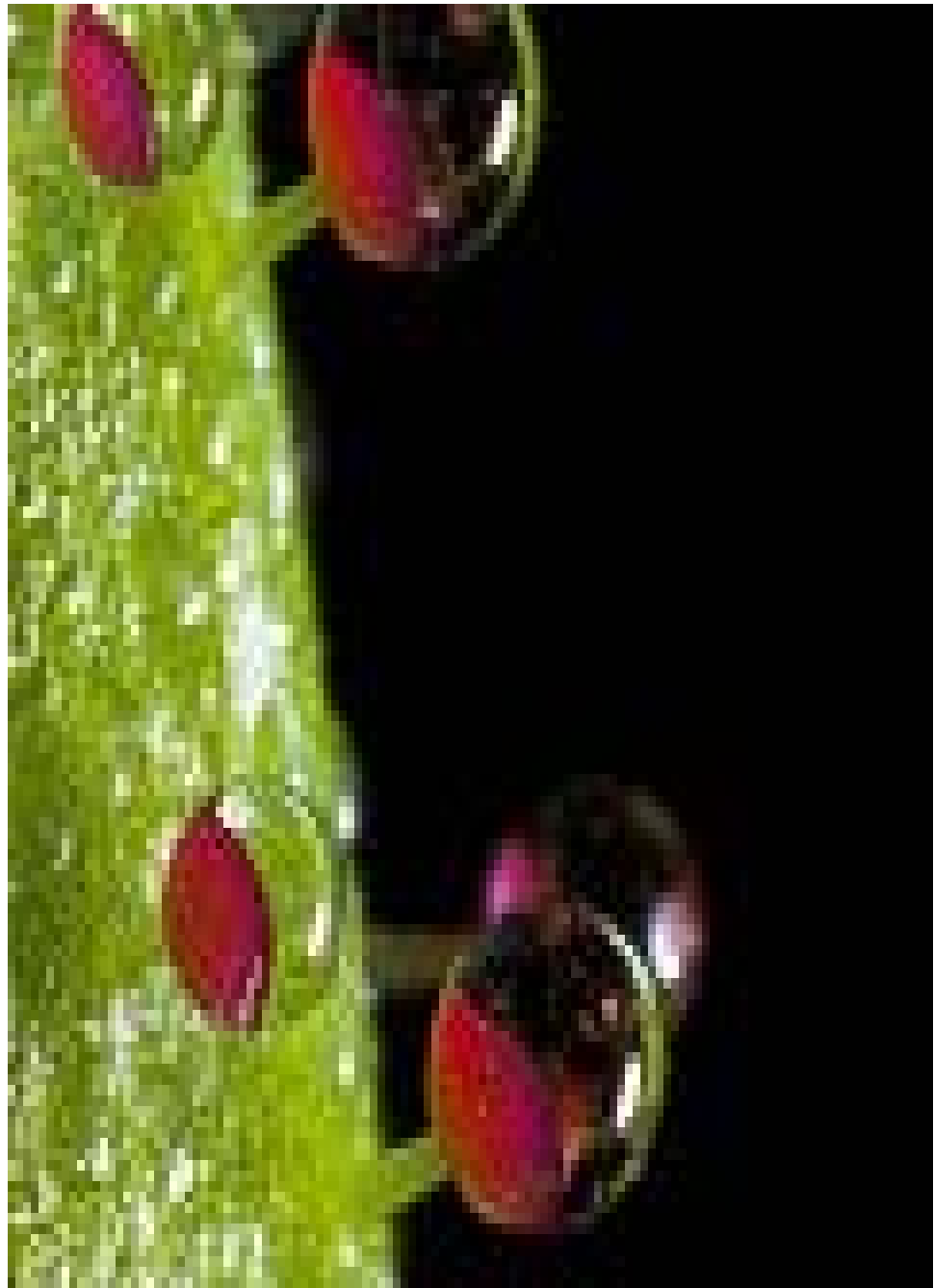
Drosera



- ▶ The Plants are herbaceous and grow in water logged places. The mature plant bears about 6-12 leaves forming a rosette



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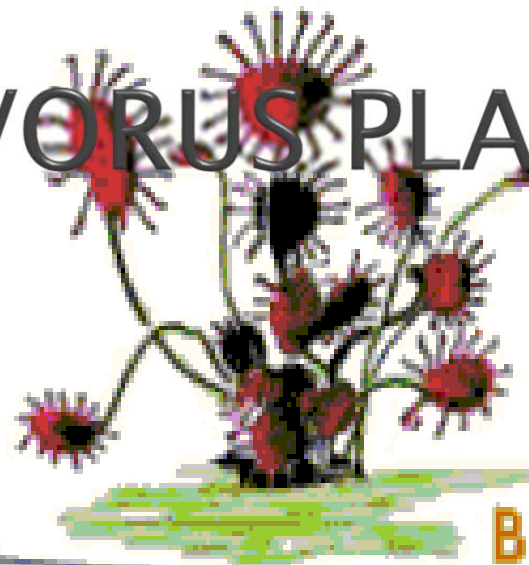




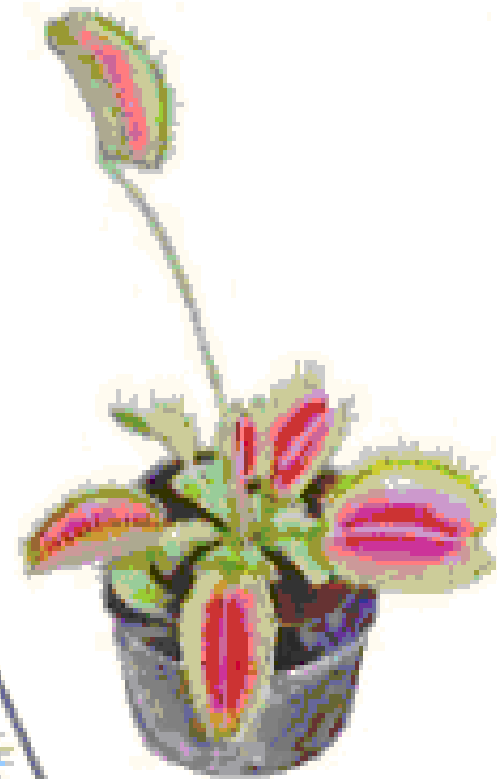
INSECTIVOROUS PLANTS



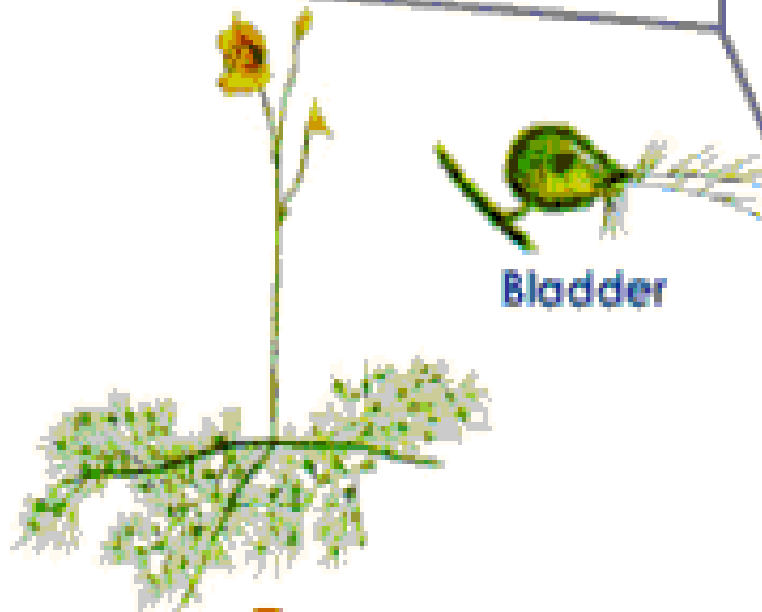
A



B



D



Bladder

C

A Pitcher Plant

B Sundew Plant

C Bladderwort Plant

D Venus Fly Trap

Thank You

