

**K.T.S.P. Mandal's
Hutatma Rajguru Mahavidyalaya,
Rajgurunagar.**

**T.Y.B.Sc. Botany
Semester – V (CBCS pattern)**

**Subject – Cryptogamic Botany
(Paper I: BO. 351)**

Chapter 1

**Topic – Introduction to cryptogams-meaning,
types-lower cryptogams, brief review with
examples.**

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INTRODUCTION TO CRYPTOGAMS

POINTS: INTRODUCTION

DEFINITION

TYPES OF CRYPTOGAMS

SALIENT FEATURES

MEANING & DEFINITION:

Cryptogams is a greek word, kryptos= hidden & gamos= marriage; hidden sex cells.

“**The non-flowering and non-seed bearing plant group** is known as cryptogams”.

OR

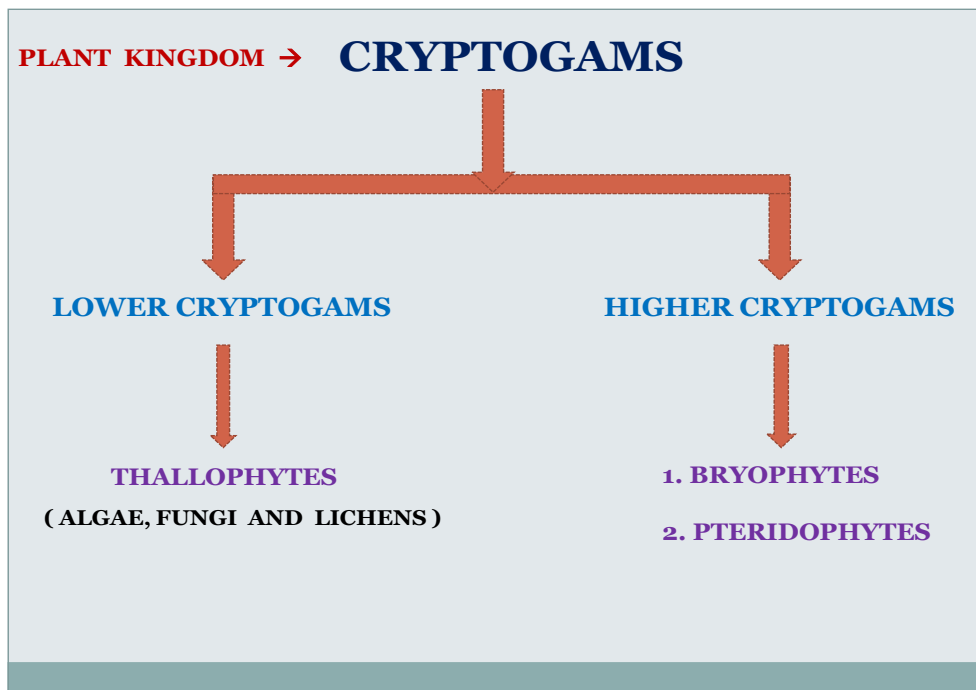
“**The flowerless and seedless plants** also called as cryptogams”.

- They include Thalloptya (algae, fungi, lichens), Bryophytes and Pteridophytes.

GENERAL INTRODUCTION:

- Cryptogam is a group of **plant kingdom**.
- It includes **lower cryptogams and higher cryptogams**.
- Lower cryptogams are microscopic plants,
 - Include Thallophyta (algae, fungi and lichens).
- Higher cryptogams are macroscopic plants,
 - Include Bryophytes and Pteridophytes.

Fig...Types of Cryptogams:



TYPES OF CRYPTOGAMS:

Cryptogams are non-flowering plants divided into Thallophyta, Bryophyta and Pteridophyta.

1) THALLOPHYTA:

- It is a division of plant kingdom.
- It comes under Lower cryptogams.
- It consists of Simplest plants.
- These are non-vascular plants.
- Plants not differentiated into root stem and leaves.
- It includes Algae, Fungi, Lichens and Bacteria.
- Thallophytes are having undifferentiated bodies (thalli).
- Plant bodies are filamentous, mycelial and undifferentiated.
- Plants may be unicellular or multicellular.
- Reproduce by vegetative, asexual or sexual methods.
- Exist almost gametohpytes, sporophytes absent or rudimentary.

- eg. *Nostoc*, *Puccinia*, *Parmelia*

• **THALLOPHYTA** : (Lower Cryptogams)

Characters	Algae	Fungi	Lichens
1. Plant body...	Green, Thalloid, Filamentous	Non-green, Thalloid, Mycelial	Composed of algae & fungi (symbiosis)
2. Cellular nature..	Uni / Multicellar Br / Unbranched	Multicellular Yeast - Unicellular	Multicellular
3. Habitat & Habit...	Aquatic, Few-Terr. Filamentous	Aquatic/terrestrial Hyphae/Mycelial	On rock, trunk Foliage/tiny shrub
4. Mode of Nutrition...	Autotrophic	Heterotrophic (sapro./parasitic)	Autotrophic (symbiotic asso.)
5. RFM... (Reserve food)	Starch	Glycogen, proteins, oil globules	Starch (algae) Glycogen (fungi)
6. Cell wall...	Cellulosic	Chitinous , Cellulosic	Cellulosic , Chitinous
7. Reroduction... e. g.	Veg, asexual, sexual e.g. <i>Nostoc</i> , <i>Chara</i>	All 3 types <i>Puccinia</i> , <i>Rhizopus</i>	Veg, asexual <i>Parmelia</i> , <i>Usnea</i>

2) BRYOPHYTA:

- These are non-vascular plants.
- They are higher cryptogams.
- They are most simple and primitive plants.
- Plants are thalloid and multicellular.
- plant body gametophyte, green and dominant.
- Habitat-aquatic or terrestrial or amphibians.
- Nutrition- Autotrophic mode of nutrition.
- Reproduction by vegetative, sexual and asexual methods.
- Gametes developed on the gametophyte.
- Fertilization-male and female gametes unite to form zygote.
- Water is imp media for fertilization.
- Zygote undergoes repeated division forms sporophyte, which produces spores.
 - Haploid spores on germination produces gametophye.
- Life cycle shows alternation of generatrions.

- Gametophytic and sporophytic generations alternate with each other to complete the life cycle.
- Gametophyte is dominant and independent where as sporophyte is dependent.
- eg. *Riccia*, *Marchantia* etc

3) PTERIDOPHYTES:

- These are non - vascular plants.
- They are Higher cryptogams.
- Plant body is sporophytic, green and dominant.
- Plant differentiated into root, stem and leaves like structures.
- Plants are multicellular.
- Habitat - terrestrial, few are aquatic.
- Nutrition-Autotrophic mode of nutrition.
- these plants are advanced than bryophytes.
- Reproduce by means of vegetative, sexual and asexual methods.
- Sporophyte produces spores (homospory or heterospory).
- Spores after germination produce gametophytes (monoecious/ dioecious).
- Gametophyte produces gametes.
- Gametes after fertilization form zygote, it undergoes div. forms sporophyte.
- Life cycle shows alternation of generation.
- Sporophytic and gametophytic generations alternate with each other to complete the the life cycle. - eg. *Sellaginella*, *Equisetum*

• **HIGHER CRYPTOGAMS :**

Characters	Bryophyta	Pteridophyta
1. Plant body....	Gametophytic, hv. gametes Thalloid (not diff.)	Sporophytic, spore bearing. Diff.into RSLeaves
2. Cellular nature.. Vas.Tissue....	Multicellular plants -Non-vascular plants	Multicellular plants - Vascular plants
3. Habitat..	Aqu./terrs. or Amphibians	Terrestrial, Few- aquatic
4. Mode of Nutrition...	Autotrophic (green)	Autotrophic (green)
5. Primitive/advanced.	Simple & Primitive	Advanced than bryophytes
6.Reproduction...	All types- veg , sexual & asexual	All types- veg , sexual & asexual
7. Other characters.. e.g. ...	Gametes → fertilization → zygote → sporophyte → spores(n) → Gametohpyte LC- Alt.of generations. <i>Riccia, Anthoceros etc.</i>	Spores → gametophytes → gametes → fertilization → zygote(2n) → Sporophyte. LC - Alt.of generations. <i>Selaginella, Psilotum etc.</i>

• **LOWER CRYPTOGAMS AND HIGHER CRYPTOGAMS**

LOWER CRYPTOGAMS

- Microscopic plants
- Unicellular or multicellular
- Non-vascular plants
- Plant body filamentous or mycelial
- Plants are thalloid
- Not differentiated into root, stem n lvs.
- Autotrophic or heterotrophic
- Reproduction- veg, sexual n asexual
- Habitt-aquatic or terrestrial
- Includes-Thallophyta-algae, fungi, lichens.
- eg. *Nostoc, Puccinia, Parmelia.*

HIGHER CRYPTOGAMS

- Macroscopic plants
- Multicellular plants
- Vascular or non-vascular plants
- Plants-gametophyte or sporophyte
- Plants thalloid or non-thalloid
- Differentiated into root, stem n lvs.
- Plants are autotrophic
- Reproduction- veg, sexual n asexual
- Habitat-terrestrial few are aquatic
- Includes- Bryophyta and Pteridophyt
- eg. *Riccia, Sellagenella.*

SALIENT FEATURES OF CRYPTOGAMS :

- Cryptogams are flowerless/seedless plants.
- These are lower plants and most primitive plants.
- It includes 3 groups i.e. Thallophyta, Bryophyta and pteridophyta.
- Thallophyta includes Algae, fungi, Bacteria and Lichens.
- Bryophyta includes Liverworts, Hornworts and Mosses.
- Pteridophyta includes Ferns and their allies.
- These were first plants to turn to land.
- They occur world wide, show more diversity in habitat.
- Plants ranging from 1 mm to 4 mt tall.
- Some are upto 18 mt tall and leaves more than 4 mt long.
- They do not have cambium, so sec. growth absent in this plants.
- They are of little economic imp. with few exceptions.
- Fossils of pteridophytes used to generate electricity (fossil fuel-coal, oils).
- *BGA*, *Azolla* with *Cyanobacteria* fix nitrogen.
- Used as organic fertilizers in flooded rice/paddy field.
- Some plants are medicinally imp, eg. *Adiantum* used on kidney stone.

REFERENCES :

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2. www.biologydiscussion.com
3. Wikipedia.