

# **GENERAL FEATURES OF BRYOPHTES**

# GENERAL FEATURES OF BRYOPHTES

- They are green land plants
- They possess chlorophylls A and B, starch, cellulose cellwalls and sometimes possess a cuticle
- The sporophyte is short-lived to annual

## GENERAL FEATURES OF BRYOPHYTES Cont'd

- The sporophyte, although photosynthetic through most of its life span preceding spore dispersal, is always attached to the gametophyte, and is at least partially dependent on it
- The base of the sporophyte (the foot) penetrates the tissues of the gametophyte

## GENERAL FEATURES OF BRYOPHYTES Cont'd

- The sporophyte is unbranched and produces a single terminal sporangium
- The spore coat is cutinized and the spores are generally disseminated through the air
- The sporophyte and the gametophyte possess no lignified tissue

## GENERAL FEATURES OF BRYOPHYTES Cont'd

- The gametophyte is generally perennial
- It often consists of a juvenile, usually filamentous phase (**PROTONEMA**) and a more complex phase that actually produces the sex organs

➤ The male gametes (sperms) are biflagellate with whiplash flagella and must reach the egg through a water film

➤ They are produced in the **ANTHERIDIUM**, that is, a stalked sac

## GENERAL FEATURES OF BRYOPHYTES Cont'd

- This sac is composed of sterile **unistratose** (one cell in thickness) jacket enclosing innumerable cells, each of which produces a sperm
- The female sex organ (**ARCHEGONIUM**) is flask-shaped; the neck of the flask is unistratose, while the lower expanded portion (**VENTER**) is **multistratose**

## **GENERAL FEATURES OF BRYOPHYTES Cont'd**

- Each archegonium encloses a single egg
- Bryophytes are generally small with the sporophyte usually not more than 3cm tall and the gametophyte usually less than 10cm tall
- ✓ although erect forms may exceed 20cm and reclining aquatic or hanging forms may reach a meter in length



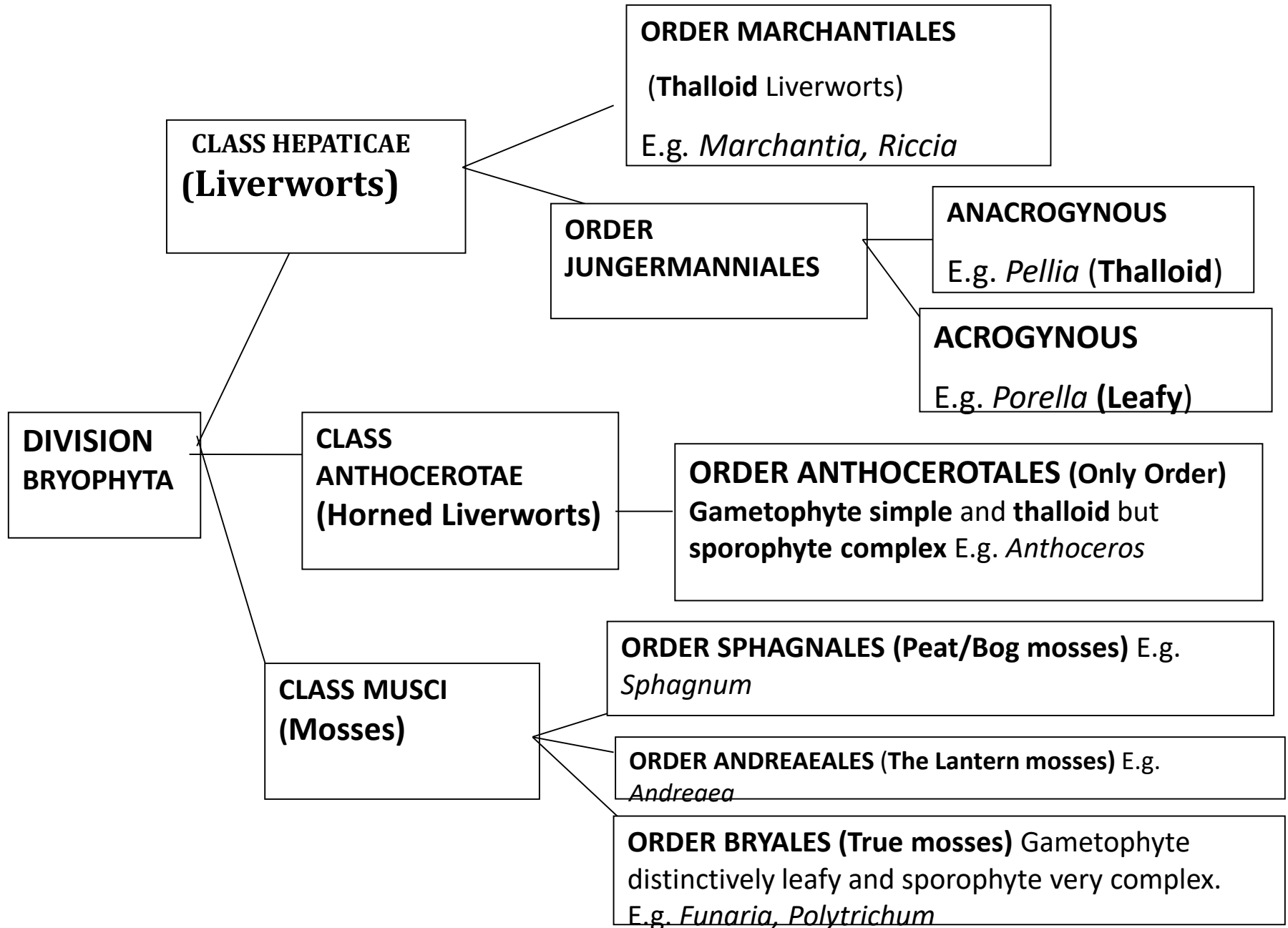
# CLASSIFICATION

- The Bryophytes fall naturally into three classes
  - ✓ HEPATICAEE (Liverworts)
  - ✓ ANTHOCEROTAE (Hornworts)
  - ✓ MUSCI (Mosses)

## CLASSIFICATION Cont'd

- The features used in this classification are the nature of the thallus and (where present) of the leaves, the extent of the development of the juvenile phase of the gametophyte (PROTONEMA) and the presence or absence of an opening mechanism in the capsule

- There is however, no general agreement concerning the number of Orders among the Bryophyta



# CLASS HEPATICAEE - THE LIVERWORTS

- The Hepaticae are the most primitive bryophytes
- The name liverwort (“liver-plant”) was probably applied to these plants because of the fancied resemblance of the thallus of some of these plants to the liver
- and the belief that plants resembling human organs would cure diseases of the organs they resembled

## **CLASS HEPATICAЕ - THE LIVERWORTS Cont'd**

- A prescription for a liver complaint in the 1500s therefore called for “liverworts soaked in wine”
- Unfortunately, there is no evidence that liverworts possess curative properties
- The hepatics possess a number of features that distinguish them from the mosses

## **CLASS HEPATICAEE - THE LIVERWORTS Cont'd**

- The “protonema” is usually reduced to two or three cells of the uniseriate (filament made up of a single linear series of cells) germ tube
- ✓ and the apical cell of the gametophyte is differentiated early

- The rhizoids are generally unicellular
- ✓ and are not branched, although the tip is sometimes knobbed
- The pronematal phase produces no gemmae
- The gametophyte is either leafy or thallose
- ✓ and leaves are arranged in two or three rows



## **CLASS HEPATICAEE - THE LIVERWORTS Cont'd**

- Sex organs lack paraphyses (filamentous sterile structures intermixed among the sex organs of most mosses) among them
- ✓ but mucilage filaments are usually present
- Leaves are usually unistratose
- ✓ and lack a costa

## **CLASS HEPATICAEE - THE LIVERWORTS Cont'd**

- Leaf cells are commonly isodiametric
- ✓ and frequently possess trigones (3- angled structures of equal length and width)
- Gametophyte cells often have complex oil bodies
- Leaves are often lobed
- The jacket of the sporangium never has stomata

- Cells of the sporangium jacket often have transverse or nodular thickenings
- The sporangium jacket is sometimes unistratose
- The sporangium usually opens by four longitudinal lines

## **CLASS HEPATICAEE - THE LIVERWORTS Cont'd**

- Even in rare cases where there is an operculum peristome teeth are absent
- Within the sporangium, there are often sterile threadlike hygroscopic cells with helical thickenings
- These are ELATERS
- A columella is absent

## **CLASS HEPATICAEE - THE LIVERWORTS Cont'd**

- The sporophyte usually produces a colorless seta of thin-walled cells
- ✓ and is held rigid by turgor pressure in the component cells
- The sporophyte generally persists for a very brief period after the spores are shed

- The calyptra is ruptured and remains at the base of the seta when the seta elongates rapidly
- ✓ and protects the maturing sporangium before seta elongation

## **CLASS HEPATICAEE - THE LIVERWORTS Cont'd**

- The seta elongates after the sporangium is completely differentiated with the included spores and elaters
- ✓ and the seta is rarely a photosynthetic organ
- Generally all spores in a sporangium are shed at the same time