HUMAN ECOLOGICAL RELEVANCE OF BRYOPHYTES

- The bryophytes are the simplest terrestrial plants, although in some parts of the world such as the bogs of temperate regions and some forests of tropical mountains they are a dominant part of the vegetation
- The dead stems and leaves accumulating below the growing surface become consolidated to peat, often many feet in depth

- Extensive peat deposits have been formed from the remains of peat mosses that flourished in past eras
- Peat, like the undecomposed peat mosses, is used around the world as soil conditioners and as fuel

- Peat has been cut into blocks, dried and burned as fuel, and in granulated form it is widely used in horticulture as a source of humus
- *Sphagnum* makes much of the peat which is the fuel of Ireland and northwestern Europe
- But the moss peat of Iowa in the US is *Drepanocladus*

- In the manufacture of Scotch whisky sprouted barley is dried on a screen over a peat fire
- The peat smoke permeates the barley and impacts a smoky flavour to the beverage
- Some bryophytes (and lichens) are pioneers on bare rocks after volcanic eruptions or other ecological upheavals and after retreat of glaciers

- They are better than flowering plants at living on stone walls and even in shady cracks of hot exposed rocks
- They slowly convert rocks to soil that accumulate mineral and organic matter which can then be inhabited or utilized by other organisms in a process called **succession**

- Mosses, in particular, retain moisture, slowly releasing it to the soil
- *Sphagnum*, also called bog or peat moss, has special nonliving cells that can absorb moisture, which is why peat moss is often used in gardening to improve the water-holding capacity of the soil
- They reduce flooding and erosion and contribute to humus formation

- The dense and extensive mat-like cover of these plants on the surface of the soil plays a significant role in soil conservation
- The dense mat prevents the rain from striking the soil surface directly
- In the dry season they protect the soil surface from the effect of strong winds which may blow away loose soil particles

- After death and decay they form humus on the soil surface, adding fertility to the soil
- Some mosses grow only on soils that are rich in calcium
- The presence of others indicates higher than usual soil salinity or acidity
- When certain mosses are present in a dry area it is a good indication that running water occurs there during a part of the year

- A few mosses are occasionally a problem in water reservoirs where they may plug entrances to pipes
- A few bryophytes are reported to be grazed along with lichens by foraging mammals in arctic regions
- But bryophytes are generally not edible

- The absence of xylem and phloem makes most bryophytes soft and pliable and birds often use them to line their nests
- Pulverized dried mosses are valuable as insulation and packing material since the empty cells enclose considerable ‘’dead” air space and the product is very light
- Some mosses have been used for packing dishes and stuffing furniture, and as bedding material for livestock

- Native Americans are reported to have used mosses under splints when setting broken limbs
- They have been used by aboriginal people as baby diapers (nappies)
- By far the most important bryophytes to man are the peat mosses
- They are ecologically very important in bogs and in the transformation of bogs to dry land

- Sometimes they form floating mats over water and help keep conditions acidic enough (with low oxygen concentration) to inhibit the growth of bacteria and fungi
- The cell walls of *Sphagnum* are able to selectively adsorb basic ions and release hydrogen ions

✓ thus increasing the acidity of aquatic medium

- The acidity can reach a pH of 3
- Organisms that die in such waters or bogs are often preserved for hundreds or thousands of years
- When allowed to absorb water, 1kg of dry peat moss will take up 25kg of water
- Its extraordinary absorptive capacity has made it very useful as a soil conditioner in nurseries and as a component of potting mixtures

- It is used as a packing for vegetables, live shellfish and other organisms are shipped in it
- And its natural acidity which inhibits bacterial and fungal growth gives it antiseptic properties
- The antiseptic feature combined with its absorbency which is greater than that of cotton has made it a useful poultice material for application to wounds

- Native American Indians in Utah ground up mosses such as *Mnium* and *Bryum* into a paste and applied it as a poultice to treat burns and bruises
- It was used for this purpose during the Crimean War of 1854- 1856 and on emergency basis during World War I

- Aboriginal people have used *Sphagnum* mixed with tallow or grease as a salve (soothe) for wounds
- And “sphagnol’’ has been extracted as a curative for skin diseases and as a relief from itching, particularly from insect bites

- In China herbalists used a decoction of *Sphagnum* gametophytes as a medicine for acute hemorrhage and also for eye diseases
- Pulverized *Sphagnum* can be used as an absorbing material for oil spills
- In Europe the growth of mosses was encouraged on shingle roofs to make them watertight