

Fucus

Describe the life history of Fucus.

or,

Describe the structure & reproduction of Fucus.

Fucus - brown, cold sea water alga.
popularly known as rockweed belongs to
Phaeophyceae

Fucales

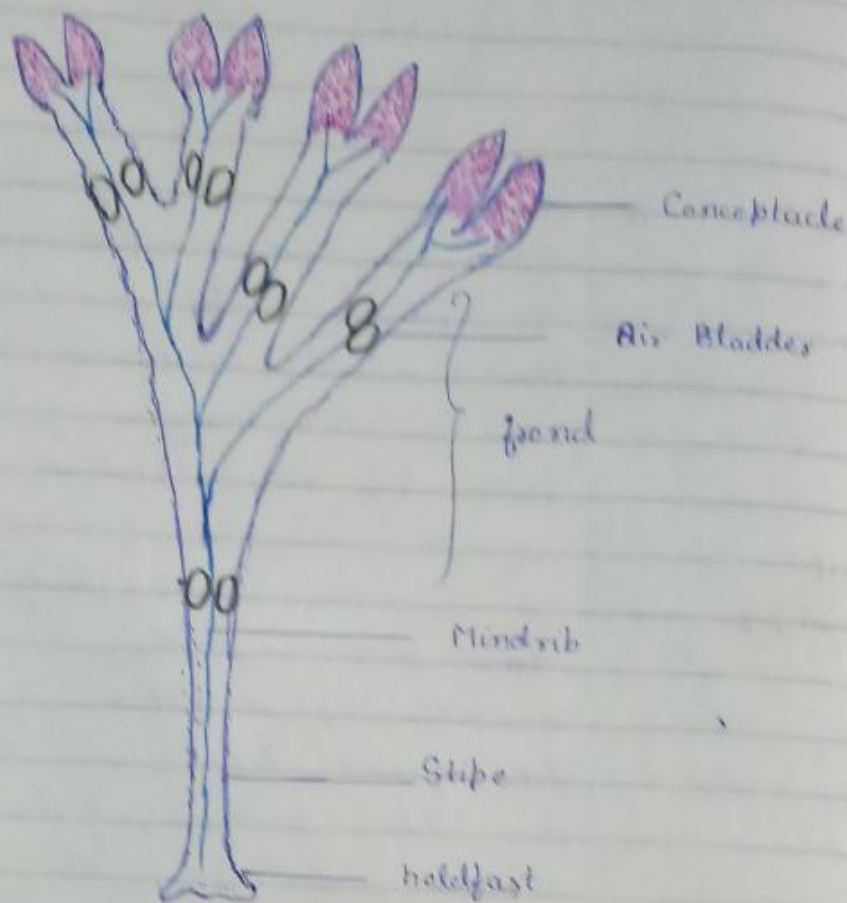
Fucaceae

The two common sps are F. Vesiculosus and F. Serratus. The former is characterised by the swollen receptacles, paired air bladders and smooth margin of the frond, while the latter by the flattened receptacles and serrate margin.

The plant body of Fucus is diploid, dark brown, leathery, slimy to touch. It consists of dichotomously branched ribbon like frond, stem like stipe and a basal disc like holdfast - the organ of attachment to the substratum. The thallus contains air-bladder like structure. The swollen tips of the thalli, the receptacles, which lack midrib are covered with small scattered pimple like projections with small openings which lead into cavity is known as conceptacles.

Each organ of the thallus has a special function to perform. The holdfast anchors the plant to the substratum. The tough stipe weathers the storm protecting the plants, being torn away from its base by the turbulent wave action. The flattened frond carries on photosynthesis.

While colla refer to the function of the bladder as respirator and supposed to give buoyancy to the thallus. The terminal receptacles constitute the localized reproductive organ.

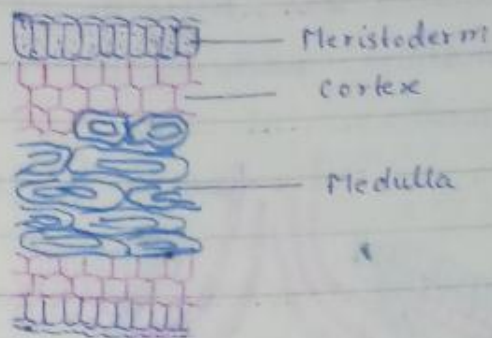


Anatomy of the thallus - The flattened frond shows the distribution as follows -
 a) Meristoderm or Palisad layer - It consists of a single layer of columnar shaped cells containing plastids and without intercellular space. It is meristematic and is covered by mucilaginous cuticle. It performs the of Photosynthesis.

b) Cortex - It is made up of several layers of thin walled mucilaginous parenchymatous cells. Its function may be is storage. According to Fritch, their function may be mechanical.

as is evident by the presence of frequent thickenings in the cells.

c) Medulla - The central tissue consists of loose, tangled mass of hypha like elongated cells. It probably performs the function of conduction of food material.



Position of the thallus in section

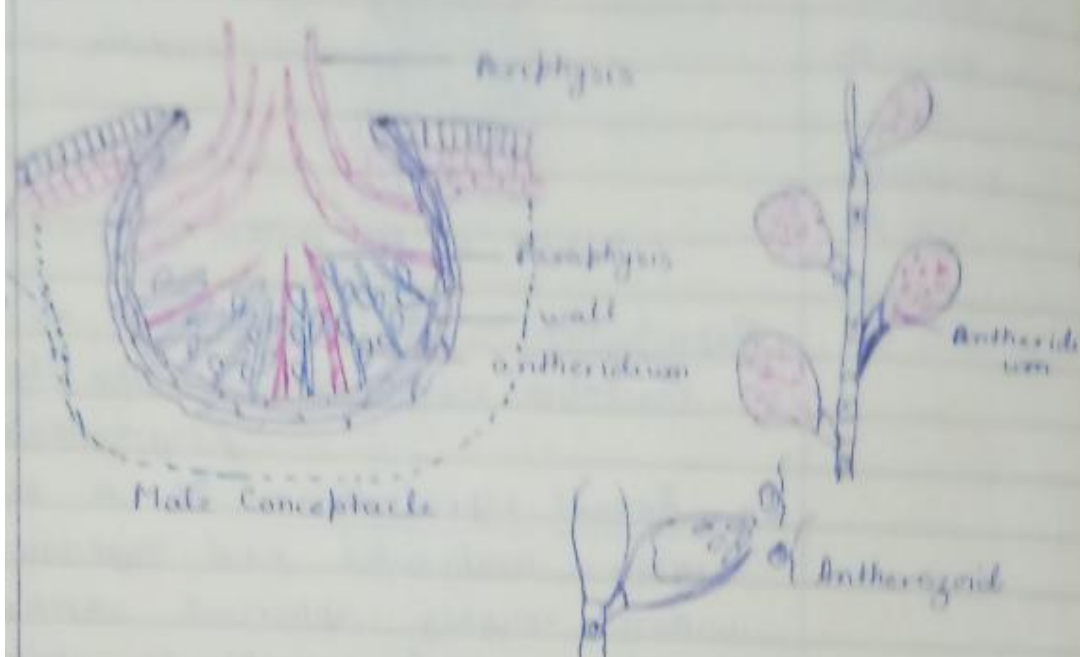
Reproduction - It takes place as follows.

a) Vegetative reproduction - By the method of fragmentation

b) Sexual reproduction - It is oogamous. Sex organs - antheridia and oogonia are developed within roughly spherical cavities termed the conceptacles. Each conceptacle opens to exterior by ostiole. Each conceptacle bears multicellular hairs - paraphyses or sterile hair-periphysis. Some sps are monoecious sp and some are dioecious. In monoecious sps, antheridia and oogonia are developed in the same conceptacle or in separate conceptacles on the same plant.

Antheridia - The antheridia are small, oval or club shaped unicellular structure borne in cluster usually on the lower branches of the fertile paraphysis. The antheridium is an orange coloured. The wall of antheridium consists of two layers - the outer form

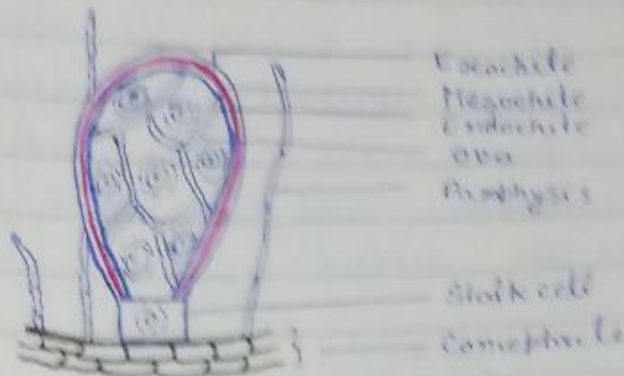
exochile and the inner gelatinous endochile. It produces two pear-shaped biflagellate antherozoids. Of the two unequal flagella the shorter basal type is directed forwardly whereas the longer whip-like type is directed backwardly. Meiosis takes place during the development of antherozoids. The mature antherozoids are liberated in the sea water.



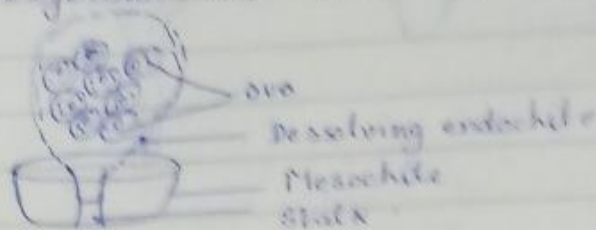
Discharge of antherozoid

Oogonia — The oogonium is a large oval or globular, one celled structure. It is produced from a single cell and is borne on a short stalk. At maturity it contains eight eggs. The oogonial wall is thick and differentiated into three layers, the outer exochile, the middle mesochile and the innermost endochile. The exochile and endochile are thin and the mesochile are thick. There is a space between exochile and mesochile. In the region of the basal pit, where the stalk cell and the oogonium adjoin the oogonial wall remains thin. On maturity,

all eight egg cells are liberated out in water.



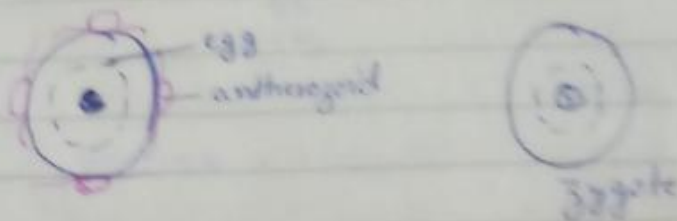
A segment of Conceptacle wall bearing a mature ovogonium and a new paraphysis.



Liberation of ova.

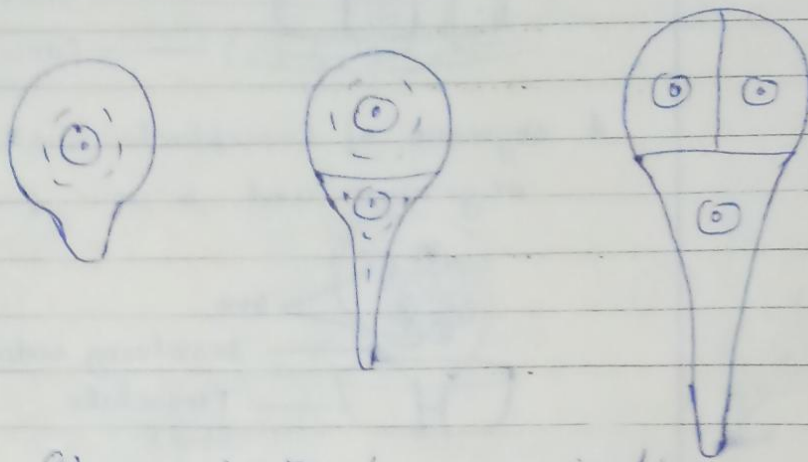
Fertilization — Fertilization is external. Eggs floating free in water are soon surrounded by numerous antherozoids which set the non-mobile egg in rotation (Thuret 1884) and may continue until an antherozoid penetrates the egg and fertilizes it resulting in an oospore. According to Fawcett & Williams (1898) and Yamanouchi (1903), there are cases of polyspermy. According to Whitaker (1911), soon after fertilization the zygote fixes itself to any substratum with the help of gelatinous wall.

Interspecific crosses have been also reported in *Fucus*.



Post fertilization changes

The zygote forms a thin wall and at once divides to produce new Fucus plant without undergoing a resting period, the lower cell growing into the holdfast and the upper the thallus which is diploid.



Stages of zygote germination

Graphic life cycle

