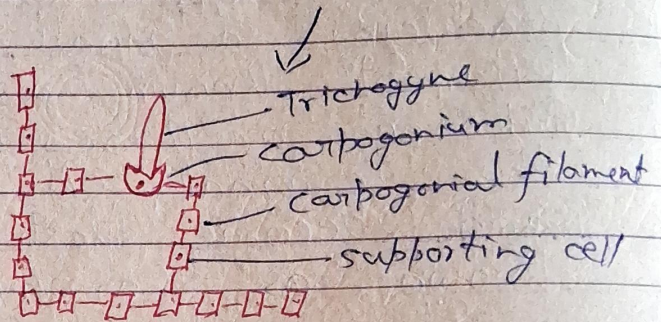
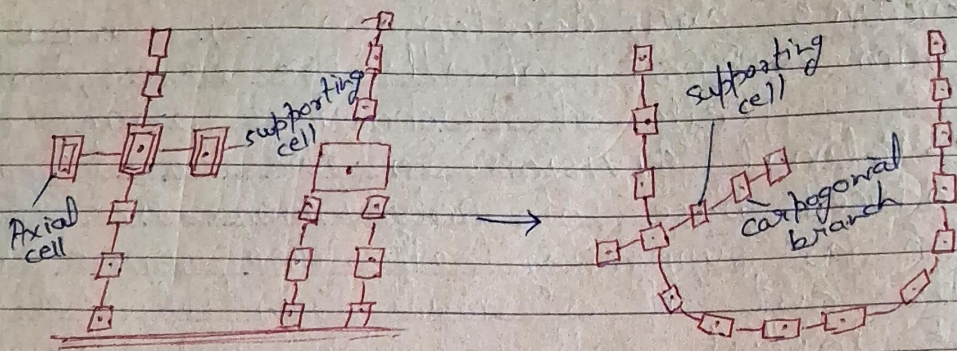


Reproduction → It reproduces only sexual methods.

Sexual Reproduction → It is advanced oogamous type and plant is dioecious either male or female plants are separate but they are morphologically similar. Male reproductive organ is known as spermatangium and gamete is known as spermatogonia and female reproductive organ is known as carpogonium.

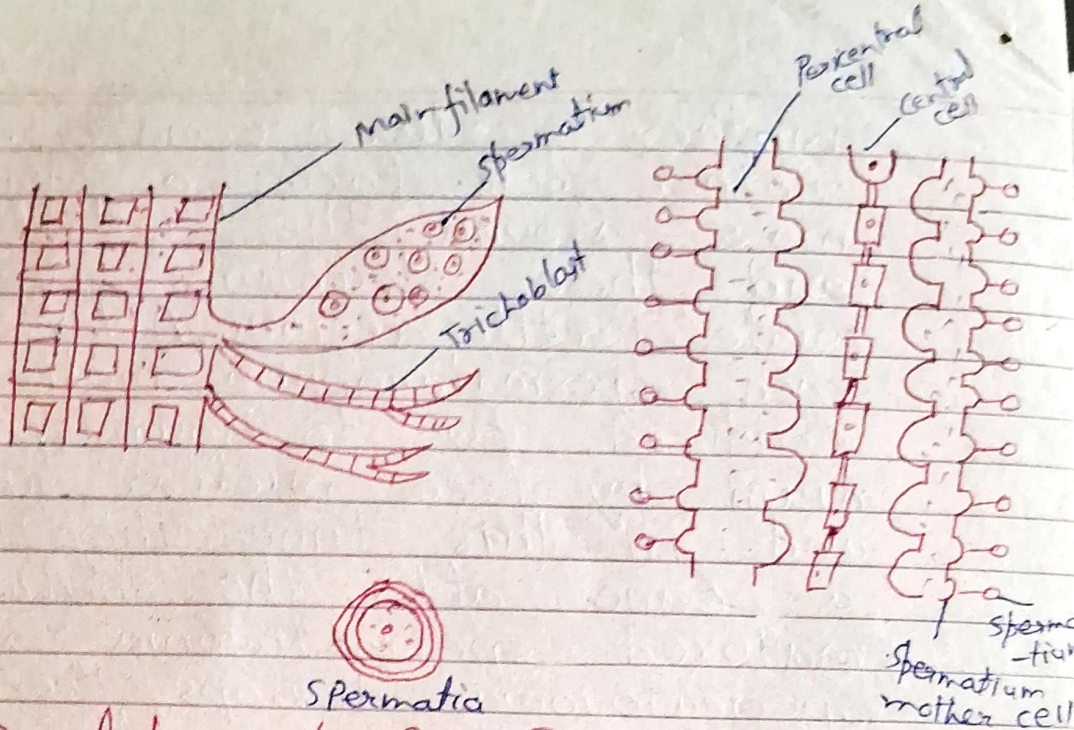
Structure and development of carpogonium → First of all the lower three cells of trichoblast undergoes periclinal division. So the basal cells produced base of polysiphons and function as supporting cells. The supporting cells cut off a small, initial cell. The initial cell divides and redivides producing a small four celled curve filament known as carpogonial filament or Procarp. After sometimes the terminal cell of Procarp enlarges and become flask shaped structure known as Carpogonia. Carpogonia has basal swollen, uninucleate, egg cell or oogonium and upper one is uninucleate, long, cylindrical, trichogone. The basal region forms two sterile cells which are known as basal sterile filament and lateral sterile filament initial. Pericentral cells *adjacent to the supporting cell give rise several out growths which covers the carpogonia and at the time carpogonium is ready for fertilization. These sterile filament are also known as pericarp.



Development of Carpogonium

Structure and development of spermatogonia → First of all male male trichoblast is produced out of the two branches of the trichoblast one is fertile and other is sterile. Lower two cells of the trichoblast is common basal stalk for sterile and fertile branch. Cells of the fertile branch divided periclinally and produced a number of pericentral cell around the central filament. So the polysiphon condition produced. Each pericentral cells divide and redivides producing a number of spermatogonium

mother cells. Spermatogonium mother cell forms a compact mass around the central siphons and these structures represent male fertile region. After sometime each spermatogonium mother cell produced two to four spermatogonium by free nuclear division. and in this time they looks like a cane after the shedding of matured spermatogonia a new spermatogonia develops there. Each spermatogonia has a large nucleus with cytoplasm and these nucleus are known as spermatium. The spermatia are spherical as oblate unicellular, pale in colour. After maturation spermatogonial wall is thick and three layered which is non-motile and is perforated through a narrow apical slit in the spermatogonial wall and is ready for fertilization. Spermatia are generally transported by water to the trichogyne of the carpogonium.



Development of SPERMATOGONIA IN Polysiphonia

Fertilization → Liberated spermatium reaches the trichogyne of carpogonia by the water current and stick to it due to the presence of mucilage substance. Then trichogyne wall is dissolve at the point of contact and spermatium nucleus and cytoplasm enter into the egg cell through the trichogyne and fusion between the egg nucleus and spermatium takes place and zygote is form. After some time zygote is separated from the trichogyne by a cross wall.

After fertilization some sterile lateral filaments arise from the base of carpogonia which is known as supporting cell also. A cell is cut off from the supporting cell at its upper end. That cell is known as axillary cell. It has a haploid nucleus a tabular connection is established between the axillary cell and the base of the carpogonium. Mitotic cell division occurs in the diploid nucleus of the carpogonium or zygote and two daughter diploid nuclei are produced. One of two diploid nuclei one is migrated into the axillary cell and the haploid nuclei of the axillary cell degenerates. Then diploid nucleus of the axillary cell divides meiotically then an out growth formation takes place at the upper end of the carpogonium. And one remaining diploid nucleus migrate into the out growth. The out growth containing diploid nucleus is cut off by a septum ~~nucleus~~ from the axillary cell forming gonimoblast initial. A number of short filaments are developed from the gonimoblast initial named as gonimoblast filaments which forms a compact mass and

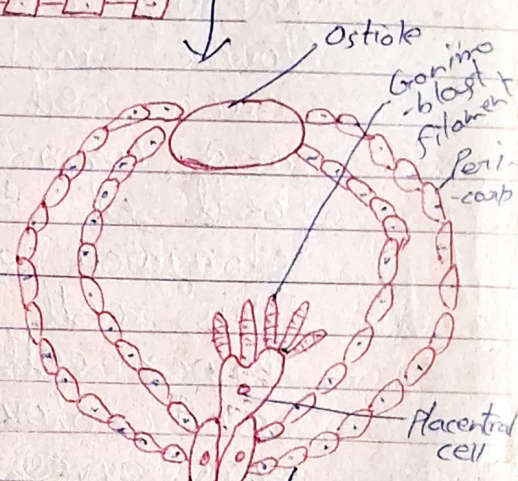
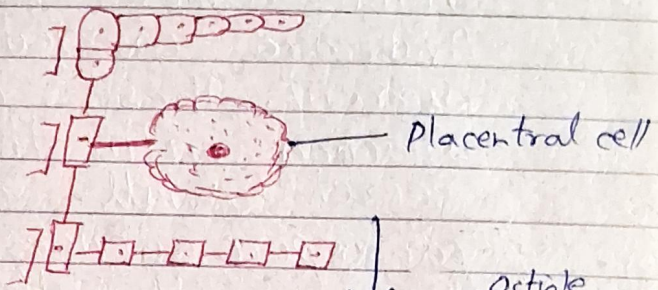
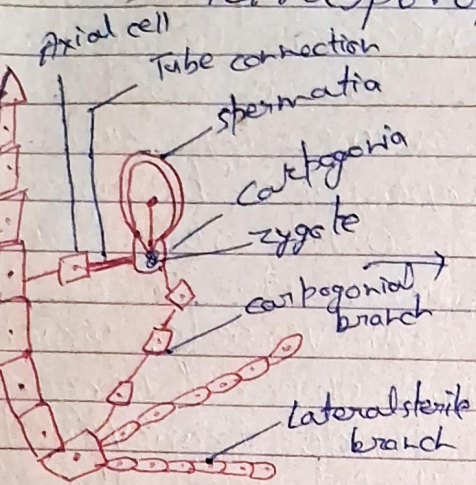
each cell of the filament has a diploid nuclei. The terminal cell of each gonimoblast filament which forms a compact mass, enlarges and develops into an elongated, pear shaped carposporangium. Diploid protoplast of each carposporium develops into a single diploid carpospore. Then the axillary cell, supporting cell, lateral cell and basal sterile filament fuses together and form an irregular placental^{ele.} elements. The carpegonial filament are also fused with the above cell while the above mention changes are taking place the pericentral cell of the female trichoblast adjacent to the supporting cell give rise out growths which alternately form an envelop around the placental elements. Where a minute opening takes place on the envelops is known as ostiole. The entire structure thus formed is known as cystocarp. It is partially haploid and paritically diploid structure. The diploid portion of the cystocarp is known as carposporophyte. It consist of carposporophyte containing carpospore. It is parasite on the female polysiphonia plant. After sometimes two layered haploid

jacket cells are formed around the carposporophyte which is known as pericarp. At maturity carposporophyte produces diploid naked carpospore which comes out to the ostiole. And are carried away by water current. These carpospore becomes attached with the solid object and secret a wall around it. Then the carpospore divides transversely which is lower small cell and upper larger cell. Each cell again divide transversely and form four cell filament. The basal cell of the filament is colourless and elongated and expanded into a disc. This cell is known as rhizoidal cell. Upper cell of the filament is globular and coloured it divide transversely and gives rise the central siphon cell. The two remaining intercalary cell divide periclinally and gives rise to pericentral siphon cell and at last the whole structure develops into a polysiphonia plant. At maturity polysiphonia plant produces tetraspore which are Asexual spores. Therefore plant is known as tetrasporophyte.

In the ~~life~~ lifecycle of polysiphonia it produces three phases into the life cycle. They are the (a) Cramentophytic phase (male and female plants)

(b) Carposporophytic phase (cystocarp)

(c) Tetrasporophytic phase.



FERTILIZATION IN POLYSIPHONIA

