Semester - I

Subject - Botany

Course - Major - 1

Question:- Describe reproduction in Batrachospermum.

Answer:- Reproduction in Batrachospermum

(A) Asexual Reproduction:- It is brought about by means of non-flagellate uninucleate spores known as monospores. These are developed single within monosporangia which are again developed on the erect portion of the heterotrichous filament called chorantia stage. It is produced during the post-fertilization stage of the sexual reproduction.

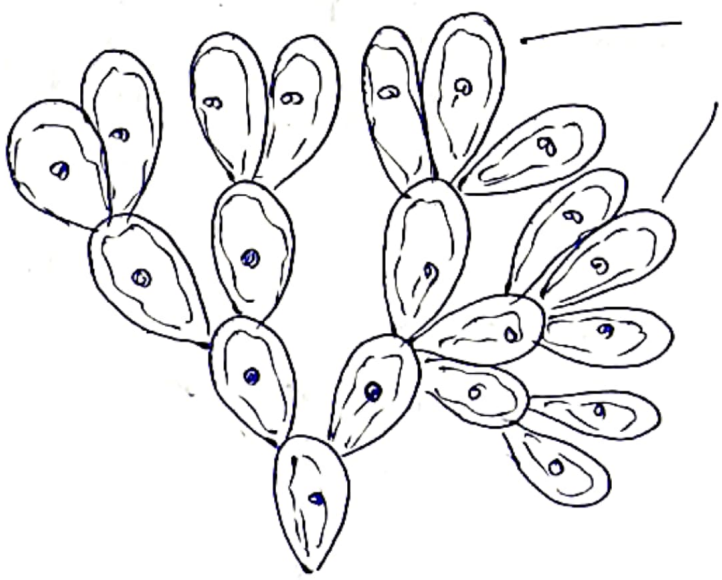

Figure- Chorantia stage.

Antheredia or Spermatangia (male sex organs) are single celled spherical structures borne on in clusters at the tip of the lateral branches ob the thallus. Contents of each antheredium become metamorphosed into a non-motile, spherical male gamete or spermatium, which is liberated through a narrow apical slit ob the antheredial wall.

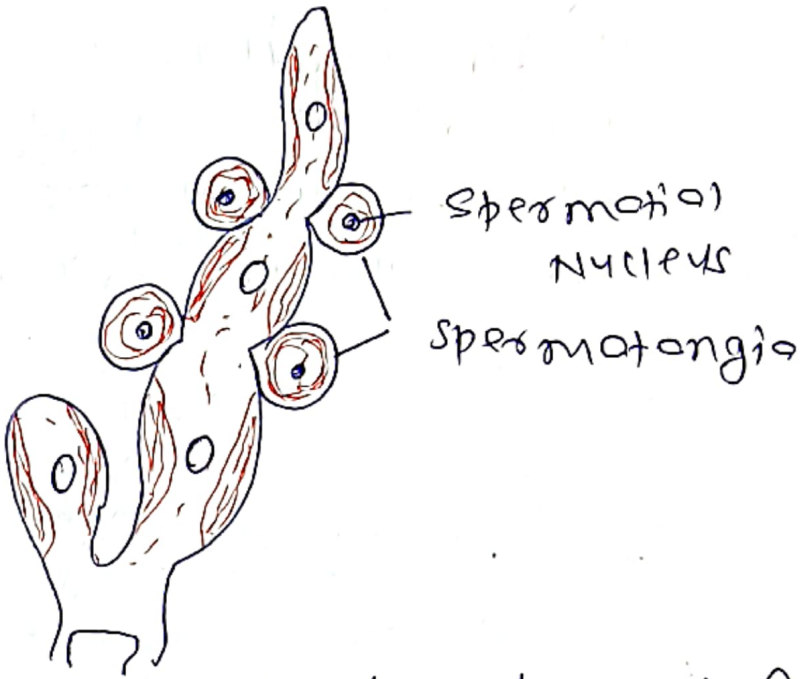

Figure: Spermatangial branch bearing spermatangia.

Fertilization

The Spermatium thus liberated floats in water and is finally carried away by water current to come in contact with the trichogyne ob the carpogonium. The walls dissolve at the point ob contact ob the spermatium and the trichogyne and the contents ob the spermatium pass through the open passage and move down the tricho

gyne into the base of carpogonium where both male and female nuclei fuse together.

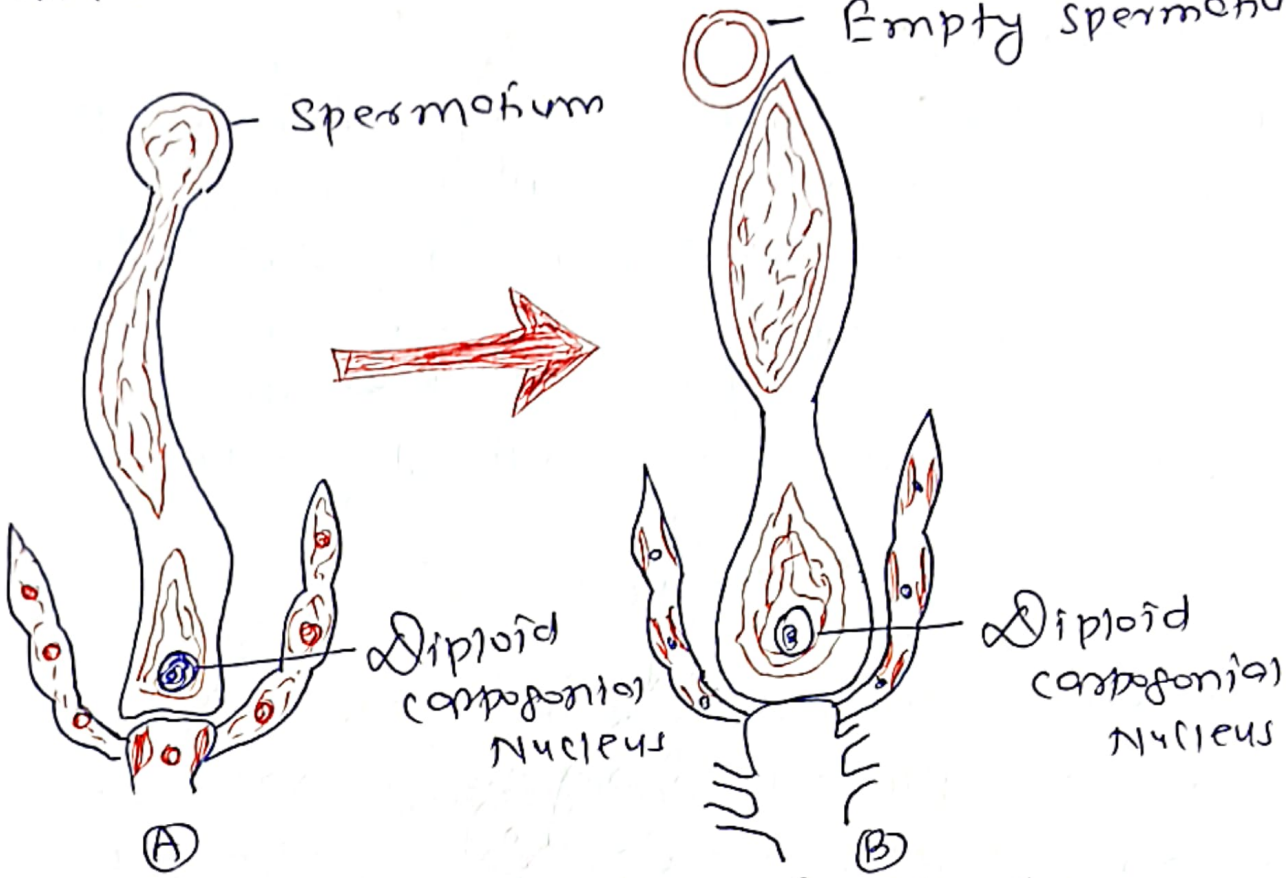

Figure- Stages of fertilization

Post-fertilization change

After fertilization the trichogyne is separated from the carpogonium by a mucilage plug and finally shrivels and disappears. The diploid carpogonial nucleus divides meiotically into two haploid nuclei. Simultaneously with the nuclear division a lateral protuberance is developed from the carpogonium. One of the two daughter nuclei moves into this protuberance, the another remaining in the carpogonium. The protuberance is cut off from the carpogonium by a

wall and is known as gonimoblast initial.

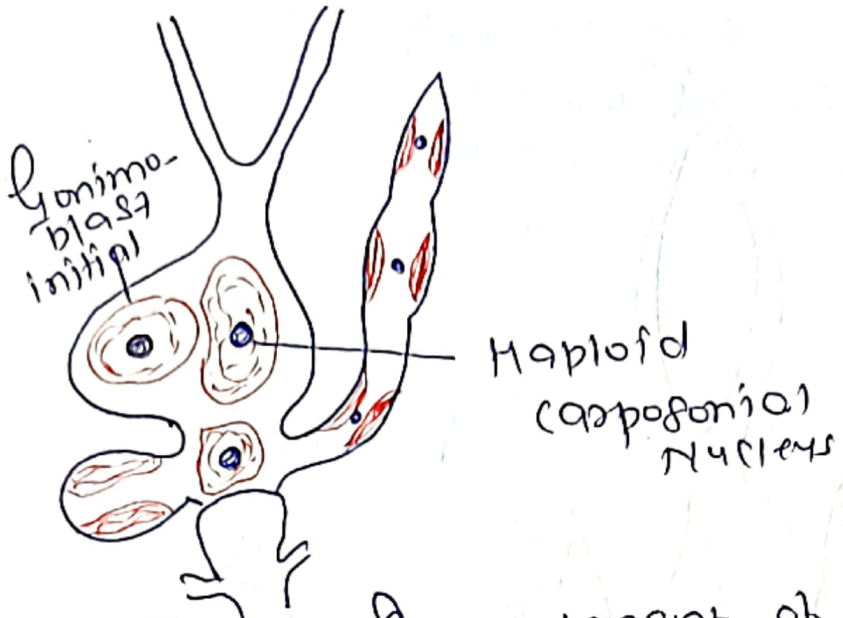

Figure → Development of gonimoblast nucleus.

Then the daughter nucleus of the carpogonium divides mitotically along with the formation of another protuberance on the other side of the carpogonium in which the daughter nucleus migrates and ultimately a second gonimoblast initial is produced and like this several gonimoblast initials are produced which by repeated divisions form branched or unbranched filaments known as gonimoblast filaments. The terminal cell of gonimoblast filaments become enlarged, each on developing into a carposporangium, the contents of which become metamorphosed into a single, non-motile

carpospore. Along with the development of the carposporangium and carpospore numerous sterile threads are developed from the cells below the carpogonium which ultimately envelope the gonimoblast filaments. These threads are known as enveloping threads. The structure so formed with gonimoblast filaments surrounded by the enveloping threads is the cystocarp. The carpospore is liberated from the carposporangium. It germinates into heterotrichous filament which is morphologically quite different from the main thallus. The heterotrichous filament is known as "Chantia stage or Juvenile stage" for long time this heterotrichous filament was considered to be a new genus 'Chantia'. But later on it was found that the apical cells of the lower branches of the erect threads developing into new Batrachospermum thallus. Finally it was linked up in the life cycle of Batrachospermum naming as Chantia stage.

The life-cycle of Batrachospermum consists of two gametophytic phases alternating with one sporophytic phase, which is however, confined in the zygotic stage. The early gametophytic phase — chantia stage is formed by the germination of the carpospore which is the product

of post-fertilization stage. The late ⑦
gametophytic phase, the main Botrachop-
permum plant is developed from the
Chorantia stage.

Dr. Umesh Kumar
Department of Botany
U. R. College, Rosera
At LNMU, Darbhanga.