

Coleochaete

1) Systematic position —

Division — Chlorophyta

Class — Chlorophyceae

Order — Coleochaetales

Family — Coleochaetaceae

Genus — Coleochaete

Species — C. scutata

C. orbicularis

2) Describe the morphology or vegetative structure of Coleochaete.

Ans. The thalli structure are of different form. In some species the thallus is typically heterotrichous and consist of partly prostrate and partly erect branched system. In some other species the thallus is entirely prostrate in which the branches radiate from a common center. In all this thalli some cells bear a single long branched cytoplasmic sitta whose base is ensheathed by a cylinder of gelatinous material. The entire thallus is often surrounded by a mucilage. The cells are uninucleated and provided with a single laminate chloroplast that partially or entirely encircle the protoplast.

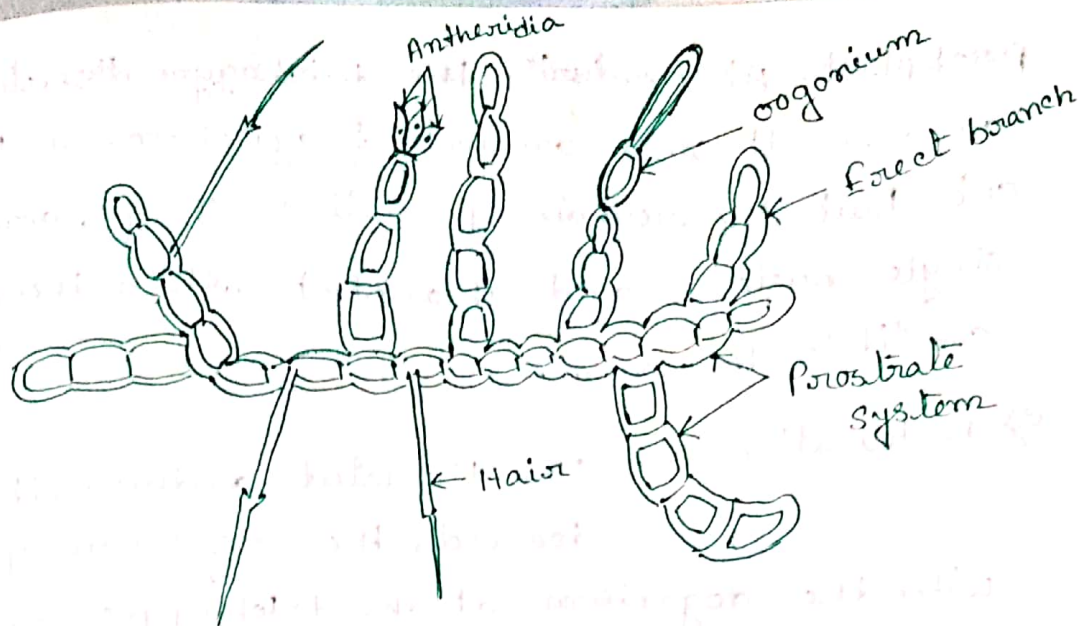


Fig:- Thalroid plant body

V.V.I
3) Describe the sexual reproduction of Coleochaete.

Am. Sexual reproduction of Coleochaete is oogamous type and it takes place by the formation of antheridia and oogonia in the following way —

A) Antheridia — The antheridia develop in cluster at the end of the branches of the projecting thread. In discoid form (C. scutata) they develop from the marginal or mid way cells. The antheridia are bluntly conical each of which produces a single oval or spherical biflagellate antherozoid. The antherozoids are liberated by the dissolution of the antheridial wall at the apex.

B) Oogonia — The oogonia are formed terminally from the marginal cells of the short lateral branches of the projecting filaments. Each oogonium is a flask shaped structure with a swollen base and a long narrow colourless trichogyne. The young oogonium contains dense

protoplast. At maturity the trichogyne disintegrates, as a result some amount of cytoplasm is liberated out. But the remaining portion of cytoplasm with single nucleus and chloroplast within the oogonium constitute the ovum.

C) Fertilization — The liberated antherozoid swims towards the oogonium fuses with the oogonium at the trichogyne and the nucleus then passes through to fertilizes the egg. After fertilization, a diploid zygote or oospore is formed within the oogonium.

D) Germination of zygote — The zygote remains within the oogonium secretes the thick wall and increases in size greatly. At the same time branches arise from the underline and the other adjacent which unite to form a complete pseudoparenchymatous envelop around the zygote. The entire structure is known as spermatocarp. The spermatocarp remain dormant over winter. Under favourable condition the zygote nucleus first divides meiotically and then mitotically. As a result 8-32 daughter nuclei are formed. Simultaneously cytoplasmic division takes place as a result 8-32 wedge shaped daughter cells are formed. Each daughter cell is metamorphosed into a biflagellate zoospores. Each zoospore after liberating from the zygote wall swims for a little period, then comes

to rest and germinates directly to form a new thallus.

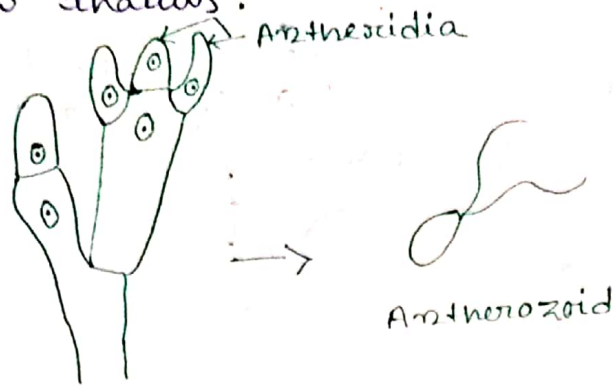


Fig:- Antheridial development

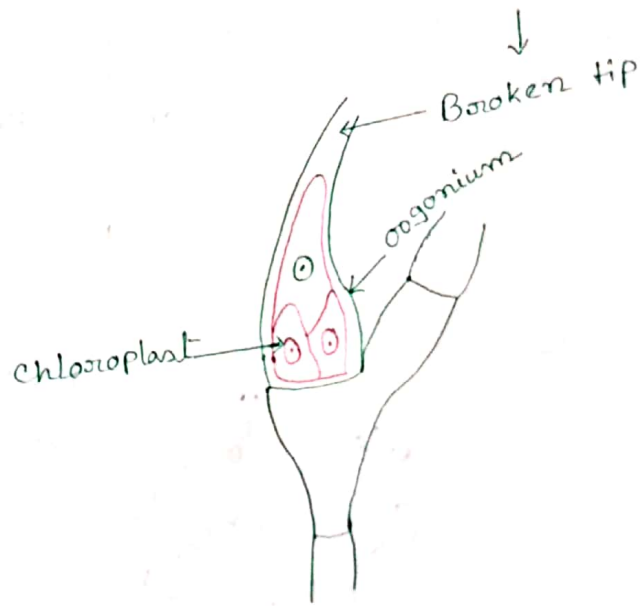
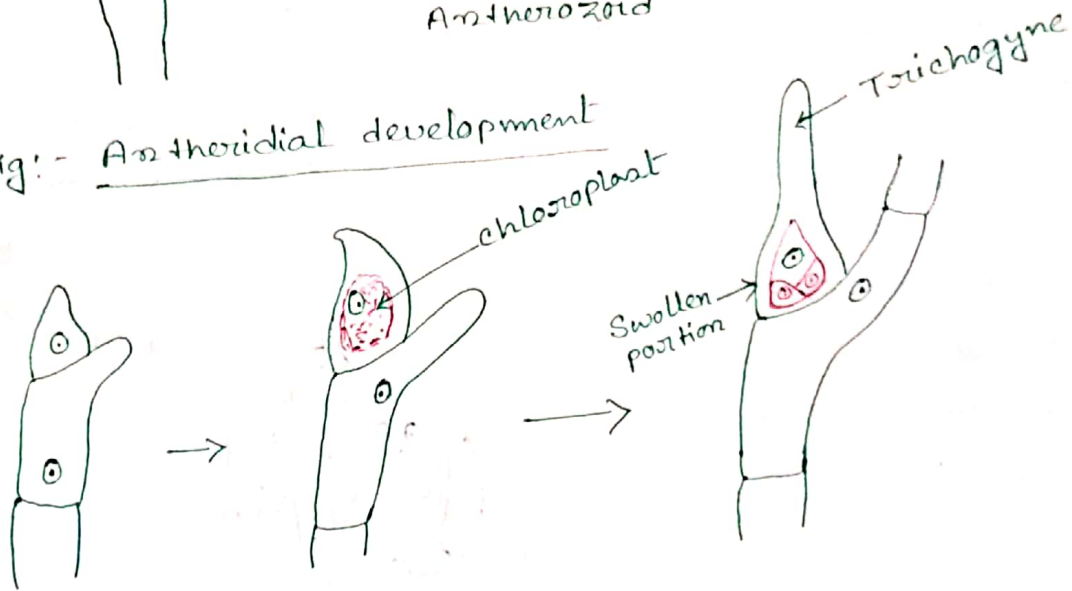


Fig:- oogonial development

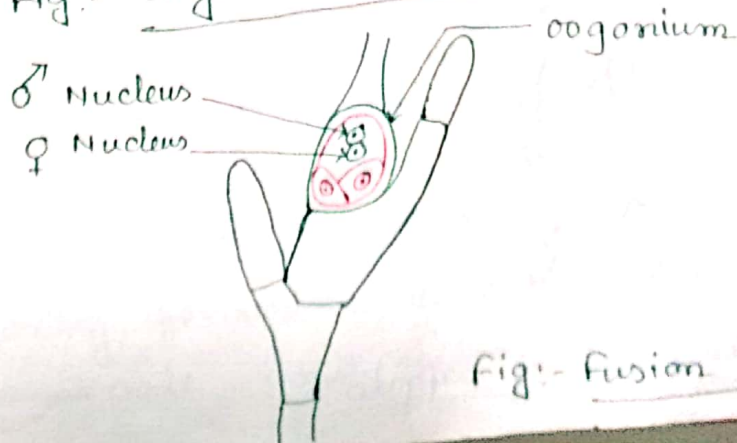


Fig:- Fusion between gametes

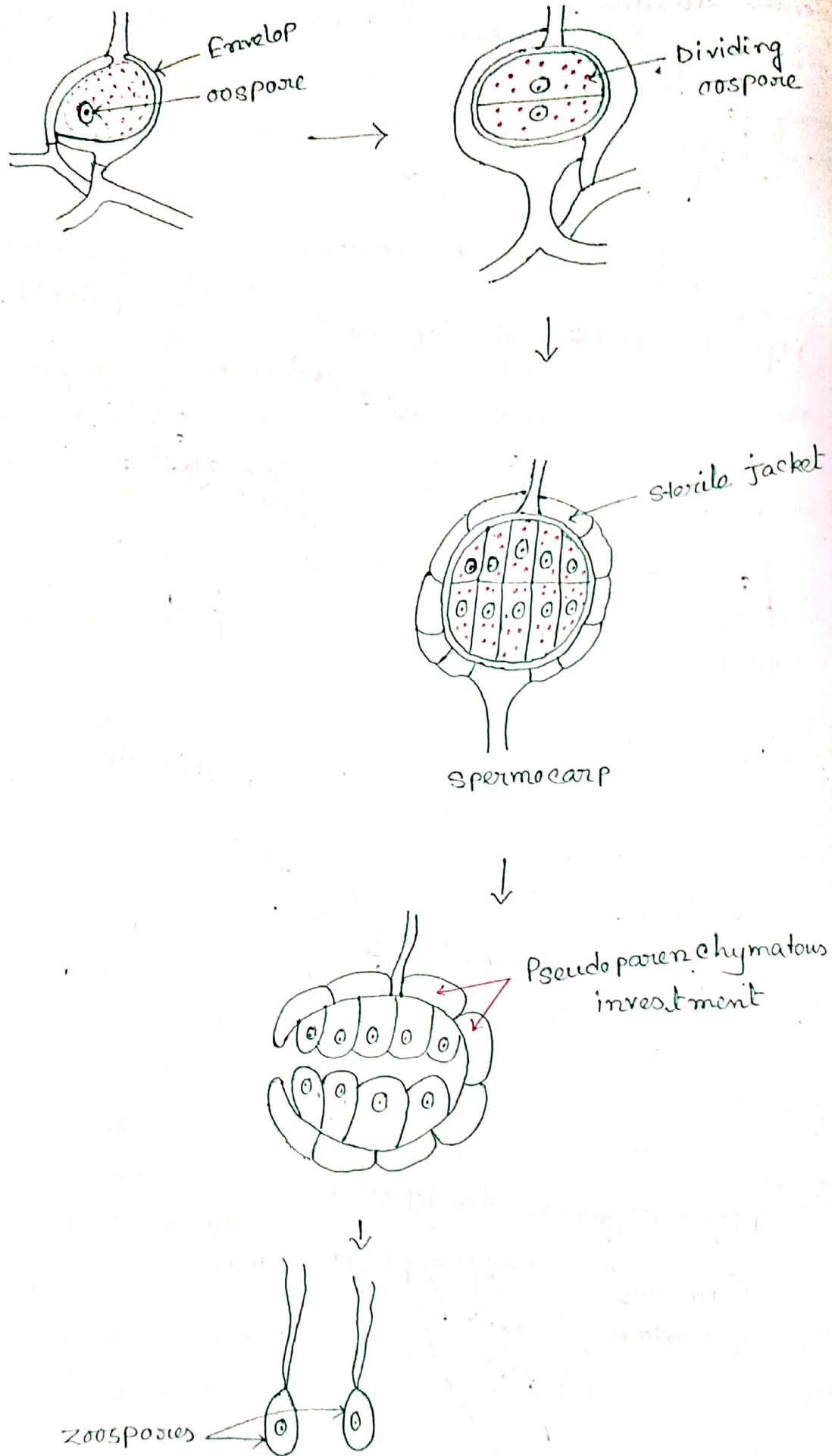
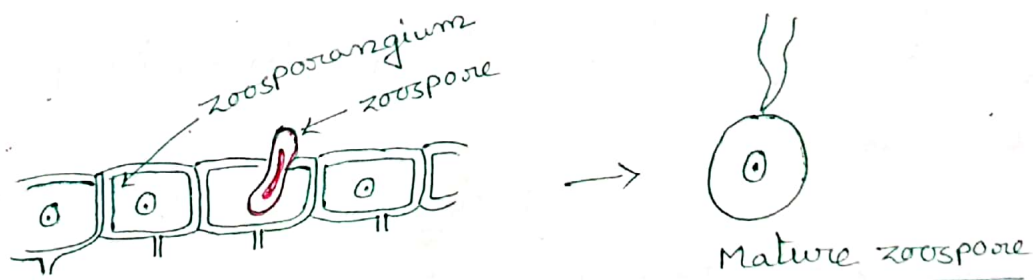


Fig:- Germination of zygote

4) Describe the asexual reproduction of coelocoste.

Ans. It takes place by zoospore and aplanospore formation.

1) Zoospore — During spring or early summer asexual reproduction takes place by the formation of zoospores. Any cell of the plant body may function as zoosporangium. Each zoosporangium produces single zoospore. Zoospores are ovoid, unicellular, uninucleate and biflagellate structure with a large parietal chloroplast. Eye spot is absent. The zoospores are liberated from the zoosporangium through a pore on the sporangial wall. It loses flagella within a short time and secretes a wall on the periphery. During germination the zoospore divides either transversely or vertically and with subsequent divisions it forms new plant body.



2) Aplanospore — Aplanospores are formed during unfavourable condition. At that condition the zoosporangium, instead of forming zoospore, forms aplanospore. The aplanospores are non flagellate, thick walled and round structure. During favourable condition the aplanospores germinate and form new thalli.

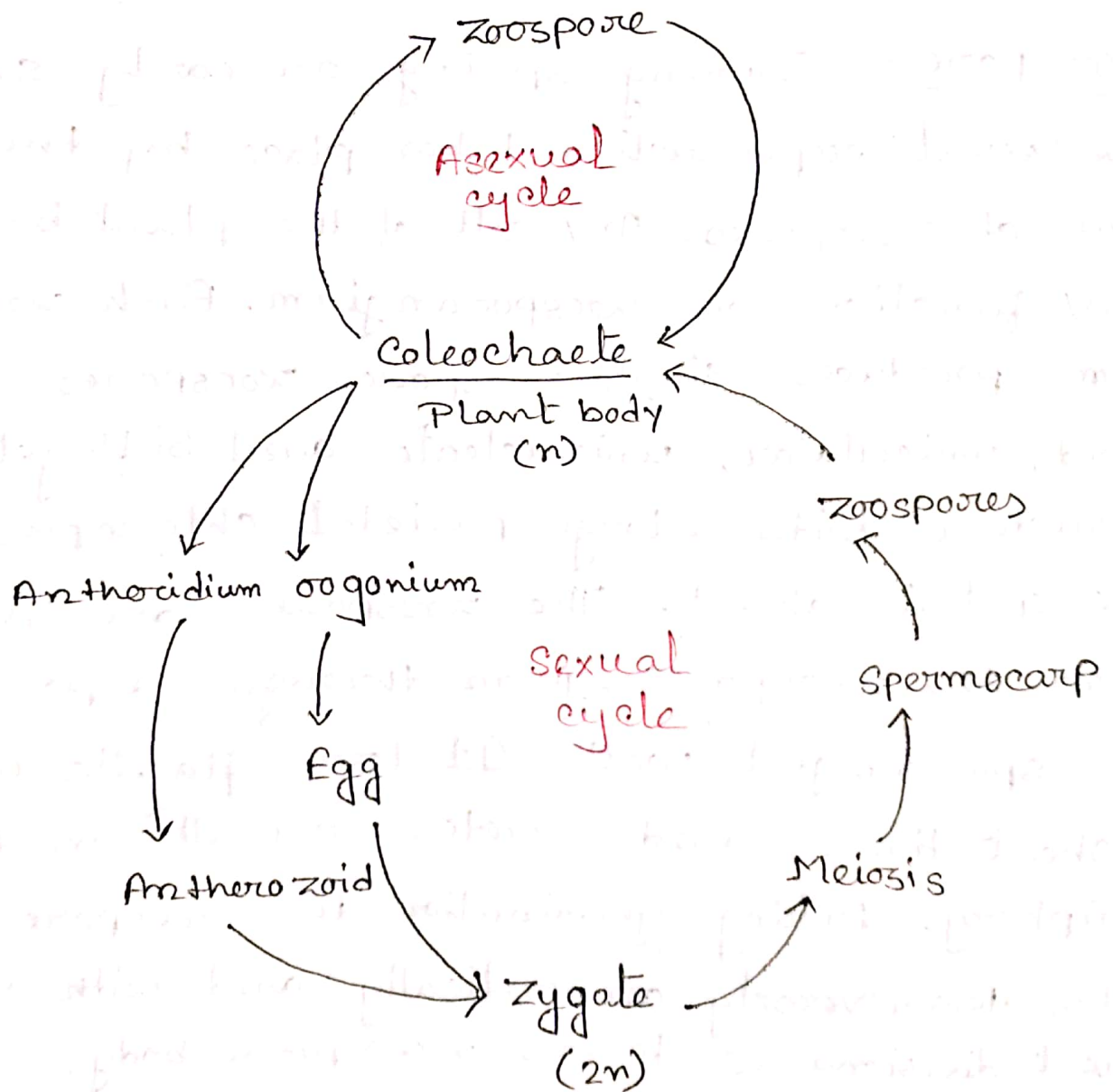


Fig:- Graphic life cycle of coleochaete sp.