Quadrant II – Transcript and Related Materials

Programme: Bachelor of Science (First Year)

Subject: Botany

Paper Code: BOC-101

Paper Title: Biodiversity-I (Microbes, Algae, Fungi and Bryophytes)

Unit: 02

Module Name: Life cycle of *Polysiphonia*

Module No: 31

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Notes

Reproduction in *Polysiphonia*:-

- ***Polysiphonia* reproduces by means of vegetative, asexual and sexual methods.**
- **Vegetative reproduction is by means of fragmentation of the thallus.**
- **Sexual reproduction is oogamus type.**
- **Asexual reproduction is by the production of Tetraspores.**

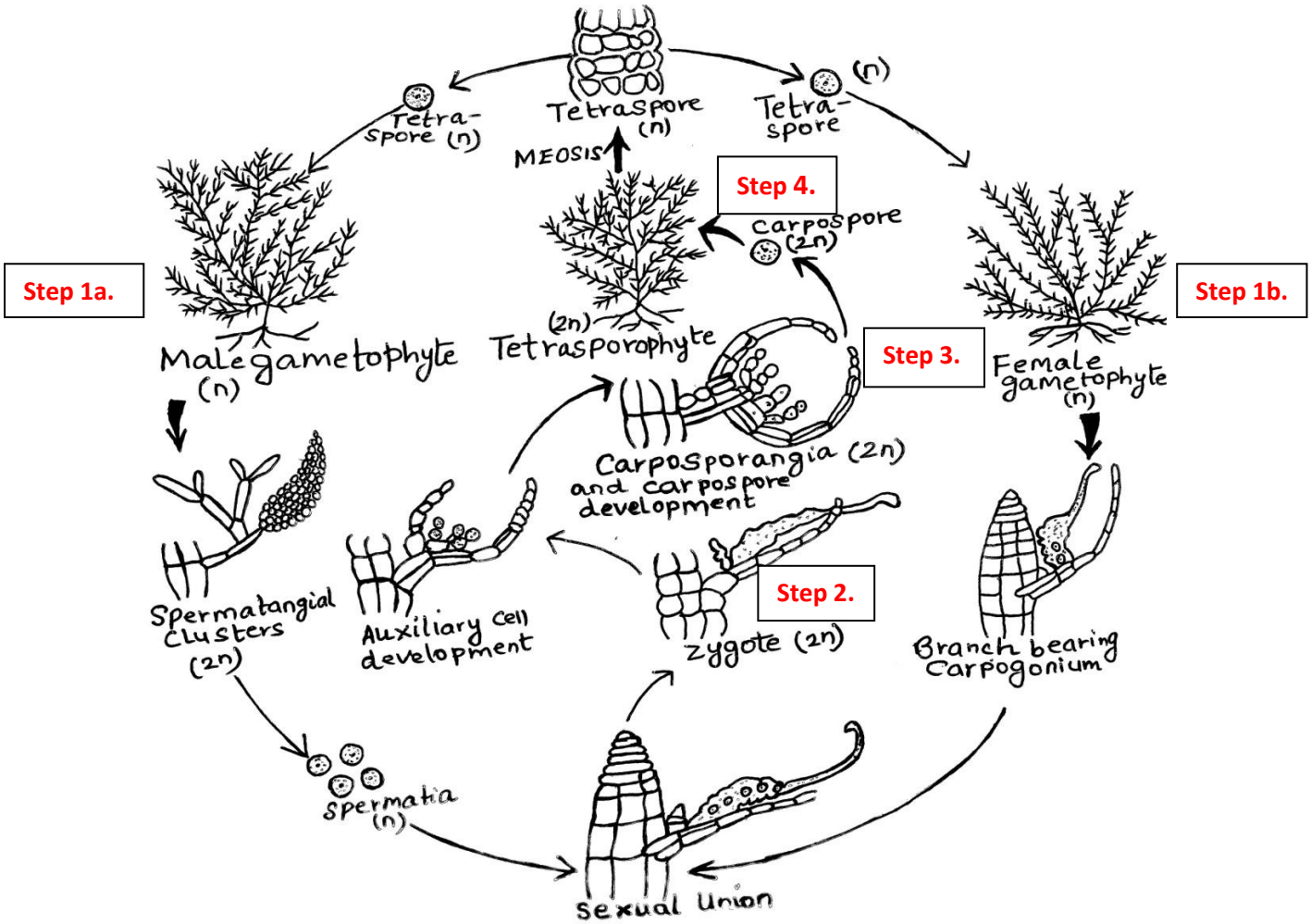
Sexual reproduction in *Polysiphonia*:

Life cycle of *Polysiphonia* is completed in three phases. The first haploid is Gametophytic phase and there are two diploid sporophytic phases i.e carposporophytic and tetrasporophytic.

1. **Gametophytic phase - This is a haploid phase (n) free Living, dioecious separate male and female plants. Male plant bears antheridia which produce male gamete called spermatium (plural: spermatia). Female plant produces female sex organ called carpogonium (plural: carpogonia).**

2. **Carposporophytic phase- This is diploid sporophytic phase (2n) and is dependent on female gametophyte and is parasite on it. This produces diploid carpospores (2n).**
3. **Tetrasporophytic phase – This is independent free living diploid sporophytic phase which produces haploid tetraspores (n). All these three plants are morphologically similar.**

LIFE CYCLE OF *POLYSIPHONIA* – <u>EXPLANATION IN A DIAGARAMATIC FORM</u>



Life cycle of *Polysiphonia* is called as Triphasic Haplodiplobiontic because the life cycle of *Polysiphonia* is completed in three phases. The first haploid is Gametophytic phase and there are two diploid Sporophytic phases i.e carposporophytic and tetrasporophytic. There is a single haploid phase that

is followed by two diploid phases which are dominant phases that is why it is called haplodiplobiontic lifecycle.

Step 1a. Dioecious Male plant forms male gamete spermatia.

Step 1b. Dioecious Female plant forms female gamete egg in carpogonium.

During Fertilization the liberated spermatia adheres to the trichogyne of the Carpogonium and the male nucleus then enters the trichogyne and moves down the egg and fertilizes it.

After Fertilization

Step 2. Diploid Zygote is formed. After fertilization a series of development takes place which forms cystocarp which bears carposporangia.

Step 3. Zygote germinates to form (2n) carposporophyte on female plant.

Step 4. Carposoporophyte produces (2n) carpospores which germinates to form tetrasporophyte (2n). This tetrasporophyte (2n) undergoes meiosis and forms haploid spores called as tetraspores. Half of the tetraspores form male gametophyte and remaining half form female gametophyte. This completes the life cycle. *Polysiphonia* lifecycle shows isomorphic alternation of generation between gametophytic phase and sporophytic phases because all these three plants are morphologically similar.