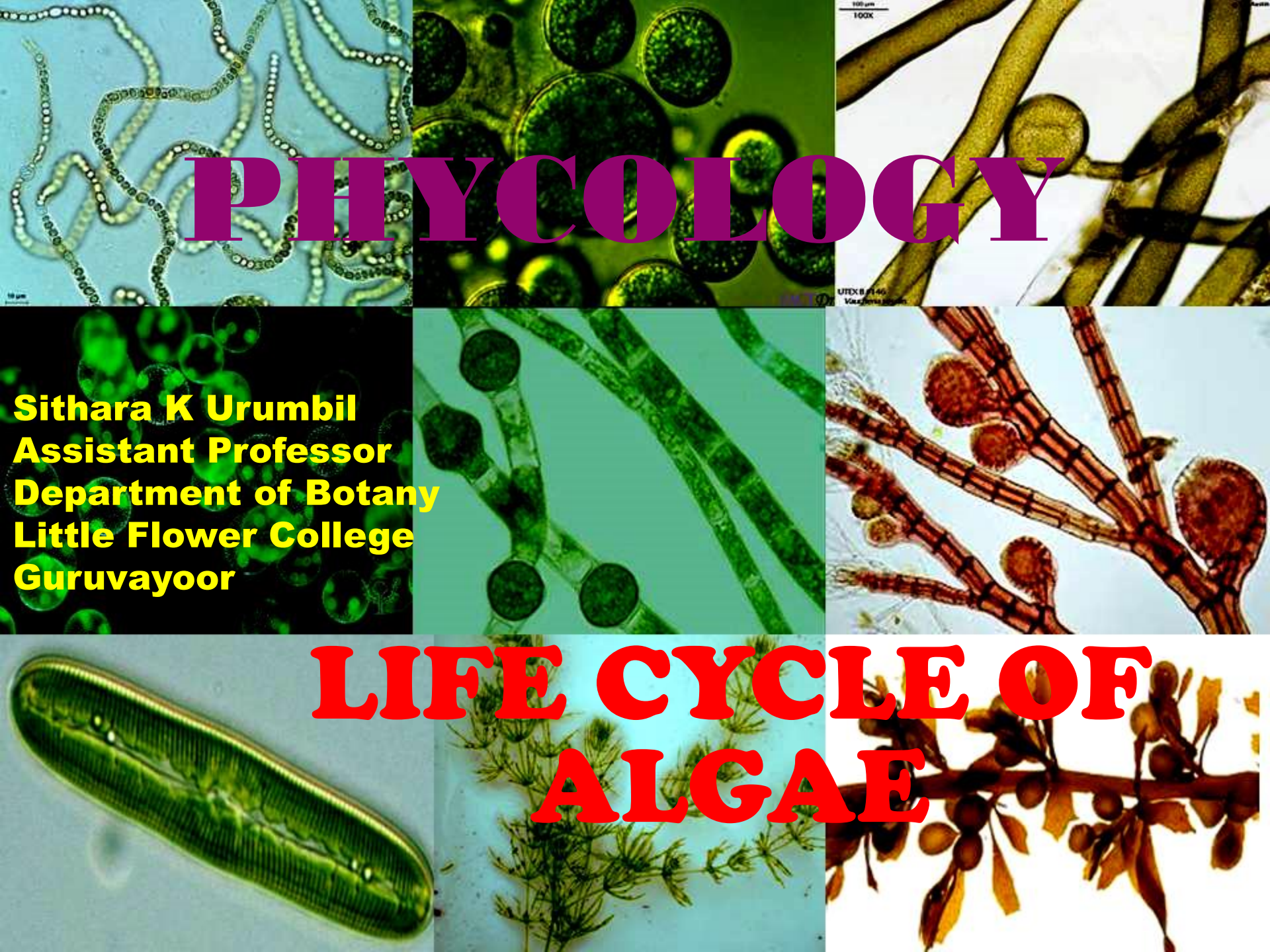

PHYCOLOGY

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LIFE CYCLE OF ALGAE

- The growth and development consists of a number of distinct **morphological and cytological changes**
- The **sequence of these orderly changes** is called as **life cycle**
- It is the sequence of all different phases or events through which an organism passes from a diploid zygote of one generation to the zygote of next generation through haploid gametes

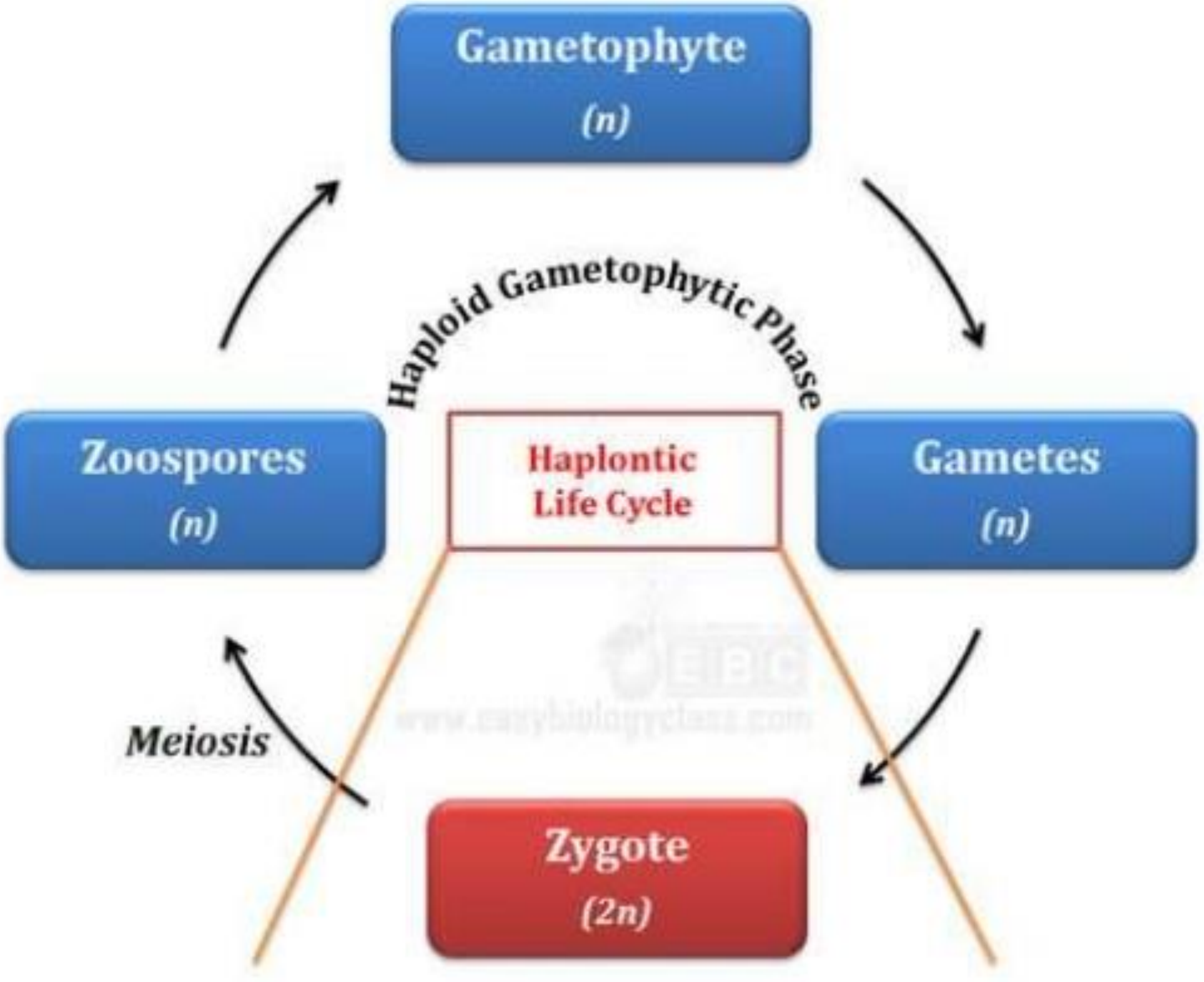
Five types of Life cycle

- Haplontic life cycle
- Diplontic
- Haplodiplontic
- Haplobiontic
- Diplobiontic

Haplontic cycle

- Most common type of life cycle in algae
- It is the most **primitive and simplest** type of life cycle
- Life cycle is **diphasic**
- The prominent phase is haploid **gametophytic phase**
- The diploid phase in the life cycle is represented by the **zygote**

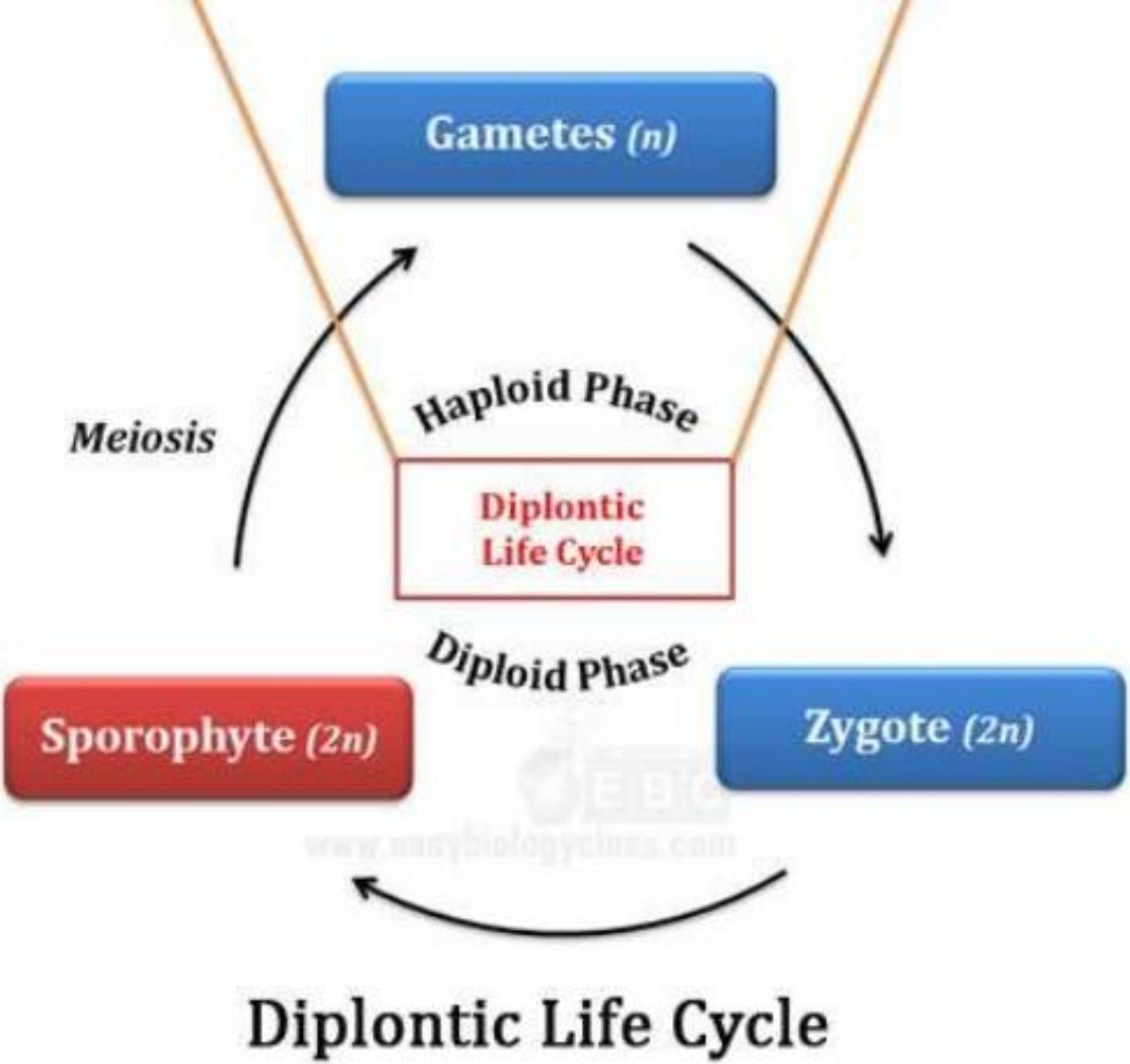
- Zygote is formed by the fusion of haploid male and female gametes
- Zygote immediately undergo meiosis to produce **haploid zoospores**
- Zoospores germinate and grow by **mitosis** to produce the **haploid gametophytic generation**
- Gametophytic plant produce **male and female gametes by mitosis**
- Ex. ***Chlamydomonas and Ulothrix***



Haplontic Life Cycle

Diplontic life cycle

- This type is just a **reversal of the haplontic** type od life cycle
- Life cycle is diphasic, but the **prominent phase is diploid sporophytic phase**
- Haploid gametophytic phase in the life cycle is represented only by the **gametes**
- Here gametes are produced in the **gametangia by meiosis**
- Moreover zygote do not undergo **meiosis,** rather it develop into a **diploid sporophytic phase by mitosis**



Diplontic Life Cycle

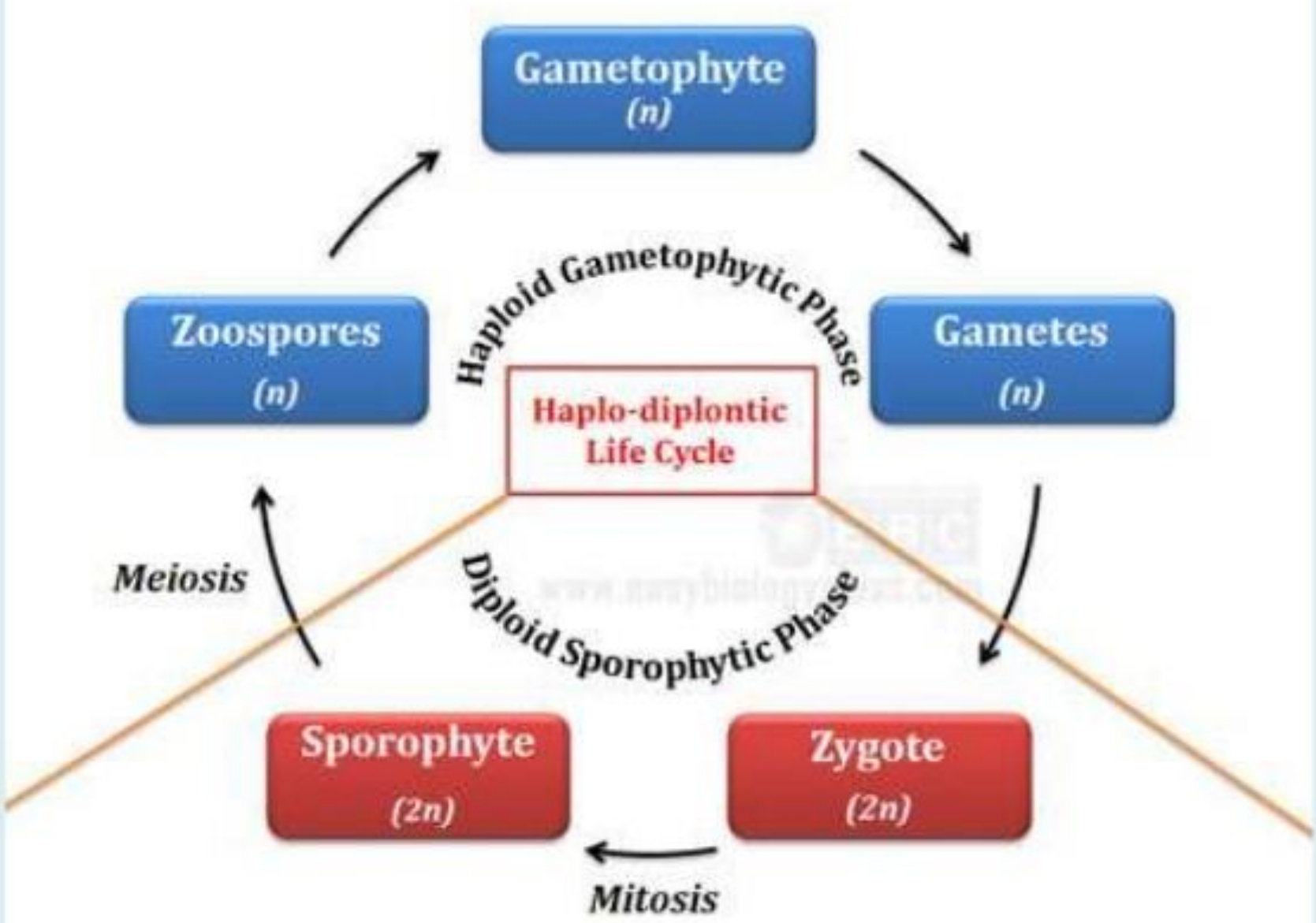
Haplodiplontic life cycle

- Life cycle is **diphasic**
- One phase is **haploid gametophyte** and the other is **diploid sporophyte**
- Sporophytic plant produce **sporangia** which produce **haploid zoospores by meiosis**
- Zoospores develop into **haploid gametophytic generation**
- Gametophyte produces **gametes**

- Male and female gametes fuse to form the **diploid zygote**
- There are two types of haplodiplontic life cycle

a.isomorphic : gametophytic and sporophytic phase are **morphologically similar** [eg. ***Ulva, Chaetophora***]

b.Heteromorphic : gametophytic and sporophytic phase are **morphologically dissimilar** [eg. ***Laminaria, Urospora***]



Haplo-Diplontic Life Cycle

Haplobiontic life cycle

- Here the life cycle is **triphasic** [three phases]
- **One diploid and two haploid phases**

The three phases are:

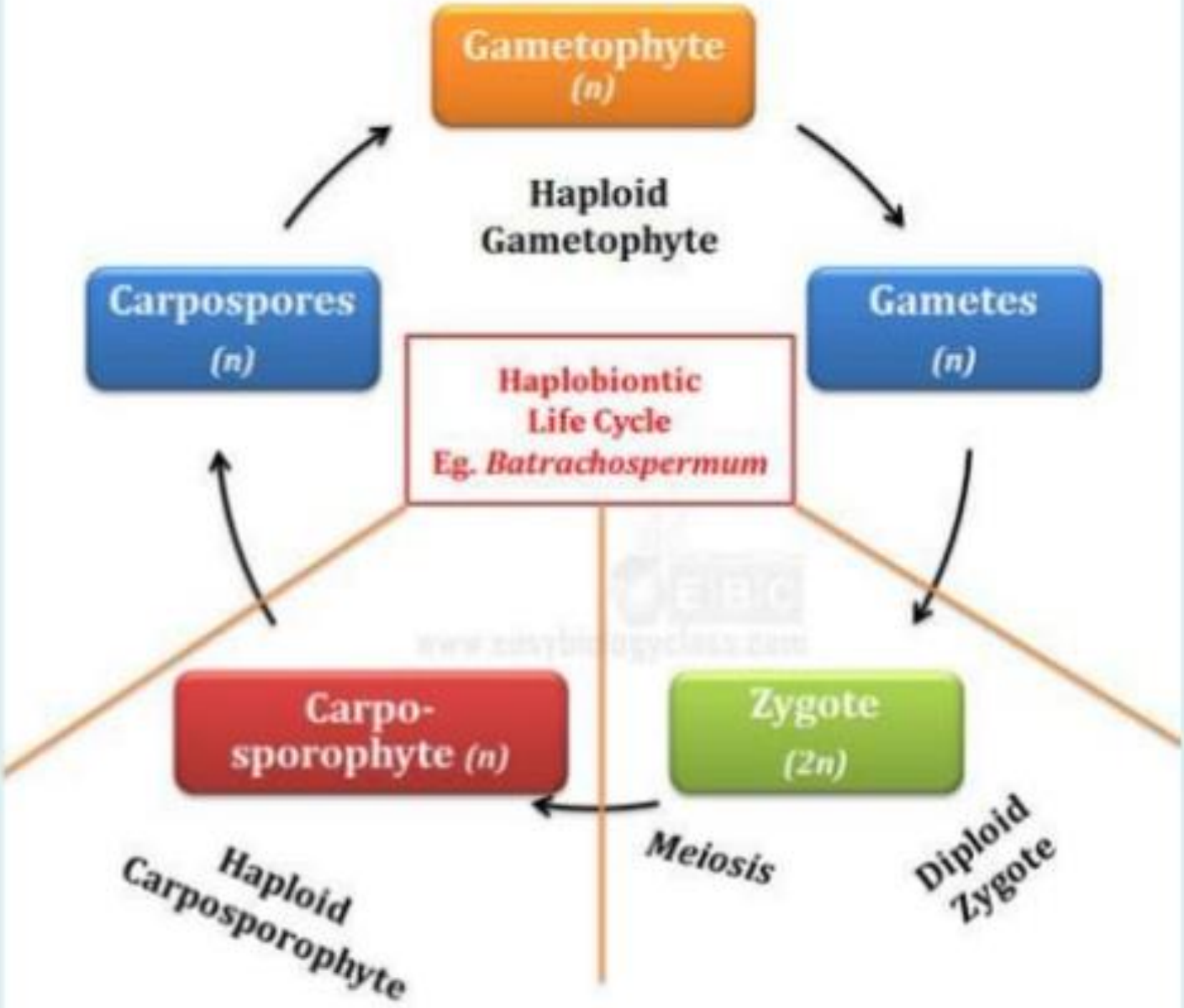
A. **Gametophyte phase [n]: haploid phase 1**

B. **zygote [2n]: diploid phase**

C. **Carposporophyte phase [n]: haploid phase 2**

- Gametophyte phase produce haploid gametes

- Male and female gametes fuse to form **zygote which is diploid**
- Zygote upon **reduction division** produces haploid spores which germinate in to a intermediate haploid phase called **carposporophyte**
- Carposporophyte reproduce **asexually by carpospores [n]**
- Carposopores germinate and develop into **haploid gametophytic generation**
- Eg. Rhodophyceae members

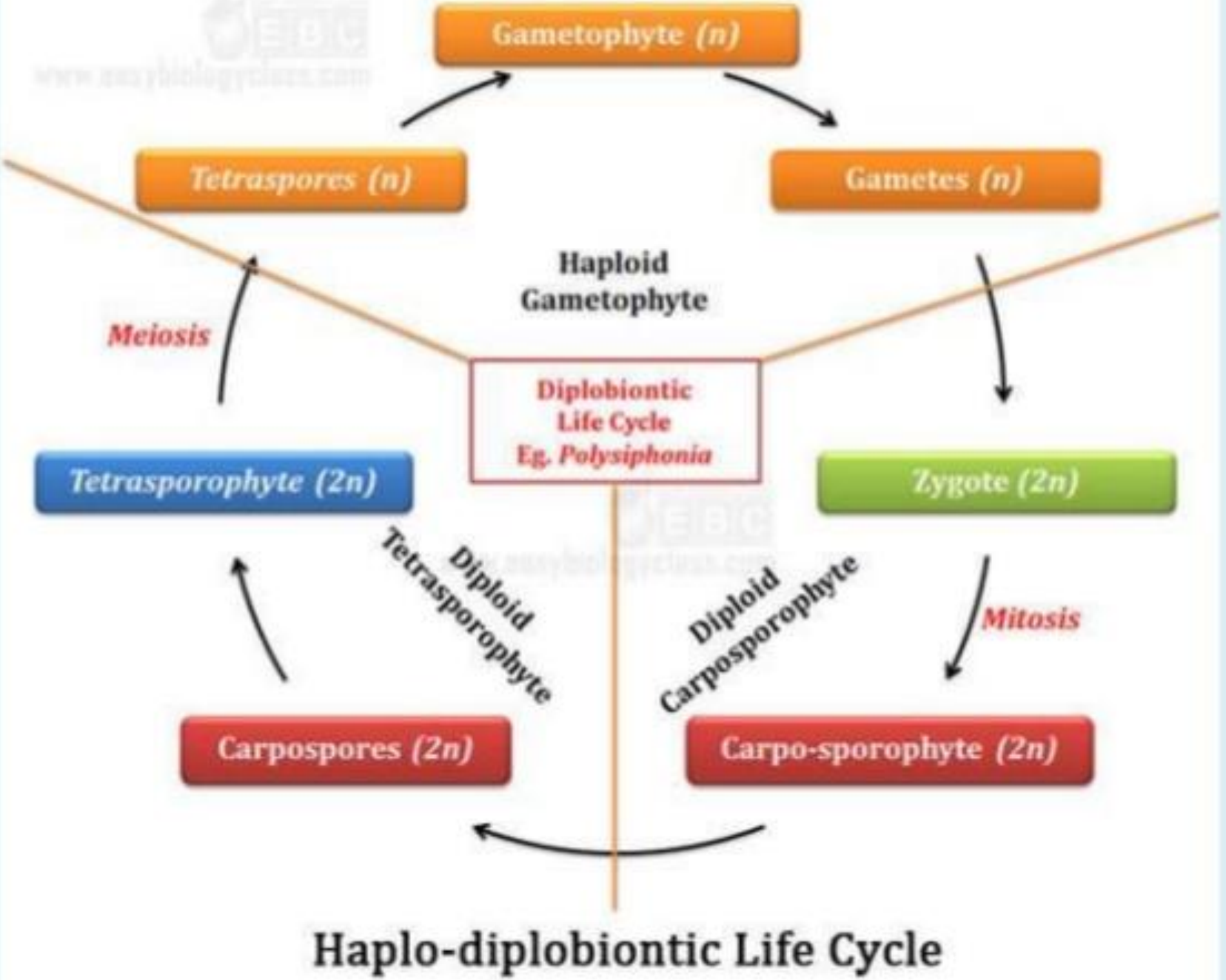


Haplobiontic Life Cycle

Diplobiontic life cycle

- Most **complex and advanced type** of life cycle in algae
- Life cycle is **triphasic** with one haploid phase and two diploid phase
- The life cycle includes
    - **A. Carposporophyte – diploid [2n]**
    - **B. Gameophyte – haploid [n]**
    - **C. Tetresporophyte – diploid [2n]**
- Diploid zygote develop **mitotically** to diploid **carpospophytic phase**
- Carposporophyte produce diploid **carpospores [2n]**

- Carposporophyte germinate into **diploid tetrasporophytic phase**
- Tetrasporophyte produce haploid **tetraspores by meiosis**
- Tetraspore germinate into the **haploid gametophytic generation**
- Gametophytic generation produce **male and female gametes**
- Gametes fuse to form diploid **zygote**
- Thus in haplo-diplontic life cycle, two diploid phase [carposporophyte and tetrasporophyte] alternate with haploid gametophytic phase
- Eg. Rhodophyceae - ***Polysiphonia***



Haplo-diplobiontic Life Cycle

THANK YOU

This class prepared for
Third Semester BSc Botany Students
Little Flower College, Guruvayur
Affiliated to University of Calicut

Next class
Class- Cyanophyceae