Difference Between Unilocular and Plurilocular Sporangia

www.differencebetween.com

Key Difference - Unilocular vs Plurilocular Sporangia

Ectocarpus belongs to the group Algae and is termed as a brown alga. It is termed as 'brown alga' due to the presence of the pigment fucoxanthin which gives it a golden brown color. It is abundantly found throughout the world in cold water habitats while few species also reside in fresh waters. The Ectocarpus cells are small cylindrical or rectangular in shape. They are uninuclear eukaryotic organisms. Their cell wall is adapted to suit the environmental conditions. Thus, it is composed of a thick cell wall composed of pectin and cellulose. In addition, align or fucoidan is also present in the cell walls of brown algae. Ectocarpus reproduce in two ways namely asexual reproduction and sexual reproduction. Asexual reproduction is mediated via the formation of zoospores. These zoospores are formed in sporangia which are mainly of two types; Unilocular sporangia and Plurilocular sporangia. **The unilocular sporangia consist of a single enlarged cell or loculus which results in the formation of haploid spores whereas plurilocular sporangia consist of many cuboidal shaped cells or loculi which give rise to many diploid zoospores.** Thus, the **key difference** between unilocular and plurilocular sporangia are the number of cells associated with the sporangia and the type of zoospores produced.

What is Unilocular Sporangia?

A Unilocular sporangium is a type of sporangia present in Ectocarpus which is composed of a single enlarged cell that has the ability to undergo meiosis to produce haploid zoospores. The sporangium develops from a terminal cell of a short lateral branch. Unilocular sporangia are more stable at lower temperatures hence found in brown alga residing in cold waters.

Figure 01: Ectocarpus unilocular sporangia

Initially, the sporangial cell enlarges in size and becomes globular in shape. The number of pigment-containing cells known as chromatophores also increases within it. Upon maturation of the unilocular sporangium, the cells start to divide meiotically to produce four haploid nuclei. This is then followed by mitosis to produce about 32-64 daughter nuclei. Each of these daughter nuclei then matures to produce zoospores. The zoospores mature to become bi-flagellate. The flagella are laterally inserted and are of unequal size. The flagellated zoospores swim freely in all directions. A new sporangium can be produced within the old sporangial wall after the liberation of zoospores.

What is Plurilocular Sporangia?

The plurilocular sporangia present in Ectocarpus or brown alga are composed of 5 -12 cells and produce diploid zoospores through repeated mitotic divisions. The Plurilocular sporangia are stalked or sessile. They are cone-like elongated structures. The sporangium develops from a terminal cell of a short lateral branch. Plurilocular sporangia are more stable to relatively warmer temperatures hence mostly found in mesophilic water sources.

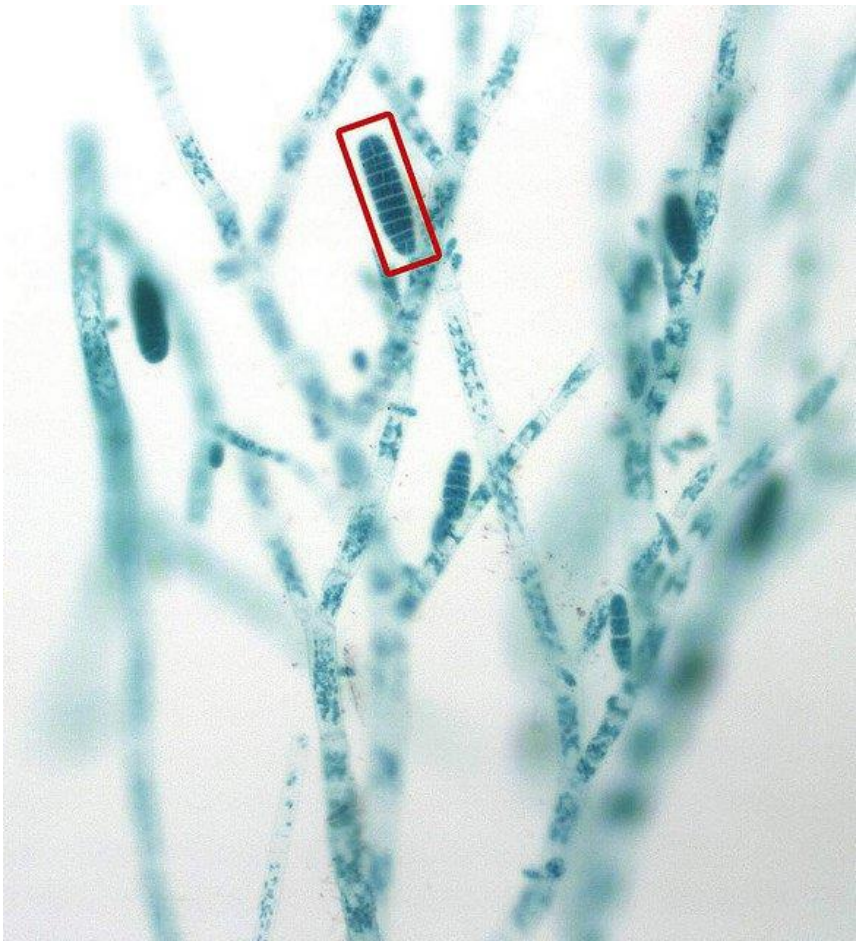

Figure 02: Ectocarpus plurilocular sporangia

The sporangium initially enlarges in size and undergo mitosis to produce around 5-12 cells. These cells then divide by vertical and transverse divisions repeatedly to form small cuboidal cells. Each of these cells then develops into a diploid, biflagellated pear shape zoospore. The flagella are of unequal in size and are laterally inserted.

What are the Similarities Between Unilocular and Plurilocular Sporangia?

- Unilocular and plurilocular sporangia are present in Ectocarpus or brown algae.
- Both structures are involved in asexual reproduction.
- Both are produced in response to temperature changes.
- Both sporangia produce zoospores.
- Both types of sporangia develop in the terminal ends of the lateral branch.
- Both sporangia result in biflagellated zoospores.

What is the Differences Between Unilocular and Plurilocular Sporangia?

Unilocular Sporangia vs Plurilocular Sporangia	
Unilocular sporangia consist of a single enlarged cell which results in the formation of haploid spores.	Plurilocular sporangia consist of many cuboidal shaped cells which give rise to many diploid zoospores.
Shape of Sporangia	
Ellipsoidal	Spherically elongated cells
Number of cells	
Composed of one large cell	Composed of many cells
Stable temperatures	
Cold temperatures	Warmer temperatures
Type of spore produced	
Haploid spores	Diploid spores
Dominant cell division process	

Meiosis	Mitosis

Summary - Unilocular vs Plurilocular Sporangia

Ectocarpus naturally produces two types of sporangia from the sporophyte; unilocular and plurilocular sporangia. The sporangia production takes place in response to temperature fluctuations. Unilocular sporangia are produced due to colder temperatures, and plurilocular sporangia are produced in response to warm temperatures. Unilocular sporangia are composed of a single enlarged cell where the plurilocular as the name suggests consist of many cells resulting in the production of zoospores. This is the difference between unilocular and plurilocular sporangia. Zoospores are asexual spores which can mature into a complete organism. Thus it is important to study about these reproductive structures in order to understand and differentiate the life cycle patterns of Ectocarpus.

Reference:

1.“Ectocarpus Occurrence, Structure ,Reproduction& Division.” Its all about Zoology , Botany and Biology. Accessed 29 Sept. 2017. Available here
2. Phaeophyte notes, cals.arizona.edu/azaqua/algaeclass/lecturenotes/Brownnotes.htm. Accessed 29 Sept. 2017. Available here

Image Courtsey:

1."Ectocarpus unilocular structure" By Curtis Clark - Own work (CC BY-SA 3.0) via Commons Wikimedia
2."Phaeophyta Ectocarpus plurilocular sporangium" by Bruce Kirchoff via flickr

How to Cite this Article?

APA: Difference Between Unilocular and Plurilocular Sporangia. (2017, October 3). Retrieved (date), from http://www.differencebetween.com/difference-between-unilocular-and-vs-plurilocular-sporangia

MLA: "Difference Between Unilocular and Plurilocular Sporangia.” Difference Between.Com. 3 October 2017. Web.

Chicago: “Difference Between Unilocular and Plurilocular Sporangia.” Difference Between.Com. http://www.differencebetween.com/difference-between-unilocular-and-vs-plurilocular-sporangia accessed (accessed [date]).