علم الأحياء الدقيقة

Microbiology

Introduction to Phycology

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مكتب ٢ بـ ٤٥

Plant-Like Protista-True Algae

- **The most common are:**

Chlorophyta	الطحالب الخضراء
Euglenophyta	الطحالب اليوجيلينية
Bacillariophyta (Diatoms)	الطحالب العصوية
Phaeophyta	الطحالب البنية
Rhodophyta	الطحالب الحمراء

Plant-Like Protista-True Algae

- **Phaeophyta (Brown algae).**
- The majority are live in marine environments, on rocks in cool waters.
- Contain “Chlorophyll” as well as a yellow-brown pigment called “**fucoxanthin**”.
- Have “cellulose” and “align” in their cell walls.
- The largest of the brown algae are the kelp.
- The body of a kelp is called a thallus, which can grow as long as 60 m.
- The thallus is composed of three sections, the holdfast, the stipe, and the blade.
- Some species have an air-bladder to keep the thallus floating at the surface of the water, where more light is available for photosynthesis.
- Brown algae store their foods as “**laminarin**”.
- Important source of **alginate**: Thickener, stabilizer, emulsifier in many products.

Fucus

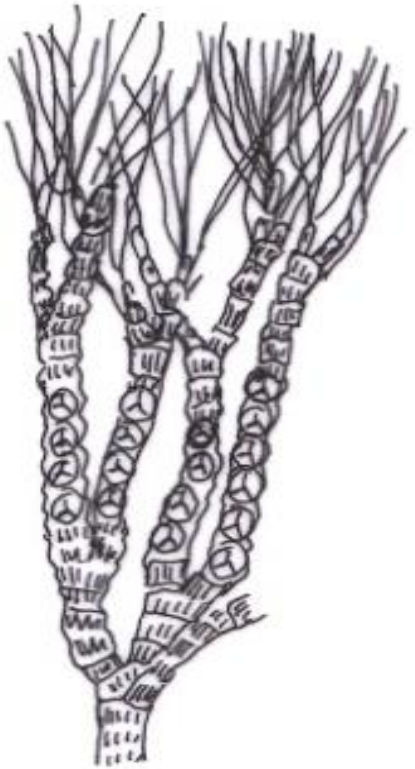
Plant-Like Protista-True Algae

- **Rhodophyta (Red-algae).**
- All of species are multicellular, and live in marine environments.
- They live attached to rocks by a structure called a holdfast.
- Their cell walls contain Cellulose.
- Some species incorporate calcium carbonate (**$CaCO_3$**) from the ocean into their cell walls as well.
- Red algae contain **chlorophyll** a as well as **phycobilins**, red and blue pigments involved in photosynthesis. The red pigment is called **phycoerythrin** and the blue pigment is called **phycocyanin**.
- **Phycobilins** absorb the green, violet, and blue light waves that can penetrate deep water. These pigments allow the red algae to photosynthesize in deep water with little light available.
- Reproduction in these organisms is a complex process of sexual and asexual phases.
- Red algae store their foods as **floridean starch**.

Plant-Like Protista-True Algae

- **Rhodophyta (Red-algae).**
- Source of **carrageenan** & **agar** (emulsifiers & gel thickeners).

Polysiphonia



Importance of Algae
Ecological and Economical

• Used as Energy source, Fertilizer, Food and Pollution control.
• **Agar**, a gelatinous substance derived from red algae, has a number of commercial uses. It is a good medium for bacteria and fungi as most microorganisms cannot digest agar.
• Algae can be used to make Biodiesel , bioethanol and biobutanol and by some estimates can produce vastly superior amounts of vegetable oil, compared to terrestrial crops grown for the same purpose.
• Algae can be grown to produce hydrogen. observed that the algae he was studying, *Chlamydomonas reinhardtii* (a green-algae.
• Algae can be grown to produce biomass, which can be burned to produce heat and electricity.

Importance of Algae
Ecological and Economical

* It is a complete protein with essential amino acids, involved in major metabolic processes for energy and enzyme production.
* Contains high amounts of simple and complex carbohydrates which provide the body with a source of additional fuel. In particular, the sulfated complex carbohydrates are thought to enhance the immune system.
* Contains an extensive fatty acid profile, including Omega 3. These essential fatty acids.
* Has an abundance of vitamins, minerals, and supplemental elements.
* Pet foods, toothpaste, ice-creams, lotions and creams.
* Algae are used in "**wastewater treatment**" facilities, reducing the need for greater amounts of toxic chemicals.

QUESTIONS??