

Division Cyanophyta (cyanobacteria)

- Differences from bacteria (Chlorophyll a, O₂)
- Ecology: Temperature, pH, Algal blooms (*Anabaena*, *Aphanizomenon*, *Microcystis*), Algal toxins, Symbiotic associations.
- Nitrogen fixation: Heterocysts
$$\text{N}_2 + 3\text{H}_2 \text{ ----> } 2 \text{NH}_3$$
- Ultra-structure
- Movement
- Nutrition
- Reproduction:
Unicellular forms: Fission (*Chroococcus*, *Anacystis*)
Colonial and filamentous forms: Fragmentation (hormogonium).

Filaments: akinetes, heterocysts, endospores, exospores.

- Morphology: unicellular, filamentous, colonial forms.

- Classification:

Class Cyanophyceae

Order 1: Chamaesiphonales (endospores or exospores)

Order2: Chroococcales

Family: Chroococcaceae

(*Gloeocapsa*, *Chroococcus*, *Anacystis*,
Coelosphaerium, *Microcystis*, *Merismopedia*)

Order 3: Oscillatoriales (Nostocales)

Family 1: Oscillatoriaceae (No heterocysts, ...)

(*Oscillatoria*, *Spirulina*, *Lyngbya*, ...)

Family 2: Nostocaceae (hetercysts,...)

(*Nostoc*, *Anabaena*, *Aphanizomenon*, ...)

Family 3: Scytonemataceae (...False branching)
(*Scytonema*, *Tolypothrix*, ...)

Family 4: Stigonemataceae (...True branching)
(*Stigonema*, *Fischerella*, *Haplosiphon*, ...)

Family 5: Rivulariaceae (...مستدقة التريومات)
(*Rivularia*, *Calothrix*, *Gloeotrichia*, ...)