

## *Algae physiology*

### ***Lab. Physiochemical parameters***

#### A- Temperature

Water temperature measurement is considered a field work, its measured immediately in sample collection field by using **thermometer**. The effects of temperature on the physical and chemical characteristics of water directly and indirectly, as the effects on the **metabolic processes** such as, osmosis, photosynthesis, respiration, and organization in aquatic plants, phytoplankton and animals as well as its impact on the **density and viscosity of water and soluble gases especially dissolved oxygen**.

For optimal growth, cyanobacteria prefer warm conditions that ranged between 35 and 40°C. These temperatures were higher than that needed for green algae (20-25 °C) and diatoms (18-30 °C) therefore, cyanobacteria could out-compete other species when exposed to extreme temperature conditions. This also explained why in water bodies most cyanobacterial bloom during summer is dominant.

#### B-Water pH

Water pH measurement is also considered field work, is measured immediately in sample collection field by using **pH meter**.

pH is a measure of the acidity in a solution. Hydrogen ions (H<sup>+</sup>) are produced by Acids and hydroxide ions (OH<sup>-</sup>) are produced by bases in a solution. cyanophyta are prefer slightly alkaline conditions. (pH higher than 7 but lower than 8.5) this value ideal for biological productivity.

In general, pH value increased in water that contain highly blooming density of phytoplankton, this might be due to photosynthesis activation, this leads to CO<sub>2</sub> utilization and raising of pH value.

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### C-Nutrients

Nutrients analysis include: NO<sub>2</sub>, NO<sub>3</sub>, PO<sub>4</sub>, Ca and Mg salts, and SiO<sub>4</sub> analysis

For Nutrients analysis; water samples are collected and Filtrated in the same day. by a Millipore Apparatus. collected in a **glass container**. The containers then kept in the **refrigerator** and away **from light** until analysis in the laboratory by **Spectrophotometric method**

Nutrient bioassays are good indicators as to which nutrient has the potential or likely to limit algal growth at a particulate time and space. the type and concentrations of nutrient in ecosystem give a prediction for dominant algal group within this ecosystem

- The high positive correlation between diatoms and reactive silicate might be due to the main biological uptake of silicon which caused by a specific abundant, group of algae (the diatoms). They have a substantial silica requirement because they construct their cell wall from silica.
- Blue- green algae have higher affinity for phosphorus and nitrogen than many other photosynthetic organisms.
- Chlorophyte *Chara* are rough to the touch because of deposited **calcium** salts on the cell wall. The metabolic processes associated with this deposition often give this alga a distinctive and unpleasant smell of hydrogen sulfide