Exercise 21

Aim: To analyse living organisms in water samples

Principle: The productivity and the trophic status of a water body is determined by assessing the number and type of organisms (micro as well as macro) present in the water body. Water body with very high density of phytoplankton per unit area is a productive water body. Such water bodies are usually turbid and have high amounts of nutrients and dissolved oxygen. These water bodies support fairly large number of organisms of different trophic levels. This is in contrast to non-productive water bodies, which have very low density of organisms per unit area, fairly transparent waters with low mineral concentration and dissolved oxygen and also fewer trophic levels. The status of health of a water body can be determined by analysing water samples for the number and type of organisms present in it at a given time. Such assays also help us to find out whether a water body is polluted as some of the organisms are strong indicators of water pollution.

Requirement: Water samples from different water bodies (lake, pond, river etc.), beakers, a few vials or small test tubes, slides and cover slips, watch glasses, dropper, compound microscope and 5% FAA (Formalin Aceto Alcohol 5:5:90:Formalin: Acetic acid: Ethanol) as preservative

Procedure

(i) Collect about a liter of water sample from nearby water body (pond lake, reservoir, river etc).

(ii) Add about 5 ml of FAA to fix and preserve the living organisms present in each sample at the place of collection.

(iii) In the laboratory, transfer the water sample into a measuring cylinder of one litre capacity. Label each water sample to indicate the site from which the water sample has been collected.

(iv) Leave the water samples undisturbed for 48-72 hours.

(v) Decant off the clear water, leaving concentrated sediment at the bottom.

(vi) Transfer the sediment into a vial or a small test tube. Cork and label each vial for future use.

(vii) With the help of a dropper, transfer a few drops of sediment liquid from a vial into a watch glass. Dilute the sediment with water if the sediment is highly concentrated.

(viii) With the help of a dropper transfer a drop of water from the watch glass on the center of a slide and mount it. Blot the excess water using blotting paper.

(ix) Prepare a few more slides of each water sample in the same way.

(x) Observe each slide, first under lower magnification and then under higher magnification.

Observations

1. Record the different types of organisms present.
2. Count the number of organisms under each field of microscope.
3. Some of the commonly found organisms of water bodies are given in Annexure 2.

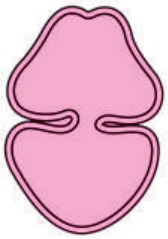
Discussion

Prepare a list of organisms observed in each water sample and make an assessment of type and density of different organisms in each water sample. Polluted waters may contain very few types of organisms but in very high density. The non-polluted waters will have large variety of organisms in low density.

Questions

1. Why do you find few organisms in polluted water? Explain.
2. Why is FAA (Formaline Aceto Alcohol) added after collecting the water sample?
3. Name at least one phytoplankton and zooplankton commonly found in polluted water.

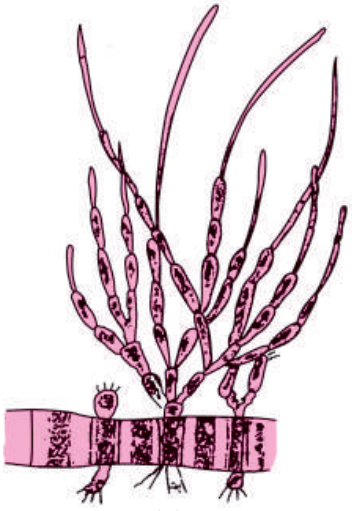
Annexure 2



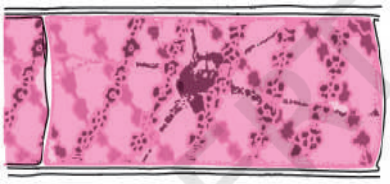
Cosmarium

Desmickum

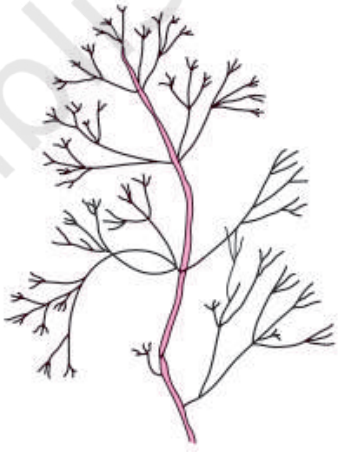
Stigeoelomium



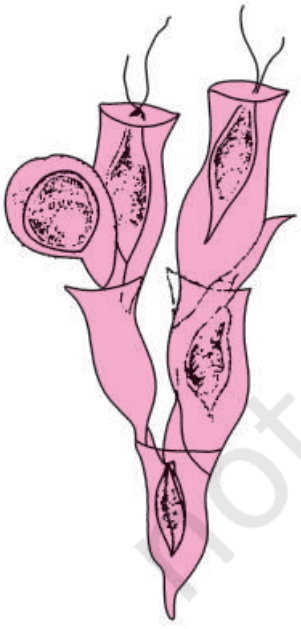
Draparnaldiopsis



Spirogyra

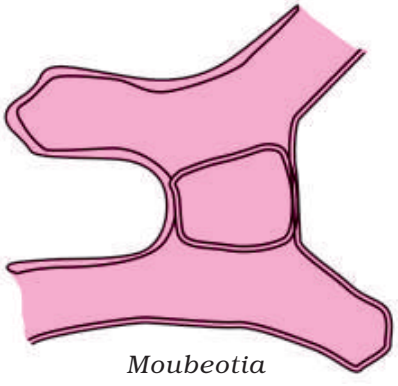


Nitella

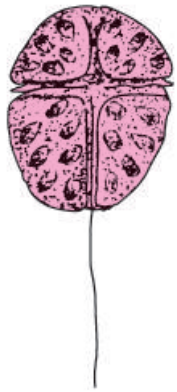


Dinobryon

Euglena

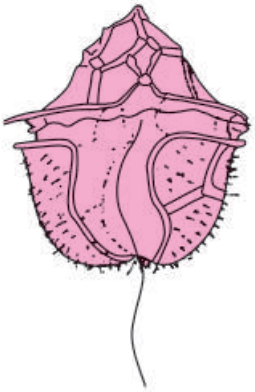


Moubeotia

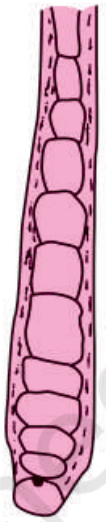


Gymnodinum

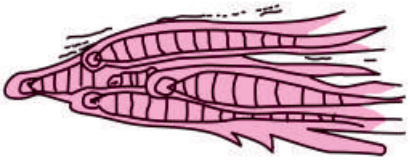
Ceratium



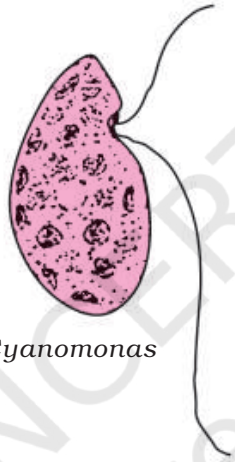
Peridinium



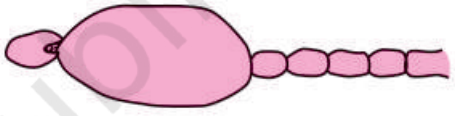
Calothrix



Rivularia



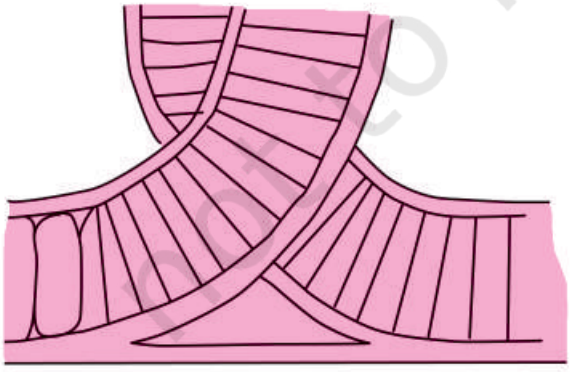
Cyanomonas



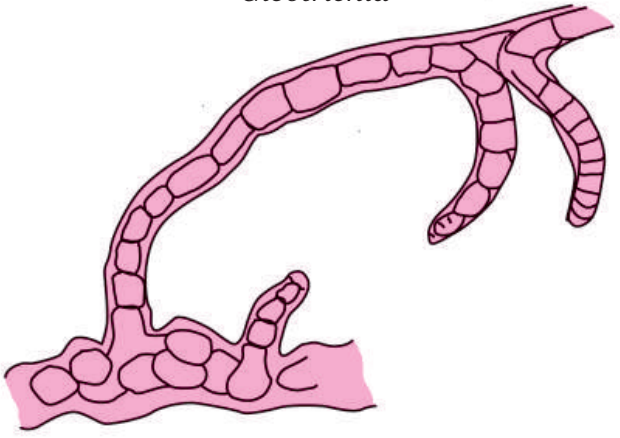
Cylindespermum

Anabaena

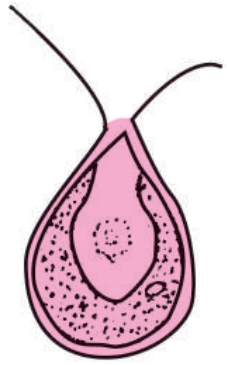
Gleotrichia



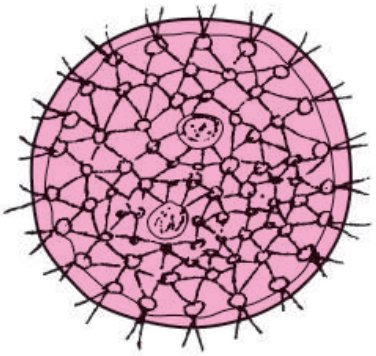
Scytonema



Fischerella

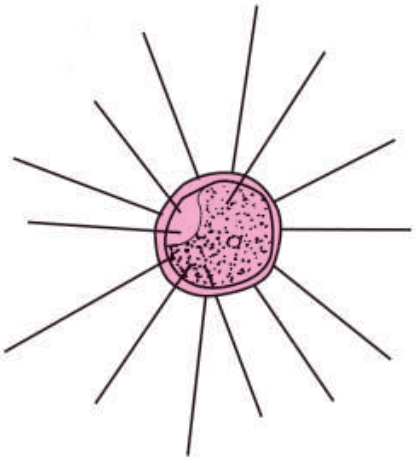


Chlamydomonas

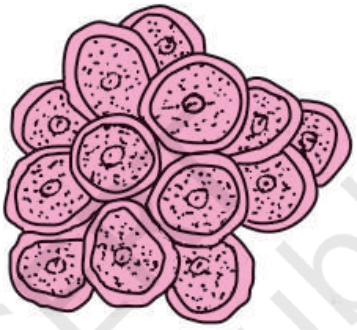


Volvox

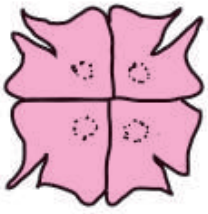
Closterium



Golenkinia

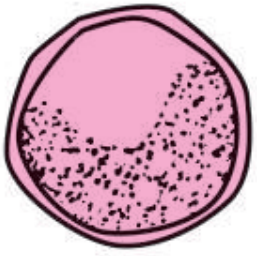


Coelastrum



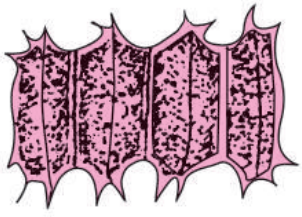
Pedrastrum

Hydrodictyon

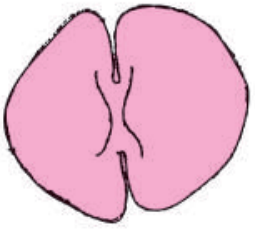


Chlorella

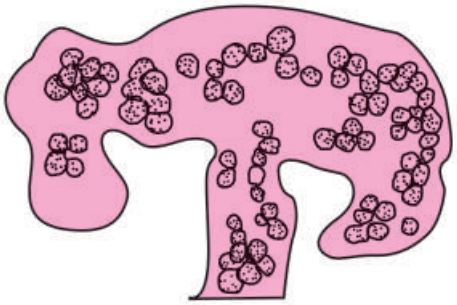
Ankistrodesmus



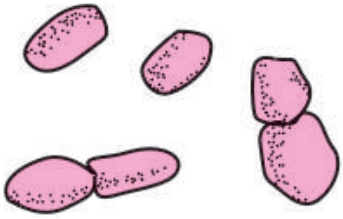
Scenedesmus



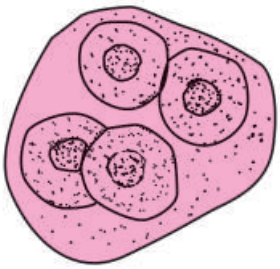
Staurastrum



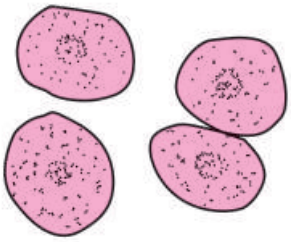
Microcystis



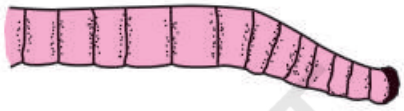
Synechococcus



Gloeocapsa

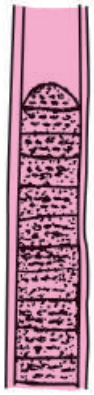


Synechocystis

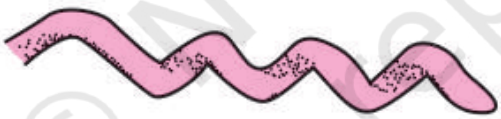


Phormidium

Oscillatoria

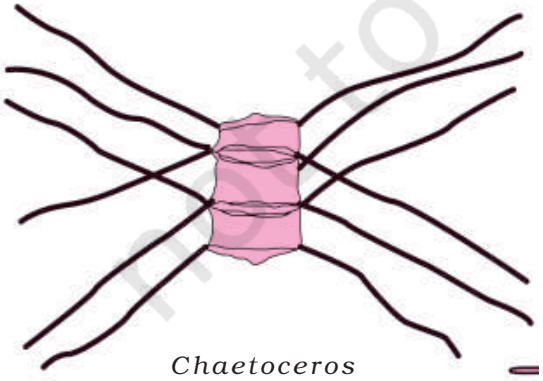


Lyngbya



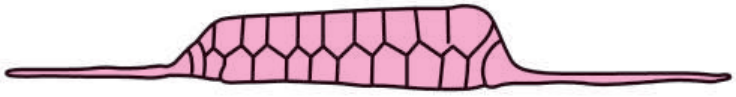
Spirulina

Nostoc

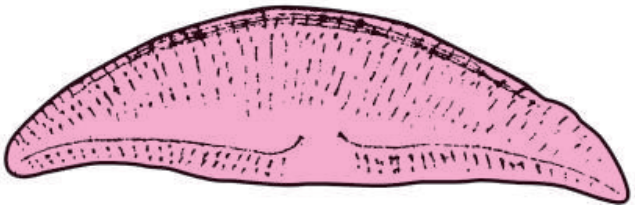


Chaetoceros

Melosira

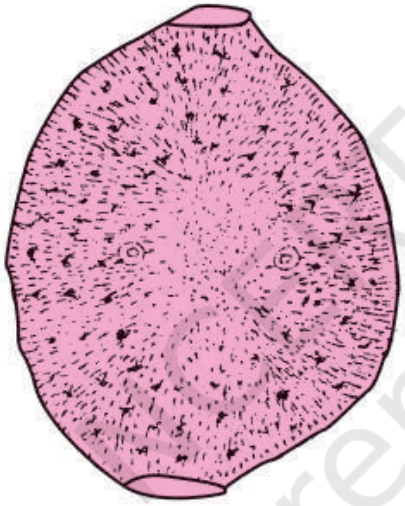


Rhizoselina



Amphora

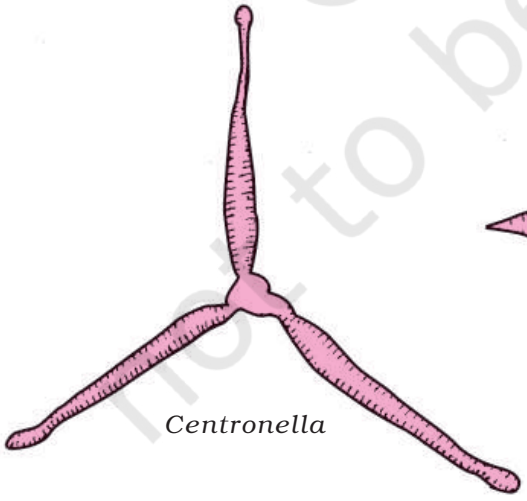
Bacillaria



Biddulphia

Nitzschia

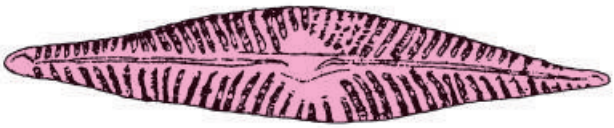
Synedra



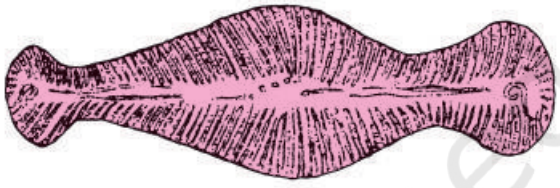
Centronella

Pleurosigma

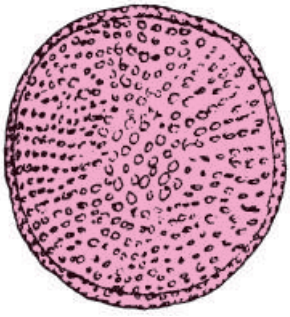
Fragilaria



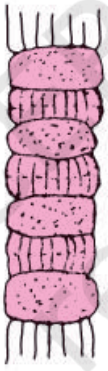
Navicula



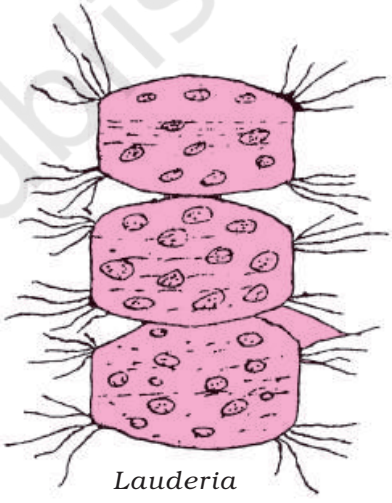
Somphonema



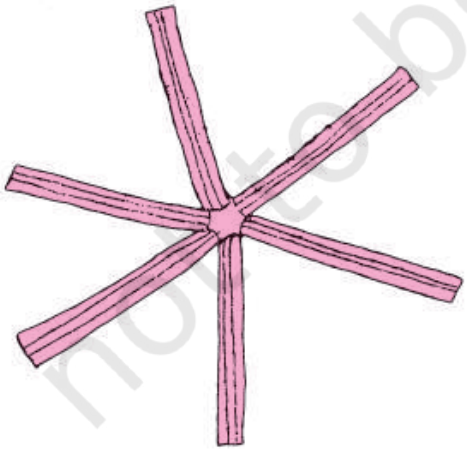
Coscinodiseus



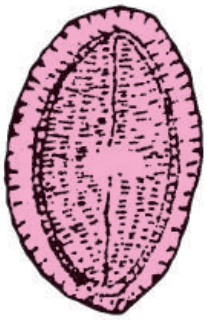
Skeletonema



Lauderia



Asterionella



Cocconeis