

Experiment-3

Aim

To study the different microorganisms (*Lactobacillus*, *Spirogyra*, *Rhizopus*, *Amoeba* and *Paramecium*) from prepared slides.

Materials Required

Compound microscope, prepared slides of *Lactobacillus*, *Spirogyra*, *Rhizopus*, *Amoeba* and *Paramecium*.

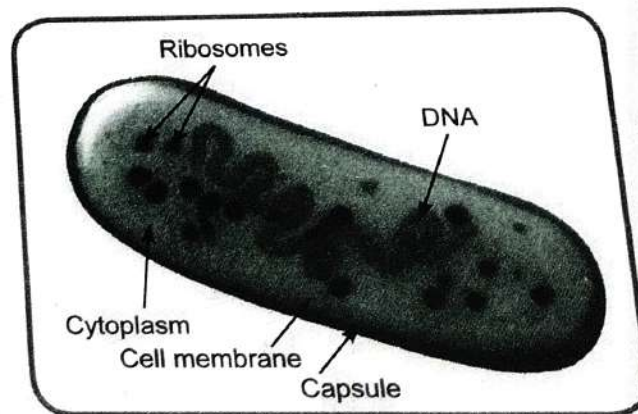
Procedure

1. Place the prepared slides under the microscope one by one and fix them carefully.
2. First observe the slides under low power and then under high power.

Observations

1. *Lactobacillus* (Bacteria)

- (i) They are single celled microorganisms and rod shaped.
- (ii) They have a nucleoid (nucleus without a nuclear membrane).

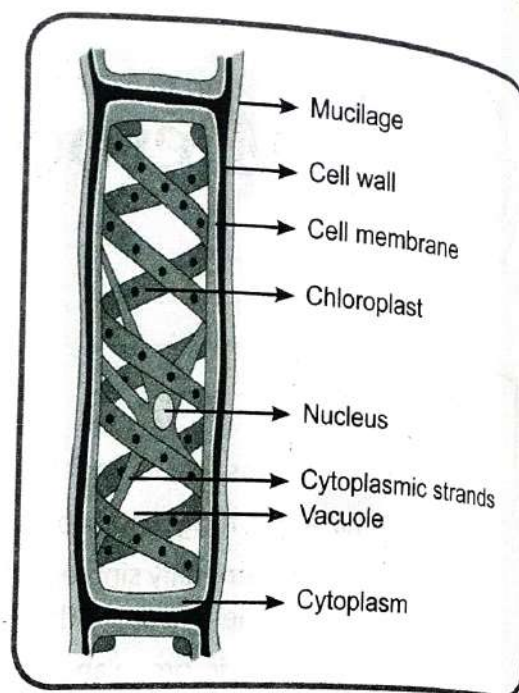


***Lactobacillus* (Bacterial cell)**

- (iii) Membrane-bound cell organelles are absent.
- (iv) The size of this bacterium ranges from 2-9 microns in length.
- (v) They are non-motile and found singly or in chains.

2. *Spirogyra* (Algae)

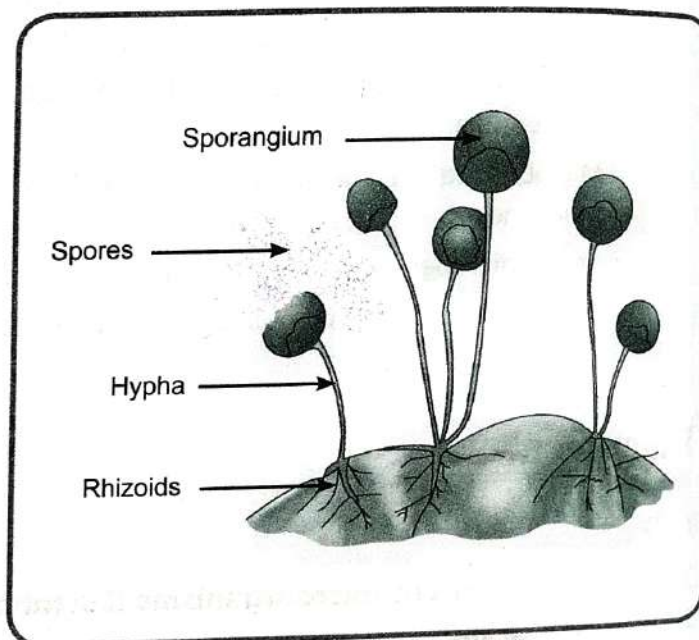
- (i) These are plant-like organisms that are usually photosynthetic.
- (ii) They have ribbon-shaped chloroplasts.
- (iii) They have a long filamentous body.
- (iv) They contain chlorophyll pigment and carry out the process of photosynthesis.
- (v) They are usually found in freshwater bodies.



Spirogyra

3. *Rhizopus* (Bread mould-Fungi)

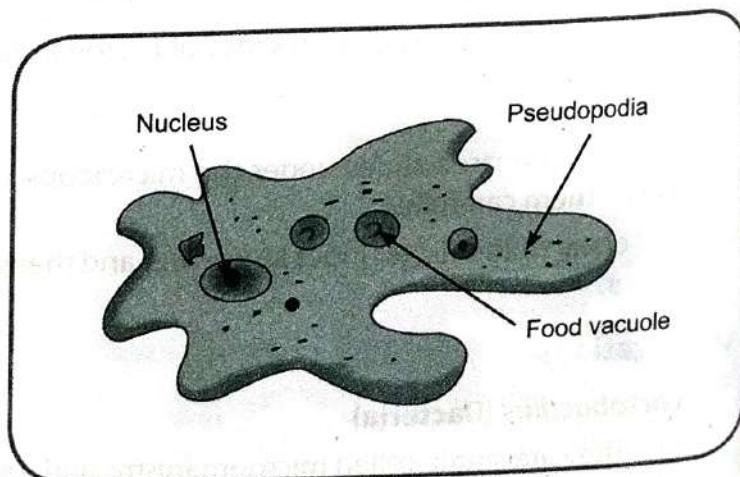
- (i) These are non-green organisms with bodies made of thread-like structures known as hyphae.
- (ii) They lack chlorophyll and so cannot perform photosynthesis. They have saprophytic mode of nutrition.
- (iii) They are multicellular.
- (iv) They are found growing over moist bread. They are saprophytic.
- (v) They have bulb shaped sporangium which bears spores.



Rhizopus (Bread mould)

4. *Amoeba* (Protozoa)

- (i) They are minute unicellular organisms. All the body functions are performed by a single cell in this organism.
- (ii) They have irregular shaped body.
- (iii) They live in fresh water. Hence, they are fresh water protists.
- (iv) Finger like projections called pseudopodia are visible on the body surface. They help in capturing the food.
- (v) Nucleus and contractile vacuole are also visible under high power microscope.



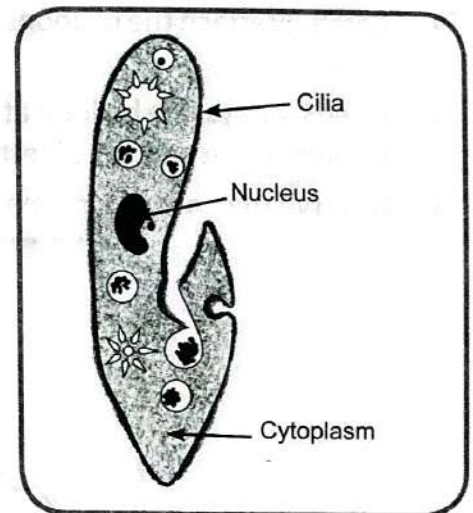
Amoeba

5. *Paramecium* (Protozoa)

- (i) They are also found in fresh waters.
- (ii) They have a slipper-shaped body.
- (iii) Their body is covered with cilia, which are small hair-like structures for locomotion.
- (iv) Nucleus and contractile vacuoles are visible.
- (v) They have a fixed shape and have a groove-like structure for taking in food.

Precautions

1. Slide should be fixed and focussed under microscope carefully.
2. Use the microscope carefully in the presence of your teacher.
3. Do not damage the slides and handle them with care.



Paramecium

Experiment- 11

Aim

To show that charcoal produces carbon dioxide on burning.

Materials Required

Charcoal, boiling tubes, lime water, delivery tube and burner.



Activity-1

Aim

To study the growth of *Lactobacillus* which turns milk into curd.

Method

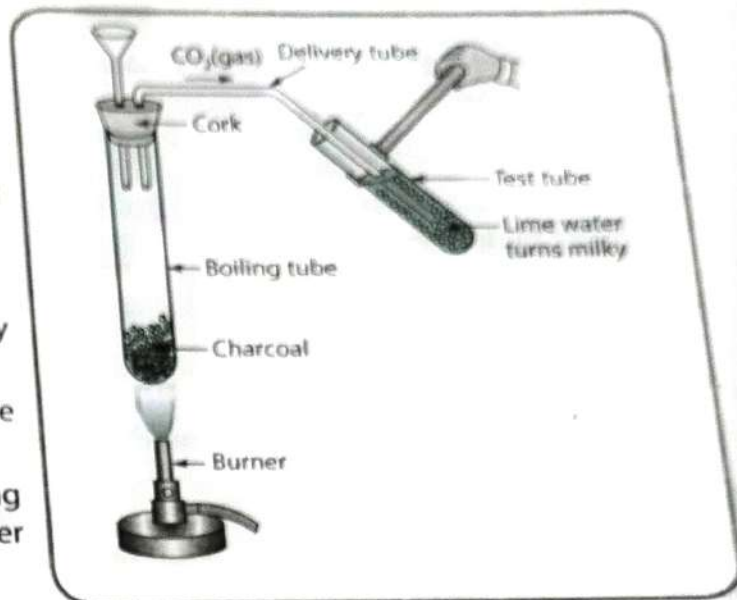
Pour some milk (250 ml) in a glass pan. Heat the glass pan to warm the milk (slightly). Now, add one spoonful of curd in this milk. Stir the milk well with a spoon. Cover it and leave it undisturbed for about 4 to 5 hours and observe.

Observations and Conclusion

Milk becomes semi-solid and turns into curd. Curd, which was added to milk, had some bacteria (*Lactobacillus*) which grew and multiplied in the presence of lactose in the milk and converted the whole milk into curd.

Procedure

1. Take some pieces of charcoal, which is an impure form of carbon, in a boiling tube and set a double holed rubber cork on it. Insert a thistle funnel in one hole for ventilation and a delivery tube bent twice at right angles in the other hole.
2. Heat the boiling tube until it becomes red hot.
3. Take another boiling tube and put some freshly prepared lime water in it.
4. Suspend the other end of the delivery tube into the lime water as shown in the figure.
5. Now again start heating the boiling tube having charcoal and observe the changes in lime water carefully.

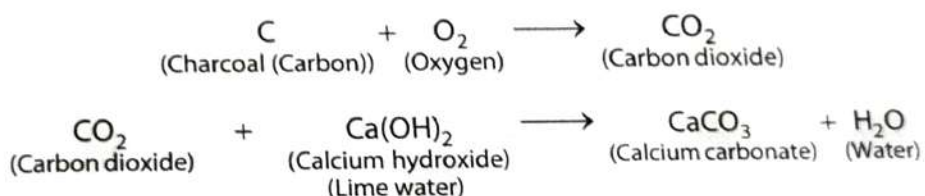


Burning of charcoal

Observations

The lime water turns milky which shows that carbon dioxide gas is released. Carbon dioxide passed into lime water gives a milky solution due to the precipitation of an insoluble suspension of calcium carbonate.

The chief product of the reaction is carbon dioxide.



Conclusion

Charcoal produces carbon dioxide on burning which turns lime water milky.

Precautions

1. Handle the glassware with care.
2. Heating should be done strongly till the vapours start coming out.
3. Use only freshly prepared lime water for the experiment.

Experiment- 13

Aim

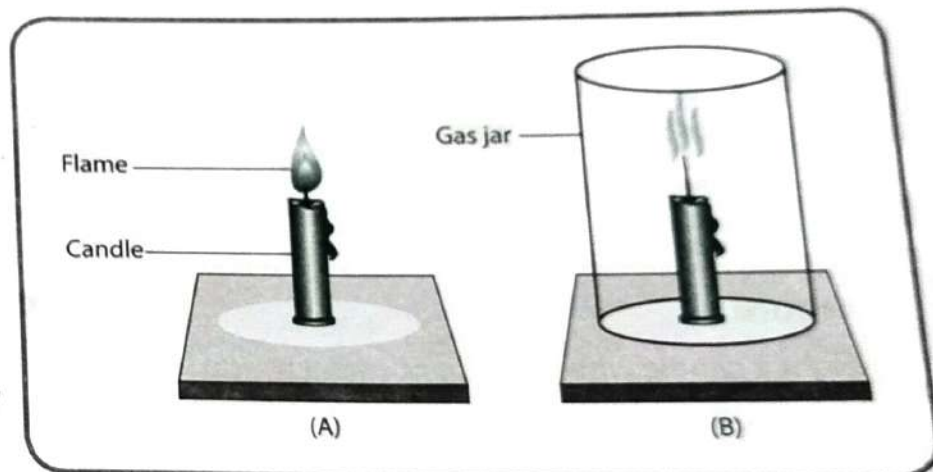
To show that air is necessary for burning.

Materials Required

Two candles, matchbox and gas jar.

Procedure

1. Take the two candles, fix them on a table and light them.
2. Now, cover one of the burning candles by putting an inverted gas jar over it.
3. Observe the flame.



Air is necessary for burning

Observation

After sometime, the candle stops burning and gets extinguished.

Conclusion

When the burning candle is covered with gas jar, then the candle consumes oxygen from the air enclosed in the gas jar. After some time, when all the oxygen from the air inside the gas jar is used up, the burning candle gets extinguished. This proves that oxygen is necessary for burning.

Precautions

1. The gas jar should be handled carefully.
2. Candle flame should be observed carefully.
3. There should be no leakages in the gas jar.

Experiment-14

Aim

To study the different zones of a candle flame.

Materials Required

A candle and a matchbox.

Procedure

1. Light a candle with the help of a matchstick.
2. Now observe the different zones of the candle flame and compare them.



Various zones of a candle flame

Observations

1. When the candle flame is lighted, the wax vapourises as it gets heated up and then burn.
2. You will notice that the flame is spindle shaped and its colour depends on the temperature, amount of air available and nature of the substance burning.

There are three different zones in a candle flame.

- (a) **Dark zone (inner zone):** It is the innermost and the coldest part of the candle flame. Oxygen is not available in this zone, so combustion does not occur. It is black and has unburnt wax vapours.
- (b) **Luminous zone (middle zone):** It is bright and illuminated zone of the candle flame. In this zone, incomplete combustion takes place. It is moderately hot and yellowish in colour. It breaks up into carbon and hydrogen particles. These particles leave the flame as smoke and soot.
- (c) **Non-luminous zone (outer zone):** It is the hottest part of the flame and is bluish in colour. Complete combustion takes place in this zone because of the presence of enough oxygen in the surrounding air.

Conclusion

The different zones of the candle flame are hence studied.

Precautions

1. Light the candle carefully and throw the matchstick in the dustbin.
2. Put on leather gloves to prevent any injury to the hands.
3. Handle the candle flame with care and do not touch it.

Experiment-17

Aim

To study binary fission in *Amoeba* and budding in *Hydra* through permanent slides.

Materials Required

Permanent slides of *Amoeba* showing binary fission and *Hydra* showing budding, microscope, pencil and eraser.



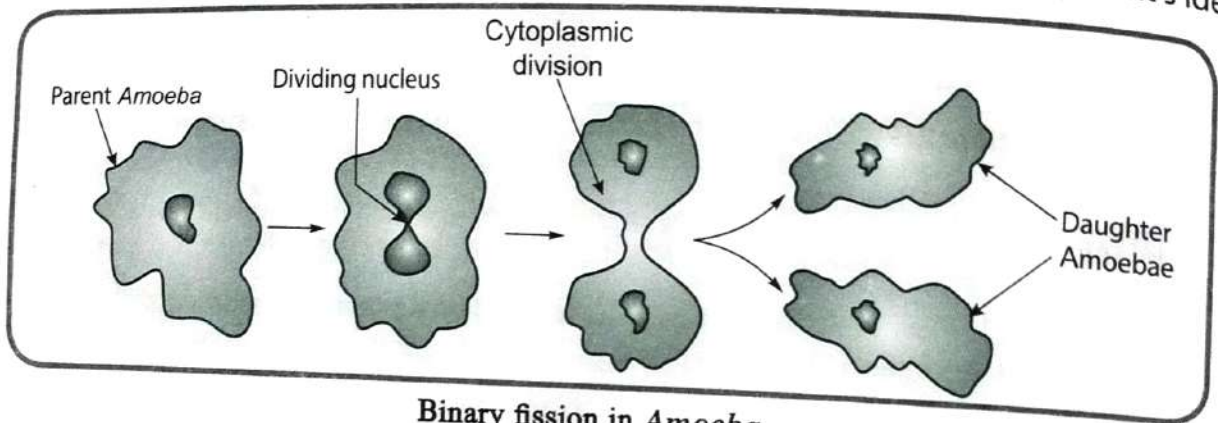
Procedure

1. Take the permanent slide of *Amoeba* and place it on the stage of microscope.
2. Focus the slide under the microscope. Note the features and draw rough sketches of different stages.
3. Similarly, observe the slides of *Hydra*.

Observations

(A) Binary fission in *Amoeba*

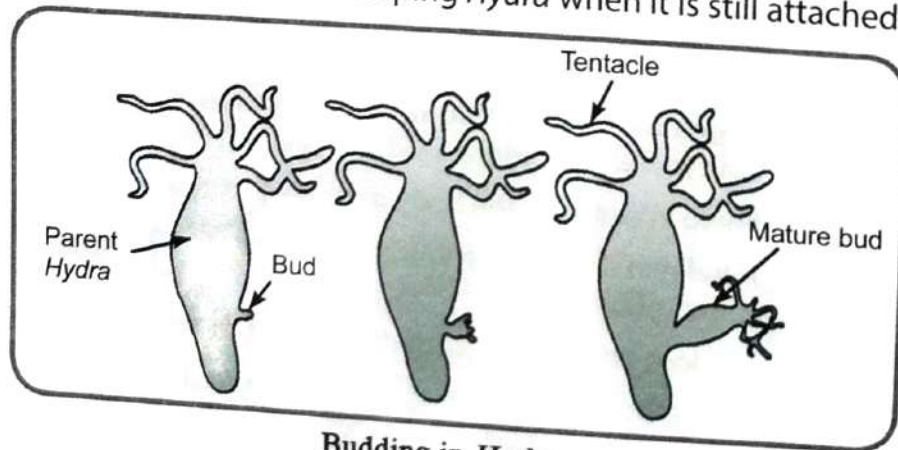
1. In this case, the division of nucleus takes place first.
2. Then, the division of the cytoplasm occurs.
3. Finally, two daughter amoebae are formed from a single parent *Amoeba* and the parent's identity is lost.



Binary fission in *Amoeba*

(B) Budding in *Hydra*

1. In this case, a bud develops as an outgrowth due to repeated cell division at one specific site.
2. When bud develops into an adult *Hydra*, it gets detached from the parent *Hydra*.
3. Sometimes a new bud can arise on the developing *Hydra* when it is still attached to the parent body.



Budding in *Hydra*

Conclusions

The prepared slides show asexual modes of reproduction, i.e., binary fission and budding, in which only one individual is involved in the production of new individuals. In binary fission, an animal reproduces by dividing into two individuals while in budding, the formation of new individual takes place from the bulging on the parent body.

Precautions

1. Handle the microscope carefully.
2. Clean the stage of microscope before and after use.
3. First observe the slides under low power of microscope and then under high power.