

22.10.13

EXPERIMENT 4 - TO STUDY (A) BINARY FISSION IN AMOEBAS(B) BUDDING IN YEASTOBJECTIVE:

To study (a) binary fission in Amoeba and (b) budding in yeast with the help of prepared slides.

A. BINARY FISSION IN AMOEBASMATERIALS REQUIRED:

1. Permanent slides of Amoeba.
2. Compound microscope

PROCEDURE:

Place the permanent slide on the stage of microscope. Adjust the mirror of microscope so that maximum light is reflected from the mirror to the slide. Adjust the eyepiece of the microscope so that the slide is clearly focused.

OBSERVATIONS

1. Amoeba are usually irregular in shape. Some of them may be in a state of binary fission. In some stages karyokinesis may be seen.
2. Others may show the division of cell body, i.e., cytokinesis. So that an amoeba may divide into two parts, i.e., daughter cells.

### CONCLUSION

Given slide shows the elongated body of amoeba with a constriction in the middle. The nucleus of amoeba is under the process of division, hence the given slide shows binary fission in amoeba.

### B. BUDDING IN YEAST

#### MATERIALS REQUIRED

1. Prepared slide of yeast, a culture of baker's yeast may be prepared in the undermentioned way:

(a) Add 5g of yeast powder to about 250 ml of 10% sugar solution in a flask. (ie, dissolve 10g of sugar in 100 ml of water).

(b) The mouth of the flask should be tightly corked or plugged with cotton wool.

(c) Keep the flask in a warm place for about 4 days.

2. Compound microscope.

#### PROCEDURE

To study budding in yeast cells, take a small drop of the culture solution on a plain slide and cover it with the coverslip. Do not add any stain. Put the slide on the stage of the microscope.

Adjust the mirror of microscope so that maximum light is reflected from the mirror to the slide. Adjust the eyepiece of the microscope so that slide is clearly focused.

### OBSERVATIONS

1. Yeast cells are usually spherical or oval in shape.
2. Yeast cells show protuberances on them called 'buds'. So that buds upon reaching maturity separate from the parent cell. This process of reproduction is known as budding.
3. Sometimes a chain of buds is seen on the parent cell.

### CONCLUSION

In the given slide some yeast cells show protuberances, while some yeast cells are present with a chain of buds. Hence the given slide shows budding in yeast.

### PRECAUTIONS

1. Always set the microscope mirror and diaphragm before placing the slide.
2. Focus the slide first under low power, then observe it under high power.
3. Focus the slide first by using coarse adjustment knob and then focus the slide by using fine adjustment knob.
4. While focusing at high power, only use fine adjustment. Do not use coarse adjustment.

## EXPERIMENT 5 - STUDY OF HOMOLOGY AND ANALOGY

### OBJECTIVE:

To study homology and analogy with the help of available specimens of plants.

### MATERIALS REQUIRED

(1) Plant specimens like - *Passum*, *Spinacia*, *Potato*, *Sweet Potato*, *Citrus* (as and *Cucurbita*).

### PROCEDURE

Observe the specimens and record their origin and functions. Draw the diagrams of these specimens.

### OBSERVATIONS

(1) Observations and record of the features of homologous organ in plants.

A. Tendrils of *Passum* and *Spinacia*.

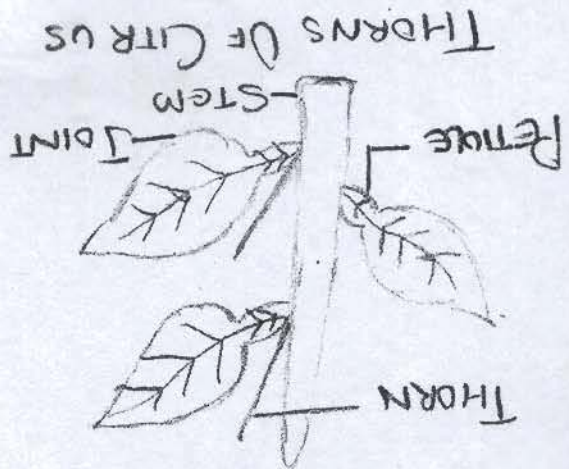
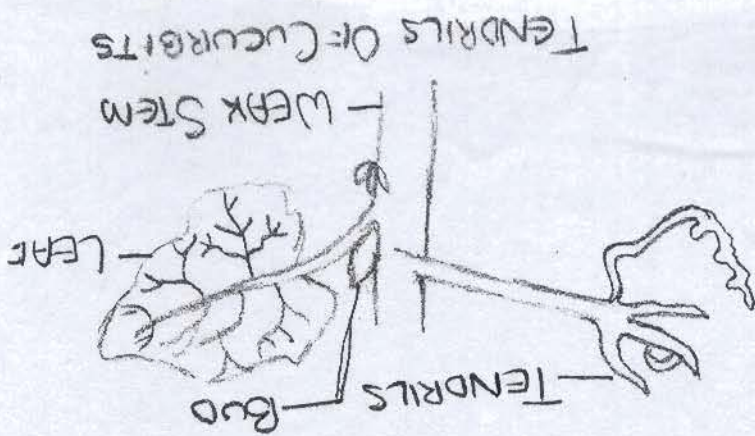
• Tendrils of *Passum* and modified leaves are used in climb a support.

• Spinacia of *Spinacia* are also modified leaves but are meant for protection. Tendrils of pea plants and spinacia have similar origin but have different functions.

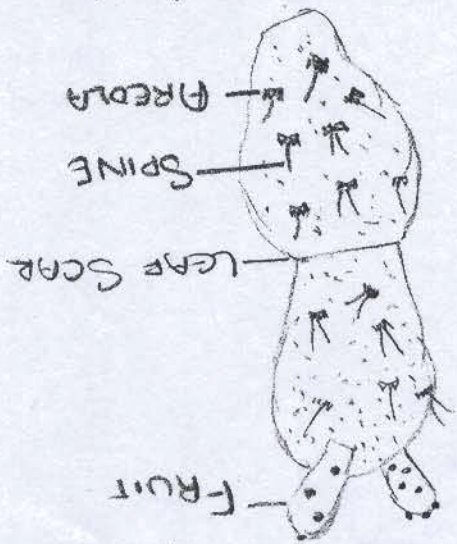
• Therefore they represent homologous organs in plants.

B. Thorns of *Citrus* and tendrils of *Cucurbita*.

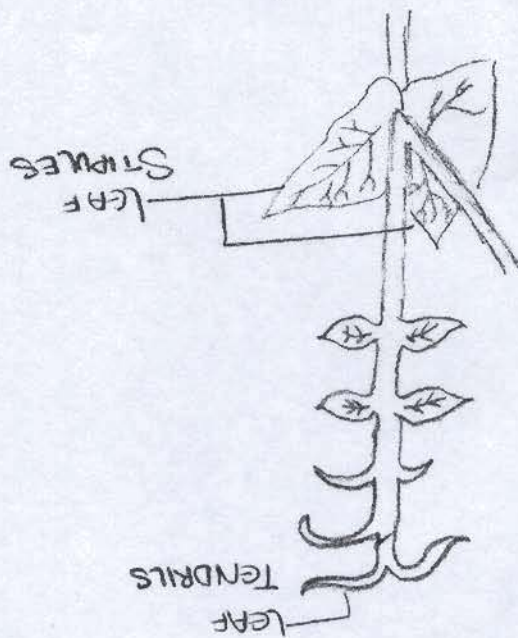
• Thorns of *Citrus* are modified stems and are used for protection against grazing animals.



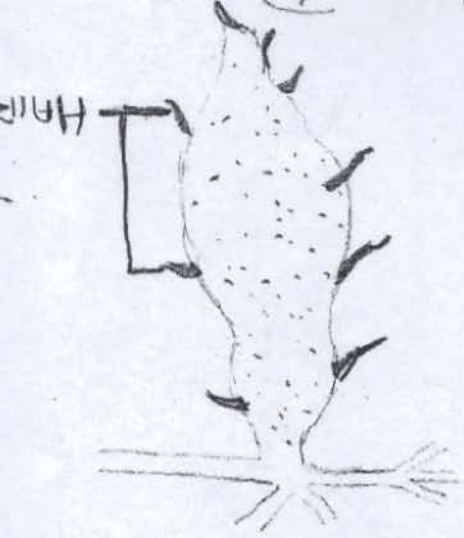
SPINES OF OPUNTIA



TENDRILS OF PISUM



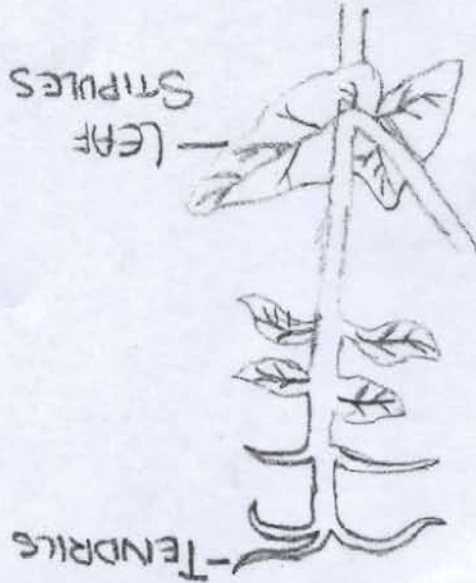
SWEET POTATO



POTATO



TENDRILS OF PISUM



PHYLLICLAD OF OPUNIA



Tendrils of cucurbits are also modified stems but are used to climb support

Thorns of citrus and tendrils of cucurbits have similar organs but different function

Therefore, they represent homologous organs in plants

(iii) Observations and recording the features of analogous organs in plants

A. Tendrils of Pea (Pisum) and Rhizoids of Spirogyra

Tendrils of Pea are the modification of upper leaflets and are used to climb support.

In Spirogyra, the stem is modified to broad succulent and photosynthetic leaf like structure. This modified stem is called Rhizoids which, works like a leaf.

Hence, tendrils of Pea and Rhizoids of Spirogyra have different function and have similar function of photosynthesis and therefore support analogous organs in plants.

### B. Potato and Sweet Potato.

Potato is a modified stem which is meant for storage of food. It has eyes which represent nodes.

Sweet Potato is a modified root also meant for storage of food. It has root hairs.

Hence potato and sweet potato have different origin but have similar function of storage and therefore represent analogous organs in plants.