Experiment No. 1 Date

Biology

Chapter - 8 Cell - The Basic Unit of life

Experiment - 1

Aim

To prepare a stained tempory mount of (a) onion peel (b) human cheeck cells and to record observation and draw their labelled diagram.

(A) Temporary Mount of onion Peel

Materials Required

Onion, plain slides, cover slip, watch glass, needles, forceps, brush, blade, safranin, blotting paper, distilled water.

Theory

Cell is a structural and functional unit of all living organism. A Plant Cell consists of cell wall, cell membrane, cytoplasm.

Procedure

1. Take a piece of fleshy scaly leaf an onion and with the help of forceps.
2. Keep the peel in water in a watch glass.

Observation

1. A large number of rectangular cells forming a distinct cell wall can be observed.

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3. A big cell central vacuole is present in cell.
4. A deeply stained round body called nucleus is seen in each cell.

Result

The epidermal peel of onion comprises of rectangular shaped cells. Each cells comprieses of a nucleus thin layer of cytoplasm.

Precautions.

1. Always take a clean slide and hold it by its edges to avoid making the slide dirty.
2. Peel should be properly stained. Avoid under or excess staining of peel.
3. Always transfer the peel with the help of a brush.

(B) Temporary Mount of Human cheek cells

Materials Required

Slide, Coverslip, needle, blotting paper, sterlised toothpicks, glycerine, 0.9% NaCl solution, dropper, fresh water, methylene blue, watch glass, compound microscope.

Theory

Animal Cells lack cell wall and prominent vacuole. In these cells, a semipermeable membrane called cell membrane surrounds the cytoplasm.

Procedure.

1. Rinse your mouth to remove any food

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particles.
2. Place it in a drop of water over a clean slide.
3. Spread with needle over the slide.
4. Add the drop of glycernine.

Observations:
1. Large number of flat polygonal cells with irregular boundaries attached edge to edge are seen.
2. The Cells have thin membrane called Cell membrane which encloses jelly like substances called Cytoplasm with nucleus.

Result
Cells under observations do not have cell wall and large prominents vacuole.

Precautions:
1. Scrap the check cells gently with the help of clean toothpick to avoid infection or injury.
2. Place coverslip gently to avoid entry of air bubbles
3. Remove extra glycerine with the help of blotting paper.
4. Spread the scrapping so that cells are properly distributed.

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Ch ⇒ 2 Tissues

Experiment - 2

Aim

To Identify parenchyma, collenchyma and sclerenchyma tissues in plants, striped, smooth and cardiac muscle fibre and nerve cells in animals from prepared slides and to draw their labelled diagram.

Material Required

Prepared Permanent slides of plant tissues: Parenchyma, collenchyma, sclerenchyma and animal tissues: striped muscles fibre and nerve cells

Theory

A groups of cells a like in formation, similar in origin and performing a definite function is known as a tissue. Depending upon the consitituion of cells, the plant and animal tissues are of following types:

Procedure

1. Take Permanent slides of the above mentioned tissues.
2. Examine the slides one by one, first under low power and then under high Power microscope.

Observations

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A. Parenchyma
1. Living, thin walled cells.
2. Intercellular spaces are present.
3. Cytoplasm is vacuolated.

B. Collenchyma.
1. Cells are somewhat oval to elongated.
2. Thickenings are present at corners of cells.
3. Intercellular spaces are absent.

C. Sclerenchyma
1. Highly thick walls due to deposition of lignin and cellulose.
2. Cell are dead and closely packed without intercellular spaces.
3. They are of two two types: fibres and Sclereinds.
4. Their main function is to provide strength to the plant.

D. Striped Muscle (Striated Muscle)
1. Striped Muscle cells are cylindrical, elongated and enclosed in a membrane called Sarcolemma.
2. There are multinucleated.
3. They show presence of light and dark bearands which giver them a striped appearance.

E. Smooth Muscle (Non-Striated Muscle)

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1. The Cell are spinde - shape.
2. Nucleus is centrally located.
3. These muscles are involuntary in nature.

F. Cardiac Muscles

1. Cardiac muscle cells are long, branched and uninucleate.
2. These show the Presence of intercalated discs.
3. They show alternate light and dark brands.

G. Nerve Cell

1. Nerve Cell comprises of a Cell body or Cyton with a single nucleus and cytoplasm.
2. Cytoplasmic projections called dendrites arises from Cyton.
3. A long Cytoplasmic projection arises from Cell body called axon.

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Chapter 7 10 Diversity in living Organisms

Experiment - 3

Aim

To study the characteristics of Spirogyra / Agaricus, Moss Fern, Pinus (either with male or female cone) and an angiospermic plant.

Materials Required

Specimens or charts of Spirogyra / Agaricus, Moss, Fern, Pinus and an angiospermic plant (Brassica).

Procedure

1. Observe the specimen carefully.
2. Note down the characteristics of each specimen and discuss with the teacher.
3. Draw rough diagram of the specimen and label the observed characteristics.
4. Write Your comment or discussion about the specimens.

Observations

(A) Spirogyra

Characteristics Features

1. It is a fresh water green algae; silky to touch so it is known as water silk or pond scum.

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2. Spirogyra has long, multicellular filaments.
3. It has a series of cell joined end to end to forms a filaments.
4. Each cell has one or more spiral choloroplast from one end to another.
5. Small protein body called pyrenoids are present on each ribbon like choloroplast.
6. Nucleus is in the centre suspended by strands of cytoplasm.
7. Single large central vacuole is also found.
8. A thin gelatinous sheath around the cellulose and pectin.

Identifying Features:
(Spirogyra belong to a group - cholophyta)
1. It has a single cell structure which grows only in length and no thickness.
2. Flat, spiral shaped ribbon like choloroplast is present.

(B) Agaricus
1. Plant body is made of filaments called mycelium.
2. Agaricus is commonly known as mushroom.
3. It is separate mycelium
4. Its vegetative Phrase, mycelium is under the substractum.
5. Basidiocarp has stipe, pileus and gills.
6. Stripe contains a membraneous ring known as velum.

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Identifying Features
(Agaricus belongs to a group - Fungi)
(i) It is Achlorophyllous
(ii) Thread like mycelium or fruiting bodies is present.

(C) Funaria
1. Funaria is a common moss of field.
2. Plant body is upright, slender and branched.
3. Distinct gametophyte and sporophyte are present.
4. Capsule encloses spores as tetrads.

Identifying Features:
(Funaria belongs to a group - Bryophyta)
(i) Short plants with little differentiation into stem and leaf.
(ii) Distinct gametophyte and sporophyte.

(D) DRYOPTERIS (FERN)
Characteristics Features:
1. The Plant Body is a sporophyte which has true roots, stems and leaves with vascular tissue.
2. Gametophyte is reduced to a prothallus.
3. The stem is underground and is called as rhizome.

Identify Features:
(i) Sporophyte (2n) is dominant having true roots, stems a leaves.
(ii) In Dryopteris, the leaves are coiled.

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E. Pinus (Gymnosperm)

Characteristics Features

1. Pine is a tall and evergreen tree.
2. Plants is differentiated into roots shoots and leaves.

Male cone

(a) Small in size, approx 0.5 cm in diameter.

Female Cone

(i) They have a large number of megasporophylls.

Identifying Features.

(i) Seeds are naked - not enclosed in an ovary or fruit ie the seed are exposed.

(ii) Microsporangia release winged pollen grains which fly through air and reach eggs.

(F) Angiospermic Dicot Plant.

Characteristics Features. (Brassica)

1. Root is tap root.
2. Stem is herbaceous and green with distinct nodes and internodes.
3. Leaves are alternate, sessile, simple with lobed margins.

Identifying Features.

(i) Brassica belongs to division tracheophyta and class angiospermae, sub-class dicotyledonae.

(ii) They are vascular flowering plants.

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Experiment No. 4 Date

Experiment - 4

Aim

To study external features of root, stem leaves and flower of monocot and dicot plants.

Materials Required:

Plants specimens (monocot e.g Maize, Rice etc. dicot eg Brassica), magnifying glass, forceps, needle and microscope

Theory

Angiosperm is made from two greek words 'angio' meaning covered and 'sperms' meaning seed.

(A) Monocotyledons or monocots

1. The seeds of these plants bear only one cotyledon.
2. The leaves are simple with a paralled venation.
3. Roots are fibrous and similar in shape
4. Flowers are trimerous having three members in each floral whorl.

(B) Dicotyledons or Dicots

1. The seeds of these plants bear two cotyledons
2. Venation in the leaves in reticulate.
3. Root system includes tap root with primary and Secondary roots.

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Experiment No. 4

Date

Procedure

1. Select a dicot and a monocot plant and roots, leaves, flowers and fruits.
2. Observe the differences in the external features of different parts of a plant (i.e, stems, leaves, roots, flowers and seeds).
3. Also study the leaves for their shape and venation.

Observation

S.No	Characteristics	Dicot	Monocot
1.	Plant size	—	—
2.	Leaf venation (Parallel/reticulate)	—	—
3.	Leaf shape (broad / narrow)	—	—
4.	Stem (hollow/solid)	—	—
5.	Vascular bundles (scattered/ring)	—	—
6.	Root System (tap/ adeventions)	—	—
7.	Flower (trimerous/ pentamerous	—	—
(i)	No. of Petals	—	—
(ii)	No. of sepals	—	—
(iii)	No. of carpels	—	—
(iv)	No. of stamens	—	—
8.	Seed (single cotyledon / two cotyledons)	—	—
9.	Conclusion (monocot / dicot)	—	

Check list for observations:

(A) Features of Monocots

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1. Plant size : Small in size.
2. Leaves size : Parallel vanation
3. Stem : Hallow steems

B. Features of Dicots

1. Plant size: Plants may be shrub or tree like in size.
2. Leaves : Leaf veins in dicots from network called reticulate.
3. Stem: Solid stem

Result

The study reveals many differences between dicot and monocot plants. The distinctive features can be seen in most of the Plants belonging to these groups.

Precautions:

1. Observations should be done using a hand lens.
2. Slides and microscope should be handled with care.
3. Handle the plants Parts with care to avoid damage.

Experiment No. 5 Date

Experiment - 5

Aim

To observe and draw the given specimens — Earth worm, Cockroach, Bony fish and Bird. For each specimen, record

(a) · One specific feature of Phylum.

Materials Required

Preserved / museum specimens of Earthworm, Cockroach, Bony fish and Bird.

Procedure

1. Hold the specimen carefully.
2. Draw and label the observed specimen.
3. Label the diagram by comparing with given diagram.
4. Note down the external structure adaptation.

(A) Earthworm

(Phylum: Annelida, class, Oligochaeta)

· Features of Phylum: Annelida

4. Metamerically segmented body.
2. Setae are present.
3. Bristles and body-wall muscles help in locomotion

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Characteristic Adaptive Features: (Sub. Soil Habitat).

1. Body is Cylindrical, streamlined without appendages.
2. Anterior end is pointed bearing mouth called peristomium, specialized to dig the soil.
3. Locamotary organs, the setae are segmentally arranged.
4. Respiration in cutaneous type.
5. Skin is slimy cement burrows.
6. It feeds on the organic matter in the soil while digging it.

(B) Cockroach

(Phylum: Arthropoda, Class Insecta)

Features of Phylum: Arthropoda.

1. Body is divided into head, thorax and abdomen.
2. chitinous exoskeleton, compound eyes.
3. The abdomen has ten segments.

Characteristic Adaptive Features: (Terrestrial Habitat)

1. Body colour is dark brown, flattened to get into terrestial crevices.
2. Mouth parts are chewing type.
3. Respiration occurs throught the network of spiracles.
4. It has two pairs of folded wings.
5. It is nocturnal (comes out at night).

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(C) Bony Fish (Phylum: Chordata, Class: Pisces)

1. Aquatic organism with flat fins, streamlined body and gills as respiratory organs.
2. Notochord is Replaced by strong vertebral column.
3. Presence of air bladder is another features of Pisces.

Characteristic Adaptive Features: (Aquatic Habitat)

1. Streamlined body to face and cut through water.
2. Presence of air bladder to flow.
3. It has gills for respirations.

(D) Bird (Pigeon) (Phylum: Chordata, Class: Aves)

Features of Phylum chordata, class: (Aves)

1. Flying animal with feathers.
2. Forelimbs modified into wings.
3. Beaks present teeth absent.

Chacteristics Adaptive features: (Aerial Adaptation)

1. Body is Boatshaped.
2. Eye covered by nictitating membrane.
3. Featured tail is present.
4. Respiration is by air sacs (Attached to lungs).
5. Feathers covers the Body to provide insulation.

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