School Code: 10908

CBSE Affiliation No. : 1730578

BHAGAT PUBLIC SR. SEC. SCHOOL

ALANIYA, KOTA

BIOLOGY PRACTICAL

MAJOR EXPERIMENT

2020-21

CLASS - XII

ADDRESS

CAMPUS : N.H. 12, JHALAWAR ROAD, ALANIYA, KOTA-325003, PH :0744-2832113, 9649991123

Email : bpssschool@gmail.com

PART-1

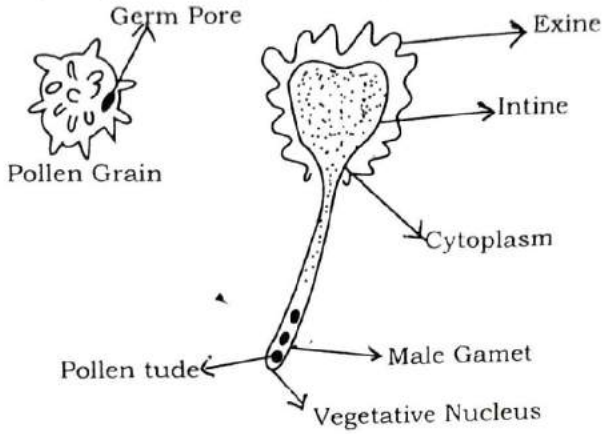
EXPERIMENT – 1

Aim –

To study the Pollen germination on a slide.

Requirement –

China rose flower, slide, cover slip, microscope beaker, dropper, sucrose 10g, boric acid 10 mg, Potassium nitrate 10mg, Magnesium sulphate 20 mg, Calcium nitrate 30 mg, 100 ml distilled water.



Procedure –

1. Mix the above chemicals in the required amount in 100ml of distilled water. This solution is called nutrient medium.
2. Dust the pollen grains from the flower on a clean and dry slide.
3. Add a drop of nutrients medium with a dropper over the pollen grains.
4. Let the slide be kept undisturbed for 10-15 min.
5. Observe the slide under low power of microscope.

Observation –

1. Some pollen grains will germinate and develop pollen tube. These pollen grains are said as viable pollen grains.
2. Some pollen grains may not show the development of pollen tube. These pollen did not germinate. They are call us non-viable pollen grains.

Conclusion -

Viable pollen grains germinate in nutrients medium.

Precaution –

1. Pollen grains should be dipped completely in the nutrient medium.
2. Slide should be kept undisturbed.

EXPERIMENT – 2

Aim –

To study the physical characteristics of soil.

Requirement –

Soil samples collected from a crop field, Road side garden soil, measuring cylinder, hand lens, water, wire meshes of different pore size etc.

Procedure-

Collect a sample of soil. Fill half the measuring cylinder with soil. Add equal amount of water in it and stir it thoroughly with glass rod. Allow it to stand undisturbed for nearly one hour. Soil particles settle down in different layers according to their size.

Table – Texture of soil

S.NO.	Texture	Soil as felt between thumb and fingers
1.	Sand	(a) Individual dry soil grains may be seen of felt. (b) They form a cast when moist soil is squeezed.
2.	Sandy Loam	(a) Individual soil grains can be seen and felt. (b) Moist soil forms a cast that does not break.
3.	Loam	(a) Gentle and gritty feeling. (b) Moist soil cast is easily handled without breaking.
4.	Slit loam	a) Soil appears cloddy or bumpy with soft feeling. (b) It moist soil is squeezed it does not form ribbons.
5.	Clay loam	(a) Hard and dry soil breaks into lumps or clods. (b) Moist soils forms cast that can bear much handling.
6.	Clay	(a) Dry soil forms very hard lumps or clods. (b) Wet soil is sticky.

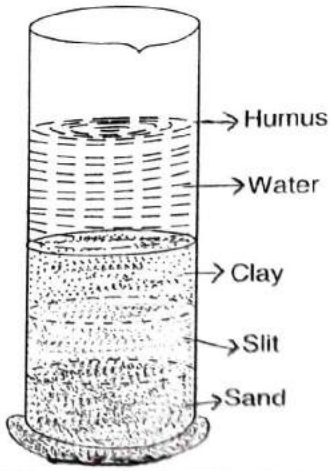
Observation –

In the cylinder, sand being heavy settles down at the bottom, silt particles remain suspended above the sand, and uppermost layer is that of clay.

S.No.	Soil Sample type	Colour	Percentage of each type		
			Sand	Slit	Clay
1	Garden soil	Brown	50%	20%	30%
2	Crop field	Black	30%	60%	10%
3	Road side	Yellow	10%	70%	20%

Precaution –

1. Aqueous layers are not very sharp so an idea taken.
2. Percentage of each soil type should be calculated before computation.



EXPERIMENT – 3

Aim –

To study the moisture content of soil.

Required –

Soil sample, oven, crucible, tripod stand, wire gauze, match box, physical balance, burner.

Procedure –

1. Take little sample of soil and weigh it.
2. Keep the soil in a suitable crucible and keep it for half an hour in hot air oven at a temp. 105^0c-110^0 C.
3. Cool the soil and weigh it. Calculate the loss of water.
4. Repeat the process for all samples of soil.

Observation –

S.No.	Type of Soil	Weight of soil before heating x gm	Weight of soil before heating x1 gm	Moisture Present (X-X1) gm	Moisture contain dry wt in %
1	Garden Soil	20 gm	12 gm	8 gm	40%
2	Field soil	20 gm	15 gm	5 gm	25%
3	Road side soil	20 gm	16 gm	4 gm	20%
4	Crop field	20 gm	13 gm	7 gm	35%

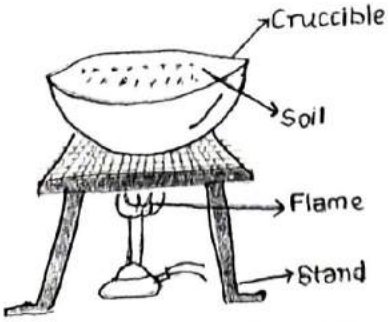
Calculation –

Moisture present = $(X-X_1)$ gm

% moisture content = $\frac{x - x1}{x} \times 100$

Result –

Garden soil has 40% (height) moisture contain road side soil has 20% (lowest) moisture contain.



Healing of soil in crucible

Precaution -

1. Weighing should be done accurately.
2. Always use wire gauge to heat the crucible.
3. Use tongs to handle the crucible.
4. Weighing should be done after cooling the sample.

EXPERIMENT – 4

Aim –
To study the water holding capacity of garden soil and road side soil.

Requirement –
Soil sample, measuring cylinder, funnels filter papers, water.

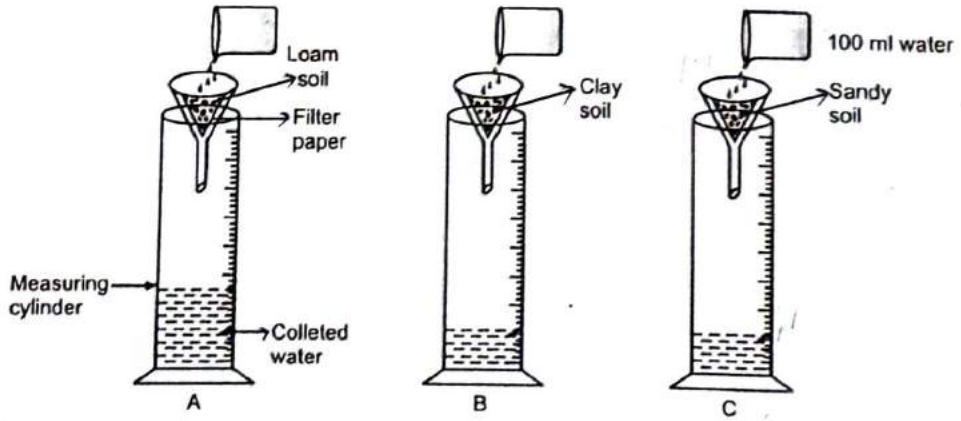
Procedure –
1. Take three funnels and thin line them with filter paper.
2. Put these funnels in the measuring cylinder.
3. Put the soils of known equal weight (100 gm) in separate funnels with cotton plug.
4. Pour an equal amount of water (100 ml) into each funnel.
5. Let the water drip into the cylinder until there is no water left in the funnels.
6. Note the volume of water collected in the cylinder.

Observation –

S.No.	Type of Soil	Weight of soil	Volume of water poured (A)	Volume of water collected (B)	Inference (A-B)
1	Garden Soil	100 gm	100 ml	50 ml	50 ml
2	Road side soil	100 gm	100 ml	60 ml	40 ml
3	Crop field	100 gm	100 ml	55 ml	45 ml

Result –
1. Garden soil retains more water in comparison to crop field.
2. Garden soil has more water holding capacity in comparison to crop field.

Precaution –
1. Take equal weights of soil.
2. Take equal volumes of water.



EXPERIMENT – 5

Aim –

To study the pH value of soil.

Requirement –

Soil sample, Test tube, porcelain tiles, pipette, test tube stand, universal pH indicator and dropper.

Procedure –

1. In clean and dry test tubes take little amount of each soil sample.
2. Add just equal amount of $BaSO_4$, and 25 ml of water to each test tubes.
3. Keep the soil solution in test tube stand for 20-30 minutes. Till a clean supernatant fluid is formed.
4. Take supernatant fluid in clean test tube. Add few drops of universal pH indicator. Mix it well.
5. Note the colour change. Match the colour indicated by the change with the colour chart for different pH value pasted on the bottle.

Observation –

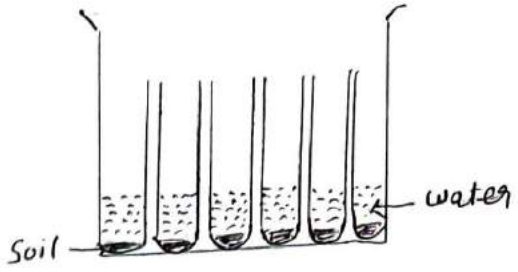
S.No.	Type of Soil	Experiment	Colour indicated	PH Value	Inference
1	Garden Soil	Soil+$BaSO_4$+15 ml water. To the soil sol^n add equal amount of pH indicator.	Light Yellow	6.5	acidic
2	Road side soil		Green	8.0	Basic
3	Crop field		Green	7.5	Basic
4	House garden		Dark green	7.5	Basic

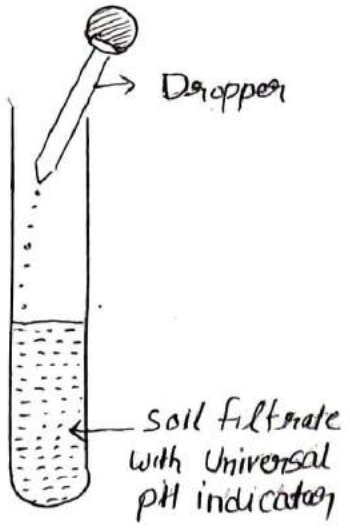
Result –

1. Garden soil is acidic. It has pH 6.5.
2. Road side soil is basic. It has pH 8.0
3. Crop field soil is basic. It has pH 7.5
4. House garden soil is basic. It has pH 7.5

Precaution –

1. Always add proper amount of universal pH indicator.
2. Note the colour charge very carefully.
3. Test tube should be clean.





EXPERIMENT – 6

Aim –
To study the pH value of water.

Requirement –
Sample water, test tube, universal pH indicator, dropper, Test tube stand.

Procedure-
1. Collect the sample water.
2. Take little water in the test tube and add few drops of universal pH indicator and mix it well.
3. Match the colour with the colour chart given on the universal pH indicator bottle.

Observation –

S.No.	Sample water	pH paper strip colour change	pH
1	River water	Green	7.5
2	Pond water	Dark green	8.0
3	Tap water	Light green	7.0

Result –
1. River water is basic pH 7.5
2. Pond water is basic pH 8.0
3. Tap water is neutral pH 7.0

Precaution –
1. Always add proper amount of universal pH indicator.
2. Note the colour charge very carefully.
3. Test tube should be clean.

EXPERIMENT – 7

Aim –
To study the clearity or turbidity of water.

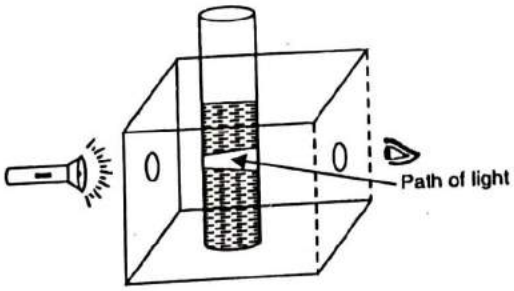
Requirement –
Test tubes, sample water from different sources.

Procedure –
1. Take three clean and dry test tubes and collect equal volume of water sample in it.
2. Mark the test tubes a A,B and c responsibility for tap water, drain water and pond water.
3. Hold the test tube against the sunlight to observe the transparency of water.
4. Record the observation.

Observation –

S.No.	Sample water	Inference
1	A-Tap water	It is clean and clear. Not turbid
2	B-Drain water	Not clean and clear
3	C-Pond water	Not clean

Result – B water used for study is turbid.



7

EXPERIMENT – 8

Aim –
To study the presence of living organisms in water.

Requirement –
Sample water, slide, microscope, collecting bottle, pipette.

Procedure –
1. Take 10 ml. of sample water from any source such as pond or ditch.
2. With the help of pipette transfer little amount of water on slide.
3. Cover the slide with a cover slip.
4. Observe the water under the microscope.

Observation –
1. Micro-organism are present in water sample. The pond water contains phytoplanktons Zygnema, Navicula, Fragilaria, Anabena, Sprorogyra, Zooplanktons-Daphnia, Rotifer, and Copepod. Other organisms-Larva of mosquito, water scorpion, Dragon fly nymph.
2. Draw the diagrams of the organisms observed.

Result –
Living micro organisms are present in water.

Precaution –
Compare the structure of micro organism carefully.

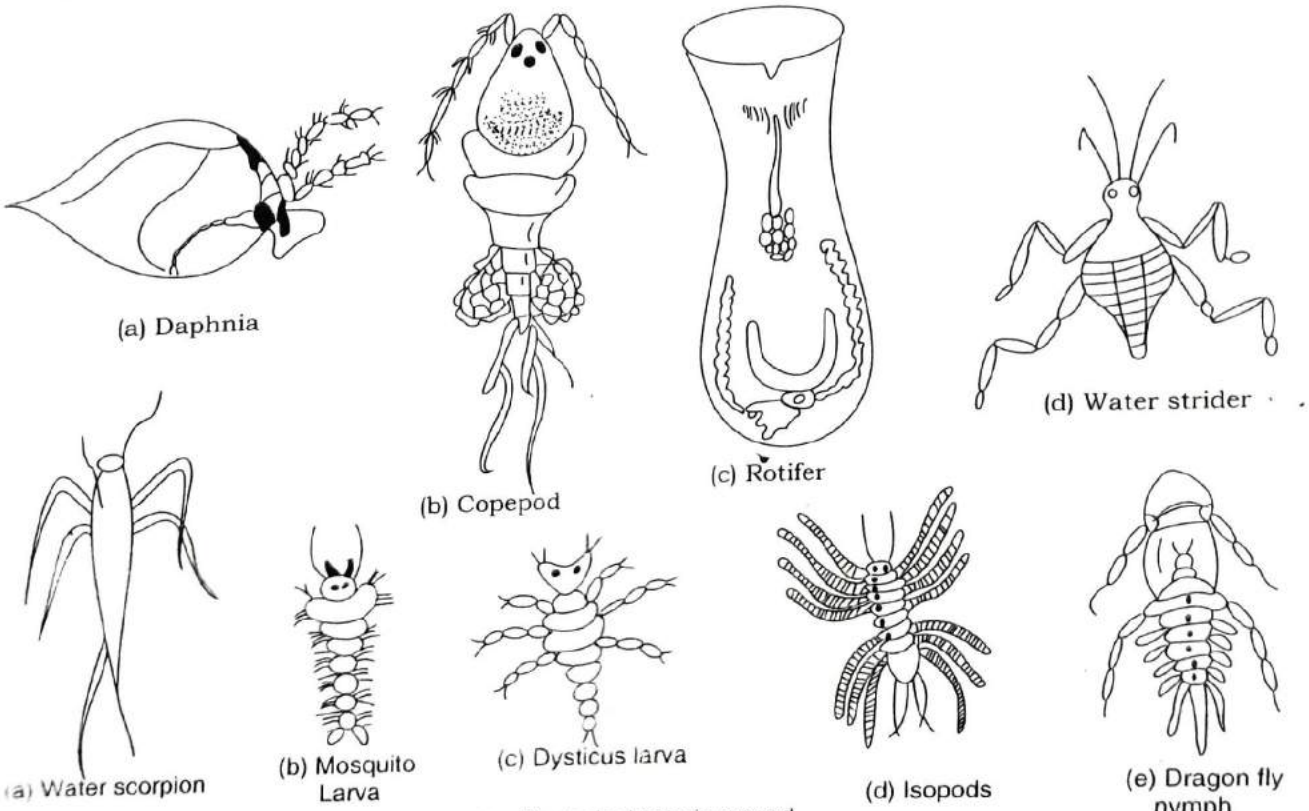


Fig: Phytoplanktons in a pond.

8

EXPERIMENT – 9

Aim –

To study of the different stages of mitosis in onion root tip.

Requirement –

Onion root tip, glass slides, cover slips, scissor, forceps, methyl alcohol, acetic acid, hydrochloric acid, acetocarmine, distilled water, sprit lamp, microscope, blotting paper.

Procedure –

1. Take an onion bulb and remove the old roots with the help of a scalpel.
2. Place the base of the bulb on the rim of a bottle filled with water in such a way that base of the bulb touches the water. Keep it for a weak to grow the roots.
3. When the new roots become 2-3 cm long, cut their extreme tips and put them in fixative (1:3 mixture of acetic acid and methanol)
4. Remove 2 or 3 tips and hydrolyze them by warming at 600c in 1 N HCl for 15 minutes.
5. Wash them in water.
6. Place a drop of acetocarmine on the hydrolysed root tip on a slide.
7. Gently squash the root by tapping the cover slip with the blunt end of a pencil until the cells separate.
8. Gently warm the slide over a flame.
9. Observe first under low power of the microscope to locate the dividing cells. Examine the different stages of mitosis under the high power of microscope.

Observation –

The process of mitosis completed under the following stage.

1. Inter phase

(i) It is a stage in between two successive cell divisions and hence a non-dividing phase.
(ii) Nucleus is large and distinct with nuclear membrane.
(iii) Nucleus containing chromatin network.
(iv) Nucleus is also clearly visible.

2. Early Prophase

(i) Chromatin reticulum has opened up.
(ii) Chromosomes appear as slender thread like structure.
(iii) Each chromosomes consists of two chromosomes held together by centromere.
(iv) Thus, the chromosomes coiled around each other.

3. Late prophase

(i) The chromosomes become shorter, thicker and denser bodies.
(ii) Chromosomes untwist and become thick and rod lives.
(iii) Nuclear membrane and nucleus disappear.

4. Metaphase

(i) Nuclear membrane completely disappear.
(ii) Chromosomes become shorter and thicker and hence become distinct and clearly visible under the compound microscope.
(iii) Series of spindle fibers attach the centromeres to the opposite poles.

5. Anaphase

(i) The centomeres spit into tow and the fibers pull the daughter centromeres to the opposite poles.
(ii) The daughter chromosomes separated. Chromatics appear V,J,L and I shaped depending upon the position of centromere.

6. Telephase

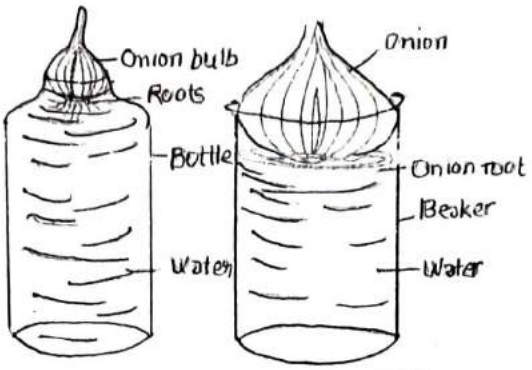
(i) Daughter chromosomes reach on the opposite poles.
(ii) The spindle disappears and the daughter chromosomes uncoil to form chromation fibers.
(iii) Nuclear membrane and nucleus reappear.

7. Cytokines is

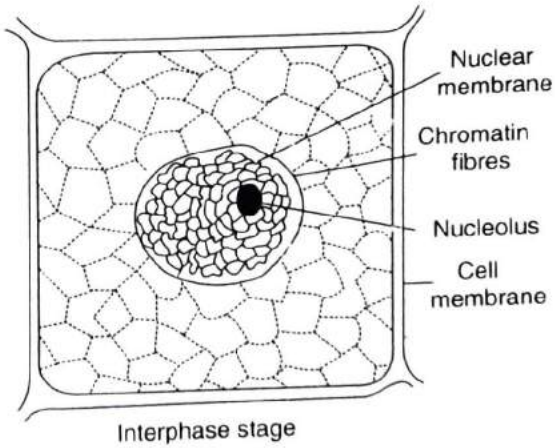
(i) Occurs by cell plate formation between the two daughter nuclei.

Precautions -

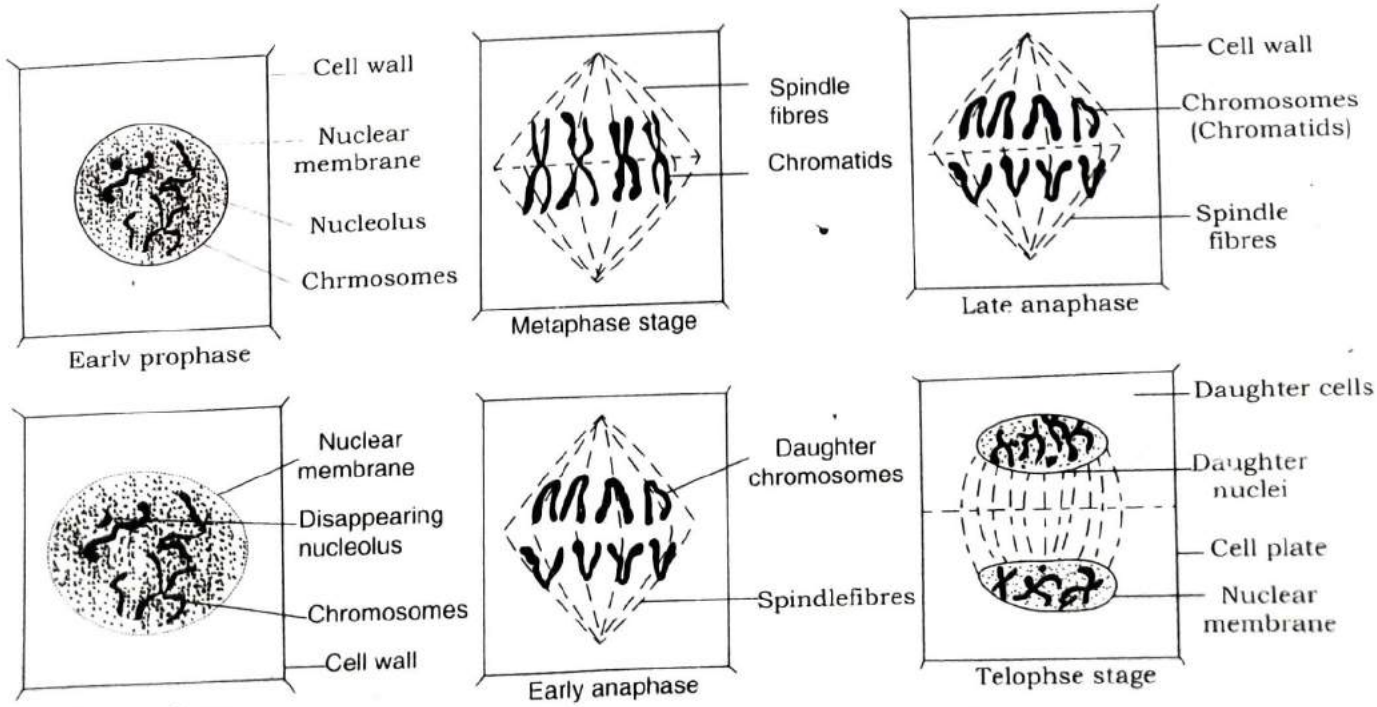
(i) The base of the onion bulb should be in contact of water while growing the roots.
(ii) Root tips should be fixed in morning between 8.00am to 1.00pm.
(iii) The root tips should not get dry during staining and warming up.



Method of growing onion root tips



Interphase stage



Early prophase

Metaphase stage

Late anaphase

Late prophase

Early anaphase

Telophse stage

Fig : Various stages of mitosis in onion root tip cells.

EXPERIMENT – 10

Aim –
To study the effect of temperature on the enzymatic activity of silvery analysis on substrate starch.

Requirement –
Test tubes, test tube stand, pipettes, funnel, sprit lamp, thermometer, measuring cylinder, cotton starch, KI, Nacl, thermocol box.

Theory – X

Salivary amylase is a amitotic enzyme found in saliva released glands in our mouth. All the enzyme show optimum enzyme activity around 37^0c. which is our body temperature, any deviation from optimum temperature can influences configuration of enzyme which involves folding of poly peptide for acquiring and maintaining its catalytic and allosteric sites. Decline in temp however, deactivated enzyme can resume its oprimum activity when ever optimum temp. of 37^0C is provided again. Increase in temp. on the other hand hampers the catalytic site and enzymatic activity is lost forever and enzyme is denatured.

Procedure -
1. Take three test tubes and mark then as 'A', 'B' and 'C'.
2. In each test tube acid add 5ml of starch sol^n (1%) 1 ml of NaCl sol^n (1%)
3. Keep the test tube 'A' at 5^0 C, test tube 'B' at 37^0C and test tube 'C' at 70^0C in different beaker.
4. Add 1 ml of dil. Enzymes in each test tube.
5. Take a drop from each test tube after every 23 minutes for 10 minutes and test with iodine sol^n.
6. Record the observation.

Observation –
Time required to reach the end point in digesting 5ml of 1% starch at 37^0C by dil. Enzyme.

Temperature	Time taken (min.) to reach the achromic point
5^0 C	15 min.
37^0 C	10 min.
70^0 C	8 min.

Result –
It takes 10 min. for 1 ml. of dil. Enzyme (1:50) to digest completely 5 ml of 1% starch sol^n to the end point.

Precaution –
1. All the glass ware used must be thoroughly cleaned dried.
2. Always filter the saliva through a wet cotton film and not through a filter paper.
3. While measuring the saliva there should be no air bubbles.

EXPERIMENT – 12

Aim –
To study the effect of pH on the activity of salivary analyze on starch.

Requirement –
Test tubes, test tubes stand, beakers, pipettes, funnels, sprit lamp, thermometer, measuring cylinder cotton, starch, iodine, KI, NaCl, thermo coal box.

Theory –
Salivary amylase is a amitotic enzyme found in saliva released from salivary glands in our mouth. All the enzyme show optimum enzyme activity around 37^0C, which if our body temp. Any deviation from optimum temp. can influences configuration on enzyme which involves folding of polypeptide for acquiring and maintaining its catalytic and allostric sites. Decline in temp. However deactivated enzyme can resume its optimum activity whenever optimum temp. of 37^0C is provided again. Increase in temp. on the other hand hampers the catalytic site and enzyme is denatured.

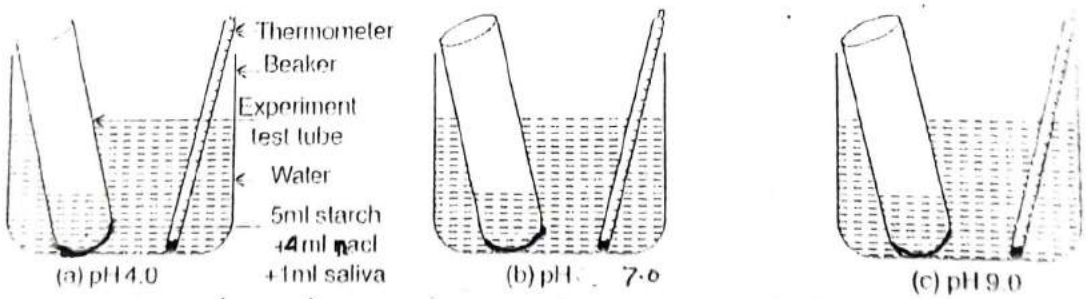
Procedure –
1. Take three test tubes and mark them as 'A', 'B' and 'C'.
2. In each test tube add 5ml of starch sol^n (1%) 1 ml of Nacl sol^n (1%).
3. Keep all the test tubes in beakers at 37^0c.
4. Add pH tablets of pH=4 in test tubes A, tablet of pH=7.0 in test tube 'B' and pH tablet of pH =9.0 in test tube 'C'.
5. Add 1 ml of dilute enzymes in each test tube.
6. Record the observation.

Observation Table–

pH	Time taken (min.) to reach the achromic point
4.0	15 min.
7.0	10 min.
9.0	15 min.

Result –
It will take minimum time to reach achromic point at pH 7.0 as it is the optimum pH for the action of salivary amylase. At lower and higher pH more time will take to reach achromic point.

Precaution –
1. All the glass wares used must be cleaned and dried.
2. Always filter the saliva through a wet cotton film and not through a filter paper.
3. While measuring the saliva these should be no air bubbles.



EXPERIMENT No. 12

AIM: ISOLATION OF DNA FROM AVAILABLE PLANT MATERIAL SUCH AS SPINACH, GREEN PEA SEEDS, PAPAYA etc.

REQUIREMENTS: Spinach leaves/Pea seeds/Papaya, Sand, test tube, 50 ml beakers, Cheesecloth, Mortar and pestle, 10m1 graduated cylinder.

95% Ethanol solution (keep ice cold in plastic bottle in freezer),12% Salt solution,29.2 g deionized salt,250 ml distilled water,50% Detergent solution,50 ml Wisk Free,50 ml distilled water, Contact Lens Cleaning Solution, Use 1 tablet per 3m1 of distilled water.

PROCEDURE:

1. Choose 2-3 spinach leaves. Remove any stems if present.
2. Place 1 ml of distilled water in a mortar and pestle along with leaves. Add a small pinch of sand and grind until spinach looks like creamed spinach. Add the contents of the mortar and pestle to a 50 ml beaker.
3. Add 1 ml of 50% detergent solution and 9 ml salt solution to spinach. Mix well with a glass stir rod.
4. Place on a hot plate and heat until boiling.
Remove from heat and let sit for 2 minutes.
5. Put on ice for 5 minutes so that it cools down.
6. Pour spinach mixture (supernatant) through cheesecloth into a clean beaker.
7. Pour the supernatant into a test tube then add 1 ml of freshly prepared contact lens cleaning solution.
8. Carefully layer 6 ml chilled 95% ethanol solution onto the green supernatant using a 10 ml graduated cylinder. Slowly pour ethanol down the side of the test tube. Try not to let the two layers mix together.
9. Using the wire loop, spool the DNA by gently swirling the loop at the interface between the green supernatant and the clear ethanol. The DNA will congeal at the point where the two layers meet.

PRECAUTIONS:

(i) Handling should be proper.

(ii) Sample should be added to solution carefully.

PART-2 (Spotting)

EXPERIMENT – 1

Aim

To study the flowers adapted to pollination by DIFFERENT AGENCIES [WIND, INSECTS]
FOR WIND POLLINATION

Requirement –

Specimens of flowers like wheat

Observation –

(a) Wheat:-

(1) The flower is very small having perianth in the form of two lodicules which offer least resistance to the movement of pollen

(2) The flower has these extend stames with versatile fixation. They yield pollen to air easily.

(3) The stigma are two and feathery to catch the wind-borne pollen easily.

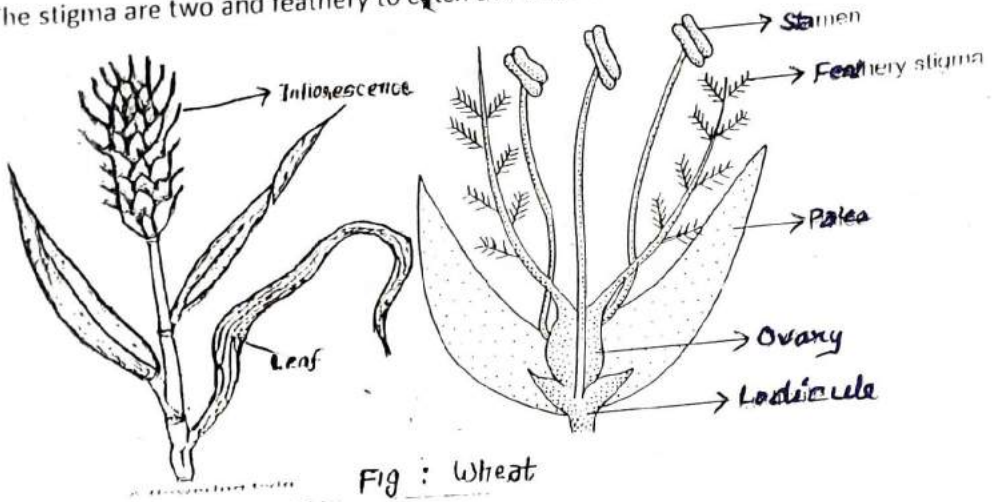


Fig : Wheat

pollination by insects.

Requirement –

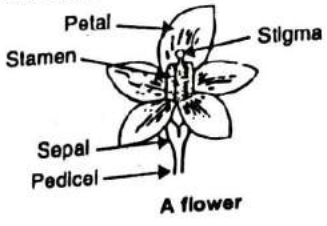
Flowers of petunia

Observation –

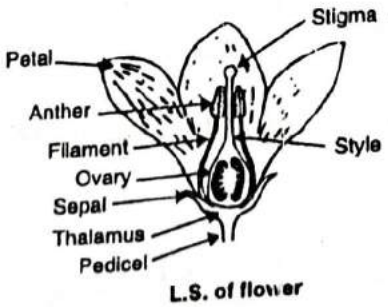
Petunia:-

(1) The flower are large, showy and have variously cloured corollas

(2) Stamens are fused with corolla tube so that insects rupture the anthers when they go inside the flower to seek nectories occure at the base of stamens which are sought after by the insects



A flower



L.S. of flower

Fig. : Petunia

EXPERIMENT – 2

Aim –

To Study permanent slides of T.S. testis and T.S. overy for identifying stages of gamate development.

Requirement –

Permanent slide of mammalion testis and overy and microscope.

Observation –

T.S. testis of mammal

Comments :-

(1) Testis is made of large number of seminiferous tubules.
(2) Each seminiferous tubule is lined by germinal epithelium and contains several layers of cell in the following sequence:-
(i) Spermatogonia along the periphery of the tuble
(ii) Primary spermatocytes.
(iii) Secondary spermatocytes
(iv) Spermatids
(v) Spermatozoa or sperms in the Center
(3) Special large sertoli cells are present on which sperms are altered in clusters
(4) Each sperm has a head and a long tail

T.S. of Mammalian ovary

Comments :-

(1) Ovary is bounded by germinal epithelium and filledwith stroma.
(2) Stroma has graffian follicles in different stages of development. These include:
(i) Eggnest
(ii) Primary follicles
(iii) Mature graffian follicles
(iv) Ruptured graffian follicles
(v) Cropus luteum
(3) Mature graffian follicles consists of a central ovum surrounded by follicular cells.
(4) Corpus luteum is formed after the rupture of graffian follicles.

EXPERIMENT – 3

Aim –

TO study T.S. of blastula through permanent slide.

Requirement –

Permanent slide of T.S. blastula of frog and microscope

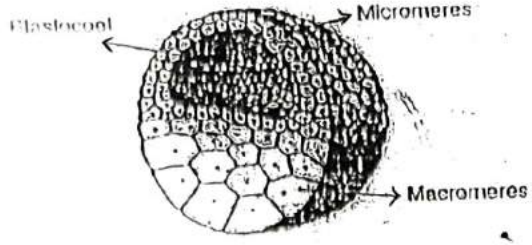


Fig. A : T.S. of Blastula

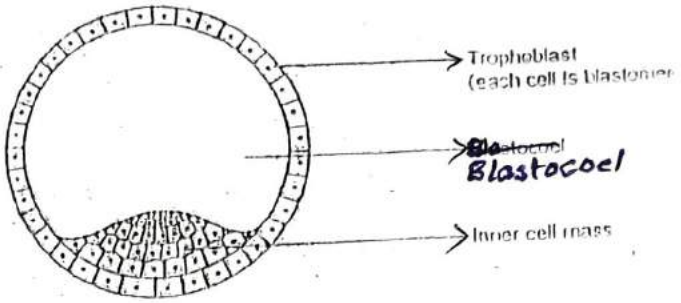


Fig.B : Blastocyst

Observation –

1. It is rounded ball like structure.
2. Micromeres and macromerer are distinct.
3. Micromeres are small cell present in the animal hemispechere. Macromeres are large cell present in the lower vegetal hemisphere
4. A cavity called blastocoels is present in the animal hemisphere and is roofed micromeres. It is filled with fluid.

EXPERIMENT – 4

Aim –

To study meiosis in onion cell through permanent slide

Requirement –

Onion floral buds, acetocarmine, methyl alcohol, acetic acid, microscope, slides, cover slips, sprit lamp, needles, scissors, forceps, etc.

Procedure-

1. Pluck onion floral buds during morning hours.
2. Place them in 1:3 mixture of acid :methanol of 2-3 hours.
3. Tack out an unopened floral buds and wash it thoroughly with water.
4. Place another on slide with a drop of acrtocarmine. Put a coverslip and prepare a squash.
5. Gently warm the slide and observe under low power and then under high power of microscope.

Observation –

A. **Meiosis-1**

1. **Prophase**: It is of long duration and is the most important stage of meiosis.

a. **Leptotene:**
   - (i) Chromatin fibres condense to form chromosomes.
   - **(ii)** Nuclear evelop nucleus are distinct

b. **Zygotine :-**
   - (i) Homologous chromosomes from pairs called bivalents.
   - (ii) The individual of a pair are similar in length and position of their centromere.

c. **Pachytene** :-
   - **(i)** The two chromatids of each chromosome become visible, so that a bivalent become a tetrad.
   - **(ii)** Crossing over takes place between non-sister chromatids.

d. **Diplotene :-**
   - (i) Paried chromosomes starts separating.
   - (ii) Homologous are held together at certain points called chiasmata.

e. **Diakinesis :-**
   - (i) Chromosomes become very short and contracted.
   - (ii) Bivalent start moving towards periphery,
   - (iii) Nucleolus and nuclear evelope disappear and spindle begins to be formed.

2. **Metaphase 1 :-**
   - (i) The bivalent arrange themselves at the equator of the spindle.
   - (ii) The spindle get attached to the centomere of the chromosome.

3. **Anaphase 1:-**
   - (i) The two chromosomes of each bivalent move to opposite pole.
   - (ii) Each pole has half the no. of chromosomes with two chromatids each.

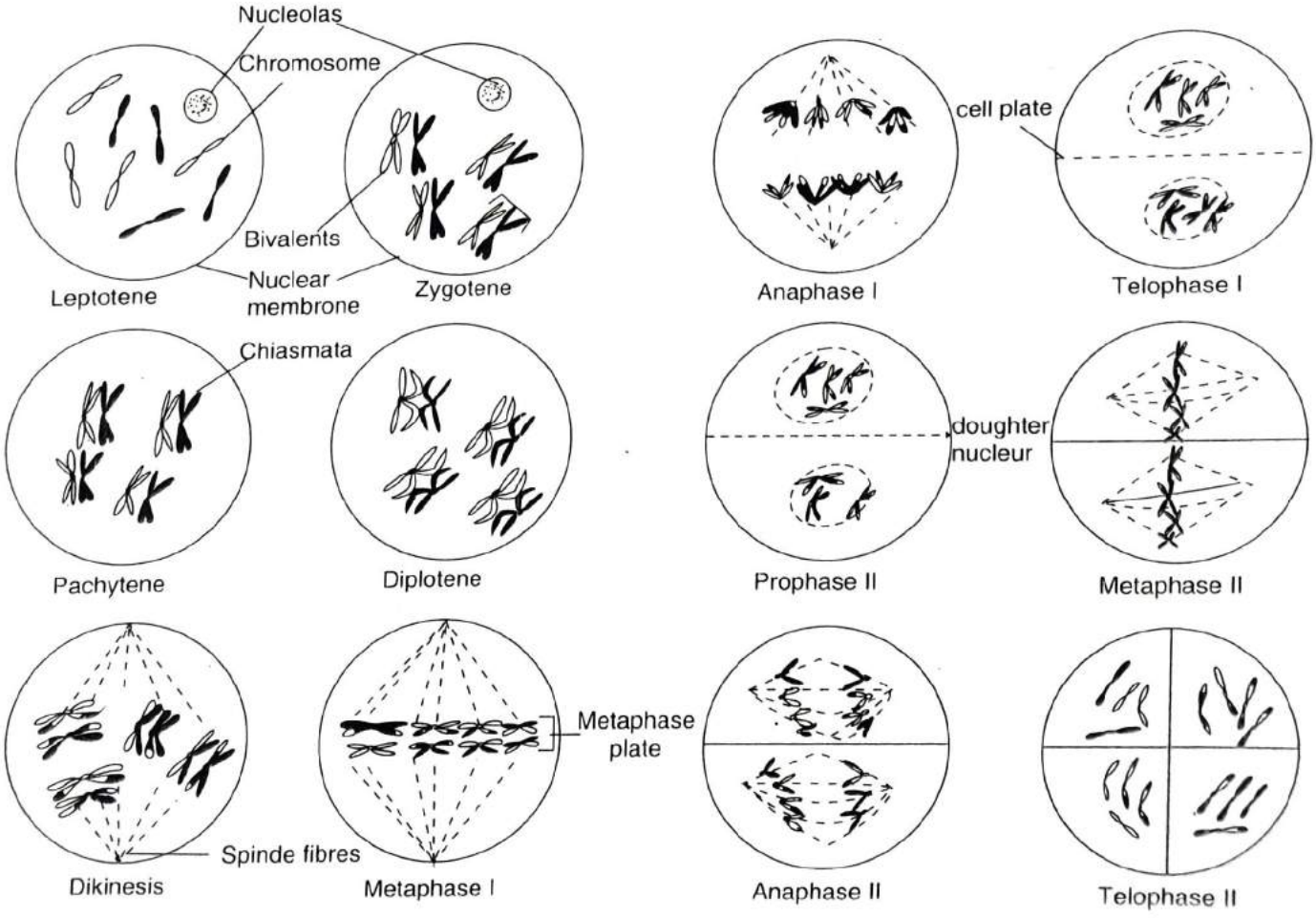
4. **Telophase 1 :-**
   (i) The choromosomes at each pole uncoil and nucleolus and nuclear envelope reappear.
   (ii) cytokinesis is occurs to form two haploid daughter cells

B. **MEIOSIS II :-**

1. **Prophase II:**
   i. Chromatides with wide arms can be seen.
   ii. Spindle formation starts
   iii. Nuclear membrane disappear
2. **Metaphase II :**
   i. Chromosomes arrange at equator.
   ii. centromere divides
3. **Anaphase II :**
   i. The sister chromatides of each chromosome separate and migrate towards the opposite pole
   ii. Each pole thus receives haploid number of chromosomes.
4. **Telophase II :**
   i. The chromosomes begain to uncoil and become thin.
   ii. The Nuclear evenlope and nuceleous are reconsititued.

precaution

(i) Fix the floral buds during morning hours .
(ii) Another should be squashed gently.
(iii) Slide should be warmed, not heated.



Stages of mitosis in animal cells.

EXPERIMENT – 5

Aim

To study analysis the given pedigree chart for generatic trait of blood group

Requirement –

Pedigree chart for genetric trait of blood group

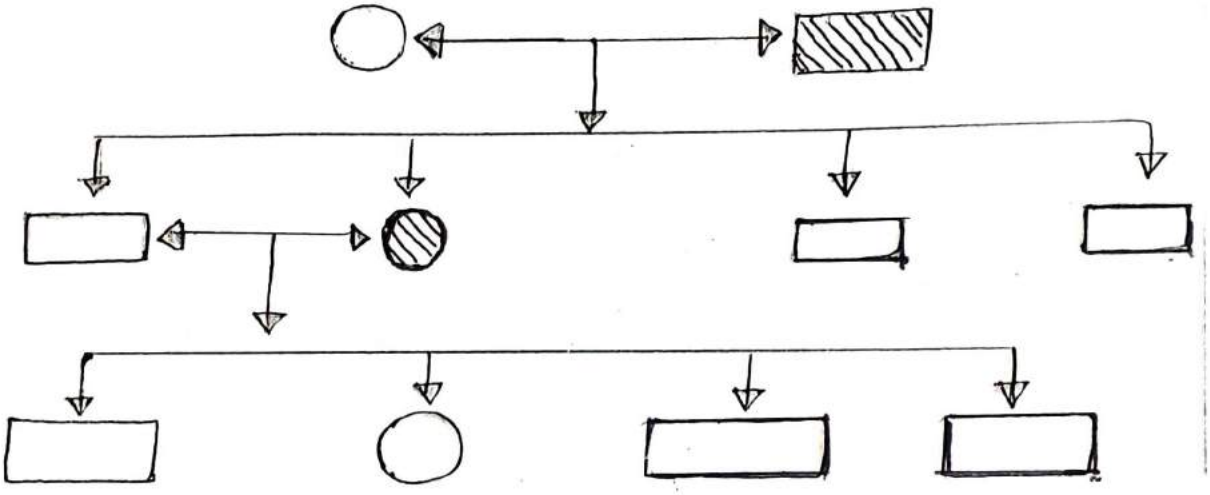
Exploitation:-

1. Square indicate male members, circles indicate female members . parents are joined by horizontal lines and their offspring are joined by verticed lines.
2. Solid symbols represent the the member having blood group 'A' and open symbol denotes individual with any other blood group.

Observation:-

i. The given pedigree chart shows that a male having blood group 'A' marries a normal female with any blood group. they have four children – three sons and one daughter is born having blood group 'A'.

ii. Marriage between a female having blood group 'A' with a male without blood group 'A' and Produce their sons and one daughter, None of the off springs is having blood group 'A'.



Conclusion:-

1. Inheritance of blood group is not related to sex.
2. Male parent with blood group 'A' is heterozygous ($1^{\wedge} 1^{0}$)
3. Daughter with blood group 'A' is heterozygous ($1^{\wedge} 1^{0}$)

EXPERIMENT – 6

Aim:-

Study and analyze the given pedigree chart for genetic trial of color blindness.

Requirement:-

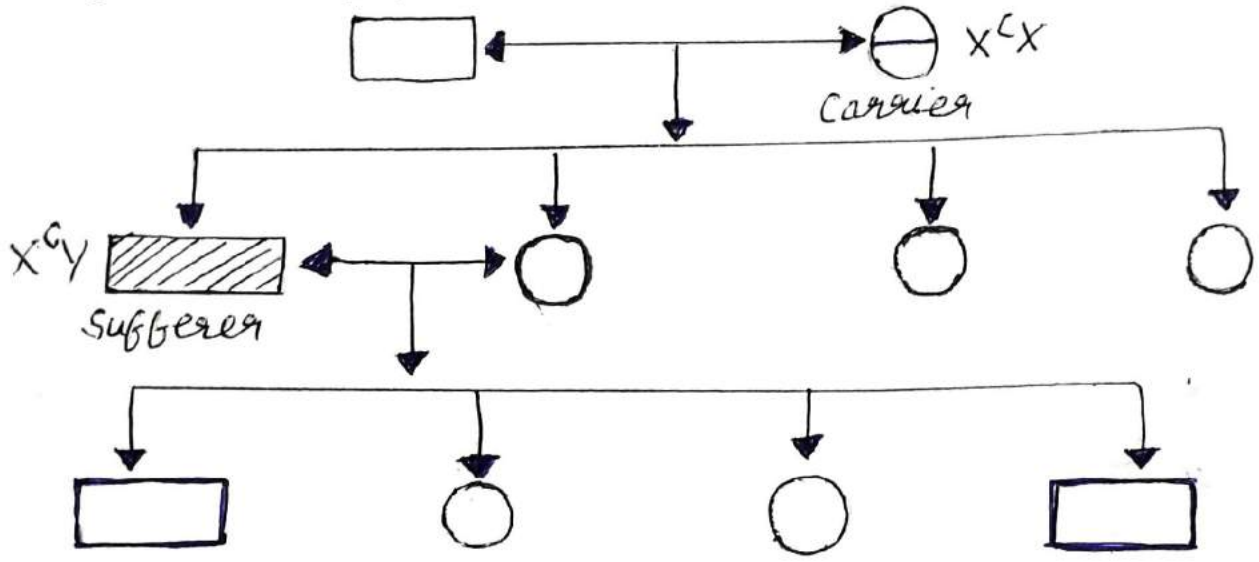
Pedigree chart for generic traits of color blindness

Examplation :-

1. Squares indicate male members and circles indicate female members . parent joint by horizontal line and their offspring are jointed by vertical line.
2. Solid symbols represent the member carrying the trait under investigation.

Observation:-

1. The given pedigree chart shows that phenotypically normal parent for color blindness produces four child -- three daughters and one son. Only son is color blindness.
2. Marriage between color blind male and phonotypically normal female produce four children – two sons and two daughter none of the offspring exhibits the trait of color blindness



Conclusions:-

1. Color blindness is related to sex
2. Color blindness is related with 'X' chromosomes and is homozygous recessive trait, hance female is either normal carrier or color blind . where as male is either sufferer or normal but never a carrier.

EXPERIMENT – 7

Aim

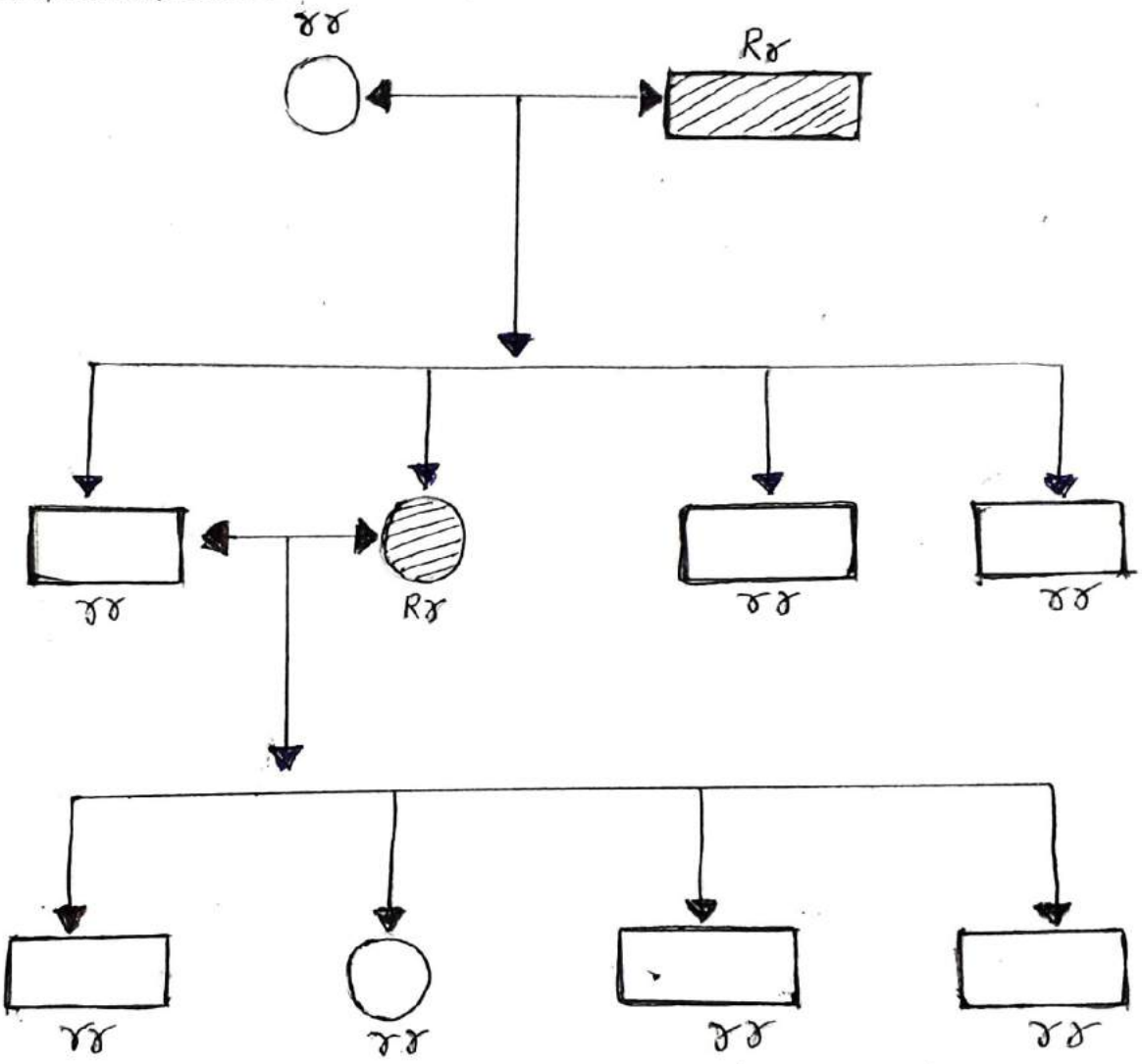
Study and analysis the given pedigrees chart for genetic traits tongue rolling

Requirement –

Pedigree chart for genetic trait of tongue rolling

Explanation :-

1. Squares indicate male members and circles indicate female members. Parent joined by horizontal and their offspring's are joined by vertical line
2. Solid symbols represents the members carrying the trait under investigation.



Observation :-

1. To given pedigree chart shows that a male parent as tongue roller marries a normal female .they have four children – three sons and one daughter as born as tongue roller.

Calculation –

1. Tongue rolling is not related to sex.
2. Male parents as tongue roller is heterozygous (R,r)
3. Female parent is non-roller (r,r)

EXPERIMENT – 8

Aim -

To study and analyse the given pedigree chart for genetic traits widow peak

Requirement –

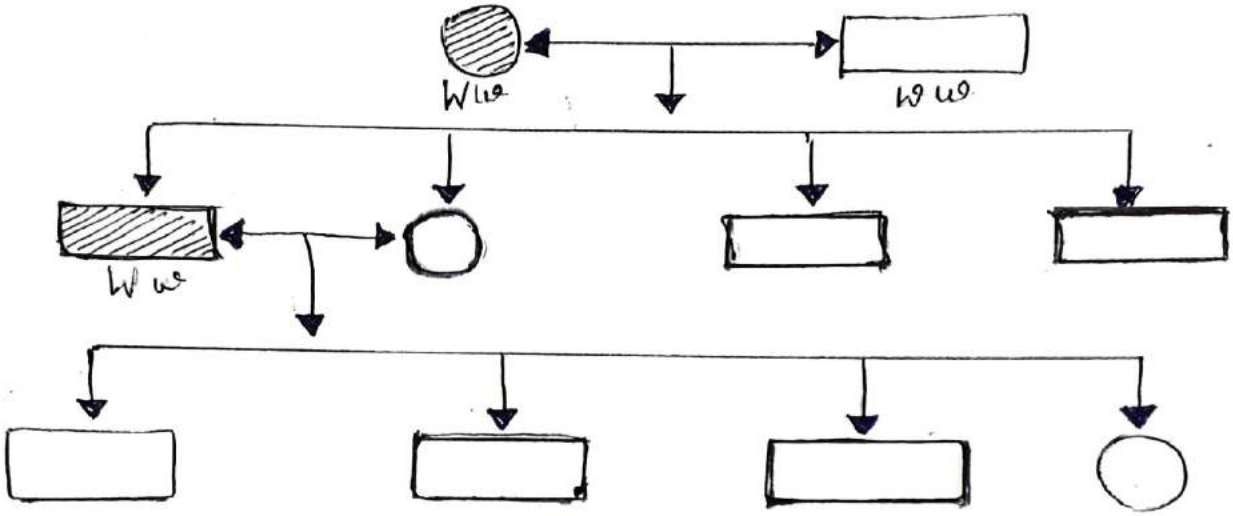
Pedigree chart for genetic traits of window seak.

Explanation : -

1. **Squares** indicates male members and circle indicate female members. Parents joined by horizontal line and their offspring are joined by vertical lines.
2. **Solid** symbols represents their members carrying the trait under investigation i.e widow peak

Observation –

1. The given pedigree chart shows that a female parent with a window peak trait marries a normal male. they have four children- three sons and one daughter . Only son is born in widow peak.
2. Marriage between a normal female with a male having widow peak produces three sons and one daughter .none of the offsprings is having widow peak.



Conclusion:-

1. Widow peak hair lines are not related to sex.
2. Female parent are widow hair line to heterozygous(W,w)

EXPERIMENT – 9

Aim –

To identify disease causing organisms like Ascaris, Entamombea, plasmodium, ringworm through permanent slides or specimens and comments on symptoms of diseases that they cause.

Requirement –

Permanent slides or specimens of the organisms and microscope

1- Ascaris (Round Worm)

Comment:-

i. It is found in the intestine of man specially of child.
ii. The body is elongated, cylindrical with pointed ends.
iii. In male the body is shorter, cylindrical and posterior end is curved having Penhial setae.
iv. In female the body is much elongated and posterior end is straight.
v. Mouth is bounded by three lips at anterior end. Anus (in female) or cloacal aperture (in male) lies just in front of posterior end.
vi. Heavy infection of ascaries causes blockagee of intestine, and abdominal pain. Itmay also cause appendicities, enteritis and pneumonia.

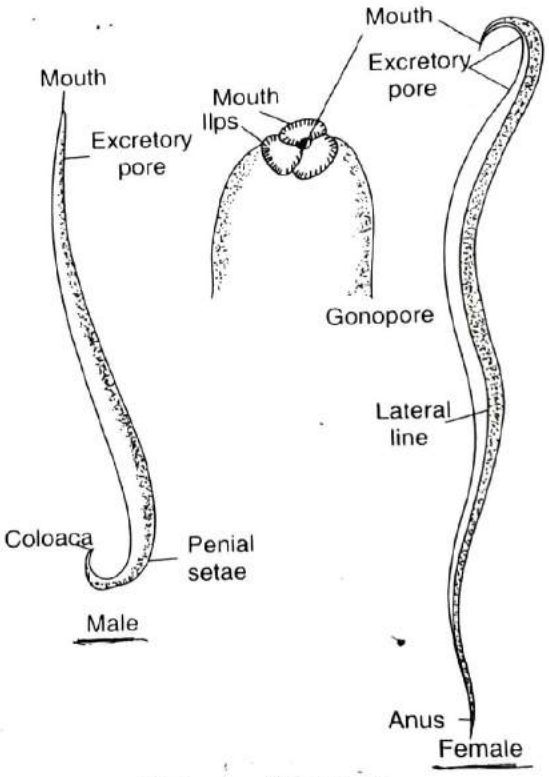


Fig : Ascaris

2- Entamomoeba histolyica

Comment:

i. It is found as parasite in the human instestive .
ii. Its body is divisible into an outer ectoplasm and inner endoplasm and covered by plasma lemma
iii. The endoplasm has a single large nucleus and food vacuoles with ingested red blood corpuscles
iv. It has lobe like pseudopodium .
v. Enatamoeba causea disease called amoebic dysentery or amoebiasis
vi. Symptoms of amoebiasis include constipation, abdominal pain and stools with excess mucous and blood

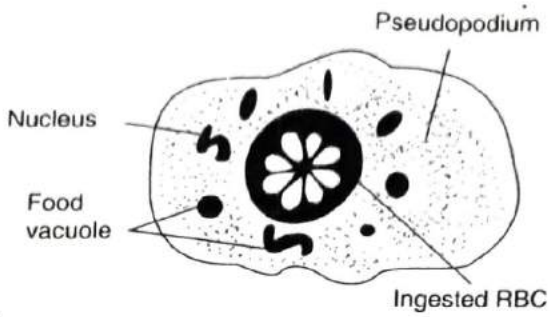


Fig : Entamoebs histolytics – The Trophozoite form

3-Plasmodium :-(Malarial parasite)

Comment:-

i. Malaria parasite enters body as sporozoite by the bite of anopheles mosquito
ii. Sporofoite is spindle shaped and uninucliate organism covered by pellicle
iii. Sporozoites multiply with in the liver call nad then allack RBC_s
iv. The RBC_s the parasite passes through trophoite, signetring and amoeboid stage.
v. The rupture of RBC_s is associated with release of toxic substance causing chill and high recurring fever every 3 to 4 days.
vi. When the female anopheles mosquito bites on infected person, these parasites enter into the mosquitoes body and multiply to form sporozites

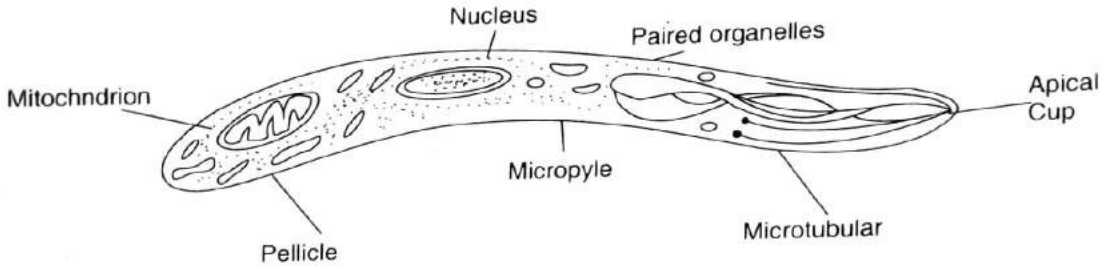


Fig : Plasmodium – Ultrastructure of sprozoite

4-Ring Worms ;-

Comment:-

i. It forms lesions on hairy parts of smooth skin.
ii. It also infects the nails of the hand and feet
iii. Same species of these fungi cause ring worm of the scalp found chiefly in children
iv. Mostly they infect in skin so this fungi and diseases are called dermatomycoses
v. Skin become dry and witish in color with reatain substrances.

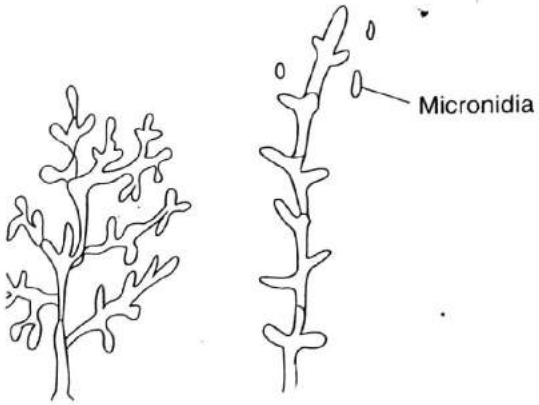


Fig : Trichophyton

EXPERIMENT – 10

Aim :-

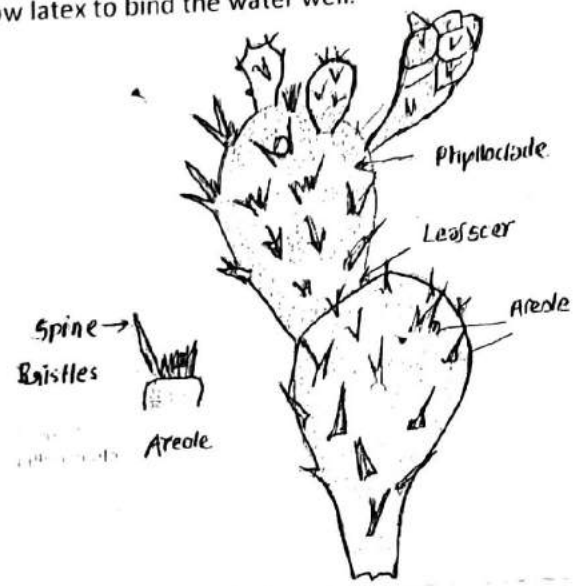
To study the commom xerophles and desirt animals and their adaptations.

Requirement –

Fresh specimens of opuntia, calotropis

Observation –

1. **Opuntia :-**
   (i) The expanded green plant part is stem bearing clusters of spines
   (ii) Leaves are modified into spines.
   (iii) Stem is green, leaf like and called phylloclade
   (iv) Stem contain a yellow latex to bind the water well.



2. **Calotropis :-**
   (i) Plants parts contain a mily latexwhich retain water strongly.
   (ii) Plant parts are covered with a white powder.
   (iii) Leaves are subsessile so that remain crowded and gets less exposed to air and son .

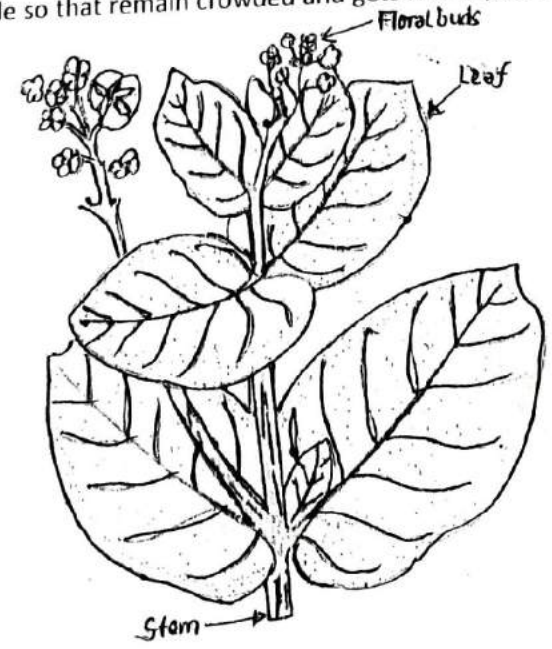


Fig : Calotropis procera

ANIMALS

1 **Hemi echinus** – Thau chuha

(i) It is very common animal found in deserts of Rajasthan
(ii) It is nocturnal animal, remaining hidden among bushes and underground tunnels during dog time
(iii) Body is small in size and globular in shape covered by hard and short spines
(iv) The limbs are short and thin. all the digits are clawed.

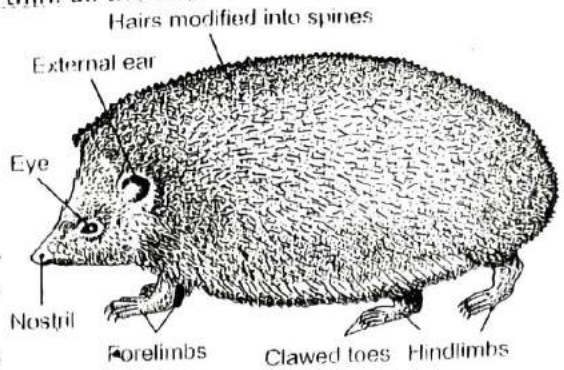


Fig. Hedgehog

camelus(camel)

(i) It is valuable beast of burden in descents and semi desert areas
(ii) The camel is tall animal with long neck , one or two humps on the back light brown hair
(iii) The head is without horns and upper lip is divided.
(iv) The feet from brood cushions for walking on sand
(v) It can live in minium food and water

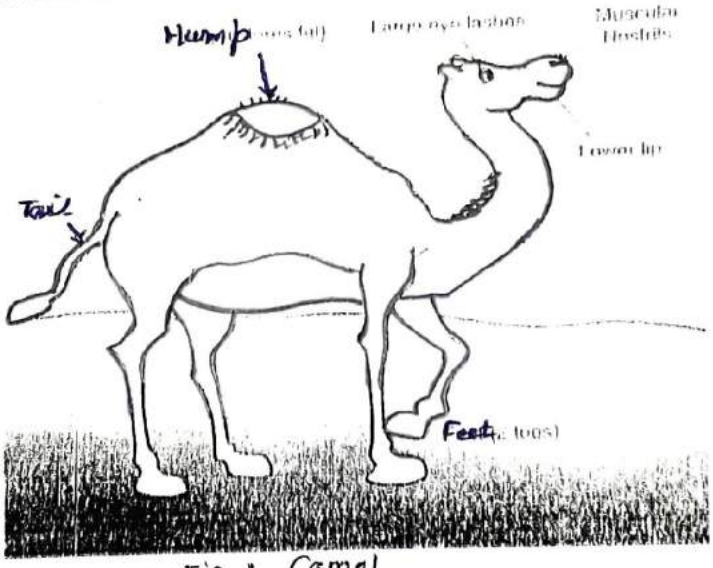
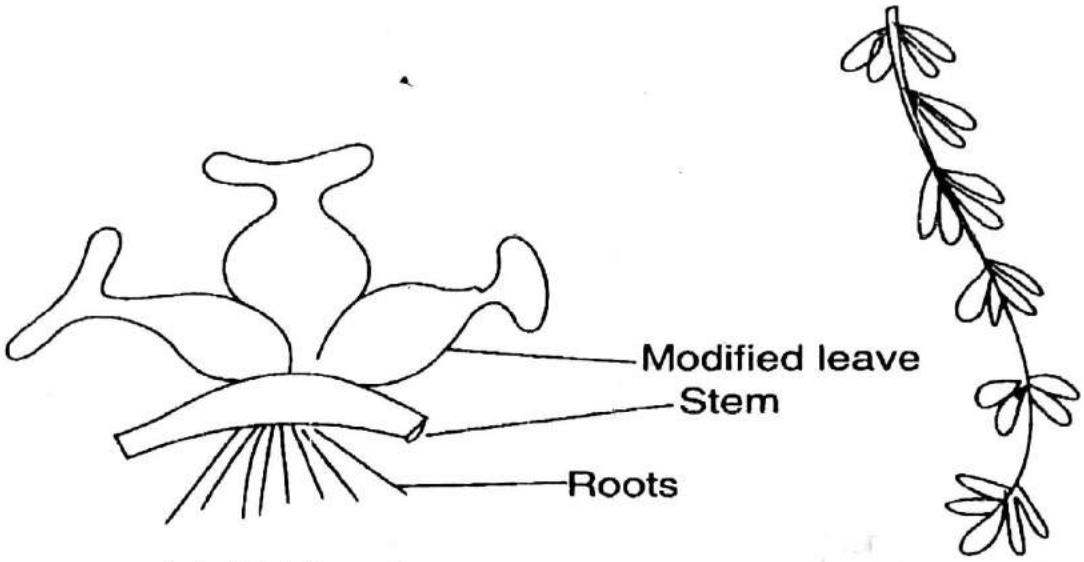


Fig : Camel



(a) Eichhornia (b) Hydrilla

Aquatic animals

EXPERIMENT – 11

Aim :-

To study the common hydrophytes and aquatic animals and their adaptations

Requirement –

Fresh specimens of echhornia, hydrirra,

1 Echhornia :-

(i) It is a free floating plant indicating the poor development of xylem
(ii) Plant parts are soft and easily compressible .it indicates air cavities inside.
(iii) Petiole is swollen and balloon- like enclosing a big air cavity
(iv) Leaves are dark green and shining indicating a waxy layer.

2 Hydrilla:-

(i) It is a rooted submerged hygrophyte
(ii) Leaves are simple and whorled and allow free flow of water in between them. It avoids the traring effect of a water
(iii) Plant is light and soft indicating poor development of xylem and air clarities inside

Animals

1. **Labeo (Rohu fish)**
   - I. It is a fresh water body fish found in all rivers and stream of north India
   - II. It is a herbivorous taking algal and acquatic plants.
   - III. Labeo has an elongated, laterally, compressed, spindle like body, tapering at either end.
   - IV. It is a green on the block and silvery-white on the sides and covered by scales
   - V. Body of labeo is divisible into three parts head, trunk and tail

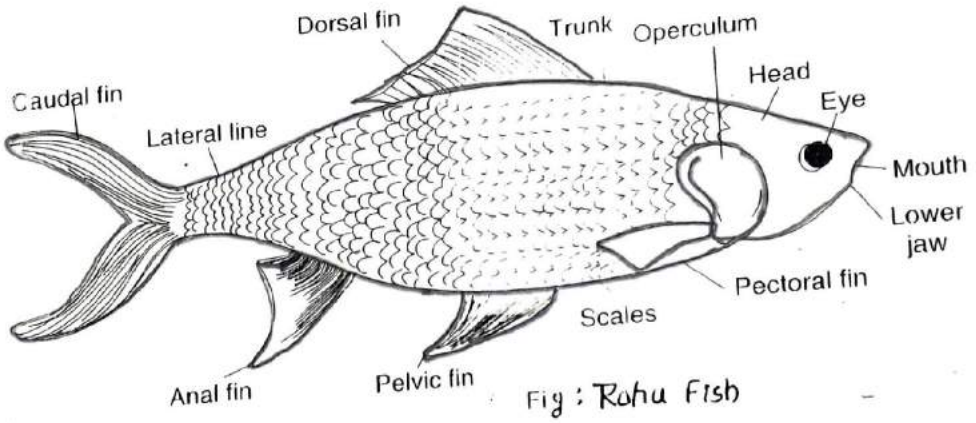


Fig : Rohu Fish

2. **Crocodiles (crocodile)**
   - i. It is found in river, tans and marshes of India
   - ii. It is carnivorous and feeds on fishes and other aquatic animals
   - iii. It has a lizard like body covered by scales
   - iv. The tail is large and laterally-comprised for swimming
   - v. The limbs are short and digits of hind-limbs are webbed

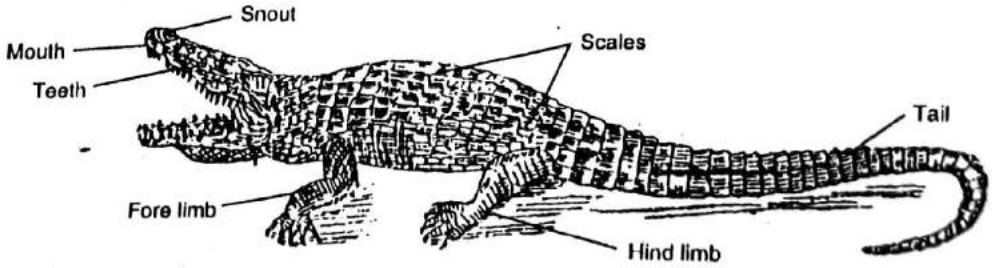


Fig. : Crocodylus