

ZOOLOGY VIRTUAL LAB 1
(INVERTREBRATE MOUNTINGS PART I)

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Computerized by

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PRACTICAL 1:

MOUNTINGS OF FORAMINIFERAN SHELLS FROM SAND

AIM: To mount and study the Foraminiferan shells from Sand.

BACKGROUND INFORMATION:

Foraminiferans are shelled organisms belong to the class Rhizopoda of phylum Protozoa. They are marine and mostly confined to bathyal and abyssal regions. When alive they are free swimming forms. Their body is generally covered by calcareous siliceous gelatinous or chitinous skeleton. After the death of the organism, the shell remains and gets washed off onto the sandy shores. The shell may be single chambered or tubular or monocular or many chambered or multilocular. It differs from species to species in-its architecture. The shell is highly porous through which string like pseudopodia streams out when the animal is alive. After the death of the organism, the shell gets washed off on to the sandy shores.

SIGNIFICANCE:

The study of skeleton in protozoans is significant because of several reasons.

1. A very important significance is that the study of shells embedded in the rock strata helps in finding out the presence of petroleum oil in the sea bed. Skeletons of foraminiferans in many rock strata are useful in checking the logs during drilling of oil wells.
2. The study of protozoan skeletons also helps in finding out the geological time scale.
3. Fossils of shelled protozoans belonging to the order Foraminifera and Radiolaria of the class Sarcodina are used in the study of different aspects of Geology and Palaeontology.

MATERIAL AND METHOD:

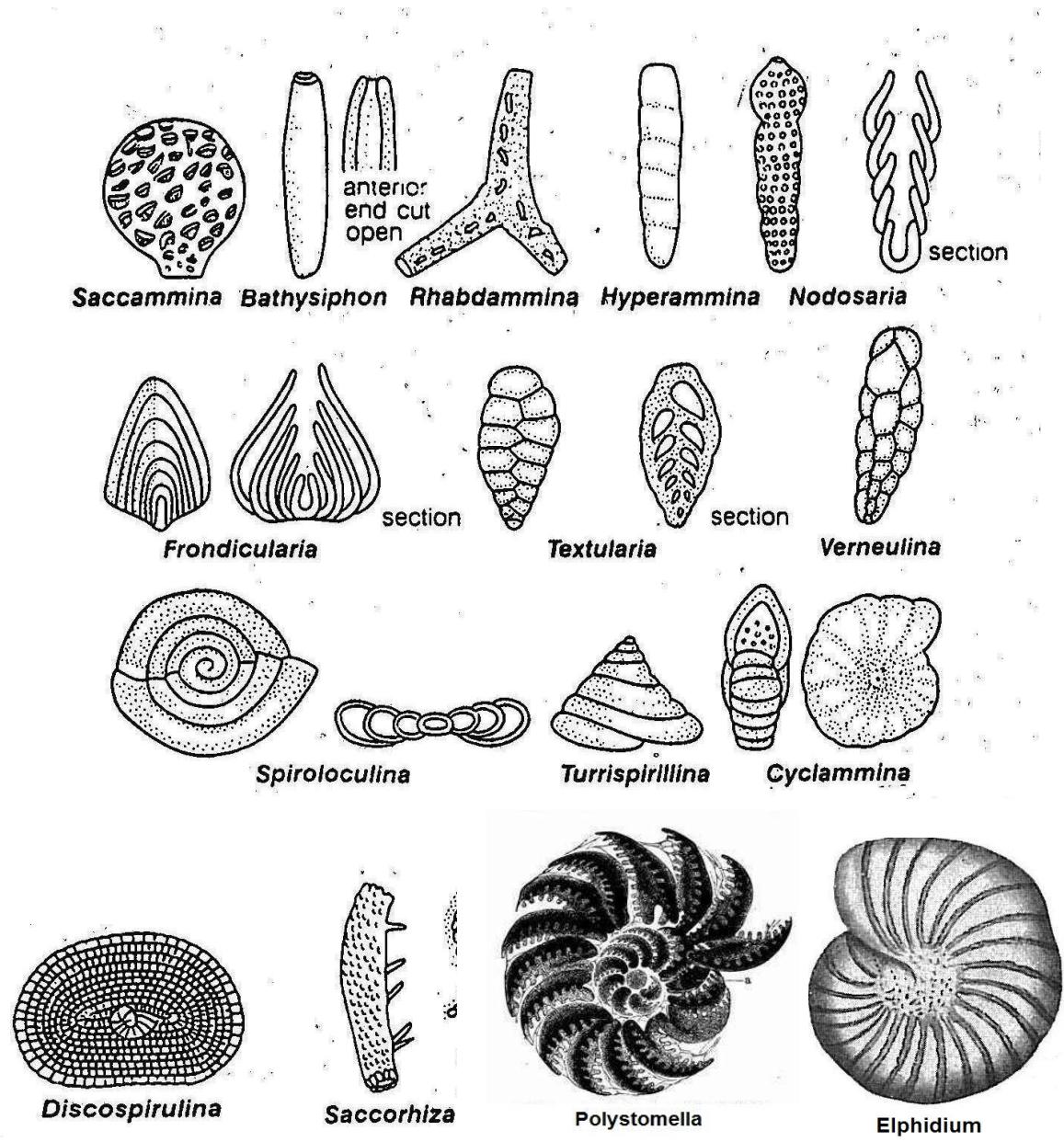
Sand sample from any sandy sea shore, Watch glass, Slide, Cover slip, Dropper, Filter paper, Compound microscope, Distilled water (D.W.) or glycerine.

PROCEDURE:

1. Take sand sample in watch glass.
2. Take clean slide and sprinkle pinch of sand uniformly with very thin layer.
3. Add a little amount of D.W. or glycerine on sand layer.
4. Watch the slide under low power objective (10X) under compound microscope.
5. Locate the foraminiferan shells and identify with the help of given chart.

The following specimens could be commonly seen in the sand sample.

1. Elphidium, 2. Cyclamina, 3. Textularia, 4. Bathysiphon, 5. Saccamina, 6. Saccorhiza, 7. Rhabdamina, 8. Spiroloculina, 9. Turispirillina, 10. Polystomella, 11. Discospirulina.



Different types of shells found in Foraminifera (

OBSERVATION AND RESULT:

The commonly seen foraminiferans shells observed are

- | | |
|----|----|
| 1) | 2) |
| 3) | 4) |
| 5) | 6) |
| 7) | 8) |

PRACTICAL 2:

MOUNTING OF POLYTENE CHROMOSOME FROM SALIVARY GLAND OF CHIRONOMOUS LARVA

AIM: To mount and study the structure of polytene chromosome from the salivary gland of Chironomous larva.

BACKGROUND INFORMATION:

Polytene chromosomes are over-sized chromosomes which have developed from standard chromosomes and are commonly found in the larval salivary glands of *Drosophila melanogaster* and Chironomous fly. Specialized cells undergo repeated rounds of DNA replication without cell division (endomitosis), to increase cell volume, forming a giant polytene chromosome. Polytene chromosomes form when multiple rounds of replication produce many sister chromatids that remain synapsed together.

Polytene chromosomes were originally observed in the larval salivary glands of Chironomus midges by Balbiani in 1881 but the hereditary nature of these structures was not confirmed until they were studied in *Drosophila melanogaster* in the early 1930s by Emil Heitz and Hans Bauer. They are known to occur in secretory tissues of other dipteran insects such as the Malpighian tubules of *Sciara* and also in protists, plants, mammals, or in cells from other insects.

SIGNIFICANCE:

Polytene chromosomes have characteristic light and dark banding patterns that can be used to identify chromosomal rearrangements and deletions. Dark banding frequently corresponds to inactive chromatin, whereas light banding is usually found at areas with higher transcriptional activity.

The banding patterns of the polytene chromosomes of *Drosophila melanogaster* were sketched in 1935 by Calvin B. Bridges, in such detail that his maps are still widely used today.

The banding patterns of the chromosomes are especially helpful in research, as they provide an excellent visualization of transcriptionally active chromatin and general chromatin structure. For example, the polytene chromosomes in *Drosophila* have been used to support the theory of genomic equivalence, which states that all of the cells in the body maintain the same genome.

Polytene chromosomes are also used to identify the species of Chironomid larvae that are notoriously difficult to identify. Each morphologically distinct group of larvae consists of a number of morphologically identical (sibling) species that can only be identified by rearing adult males or by cytogenetic analysis of the polytene chromosomes of the larvae.

Karyotypes are used to confirm the presence of specific species and to study genetic diversity in species with a wide range.

REQUIREMENTS:

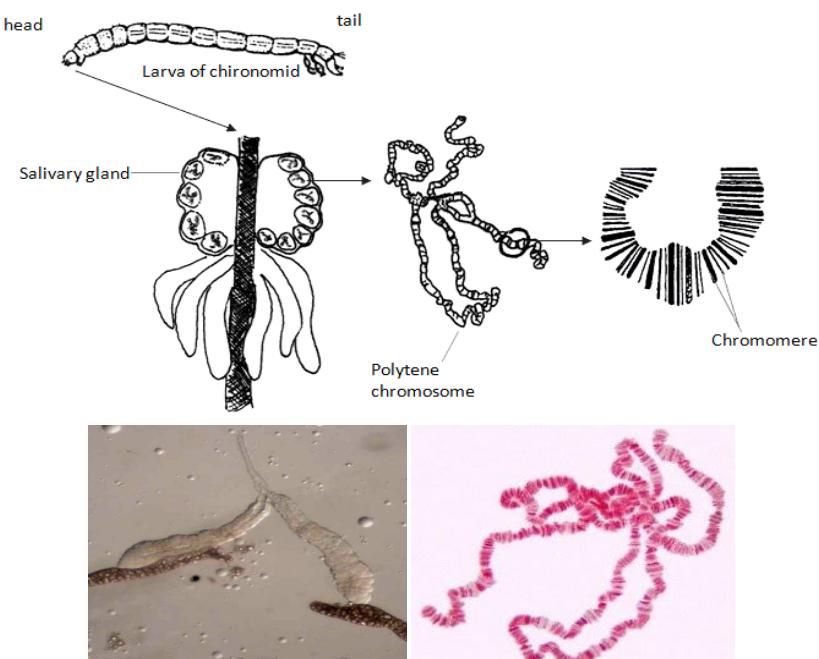
Chironomous larvae, Acetocarmine or Acetoorcein, 10% Acetic acid, 1N HCl, Slides, Cover slip, Fine pointed needles, Forceps, Filter paper, Dropper, D.W., Dissecting microscope and Compound microscope, etc.

PROCEDURE:

1. Take a mature chironomous larva on slide and keep it under a dissection microscope.
2. Place a needle on the head (blackish pigmented) and the other needle on the body and pull the head.
3. After this attached to the head long tubular digestive tract comes out.
4. Locate the sac shaped salivary glands near the head region with their ducts attached to the digestive tract.
5. Isolate the salivary glands from the digestive tract by gently teasing the duct attached to the digestive tract
6. Discard other debris away from the pair of isolated salivary glands, Blot off excess water.
7. Add a drop or two of 1 N HCl on the salivary gland. Allow it to remain for 5 min.
8. Blot off excess 1 N HCl and add a drop of stain (acetocarmine). Allow it to stain for 15 min. Do not allow the stain to dry.
9. Wash off the excess of stain with 10% acetic acid and mount in the same.
10. Place the cover slip gently on the glands, blot off the excess of acetic acid.
11. Observe the slide under low power of microscope, locate a cell with properly spread out chromosome, turn to the high power objective and study the nature of the chromosome.

OBSERVATION AND RESULT:

The gland shows linearly arranged globular cells with dense nucleus in the center of each globular cell. Enclosed within the nucleus is present four independent polytene chromosomes, each one with definite pattern of dark and light bands and puffs or swollen regions at certain segments of the chromosome. The centromere cannot be easily distinguished. Puffs in the salivary gland chromosome indicate gene action, where the DNA is unwound and transcription and simultaneous translation is going on. Bands indicate inactive sites of the DNA, which is highly wound and heterochromatized.



PRACTICAL 3:

MOUNTING OF STRIATED MUSCLES FROM COCKROACH LEG

AIM: To mount and study Striated muscles from Cockroach leg.

BACKGROUND INFORMATION:

Limb muscles have muscle cells which are called striped or striated muscles and these are under voluntary control also known as skeletal muscle.

REQUIREMENTS:

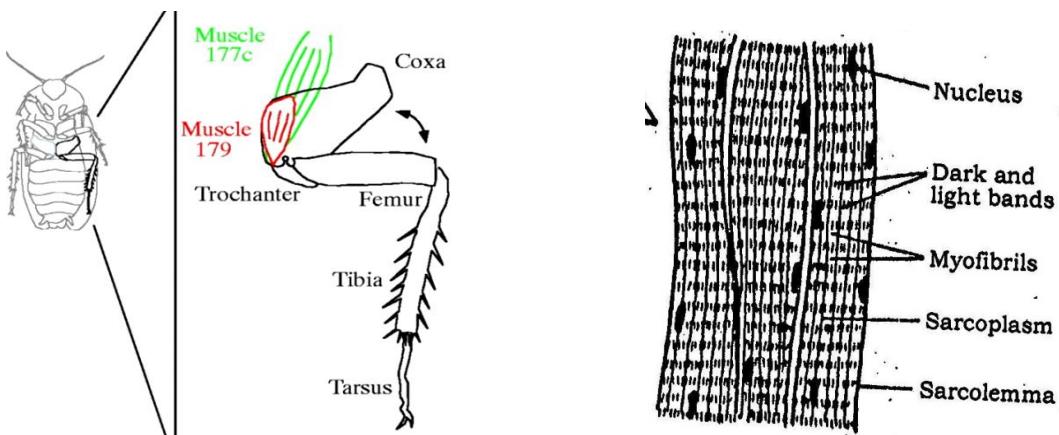
Cockroach, Slide, Cover slip, Petri-dish, Forceps, Needles, Brush, Watch glass, Methylene blue stain, Glycerine, Filter paper, Compound microscope, etc.

PROCEDURE:

1. Cut open the cockroach to expose its thigh region in water.
2. Take a small piece of muscle from this region & tease it in petridish with the help of needle.
3. Add a few drops of methylene blue to stain the muscle fibres for 2 mins. Then wash with water so as to remove excess of stain.
4. Put the muscle piece on a slide and again tease it with needles so that the muscle fibres are well separated.
5. Add a drop of glycerine on the slide and with the help of needle gently put the cover slip and gently press the slide so as to spread it properly.
6. Examine the slide under low power (10X) compound microscope.

OBSERVATIONS AND RESULT:

The muscle fibres are long and cylindrical and contain many nuclei (multinucleated). Each fibre is surrounded by a membrane called sarcolemma and contains the cytoplasm known as sarcoplasm. It shows many longitudinal fibrils called myofibrils. Each muscle fibre is unbranched and have alternate dark and light bands, gives striated appearance.



PRACTICAL 4:

MOUNTING OF THE MOUTH PARTS OF COCKROACH

AIM: To mount and study the mouth parts of Cockroach

BACKGROUND INFORMATION:

Mouth parts are the appendages grouped around the mouth. The 'primitive' arrangement of mouthparts is seen in the cockroach - here they are used for chewing and biting and work in the horizontal plane. Nutrition in cockroach is holozoic and it is an omnivore, feeding on different kinds of organic matter. It takes in pieces of food and has to grind them before digesting them. Thus its mouth parts are modified accordingly for chewing the food.

REQUIREMENTS:

Cockroach, Slide, Forceps, Water, Glycerine, Filter paper, Dissecting microscope, etc.

PROCEDURE:

1. Hold the head of Cockroach in between the thumb and first finger facing dorsal side up and with the help of Forceps pull the labrum and keep it on slide.
2. Now hold the Cockroach in between the first two fingers by facing ventral side up and lift up the antennae so ventral mouth parts are visible. Insert the needle at the base of the labium and loose the connective tissue. Then pull the labium with the help of Forceps.
3. With Forceps hold the cardo and carefully remove the 1st maxilla from both the sides.
4. Similarly remove the mandible by holding the base of it with the help of Forceps from both the sides.
5. Remove the tongue with the help of Forceps.
6. Arrange all the mouth parts in order and observe under dissecting microscope or lens.

OBSERVATIONS AND RESULT:

Mouth parts include the labrum, a pair of mandibles, a pair of 1st maxillae, a pair of 2nd maxillae or labrum and hypopharynx or tongue.

1. The **labrum** or upper lip is a broad, movable semicircular plate-like structure, slightly notched at the free end. It is hinged to the lower margin of the clypeus, overhangs the mouth and covers major part of the mandibles.
2. The **mandibles** or true jaws are a pair of stout, triangular, unjointed, heavily sclerotised structures. They are articulated by small condyle into a socket-like groove in the head. Their opposable medial edges bear strong chitinous teeth. The anterior pointed teeth are used for cutting and biting while the posterior blunt teeth are used for grinding or crushing food. Each mandible is moved mainly by a pair of strong muscles called **abductors** and **adductors**.
3. The **first maxillae** are situated below mandibles. They are mainly used for handling food. Each maxilla is jointed. The proximal part is made up of two pieces the **cardo** which is short and horizontal is articulated to the head capsule and **stipes** which is vertical and free. The

distal part consists of two pieces, the inner **lacinia** and outer **galea**. The lacinia is oval, leaf-like piece provided with two apical teeth and the inner margin fringed with brush-like bristles. It is mainly used for sweeping the food into the mouth. The galea is providing protection to the lacinia. The external part called **maxillary palp** is five-jointed, the basal one of which is known as the **palpifer**. All of them bear sensory bristles. Maxillae are also used for cleaning the antennae.

4. The **second maxilla or labium** is a pair of appendages fused basally along the midline forms the lower lip. The labium consists of the basal plate called **submentum**, the middle oval plate called **mentum** and the distal partly divided structure called **prementum**. The prementum bears in front a pair of inner lobes called **glossae** and a pair of outer lobes called **paraglossae**. They correspond to the lacunae and galeae respectively, of the first maxillae. The prementum also bears on the lateral sides, a pair of three jointed labial palps each of which is raised on a short projection called **palpiger**.
5. The **hypopharynx or tongue** lies in the preoral cavity, just dorsal to the labium. It is provided with a group of small sensory bristles on either side and an opening of the salivary duct at its base.

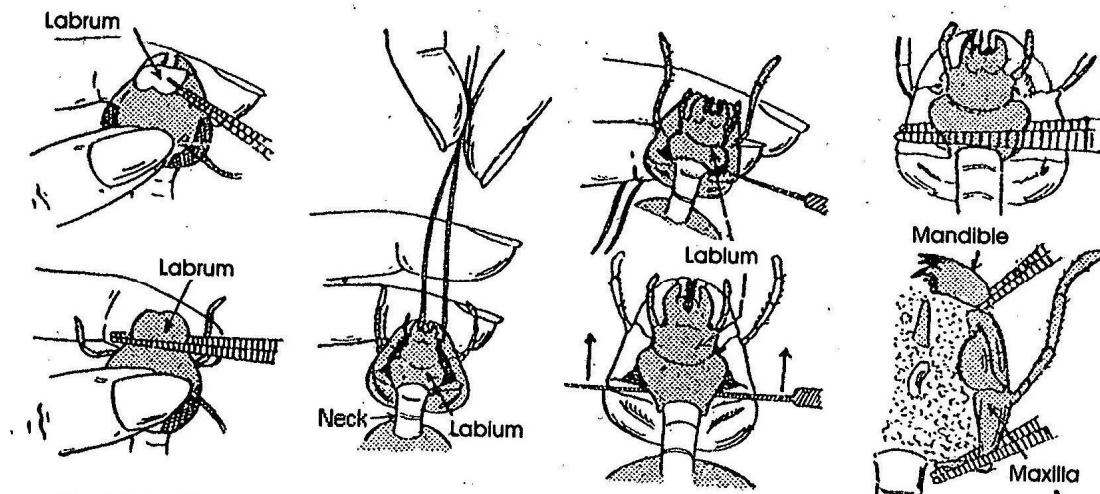


Fig. 15.1, 15.2
To take off the labrum

Fig. 15.3, 15.4, 15.5
To take off the labium

Fig. 15.6, 15.7
To take the maxillae and mandibles

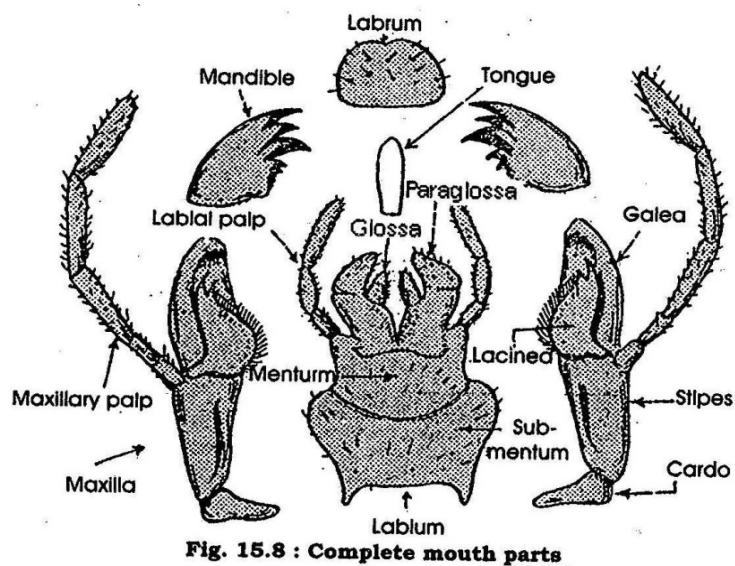


Fig. 15.8 : Complete mouth parts

PRACTICAL 5:

MOUNTING OF THE SALIVARY GLANDS OF COCKROACH

AIM: To mount and study the Salivary glands of Cockroach.

BACKGROUND INFORMATION:

The salivary glands of most insects are labial glands, which are the focus of this section. Labial salivary glands have been examined in detail in relatively few insect species, and there is great variation among the species examined. This is not surprising, considering the great variation in mode of feeding (e.g., chewing, piercing-sucking, non-piercing-sucking, sponging, etc.) and types of food consumed by different insect species.

REQUIREMENTS:

Cockroach, Slide, Forceps, Slide, Water, Glycerine, Filter paper, Dissecting microscope, etc.

PROCEDURE:

1. Cut open the cockroach from its ventral side and observe the salivary glands by the sides of the crop.
2. Forward the cut in neck region and head region up to the tongue.
3. Lift up the crop note the ducts of salivary glands running below the nerve cord and cut off the nerve cord crossing the ducts and Separate the glands from the crop.
4. Remove the part of the alimentary canal, brain and trace the ducts of salivary glands up to the tongue.
5. Put salivary gland on slide and mount it in water or glycerine.
6. Observe it under dissecting microscope.

OBSERVATIONS AND RESULT:

Paired **salivary glands** are lying in the thorax region surrounding the crop ventro-laterally. Each is a glandular structure with thin-walled elongated sac-like **reservoir** or **receptacle**. The ducts from the glandular structures on the side unite, run forward and join its fellow of the opposite side to form a **common salivary duct**. The two ducts of the receptacles coming from the opposite sides also unite to form a **common receptacular duct**. The common salivary duct and the common receptacular duct in turn join to form the **efferent salivary duct** which runs forward through the neck and opens at the base of the **hypopharynx**.

The secretion of glandular part is poured into the common salivary duct from where it flows back into the receptacular duct and stored in the receptacles. When required, the saliva is squeezed out of the receptacles into the preoral cavity.

4. Salivary Glands :

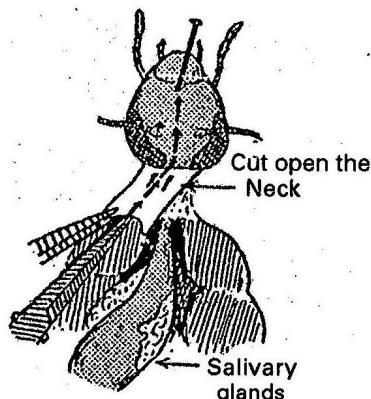


Fig. 15.13
To cut open the neck

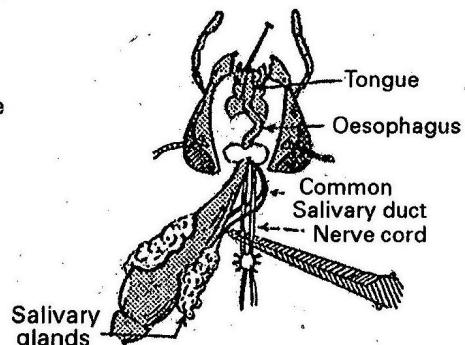


Fig. 15.14
To trace the glands

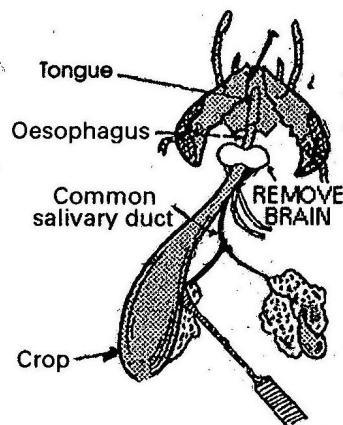


Fig. 15.15
To separate the salivary glands

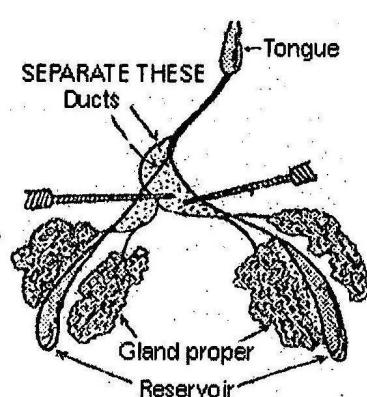


Fig. 15.16 : To separate the ducts

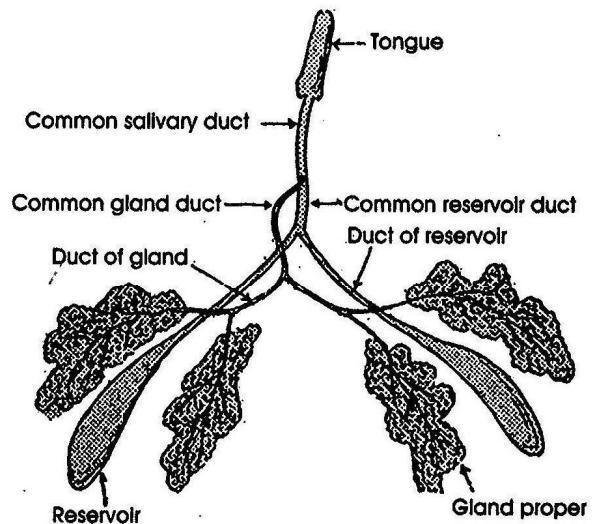


Fig. 15.17 : Salivary glands

PRACTICAL 6:

MOUNTING OF GIZZARD OF COCKROACH

AIM: To mount and study Gizzard of Cockroach.

BACKGROUND INFORMATION:

The crop at its posterior extremity narrow down and opens into a small, conical and thick walled sac, the gizzard which is broad anteriorly and narrow posteriorly which is the part of fore gut. The gizzard is a small biconical organ with muscular wall. The chitinous teeth are mainly used for grinding the food material.

REQUIREMENTS:

Cockroach, Slide, Forceps, Filter paper, Dissecting microscope or Lens, Water, etc.

PROCEDURE:

1. Cut open the Cockroach and take the alimentary canal outside the body.
2. Locate the gizzard which is thick biconical structure below the crop.
3. Remove it by cutting on both the sides.
4. Invert the gizzard by pressing with the pin-head from the posterior side.
5. Keep it on slide and watch it under the dissecting microscope or with lens.

OBSERVATIONS AND RESULT:

The gizzard is a small biconical organ with muscular wall. Its inner cuticular structure is raised into six, hard chitinous teeth which together form the efficient grinding machine to grind the food. Behind the teeth are cushion-like filter pads, beset with bristles which form the effective strainer. The anterior part of gizzard (also called proventriculus) has six longitudinal folds bearing six chitinous teeth and in the posterior part, six cushions like pads with chitinous hair are present.

When the muscular wall of gizzards contracts the teeth work against each other and grind the food, while the hairs act as sieve or strainer stomodaeal valve present also in the posterior partnership the of gizzard prevents regurgitation of food.

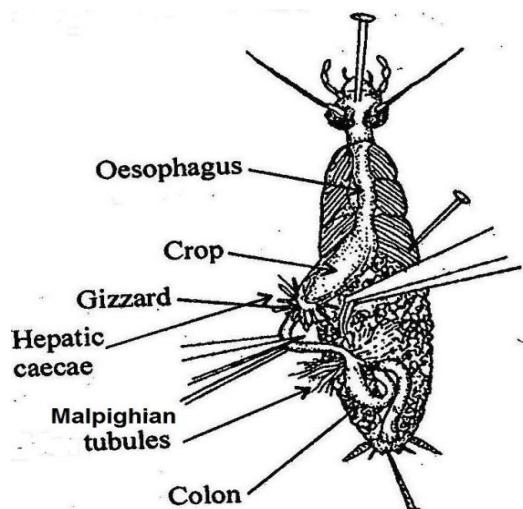
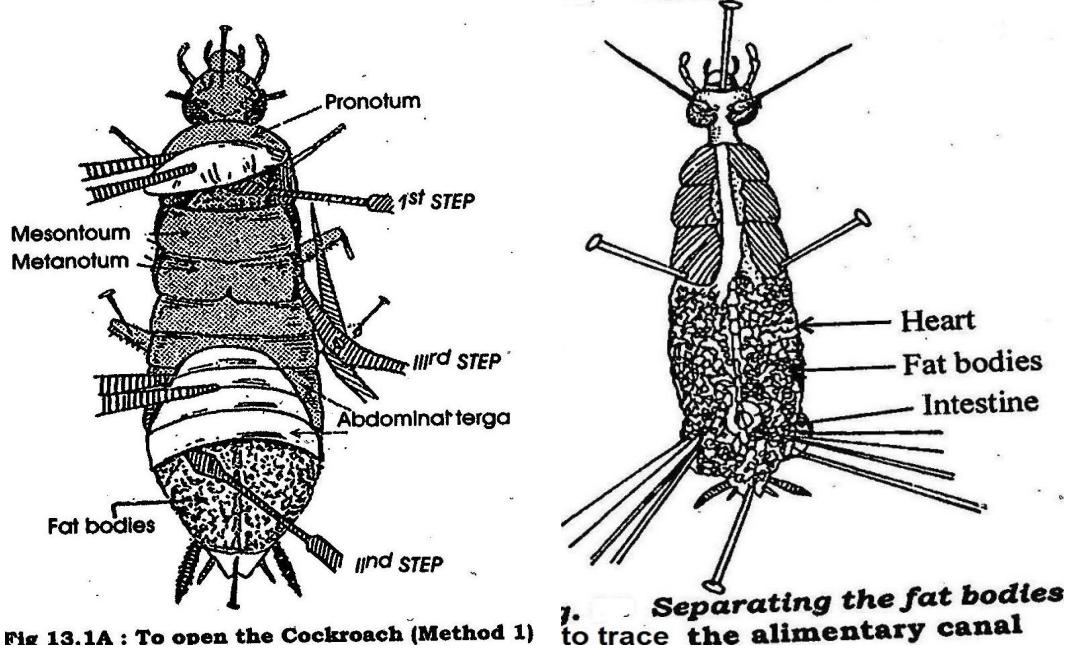


Fig. Tracing the various parts of the alimentary canal

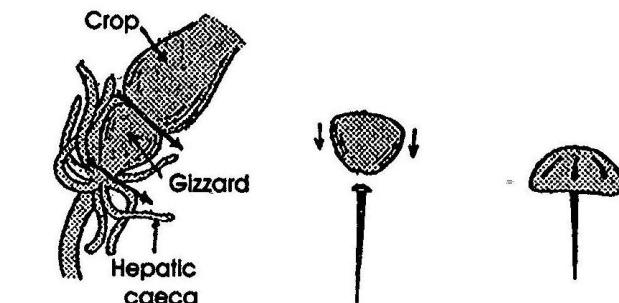


Fig. 15.9
To cut off the gizzard

Fig. 15.10, 15.11
To invert the gizzard

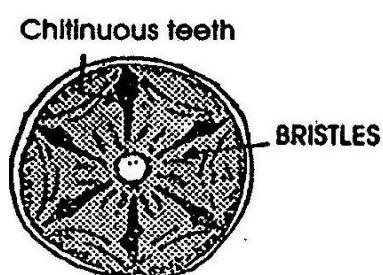


Fig. 15.12
Gizzard

PRACTICAL 7:

MOUNTING OF TRACHEA OF COCKROACH

AIM: To mount and study Trachea of Cockroach.

BACKGROUND INFORMATION AND SIGNIFICANCE:

The invertebrate trachea refers to the open respiratory system composed of spiracles, tracheae, and tracheoles that terrestrial arthropods have to transport metabolic gases to and from tissues. In general each segment of the body can have only one pair of spiracles, each of which connect to an atrium and have a relatively large tracheal tube behind it. The tracheae are invaginations of the cuticular exoskeleton that branch throughout the body. The smallest tubes, tracheoles, penetrate cells and serve as sites of diffusion for water, oxygen, and carbon dioxide.

REQUIREMENTS:

Cockroach, Slide, Cover slip, Forceps, Water, Glycerine, Compound microscope, etc.

PROCEDURE:

1. With the help of fine Forceps cut open the neck region and take a large trachea from thorax or cut open abdominal region and remove any silvery thread-like structure.
2. Put that thread-like structure on slide, add glycerine or water on it and put coverslip.
3. Observe the slide under low power objective (10X) under compound microscope.

OBSERVATIONS AND RESULT:

The tracheae are ectodermal tubes lined by single layer of epithelium and internally supported by a cuticular spiral thickening called spiral intima. The spiral intima prevents the trachea from collapsing under the pressure of surrounding organs. The trachea divides and subdivides into many branches. The ultimate branches of tracheae end into the tracheal cells or tracheoblasts from which extend further, into the tissue cells, fine intracellular tubules called tracheoles. They reach each and every cell of the body to provide oxygen directly. Unlike tracheae, the tracheoles are without spiral intima but they are filled with a liquid called tracheolar fluid which moves up or down the tracheole depending upon the changes in the osmotic pressure of the haemolymph.

i. Trachea :

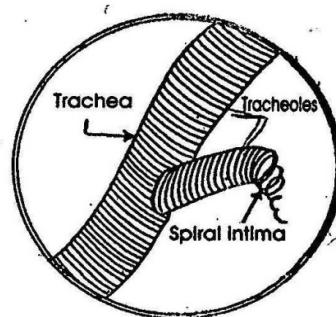
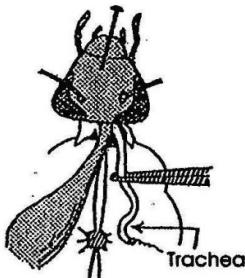
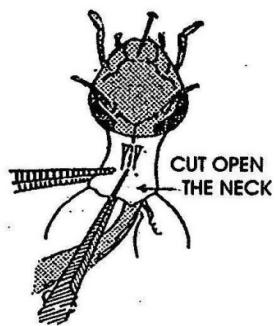


Fig. 15.18 : To cut open the neck

Fig. 15.19 : To take off the trachea

Fig. 15.20 : Trachea

PRACTICAL 8:

MOUNTING OF SPIRACLES OF COCKROACH

AIM: To mount and study Spiracles of Cockroach.

BACKGROUND INFORMATION:

The spiracles are the small openings situated laterally between the terga (the dorsal hard sclerite) and the sterna (ventral hard sclerite). These openings are small brownish areas located in the soft membranes in the following places. In cockroach there are two pairs of thoracic and 8 pairs of abdominal spiracles.

1. Between the first and second pair of leg- MESOTHORACIC SPIRACLE.
2. Between the second and the third pair of leg- METATHORACIC SPIRACLE.
3. Between the terga and the sterna of the abdominal segments- ABDOMINAL SPIRACLE.

An insect's respiratory system is the biological system with which it introduces respiratory gases to its interior and performs gas exchange. Air enters the respiratory systems of insects through a series of external openings called spiracles. These external openings, which act as muscular valves in some insects, lead to the internal respiratory system, a densely networked array of tubes called tracheae.

REQUIREMENTS:

Cockroach, Slide, Cover slip, Forceps, Water, Glycerine, Compound microscope, etc.

PROCEDURE:

Mounting of Thoracic spiracles:

1. Hold the animal and stretch either the first and second legs or the second and third legs. Observe a very small, slightly brownish area between the basal portions of the legs.
2. Cut the membrane all around the spiracle and collect in onto a slide by BB Forceps.
3. Remove the muscles and the membranes.
4. Put few drops of glycerine on the slide and place a cover slip.
5. Set the microscope at a low power and observe the slide.

Mounting of abdominal spiracles:

1. Cut the lateral side of the abdomen and place it on slide.
2. Keep the piece of the abdomen in such a manner that the terga and the sterna are stretched.
3. Remove the muscles and the membranes.
4. Put few drops of glycerine on the slide and place a cover slip.
5. Set the microscope at a low power and observe the slide.

OBSERVATIONS AND RESULT:

Mesothoracic Spiracle: It is located between the first and second pairs of leg on each side. Its spiracular opening is long. The opening is bounded by two lips, the anterior-lip and the posterior

lip. The wall of the spiracles bears small bristles or hair-like structures which help in filtering the air. Air enters into the trachea through these openings.

Metathoracic Spiracle: It is located between the second and third pair of leg on each side. Its spiracular opening is bounded by a thick chitinous ring. It is provided with a lid and an atrium or an air-chamber. Air enters into the trachea through these openings.

Abdominal Spiracle: The first abdominal spiracles are situated near the margin of the first abdominal tergum. The other abdominal spiracles are situated between the terga and the sterna of 2nd to 8th abdominal segments. The opening is small. It is bounded by more or less circular chitinous ring. Air enters into the trachea through these openings.

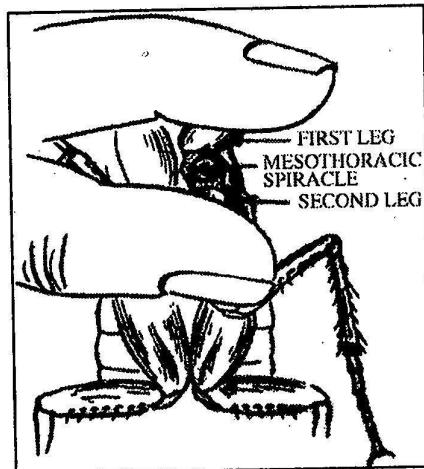


Fig. 5.1 : Position of the thoracic spiracle and method of collecting it.

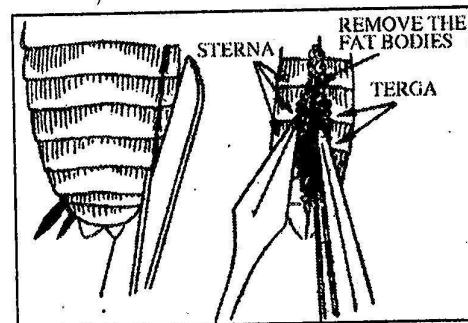


Fig. 5.2 : Method of collecting the abdominal spiracle.

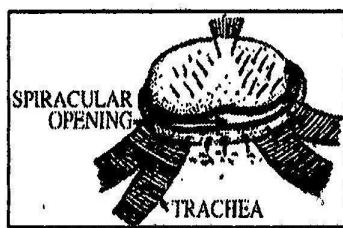


Fig. 5.3 : Mesothoracic spiracle.



Fig. 5.4 : Metathoracic spiracle.

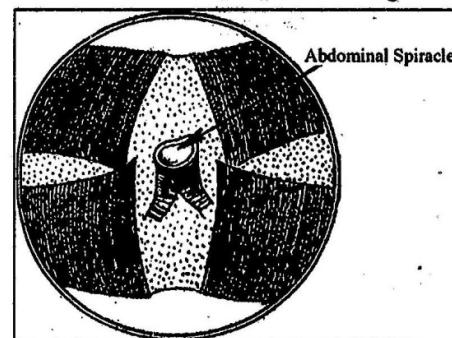


Fig. 5.5 : Abdominal spiracle

PRACTICAL 9:

MOUNTING OF CORNEA OF COCKROACH

AIM: To mount and study the Cornea of Cockroach

BACKGROUND INFORMATION AND SIGNIFICANCE:

The cockroach visual system consists of two simple eyes, ocelli, and two large compound eyes. Ocelli and compound eyes give input to the optic lobes, which contain three visual ganglia responsible for processing the visual information.

The ocelli of the cockroach can be recognized as two large white spots, located between the compound eyes at the base of the antenna. Each ocellus contains thousands of photoreceptors. Consequently, the ocelli have extremely high light-sensitivity and seemingly more or less non-existent spatial resolution, which is why they are considered as general intensity level detectors incapable of forming images.

The primary visual organ in most adult insects is the compound eye. Compound eyes consist of repeating units called ommatidia, which together form the retina. The compound eye surface, or cornea, is formed by ommatidial facet lenses. Each eye contains about 2,000 ommatidia. The pigments separating ommatidia are not retractable in the eyes of cockroach since the animal is nocturnal and spends daytime in dark places. But the eye produces mosaic vision similar to the crustaceans. Compound eyes are specially adapted to perceive movements of objects. The insect compound eye is advanced structure because the number of ommatidia in insect eyes increases giving the eye sharpness of vision. Also the distance of vision increases in predatory insects and fast flying insects.

REQUIREMENTS:

Cockroach, Fine scissor, Forceps, Slide, Cover slip, Compound microscope, Water, Glycerine, etc.

PROCEDURE:

1. Hold Cockroach head in between fingers.
2. Cut the black lateral sides of head capsule by using angular scissor.
3. Pick up the black part and gently wash it and remove black pigments.
4. Keep it on slide and mount in water or glycerine.
5. Observe under low power objective of compound microscope.

OBSERVATIONS AND RESULT:

The compound eyes are sessile in the form of convex brownish-black, kidney-shaped structures on the lateral sides of head. Compound eyes consist of repeating units called ommatidia, which together form the retina. The compound eye surface, or cornea, is formed by ommatidial facet lenses. Unlike in most insects, which have hexagonal and regularly distributed lenses, the lenses in cockroach compound eye vary significantly both in size and shape within the same eye.

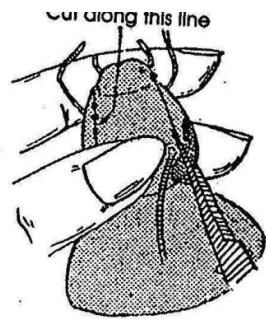
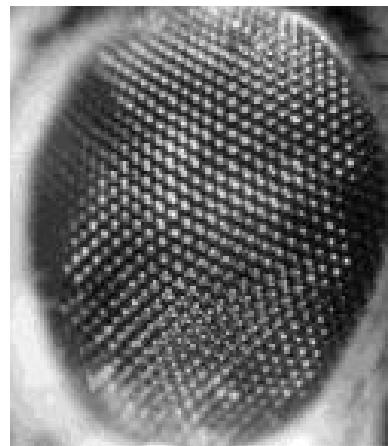


Fig. 14.1 To cut on lateral sides
Procedure



PRACTICAL 10:

MOUNTING OF NEUROSECRETORY CELLS FROM COCKROACH BRAIN

AIM: To mount and study neuro-secretory cells from Cockroach brain.

BACKGROUND INFORMATION:

The brain and all ganglia in the cockroach are uniposed of nerve cell. In nervous system the certain nerve cell are modified and specialized into secretory cell known as neuro-secretory cell. The cell bodies of those secretory cells have secretory granules. These cells secrete chemical messengers known as neuro-secretions or neurohormones.

The neuro-secretory cells receive impulses from CNS and respond by releasing neurosecretion which stimulates or inhibits the target organ or gland. In cockroach, the neuro-secretory cells in the brain secrete neurohormone, which are stored in the neurohaemal organ i.e. Corpora cardiata. The neuro-secretory cells in the brain secrete the neurohormone which are stored in neurohaemal organ i.e. Corpora cardiata and released whenever required this secretory cells and control a number of physiological processes. They also control growth and reproduction in insects. They respond for spontaneous nerve activity.

REQUIREMENTS:

Cockroach, Forceps, Slide, Coverslip, Angular scissor, Filter paper, D.W., Mallory's triple stain or methylene blue, Glycerine, Compound microscope, etc.

PROCEDURE:

1. Cut the head capsule of cockroach by using angular scissor or any other suitable sharp instrument. On the lateral sides as well as on the posterior side.
2. Then separate the chitinous upper layer of head capsule carefully by lifting it with the help of Forceps. Remove only chitinous part without disturbing any soft tissue inside.
3. Now, observe a whit bilobed structure i. e. the brain or Cerebral ganglia.
4. Separate the tissue around it and take out the brain with the help of Forceps and place it on clean slide.
5. Smash the brain tissue with the help of flat surface.
6. Place a drop of Mallory's triple stain or methylene blue on the brain and allow it to stain for 5-10 mins.
7. Remove excess of stain by gentle wash with D.W. and blot excess of water with filter paper.
8. Finally add a drop of glycerine and put the coverslip and observed under compound microscope.

OBSERVATIONS AND RESULT:

Nerve cells and Neuro-secretory cells are observed.

1. Nerve cells – These are small cells seated in the matrix contains distinct nucleolus in cytoplasm.

2. Neuro-secretory cells – These are comparatively large cells. Each neuro-secretory cell contain a distinct nucleolus and many darkly stained granules. Some of the cell may contain large vacuole.

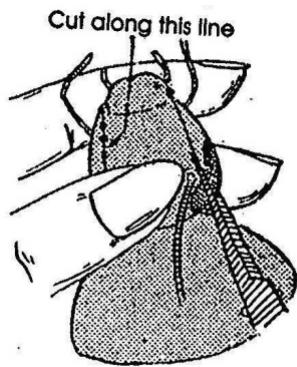


Fig. 14.1 To cut on lateral sides

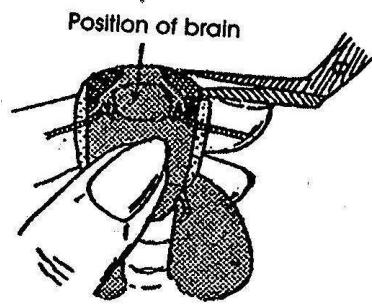


Fig. 14.2 Cut the epipharynx

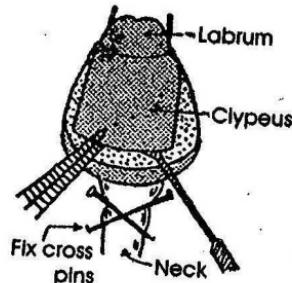


Fig. 14.3 To expose the brain

