

**PERIYAR INSTITUTE OF DISTANCE EDUCATION
(PRIDE)**

**PERIYAR UNIVERSITY
SALEM - 636 011.**

**B.Sc. BOTANY
FIRST YEAR
ALLIED PRACTICAL – I : ZOOLOGY**

Prepared by :

Dr. G. MANIMEGALAI, M.Sc.,M.Phil.,Ph.D.

Professor and Head

PG and Research Dept. of Zoology

Kandaswami Kandar's College

Velur, Namakkal Dt.

B.Sc. BOTANY
FIRST YEAR
ALLIED PRACTICAL – I : ZOOLOGY

DISSECTIONS:

1. Frog – Digestive system;
2. Frog – Urino – genital system.
3. Cockroach – Digestive system.

MOUNTINGS

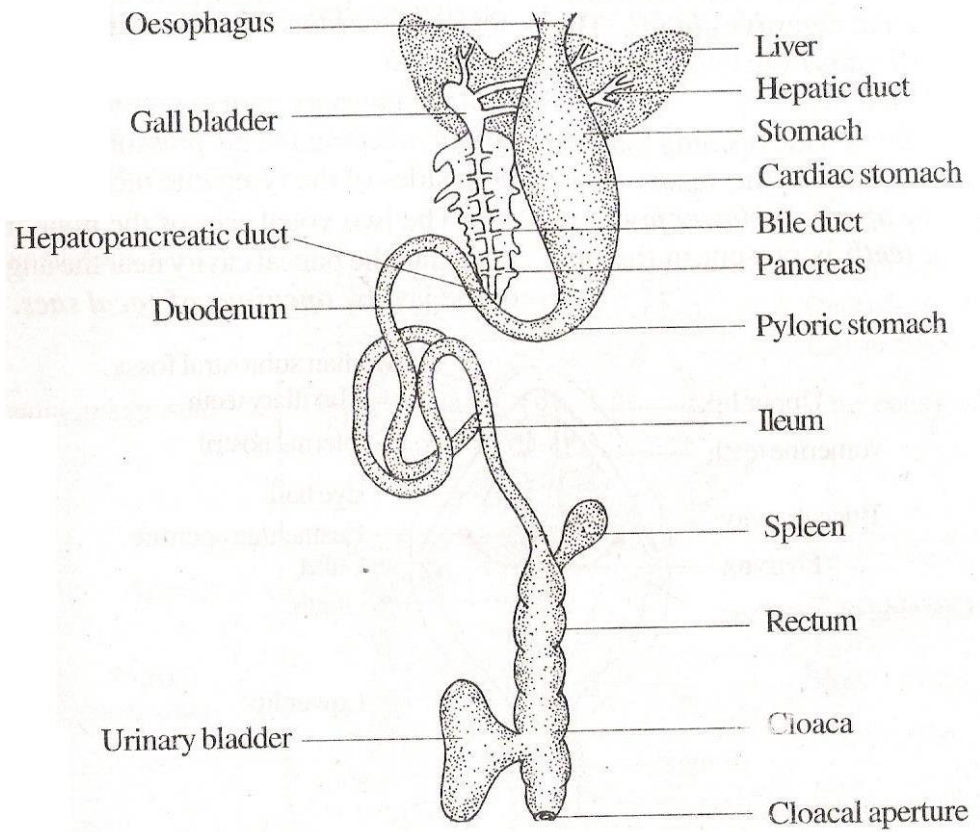
1. Mouth parts of cockroach.
2. Earthworm—body setae.
3. Brain of frog.

SPOTTERS:

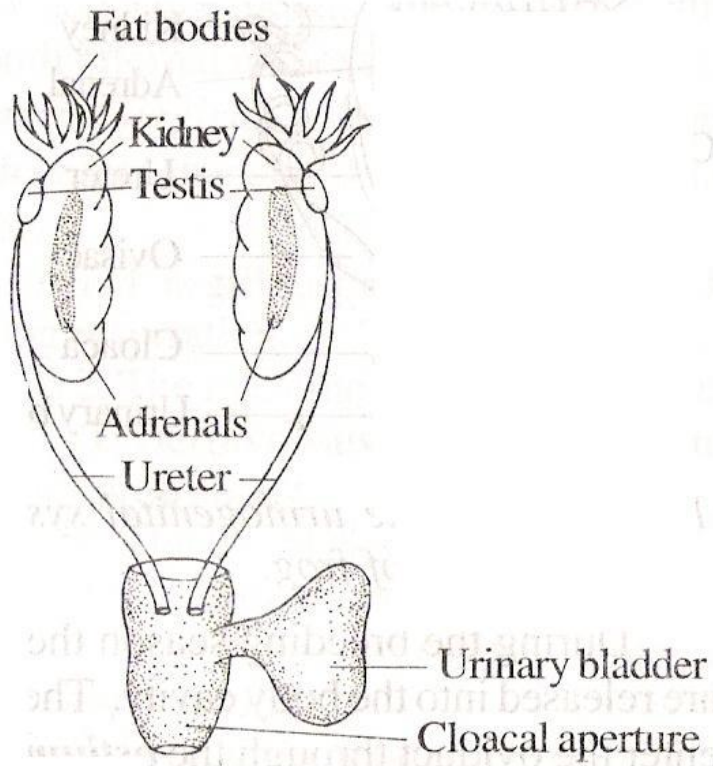
1. Amoeba.
2. Paramecium.
3. Taenia – entire.
4. Taenia-scolex.
5. sponge-spicules
6. sponge- gemmule.
7. sacculina.
8. sea anemone on hermit crab.
9. starfish oral and aboral views.
10. prawn-antennule.
11. prawn-petasma.
12. prawn-second maxillipede.
13. pila-radula.
14. sea cucumber.
15. Any mammalian placenta. Sheep/Goat/human/pig
16. Amphioxus.
17. Rabbit- Dentition.
18. obelia colony

DISSECTIONS

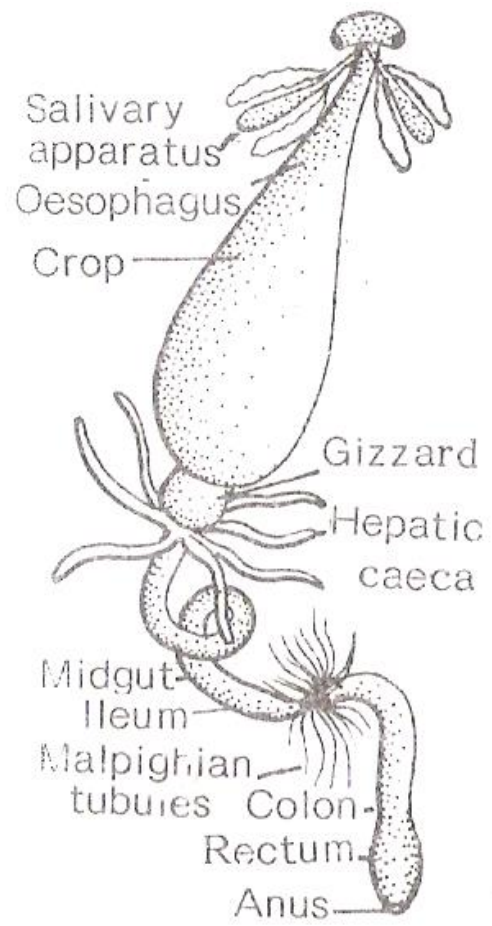
FROG - DIGESTIVE SYSTEM



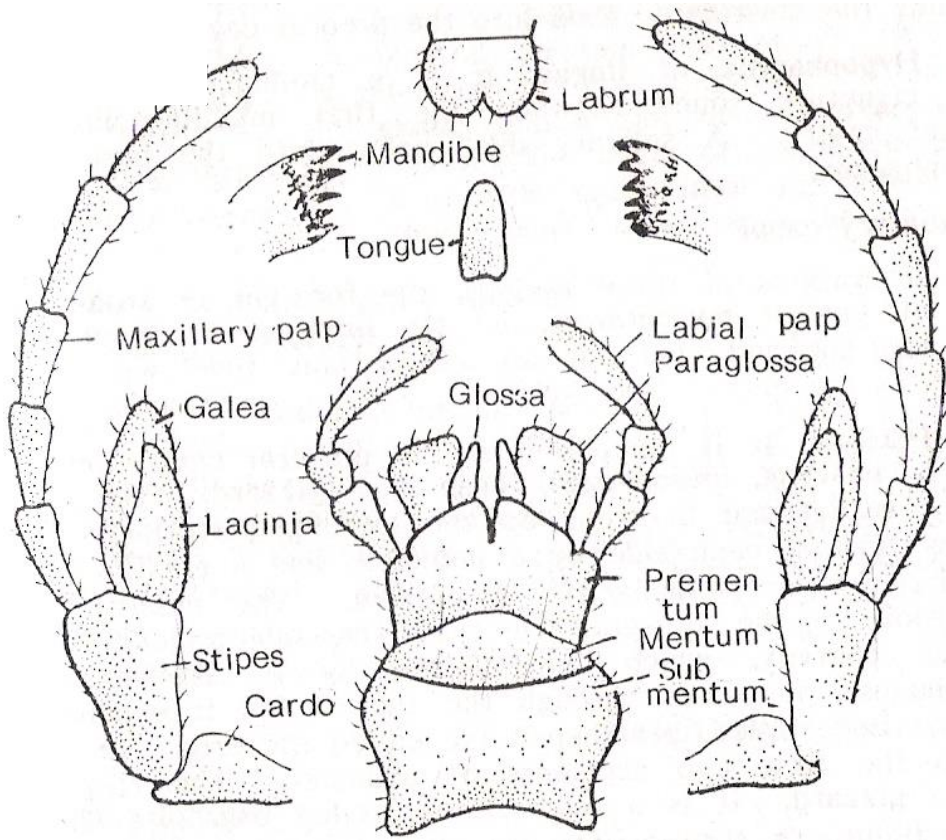
FROG - MALE URINO GENITAL SYSTEM



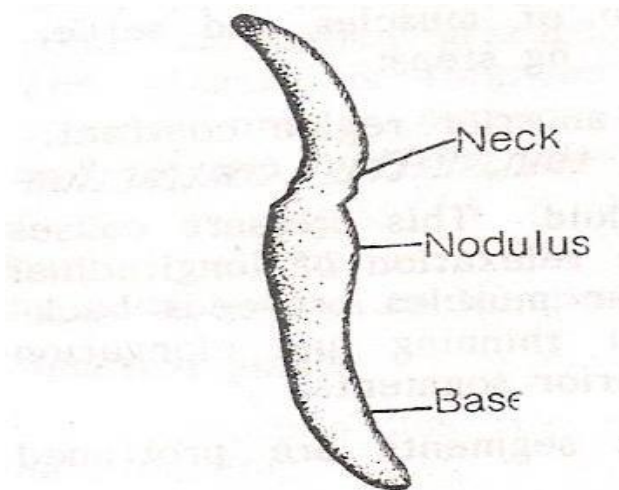
COCKROACH – DIGESTIVE SYSTEM



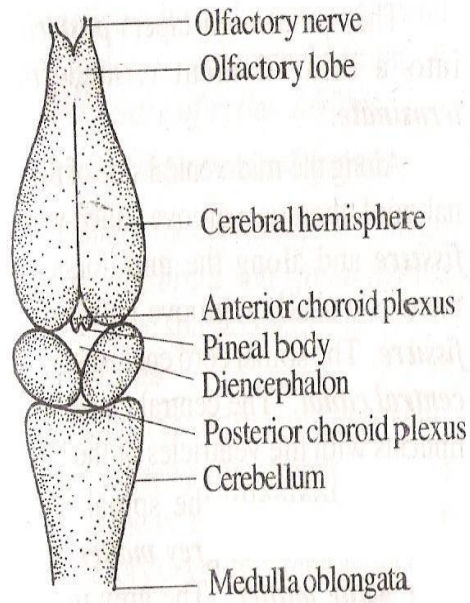
MOUNTINGS
MOUTH PARTS OF COCKROACH



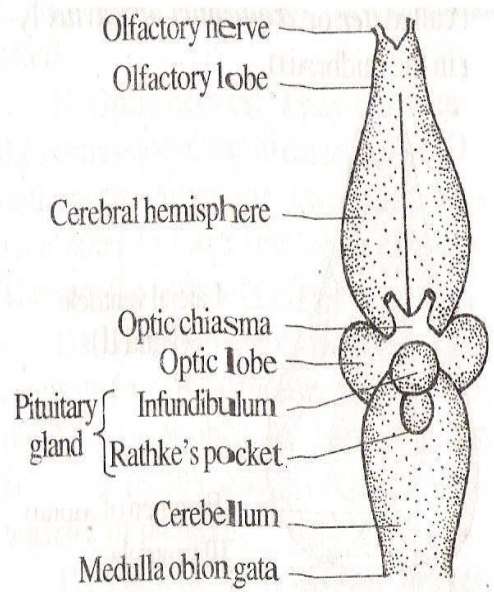
EARTH WORM-BODY SETAE



BRAIN OF FROG



Dorsal view



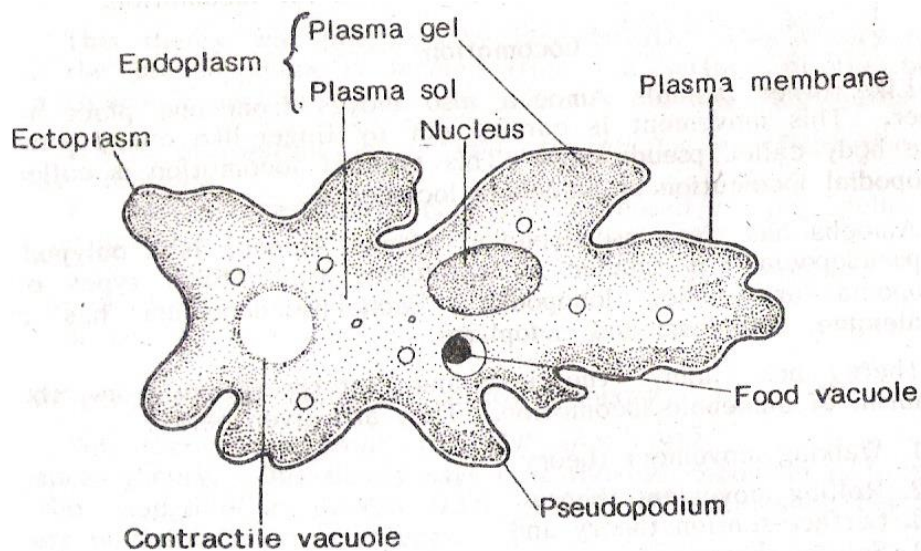
Ventral view

SPOTTERS

AMOEBA

Phylum : Protozoa.
Class : Rhizopoda.
Order : Lobosa.

Amoeba is included in the phylum protozoa because, it is a single cellular organism.



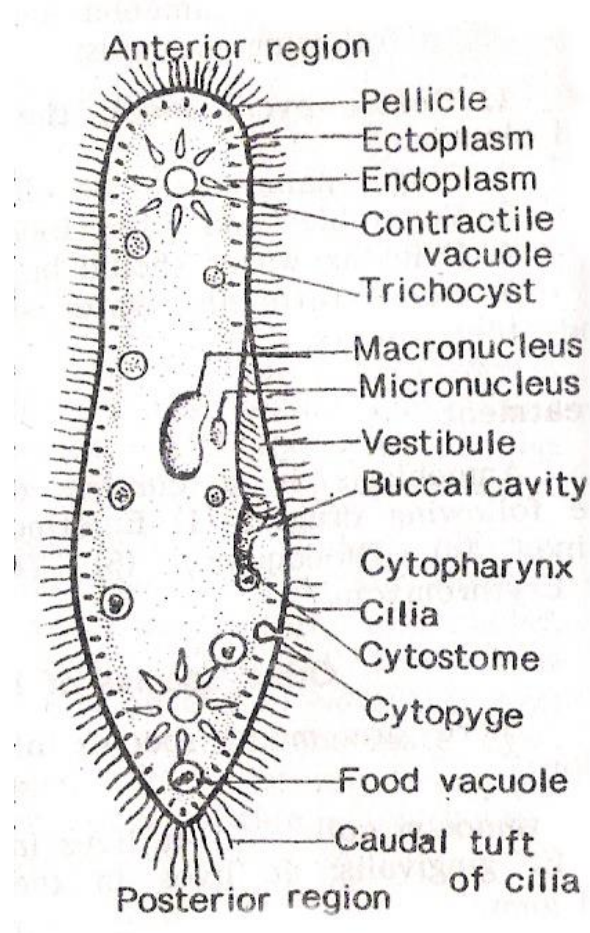
It uses pseudopodia for locomotion. Hence it comes under the class rhizopoda.

The pseudopodia have blunt ends. So, it comes under the order lobosa.

- Amoeba is a fresh water protozoan.
- The body is asymmetrical and irregular in shape.
- It is covered by a thin pellicle.
- The cytoplasm is divided into ecto and endoplasm.
- Ectoplasm is clear.
- Endoplasm is granular and contains nucleus, food vacuoles.
- Contractile vacuoles etc.,
- The pseudopodia help for locomotion and food capture.
- Contractile vacuoles are for osmoregulation.
- Nucleus controls all the biological activities and participates in reproduction.
- Amoeba reproduces asexually by binary fission and multiple fission.

PARAMECIUM

Phylum	:	Protozoa.
Class	:	Ciliata.
Order	:	Holotricha.



Paramecium is a single cellular organism. So, it comes under the phylum protozoa. The cilia are the locomotary organs. So, it is a ciliate form. The cilia are found throughout the entire surface of the body. Hence, it comes under the order holotricha.

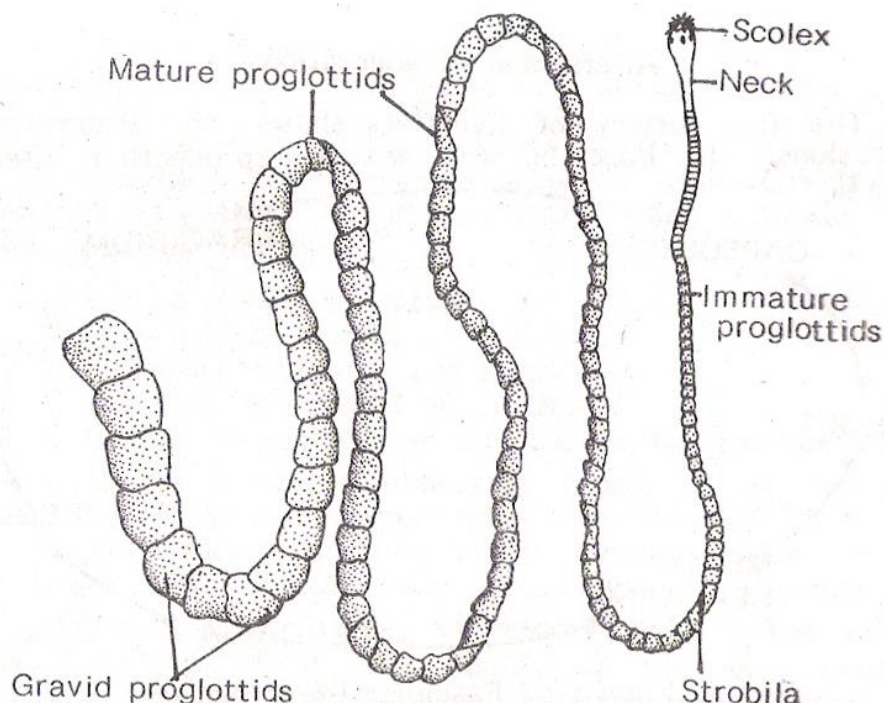
- Paramecium is a freshwater protozoan.
- It looks like a slipper. Hence called as 'slipper shaped animalcule'
- The body is more or less elongated: oral apparatus lies ventrally.
- The posterior end is pointed than the anterior end.

- Body is covered by a thin pellicle.
- Cytoplasm is divided into ecto and endoplasm.
- Ectoplasm contains basal granules and trichocysts.
- Cilia arise from the basal granules.
- Trichocysts are the organs of offense and defense.
- Endoplasm has nucleus, contractile vacuoles, food vacuoles etc.,
- Two contractile vacuoles one on each end.
- They are surrounded by radiating canals. They help for osmoregulation.
- Nuclei are two in number. One macronucleus and one micronucleus.
- Macronucleus is vegetative in function.
- Micronucleus is reproductive in function.
- Paramecium reproduces by binary fission, conjugation, endomixis, autogamy, cytogamy, endomixis etc.,

TAENIA SOLIUM

Phylum	:	Platy helminthes
Class	:	Cestoda
Order	:	Eucestoda.

Taenia solium comes under the phylum platyhelminthes because it has a flat, ribbon – like, acoelomic body.



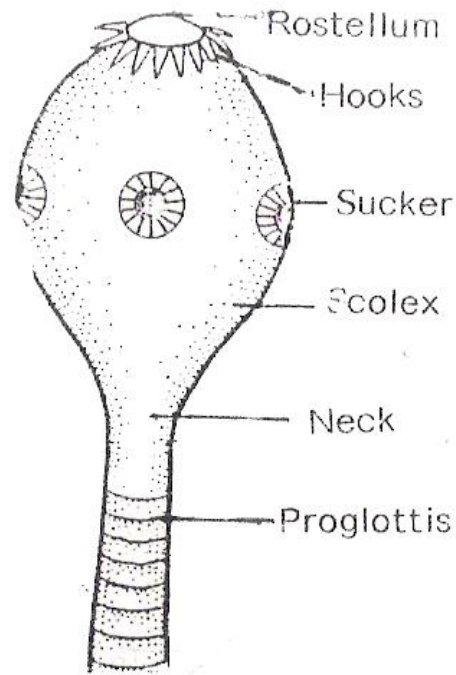
The body is divided into proglottids. Alimentary canal is absent. It lives as an endoparasite in the human intestine. So, it is placed under the class cestoda.

The head is called scolex. So it is placed in the order Eucestoda.

- Taenia is commonly called Tape – worm.
- It is an endoparasite, lives in human intestine.
- Head is called scolex. With the help of it, the worm get attached to the host firmly. Scolex has rostellum. Hooks and suckers.
- Neck connects the head with the trunk.
- Trunk is divided into several transverse segments, by a process called strobilization.

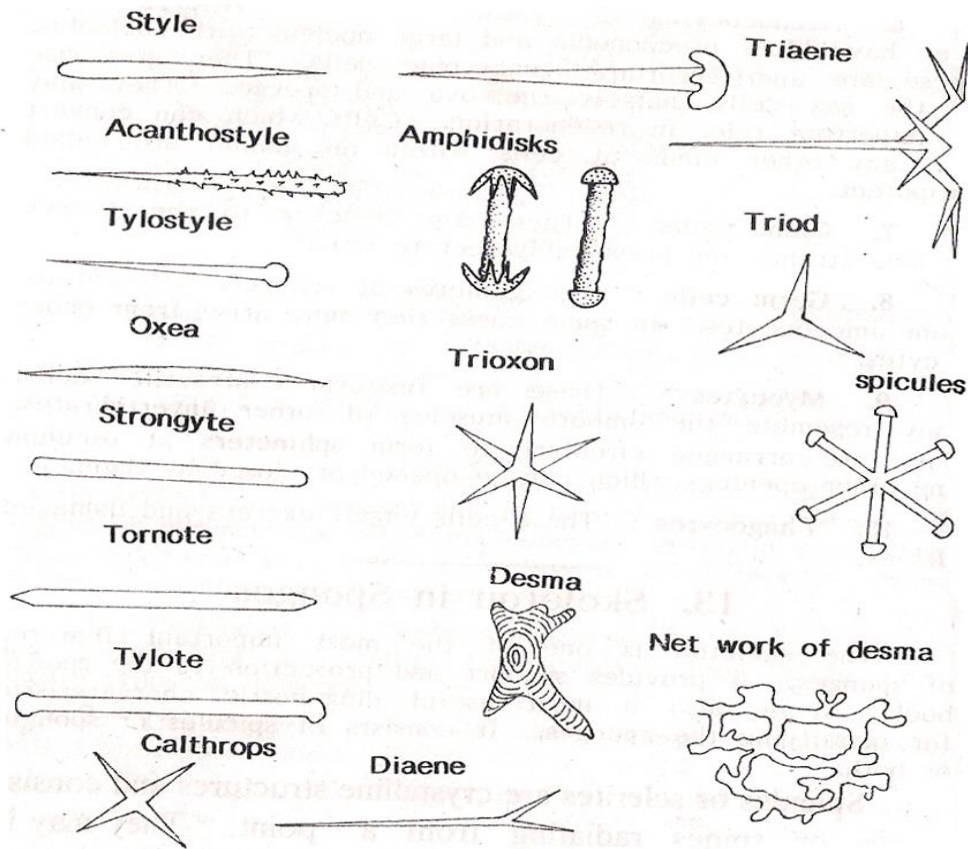
- The segments are budded off from the neck.
- The segments near the neck are smaller in size; they don't have reproductive structures. So, they are called immature proglottids.
- Segments away from the neck are called mature proglottids because they have reproductive organs.
- Taenia is a hermaphrodite.
- Life cycle includes Hexacanth larva, cysticercus larva etc.,
- Respiration is anaerobic.

TAENIA – SCOLEX



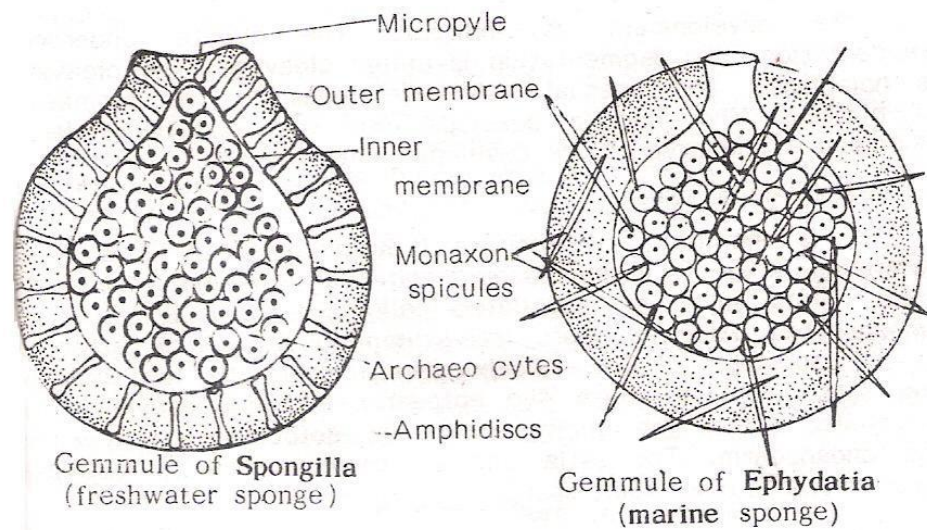
- The head of Taenia is called scolex.
- It is very small and looks like a pin head.
- Scolex is formed of rostellum, hooks and suckers.
- Rostellum is the muscular projection of the head.
- It can be protruded and retracted.
- At the base of rostellum a circlet of backwardly directed spines are found.
- With the help of these hooks, the worm can firmly attached with the intestinal wall of host.
- The head also bears fours suckers.
- They are cuplike structures.
- They also help the worm to get attached with the host firmly.
- Thus the scolex of Taenia shows adaptation for its mode of parasitic life.

SPONGE – SPICULES



- The endoskeleton of sponges is formed of spicules.
- The spicules may be formed of calcium carbonate or silica or spongin.
- Spicules are secreted by scleroblast cells.
- They lie in the mesoglea.
- Spicules may be classified on the basis of the number of axis they have.
- Accordingly they are called
- Monaxon – with single axis. These are rod – like spines.
 - Tetraxon – have 4 axes
 - Triaxon – have 3 axes.
 - Polyaxon – several axes.
 - Spheres – rounded axes.
- Amphidiscs – These are monaxon spicules. The ends of the spicules show thickenings.
- Spicules may be microscleres or macroscleres.

SPONGE GEMMULE



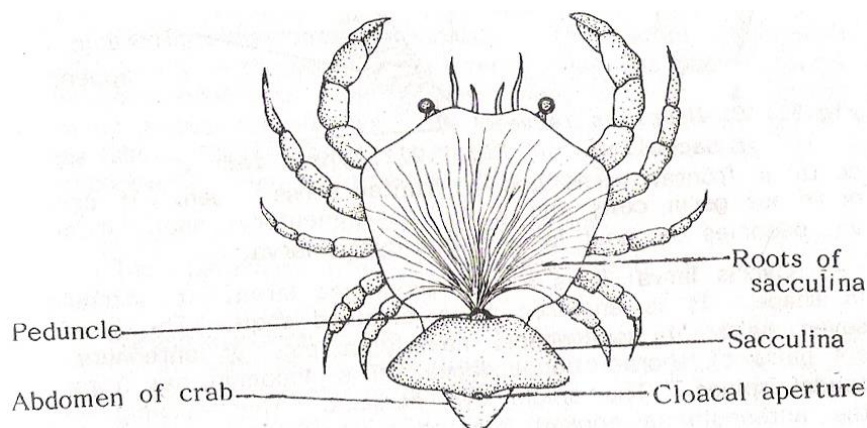
SPONGE – GEMMULE

- During unfavourable seasons, fresh water sponges develop gemmules.
- Gemmules are highly resistant to drought conditions.
- Each gemmule is spherical in shape.
- It is covered by a double membrane.
- The outer membrane is thick.
- The inner membrane is tough, flexible and thin.
- In between the two layers, spicules are present
- Its micropyle is present at one end.
- It encloses numerous amoebocytes.
- A micropyle is present at one end.
- When favourable conditions arise, the micropyle cover is opened.
- The amoebocytes are liberated into the water.
- Each one develops into a new sponge.
- Formation of gemmules is an adaptation found among sponges.

SACCULINA

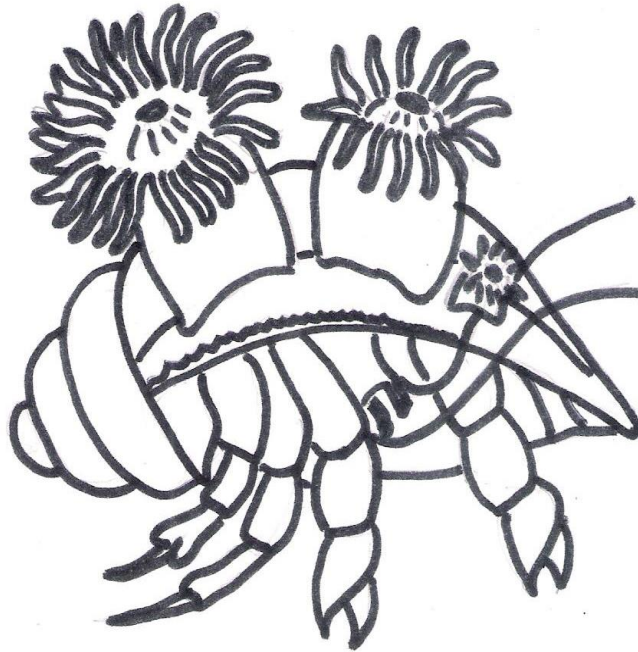
Phylum : Arthropoda

Class : Crustacea.



- Sacculina is a parasitic crustacean.
- It lives as an ectoparasite on crabs.
- It causes parasitic castration in the host.
- The body is extremely reduced.
- It looks like a fleshy tumour, at the abdomen of crab.
- It gets attached with the body of the host by a peduncle.
- It shows no segmentation.
- No appendages; no alimentary canal.
- The hind end of the tumour has cloacal opening leading to the male cavity.
- Peduncle sends numerous root – like filaments into the body of the host. They extend through out the internal of body.
- They help to receive the nourishment from the host body.
- It is a hermaphrodite.
- The infected male crabs develop female characters.
- The infected female crabs possess reduced swimmerettes.
- This phenomenon is called “Parasitic castration

**SEA ANEMONE ON HERMIT CRAB
(COMMONSALISM)**



SEA ANEMONE ON HERMIT CRAB

It is a very good example of commensalism—a kind of animal relationship. The hermit crab is an arthropod. It lives inside the shells of gastropods. The sea anemone belongs to the phylum coelenterata. They live on the shells, where the hermit crab lives. Thus these two individuals lead a mutual life. In this type of animal relationship, both are benefited by each other.

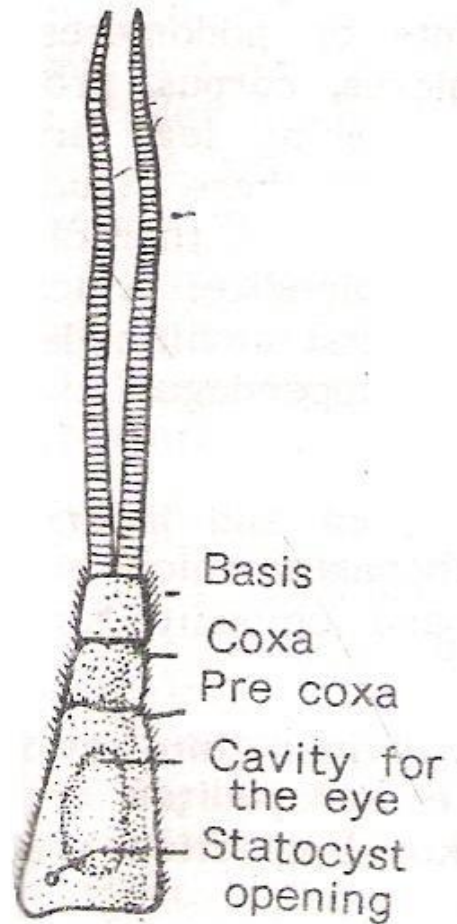
In this, the hermit crab carries the sea anemone to various places, where food is in abundance. In turn, the sea anemone protects the hermit crab by living on their shelter.

Sea anemone gives protection from enemies to the hermit crab.

Hermit crab in turn gives shelter as well as food by carrying them to different places. It also helps in the wide dispersal of sea anemone. Thus mutualism exists between these two organisms. This type of relationship is called commensalism.

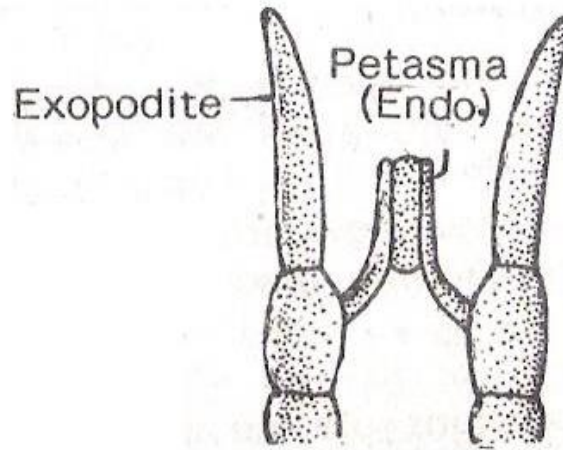
PRAWN – ANTENNULE

ANTENNULE



- In prawn the first pair of cephalic appendages are called antennules.
- Each antennule consists of, a coxa with three podomeres, and a basis with one podomere and these two constitute the protopodite.
- The exo and endopodites are flagellum like.
- They have several small segments.
- The first coxal segment is attached to the body.
- It has space for the attachment of eye stalk.
- It has a small opening for statocyst.
- The exo and endopodites act as feelers.
- In prawn, the appendages are modified according to their function

PRAWN – PETASMA



In prawn, the first abdominal appendages in male and female show variations.

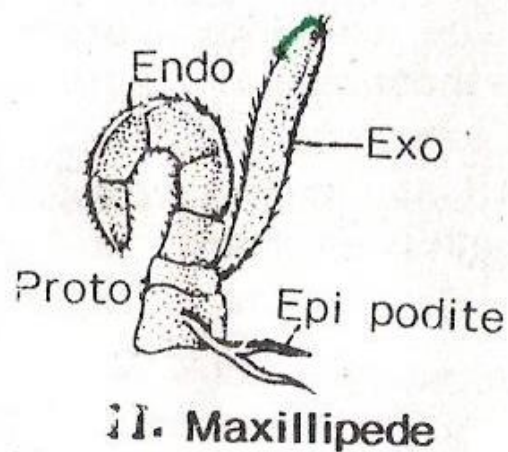
Thus they exhibit sexual dimorphism.

In male, the endopodites of the first abdominal appendages, fuse together in the middle to form a structure called petasma.

It encloses a groove.

During copulation, it is used to conduct the spermatophores into the thelycum of female.

PRAWN – SECOND MAXILLIPEDE



In prawn, the second maxillipede is the second thoracic appendage.

It resembles the structure of a question mark.

Each second maxillipede consists of, a protopodite, exopodite, endopodite and Y—shaped epipodite.

The protopodite has two segments.

Epipodite is attached to the first segment.

The Exopodite is leaf – like.

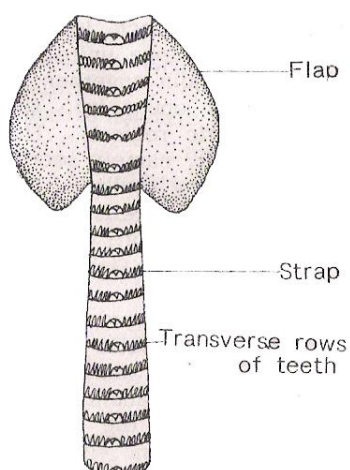
The Endopodite has five segments.

They are curved like a question mark.

The segments are named from the base as, Ischium, merus, carpus, propodus and dactylus.

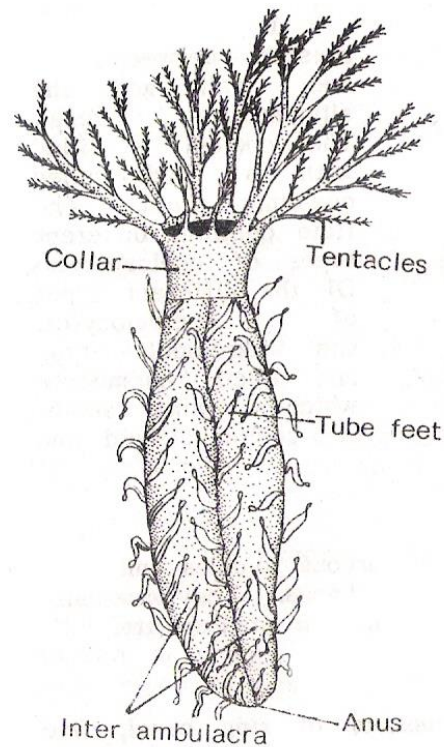
Epipodites help for respiration.

PILA – RADULA

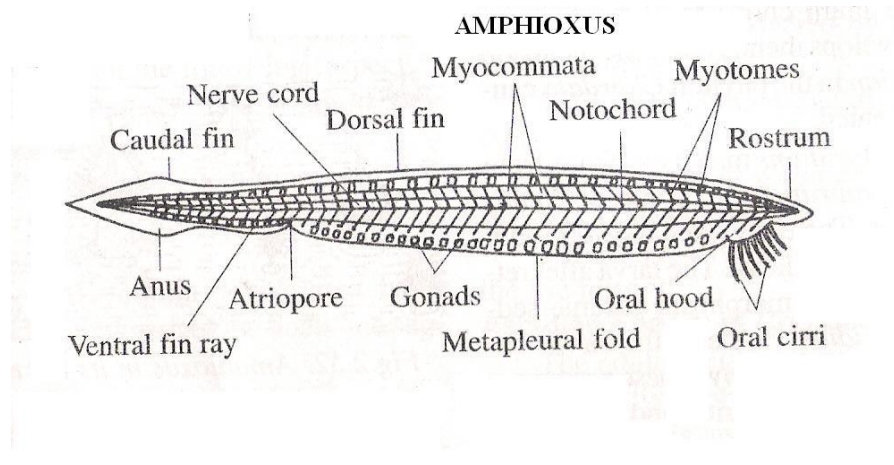


- Radula is the flat strap of teeth found in the buccal cavity of pila.
- Radula lies in radular sac.
- It consists of transverse rows of seven teeth each.
- In each row the teeth are named on the basis of their position.
- They are a central teeth,
a pair of lateral teeth,
a pair of inner marginal teeth and
a pair of outer marginal teeth.
- Radula helps to cut the leaves into smaller pieces.

SEA CUCUMBER



- In sea cucumber the respiratory tree is the respiratory structure.
- It arises from the cloacal wall.
- Each tree is formed of a trunk and branches.
- The branches terminates in small vesicles.
- The cloaca sucks water and send it to the respiratory tree.
- The branches of the respiratory tree are inside the coelom,
 - Gaseous exchange occurs by simple diffusion.
- The water is ejected out by contraction of muscles of the branches of respiratory tree and cloaca.



AMPHIOXUS

Phylum – chordata.

Sub phylum – cephalochordata.

Amphioxus is a chordata animal because it has

A notochord,

A nerve cord and

Pharyngeal gill clefts.

It is included in the sub phylum cephalochordata, because, the notochord extends into the cephalic region,

It is a marine form.

It is a burrowing form.

It looks like a fish.

It is transparent.

It has no distinct head.

The body shows a dorsal fin that extends around the tail and end in the 1/3 of the ventral surface of the body.

It has atrium and atriopore.

Pharynx is an enlarged sac.

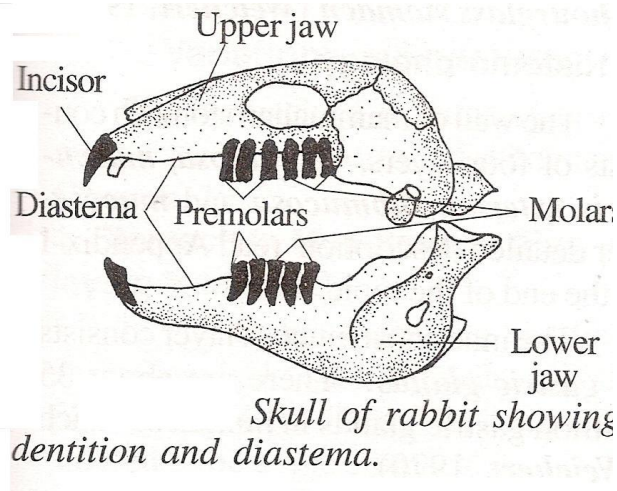
It is perforated by gill slits

The ventral groove of pharynx is called endostyle.

It is a ciliary feeder.

It shows affinities with invertebrates and chordates.

RABBIT – DENTITION



Rabbit is a herbivore.

So canine teeth are absent.

It has Incisors, premolars and molars only on its jaws.

The dental formula is calculated by using the following formula

Number of teeth on one half of the upper jaw

Number of teeth on one half of the lower jaw

In rabbit the dental formula is,

$$I = \frac{2}{1}$$

$$C = \frac{0}{0}$$

$$PM = \frac{3}{2}$$

$$M = \frac{3}{3}$$

TOTAL=28.

Where I – is incisors

C-- canine.

Pm – premolar

M – molar

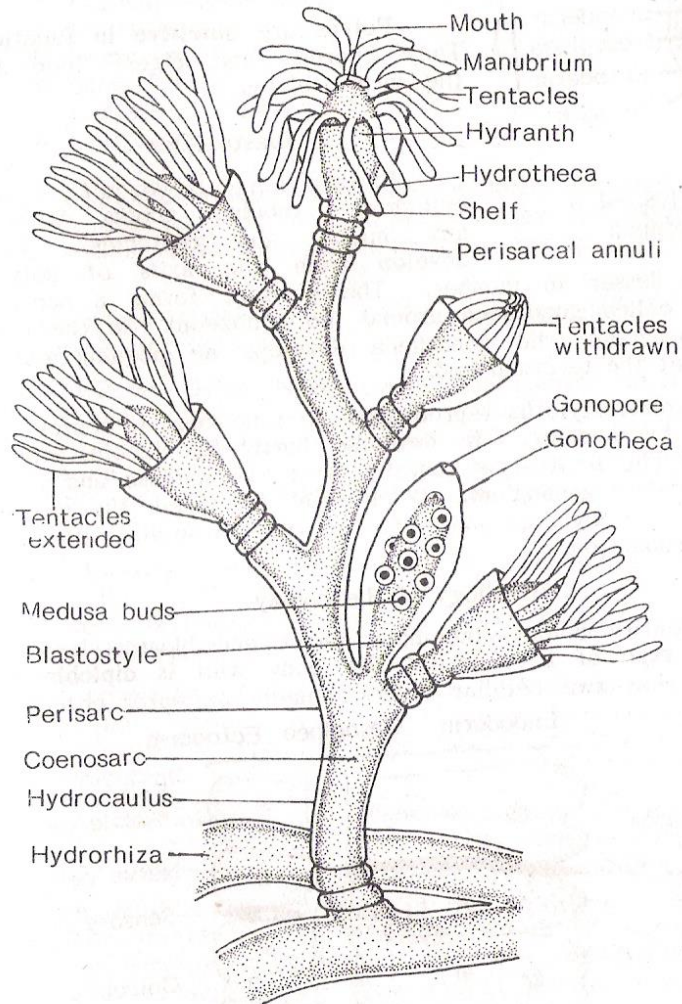
Because the canines are absent, there is a gap between incisors and canines.

The gap is called diastema.

OBELIA GENICULATA

Phylum : Arthropoda

Class : Hydrozoa



- Obelia geniculata is a colonial form.
- It lives in sea water.
- The colony bears a horizontal stem called hydrorhiza, by which it get attached to the substratum.
- The vertical branches. They bear zooids called hydrocaulus.

- The colony is dimorphic because two types of zooids are present. They are the polyp and blastostyle.
- Polyp is nutritive in function.
- Blastostyle is reproductive in function.
- Blastostyle produce medusa by budding.
- Medusa develop gametes, so, they are the sexual forms.
- External fertilization.
- Planula larva is formed. It is minute, microscopic and free swimming.
- It changes to hydrula stage.
- Then develop as a colony.
- Alternation of generation is found.
- It exhibits polymorphism.
- Thus division of labour among zooids is seen.

PLACENTA OF MAN:(mono discoidal)

Placenta is a temporary organ that connects the developing embryo to the uterine wall of mother. It supplies nutritive substances to the foetus, eliminates nitrogenous wastes and CO_2 from the foetus and supplies O_2 to the foetus. It is of various types.

Based on its barriers with the foetus it is classified as,

- Epithelio-chorial,
- Syndesmo chorial
- Endothelio chorial,
- Haemo-chorial and

Haemo-endothelial placenta.

Based on morphology it is classified into, Non-deciduous, deciduous and contra-deciduous type.

Based on the distribution of villi on chorion it is classified into,

Diffuse placenta, cotyledinary placenta, Zonary placenta, Discoidal placenta and meta discoidal placenta.

The placenta of pig is of Diffuse placenta. The villi remain scattered all over the surface of the chorion.

It is non-deciduous type because the blastocyst lies in the cavity of the uterus in contact with the uterine wall.

The blastocyst develops finger like projections.

They penetrate into the depressions in the uterine wall.

In man the placenta is of meta discoidal placenta.

It is restricted to one disc.

In man the villous are single disc shaped. So, it is mono discoidal type.

FUNCTIONS OF PLACENTA:

Supplies nutritive substances to the foetus.

Eliminate excretory products foetus.

Gives protection to the developing embryo.

PLACENTA OF PIG:(diffuse type)

Placenta is a temporary organ that connects the developing embryo to the uterine wall of mother. It supplies nutritive substances to the foetus, eliminates nitrogenous wastes and CO₂ from the foetus and supplies O₂ to the foetus. It is of various types.

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FUNCTIONS OF PLACENTA:

Supplies nutritive substances to the foetus.

Eliminate excretory products foetus.

Gives protection to the developing embryo.

PLACENTA OF SHEEP/GOAT:(Cotylidinary)

Placenta is a temporary organ that connects the developing embryo to the uterine wall of mother. It supplies nutritive substances to the foetus, eliminates nitrogenous wastes and CO₂ from the foetus and supplies O₂ to the foetus. It is of various types.

Based on its barriers with the foetus it is classified as,

Epithelio-chorial,

Syndesmo chorial

Endothelio chorial,

Haemo-chorial and

Haemo-endothelial placenta.

Based on morphology it is classified into, Non-deciduous, deciduous and contra-deciduous type.

Based on the distribution of villi on chorion it is classified into,

Diffuse placenta, cotyledinary placenta, Zonary placenta, Discoidal placenta and meta discoidal placenta.

In sheep and goat the placenta is of cotyledonary type. Here, the villi are found in groups or patches. The remaining place seems to be smooth. The patches of villi are called rosette or cotyledon.

FUNCTIONS OF PLACENTA:

Supplies nutritive substances to the foetus.

Eliminate excretory products foetus.

Gives protection to the developing embryo.

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