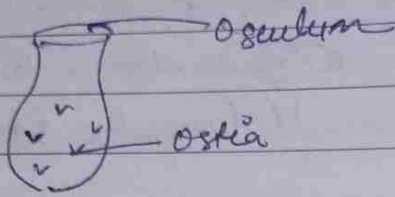


Phylum Porifera

* Pore bearing Animals.

- The branch of science dealing with porifera is Parazology.
- Flask shaped pore bearing.



- ✓ → Cellular level of body organisation.
- Radial symmetry or absent.
- Ectoderm - Pinacoderm, Endoderm - Choanoderm.
- Respiration through body surface.
- Calcareous - skeleton.
- Canal System - Ascon, Leucon or Ragon type.
- Indirect development.
- Intracellular digestion.
- Sessile
- Robert Grant - gave name Porifera.
- Spicules
- Reproduction by budding & gemmule formation.
Eg - Euplectella, Sycon
- Regeneration power.
- Hermaphrodite
- mostly marine but may be freshwater also.
- Lack of Nervous System.

→ Pore bearing.

- They are k/a sponges due to capacity to absorb and with hold fluids

- The phylum porifera includes lowest multicellular animals without tissue grade of organisation, having ~~coarse~~ all pores all over their body & remain fixed to substratum.

- In the ancient time several scientist consider sponges as a plant due to their sessile nature and it was Ellis who 1st observed the animal nature of sponges.

Robert Grant finally proved the animal nature of sponge & used the term Porifera for them.

After sometime sponges put in a separate group Porifera on the basis of their study on physiology & embryology of sponges.

* General characters—

→ Habit and Habitat

Sponges are mostly marine but some of them as freshwater also.

Marine — Leucosolenia and Euplectella (Venus flower basket)
Freshwater — Spongilla.

→ They are multicellular organism & cellular grade of body organisation

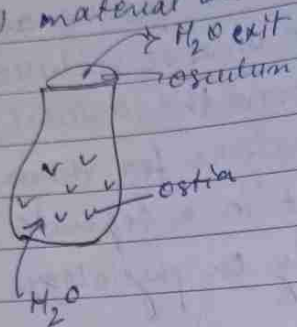
- They may be solitary or colonial but all are sessile.

- The body symmetry is either radial or no symmetry.

- Body wall is diploblastic, which means during development only 2 layer ectoderm & endoderm that give rise to outer Pinacoderm & inner choanoderm.

→ In b/w these 2 layers a gelatinous non-cellular layer called k/a Mesenchyme which is secreted by Pinacoderm & choanoderm.
So these are not truly diploblastic.

→ There is a canal system which is made up of Ostia, Spongocoel & Osculum.
It maintains a constant inflow of water through which nutritive substances come inside the body & excretory (waste) material are thrown out.



This serve as canal system-

- ① Ascon
- ② Leucon
- ③ Sycon.

The body is having skeletal elements which are minute & fibre like k/a spicules.

The spicules can be CaCO_3 , SiO_2 and spongin protein present or absent.

- Digestion - Intracellular
- Respiration - through body surface
- Circulation - Σ the help of amoebocyte called Protophytes
- Nitrogenous waste product - Ammonia.
- Without nervous system.
- Reproduction - asexual by budding gemmule
Sexual - By Ova & sperm (archaeocytes)
- Cross fertilisation, hermaphrodite, monoecious, bisexual.
- Cleavage holoblastic.
- Larvae - Amphiblastula, Rhagon.

Demospongia

Hexactinellida

Calcarea

- Choanocytes cells present
- Great power of regeneration.

Classification

Characteristics	Calcarea	Hexactinellida	Demospongia
1) Habitat	Marine water	Marine water	Marine water / Freshwater (Eg → Spongia)
2) Shape & size	10-15 cm	upto 1m	Much larger (larger in size)
3) Skeleton (Spicules)	CaCO ₃	Silica (SiO ₂)	Present or absent (Silica) (Spongy tissue)
4) Contraction	Absent	Absent	Present
5) Canal System	Ascon type	Leucon type	Rhagon type
6) Choanocytes	Larger	Small	Small
7) Type of spicules	1, 3, 4 rayed Eg → Leucosolenia Sylon Grantia	6 rayed Eg - Sycon (flower basket) Equis (flower basket) Hyalonema (Glass ropes sponge)	1 or 4 rayed Eg - Euporgia (bath sponge) Hippospongia (horse sponge) Cliona (Boring sponge) Chalina (Dead sponge)

phylum Porifera

class

Calcarea
(Calc)Hexactinellida
(Silica)Demospongia
(spongin protein)

2 orders

2 orders

3 subclasses

Homocolla
(Ascon
type)Hetero-
colla(Leucon Sylon
type)

Eg - Sylon

Hexa-asterophora

Spicules

Eg - Euplectella

Amphidiscophora

Eg - Hyalonina
(glass rope sponge)

Tetractinellida

3 orders

Myxospongiata

Carnosa

Charistoidia

Monaxonida

4 orders

Hedromorina

Halichondrina

Paesilascaria

Haploerina

(Eg - Chalina)

Kerotosa

1 order

Eg - Euspongia

(Bath sponge)

Sycon (Crown sponge / Vase sponge)

Systematic Position

Phylum - Porifera

Class - Calcarea

Order - Heterosclera

Family - Syconidae

Genus - Sycon

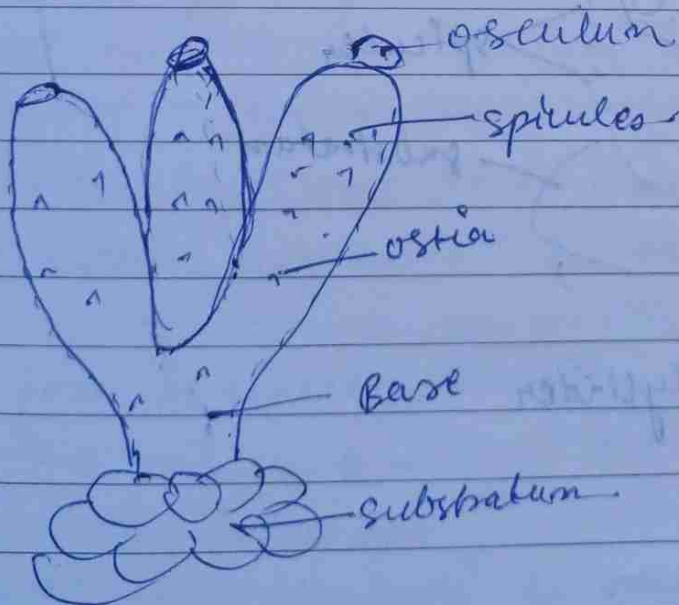
Species - coronata

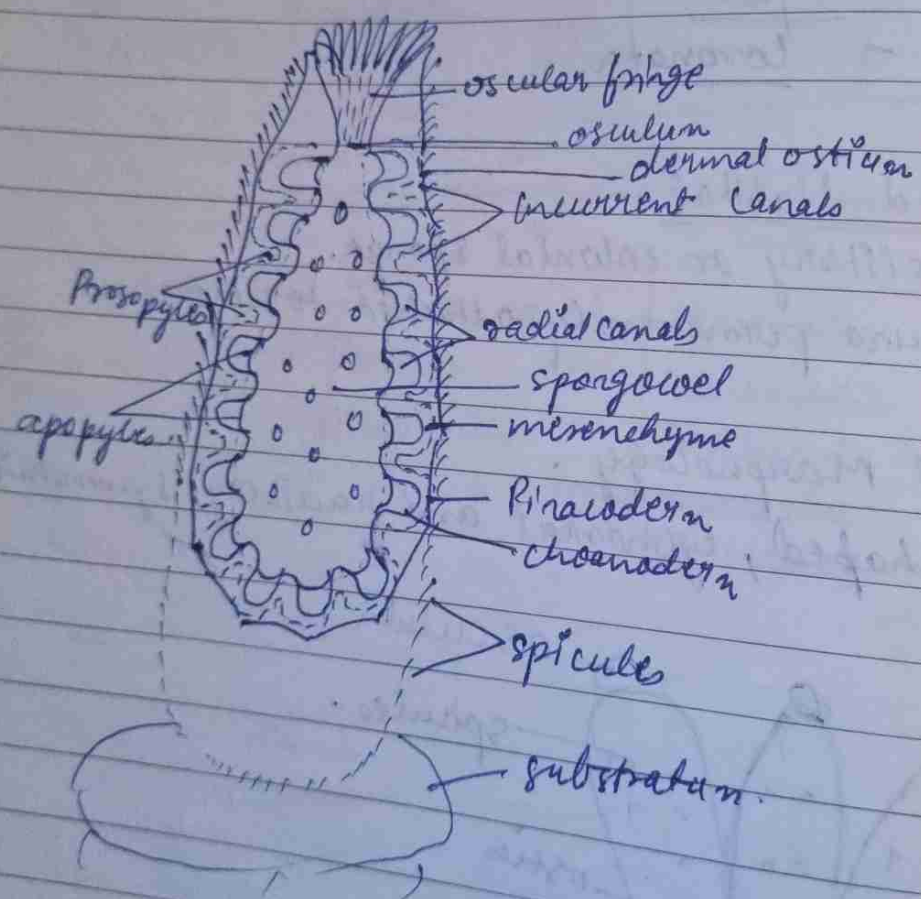
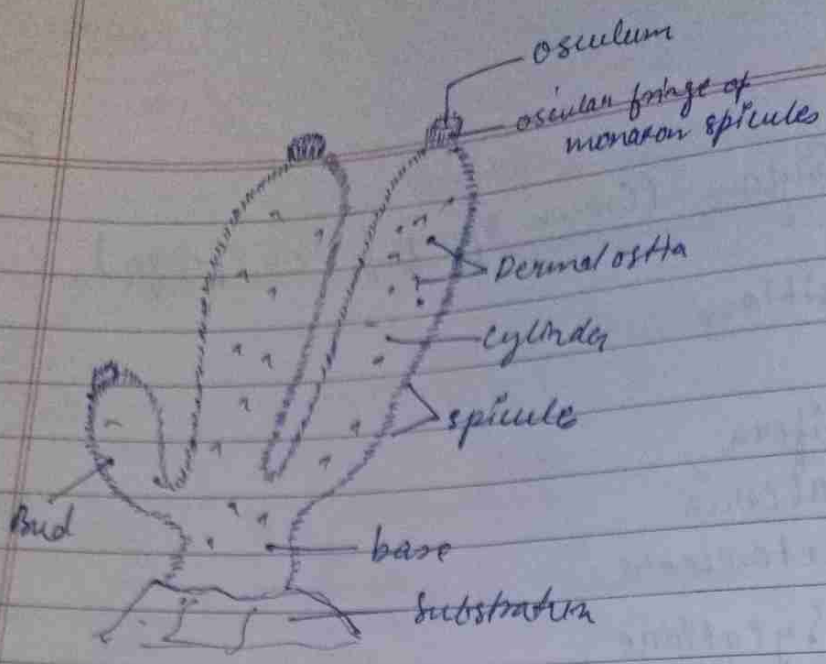
Habit and Habitat

- Marine, solitary or colonial sponge.
- It is found permanently attached to substratum.

External Morphology

Vase shaped, cylindrical and radially symmetrical also.





Sycon - L.S of cylinder



classmate

Date _____

Page _____

Hollow body cavity

sporangia Coelenterata Chordata

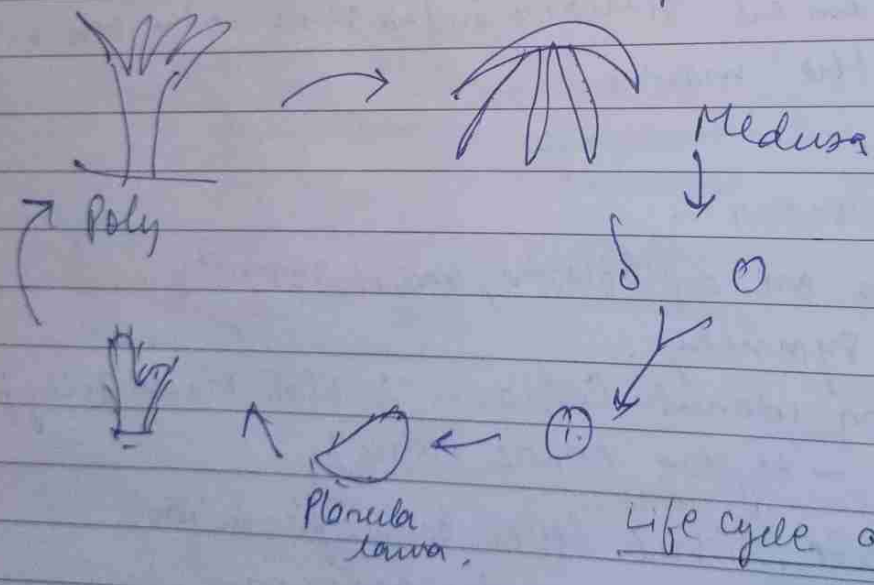
- Most of them are situated on the shore of the sea & are ^{littoral}.
- Some of the mounds,

Choanoderm also called basketoderm.

- Poly form is usually sessile (inactive) & has a cylindrical body & a mouth and tentacles at the upper free end.
Ex - Obolus & Myda.
- Habitat of Coelenterata is saltwater but some live in freshwater.
- They do not have a complete nervous system but they have nerve net.

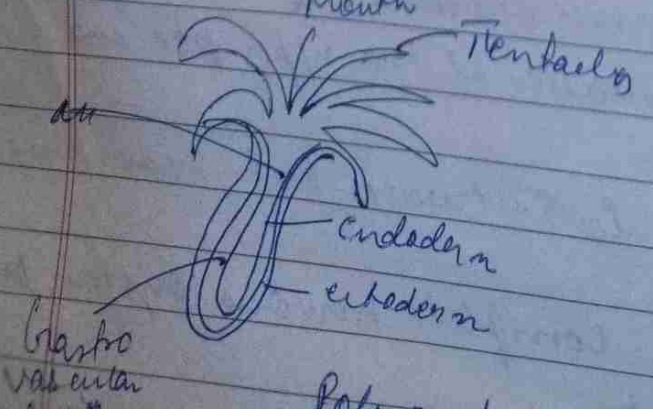
- Coelenterata have a sac like gut which serves as mouth & is surrounded by tentacles. Respire by diffusion across cell membrane.
- Coelenterata have two definite tissue layers - ectoderm & endoderm.
- Stinging cell or nematocyst on their tentacles.
- Reproduction both by sexual & Asexual means.

Polyp	Medusa
→ Asexual	Sexual form
→ Sessile	Active
Eg - Hydra.	Eg - Jelly fish



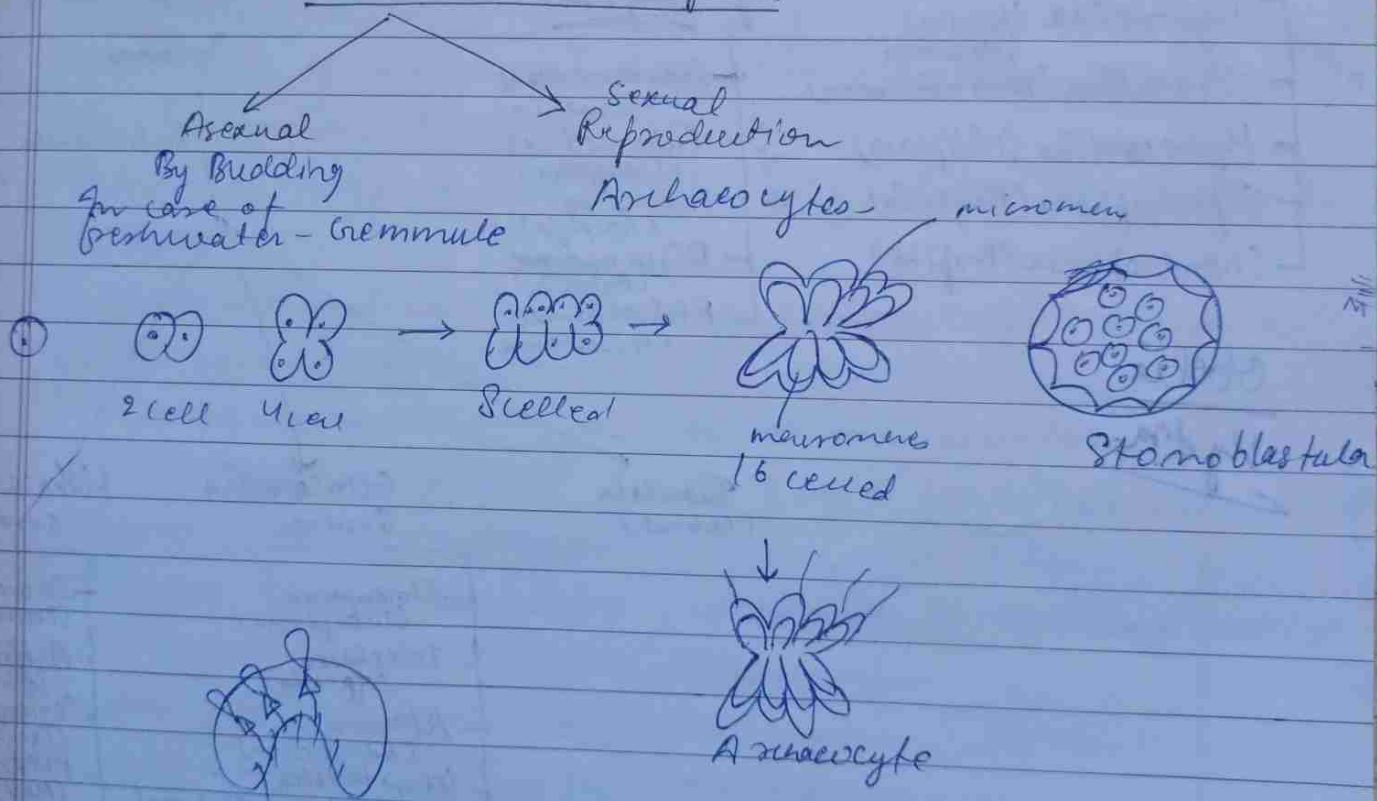
Life cycle of Obelia

Body form of Coelenterata



- * All Coelenterates contain central cavity.
- * Str. of hydra is a typical example of a Coelenterate.
- Mesoglea - jelly like
 - Gastrovascular cavity serves both as a circulatory & digestive ^{system}
 - It is surrounded by an inner layer of the body that is made of secretory cells & columnar cells.
- Hydrozoa → polyp & medusa both, except hydra (only polyp)
- Classification

Reproduction in Sycon



Alternation of generation -

classmate

Date

Page

Classification of Coelenterata

On the basis of types of form Coelenterata phylum is divided into 3 classes.

Coelenterata

① Hydrozoa

(both polyp & medusa)

- Hydrozoa (Hydra) freshwater
- Trachina (Obelia) (marine)
- Hydrocorallina (Milipora)
- Siphonophora (Physalia)
- Chondrophora (Porpita)

Obelia

Hydra

② Scyphozoa

(Medusa)

Exclusively marine & solitary forms

Eg - Jelly fish

- Stauromedusae (Leutemaria)
- Cubomedusae (Charybdea)
- Coronatae (Periphylla)
- Discomedusae (Aurelia)
- Rhizostomae (Rhizostoma)

③ Anthozoa

(always polyp stage) always sedentary.

Classes

Sub classes

Tabulata (extinct)

Octocorallia
Orders

- Stolonophora (Tubiphorina)
- Telestacea (Tetras)
- Acyonaceae (Acyonium)
- Coenothecalia (Metopora) - Blue coral
- Gorgonaceae (Gorgonium)
- Pennatulaceae (Pennetula)

Hexacorallia
Orders

- Zoanthidea (Zoanthus)
- Actinaria (Actinia)
- Ceriantharia (Cerianthus)
- Madreporaria (Madrepora)
- Antipatharia (Antipathes)

Stackhorn

Fungia (Mushroom coral)

Hydra have only polyp stage. It is not sedentary. It is not the exception of Hydrozoa.

Obelia

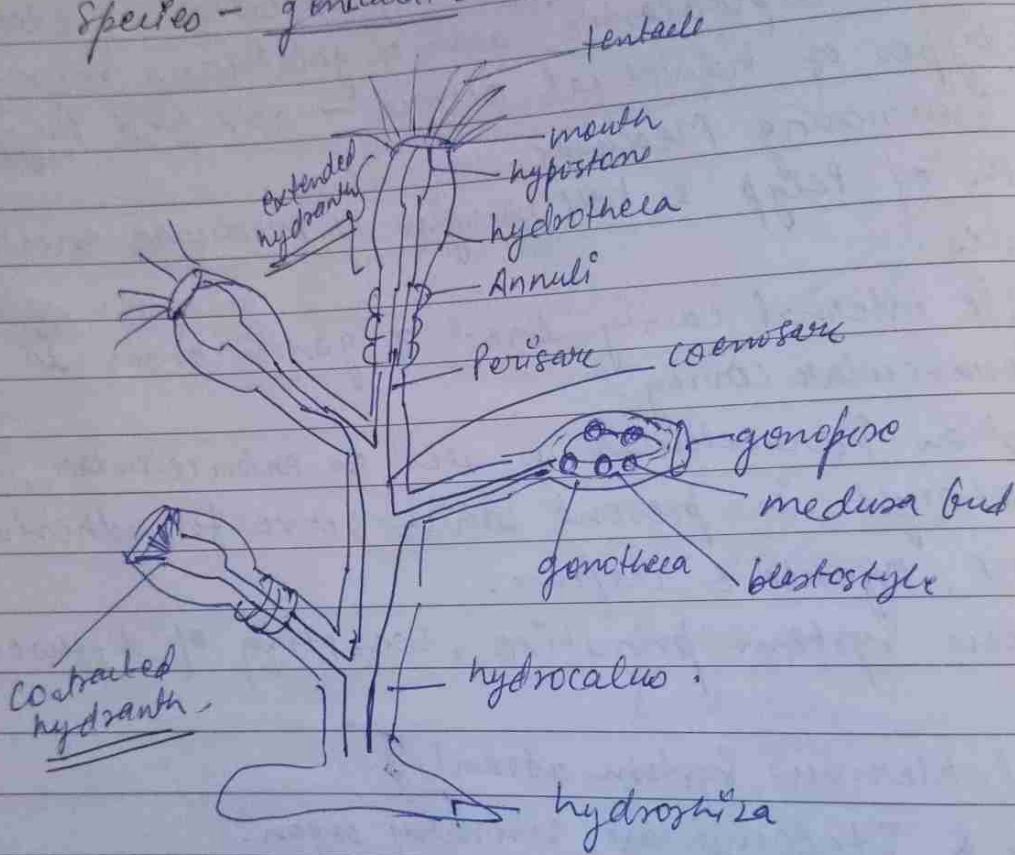
General characters—

- The Phylum Coelenterata includes organism with Tissue grade of organisation.
- All are aquatic, some freshwater & mostly marine.
- Solitary or colonial, sedentary or free living.
- Symmetry radial or biradial.
- Exoskeleton chitinous (perisarc) or calcareous (corals).
- Body wall diploblastic with a gelatinous mesoglea.
- Two types of individual occurs - attached Polyp & free swimming Medusae.
- Mouth of Polyp & bell margin of Medusae encircled by tentacles.
- A single internal cavity lined w. gastrodermis is called gastrovascular cavity.
- Digestion intracellular as well as extracellular.
- nematocyst is present which serve for adhesion, food capture, offense & defense.
- Nervous System primitive, consisting of diffused nerve net.
- Central Nervous System absent.
- Ocelli & Statocyst are sensory organ.
- Asexual reproduction by budding & sexual reproduction by ova & sperm.
- Sexual form monoecious or dioecious.
- Development indirect w. planula larva.
- Life cycle shows alternation of generation & a Metagenesis.

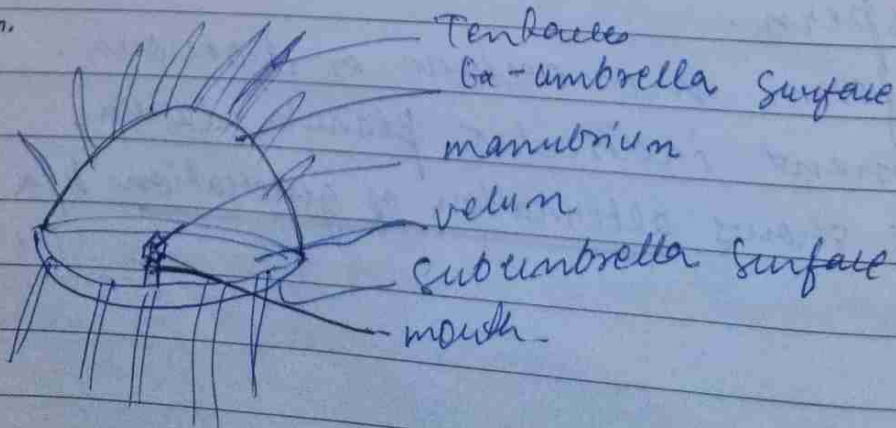
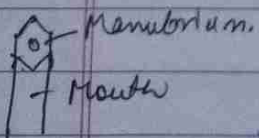
Obelia

Systematic Position

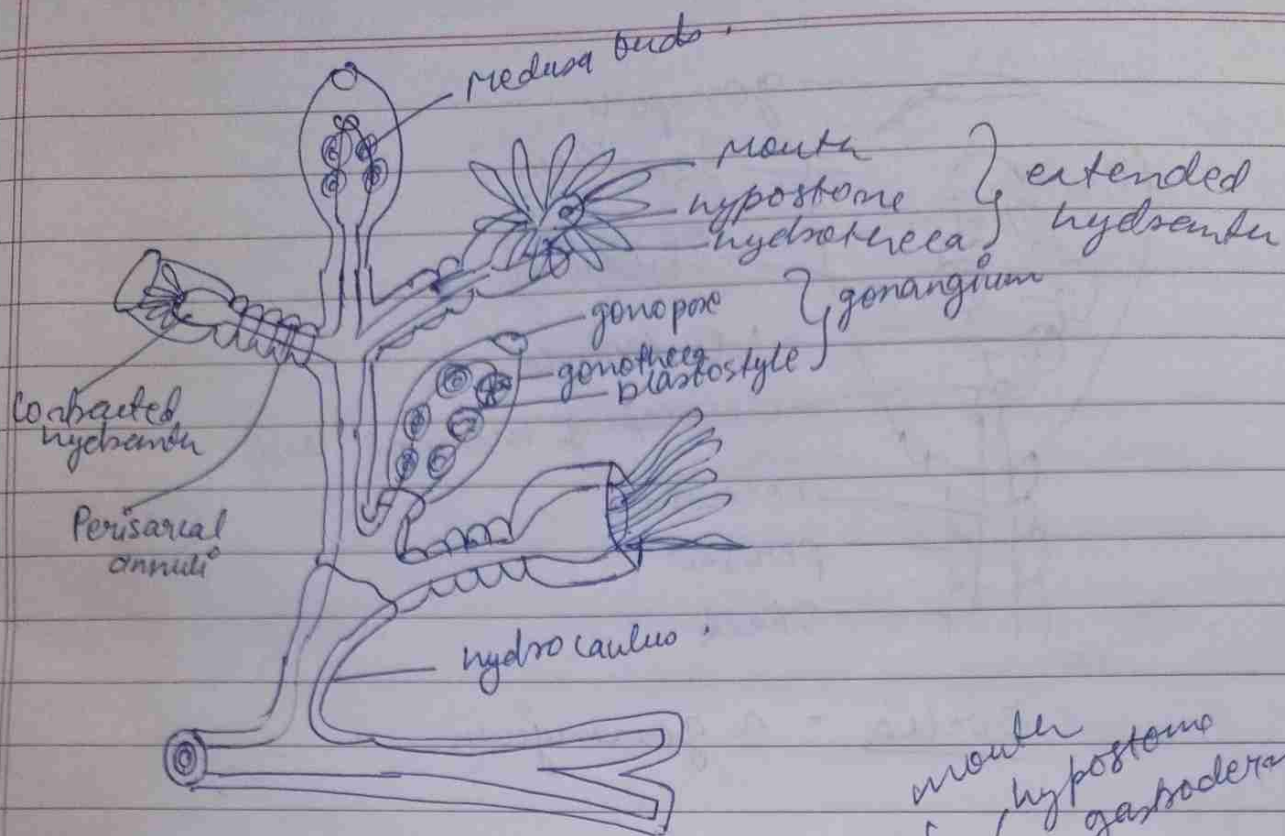
Phylum - Coelenterata
 Class - Hydrozoa
 Class - Hydroida
 Family - Euopidae
 Genus - Obelia
 Species - geniculata



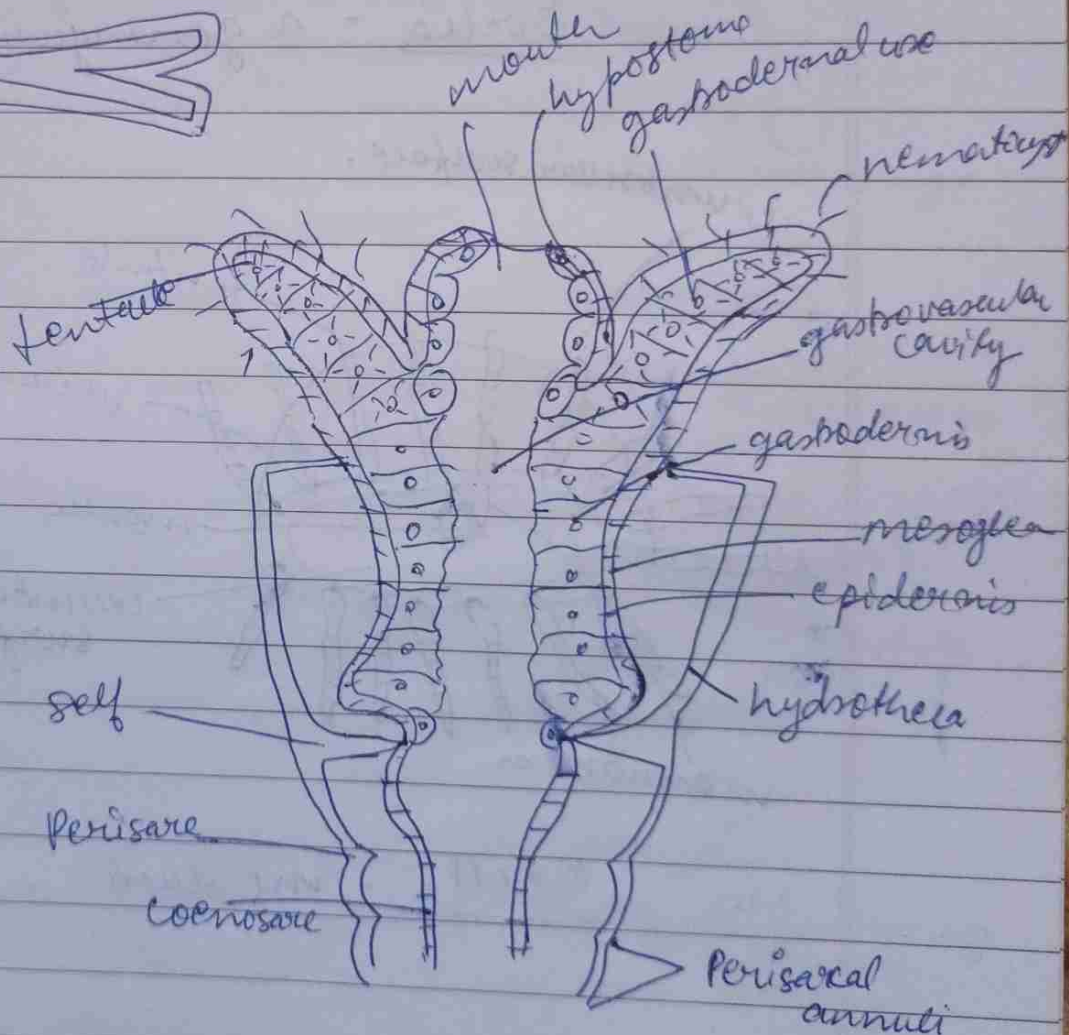
Obelia: Polyp stage (Cemeter)



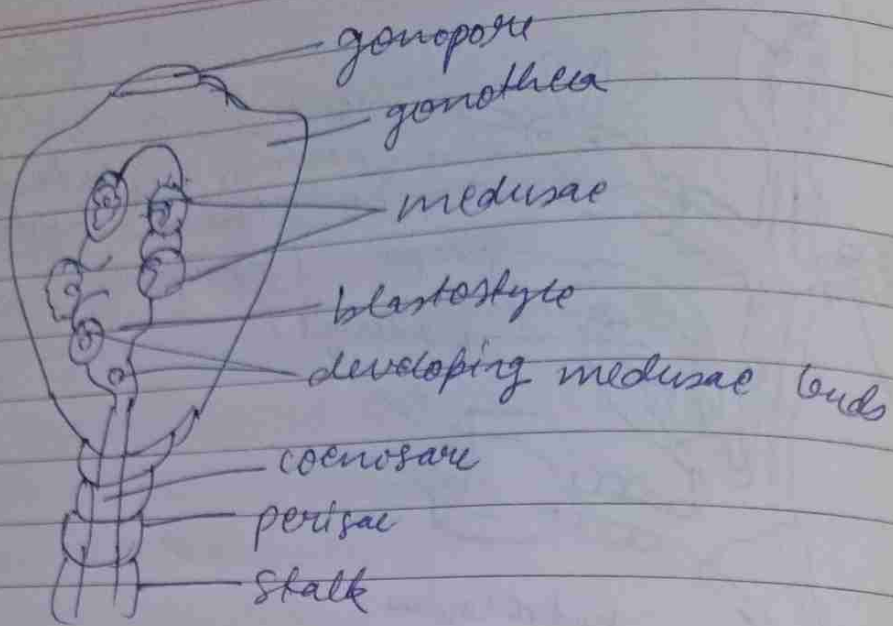
Medusa stage (active)



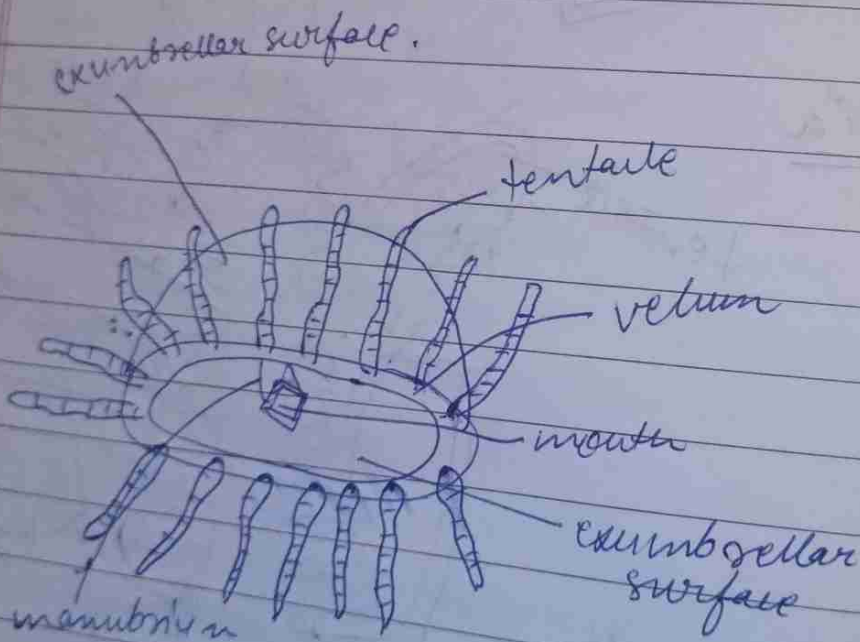
Obelia



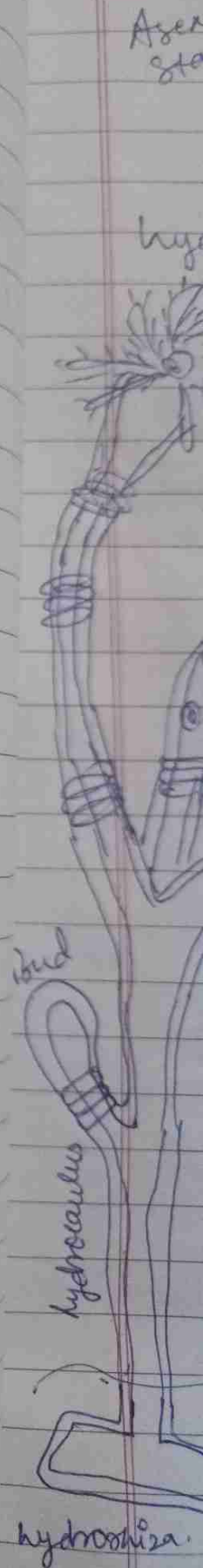
Obelia: A hydrambu in V.S



Obelia - a gonangium

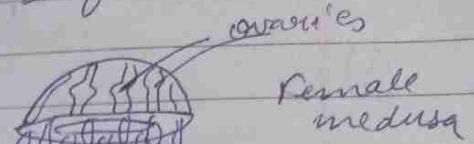
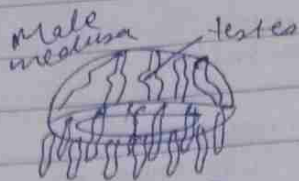


Obelia - medusa



Asexual stage

Sexual stage



Hydranth spread

Sperm

Ovum

Zygote

2-cell stage



blastula



planula settles down

young polyp



Hydranth contracted

Hydrula budding

Bud

Hydrocaulus

Hydrozoa

Life cycle