LABORATORIO: Parte 2

Filo Cnidaria

EJERCICIO 8
121-138-120 (EDITION 14TH)
119-133 (EDITION 15TH)
Goals for today

• Learn to recognized the Phylum **Cnidaria** from other animals
• Learn the main ‘diagnostic’ characteristics
• Learn about some cnidarians biology
• Learn about the internal anatomy of anemones
Cnidaria

Radiate Animals

- True multicellular animals
- Radial or biradial symmetry
- Simplest animals having a tissue level organization.
- However, tissues of radiates are not organized into organs having specialized functions.
Cnidaria

Main characteristics of cnidarians are:

- **Diploblastic**: two germ layers (ectoderm and endoderm).
- Internal space for digestion = **gastrovascular cavity**.
- **Mesoglea**: is a thin non cellular layer
- Some have a skeleton (corals) but most radiates, have fluid in their gastrovascular cavity, and serves them as **hydrostatic skeleton**.
Cnidaria

Main characteristics of cnidarians are:

- Cnidarians have **cnidocytes**

- **Cnidocytes** contain stinging organelles called **nematocysts**

- Each nematocyst contains a tiny capsule with a coiled thread like filament that injects a paralyzing toxin

See video of nematocist sorry is in french! But excellent visualization of this works
Cnidaria

Main characteristics of cnidarians are:

• Polymorphism- some species of cnidarians have more than one morphological kind of individual
  • Polyp (hydroid) = sessile
  • Medusa (jellyfish) = free-living

Polyps = may reproduce by budding to form clones or colonies
Medusas = reproduced sexually
# Cnidaria: Classification

## Classes:

### Hydrozoa:
- Both **polyp** and **medusa** stages present
- Medusa with a velum
- Fresh and marine water
- **Examples:** *Hydra, Obelia, Physalia*

### Scyphozoa:
- Medusa stage emphasized
- Medusa without velum
- **Polyp reduced or absent**
- Enlarged mesoglea
- Solitary
- **Examples:** *Aurelia*

### Anthozoa:
- All polyps
- No medusa
- Gastrovascular cavity is subdivided by mesenteries (septa).
- **Examples:** *Metridium, corals*

### Other classes for which we don’t specimens but that you should know about:
- Cl. Staurozoa
- Cl. Cubozoa
Cnidaria: Your Tasks

**Exercise 8A:**

- Phylum: Cnidaria
- Class Hydrozoa
  - *Genus: Hydra*

**Hydras** are freshwater solitary **polyp** forms, but are **atypical** hydrozoans because **they don’t have medusa stage.**
Cnidaria: *Hydra*

1. Look at a slide of *Hydra* body parts: hypostome, mouth, tentacles. Can you see the basal disc?
Cnidaria: *Hydra*

1. If you have a cross section of Hydra, try to identify the following structure.
Cnidaria: *Hydra*

2. Hydras reproduce asexually. Check if your slide of hydra has a bud.
Cnidaria: *Hydra*

2. Some hydra species reproduce sexually. Some species have separate sexes (*dioecious*) or an individual may have both (*monoecious*). Your instructor has hydras with ovaries. For comparison look at this photo of an hydra with testes.
Cnidaria: *Hydra*

3. Your instructor has staged a slide of an Hydra nematocysts
Cnidaria: Something you should know

Exercise 8A:

– Phylum: Cnidaria
  – Class Hydrozoa
    • Genus: Physalia

Physalia physalis “The man-of war” is often mistaken for a jellyfish. However, this animal is a floating hydrozoan colony, made up of four polyp types: pneumatophore (float), dactylozooids (tentacles for defense and prey capture), gastrozooids (feeding), and gonozooids (reproduction).

Look at the preserved Physalia
Exercise 8A:

- Phylum: Cnidaria
- Class Hydrozoa
  - Genus: Obelia

*Obelia* is a marine colonial hydroid. *Obelia* has both polyp (hydroid) and a tiny medusa (jellyfish).
Cnidaria: *Obelia*

1. Look for your slide of *Obelia*. The colony:

- **Coenosarc**: Living part of the colony stem
- **Perisarc**: Non-living protective cover that protects the coenosarc
1. Look for your slide of *Obelia*. Reproductive polyps
1. Look for your slide of *Obelia*. Feeding polyps

*Hydrant*
Feeding polyp that captures and ingests prey

*Hydrotheca*

500 µm

*Obelia* hydroid
Cnidaria: *Obelia*

1. Look for your slide of *Obelia*. The cycle

The life cycle of *Obelia* alternates between a sessile polyp stage and a swimming medusa stage.
2. Look at the slide of the tiny *Obelia* medusa. Medusas are dioecious
Exercise 8B:

- Phylum: Cnidaria
  - Class Scyphozoa
    - Species: Aurelia aurita

*Aurelia aurita* “moon jelly” is a marine scyphomedusa. The *mesoglea* is thicker. Sexes are separate. The gastrovascular system has more canals. They have a tretamerous radial symmetry.
1. Take a look of scyphomedusa body parts

A= mouth
B= Gonad
C= oral arm
D= gastric pouch
E= radial canals
F= ropalium (sense organ containing statocyst and ocellus)
Cnidaria: *Aurelia*

2. *Aurelia aurita* life cycle

- Larvae planula
- Strobila stages
- Medusa
- Ephyra
Metridium senile is a common species in northern seas. They often reproduce asexually by pedal laceration, and are said to be capable of binary fission as well. Sexual reproduction also occurs. Diet is mostly small zooplankton, though they may also eat small benthic polychaetes, fish, and squid.
Cnidaria: *Metridium*

1. Take a look at the external anatomy

- A = mouth
- B = oral disc
- C = tentacles
- D = column
- E = acontia (armed with nematocysts)
- F = pedal disc
Cnidaria: *Metridium*

1. Take a look at the internal anatomy
Cnidaria: Your Tasks

Exercise 8C:

- Phylum: Cnidaria
  - Class Anthozoa
    - Corals
Cnidaria: *Corals*

1. Observed the coral examples in the table. Make sure to note differences between them and the sponges!

Corals are marine, typically living in compact colonies of many identical individual "polyps". The group includes the important reef builders that inhabit tropical oceans, which secrete calcium carbonate to form a hard skeleton.

wikipedia
Cnidaria: Your Tasks

1. Observed the coral examples in the table.

A coral "head", which appears to be a single organism, is a colony of myriad genetically identical polyps. Each polyp is typically only a few millimeters in diameter.

Individual heads grow by asexual reproduction of individual polyps. Corals also breed sexually by spawning. Polyps of the same species release gametes simultaneously over a period of one to several nights around a full moon.
Cnidaria: Your Tasks

Blanqueamiento de Corales

Although corals can catch small fish and animals, such as plankton, using stinging cells on their tentacles, most corals obtain the majority of their energy and nutrients from photosynthetic unicellular algae called zooxanthellae.

El blanqueamiento en los corales o "coral bleaching" se refiere a la pérdida o expulsión de zooxantela en las anémonas, corales y otros organismo fotosintéticos, así como también a la reducción de pigmentos en la zooxantela cuando la misma expulsa las proteínas que caracterizan su color.

What are the consequences of bleaching for the reef?
Important Links

Cnidaria

http://www.ucmp.berkeley.edu/cnidaria/cnidaria.html

http://biodidac.bio.uottawa.ca/Thumbnails/searchresults.htm?
frompage=1&StartRow=513&sujet=&formattype=&auteur=Houseman&keyword=&phylum=&datesoumis=&maxrows=64

http://www.biology.ualberta.ca/courses.hp/zool250/Labs/Image-key.htm

http://www.biol.wwu.edu/donovan/biol460/Biology_460.html