Snails

BY

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Phylum mollusca include snails and slugs.

Snails are the most important group of molluscs which play an important role as I. H for parasites

CLASS GASTROPODA

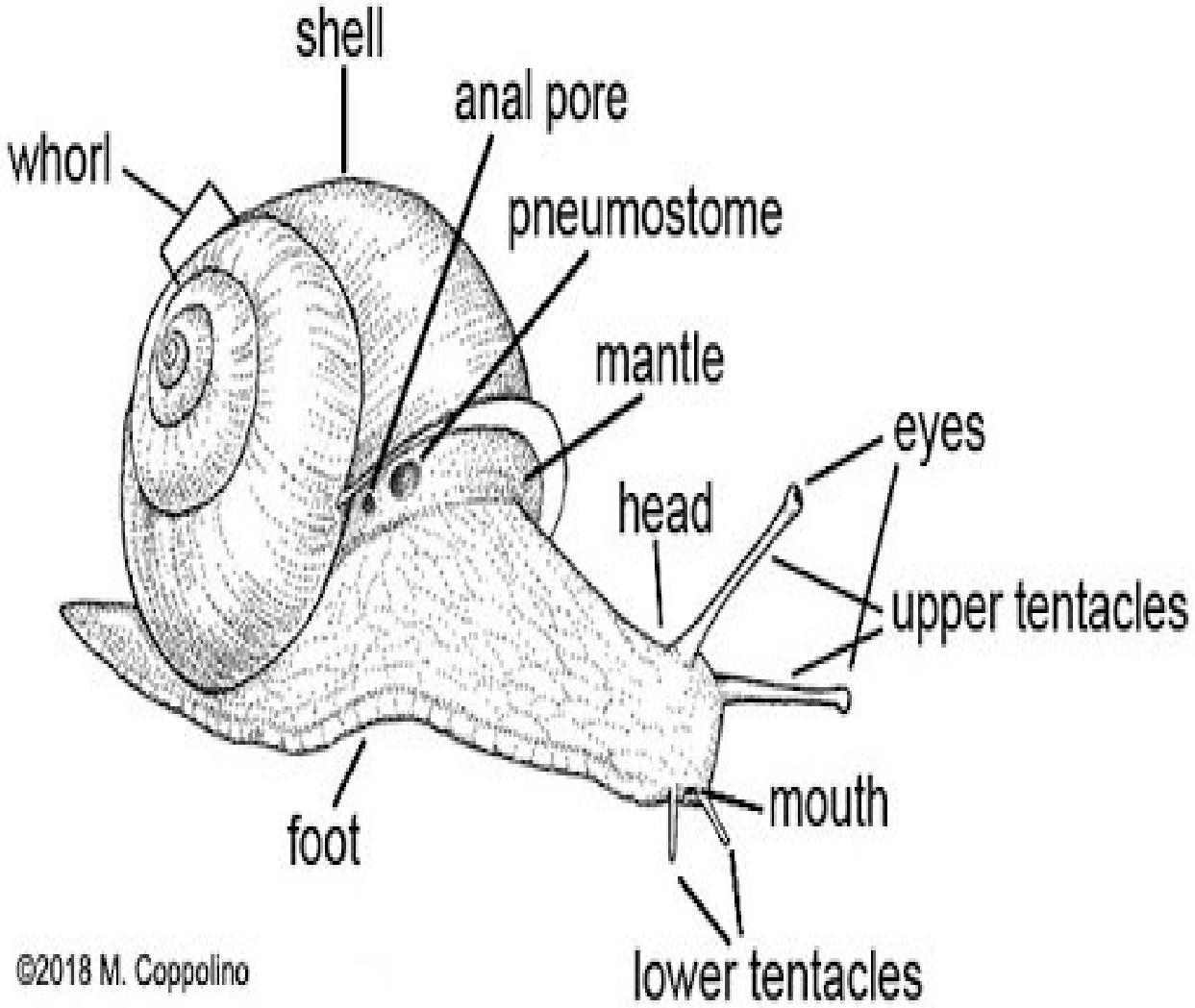
MANTLE

- TISSUE THAT SECRETES SHELL

RADULA

- ROWS OF RASPING TEETH FOR GRAZING
- MODIFIED IN PREDATORS

PARTS OF A SNAIL



Classifications of snails

Acc to habitat:

1- fresh water snail

2- brackish water snail

3- amphibian snail

4- land snail

Acc to morphology

1 - Typical (elevated) form

R handed snail (dextral), L handed snail (sinistral)

2- button shape (discoidal)

R handed snail, L handed snail

Fresh water snail

1 *-Lymnaea cailliaudi*

2- *Lymnaea stagnalis*

3- *Lymnaea truncatula*

4- *Cleopatra bulimoides*

5- *Cleopatra cyclostomoides*

6- *Bulinus truncatus*

7-Biomphalaria alexandrina

8- *Physa acuta*

9 - *Melania tuberculata*

Brackish water snail

Pirenella conica

Amphibian snail

vivipara

Land snail

Hellicella

zebrina

Typical form
1- R handed snail

* With large aperature lymnaea
* With umblicus as vivipara
* With stripes w may be logitudinal as zebrina or transverse as cleopatra
* With tubercles which may be corse as pirenella conica or fine as melania tuberculata

2 - L handed snail

With blunt apex as bulinus spp

With pointed apex as physa acuta

Button shaped

R handed snail as Helicella

L handed snail as Biomphilaria

5 long spire (L. caillaudead, L. stagnalis, melania tuberculata, pirenalla conica, zebrina)

5 short spire (L . Trancatula, physa, bulinus, biomphilaria, hellicella)

3 medium spire (c. bulimoides, c . Cyclostemoides, vivipara).

I. Fresh water snails:

Lymnaea cailliaudi

Morphology:

Right handed (dextral)

thin shelled (fragile)

a sharp or pointed apex

Spire is long

body whorl large

the aperture oval and wide.

Medical importance:

I . H for *Fasciola gigantica*

first I . H for *Echinostoma revolutum*.

LYMNAEA SP.

2- *Lymnaea stagnalis*

Morphology:

Right handed
large sized
thick shelled
ill-defined sutures
wide aperture.
The spire is long
the apex is pointed.

Medical importance:

I .H for *Fasciola gigantica*, *Fasciola hepatica* & *Echinostoma revolutum.*

3- *Lymnaea truncatula*

Morphology:

Right handed

small in size

brown in color

The aperture is relatively wide.

The spire is short

the apex is pointed.

Medical importance:

I . H for *Fasciola hepatica*

4- *Cleopatra bulimoides*

Morphology:

Right handed
thick-shelled
with medium spire
blunt apex,
oblique whorls which provided with dark brown bands
shallow sutures
smooth shell
The aperture is narrow and provided with operculum in living snails.

Medical importance I. H for *Gastrodiscus aegyptiacus*.


5mm.

5- *Cleopatra cyclostomoides*

Morphology:

Similar to *Cleopatra bulimoides* but the whorls are whitish in color.

Medical importance:

I. H host for *Gastrodiscus aegyptiacus*

6- *Bulinus truncatus*

Morphology:

Left handed

short spire

blunt apex

smooth and thin-shelled

relatively large body whorl.

Medical importance:

I . H for *Paramphistomum, Cotylophoron, Echinostoma,* and *Schistosoma haematobium*

7- *Physa acuta*

Morphology:

Left handed

pointed apex

thin-shelled

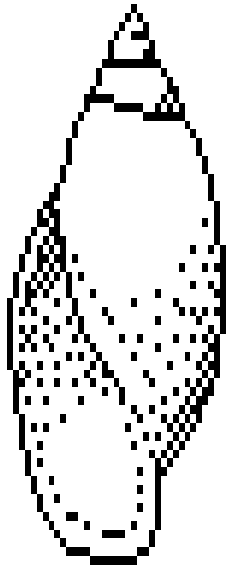
slightly oblique whorl

less deep sutures

the aperture is relatively wide.

Medical importance:

I . H for *Echinostoma revolutum.*



8- *Biomphalaria alexandrina* (*Planorbis boissyi*)

Morphology:

Left handed
discoidal (button-shape)
has a smooth shell.

Medical importance:

I. H for C. gregarius, *Paramphistomum, Cotytophoron,. Echinostoma revolutum* and *Schistosoma mansoni.*

9- *Melania tuberculata*

Morphology:
Right handed
long spire
shell is ornamented with tubercles arranged in numerous rows (more than 4)
aperture is oval.

Medical importance: First intermediate host for *Echinostoma revolutum.*


Red-rim Melania

10- *Lanistas bolteni*

Morphology:

Large-sized

left handed

short spire

blunt apex,

convex whorl

deep sutures and smooth shell

Large umbilicus is present.

Medical importance: I . H for *Echinoparaphium sp*. (trematode) and *Angiostrogylus sp*. (nematode).

2 Brackish water snails:

Pirenella conica

Right handed

conical in shape

long spire

Sharp apex

The whorls are less oblique

the shell is ornamented with coarse tubercles arranged in 1-4 rows.

Syphonal notch is present.

Medical importance: First I . H for *Heterophyes heterophyes.*

Amphibian snail

Vivipara vivipara

Morphology:

Right handed

medium spire

sharp apex

convex and oblique whorls

deep sutures

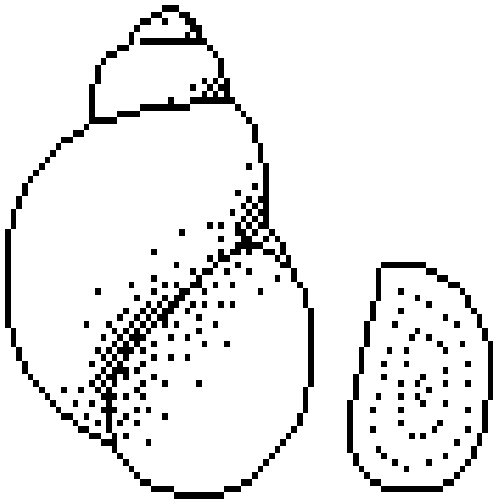
smooth shell

small umbilicus.

The aperture is oval, relatively narrow and covered with operculum in living snails.
This species of snail is unisexual.

Medical importance:

Second I . H for *Echinostoma revolutum.*




S. Ghesquiere

Land snails:

Helicella species

Discoidal in shape
right handed
white or whitish in color.

Medical importance: First I . H for *Dicrocoelium dendriticum.*

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Zebrina species

R handed snail
Long spire
Blunt apex
Thick-shelled
white color with longitudinal marbled ornamentation.

Medical importance: First I . H for *Dicrocoelium dendriticum*

control

The control measures depend in

1- on snails surveys at the defined area to determine the extent of their distribution.

2- Maps of the area with scales must be drawn starting with the main water sources, then branches and finally the peripheral tributaries in the investigated area.

3 - The length, width, depth, type of waterway, the vegetation, system of irrigation and the season.

The main control measures are physical, chemical and biological means.

Physical methods:

1- Improvement of irrigation and drainage by:

- Increase the slopes of canals to avoid standing water.
- Diverting their courses by pitching of banks with limestone to prevent growth of aquatic plants
- Substituting canals and drains by under ground pipes.

2- Canal clearance every two months from aquatic vegetations.

Biological control:

Several species of animals and plants were reported to decrease the number of snails as:

Palm-leaf traps:

They are distributed in the main canals in Egypt, and pulled off at short intervals, then destroying the attached snails. This help in the reduction the number of *Bulinus truncatus* snail.

b- <u>Aquatic birds (ducks & geese)</u>:

They can feed on these snails and decrease their numbers.

c- <u>Some plants</u> as:

- *Calendula micranth* (*Saponin triterpene*) used as a molluscicide against some snails. The plant flower, dried, powdered and extracted in 1 % concentration kills the snails.

- *Synadenium grantii* used as a molluscicide (the whole plant was shade dried, finally powdered, extracted in 1% concentration to kill the snails).

d. <u>Some agents</u>: as competitors and predators are parasitized on the present snails such as:

- Some predators as algae; *Chlorophyta spp. Closterium & Cladophorales spp.* attached to the shell and egg masses leading to complete death o the snails or the embryos.
- Different species of fungi as *Catenaria* destroying egg-masses of the snails.
- Some gram negative bacteria as *Bacillus pinoti* have high destructive ability against most of the aquatic snails.
- Some protozoa as ciliates of the genus *Conchophirius* and flagellate as *Dimoeriopsis destructor* recorded to destruct the snails.

Flat worms as *Notocotyle attenuatum*, a trematod
of ducks, cause castration of the snails.
- Larvae of helminthes including *Schistosoma* ha
decreased the survival and fertility rates of snails.
- Infection of the snails by *Echinostoma spp*. lead
to reduction in snail population in the area due t
parasitic castration and high mortality.
-Nematodes of *Dorylaimus spp* causing mortality ir
Lymnaea snails.
-Annelids as Leech, *Helobdella fusca* were
effective in the destruction of the smaller snails.

- Reptiles also acted as biological agents against snails.

Many fresh water fishes utilized molluscs as a - source of food.

- Some species of water mites kill aquatic snails.

- Crustacea as one small carp; can suppress *Lymnaea* snails in 6 square feet

Some arthropods as:

- Beetles and glow worms; *Dytiscus marginalis* (carnivorous beetles),
destroy *Lynmaea stagnalis* snails.
- Aquatic larvae *of Luciola cniciata* had fed upon some species of *Lymnaea, Planorbis, Melania & Onchomelania*.
- Tabanid flies larvae can fed upon aquatic molluscs.
- Larvae of some Diptera can kill the small snails or eat the eggs

Chemical control:

It is represented by the application of molluscicides.

The most common used molluscicides are copper sulphate (15-20 p.p.m)

Bayluscide (0.2-0.5 p.p.m.)

Mollutox (0.5 p.p.m)

Other applicable molluscicides as Sodium pentachlorophenate (5-10 p.p.m.) and Dintro-O Cyclohexyl-phenol (3 p.p.m.)