Phyllum: Mollusca

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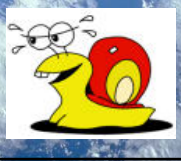


Status of mollusc in the Zoological system

COELOMATA

A. Schizocoelia - coelom develops from teloblastic strip (base Blastomere 4d)
if the single point > Type Oligomeric
three phyllums: **Mollusca** (coelom occupies only a small part of the primary body cavity, the rest of it is mesenchyme)
Sipunculida (coelom fills the whole body and is earmarked ring, which backs around the mouth, antennae here)
Echiurida (coelom fills the whole body uniformly)
if the embryo is based at least in terms of number of pair follicles > Polymer Type
five phyllums: **Annelida**
Onychophora
Tardigrada
Pentastomida (the old concept, now they are crustaceans)
Arthropoda

B. Enterocoelia – coelom is directly from the wall of the intestine

Phyllum: Mollusca

Size: from 1 mm to 30 m, the number of species: up to 130 000

Cutting the subphyllum by nature cover the body:

1. Subphyllum: ACULIFERA
- Classis: **Aplacophora**
- Classis: **Polyplacophora**

2. Subphyllum: CONCHIFERA
- Classis: **Monoplacophora**
- Classis: **Gastropoda** (Snails) based on location and type of respiratory:
  - Subclassis: Prosobranchiata
    - Ordo: Diotocardia
    - Ordo: Monotocardia
  - Subclassis: Opisthobranchiata
  - Subclassis: Pulmonata
    - Ordo: Basommatophora
    - Ordo: Stylommatophora

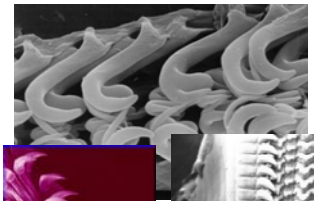
(Alternative separation gastropods from the pleurovisceral connective, there is a transition in the case of separation by breathing. org.: tropical group Soleolifera
- Subclassis: Streptoneura = Prosobranchiata
- Subclassis: Euthyneura = Opisthobranchiata + Pulmonata)
- Classis: **Scaphopoda**
- Classis: **Bivalvia** (Shells)
  - Ordo: Protobranchiata
  - Ordo: Filibranchiata
  - Ordo: Eulamellibranchiata
  - Ordo: Septibranchiata
- Classis: **Cephalopoda**
  - Subclassis: Tetrabranchiata
  - Subclassis: Dibranchiata
    - Ordo: Decabrachia
    - Ordo: Octobrachia

Basic characteristics of Phyllum

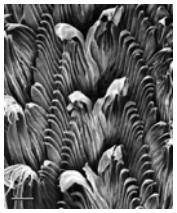
- The body usually divided into head, foot and digestive gland
- Create conchs
- Body cavity is coelom type
- Two types of muscle: retractors, adductors
- Shell cavity
  The default type of the nervous system is amfineuric, concentration and move of ganglia to the head
- Statocysts, osfradia
- The through digestive system, radula, hepatopancreas, digestion of cellulose
- Metanefridia
- Open vascular system (1 to 4 cardiac hall)
- Breathing through ktenidia, lung

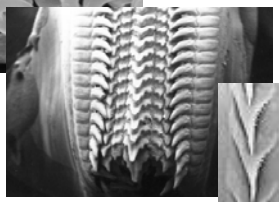
Beauty of Radulas

Radula arises from specialized cells



Radula has specific characteristics





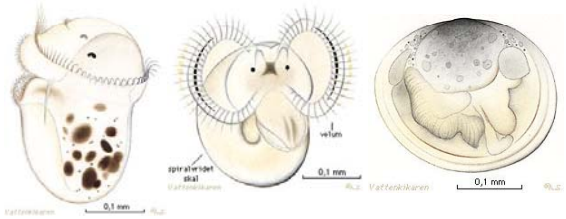
Serves the scaling of food

Reproduction

- Native Gonochorism
- External and internal fertilization
- Asexual reproduction is not known
- Hermaphroditism
- Very rarely appears self-fertilization

Developmental stages of molluscs

- In the marine environment, the eggs hatch larvae: Trochofora type, Veliger type of snail and clam
- In fresh water bivalve larvae as call glochidia

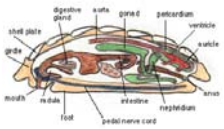


Subphyllum: ACULIFERA

Characters: low level of cephalisation, amfineuric

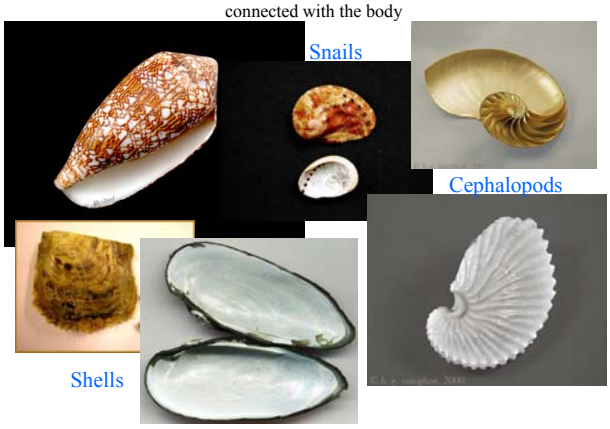
Classis: **Aplacophora**
Characters: body like worm, leg crease dull abdominal, primitive radula
Species: ***Chaetoderma productum***

Classis: **Polyplacophora**
Characters: ventrally visible head, on the surface of 8 plates, primitive shell cavity with a large number of ktenidia, metanefridie
Species: ***Chiton olivaceus:*** 3 – 5 cm, perinotum (border), was able to furl in part, nocturnal animal, external fertilization, movement of sperm, larvae, tropical species are up to 30 cm

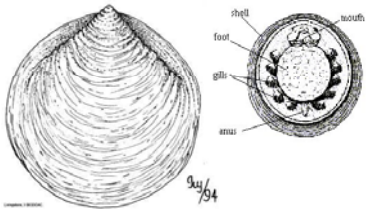


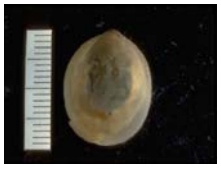
Subphyllum: CONCHIFERA

Characters: well-developed head, characterized by open conchs connected with the body



Classis: **Monoplacophora** (older systems this classis sometimes excluded from Conchifera, while they should shell, but other nervous system)
Characters: conch, 8 muscle indentation, circular foot, 5 pairs of ktenidia, amfineuric, 6 pairs of nefridia, 2 pairs of gonads, 2 pairs of inlet veins to the heart, coelom forms a cavity of the gonads and pericardium, long a fossil, as the Devonian (400 million years ago)
Shortcut: *Neopilina galatheae* - discovered in the deep ditch in 1951-52 by the Danish expedition in the Pacific Ocean 300 nautical miles west of Mexico and Costa Rica, now known more recent species!



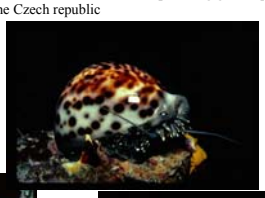


Classis: **Gastropoda** (Snails)
Characters: loss of bilateral and radial symmetry - a spiral winding of the shell, head with antennae, division based on location and type of respiratory, shell usually clockwise (! Exceptions), perhaps the secondary reduction, cerebral ganglion, pedal, pleural, parietal, visceral ganglia, during phylogenesis streptoneuric, eutyneuryc, osfradia, statocysts, eyes, radula, specialization of teeth, saliva with sulfuric acid, pericardial heart sac, 1-2 hallway, head and visceral arteries, with or without hemolymph mechanical function, kidneys; ktenidia breathing initially, then the blood circulation inside wall tires; gonochorists and hermaphrodites, unpaired gonads, duct behind the right tentacle, external and internal fertilization, very rarely self-fertilization, accessory glands, proteins, arrow bag, penis up to 10 x longer than the body, on direct the development of land, sea sometimes larvae (approximately 60% of marine species, 30% land, 10% of freshwater)

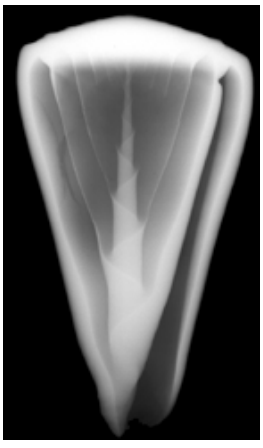
Subclassis: Prosobranchiata
Characters: ktenidia, the heart foyer, gonochorists, shell with a permanent lid (operculum)

Ordo: Diotocardia
Characters: Both cardiac vestibule present, 2 to 1 ktenidium, pearl shell layer
Species: Vulgate ***Patella*** (limpet), ***Haliotis*** (abalone), ***Theodoxus danubialis***

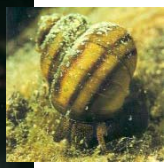
Ordo: Monotocardia
Characters: 1 heart hall, 1 ktenidium, 1 kidney and pedal ganglion
Representatives: ***Cypraea*** - *C. moneta* as currency, ***Strombus gigas*** - decoy calls, ***Murex brandaris*** - color, ***Conus*** - fierce, poisonous, beautiful and precious as *C. Milne-edwardsii* about 300 USD, *C. gloria-maris*, about $ 2,000, etc., aristocratic collections - M. Teresa for *Epithonium scalare* 15 000 tolars - pay may, in some *Conus* and 20 000 gold marks, etc., ***Vermetus***, ***Entoconcha mirabilis*** - intestinal parasites in the blood vessels Sea Cucumbers, ***Ampularia gigas*** - aquarium, ***Viviparus*** – in Czech Republic, ***Bithynia*** – in the Czech republic









Subclassis: Opisthobranchiata
Characters: eutyneuryc, if the conch usually without lids, hermaphrodites, sea
Species: ***Aplysia depilans, Clione limacina***

Subclassis: Pulmonata
Characters: eutyneuryc, conch without a permanent lid (usually), hollow shell without gills, 3 ordo, from the Czech republic only 2:

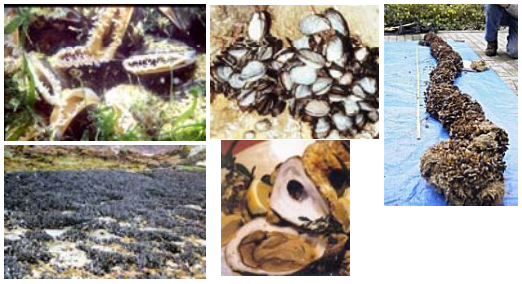
Ordo: Basommatophora
Characters: eyes at the base of a single pair of antennae, usually water
Representatives: Lymnaeidae - hosts of parasites (*Galba truncatula*), Planorbidae - bilharsiosis, Ancylidae, Physidae, Carychiidae, etc.

Ordo: Stylommatophora
Characters: eyes on the upper end of retractile pair of antennae, land
Representatives: Helicidae - *Helix pomatia* + *H. aspersa* - edible species, Clausilidae, Achatinidae - *A fulica* – pest, *Vertigo* - the smallest species, *Arion* - pest, breathing hole in the front, *Limax* - pest, breathing hole in the back, etc.

Classis: **Scaphopoda**
Characters: box appearance hollow tusk, without eyes, triangular foot passing point without ktenidia, shell, radula, the transition between snails (common body structure, language tape) and bivalves (bilateral symmetry, engraving leg), in marine mud
Shortcut: ***Dentalium vulgare*** - about 3.5 cm, some dentalia - exchange tender Indians

Classis: **Bivalvia**
Features: bilateral symmetry, the mantle consists of 2 lobes, shells, castle - ligament, 3 holes: acceptance, gutting and slide the foot (locomotion), sometimes reduction - byss fibers, missing head, radula and pharynx, microphaguous, mouth at the opposite end of the shell cavity than the opening reception, epithelium, adductors and retractors, cerebral ganglion, pleural blends, eyes on the edges of the shell or siphon (extended receiving tube emitted) osfradia, statocysts next pedal g. Innervated, cerebral, stomach, hepatopancreatic gland (2), intestine through the heart chamber, gills are ktenidia the original, derived from other types: filibranchia and lamelibranchia, heart 2 hall, the kidneys with a spout (Bojans) connected to pericardium, gonads in the leg, mostly marine, a few freshwater

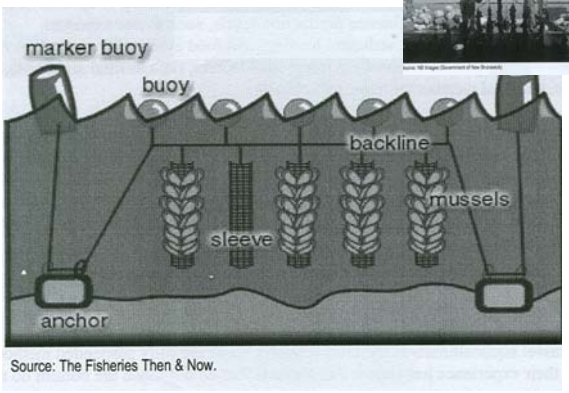
Ordo: Protobranchiata
Characters: ktenidia, the leg with the foot without byss gland
and pericardium, gonads párovité in the leg, mostly marine, a few freshwater
Ordo: Filibranchiata
Characters: sedentary species with byss gland, hypertrophic back adductor mostly at the expense of the front and moved to the center of the body
Representatives: ***Mytilus edulis*** (blue mussel) - Baltic, in Europe 100 000 t per year for food!, ***M. galloprovincialis*** - Mediterranean, allergies, mytilotoxin, synthetic production of mussels in the Netherlands - benches up to 60 000 t, ***Ostrea*** (oyster), ***Pecten*** (scallop), ***Pinctada margaritifera*** - up to 30 cm, 9-10 kg, Japanese artificial pearls



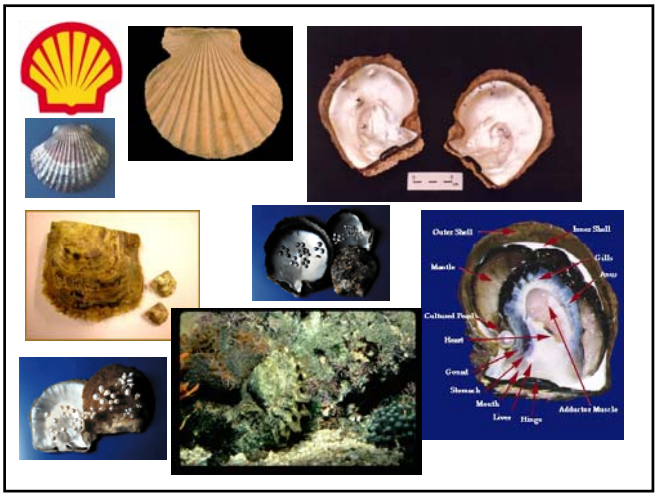
Production of shellfish in aquaculture

- Annual production of molluscs in aquaculture is around 7 000 000 tons. A substantial part of the quantity of these are bivalves.
- Of the approximately 43% of oysters and mussels for about 16% (due to the price of oysters exhibit higher profitability)
- Most common species in aquaculture is *Crasostrea gigas*, in Brazil, such as *Perna perna* - 90% of production

LONGLINE SYSTEM



Source: The Fisheries Then & Now.

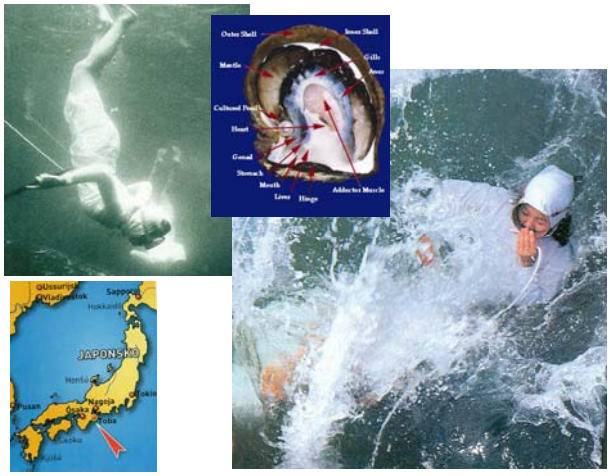


Pinctada margaritifera and artificial pearls

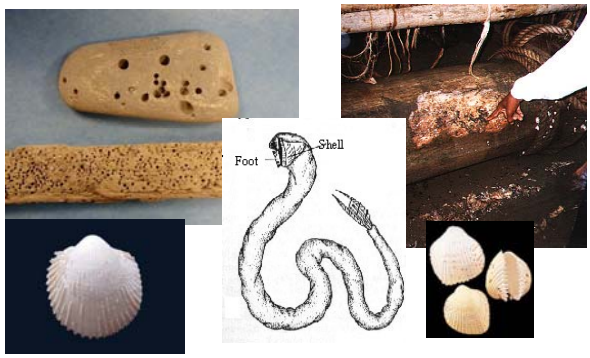
- Pearl fishery operated from ancient times - a dangerous profession
- Kokiči Mikimoto - experiments with artificial cultivation of pearls since 1888, first success in 1893

Artificial pearls

- Catching live bivalves (now about 3 years old)
- Incised muscle around the gonads, insertion or cut a piece of pearl shell donor
- Deletion of infected bivalve molluscs to the original habitat in the basket, keeping about 2 to 3 more years
- Selecting "prepared" pearls, if the procedure survive, live for up to 15 years (repeat cycle)
- Today is a closed cycle associated with pearl mussel larvae breeding in artificial containers, from where they are transferred back into the sea in the age of 1 year



Ordo: Eulamellibranchiata
Characters: freshwater only from this order, a large species of larvae - glochidia, small species are viviparous
Shortcuts: sea: ***Cardium***, ***Teredo navalis*** - reduction of shells, ***Tridacna,*** freshwater: ***Anodonta*** (Swan) - does not lock, ***Unio*** (mussel) - lock, ***Margaritana margaritifera*** (Freshwater pearl mussel), ***Pisidium, Sphaerium***





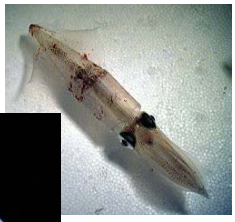
Ordo: Septibranchiata
Characters: deep sea species, the gills as the septum, divides the mantle
Shortcut: ***Cuspidaria*** - about 1.5 to 2.5 cm

Classis: **Cephalopoda**
Characters: head and torso, leg and arm changed in the funnel, sepia color, the concentration of ganglia in the head, eyes, convergence almost identical with the eyes the most advanced vertebrates, statocysts, olfactory pits, jaw, radula, salivary and poison glands, stomach, blind Pendant (coekum), paired hepatopancreas, rarely extracorporeal digestion, nearly closed vascular system (cerebral ganglia lacunae wheels and stomach), the number of heart hallway the same as ktenidia number, whether the number of kidney, gonochorists, hektocotylus, egg packaging with discoidal grooving, direct development, very large group of fossil

Subclassis: Tetrabranchiata
Characters: up to 90 arms, spiral coil conch
Shortcut: ***Nautilus*** - about 25 cm, the Indian Ocean, conch (buoyancy chamber with N), fiber Sifo, living fossil




Subclassis: Dibranchiata
Characters: 8-10 arms, reduction of conch
Ordo: Decabrachia
Characters: 8 short and 2 long arms, suction cups on the stems, Flipper hem on the sides of the hull, meals Italy polyps di Scoglio
Representatives: ***Sepia officinalis*** (cuttlefish), ***Loligo*** (squid) - 0.5 m, a move to multiply into the North Sea, mating and egg at a depth of about 10 - 30 m, ***Architeutis dux*** - the largest invertebrate of planet, Flowers Cove (Florida): 21 m 95 cm, eye diameter 40 cm and 18 cm suction

Ordo: Octobrachia
Characters: 8 identical arms
Shortcuts: ***Octopus vulgaris*** (common octopus), ***Argonaut argo*** - secondary conch in female egg, arm effusion base, 3 left arm, the male mating - hektocotylus (Cuvier), female 30 cm, male 1 cm



Phyllum: Sipunculida

Size: from 1 to 60 cm, number of species: about 320
Characters: elongate, trunk and introvert with a ring of wheels antenas, mouth cuticle (missing only in antenas), tree brain nerve cord, digestive tube longer than the body, metanefridia, extracorporeal fertilization, Trochofory type larvae, detritophagous,
Shortcut: ***Sipunculus nudus*** - digging mud and sand, as land earthworms

Phyllum: Echiurida

Size: from 1 mm to 1 m, the number of species: up to 140
Characters: sacculated prostomium and trunk, brain in trunk, the ventral side of the hull unpaired strand, closed vascular system, the function metanefridie, sex taps, gonochorists, dimorphism (male dwarf), cloaca, larva Trochophore type
Shortcut: ***Bonelia viridis*** - males with no gastrointestinal tract, larvae homonomous, hormonal sex determination