

Molluscs

Single Phylum (Mollusca)

Over 90,000 spp in 8 Classes

Tube-within-a-tube body plan

True coelom (Mesodermal origin)

Several advanced systems

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Mollusc Defining traits

Complete Respiratory system with gills or lungs

Circulatory system with heart

Mantle that secretes shell See Fig. 10.3 in text

Muscular foot for locomotion

Rasping organ in mouth (Radula)

Ciliary tracts

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Mollusc Form and Function

• Well-developed head

• Protrusible radula

• Foot modifications See Figs. 10.4 and 10.5 in text

• Protective mantle

• Mantle cavity for nutrition and waste exchange

• 3-layered shell

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Mollusc Form and Function

- Gas exchange mostly in gills called ctenidia
 - Most have open circulatory system
 - Digestive tracts very specialized
 - Most dioecious
 - Two free-swimming larval stages
 1. trochophore
 2. veliger
- See Figs. 10.6 and 10.7 in text

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Mollusc Taxa

Class Gastropoda

- Largest and most diverse (70,000spp)
 - If present, shell is single piece
 - Many have operculum to cover shell opening
 - Undergo torsion in larval stage
 - Undergo coiling of shell and visceral mass
- See Figs. 10.12 and 10.13 in text

Also see Fig. 10.18 in text

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Mollusc Taxa

Class Gastropoda

- Most are herbivores, but many are carnivorous
 - Some use cilia or mucous for food capture
 - Usually one efficient gill or lung
 - Mostly internal fertilization
- See Fig. 10.4 in text
- See Fig. 10.14 in text

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Mollusc Taxa

Class Bivalvia

- Mussels, clams, scallops, oysters
- Most are filter feeders
- No head (reduced cephalization)
- Most are marine
- Two shells (valves) and dorsal hinge ligament

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Mollusc Taxa

Bivalve Form and Function

- Dorsal ligament for opening and adductor muscles for closing
- Umbo important for aging
- Mantle posterior modified into openings for water (siphons)
- Cilia for water flow over 2 gills
- Foot moved anteriorly for locomotion
- Swimming in scallops

See Fig. 10.24 in text

See Fig. 10.28 in text

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Mollusc Taxa

Bivalve Form and Function

- Gills highly modified for filter feeding
- Mucous ensnares food which is passed along grooves to mouth
- Ciliary tracts in stomach for sorting
- Circulatory, Excretory and Nervous systems present
- Dioecious; mostly external fertilization with several larval stages

See Fig. 10.23 in text

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Mollusc Taxa

Class Cephalopoda

- All marine and carnivorous
- Foot highly modified and moved toward head
- Giant squid is largest invertebrate known
- Primarily found at high salinities

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Mollusc Taxa

Cephalopod Form and Function

- Shell reduced in many, absent in Octopus
- Nautilus shell divided by septa **See Fig. 10.32 in text**
- Locomotion by jet propulsion through ventral funnel or siphon
- Squid lateral fins for stabilization; no fins in crawling octopus **See Fig. 10.31 in text**
- All cephalopods very active and move well

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Mollusc Taxa

Cephalopod Form and Function

- No cilia on gills, use muscular contraction of mantle for water flow
- Closed circulatory system with accessory hearts near gills
- Brain largest of all invertebrates; complex eyes **See Fig. 10.34 in text**
- Visual communication
- Most have ink gland for defense
- Separate sexes, copulation, and no larval stage

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