Animal Diversity & Wildlife Conservation

Zoology Complementary Course for I Semester B.Sc. Botany Complementary Course 1

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PHÝLUM MOLLUSCA

MOLLUSCS









garden snail

limpet

A variety of molluscs.

MOLLUSCA

• SHELL FISHES

BILATERALLY SYMMETRICAL AND UNSEGMENTED COELOMATES, SOFT BODY ENCLOSED WITHIN A CALCAREOUS SHELL 60000 SPECIES

SALIENT FEATURES

- SOFT UNSEGMENTED BODY HEAD, VISCERAL MASS & FOOT
- MANTLE OR PALLIUM MEMBRANEOUS
 FOLD MANTLE. SHELL SECRETING GLAND
 MANTLE CAVITY GILLS
- CALCAREOUS SHELL SHELL GLANDS
- REDUCED COELOM IN ADULT
- RADULA IN ORAL CAVITY
- OPEN CIRCULATORY SYSTEM WITH CHAMBERED DORSAL HEART

SALIENT FEATURES

- RESPIRATORY ORGANS CTENIDIA OR AQUATIC FORMS & PULMONARY SACS IN TERRESTRIAL FORMS
- SEXES SEPARATE, FERTILIZATION INTERNAL OR EXTERNAL
- DIRECT OR INDIRECT DEVELOPMENT
- LARVA TROCHOPHORE, VELIGER OR GLOCHIDIUM

MOLLUSCS



CLASSIFICATIONS

APLACOPHORA
MONOPLACOPHORA
POLYPLACOPHORA
SCAPHOPODA
GASTOPODA
PELECYPODA/BIVALVIA
CEPHALOPODA

APLACOPHORA

- POPULARLY KNOWN AS SLOENGSTER OR MUD MOLES
- PRIMITIVE & DEGENERATE MARINE MOLLUSCS
- LONG NARROW BILATERALLY SYMMETRICAL & VERMIFORM BODY
- ABSENCE OF HEAD, FOOT, MANTLE, SHELL AND NEPHRIDIA
- CALCAREOUS SPICULES IN SKIN
 STRAIGHT DIGESTIVE TRACT WITH RADULA

APLACOPHORA

- A PAIR OF COELOMODUCTS GONODUCTS
- HEART SINGLE AURICLE & SINGLE VENTRICLE
- HAEMOCOEL 2 PORTIONS DORSAL & VENTRAL
- HERMOPHRODITES
- DEVELOPEMNT DIRECT OR INDIRECT
- ALL DEPTHS OF SEAS
- SOME BURROW IN MUD
- EGS. NEOMENIA, CHAETODERMA

SOLENOGASTER/ MUD MOLES



MONOPLACOPHORA

- PRIMITIVE MARINE MOLLUSCS
- BILATERALLY SYMMETRICAL, FLAT , OVAL BODY WITHBMINUTE HEAD
- INTERNALLY SEGMENTED BODY
- UNIVALVED SHELL CONICAL OR CUP SHAPED & SYMMETERICAL
- SEGMENTALLY PAIRED EXTERNAL GILLS
- SEGEMENTALLY REPEATING GONADS AND NEPHRDIA
- PRIMITIVE LADDERLIKE NEVOUS SYSTEM
 SEXES ARE SEPARATE

NEOPILINA



POLYPLACOPHORA

- CHITONS PRIMITIVE MARINE MOLLUSCS
- BILATERALLY SYMMETERICAL & DORSOVENTRALLY FLATTENED BODY – THICK & LEATHERY MANTLE
- ARTICULATED SHELL, EIGHT HINGED & OVERLAPPING TRANSVERSE PLATES
- INDISTINCT HEAD WITOUT EYES &TENTACLES
- FOOT BROAD FLAT- MUSCULAR AND GLANDULAR CREEPING SOLE

POLYPLACOPHORA

RADULA ON ODONTOPHORE
PAIRED EXTERNAL GILLS
PRIMITIVE LADDERLIKE NERVOUS SYSTEM
UNPAIRED GONADS & PAIRED GONODUCTS

• EGS. CHITON, LEPTOCHITON, ETC

CHITON



SCAPHOPODA • ELEPHANT TUSK SHELL • VERY LOW GRADE OF ORGANIZATION LONG, CYLINDRICAL, UNTORTED & BILATERALLY SYMMETRICAL BODY • NO EYES, SENSORY TENTACLES & GILLS • TUBULAR & TUSK LIKE SHELL WITH OPENING AT BOTH ENDS • MANTLE FUSE – MANTLE TUBE LONG, NARROW, PROTRUSIBLE FOOT

SCAPHOPODA

- CILIATED PROTRUSIBLE TENTACULAR
 POCESS CAPACTULA AROUND HEAD –
 FEEDING ORGAN
- MEDIAN JAW AND TOOTHED RADULA IN ORAL CAVITY
- HEART RUDIMENTARY
- SEXES ARE SEPARATE, GONADS UNPAIRED
- FERTILIZATION IN MANTLE CAVITY
- DEVELOPMENT INDIRECT TROCHOPHORE LARVA
- EGS. DENTALIUM

DENTALIUM



GASTROPODA

- Torted or detorted, unsegmented and asymmetrical body - distinct head, spirally coiled visceral mass and well developed foot.
- Head eyes & tentacles; foot broad and flat creeping sole
- Torsion 180 degree counter clockwise rotation of visceral mass with respect to foot
- Mantle continuous enveloping the visceral mass
- Shell univalved, conical and spirally coiled

GASTROPODA

- Asymmetry in the organization of internal organs.
- Digestive tract U-shaped; buccal cavity contains odontophore and radula
- Respiration ctenidia aquatic forms and pulmonary sacs – terrestrial
- Open lacunar type circulatory system
- Excretory organs are nephridia, paired in primitive and unpaired in in others
- Nervous system cephalized, paired and unpaired ganglia – connectives and commissures – sense organs

GASTROPODA

- Most gastropods are diocious but some are monoecious
- Single gonad
- Fertilization internal
- Development indirect trochophore and veliger larva
- Egs. Turbinella

GASTROPODS



Turbinella





PELECYPODA

- Bilaterally symmetrical and laterally compressed body, enclosed by a bivalved and dorsally hinged calcareous shell.
- Mantle consists of symmetrical right and left lobes, which join the visceral mass dorsally. In between the mantle lobe and visceral mass is the mantle cavity.
- Cephalic region rudimentary without eyes and tentacles, a pair of labial palps present. Sensory structures are located elsewhere.

PELECYPODA

- Foot is ventral, large, muscular, plough shaped – burrowing
- Byssus glands, byssus threads attachment
- Coiled alimentary canal with crystalline style intestine and without jaw and radula in buccal cavity. Suspension feeders.
- Open type circulatory system trilocular heart – two auricles and a ventricle
- Respiratory organs ctenidia or gills

PELECYPODA

- Renal organ are a pair of kidney opens to pericardium and mantle cavity at opposite ends
- Nervous system paired ganglia with connectives. Osphradia and statocysts sensory organs
- Sexes are separate. Fertilization is external. Indirect development – Glochidium Iarva

• Egs:- Perna

PELYCEPODS



Perna





Fig. 430. Tevedo boring into wood. Sawdust formed by the rotating movement of the shell enters the mouth, and faecal pellets of undigested wood are sent out via the enhalant chamber. The arrows indicate the direction of water currents. (Original.)

Pinctada



CEPHALOPODA

- Bilaterally symmetrical body, distinct and highly organised head and well developed eyes
- Anterior part of foot is modified into a crown of prehensile circum-oral arms and the posterior part into funnel or exhalent siphon
- Thick muscular and leathery mantle protective covering
- Shell present or absent. External shell rarely internal.
- Ink gland present melanin containing dark coloured ink to discolour surrounding and escape from enemies.

CEPHALOPODA

- Cartilaginous endoskeleton to support and strengthen the body – to protect and enclose nerve ganglia and eyes.
- Oral apparatus with radula, horny jaws and poison glands
- Closed type of blood vascular system, three chambered heart and accessory branchial hearts
- Highly organized nervous system, well developed eyes, high degree of intelligence and great learning powers

CEPHALOPODA

- Sexes are separate.
- Male has characteristic copulatory organ

 Spadix or hectocotylus spoon shaped
 tip of one oral arm
- Development direct
- Unusual power of colour change expression of emotion or protective adaptation
- Active movement water-jet propulsions using exhalant siphon
- Egs:- Sepia

LOLIGO & SEPIA





NAUTILUS & OCTOPUS



NAUTILUS SHELL



