Welcome to the course diversity of

non chordates and cell biology.

Today's module we are going to study

classification of phylum Mollusca up to

their classes. At the end of this module

students will be able to describe the

characteristic of different classes

of phylum Mollusca,

as well as site examples of each class.

Phylum Mollusca is divided into 7 classes

which include Aplacophora, Polyplacophora,

Monoplacophora, Gastropoda, Scaphoda,

 Pelecypoda and Cephalopoda.

Let us begin with the first class

that is Aplacophora, the term

means or includes all those molluscs

which do not bear any plates.

They are also called as Solenogaster.

So basically, aplacophorans occur in oceans.

They may be borrowers in mud bottoms,

or they may occur as creepers on Cnidarians.

As you can see in the image,

their body is wormlike, bilaterally

symmetrical, cylindrical and unsegmented.

They range in size from few

millimeters to few centimeters.

They do not possess a distinct head

or mental, foot, shell or nephridia.

They have calcareous spicules

embedded in cuticle.

A mid dorsal

longitudinal crest is often

present in the creeping aplacophorans,

mouth and anus are terminal

with straight digestive tract,

and the gut contains a style sac which

includes style and a gastric shield and

functions just like a motor and a pestle,

and is used in

transferring the digestive

enzymes from the stomach.

The buccal cavity contains radula.

The borrowers are selective,

carnivores and scavengers.

While the creepers are usually

feeding upon the Cnidarians.

They may be hermaphrodites,

which show copulation or dioecious forms,

which show spawning. Examples of Aplacophora

include *Neomenia,*

and *Wirenia argentea*.

Moving on to the next class

that is Polyplacophora,

which includes all those

mollusc’s which bear many plates.

So the polyplacophorans

contain the Chitons.

These are found close to the shore,

adhering to the rocks and shells.

Their size ranges from few centimeters,

or it could be a little less.

They are bilaterally symmetrical

and as can be seen in the image,

dorsoventrally flattened,

body convex dorsally,

flattened ventrally and head

distinct without eyes and tentacles.

The shell is composed of

eight calcareous plates,

multisectioned and can bend, the mental have

calcareous spicules mantle cavity

forms two lateral grooves and we can

see in the image on the right that

the bipectinate ctenidia

divides the mantle cavity into

incurrent and excurrent chambers.

The flow of water and blood shows

countercurrent exchange system.

The foot is flat and broad to

facilitate adhesion to hard substratum.

They are microphagous in their feeding

habit. Radula has 17 teeth and it is

used to scrape food from the substratum.

They also show pharyngeal glands,

which are also known as sugar glands,

which release a amylase containing

secretions into the stomach.

Intestine is coiled, has terminal

anus, nervous system is simple ladder

like, sensory system is reduced, blood

from gills is collected by pair of auricles.

They also have a pair of gonoducts

but without relation to pericardium,

these are dioecious form and

examples include *Chaetopleura apiculata*,

and *Cryptchiton stelleri*.

The next class is monoplacophora,

which means bearing a single plate,

so these are marine forms, body is

bilaterally symmetrical and segmented,

and you can see in the image they have

a single shell which is unhinged.

The shell length ranges from one

millimeter to three centimeters.

Head is without eyes and tentacles.

The foot is flat and ventral,

Mantle encircles the body

as a circular fold of the body.

Mental cavity forms two lateral grooves.

3/5 or 6 pairs of gills hang within

the grooves, radula and style are present.

Gills externally and serially arranged.

5 pairs of nephridia serially

arranged. Sexes separate and they

show external fertilization.

The next class is Gastropoda. In Greek

Gaster means belly and podos means foot.

Now this is the largest and most

successful class of Mollusca.

The gastropods could be

aquatic in their habit,

which which includes freshwater, marine waters,

bottom dwellers as well as pelagic forms.

They could be terrestrial,

or they could be parasitic.

They are suspension feeders, carnivores,

herbivores, deposit feeders,

as well as ectoparasites.

Their size ranges from under one

millimeter to over six centimeters.

Three major development in gastropods

include the presence of head with tentacles,

eyes and mouth; shell with protective

portable retreat that is asymmetrical,

univalve, spirally coiled and the process

of torsion which is counterclockwise

turning of the body or visceral

mass through 180 degrees behind

the head during early development.

The foot is flat, muscular,

Bears operculum, radula is used for feeding.

They usually show extracellular digestion.

Respiration is through gills or

Lungs, depending upon the habitat.

Circulatory system is of open type.

The heart is enclosed in pericardium,

and excretory system is through

metanephridia.

The nervous system of gastropods

is well developed.

Sense organs include the eyes,

tentacles,

osphradia, statocyst. Sexes are

separate. Development shows trochopore

and veliger larval stages.

Examples of gastropoda

include *Aplysia* and *Pila.*

The next class of phylum Mollusca

is Scaphoda wherein in Greek Scapha

means boat and podos means foot.

These molluscans are exclusively

marine, sedentary forms.

Their size ranges from 3 to 6 centimeters.

They are bilaterally symmetrical

and closed in Tusk like Shell

which is open at both ends.

Eyes, tentacles and gills are absent.

They possess foot, mental tissue,

mental cavity, radula, and shell.

Mental is tubular,

completely enclosing the body.

They also possess captacula,

which is nothing else but thin

tentacles which are used to capture food

particles such as the foraminiferans.

Their foot is reduced and it is

used for digging and burrowing.

Ctenidia are absent, heart is rudimentary,

sexes are separate and they

show external fertilization.

Examples include *Dentalium* and *Cadulus*.

The next class of phylum

Mollusca is Pelecypoda,

also called Bivalvia, in Greek pelekys

means hatchet and podos means foot.

These are aquatic molluscs which

occur in marine as well as fresh

water and their lifestyle is sedentary

they are bilaterally symmetrical,

laterally compressed,

and as you can see in the image,

the shell is composed of two lateral

halves hinged together mid dorsally.

They lack cephalization that is they

do not have a distinct head, pharynx,

jaws, radula/ odontophore complex as

well as the tentacles.

The foot is ventral, muscular.

They have spacious mantle cavity which

is bilobed, Gills are paired, one on each side.

Coelom reduced, alimentary canal,

Coiled, paired digestive glands present.

Heart enclosed in pericardium and

has ventricles and two auricles.

Nephridia open into the pericardium

at one end and into the exterior

at the other. Nervous system

comprises of four pairs of ganglia.

Sense organs include statocyst

and osphradium.

Sexes may be separate or united.

They show metamorphosis and trochophore

larval stage examples include clams,

mussels and oysters.

The next class of Mollusca is the

Cephalopoda, where in Greek kephale,

means head and podos means foot.

These are exclusively marine mollusks.

Their size ranges from less than

two centimeters to 18 meters.

They're fast moving,

active carnivores, bilaterally

symmetrical showing head and trunk.

The shell is spiral, chambered

embedded in the mantle.

Head well developed and has

large eyes and mouth, symmetrical

and uncoiled visceral mass.

They have series of sucker bearing arms,

encircling the mouth.

Mouth shows the presence of jaws

and radula. Gills are bipectinate , 2 to

4 pairs, ctenidia are not ciliated.

They have closed circulatory

system comprising of arteries,

veins and capillaries.

Excretory system includes 2 to 4 pairs of

Nephridia, nervous system is highly developed.

The skin has chromatophores which

has the ability to change colors

and are used as defense structures.

Photophores which are the light organs

and ink sac which is used to confuse

predators and also act as a mild narcotic.

Sexes are separate.

Development is without metamorphosis.

Examples include Sepia,

loligo and squid.

These are the references

which have been used for this module.

Thank you.