

Hello students. Today I'll be

dealing with the unit 4: Amphibia

classification of amphibian up to orders.

Model number is 12.

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So the outline of the presentation

consists of classification of

class in Amphibia up to order level.

It consists of two sub classes:

Subclass: Stegocephalia which consists of extinct groups.

Under that there are three orders mentioned.

Order : Labyrinthodontia, Order: Phyllospondyli and

Order : Lepospondyli

The next subclass is subclass : Lissamphibia.

Again, there are three orders here.

1st Order is Gymnophiona

, also referred to as Apoda

order Caudata also referred to as Urodela

and order Anura also referred to as Salientia.

Learning Outcome includes:

List out the orders of Class Amphibia and

describe the characteristic features of orders of class amphibia

with examples.

Coming onto introduction.

The term Amphibia is derived from

2 Greek words.

'Amphi' here refers to the dual and 'Bios'

Here refers to life,

so amphibia are the members which

show dual life or double life.

That means that they are adapted

for both aquatic as well as land or terrestrial mode of Life.

Amphibian has been classified differently

by different authors.

The most followed one is given by G.Kingsley in 1924.

He classified class amphibia into

three orders of extinct groups and

three orders of living groups.

They extinct groups of Amphibians

were placed in the subclass Stegocephalia

and the living members or the living

groups were classified under subclass Lissamphibia.

subclass Stegocephalia

now subclass Stegocephalia consist of all extinct members

No know members belonging to subclass Stegocephalia are present at this moment.

They're all extinct and gone.

Whatever studies are carried out

They are carried out using fossils.

Now they're extinct Salamander like amphibians.

Now this amphibians had limbs,

which were pentadactylous , term

pentadactyl simply means here,

that both fore limb and the hind limbs,both consist of 5 digits.

Now the skin here was covered

with scales and bony plates.

Now scales basically,tell that there is an evolutionary

history regarding them,

which is comparing them to fishes.

Now they appeared during Permian to Triassic period.

skull here is solid.It's a Bony structure.

Which is protecting the vital organ brain

now it consists of three orders.

Order Labryinthodontia, order Phyllosopondyli and order Leposopondyli.

coming on to the 1st order that is Labryinthodontia .

Now they are the oldest Known tetrapods that means they are the oldest known amphibians which we're walking on four legs and they are also referred to as stem Amphibia.

They are the crocodile or salamander

like fish eating amphibians.

They depended on fish for

their survival as food.

Now teeth which were present in the

Labryinthodontia had much

Folded dentine which was similar

to that once which was found in

the Crossopterygian ancestors.

Now dentine is nothing,

but it's a calcareous substance which

is forming major portions of teeth as well as the placoid scales.

Now this shows the relation between

the crossopterygian ancestors.

Many species of this Labryinthodontia were aquatic or semi aquatic and some

had already moved on to the land.

Or they said they had acquired

the terrestrial mode of life.

They lived from the Carboniferous to the Triassic period.

Example is Eryops

This is the image showing the example of

the member belonging to Labryinthodontia, that is the Eryops.

It is an extinct form.

Moving on to the next order,

order:Phyllospondyli , they are

the small salamander looking like

organisms with large and flat head.

Their head is flattened.

They also showed the presence of something

called Preopercular bone

which is showing a fish in ancestry

Now this Preopercular bone was

seen in case of fish forming the

operculum along with three other bones.

That is Opercular, interopercular and subopercular.

And this was retained in the phyllospondyli.

They also showed presence of something

Tubular vertebrae with

presence of both notochord and

spinal cord lying in the same cavity.

Clavicle, cleithrum and scapula which

forms the pectoral girdle were present

and the coracoid was cartilaginous structure here.

the cleithrum which is present

is actually a bone which is a broad

bone which is developed from the

pectoral girdle of the fish.

So there is some ancestral relationship

again seen here in this Members also.

They were found during the Carboniferous

to Permian deposits or the Permian.

Period of geological time scale.

Example is Brachiosaurus or Ichthyostega.

This is the image of Ichthyostega, this is the member

belonging to the Phyllospondyli

moving on to the next order that is the

last order from this subclass Stegocephalia that is order Lepospondyli.

They're again small salamander or eel-like amphibians.

Vertebrae here is cylindrical and each

vertebrae is a single unit.

There is no Fusion of vertebra which is seen.

So every vertebra is a single vertebra.

Now ribs are articulating intervertebrally.

Now this term says that, the ribs are originating from the

ventral side of the body and going back

on the dorsal side and articulating

with the vertebra. So, each

Each rib will go and articulate

with the vertebra.

Neural arch and the centrum of

the vertebra is continuous together, there is no separation

which is seen.

They're both together and are continuous.

Example is Diplocaulus and Lysorophus

These are the two example on the

left inside there is Diplocaulus

and the other is Lysorophus.

Both are showing presence of limbs.

One is looking similar to that of
the salamander and the other is looking
similar to that of the eel.

Moving on to the next subclass that is subclass: Lissamphibia
now Lissamphibia is a subclass which include
modern Amphibia or the living members of amphibia
which we can study now.

There is no a single fossilized form
which will be which is covered under Lissamphibia.

They are all modern amphibians,
having small and simple teeth.

The entire skeleton is made above dermal bones.

The entire skeleton is taken up by the dermatocranium, or the dermal bones,
and there is no cartilaginous structure which is seen.

And even if it is present it is partially cartilaginous and include again three orders.

The 1st order is Gymnophiona,
which is also referred to as Apoda.

Next order is Caudata which
is also referred to as Urodela.

The 3rd and the last order is Anura
which is also referred to as Salientia.

Coming onto the 1st order that is Gymnophiona or Apoda.

Now Gymnophiona is a term which

is Greek in origin where “gymnos”

refer to the naked and “ophioneos” refer

to serpent like.

when we look into the Apoda

The term Apoda here simply refers to that there are no limbs.

It is without any legs or poda.

Now this forms primitive and very initial forms.

They are limbless that means here the term Apoda

is very well explained here because

they are limbless and there is no

presence of fore limb as well as hind limb.

They are again blind borrowing tropical forms, body similar to that of the eel-like.

If Tail present it is short and if it is not, it is absent totally.

Skin shows some presence of dermal scales and the skin is

transversely wrinkled and

Gives it a shrunken appearance.

Males have copulatory organs.

Example is Ichthyophis and Siponops.

These other two examples, on the right hand side is siphonops and on the left.

Hand side it is like the Ichthyophis

Moving onto the next order, order: Caudata.

Also referred to as Urodela.

now Urodela is a Greek origin term

where "ura" stands for Tail and "delos" refers to visible.

When we move on to the caudata.

The term caudata is Latin in origin.

Wherein talks about "cauda" mean tail.

Now both this terms caudata and urodele which is

allowing us to know that there is presence of tail.

Body of members belonging to caudata

or urodela are having body which

is divided into 3 distinct head, trunk and tail.

There are two pairs of limbs usually,

which are weak and equal in size.

So both the fore limb as well as the

Hindlimb, they are equal in size.

Gills are permanent or lost in case of adults.

Males do not bear any copulatory organs,

females are oviparous, that means females lay eggs,

which are hatched outside the body.

Larvae are aquatic and the larvae,
which are present, they look very much similar to that
of the adult and are having teeth.

Example are Hynobius and salamandera,
these are the two examples: Hynobius and Salamandra.

Moving on to the last order order Anura or Salientia.

Now term salientia is Latin in origin

wherein "saliens" means leaping and .

When we talk about anura, the anura term is Greek in origin where

"an" stands for without and aura refers to tail.

So these two terms tells us about

that there is no tail in the

members belonging to this order

as well as they are leaping forms.

Now when we talk about the characters here,

body is very short and broad

without the presence of tail.

Fore limbs are short, hind limbs present adapted for leaping and swimming

as well as jumping.

Hind limbs are very well developed here when we compare it to the fore limbs.

Head and trunk are fused, neck is absent here.

External gills or gill slits are totally absent.

They have moved onto the land

and shows presence of lungs,

mandible are toothless that is

no more teeth which are present

in the mandible region,

but maxilla shows fine, ridge of small cone teeth,

Pectoral and pelvic girdle both are

present allowing attachment of the

forelimb and hindlimb respectively.

Fertilization is always external.

Examples are Rana and Bufo that

the two examples belonging to members belonging to order

Salientia.

References: I have used two books that is

Chordate zoology by Jordan and Verma

and modern textbook of zoology of vertebrates by Kotpal.