

CLASSIFICATION OF REPTILIA

Reptiles are the first vertebrates adapted for life on land. The term reptilia has originated from a Latin word "reper" which means to creep. They arose in the Carboniferous period from Amphibian stock and flourished during the Mesozoic era.

Reptiles are defined as "cold blooded" vertebrates respire by lungs throughout their life, and having the body covered with scales or scutes. Reptilia includes 7000 living species of lizards, snakes, tortoises, alligators, crocodiles etc.

General Characters: →

1. Terrestrial, poikilothermous (Cold blooded) tetrapods with ~~penta~~ pentadactyle limbs having digits with claws.
2. Body divisible into head, trunk and tail.
3. Body covered with dry, epidermal scales, beneath which bony dermal plates may be present in some forms.
4. Skull is monocondylic. One or two temporal fossae are usually present.
5. A pineal foramen is present in the skull.
6. Teeth are simple, conical and thecodont.
7. Heart with a sinus venosus, two auricle and an incompletely divided ventricle.
8. Both right and left systemic arches are present.
9. Respiration is pulmonary, i.e. by means of lungs.
10. Alimentary canal leads into cloacal chambers.
11. ~~Smooth~~ Cerebral hemispheres are smooth. 12 pairs of cranial nerves are present.
12. Eyes, ears and nose are well developed. Lateral line system is absent.
13. Eyes can distinguish colours.
14. The kidneys are metanephric with no nephrostome.

5. Sexual and separate, male possess copulatory organs.
6. Fertilization is internal.
7. Eggs are large with considerable yolk and covered by a firm calcareous shell.
8. The embryo develops within embryonic membranes, amnion and allantois.
9. Diet reptiles are omnivorous, some lakes are carnivorous.

Classification →

Reptiles are classified into four orders differently. Generally, it was classified on the basis of the presence or absence of temporal vacuities or fossae in the skull, into four subclasses. The scheme of classification presented here is mainly after Parker and Haswell recognizing six subclasses and their orders.

1. Subclass - Anapsida (without an arch)

- i. Skull is devoid of fossae in the temporal region.
- ii. The roof of the skull is solid.

It is divided into two orders -

A. Cotylosauria (corp Kotyla - cup-shaped, saucer-like)

(i) Extinct stem reptiles from which other reptiles have probably evolved.

(ii) Complete roofing of the skull.

(iii) Flattened plate like pelvis.

eg. *Seymouria*, *Diadectes*.

B. Chelonis - (Chelona - Tortoise)

(i) It is assumed to be direct descendants of *Cotylosaurus*.

(ii) Body is more or less elliptical and dorsoventrally flattened.

(iii) Body enclosed by a dorsal carapace and a ventral plastron.

- (iv) The head, neck, tail and limbs can be retracted inside the encased body.
- (v) Jaws are without teeth but encased in horny sheath.
- (vi) In aquatic forms, limbs are modified into paddles.
- (vii) The sternum is absent.
- (viii) Single nasal opening.
- (ix) Longitudinal cloacal aperture.
- (x) Kidney metanephric.
e.g. Trionyx, Testudo, Chelonia.

2. Subclass - Synaptosaurus (extinct)

- (i) ~~Temporal~~ Late Palaeozoic and Mesozoic aquatic reptiles.
- (ii) Temporal region has one vacuity or fossa.
It is divided into two orders: -

A. Order - Protorosauria

- (i) Lizard like reptiles of lower Permian.
e.g. Anascleris

B. Order - Sauropterygia

- (i) Existed between Permian and Triassic period.
- (ii) Aquatic forms with webbed feet.
e.g. Placodus, Cyamodus.

C. Order - Placodontia

- (i) Existed in Triassic period.
- (ii) Jaws with grinding teeth and palate.
e.g. Henodus.

3 Subclass - Dehthyopterygia (Gk. Dehthys - fish, pterygas - fin)

- (i) Extinct, aquatic reptiles of Carnivorous habit. Skull had a single temporal fossa. The sternum was lacking but abdominal ribs were present. It is divided into following orders -

(a) Mesosauria -

- (i) Small freshwater forms. e.g. Mesosaurus.

Order 2 - Ichthyosauria

- (i) It includes extinct marine carnivorous reptiles.
- (ii) Skull with a single lateral vacuity.
- (iii) Large head with an elongated snout.
- (iv) Sternum absent, Long tail and in the form of paddle.
e.g. Ichthyosaurus, Ophthalmosaurus.

4. Subclass 4 - Lepidosauria (Gk. lepis - scale, sauros - lizard)

Includes fossil and living forms. Skull with two temporal vacuities or Diapsid. One above and the other below the suture joining the squamosal and postorbital. In some forms, the vacuities become reduced.

It is divided into following orders:-

1. Order 1 - Eosuchia

Extinct forms from the upper Permian. e.g. Youngina.

2. Order 2 - Rhynchocephalia

- (i) Mostly fossil forms with a single species - Sphenodon.
- (ii) Lizard like body with weak limbs and a laterally compressed tail.
- (iii) Amphicoelous vertebrae, Abdominal ribs present.
- (iv) Immobile quadrate, Mandibular symphysis is ligamentous.
- (v) Well-developed parietal eye present.
- (vi) Transverse cloacal opening present, Copulatory organ absent.

3. Order 3 - Squamata

- (i) Includes lizards and snakes. Skull bears superior temporal fossa in lizards or none in snakes.
- (ii) Procoelous vertebrae, Chevron bones present.
- (iii) Single headed Rib Ribs.
- (iv) Teeth acedont or pleurodont.
- (v) Immobile quadrate.
- (vi) Horny epidermal scales cover the body, sometimes plates are also present.

The order is divided into two suborders

Suborder 1 - Lacertilia

- (i) Includes all lizards with elongated body and two pairs of pentadactyle limbs.
- (ii) Movable eyelids and a nictitating membrane are present.
- (iii) Tympanum and tympanic cavity are present.
- (iv) Skull with two subtemporal fossa.

e.g. Draco, Varanus, Hemidactyles etc.

Suborder 2 - Ophidia

- (i) It includes all snakes.
 - (ii) Body cylindrical, much elongated and without limbs.
 - (iii) Eyelids are covered with a transparent scale. Nictitating membrane is immovable.
 - (iv) Tympanum and tympanic cavity absent.
 - (v) Skull without fossa.
 - (vi) Well developed "organ of Jacobson" is present.
- e.g. Naja, Bungarus, Python etc.

5 Subclass - Archosauria

- (i) Diapsid skull.
- (ii) Interparietal and parietal foramen absent. Palatal teeth absent.
- (iii) Lower jaw with a vacuity on the outer surface.
- (iv) Teeth thecodont or absent.
- (v) Hind limb and pelvic girdle modified in some forms for bipedal locomotion.

Archosauria is divided into five orders:—

Order 1 - Crocodylia

- (i) Carnivorous, freshwater living reptiles like crocodile, alligator and gharials.
- (ii) Body with epidermal scales and bony scutes.
- (iii) Long head with nostrils at the top of the snout.

- (IV) Limbs short, webbed and tail laterally compressed.
- (V) Sternum present, double headed ribs.
- (VI) Thecodont teeth.
- VII Heart completely four chambered.
- VIII Urinary bladder absent.
e.g. crocodile, Alligator.

order 2 - Pterosauria

- (i) Extinct flying reptiles, limbs converted into wings.
e.g. Pterodactylus.

order 3 - Thecodontia

- (1) Extinct carnivorous reptiles from Triassic period.
e.g. Phytosauria.

order 4 - Saurischia

- (1) Extinct large sized dinosaurs. e.g. Tyrannosaurus.

order 5 - Ornithischia

- (i) Bird like dinosaurs. e.g. Iguanodon

Subclass 6 - Synapsida

- (1) Fossil forms some of which give rise to mammals. Skull with a single temporal vacancy on each side between squamosal, post orbital and jugal.

Synapsida is divided into three orders —

- 1) order Pelycosauria e.g. Dimetrodon.
- 2) order Therapsida e.g. cynognathus.
- 3) order Tridactylia e.g. Tridactylon.