

Metatheria (Marsupialia)

Metatherians are primitive mammals which possess a characteristic brood pouch or Marsupium in which the immature young ones are sheltered and nourished. The mammary glands open by teats into the Marsupium. They represent a lower grade of organization than that of Eutheria but are basically similar to them.

Distribution - Mainly confined to the Australian region and South America, and a few are found in North America (= Didelphys virginiana). Thylacinus and Sarcophilus are found in Tasmania. The Australian region is the home of Kangaroos, Wombats, Phalangers and Koalas etc.

External feature - (i) The skin is furry

- 2) Presence of an abdominal pouch in the female.
- 3) Mammary glands have teats
- 4) Well developed pinna
- 5) Tail is well developed and used for balancing.
- 6) All digits end in claws.
- 7) Hind limbs are usually longer than the fore limbs.

Skeleton - (i) skull is dicondylic

- ii) Brain case is small and top of skull is flat
- iii) Orbit and temporal fossae are confluent.
- iv) Jugal takes part in the formation of glenoid fossa.
- v) Palatine is with large posterior vacuities.
- vi) Zygomatic arch is complete. Lower jaw is made up of a single dentary.
- vii) The alisphenoid forms a bulla
- viii) Clavicles are large and Interclavicle is absent.
- ix) Cervical vertebrae are perforated
- x) Caudal vertebrae bear chevron bones except in koala and wombats
- xi) Coccygals are reduced.
- xii) Epipubic bones are present
- xiii) Femur is without a third trochanter.

Digestive system

- ① A single set of teeth is functional throughout life. Only one tooth, a milk molar is said to be replaced by the permanent last premolars
- ② Teeth exceed the typical mammalian number of 44 and the incisors, in the two jaws, are not equal.
- ③ Shape and size of stomach vary according to feeding habits. In kangaroos, the stomach is sacculated and elongated.
- ④ In herbivorous form a large caecum is present, while it is absent in carnivorous forms.

Circulatory System

Heart is four chambered.

Atriculo-Ventricular valve is membranous.

- Two Superior Vena Cavae are present and each receives an azygous vein.
- The fossa ovalis in the inter-auricular septum is absent.

Nervous System

- The brain is smaller than that in higher mammals.
- Cerebral hemispheres are small.
- Olfactory lobes are large.
- The cerebellum is small, simple and exposed.
- The corpus callosum is either absent or poorly developed.
- Anterior commissure is large.
- The cochlea is spirally coiled.

Urogenital System

- Anal and urogenital apertures are surrounded by a common sphincter muscle.
- Ureters run between the genital ducts in both sexes.
- Oviducts are separate and uterus and vagina are paired.
- Testes are extra-abdominal and lie in a scrotal sac in front of the penis.
- The gland of penis is bifurcated.
- A shallow cloaca is present.

Development

- Fertilization is internal.
- Females are viviparous.
- Young are born alive in an immature condition.
- A true allantoic placenta does not occur except in Peromyscus.
- Young are transferred to the abdominal pouch or marsupium, they are fed with milk for a considerable period until fully formed.

Affinities of Metatheria

Metatheria includes mammals which possess both primitive and advanced characters. They share certain characters with prototherian and in several characters they resemble the higher placental mammals or eutherians.

- (4) Presence of anterior commissure.
- (5) Presence of large olfactory lobes.
- (6) Presence of cloaca.

Though the marsupials possess the above characters resembling the prototherians, yet they show differences from them in the possession of the following characters.

Differences:-

1. Marsupials are viviparous, while prototherians are oviparous.
- (2) Mammary glands with teats are found in metatherians but in prototheria they are without-teats.
- (3) In prototheria vertebrae are without epiphyses, while in marsupials vertebrae have epiphyses.
- (4) Coracoid is well developed and separate in prototherians but reduced in metatheria.
- (5) Interclavicle is present in prototheria but absent in metatheria.
- (6) In prototheria ribs are single-headed but in metatherians they ~~are~~ are double-headed.

The above characters suggest that Marsupials and prototheria ~~are~~ arose from some common ancestral stock in remote past and evolved along different lines.

(B) Affinities with Eutheria

Marsupials resemble eutherians in the following characters:

- (1) Presence of penna.
- (2) Fenestrated bony plate.
- (3) Presence of humeral and epicondylar foramina.
- (4) Heterodont dentition.
- (5) Presence of Extra-abdominal testes.
- (6) Presence of four optic lobes.
- (7) Allantoic placenta and gestation.
- (8) Ova small and yolky.
- (9) Viviparous.
- (10) Presence of mammary glands, with teats.

CONCLUSION

It is evident from the study of the above characters and the structural organisation of the prototheria and

cannot be regarded as an intermediate stage in the
ancestral line of eutherian evolution. It is now held
that marsupials and placentals (or eutherians) have
evolved independently from the common pantherian
ancestors in the upper Jurassic period and then
evolved along different lines.

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