B.Sc. (Hons) Part-II, Paper III A (G-1) 13/07/20

Subject: Zoology

Affinities of Metatheria (Part-Two)

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Metatherians show a mixture of primitive and advanced features.

II. Affinities with Prototherians :-

(i) Presence of cloaca. The rectum and urinogenital sinus open together in a common cloaca.

(ii) Presence of clavicles, epipubic bones in Pelvic girdle and tympanic bone is ring-like.

(iii) Tympanic bulla is absent. Tympanic is not united with the periotic.

(iv) Brain is relatively smaller with large olfactory bulbs and anterior commissure. Corpus Callosum is absent.

(v) True allantoic placenta is absent.

(vi) Bulbourethral Seminales are absent in males.

Differences with the Prototheria :-

1. Metatherians have well developed pinnae, absent in prototherians.
2. Matatherians have well-developed marsupium.
3. Vertebrae with epiphyses. Ribs bicephalous (Monocephalous in prototherians). No Interclavicle. Coracoids reduced as in Placentals.
4. Teeth present in the adults. (only one set of teeth).
5. ~~cloaca~~ Cochlea is Spirally coiled, whereas it is partly coiled in Prototheria
6. Viviparous.
7. Uterine gestation. (No gestation in monotremes.)
8. Testes in the scrotal sac; whereas in prototherians these are abdominal. Glans penis is bifid.

II Affinities with Eutheria :-

Metatherians have many advanced features similar to Eutherians or higher placental mammals.

1. Presence of hairs over the body.
2. Presence of External Ear (pinnae).
3. Sebaceous mammary glands with teats.
4. Coracoids reduced, interclavicle absent

and ribs bicephalous.

5. Teeth heterodont: Incisors, Canines, Premolars and molars.

6. Brain with 4 optic lobes. Cochlea spirally coiled.

7. Testes in Scrotal sac. Presence of erectile penis in male.

8. In female, uterus and Vagina are present & the oviduct.

9. Viviparous, Ova microlecithal. Uterine gestation and placenta present.

Differences with Eutherians:—

1. Metatherians have restricted distribution; found only in Australia and North & South America.

2. Presence of characteristic marsupial pouch.

3. Sebaceous mammary glands with teats.

4. Coracoids reduced. Interclavicle absent and ribs bicephalous.

5. Teeth heterodont: Incisors, Canines Premolars & molars., But no. of Incisors is more in both the jaws.

6. Tympanic bone is absent.

7. Alisphenoid accists in forming the tympanic bulla. Periotic and Squamous bones remain separate. Jugal extending back and participates forming the glenoid cavity for

for the articulation of lower jaw. Well-developed epipubic bones. Ventral posterior border of lower jaw is inwardly inflected.

8. Corpus Callosum is absent in the brain.
9. In Perameles, a true chorio-allantoic placenta is present but it is absorbed after the birth of the young. Others have yolk sac placenta.
10. A pair of uteri and Vagina are present in female. Each Vagina has a separate opening into the urinogenital Canal.
11. Ureters pass between the genital ducts, whereas in eutherians they pass outside the genital ducts.
12. In male, penis is sometimes bifid and lies behind the Scrotal sacs.
13. Gestation Period is brief.

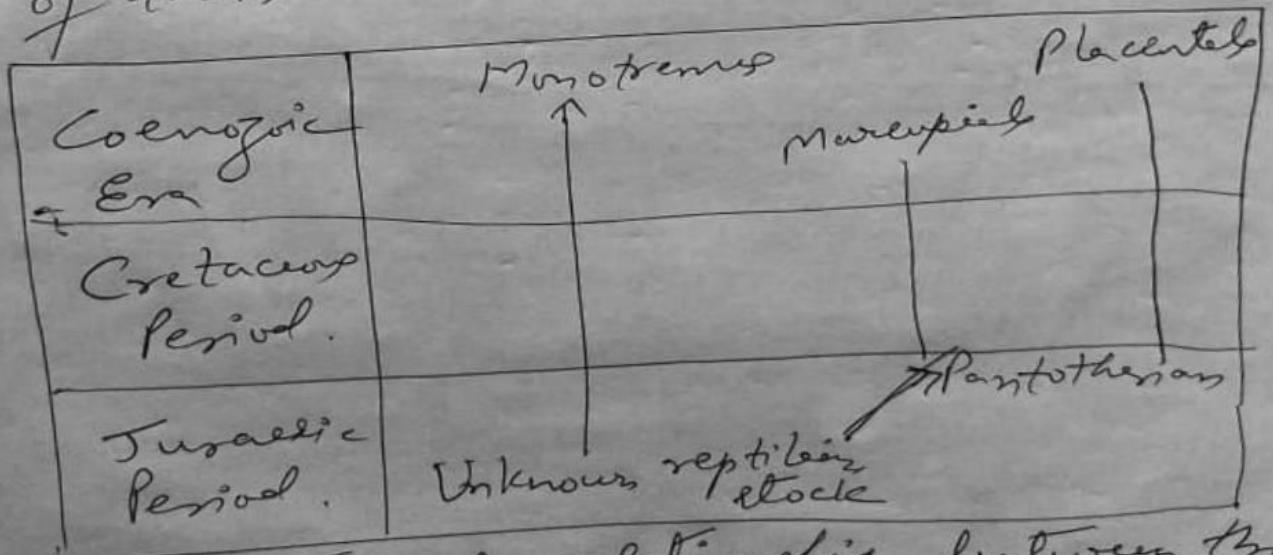
Systematic Position :-

It is obvious that Metatherians are more advanced than the primitive, reptile-like, Oviparous prototherians. They are more closely related with Eutheria, but dont belong to the same grade of evolution. Therefore, they are put under a separate Infra class Metatheria, which the rest of the higher and truly

Placental mammals are placed in this Infraclass Eutheria and both combined in subclass Theria.

Phyllogenetic Considerations of Metatheria

Comparative Study of biological organisation of marsupials and placentals reveals that the marsupials appear to be equal grade of mammals. For this reason, it was the common practice for the Zoologists to regard the marsupials as the transitional step in the evolution of mammals, between the ancestral Jurassic mammals and the coenozoic placentals. But, now it is believed that placental mammals and marsupials evolved independently from some common pantotherian ancestor in the late Jurassic period and both of them evolved side by side.



Phyllogenetic relationship between three surviving Mammalian Groups