DEPARTMENT OF ZOOLOGY

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B.Sc. Zoology Part II

CHARACTERS, DISTRIBURION AND GENERAL ORGANISATION OF METATHERIA (MARSUPILIA)

INTRODUCTION

- Female Metatherians are provided with an integumentary pouch in the abdominal region.
- This pouch is called marsupium and for this reason these are called marsupials.
- These are primitive mammals in which youngs are born in an immature condition and undergo further development in the marsupium of the female.
- Their mammary glands open in the marsupium by teats.
- These lack allantoic placenta.

A. GEOGRAPHICAL DISTRIBUTION

- Marsupials evolved completely during cretaceous period and enjoyed cosmopolitan distribution.
- But, presently they found mainly in Australia (except New Zealand), South America and in North America (only with a few species).
- Kangaroos, wombats, phalangers, koalas etc. are found in Australia.
- *Thylacinus* and *Sarchophilus* are found in Tasmania.
- South America is home for Cocholestes, Orolisters and Rhyncholisters.
- The best known North American member is Didelphis viginiana (opossum).
- Cenozoic era witnessed an enormous increase in number of placentals, so marsupials has to face competition with them.
- Unlikely they failed in competition and consequently become exterminated from many parts of world.

B. GENERAL CHARACTERS

1. HABIT AND HABITAT

- Marsupials differ greatly among themselves in feeding and other habits.

- These may be diurnal or nocturnal, most of them are terrestrial, burrowing or arboreal, while aquatic forms are rare.
- These may be exclusively herbivorous (Kangaroos) or exclusively carnivorous (*Thylacinus* and *Dasyures*) or omnivorous.

2. EXTERNAL FEATURES

- Soft furs cover the body.
- Pinnae are well developed.
- Females have marsupium supported by two epipubic or marsupial bones (absent in *Didelphis*).
- Mammary glands open into marsupium by teats.
- Tail is well developed which help in balancing.
- The second and third toes of hind limbs are slender and remain enclosed in a sheath of skin.
- These two together are known as syndactylus digits which form a sort of two pronged comb.
- The fourth toe is largest.
- All digits end in claws.
- Hind limbs are longer than limbs.

Fig. 7.2. A Kangaroo with an young in marsupium.

4. ENDOSKELETON

- Dicondylic skull bears distinct sutures.
- Jugal participates in the formation of glenoid fossa.
- Tympanic bulla is partly formed by alisphenoid and is incompletely united with skull.
- Orbital and temporal fossae are continuous.
- Mandible is formed of a single dentary zygomatic arch is complete.
- Pterygoid is small.
- Palate is fenestrated.
- Dentition is thecodont, heterodont and monophyodont.
- Vertebrae with epiphysis.
- Vertebral column is divisible into five regions (cervical- 7, thoracic-13 with ribs, lumber- 7 devoid of ribs).
- Caudal vertebrae are with 'chevron bone' except in koala and wombat.
- Atlas is incomplete and is provided with cartilage in the ventral incomplete side.
- In pectoral girdle interclavicle is absent but a clavicle is present.
- The scapula is large and is provided with a spine, but the coracoid is reduced.
- In pelvic girdle, epipubic bones are present, projecting forward from the pubis, but is not homologous to reptilian epipubic bone.

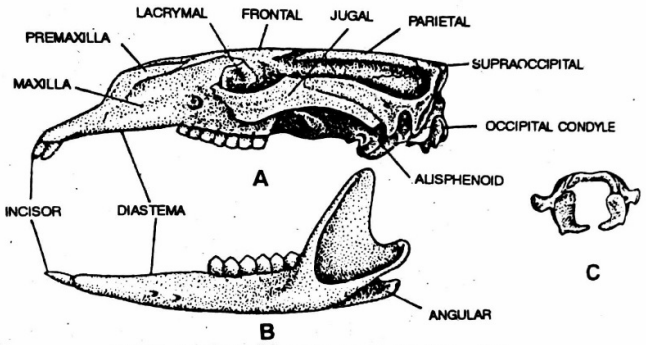

Fig 7.3 (A) Skull (B) Lower jaw & (C) Atlas of *Macropus*

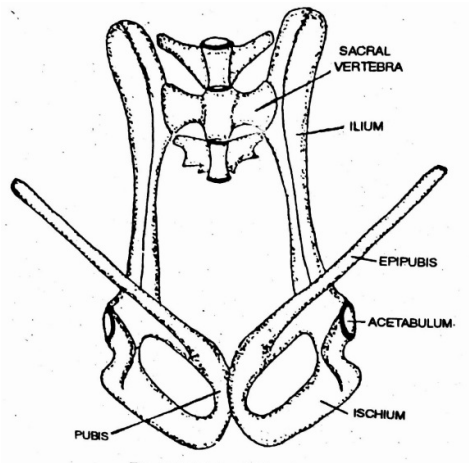

Fig. 7.4 Pelvic girdle of opossum.

5. DIGESTIVE SYSTEM

- In kangaroos, the stomach is enlarged and sacculated.
- A gall bladder is always present.
- A large caecum is found in herbivores forms, sometines with a vermiform appendix.
- Caecum is absent in carnivorous forms.

6. CIRCULATORY SYSTEM

- The fossa ovalis is absent in auricular septum.
- Each superior venacava receives an azygous vein.
- Auriculo-ventricular valves are membranous and remain attached by chordae tendineae to the papillary muscles.

7. NERVOUS SYSTEM

- Brain is small with little convolutions.
- Corpus callosum is absent or poorly developed.
- Cochlea of internal ear is spirally coiled.

8. URINOGENITAL SYSTEM

- Kidneys are metanephric.
- Ureters run between genital ducts in both sexes.
- In male testes are extra-abdominal and lie in scrotal sacs in front of penis.
- The glans penis is often bifurcated.
- Vesicular seminalis is absent.
- The opening of the urinogenital canal and anus are enclosed by a common sphincter muscle.
- In female, two oviducts open separately into urinogenital sinus hence there are two uteri and two vaginae.

9. DEVELOPMENT

- Females are viviparous, give birth to immature youngs which are kept in marsupium where the embryos remain attached to the nipples of the mother.
- Gestation period is very short.
- Yolk sac placenta is common in all.
- But an allantoic placenta is formed in *Parameles.*

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