B. Sc. (Hons) Part-II Practical
Course: Zool. H. 211
Experiment 5
Osteology (The study of bones)

Definition

Osteology is the study of the structure and function of the endoskeleton including bones and cartilages. In other words, osteology is a detailed study of the structure, morphology and function of cartilages and bones.

Types of skeleton

- **Exoskeleton:** Most invertebrates like protozoans, sponges, arthropods, molluscs etc. have their exoskeletons
- **Endoskeleton:** Most vertebrates like fishes, amphibians, reptiles, birds and mammals have their bony endoskeleton

Endoskeleton of vertebrates includes the following types

1. Axial skeleton: Skull, vertebral column, sternum and ribs;
2. Appendicular skeleton: Girdles and appendages (fore- and hind limbs).

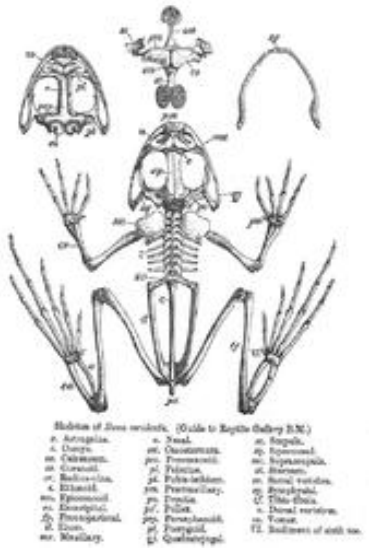


Fig. 1 Endoskeleton of Amphibia

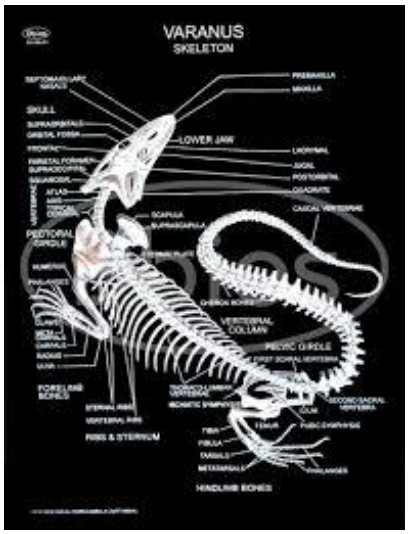


Fig. 2 Endoskeleton of Reptilia

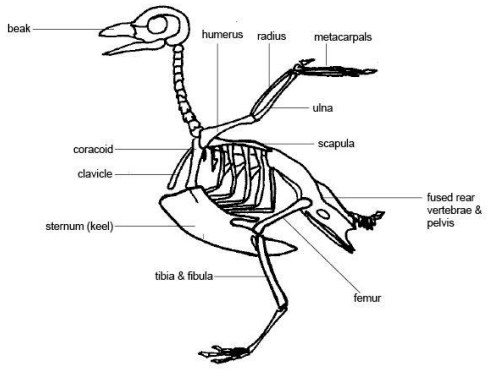


Fig. 3 Endoskeleton of Aves

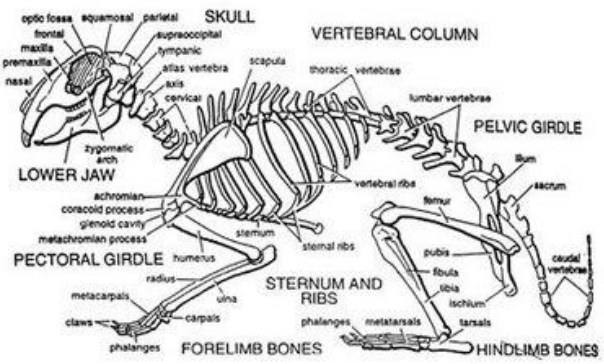


Fig. 4 Endoskeleton of Mammalia

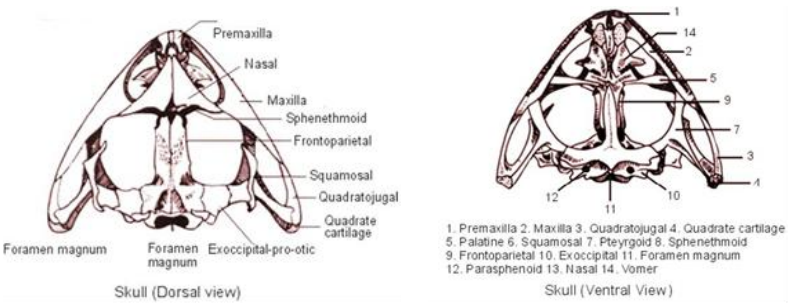


Fig. 5 Skull of Amphibia

Main features of amphibian skull

a. Dorso-ventrally flattened, triangular in shape;
b. Dicondylic;
c. Toothless lower jaw.

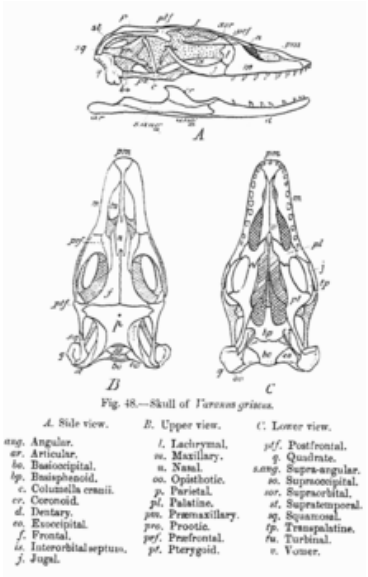


Fig. 6 Skull of Reptilia

Main features of reptilian skull

a. Elongated; narrow anteriorly;
b. Monocondylic ;
c. Homodont dentition.

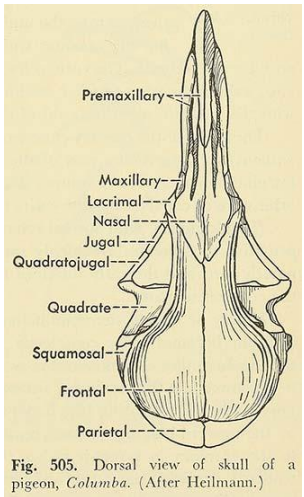


Fig. 7 Skull of Aves

Main features of avian skull

a. Toothless beak;
b. Light-weight bones;
c. Monocondylic.

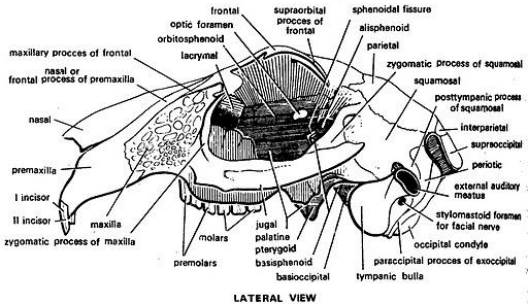
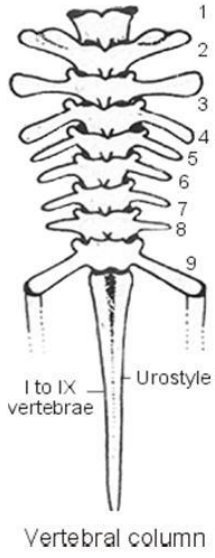


Fig. 8 Skull of Mammalia

Main features of mammalian skull

a. Heterodont dentition;
b. Dicondylic;
c. Presence of tympanic bulla.



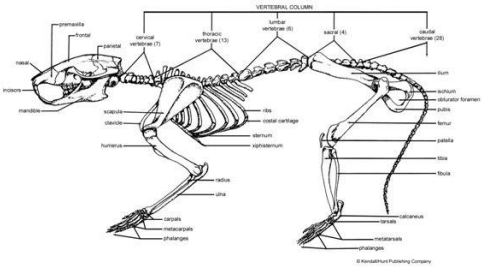
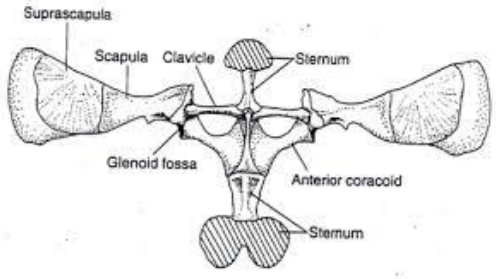


Fig. 9 Vertebral column of Amphibia **Fig. 10** Vertebral column of Mammalia

Main pectoral girdle bones of vertebrates

Supra scapula;
Scapula;
Clavicle;
Coracoid;
Glenoid cavity;
Sternum.



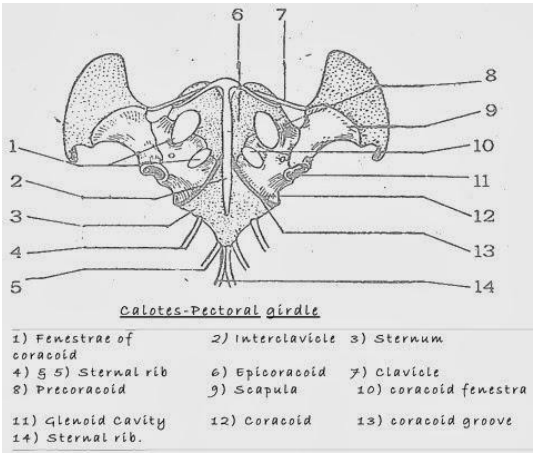


Fig. 11 Pectoral girdle of Amphibia **Fig. 12** Pectoral girdle of Reptilia

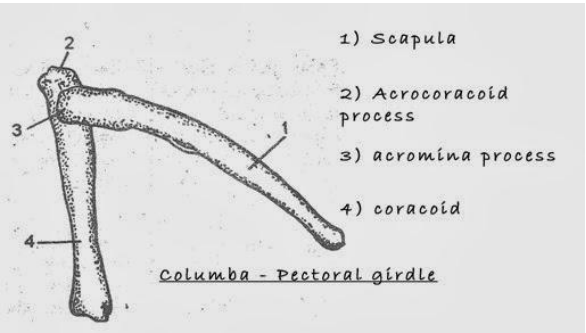


Fig. 13 Pectoral girdle of Aves

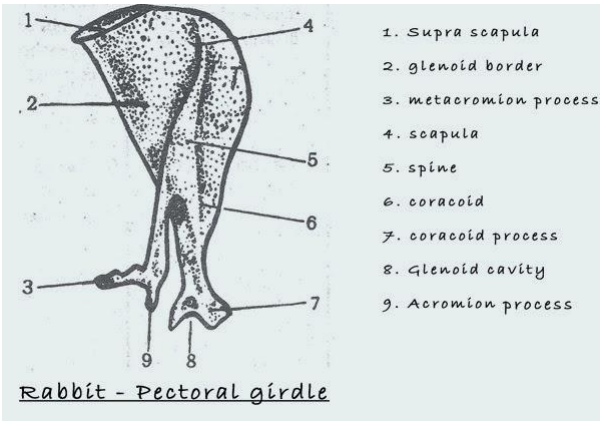


Fig. 14 Pectoral girdle of Mammalia

Main Forelimb bones of vertebrates

1. Humerus (deltoid ridge, trochlea, condylar ridge);
2. Radio-ulna (olecranon process, cavity for trochlea);
3. Carpals (wrist);
4. Metacarpals (hand);
5. Phalanges (digits).

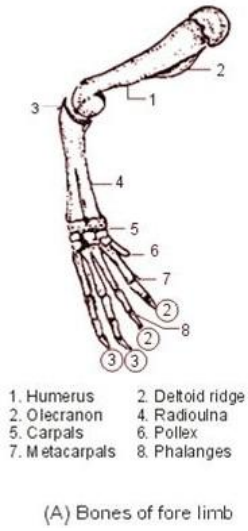


Fig. 15 Amphibia

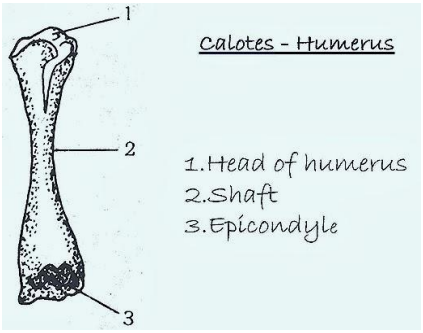


Fig. 16 Reptilia

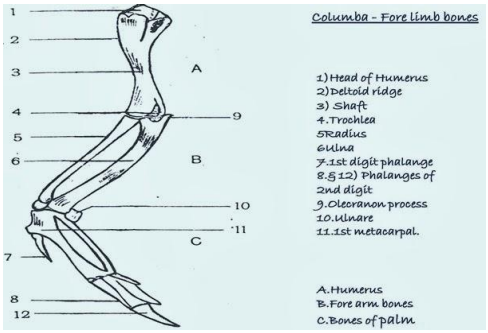


Fig. 17 Mammalia

Fig. 18 Radius and ulna of Aves

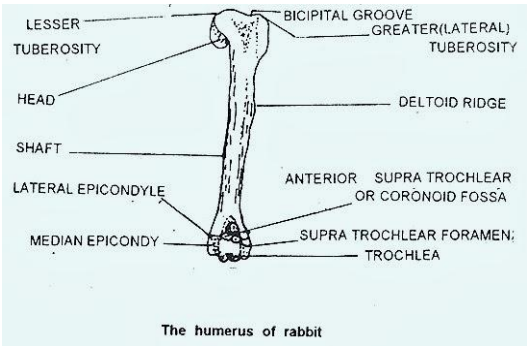


Fig. 19 Humerus of rabbit

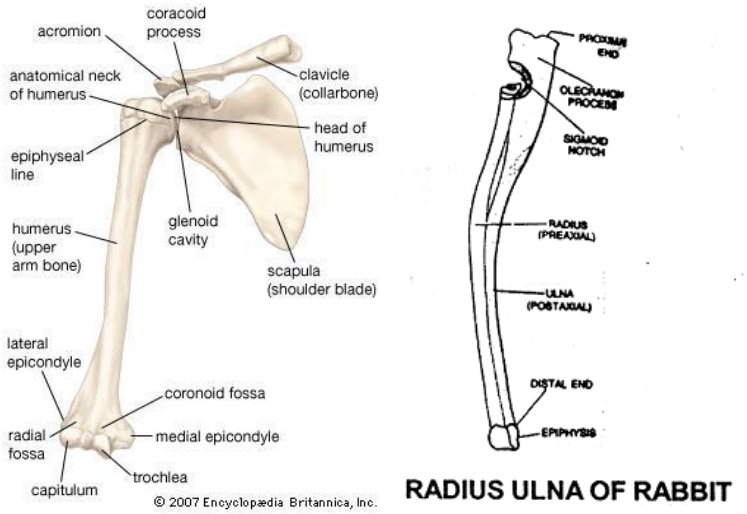
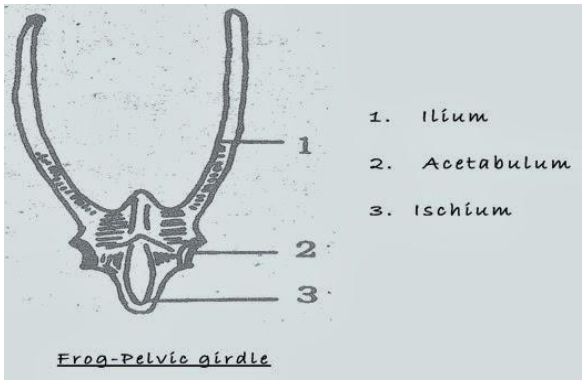


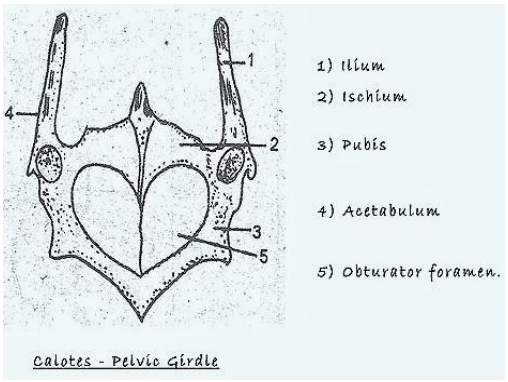
Fig. 20 Pectoral girdle, humerus and radius & ulna of rabbit (Mammalia)

Main pelvic girdle bones of vertebrates

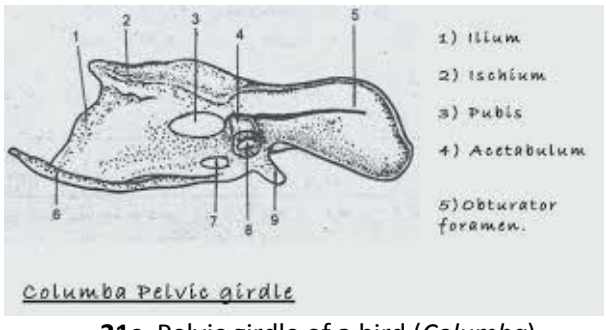
a. Ilium;
b. Ischium;
c. Pubis;
d. Acetabulum;
e. Obturator foramen.



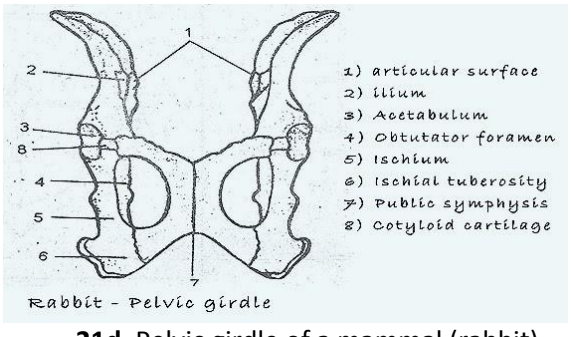
21a. Pelvic girdle of a frog (*Bufo*)



21b. Pelvic girdle of a lizard (*Calotis*)



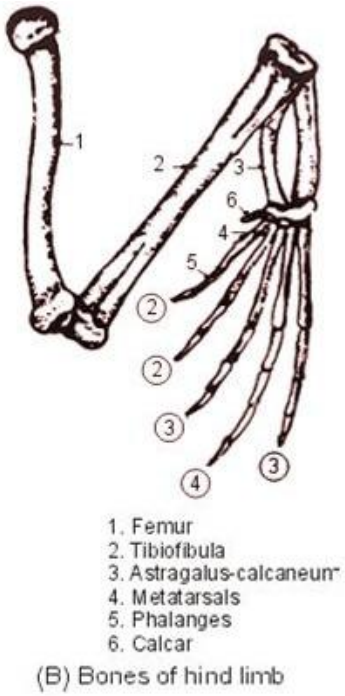
21c. Pelvic girdle of a bird (*Columba*)



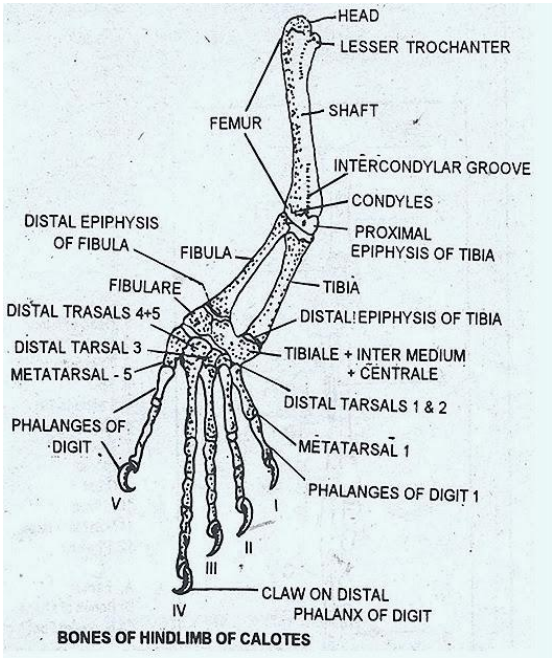
21d. Pelvic girdle of a mammal (rabbit)

Fig. 21 Pelvic girdles of vertebrates (Amphibia through Mammalia)

Fig. 22 Hind limb bones of vertebrates

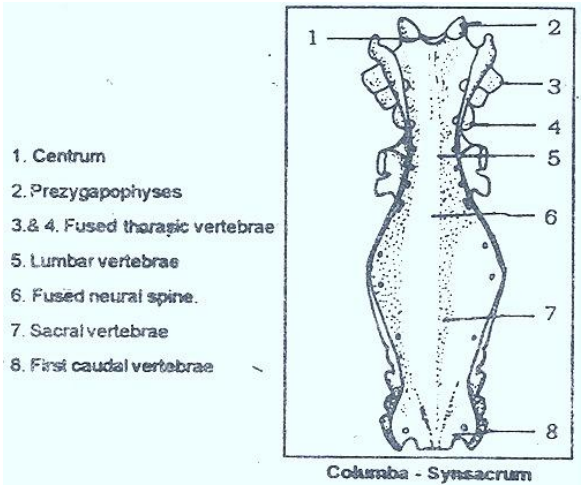


Hind limb bones of Amphibia (frog)



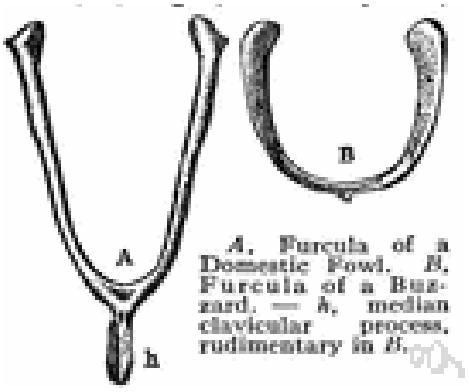
Hind limb bones of Reptilia (*Calotis*)

Hind limb bones of a bird



Synsacrum of a bird

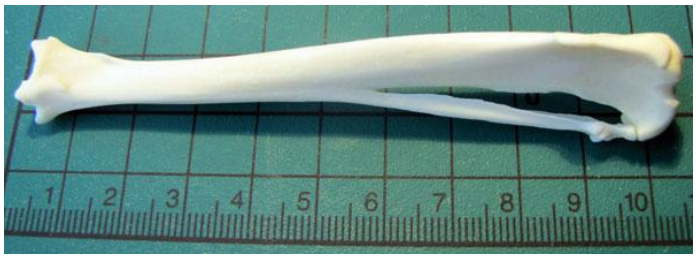
Sternum (breastbone) of a bird



Furcula (merry thought) of a bird

Hind limb bones of Mammalia

Femur of a rabbit



Tibia and fibula of a rabbit

Fig. 23 Girdles and limb bones of Mammalia

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