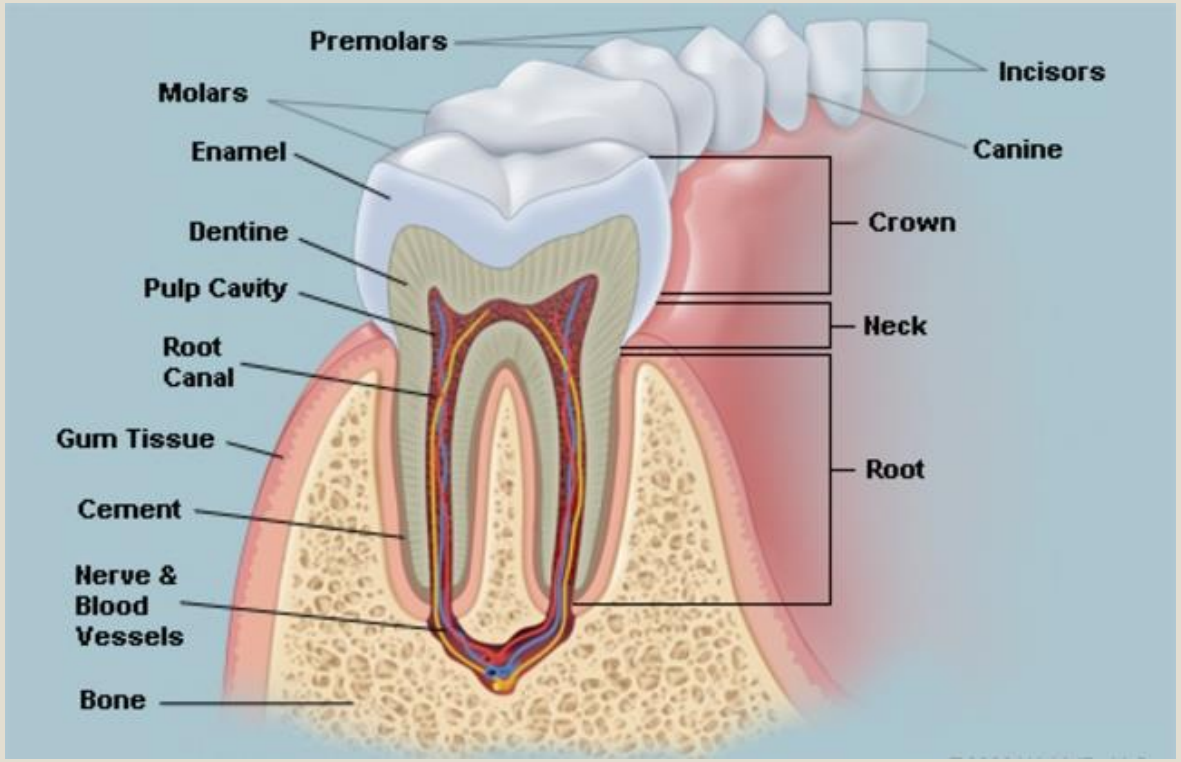
DENTITION IN MAMMALS

B.Sc. Part I, Paper II, Group A, By Dr. Vandana Kumari, Department of Zoology

Introduction

The arrangement of teeth in the upper and lower jaw, mainly on the premaxilla, maxilla and dentary bone is called dentition. Teeth are the dermal derivatives of integuments. These are hard bony structure modified to capture,tear,cut and grind food material before swallowing. Epidermal teeth are hard cornified epidermal structures of rare occurrence, as in buccal funnel of cyclostomes and on the edges of tadpole jaws. Dermal teeth is found in most of the vertebrates. These are developed as a result of calcification in the mucus membrane of the cavity.

Structure of teeth



Structure of teeth is similar in all the vertebrates. Atypical mammalian tooth is differentiated into 3 parts-

- **Crown-** Visible part of the teeth.
- **Root-** Basal part, embedded in the socket of the jaw bone.
- **Neck-** It is the area of junction of crown and root.

Parts of the teeth

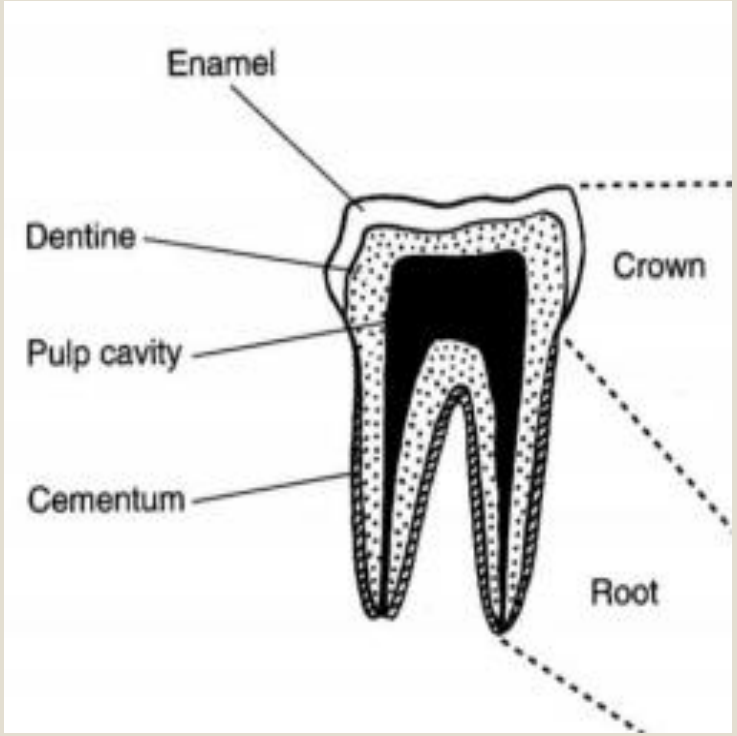
Mammalian teeth is composed of following structural components-

Enamel: Hardest substance in a mammals body. Almost completely made up of calcium phosphate crystals and 3% organic materials. Covers crown of tooth.

Dentine: Inner material of tooth, mostly calcium phosphate but about 30% organic component. It makes it softer.

Cementum: Softer, bind teeth to jaw. May form part of crown in some complex teeth. It is a layer of connective tissue that binds the root of the teeth firmly to the gums and jaw bones.

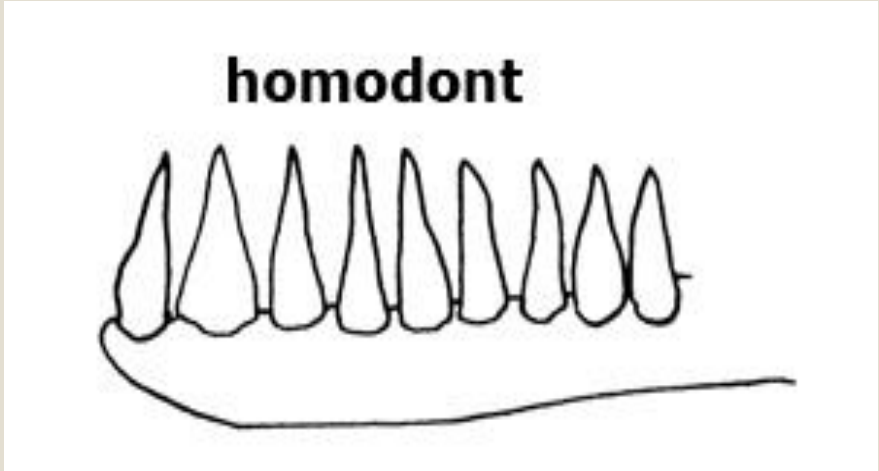
Pulp: The softer living inner structure of teeth. Blood vessels and nerves runs through the pulp of the teeth.



On the basis of shape and size

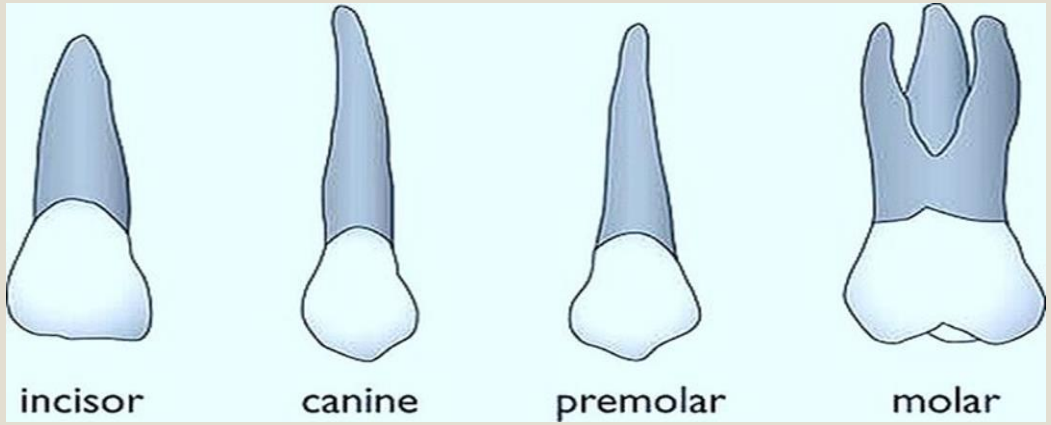
Homodont

Also called isodont type of teeth, is a condition where the teeth are all alike in their shape and size, e.g. the toothed whales (Odontoceti). Pinnipedians show a tendency towards homodont condition. Fishes, amphibians, reptiles and in the extinct toothed birds, homodont or isodont condition is observed.



Heterodont:

This condition is the usual feature in mammals, i.e. the teeth are distinguished according to their shape, size and function. The function is also different at different parts of the tooth row. Except mammals heterodont condition is found in Port Jackson Shark (Heterodontus), in several reptiles, specially among mammal-like reptiles.



On the basis of mode of attachment

Thecodont:

- This type of dentition is found among mammals. In this condition, the teeth are lodged in bony sockets of the jaw bone, Capillaries and nerves enter the jaw bone and the pulp cavity through the open tips of the hollow roots. This is a peg and socket attachment with the help of cementum that surrounds the root portion of the tooth.
- Except mammals, the thecodont types of teeth are found in crocodiles and in some fishes (Haddock, Garpike and Barracuda). Among vertebrates, in addition to the thecodont dentition, acrodont and pleurodont type of dentition are also found.

Acrodont

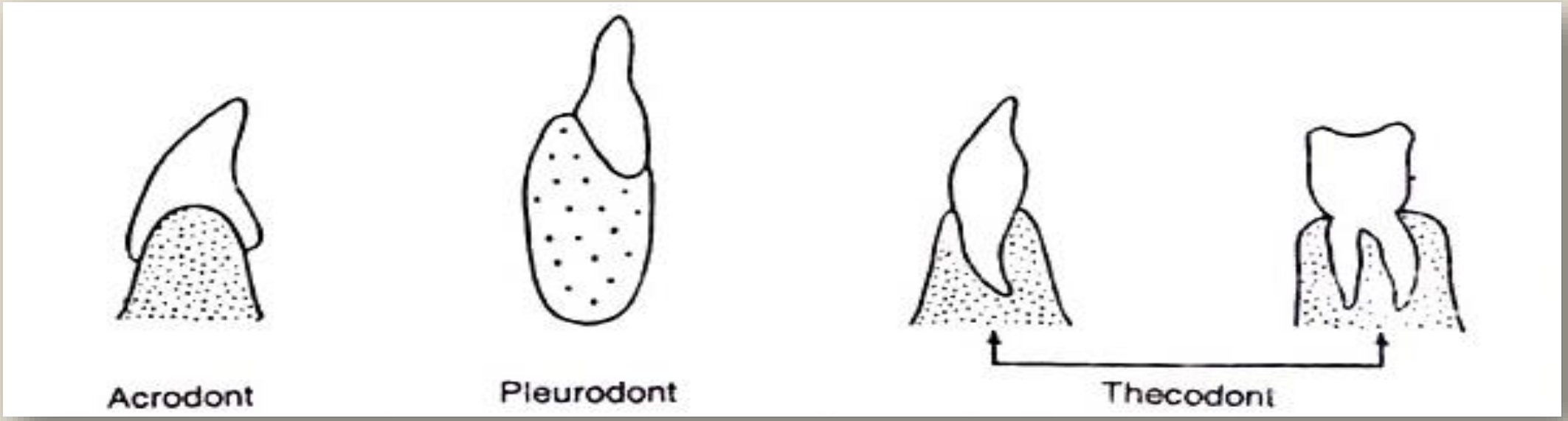
- In this type the teeth are fused to the surface of the underlying jawbone. These have no roots and are attached to the edge of the jawbone by fibrous membrane. This type of attachment is not very strong and teeth are lost easily and are replaced by new ones.
- E.g. fishes, amphibians and some reptiles. In amphibians if teeth are present, that are acrodont and homodont type except Necturus. The acrodont-possessing reptiles are Sphenodon, Calotes, Draco, Agama, Uromastix and some snakes.

Pleurodont

- Here the teeth are attached to the inner side of the jawbone . The tooth touches the bone only with the outer surface of its root. In acrodont and pleurodont types of dentition, there are no roots, and nerves and blood do not enter the pulp cavity at the base, e.g. Necturus (Amphibia) and some reptiles. This attachment is not so strong as thecodont.

- Among reptiles the following families possess the pleurodont type of teeth:
- Iguanidae (Iguana), Xenosauridae (Xenosaurus, Mexico), Zonuridae (Africa), Anguidae (Anguis, Ophisaurus), Lacretidae (Lacerta), Scincidae (Mabuya), Helodermatidae (Heloderma, Mexico), Varanidae (Varanus), Gerrhosauridae (Africa).

Mode of attachment of teeth



Succession of teeth

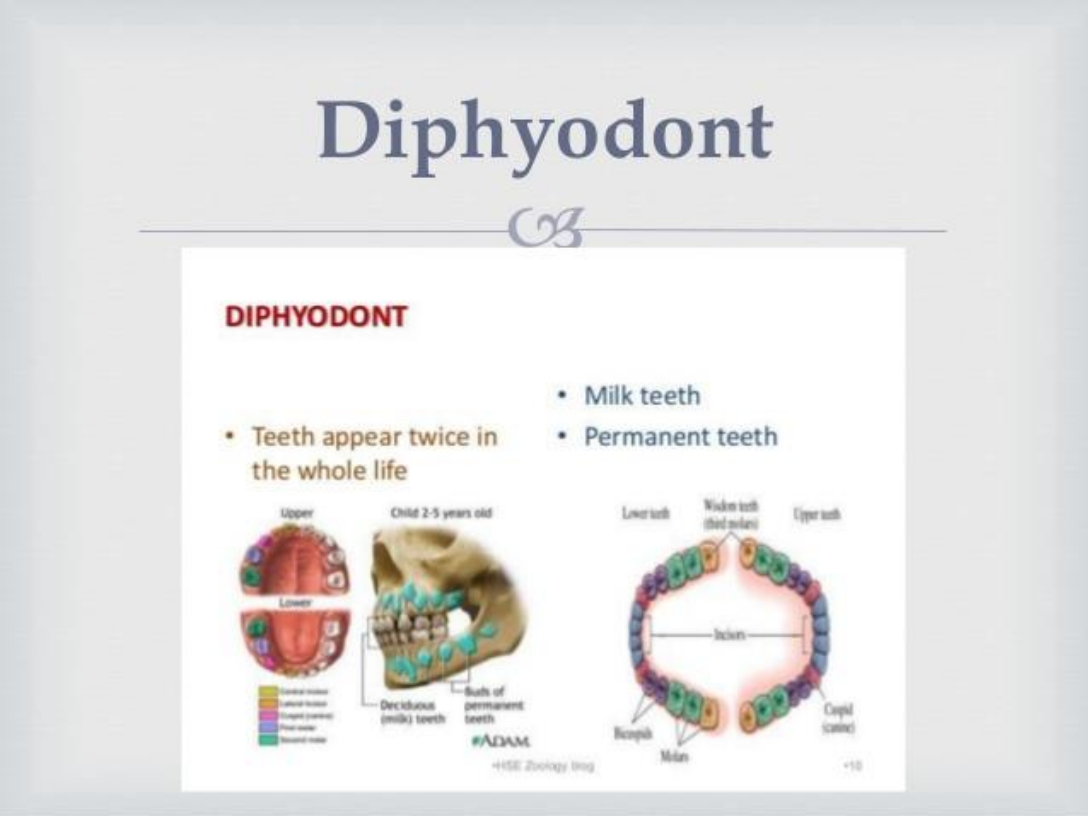
According to their permanence or replacement, teeth fall into three categories:

1. Monophyodont
2. Diphyodont
3. Polyphyodont
   - Among mammals the first two categories are found.

Monophyodont

Monophyodont teeth appear only once in lifetime and if they fall they are never again replaced by the new ones. Toothless animals have this kind of teeth and marsupials retain their milk teeth.

Diphyodont



Diphyodont dentition is a characteristic of mammals in which milk teeth appear in the young ones but as they grow and jaw becomes larger, milk teeth are replaced by larger permanent ones to fit in the larger jaw bone.

Polyphyodont

Polyphyodont dentition involves replacement of teeth from time to time several times in lifetime so that jaws are never left without teeth. Lower vertebrates having loose attachment of teeth lose teeth while feeding and capturing prey and hence teeth must grow again to replace the lost ones.