Lecture 7 – Teeth

Generally teeth should be regarded as modified scales which have migrated into the mouth.

Agnathans (hagfish and lampreys)

- horny cones
- beneath cones are papillae of the mesoderm covered with ectoderm which resemble the dental papillae and enamel organs although no calcification occurs

Gnathostomes (vertebrates with a jaw)

Chondricthyes (cartilagenous fishes)

- teeth are arranged in several rows
- when front row fall a new row takes their place
- sometimes triangular sharp as in the sharks
- sometimes flattened and arranged like a pavement for crushing as in rays.
- These teeth only represent the crowns of human's teeth - not embedded in sockets except in the case of the teeth in the saw of the saw-fish (Pristis)
- These teeth are largely composed of dentine, but they resemble bone and fill up the whole pulp cavity.



Actinoptergyii (ray fin fishes)

- Continuously replaced, sometimes in blocks or rows (characids = sides of a jaw)
- Variable – no teeth (sturgeon) to all bony plates in the mouth (monkfish)
- Hinged teeth - pike and the hake where teeth bend backward during the passage of prey down the throat, but are re-erected by elastic ligaments.

Types of teeth

- Canine: large conical teeth often at the corners of the mouth
- Molariform – pavement like or molar like crushing teeth (rays, musselcracker) – hard prey items eg. gastopods.

Types of teeth

- Villiform – small fine teeth
- Cardiform – fine pointed teeth arranged closely together

Places for teeth (overhead)

- Jaws
- Pharyngeal teeth – modified 6th gill arch
- Gill rakers
- Mouth bones

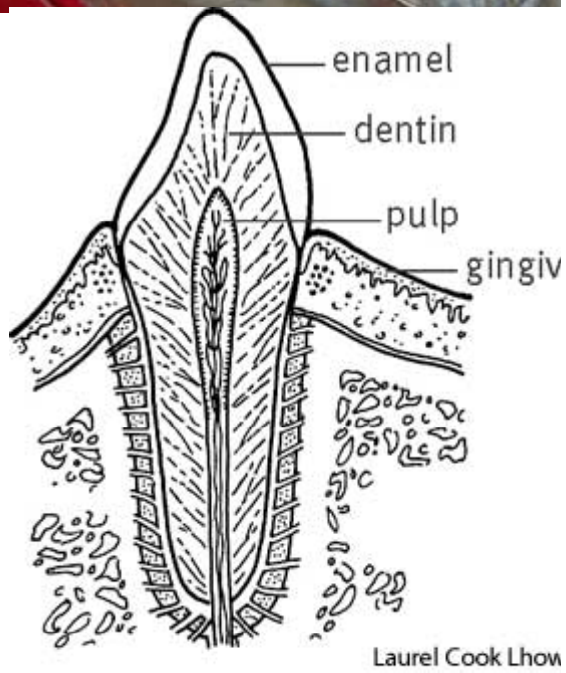
Development

Development of teeth similar to the development of scales

evolve from epidermal eruptions in the skin of the jaws

The basic structure of a tooth consists of three main regions:

1. enamel - the surface layer of the tooth that is hard and protective (1% protein = enamelin + 99% calcium phosphate (apatite) crystals). Arranged in prisms perpendicular to dentines)
2. dentine - makes up the bulk of the tooth (matrix of collagen and hydroxyapatite crystals)
3. pulp cavity - contains the blood vessels and nerves that feed and innervate the tooth

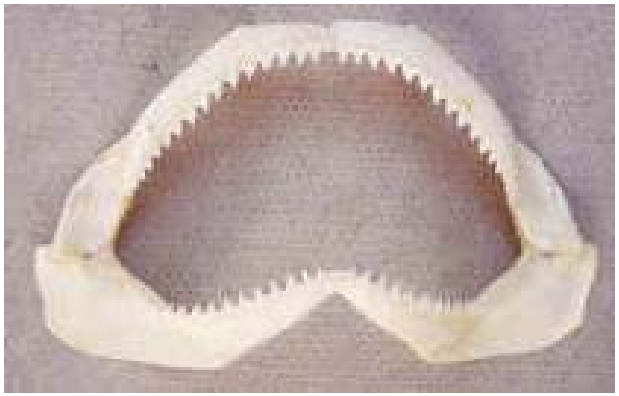


Teeth can vary in their permanence, their attachment, and their structural differentiation.

- Polyphyodont - continuous succession of teeth throughout life (shark)
- Diphyodont - replacement of milk or deciduous teeth by permanent teeth (mammals)
- Monophyodont - single set of teeth retained throughout life (whales, marsupials)

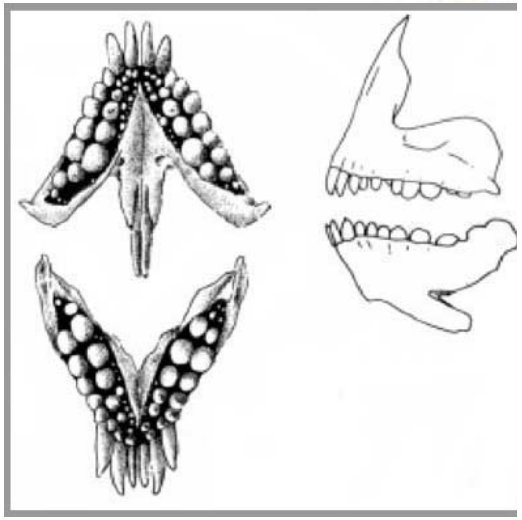
Attachment

- Acrodont - simplest teeth that have no roots and may break off easily from jaw (fish and amphibians)
- Pleurodont - teeth attached by one side to the inner surface of the jaw bone (lizards)
- Thecodont - teeth set into sockets and relatively immobile



Structural differentiation:

- Homodont - teeth essentially all alike
- Heterodont - teeth differentiated into a variety of uses



Comparison

- Humans – heterodontic and diphyodontic (multiple uses, milk teeth replaced once)
- Fish – Mostly homodontic and acrodontic (simple teeth, no roots)