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CLASS 11 & 12th



Learning Inquiry
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CLASS 11th

**Digestion and
Absorption**

misostudy



01. Digestive System

The human digestive system comprises of alimentary canal and digestive glands.

02. Alimentary Canal

The alimentary canal is a tube-like structure extended from mouth to anus. Its lumen is called **enteric cavity**. On the basis of embryonic origin, the structure of alimentary canal contains three regions, namely foregut, midgut and hindgut. The foregut (stomodaeum) region is ectodermal in origin and contains mouth, buccal cavity, pharynx and oesophagus in it. The midgut (mesenteron) is endodermal in origin and contains main digesting parts, i.e. stomach and intestine upto the colon region. The hindgut (proctodaeum) is again ectodermal in origin and contains colon, rectum and anus.

03. Mouth and Buccal Cavity

Mouth is a transverse slit-like aperture on the ventral side of the body. It is normally guarded by two movable lips, i.e. upper and lower lip. A specific muscle is associated with lips. It is called orbicularis oris muscle.

Upperlip has a tubercle (a small rounded projection) in the middle and a ventral groove or philtrum above. There is also present a space between gums and lips in front and gums and cheeks on the side called **vestibule**. The mouth opens into the buccal cavity or oral cavity. The buccal cavity contains the palate, tongue and teeth. The palate is a horizontal structure separating the buccal cavity and the nasal cavity.

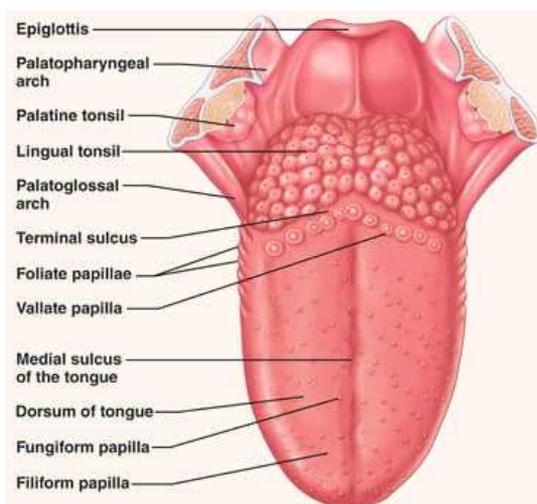
The anterior part of the palate is called **hard palate**. This part is well-supported by maxilla bone. This part contains specialised grooves and ridges over it, called as **palatine rugae**. These rugae are well-developed in carnivores. They are helpful in gripping the prey firmly. The posterior region of the palate is called **soft palate**. This soft palate contains a hanging portion called as **velum palate** or **uvula**.

This hanging portion is covered with four folds of mucous membrane. Out of these, two passes downwards at each side to form the membranous arches. The anterior arches are called palatoglossal arches. The posterior arches are called palatopharyngeal arches.

04. Tongue

It is a highly muscular structure containing voluntary muscles. It is attached to the floor of buccal cavity with the help of a connective tissue fold called **frenulum linguae** or **lingual frenulum**. The anterior part of tongue is free while posterior part of tongue is connected to hyoid plate or hyoid bone. The dorsal surface of tongue is divided into two unequal halves by a V-shaped sulcus, called as sulcus terminalis. These halves are pharyngeal part (i.e. posterior 1/3 part) and oral or papillary part (i.e. anterior 2/3 part). The papillary part has specialised gustatory or taste receptors present on it.

These receptors are in the form of taste buds. The four major types of papillae are circumvallate (surrounded by wall), fungiform (mushroom-shaped), foliate (leaf-shaped) and filiform (filament-shaped). Out of which filiform papillae are the most numerous, but are without taste buds. The main function of tongue is that it helps in tasting and swallowing of food. Also, in animals like dogs, tongue is helpful in the process of thermoregulation.



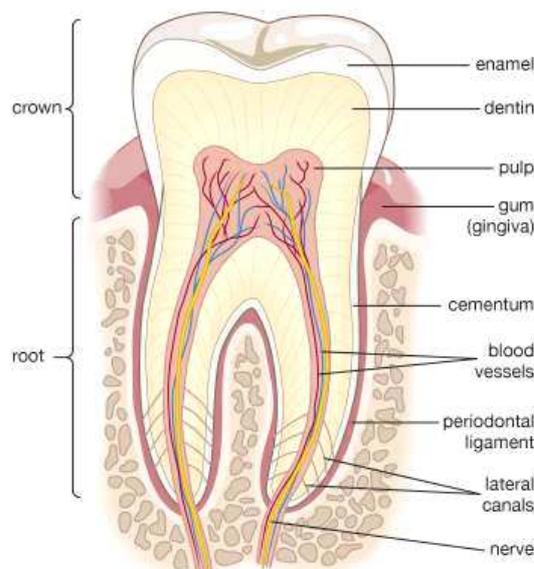
05 Dentition

The oral or buccal cavity of vertebrates contains unique masticatory organs called teeth. Teeth are derived from both ectoderm and endoderm. In mammals the individual have two sets of teeth. The first set is called **deciduous** or **milk teeth**. These appear early in life. The second set is called **permanent teeth**. These appear late in life. The milk teeth are normally replaced by the permanent teeth. In mammals, four types of teeth are present namely incisors, canines, premolars and molars. The number of each type differs in different group of animals. These are used for different purposes by animals, i.e.

- (i) **Incisor** present at the front of the mouth and are used for cutting or clipping.
- (ii) **Cannier** are next to incisors and are used for puncturing or holding or tearing.
- (iii) **Premolars** and **molars** are the innermost and are used for crushing or grinding the food. It is often hard to differentiate between premolars and molars visually. The collective term used for both of these is called **molariform** or **check teeth**.

06. Teeth Structure

The structure of teeth in its sectional view is given below



07 Type of Dentition

- In lower vertebrates, teeth are usually/ homodont (similar in general appearance) whereas in tetrapods and mammals teeth are heterodont i.e., differ in general appearance.
- According to food and feeding habits, molars can be
 - (i) **Bunodont**, i.e. small, separate and rounded for grinding, e.g. man.
 - (ii) **Secodont**, i.e. pointed margins forming sharp cutting crowns for tearing, e.g. carnivore.
 - (iii) **Lophodont**, i.e. multicuspid condition with margins irregularly drawn as ridges, e.g. horses.

On the basis of length of crown and root, molar can be

- (i) **Hypsodont**, i.e. high crown with short roots, e.g. horses.
 - (ii) **Brachyodont**, i.e. short crown with deep roots, e.g. humans
- According to the type of attachment, teeth can be acrodont (attached to terminal part of jaw bone), pleurodont (attached to lateral side of jaw bone through connective tissue) and thecodont (present in bony sockets).
 - On the basis of appearance, Teeth can be
 - (i) **Monophodont** (appear once in lifetime), e.g. 3rd molar and all premolars of humans.
 - (ii) **Diphyodont** (appear twice in lifetime), e.g. canines and 1st molars of humans.
 - (iii) **Polyphyodont** (appear several times in lifetime after replacement of fallen), e.g. teeth of shark.