**Dr. Iman**

**Avian Digestive System**

-Is phologically different From that of mammals.

- In place of lips and teeth , the entrance of the oral Cavity is formed by cornified beak attached to the upper and lower jaws.

- The oral Cavity and the tongue are lined by and by keratinized stratified squamous epithelia.

Oral Cavity \*

 Mucosa:- epithelium: keratinized stratified squamous ep .

 Propria – Submucsa: conitains

\* Salivary-like glands / not developed as those of mammals .

\* Simple branched tuloular and mucous in their Secretions.

Tongue

-Is narrow and Tapered

- Has core of skeletal muscle , mucous lingual salivary glands and bone(ento glossal bone) more positioned caudally.

-The glands of : oral cavity, tongue , esophagus and Crop----- all are mucus glands.

\*Esophagus

- Epithelium: keralinized stratied squamous ep.

- Propria – Submucsa : Has Simple branched mucous gland.

- The tubular secretory units of glands arranged in a circular fashion , all empty into duct then to the alimentary canal .

\*Crop

-Within the esophagus is adiverticulum that temporarily store ingesta & further moistened by its own glands (mucus glands).

-These glands are vary in amount and shape according to the species and even absent in some species like turkey .

- Histologically the Crop is similar to the esophagus

- In pigeon two lateral glomerular sacs secrete [crop milk].

Stomach

-Consist of two separate organs:

The proventriculus and ventriculus

\*Proventriculus :- Or The glandular stomach.

- Mucosa : arranged in Folds or plicae that lie or broad papillae .

-Mucosal Folds : lined by Simple Columnar ep.

-Mucosal glands at the base of mucosal folds.

-Submucosa: contains :

- Submucosal glands:

-empties at the tip of each papilla .

- Compound gtands , composed of a collection of numerous branching

 tubular

adenomeres that empty into large central

d that leads to single duct opening at each papillae.

-more developed that found in oral Cavity, tongue, crop, esophagus.

-The secretory portion consist of indisting uisheble cells from one another.

-Composed of one type of low columnar epithelial cells and has round basally located nucleus.

-Secrete enzyme, Hcl , smlarto glandular portion of mammalian stomach.

-Muscularis: Consist of 3 layers

-inner outer layer –longitudinal

-middle-circular.

-Serosa: typical

Ventriculus ( Gizzard or muscular stomach) \*

-Has distinguish in Feature : developed Tunica muscular which consist of multiple bands of smooth muscle Fibers that lie parallel to the lumen of the gizzard and is replased by D.R.CT. along its taleral sides.

-Muscle Functions : to mechanically break up ingesta before entering the small intestine.

-Deve loved in Herbivorous and grainivorous

-In carnivorous and Frugivorous possess thin – walled gizzard.

 -Mucosa:- Simple slumnar epithelium that subtended by simple, straight tubular glands – produce cuticle (Keratinoid or koilin) .

-it given this name due to its histolgical appearance and stainnnnning characteristics.

-This Cornified –like secretion can occur in layers and react positively to stains that are used to reveal keratohyalin\ muscular smocsa: Absent.

 -Submucosa: present : Musuleris externa : thick S.M.

\*Small and Large intestine

-Similar to those in mammals.

-However the junction of the small& large intestine opens into two appended blind sacs:

\*Ceca:-

- The villi shrink in size and disappear at the distal portion. The villi covered by simple columnar epithelium.

-Lamina propria and submucosa :

-Are heavily infiltrated with both diffuse and nodular Lymphatic tissues.

-The nodular Lymphatic T. is well established near the opening of the ceca and forms( Cecal Tonsisls).

-The large intestine similar appearance of the ceca.

\*Cloaca

- The avian alimentary canal ends at the cloaca , which is acommon orifice for the digestive, excretory & reproductive tracts, is subdivided by transverse folds into three portions:-

- The coprodeum

- The urodeum

- The proctodeum (respectively).

-The mucosal lining of the cloaca is composed of a simple columner epithelium with a variable number of mucous secreting cells.

-Lp.:Vascular Lp. With simple tubular glands.

-muscularis mucosa, present.

-Muscularis externa ,present.

\*Liver

-Very similar to the mammalian.

-The hepatocytes are arranged in rows , often two cells thick , separated by sinusoids.

\*Pancreas:-

-is smibr to the mammdian , but less interlobular C.T.

-The endocrine panceatic islets are of three types: Light (beta) islets,

Dark (alpha) islets and mixed.

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