Digestive System

Chapter 12

Digestive System Components

- Mouth
  - oropharyngeal cavity in fish
  - buccal (oral) cavity in tetrapods
- Pharynx
  - division between digestion & respiration
- Esophagus
  - muscular tube leading to stomach
- Stomach
  - chamber for chemical & mechanical digestion
    - processing of food
- Intestines
  - absorption of nutrients
- Accessory Glands
  - liver, gall bladder, pancreas

Mouth & Oral Cavity

- Tongue
  - highly variable with a variety of functions
- Oral Glands - aid in digestion
- Teeth - homologous to dermal denticals of fish
  - acrodont/pleurodont/thecodont
  - polyphyodont/diphyodont/monodont
  - homodont/heterodont
    - incisors
    - canines
    - premolars
    - molars
    - (carnassial/selenodont/lophodont/bunodont)
- Epidermal teeth - made of keratin

Gut Wall Morphology

- 1) mucosa
  - formed from glandular epithelium, connective tissue & smooth muscle fibers
  - may be highly vascularized
  - may contain microvilli to increase surface area
- 2) submucosa
  - a thick layer of connective tissue that is highly vascularized
- 3) muscularis externa
  - smooth muscle fibers arranged in two layers (circular & longitudinal)
  - used for peristalsis
- 4) serosa
  - loose connective tissue
  - secretes serous fluid to lubricate outer surface

- Esophagus
  - starts with glottis
  - secretes mucous as lubricant
  - specializations
    - esophageal sphincter in fish
    - crop in birds for storage
    - rumen, reticulum and omasum in ruminants

- Stomach
  - highly muscular chamber for maceration & mixing
  - specializations:
    - proventriculus = glandular stomach
    - gizzard = muscular stomach
- Intestines
  - highly variable
  - functions for absorption
    - Small intestine typically for nutrient absorption
    - Large intestine typically for water & vitamines

- Accessory Organs:
  - Liver
    - produces bile for lipid digestion
    - breaks down red blood cells
    - stores glucose as glycogen
    - removes amino acids and converts them into nitrogenous waste
    - produces blood additives (fibrinogen, prothrombin)
  - Gall Bladder
    - stores bile for release into small intestine
  - Pancreas - two portions with different functions
    - Exocrine portion secretes digestive enzymes
    - Endocrine portion secretes insulin & glucagon