

VERTEBRATE DIGESTIVE SYSTEM

Functions:

- mechanical breakdown - big lumps of food to small
- chemical breakdown - digestion → monomers
- absorption of monomers
- compact waste → feces, extract water → eliminate

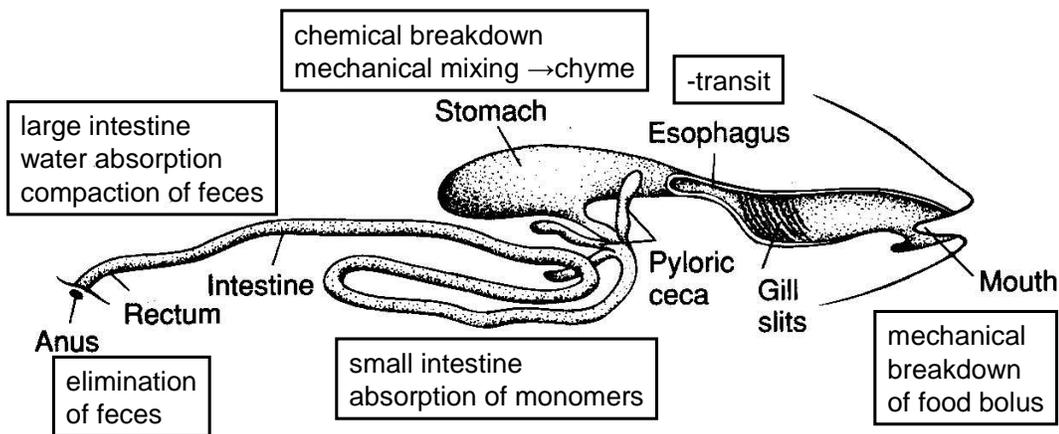
Common features:

- longitudinal tube through body
- regional specializations along length
- basic wall plan common to all vertebrate groups

Trends:

- simple → complex as diet harder to digest
- easily digested food: simple, short gut
(filter-feeders, carnivores)
- "tough" food: gut longer, more complex (herbivores)

FUNCTIONAL REGIONS OF ALIMENTARY TRACT



FISH DIGESTIVE SYSTEM

Trends:

no oral salivary glands - water lubricates food

no separate stomach in some species

intestine surface area for absorption increased:

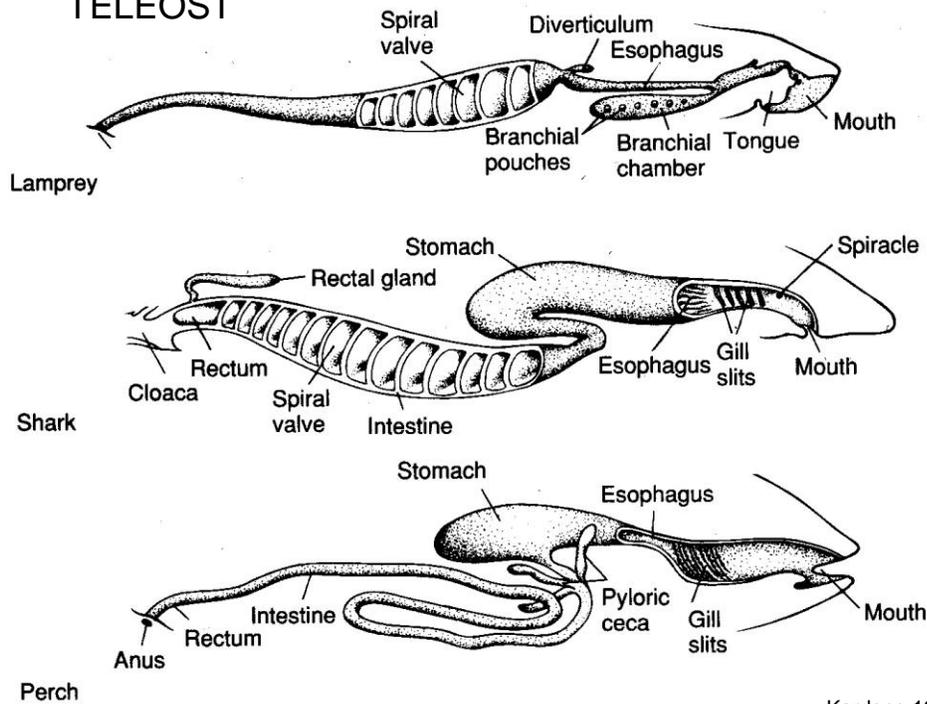
-long tube, folded/coiled in coelom

-mucosa folded internally

-spiral valve

-villi

ALIMENTARY TRACTS: PRIMITIVE FISH, ELASMOBRANCH, TELEOST



AMPHIBIAN DIGESTIVE SYSTEM

Trends:

ciliated oral epithelium

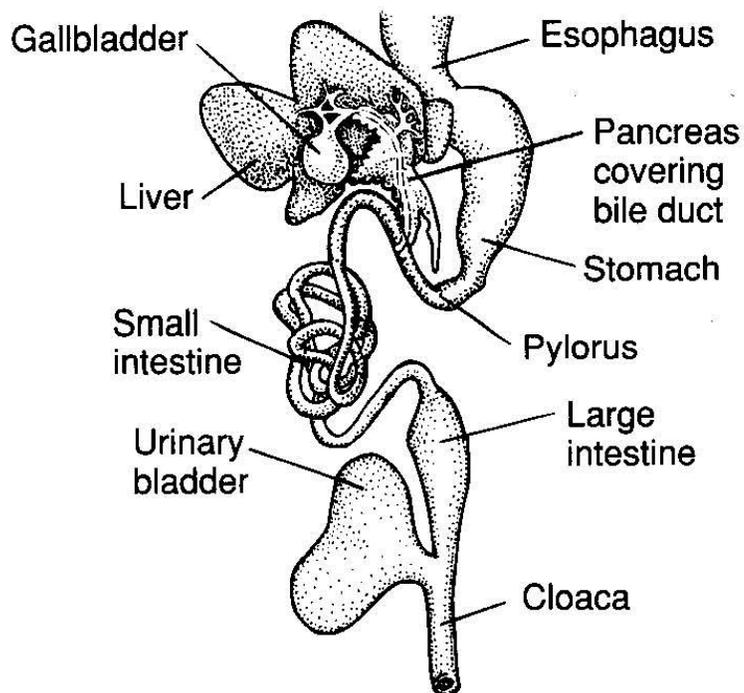
esophagus short, wide, ciliated

stomach regions: fundus, pylorus
-glands short tubular

small intestine coiled
-large mucosal villi, no glands

large intestine → cloaca

AMPHIBIAN ALIMENTARY TRACT



Frog (*Rana*)

REPTILIAN DIGESTIVE SYSTEM

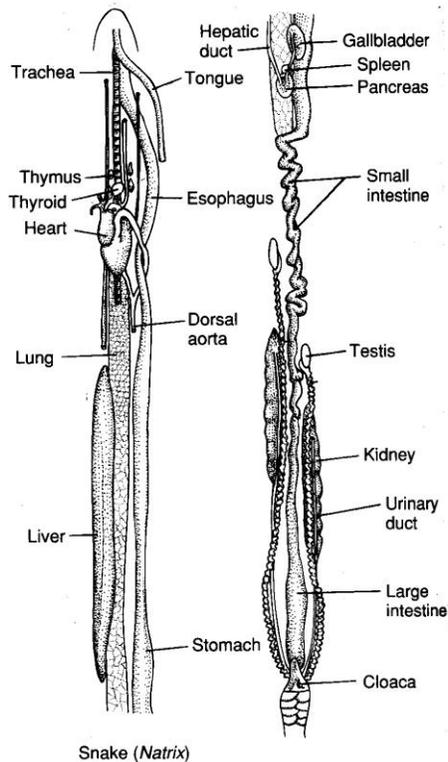
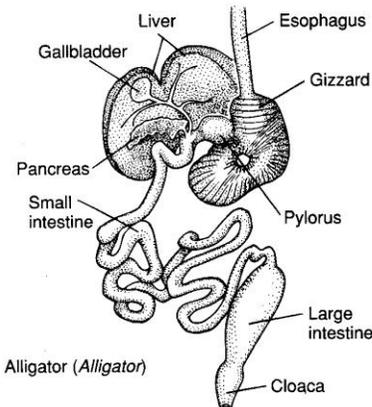
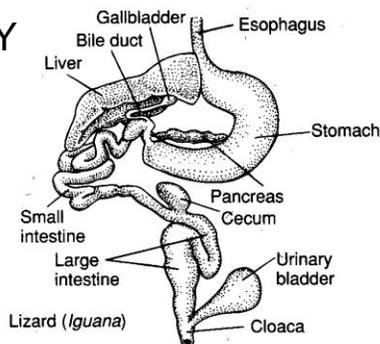
-regional structure similar to amphibian gut

Trends:

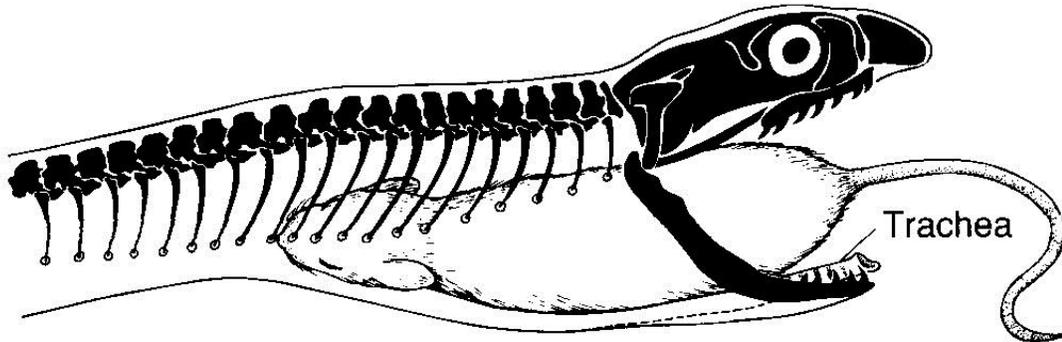
gizzard: enlarged pylorus
- grind food

cecae: pouches off intestine
-more time for digestion

REPTILE ALIMENTARY TRACTS

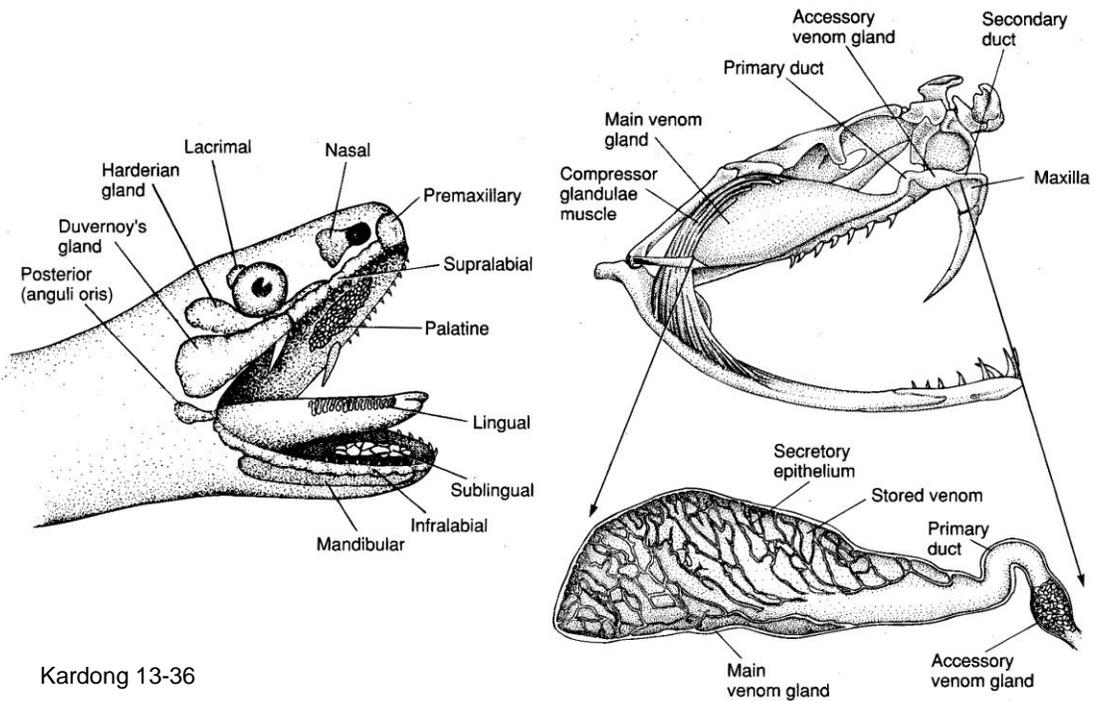


SNAKE FEEDING ON WHOLE PREY - NO MECHANICAL BREAKDOWN, ALL CHEMICAL



Kardong 13-20

SPECIALIZED ORAL GLANDS IN REPTILE: SNAKE VENOM GLAND



Kardong 13-36

BIRD DIGESTIVE SYSTEM

Trends:

keratinized beak - no teeth in modern birds

keratinized tongue - aids mechanical breakdown

crop: expanded esophagus

food reservoir - regurgitation for young

herbivores/seed eaters:

gizzard - mechanical breakdown

using stones, grit to grind food

MAMMALIAN DIGESTIVE SYSTEM

Diet-related specializations:

length of gut related to digestion time

-carnivores - chemical digestion fast, gut short

-herbivores - chemical digestion slow, gut longer

keratinized esophagus - rodents, herbivores

fermentation - extra chambers for bacterial action

to break down plant cellulose

-foregut fermenters

-intestinal fermenters