

# SEM IV ZOOA

## CC8 UNIT 5: URINOGENITAL SYSTEM (Part - 4)

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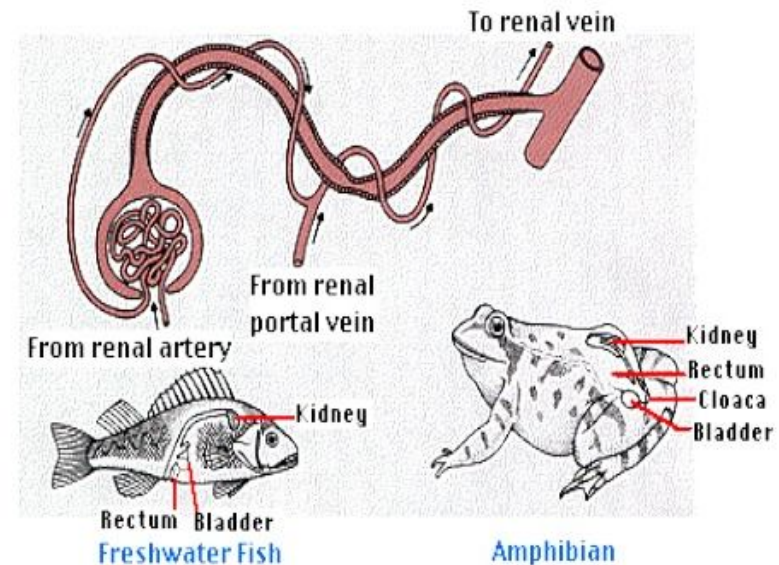
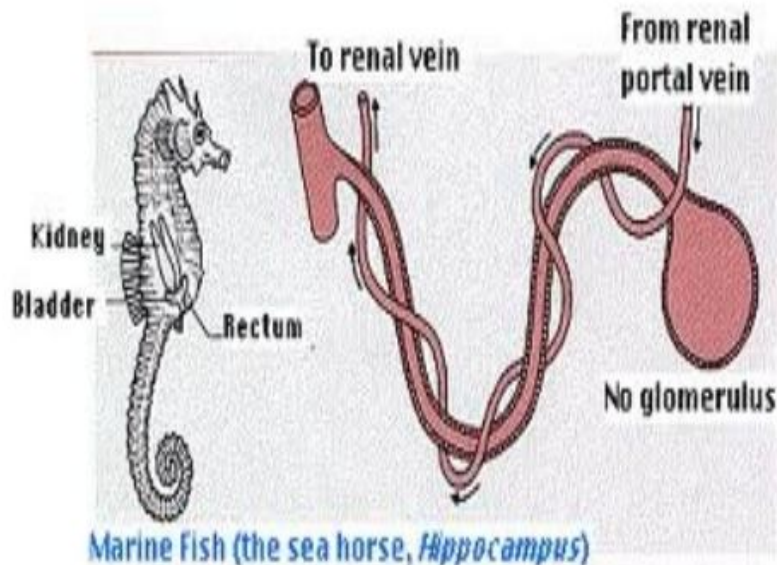
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# EFFECT OF ENVIRONMENT ON KIDNEY STRUCTURE AND FUNCTION

- Kidney is not only involved in waste elimination but also involved in the maintenance of water balance in the body.
- Regulates the amount of water given off in the urine and controls the amount of salts and other electrolytes eliminated through the urine.
- Vertebrate kidneys have adaptations to their environments
- Size of glomeruli is related to the amount of filtrate removed from the blood.
- Larger glomeruli indicates an increase of filtrate moving out from the blood into the kidney tubules.

# EFFECT OF ENVIRONMENT ON KIDNEY STRUCTURE AND FUNCTION

- Terrestrial forms have reduced glomeruli.
- Marine teleosts do not have glomeruli in their kidneys.





# EFFECT OF ENVIRONMENT ON KIDNEY STRUCTURE AND FUNCTION

- Kidney tubules vary among vertebrates but all have proximal convoluted tubule
- **Agglomerular** kidneys of marine teleosts have their proximal convoluted tubule as the only functional, but their urine does not differ from the urine of fishes with glomeruli.
- The distal convoluted tubule is involved in ionic and water reabsorption.
- Amphibians have a degree of selective reabsorption in their distal convoluted tubule.
- Reptiles, birds, and mammals have tubules in their kidneys but their development depends on the amount of water available to the animal.

# EFFECT OF ENVIRONMENT ON KIDNEY STRUCTURE AND FUNCTION

- In desert forms, the distal convoluted tubules are very long and are capable of resorbing nearly all water, so they have a very concentrated urine.
- Animals which are accessible to water sources have shorter tubules and their urine is less concentrated.

## EXTRARENAL SALT EXCRETION

- Present in vertebrates that live in salt-rich environment or that live in arid environments.
- **Chloride-secreting glands** are present on the gills of marine fishes.
- **Rectal glands** are present in elasmobranchs.
- **Nasal or orbital glands** are present in marine reptiles and birds that feed on fish from salt water.
- **Sweat glands** in mammals eliminate some salt of the body.



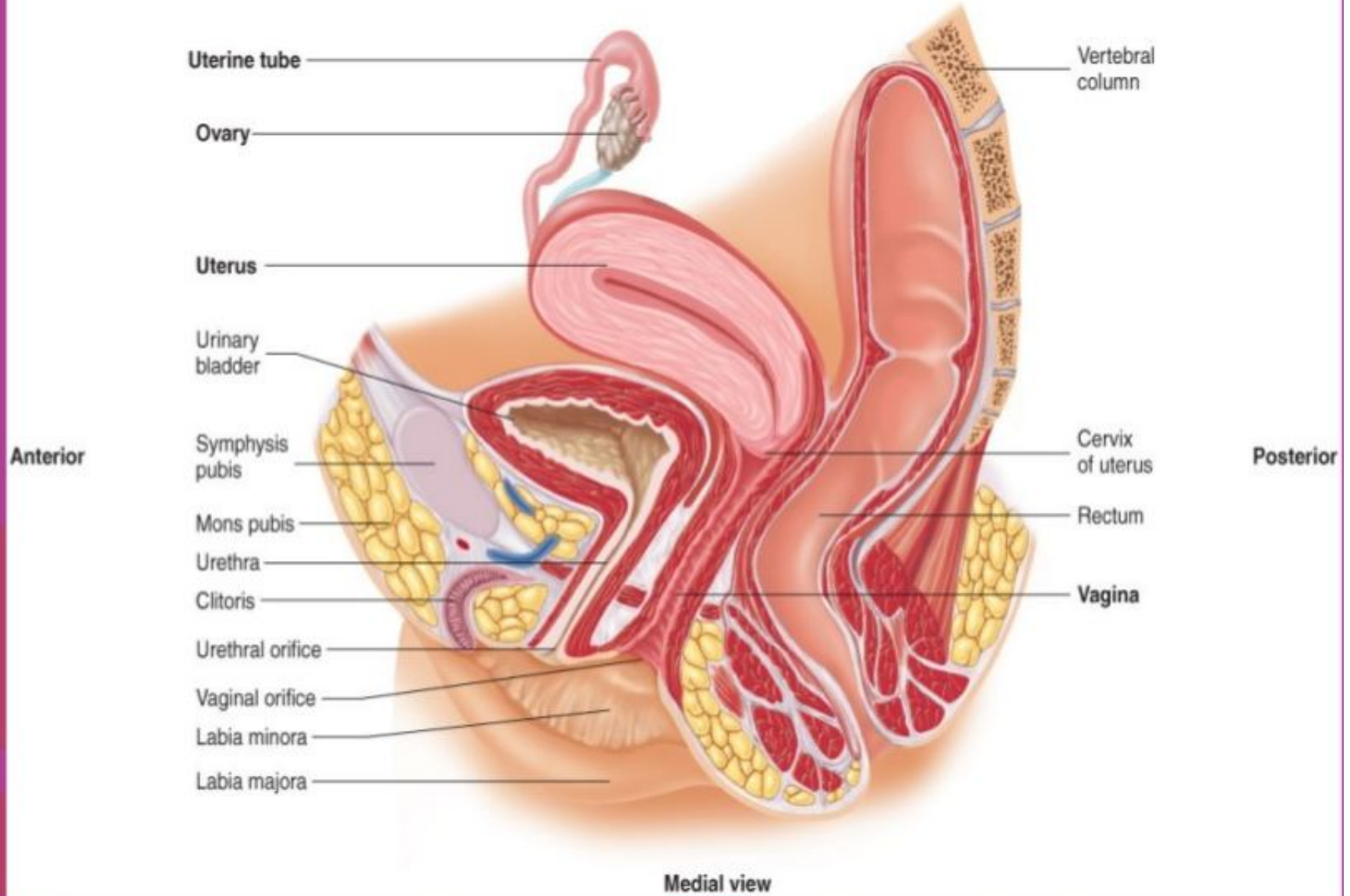
## REPRODUCTIVE SYSTEM

- Vertebrates exhibit **sexual reproduction**.
- **Zygote** results from the union of male and female **gametes**.
- **Ova** and **spermatozoa** are produced in the **gonads**, the **testes** and **ovaries** respectively.
- Gonads are derived from the mesoderm.
- **Deferent ducts** in male, and **oviducts** in female transport gametes to the outside of the body.

# REPRODUCTIVE SYSTEM

- Deferent ducts are usually the archinephric or the Wolffian ducts which also transport urine from the kidney.
- Wolffian ducts in amniotes persists to become the ductus deferens.
- **Accessory sex organs** bring the germ cells together.
  - Reproductive ducts
  - Associated glands
  - Intromittent or copulatory organs.





# FEMALE REPRODUCTIVE SYSTEM

## **REFERENCES:**

**Kent, George C & Carr, Robert K. Comparative Anatomy of the Vertebrates. *Urinogenital System.***