3055 BA SANGAM COLLEGE

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WORKSHEET 14

School: Ba Sangam College **Year:** 12

Subject: Biology **Name:**

Strand	**1 – Structure and Life Processes**
Sub strand	**1.4 – Comparative Form and Function in Plants and Animals**
Content Learning Outcome	**-Examine the products of different excretory systems and discuss the system of excretion and osmoregulation and associated problems in selected organisms.**

Excretion and Osmoregulation in Invertebrate Animals

I. Aquatic Invertebrates: Cnidarians and Mollusc (Bivalves)

Excretion and Osmoregulation

- Sessile aquatic animals in which ammonia diffuses out into the surrounding water.
- These organisms are small and create metabolic wastes slowly. Therefore, they do not need a special excretory system.

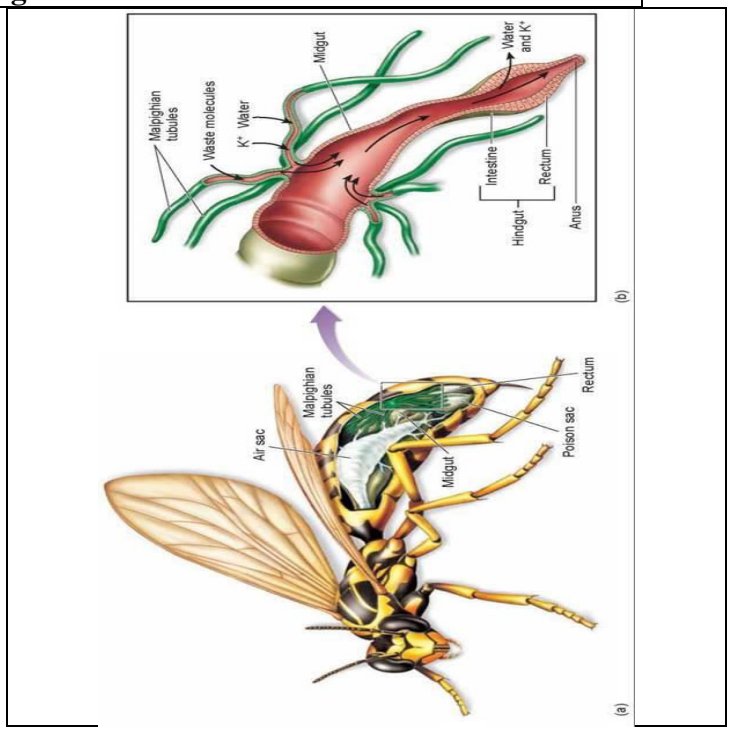
Water Conservation

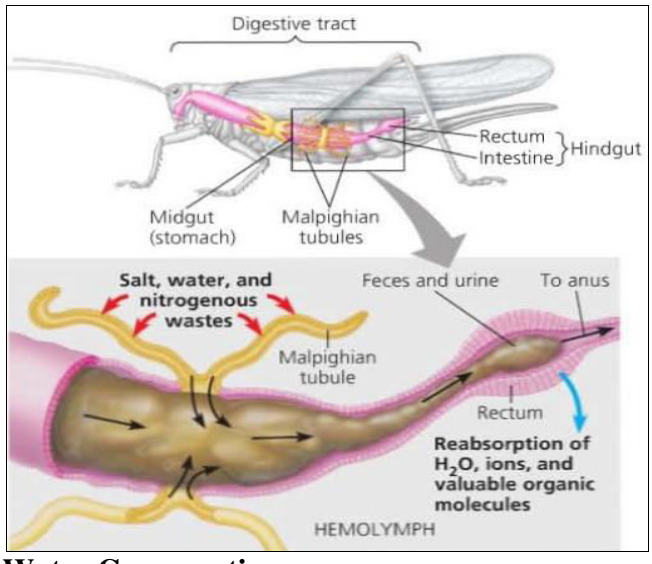
- They live in water; therefore, do not worry about dehydration.

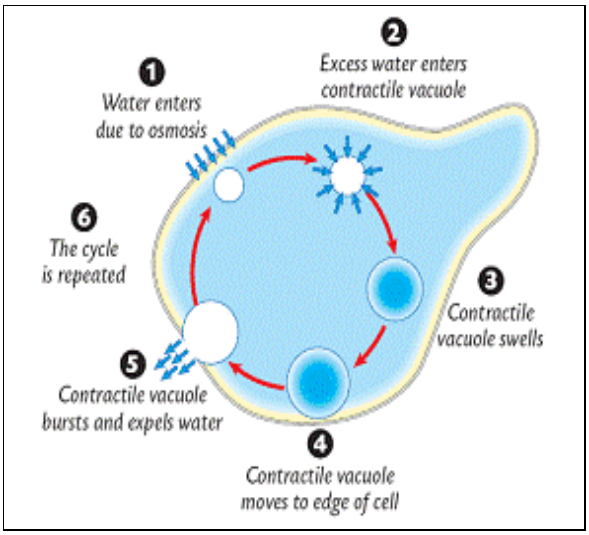
II. Terrestrial Invertebrates: InsectsExcretion

Excretory organ of the insects is known as **Malpighian Tubules**. These are tube extensions of the gut which float in the open blood cavity (haemocoele).

- Excretory products of insects are **uric acid**. The Malpighian tubules absorb nitrogenous wastes form the blood and convert it to **uric acid**.
- The tubules join with the hind gut and uric acid crystals pass out with the faeces.







Water Conservation

- Insects are terrestrial animals - threat of dehydration. Their water conserving adaptations include:

-Excretion of solid uric acid crystals instead of urea which needs to be diluted in water.

- Waxy exoskeletons reduce water

evaporation form body surfaces.

- Moist respiratory surfaces of the trachea – inside their bodies- reduce evaporation.
- Closing of spiracles when they are inactive.
- The hind gut reabsorbs water from the faeces.

Excretion and Osmoregulation in Vertebrate Animals

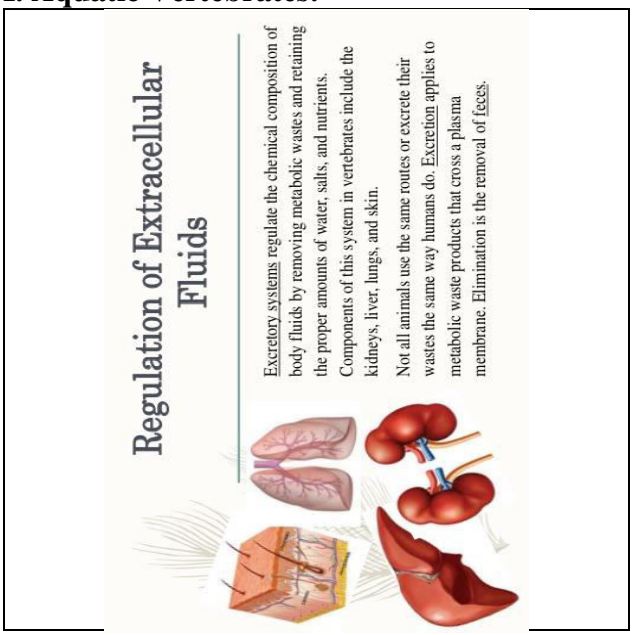
Excretory Organ:

(1) **Liver**- which deaminates excess amino acids; and

(2) **Pair of kidneys**- which filter the resulting nitrogenous wastes out of the blood.

- Hormones, the brain tells the kidneys how much water and salts the body needs to retain to maintain homeostasis.

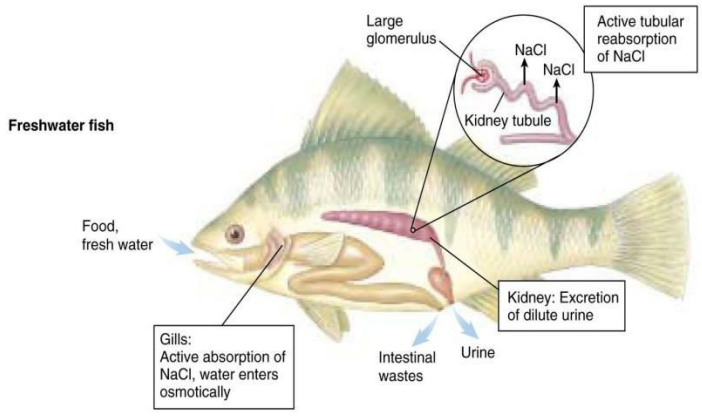
I. Aquatic Vertebrates:

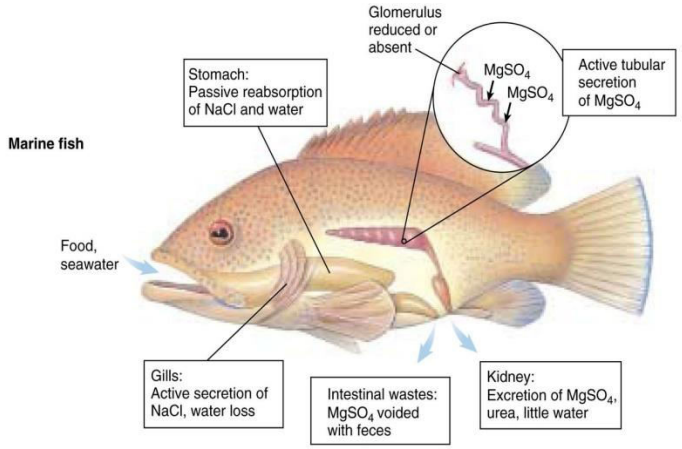


Fish

Excretion and Osmoregulation

- Both fresh and saltwater fish excrete ammonia directly into water therefore no energy is spent on converting it to urea.
- Fish face osmotic problems. Water constantly moves into freshwater fish's cells and move out of a saltwater fish's cells.





Exercises

1. Identify four ways in which insects reduce water loss? **(4 marks)**

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   _____
   _____
   _____

2. Briefly explain how human excretory system (liver and a pair of kidneys) conduct excretion and maintain osmoregulation.**(2 marks)**

   _____
   _____
   _____
   _____

3. Identify the advantages and disadvantages of excreting the following products: **(6 marks)**

Waste	Advantages	Disadvantages
Ammonia		
Uric acid		
Urea		