



### Sponges: simple body plan

- Sessile: live permanently attached to bottom
- Numerous pores (**ostias**)—allow water to enter
- water filtered through **collar cells**, food ingested, water leaves through **osculum**

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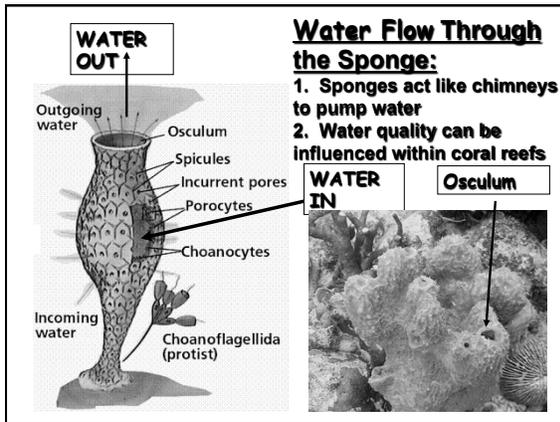
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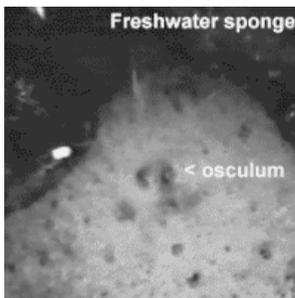
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### Water Flow Through Sponge



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### Sponges: feeding

- Suspension feeders:
  - Eating food particles suspended in water
- Filter feeders:
  - Actively filter food particles by pumping water

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### Skeletal Structure of the Sponge

- Skeleton made of network of protein fibers called **Spongin**
- **Spicules** are hard spear or star-shaped structures
- Spicules made of **CaCO<sub>3</sub>** (limestone) or **silica** (glass)

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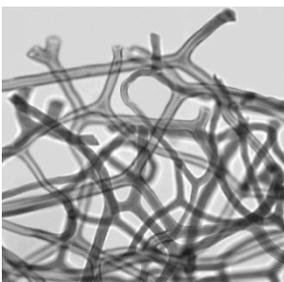
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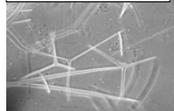
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### Sponge Skeletons

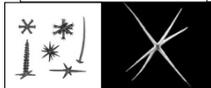


SPONGIN

Silica Spicules  
SiO<sub>4</sub>



Limestone Spicules  
CaCO<sub>3</sub>



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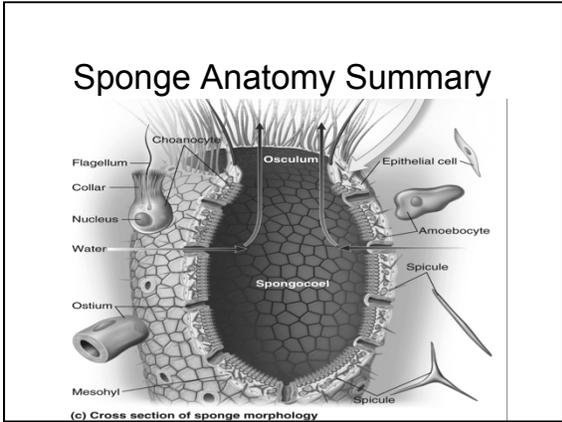
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### Sponge Sex: They do it all!

- **Hermaphrodites:**
  - Male and female gonads in same sponge; produces both sperm and egg
- **Asexual:**
  - Branches or buds break off, grow into identical sponge
- **Sexual:**
  - Broadcast spawning releasing eggs & sperm into the water from the Osculum

Sponge releasing eggs & sperm

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### Sponge Reproduction

- o Sponges can **regenerate (regrow)** lost body parts through mitotic cell division (asexual)
- o Sponges also reproduce **asexually by budding**

Two photographs showing sponge regeneration: one showing a sponge being cut into pieces, and another showing a sponge with a small bud growing from it.

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### Surviving Harsh Conditions

- o **Gemmules** are specialized buds made to survive harsh weather (hot or cold)
- o Contain **food, amoebocytes, and a protective covering of spicules**
- o Released when a **sponge dies**
- o Resist **desiccation (drying out)**
- o Become adult sponge when **conditions become favorable**



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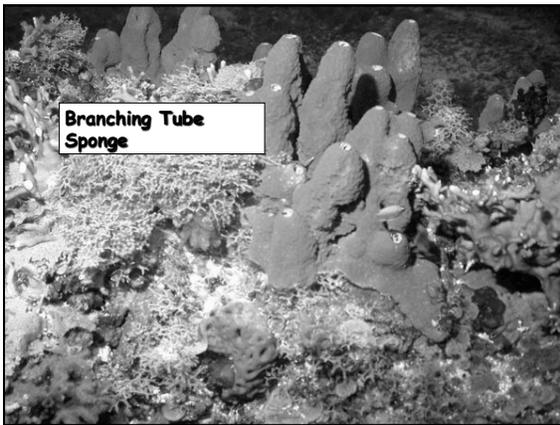
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Branching Tube Sponge

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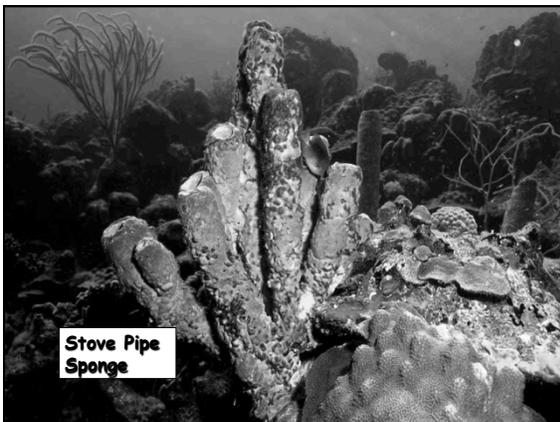
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Stove Pipe Sponge

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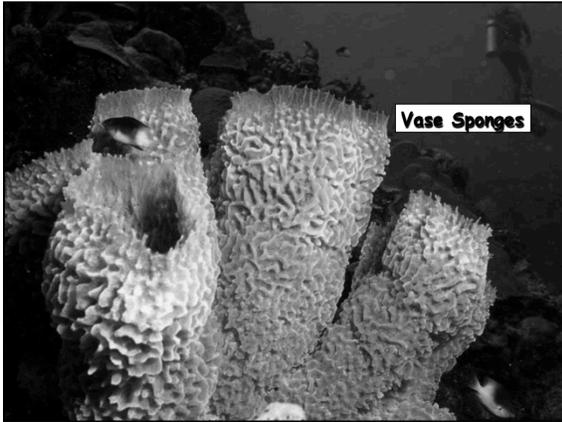
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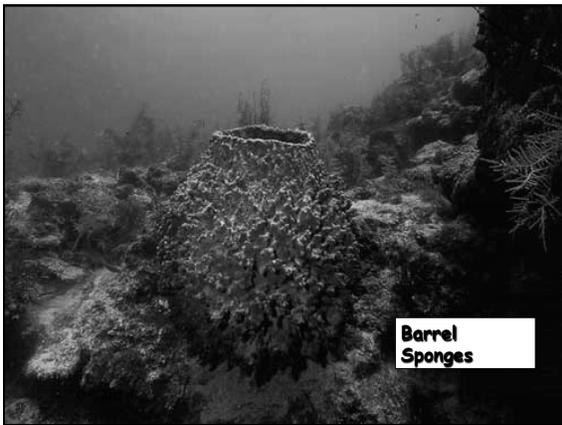
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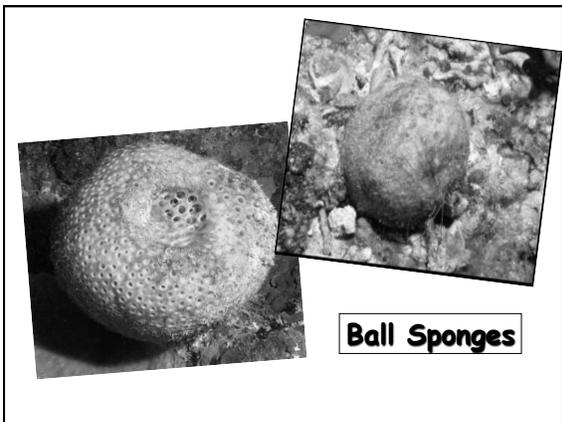
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