Biology 0871 **Sponges**

**PHYLUM PORIFERA**

FORM AND FUNCTION IN SPONGES

**Body Plan**

-**Asymmetrical**

-a cylindrical water pump; the body of a sponge forms a wall around a **cental cavity** through which water is circulated; water enters through **pores** on the side wall of the sponge and is circulated up through the central cavity; water leaves through a large whole at the top of the sponge called the **osculum**.

-while a sponge has a number of different cell types most notable are the **choanocytes** (collarcells) **and the archaeocytes.**

**Choanocytes:** are specialized cells that use flagella to move a steady current of water through the sponge.

**Archaeocytes** produce the **skeleton of the cell**. The skeleton of a sponge can be made of **glass like fibers** or made of **spongin fibers**. Sponges made of spongin fibers can be harvested and used as natural bath sponges.

**The movement of water through the sponge provides for a simple mechanism for feeding, respiration, circulation and excretion.**

**Feeding**

**Filter feeders** – filter food from the water that flows through their bodies. Microscopic organisms and oxygen are carried with water into the central cavity through the pores of the sponge. The flagella of choanocytes moves microscopic organisms to inside the cell where the organisms are digested or passed on to archaeocytes. The archaeocytes then digest the food particles.

**Respiration, Circulation and Excretion**

* **by the movement of water through the sponge**; as water moves through the sponge **oxygen diffuses** into surrounding cells. At the same time **carbon dioxide and other wasters such as ammonia diffuse** into the water and are carried away.

**Response**

Sponges **do not have nerve cells or nerve tissue**. However, **the skeleton of a sponge is not tasty** to predators – not many animals eat sponges. Sponges can also **produce chemicals** that are **toxic to predators** or **that smell bad** to a predator **thus avoiding been eaten by a predator.**

**Reproduction**  - asexual/sexual reproduction

**Asexual**  **By Budding:** when a bud on the side of the parent sponge develops into a small sponge. The bud breaks away and develops into a sponge away from the parent sponge. **Production of gemmules** – group of archaeocytes surrounded by a layer of spicules – gemmules can survive freezing temperatures and drought. When conditions become favorable a gemmule grows into a new sponge.

**Sexual** – sponges are hermaphrodites. The sperm is released by one sponge and fertilizes the egg in another sponge. A zygote is formed – called larvae and the larvae is released into the central cavity and is released from the sponge through its osculum. The larvae anchors itself to a surface in the water and begins to develop into a new sponge.

**Ecology of Sponges**

-provide habitats for marine animals such as snails, sea stars and shrimp – these are examples of **commensalism**.

-sponges can also form partnerships with photosynthetic bacteria, algae and plantlike protists – these are examples of **mutualism** – the photosynthetic organisms provide food and oxygen to the sponge, while the sponge provides a protected area where these organisms can thrive.

* sponges live attached to the sea floor.