



Are You Sponge Worthy?

An Intimate Look
at Porifera

By Alan Hughes, NAUI #15256

Photographs by Alan Hughes

Sponges are different things to different people. To most folks, they're just bathtub accessories kept under the sink along with their rubber ducks. Housewives may see them simply as kitchen utensils used for cleaning up messy counter tops. And fans of the sitcom "Seinfeld"—well, they see them in a completely different light, altogether, which you already know about (or don't need to know). The common thread, however, is that hardly anyone sees them as animals.

Sponges are members of the phylum Porifera, the most primitive group of multi-

cellular creatures. They have no internal organs. They don't have mouths or stomachs. Completely without visible moving parts, and always firmly attached to a suitably solid substrate, sponges were considered to be plants for more than two thousand years, at least since the time of Aristotle. It wasn't until the 18th century that scientists determined that they were indeed animals.

What these scientists observed that caused them to change their minds about the nature of sponges was the sponges' internal water currents. Sponges draw water in through small incurrent pores in their outer

surface (the word Porifera means "pore-bearer"), through a system of water canals into the large central cavity or atrium, and expel it out of their large oscula (the big holes). This current is created through the efforts of a specialized cell called a choanocyte (ko-an-o-site), which moves water with the whip like motion of its flagellum. In even the smallest sponges, there will be a vast number of these choanocytes working together to produce this water movement. The sponge depends on this flow of water for obtaining food and oxygen, and for the removal of waste material.

As the water flows in and out of the sponge, it filters extremely small organic particles out of the water for use as food. The majority of this stuff is so small as to be invisible even to ordinary microscopes. One key to the overwhelming success of sponges worldwide is their ability to use this extremely fine but apparently ubiquitous organic material as a food source. The larger particles in a sponge's diet consist of bacteria and fine plankton, single-celled plants and animals.

Most sponges are hermaphroditic, producing both sperm and eggs. When it is time for them to reproduce, they release a cloud of sperm into the water (it looks like smoke rising from a chimney), which then disperses into the current. Sponge eggs are fertilized when sperm is drawn in through a sponge's incurrent pores along with the other particulate matter in the water. A flagellated larva called a blastula is produced. This embryonic sponge is ejected into the water, and, if it doesn't get eaten by something bigger during its journey, will eventually attach itself to a solid substrate and continue to develop.

There have been over five thousand species of sponges identified. Only about 150 of these live in freshwater, with the rest being marine organisms. The marine species flourish in all oceans, wherever they can find solid sites to attach and grow. People have been fishing commercially for sponges since ancient times (the sponge diving industry in the U.S. was the backdrop for the movie 'Beneath The 12 Mile Reef' starring Gilbert Roland and a very young Robert Wagner), though the availability of cheap synthetic sponges has greatly cut the demand for marine ones.



Sponges vary in size from tiny ones that grow to about as large as a grain of rice, to vase and barrel sponges that grow so big that a grown man can fit inside (now that we have the ability to get there). They appear in a great variety of shapes and colors. Some common sponge forms that divers are familiar with include tube sponges, rope sponges, vase sponges, barrel sponges, encrusting sponges, and boring sponges.

Being such benign, unmoving organisms make sponges the favorite hosts of many other sea creatures, and easy, reliable hunting grounds for underwater photographers in search of macro subjects. Close examination of the surface of many vase sponges will reveal multitudes of tiny zooanthid anemones, and if you look down into their atria, you're likely to find fine-limbed brittle starfish or banded coral shrimp. Arrow crabs are also common residents of these Poriferan condos.

Sponges, be they large or small, hard or squishy, are some of the most underrated and ignored of marine organisms, probably because they just seem to sit there and do nothing amidst the hustle and bustle of the underwater environment. But, for divers in the know, there's no question as to whether or not the lowly sponges are worthy of our attention.

References:

- Robert D. Barnes. *Invertebrate Zoology*. 1980.
- Helena Curtis. *Biology*. 3rd Edition, 1979.
- Thomas M. Nielsen. *The Marine Biology Coloring Book*. 1982.
- Paul Humann. *Reef Creature Identification*. 1992.