

Reading Resources: Marine Invertebrates

Nudibranchs are mollusks in the Class Gastropoda, which includes slugs, snails, sea hares and limpets. In their larval stage they have a shell which disappears when it reaches adulthood.

There are over 3,000 species of nudibranchs. They range in size from a few millimeters to 12 inches long and they can weigh up to 3 pounds. Nudibranchs can be found in all oceans from cold to warm water. Two main types of nudibranchs are dorid and eolid. Dorid breathe through gills. Eolids have finger-like appendages called cerata which are used for breathing, digesting food and for self-defense.

Nudibranchs move on a broad, flat muscle – a foot – which leaves a slimy trail. They are carnivores and use a radula to eat sponges, coral, anemones, fish eggs and other nudibranchs. They obtain their bright colors from the prey they eat. Some nudibranchs are able to make their own food. They eat coral with algae, absorb the chloroplasts, then perform photosynthesis with sunlight. The nutrients created from this process can feed the nudibranch for months.

Nudibranchs may be toxic to their prey, but not to humans. One exception is the eolid *Glacus Atlanticus* which eats Portugese man-of-wars, then stores the venom for future use. Dorid nudibranchs develop their own toxins or absorb toxins from the prey they eat and can release the poison into the water as needed.

Nudibranchs are hermaphrodites, they have reproductive organs of both sexes. They are able to breed with other nudibranchs without fertilizing themselves in the process! Nudibranchs have a short life span, ranging from a few weeks to one year.

Books for Adults

Citizens of the Sea / Nancy Knowlton. National Geographic Society, 2010.

Eastern Pacific Nudibranchs / David W. Behrens and Alicia Hermasillo, 2005.

Nudibranch and Sea Slug Identification: Indo-Pacific / T. M. Gosliner, Angel Valdes and David W. Behrens, 2015.

Nudibranch and Sea Snugs Indo-Pacific Guide / Helmut Debiilius. IKAN, 2001.

The Rise and Decline of the Olympia Oyster / Steele, Earl N. Fulco Publications, Elma, WA., 1957.

Sea Slime: It's Eeuwy, Gooley and Under the Sea / Ellen Prager. Sylvan Dell Pub., 2014.

Featured Websites

Advanced Aquarist : Nudibranchs – Beautiful but Dangerous Marine Creatures

<http://www.advancedaquarist.com/2007/11/afeature2>

Southern California Nudibranch ID Guide

<https://scottpenny.smugmug.com/Underwater/Field-ID/Southern-california-Nudibranch>

NBC News: Beachfront Real Estate: Oysters help Restore California Coastline

<http://www.nbcnews.com/science/environment/beachfront-real-estate-oysters-help-re-storecalifornia-coastline-n367801>

This news story features Dr. Danielle Zacherl, a marine biology professor at California State University, Fullerton, and her project to restore Olympia oyster beds along a small section of Alamitos Bay in Long Beach, California.