

Sea Slugs

Bonus content from the April 2010 AFI magazine article "Slugs in the Reef Tank."

By Scott W. Michael

The fact that sea slugs exhibit a variety of feeding and anti-predation strategies should not be surprising, considering that there are more than 3,000 species. Most sea slugs feed on sessile invertebrates, such as sponges, hydroids and bryozoans. In many cases, these animals are specific about the prey items they ingest. For example, the beautiful *Hypselodoris apolegma* feeds only on sponges in the genus *Euryspongia*, while *Phidiana indica* only eats the hydroid *Salacia tracythara*. (Is it any wonder that these animals are difficult to feed in captivity?) There are also sea slugs that exhibit more unusual diets. For example, there are some specialized opisthobranchs that eat other sea slugs (e.g., *Gymnodoris rubropapulosa*), while another genus, *Chelidonura*, makes its living hunting acoel flatworms. There are some species that feed on corals; the *Phestilla melanobranchia* eats orange cupped coral (*Tubastrea* spp.), while members of the genus *Phyllodesmium* eat soft corals. Not all sea slugs are carnivorous. A number of species graze on algae and cyanobacteria (e.g., blue-green algae).

The sea slugs have some interesting ways to avoid being eaten. There are species that are extremely well-camouflaged that blend in with a food source (e.g., *Phyllodesmium* spp.), species that burrow under the sand (e.g., *Euselenops luniceps*) and species that are more active at night when they are more likely to avoid predators.

Some also have more elaborate defensive strategies. For example, there are sea slugs that incorporate the stinging cells of their prey for their own defense. Many of the *Phyllidia* eat stinging hydroids. As they feed on them, some of the hydroid's stinging cells (known as nematocysts) are not discharged, but instead they are transported through the digestive system of the slug and accumulate in organs known as cnidosacs. These organs are usually located in the cerata (tube-like structures connected to the digestive tract) that are located on the sides and back of the aeolid nudibranchs. If one of these sea slugs is harassed by a potential predator, the recycled stinging cells can be discharged against the slug's enemy.

In some species of aeolid sea slugs (e.g., *Phyllodesmium*) that do not feed on cnidarians with potent stinging cells, the cerata are thrown off when they are harried by a predator (this is known as autotomy). The amputated cerata wiggle and produce copious amounts of slime, which is thought to distract the would-be predator and allow the sea slug to get away. The sea hares don't engage in autotomy but instead excrete a cloud of purple ink to distract an attacker. There are numerous slugs that dissuade predators by accumulating or producing secretions that do not taste good or that are toxic. In some cases, these chemicals are extracted from their food (e.g., algae, sponges, soft corals), while in other species, acidic secretions are produced and exuded out of specialized glands in the skin.

The sea slugs are indeed as interesting as they are beautiful!

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