

NELSON W. BAKER
Photographed by
Jack Drafa, Jr.

TO MOST PEOPLE the garden slug — lackluster, slimy, and shell-less — is a highly repulsive creature. With its long, file-like tongue it scrapes holes in their decorative plant leaves, devours their flowers, and strings shiny trails of slime over their walks and walls. Working with its close relative, the common garden snail (which carries its shell around with it), the slug can do a lot of very visible damage unless kept under control. Both these undesirable mollusks are pulmonates, or air-breathing land snails.

The garden slug is indeed the “ugly duckling” of the snails, but many of its marine relatives, the sea slugs, or nudibranchs, could be called the “birds of paradise” of the gastropods. Some are creatures of great beauty, so varied in form and color one might never suspect they were all “brothers under the skin.”

What a thrill it must have been for the person who first discovered the nudibranch! It is extremely doubtful whether anyone could find out his name or the date now, but any diver-photographer who comes upon his first orange and purple *Flabellinopsis iodinea* or varicolored *Hermisenda crassicornis* quickly realizes that nudibranchs are extremely photogenic marine forms.

In the scientific classification of the animal kingdom the nudibranchs will be found under the invertebrate phylum Mollusca (snails, clams, etc.), class Gastropoda (snails), subclass Opisthobranchiata (rear-gilled snails), and suborder Nudibranchiata (naked-gilled snails). They vary in size from about 2 mm to over 100 mm.

THE SEA SLUGS: Unlikely show-offs of the sea.

Flabellinopsis iodinea
in swimming attitude.

Anisodoris nobilis
on sponge.



Like the garden slugs, none of the nudibranchs possess shells. Since they live in a marine habitat, they need gills to obtain oxygen from the water. As the name nudibranch suggests, their gills are "naked," or exposed.

Nudibranchs can be placed in two general categories for easier identification. The dorids are somewhat flattened and some have a warty appearance. Their gills may be either flower-like, feathery, or branched but are clearly visible on their dorsal surfaces, usually toward the posterior end. On their heads are two horn-like sensory structures called rhinophores. The second group of nudibranchs, the aeolids, are shaped more like the garden slug, with finger-like projections called cerata on their sides and backs, which presumably serve the purpose of gills. Like the dorids, they too have rhinophores, in addition to their two long tentacles. Most of the species are more brightly colored than the dorids, but all are beautiful and interesting. In motion they seem to flow effortlessly over the substrate. A few species, like *Flabellinopsis iodinea*, swim sideways with flapping, wing-like movements. Their colors blend with their sometimes colorful habitats, which may make them hard to see, but they can usually be found on or near their preferred food.

Nearly all species of nudibranchs are carnivorous, dining on such marine animals as sea anemones, hydroids, and

sponges by scraping off bits of their prey with their tongues, or radulae, in the same way garden slugs scrape holes in the leaves of plants. Anemones and hydroids belong to a group of animals which possesses stinging cells called nematocysts or cnidocysts. These might be likened to the practical joker's little gift box that, when opened, shoots out a paper snake on a spring. However, nematocysts are no joking matter, for the sharp tips of these coiled "spears" contain a paralyzing venom.

Scientists have discovered that in many of the aeolids which prefer a diet of hydroids or anemones, the swallowed nematocysts are channeled through the midgut into the tips of the cerata, where they are stored in special structures called cnidosacs. The nudibranch is then armed and prepared to use the nematocysts for its own defense; it vigorously shakes its cerata to fire the dart-like little weapons. This behavior can often be seen in the nudibranch *Phidiana pugnax*, so named because of its ill temper and pugnacity. When two of them meet, there is inevitable violent shaking of their cerata as they exchange barrages of nematocysts. Not all nudibranchs are equipped with cnidosacs, however. Many have repugnatorial glands which secrete a strong repellent substance that discourages predators, and some have glands which exude acids effective for defense.

Certain species of dorid nudibranchs

Phidiana pugnax.

Note rhinophores, tentacles, and cerata.

Hermisenda crassicornis
form found in colder water.







