

NUDIBRANCH CARE

SOP# - MOLL4

PURPOSE: To describe methods of care for sea slugs.

POLICY: To provide optimum care for all animals.

RESPONSIBILITY: Collector and user of the animals. If these are not the same person, the user takes over responsibility of the animals as soon as the animals have arrived on station.

PROCEDURE: At present there are many species of nudibranchs found around BMSC. The following are some of the more commonly found ones.

Species

English Name	Scientific Name
Noble sea slug	<i>Peltdoris nobilis</i>
Monterey sea lemon	<i>Doris montereyensis</i>
White nudibranch	<i>Doris odhneri</i>
White-spotted sea goddess	<i>Doriopsilla albopunctata</i>
Heath's dorid	<i>Geitodoris heathi</i>
Leopard dorid	<i>Diaulula sandiegensis</i>
Yellow-rimmed nudibranch	<i>Cadlina luteomarginata</i>
Nanaimo nudibranch	<i>Acanthodoris nanaimoensis</i>
Red sponge nudibranch	<i>Rostanga pulchra</i>
Clown nudibranch	<i>Triopha catalinae</i>
Orange-peel nudibranch	<i>Tochuina tetraquetra</i>
Giant nudibranch	<i>Dendronotus iris</i>
Hooded nudibranch	<i>Melibe leonina</i>
Striped nudibranch	<i>Armina californica</i>
Frosted nudibranch	<i>Dirona albolineata</i>
Opalescent nudibranch	<i>Hermisenda crassicornis</i>
Shag-rug nudibranch	<i>Aeolidia papillosa</i>
White-and-orange-tipped nudibranch	<i>Janolus fuscus</i>
Leather nudibranch	<i>Onchidoris bilamellata</i>

Identification:

Refer to David Behrens and Alicia Hermosillo's book "Easter Pacific Nudibranchs" and Eugene N. Kozloff's book, "Seashore Life of the Northern Pacific Coast" for in depth descriptions of individual specimens.

The fleshy dorsal processes of eolid nudibranchs are called cerata. Eolid nudibranchs do not have feather like gills. Dorid nudibranchs do not have true cerata and are marked by the presence of feather-like gills surrounding the anus, on the posterior dorsal surface.

The rhinophores are the head tentacles of all sea slugs.

Species	Description
<i>Peltodoris nobilis</i>	<ul style="list-style-type: none"> ▪ Can be 25cm long. ▪ Clear pale yellow to bright orange-yellow in color; paler yellow tubercles always show through dark patches.
<i>Doris montereyensis</i>	<ul style="list-style-type: none"> ▪ Commonly found on floats and in the intertidal. ▪ Dingy yellow in colour, though varies in shade. ▪ Change colour with their food source (esp. <i>Halichondria</i>). Patches of black may be found on the tubercles and body. At very least, a few tubercles are tipped with black. It can reach 15cm in length.
<i>Doris odhneri</i>	<ul style="list-style-type: none"> ▪ Can be up to 20cm long. ▪ Completely white; look like an alino version of <i>Peltodoris nobilis</i> or <i>Doris montereyensis</i>
<i>Doriopsilla albopunctata</i>	<ul style="list-style-type: none"> ▪ Can be up to 6 cm ▪ Distinguished by the white spots only on the tips of the small tubercles.
<i>Geitodoris heathi</i>	<ul style="list-style-type: none"> ▪ Colour is yellow, yellow-brown or white. ▪ Identifiable by a sprinkling of minute black or brown specks over the dorsal surface and the white branchial plume. ▪ In some animals, the black specks are concentrated into a dark blotch just anterior to the gills. ▪ Can be up to 4 cm in length.
<i>Diaulula sandiegensis</i>	<ul style="list-style-type: none"> ▪ Distinct colour variations between individuals are colour morphs. ▪ Usually pale gray with several conspicuous rings or blotches of blackish brown. ▪ Dorsal surface is covered in minute tubercles giving them a velvety look. ▪ Gills can be completely retracted. ▪ Can reach a length of 12 cm.
<i>Cadlina luteomargina</i>	<ul style="list-style-type: none"> ▪ Are relatively broad and flat. ▪ Do not often exceed 8cm in length. ▪ Body is white and is entirely edged in a band of lemon yellow.

	<ul style="list-style-type: none"> ▪ Tubercles of the dorsal surface are also tipped in yellow. ▪ Easily mistaken with <i>Acanthodoris hudsoni</i>
<i>Acanthodoris nanaimoensis</i>	<ul style="list-style-type: none"> ▪ Recognized by the varying amount of maroon colour that tips the gills and rhinophores. ▪ Can be up to 4cm in length.
<i>Rostanga pulchra</i>	<ul style="list-style-type: none"> ▪ Associated with, spawn on and eat red encrusting sponge, particularly <i>Ophlitaspongia pennata</i>. ▪ Are bright orange-red in colour (as is the sponge) ▪ Small; grow to a maximum of 3cm in length.
<i>Triopha catalinae</i>	<ul style="list-style-type: none"> ▪ Are very brilliantly colored; all processes are tipped with orange. ▪ Orange spots are also scattered over the white or yellow-white body. ▪ Head region is broadened into a 'veil' that is fringed by branched tentacles. ▪ Can reach a length of 15cm.
<i>Tochuina tetraquetra</i>	<ul style="list-style-type: none"> ▪ Are bright yellow in colour with tubercles that are lightly tipped with white. ▪ Body is margined with a lacy veil of white. ▪ Can attain quite large sizes, up to 50 cm in length. ▪ Are subtidal.
<i>Dendronotus iris</i>	<ul style="list-style-type: none"> ▪ Beautifully showy and large nudibranchs attaining a size of 30 cm. ▪ Colour is highly variable, but it is usually white, grey, orange or red. ▪ Has large, lateral rhinophores and a white line along the edge of the foot. ▪ Head is 'veiled' with processes. ▪ Cerata are branched, long and pointed. ▪ Are subtidal.
<i>Melibe leonine</i>	<ul style="list-style-type: none"> ▪ Often associated with kelp and eelgrass. ▪ Attach to seaweed with their foot and use their hoods much like a Venus Flytrap plant to catch zooplankton. ▪ Are a translucent tan colour with large flattened cerata. ▪ Exude a sweet smell when disturbed.

	<ul style="list-style-type: none"> ▪ Can reach 17 cm in size.
<i>Armina californica</i>	<ul style="list-style-type: none"> ▪ Are about 7cm long ▪ Strikingly marked with alternating, longitudinal, white and brown stripes, which converge anteriorly. ▪ Have no gills or dorsal processes, but have a series of flap-like gills on either side of the body. ▪ Rhinophores point forward instead of rising straight up as they do on other nudibranchs. ▪ Usually found on sand or mud sediment.
<i>Dirona albolineata</i>	<ul style="list-style-type: none"> ▪ Off-white in colour ▪ Up to 18cm long. ▪ Have large, flattened, showy cerata that are edged with white. ▪ Whole body is also edged with white giving them a highlighted effect.
<i>Hermisenda (Phidiana)crassicornis</i>	<ul style="list-style-type: none"> ▪ A ubiquitous eolid found in eelgrass beds, rocky intertidal shores and on floats. ▪ Have a translucent, nearly white body. ▪ Brown cerata have an orange band close to the tip and are capped with white at the tip. ▪ An orange band may run down the length of the dorsal side, bordered by opaque white or electric blue lines. ▪ Maximum length of 5cm. ▪ Generally associated with hydroids like <i>Obelia</i>.
<i>Aeolida papillosa</i>	<ul style="list-style-type: none"> ▪ Can be up to 10cm. ▪ Are found in a variety of habitats. ▪ Have a whitish, translucent body with some gray or brown spots and a large triangular white patch devoid of cerata in front of the rhinophores. ▪ Cerata are grayish brown, sometimes with white tips, but can be almost colorless. ▪ The numerous cerata make this nudibranch look like a shaggy mouse.
<i>Janolus fuscus</i>	<ul style="list-style-type: none"> ▪ Are translucent. ▪ Nearly white body. ▪ Have a reddish mid-dorsal band and a

	<p>reddish blotch between the rhinophores on the head.</p> <ul style="list-style-type: none"> ▪ Cerata are white tipped followed by a colourless ring followed by a ring of orange. ▪ Can reach a length of 6cm.
<i>Onchidoris bilamellata</i>	<ul style="list-style-type: none"> ▪ Can be up to 3cm in length. ▪ Have 16 bushy gills around the anus. ▪ Brown coloring of its upper surface is concentrated in a few bands. ▪ Colorless club-shaped tubercles cover the dorsal side. ▪ Are generally found associated with barnacle rocks in the intertidal.

Sites:

All the above nudibranchs can be found intertidally and subtidally except ***Tochuina tetraquetra*** and ***Dendronotus iris***, which are only found subtidally.

Sites are found on:

- The Deer Group Islands
- Diana Island
- English Bay (Scott's Bay)

Note: Collect on a low tide.

Collection Methods:

- The best method to collect nudibranchs is by hand at low tide or by scuba diving.
- The animals are very delicate so care must be taken not to damage them during collection and transport.

Holding:

- Held in sea tables with continually flowing, cold seawater.
- Lidded tanks are necessary.
- The nudibranchs should be provided with habitat based on its natural environment (i.e. rocky, shell, sand, mud, kelp, eelgrass, etc.)

Feeding:

Species	Food
<i>Aeolida papillosa</i>	Feeds almost exclusively on anemones, particularly plumose anemones.
<i>Peltodoris nobilis</i> , <i>Doris montereyensis</i>, <i>Doris odhneri</i>, <i>Geitodoris heathi</i>	Feeds almost entirely on sponges, especially <i>Halichondria</i> .
<i>Armina californica</i>	Feeds on sea pens and feeding polyps of the sea pansy
<i>Cadlina luteomarginata</i>, <i>Doriopsilla albopunctata</i>	Feeds on sponges
<i>Dendronotus iris</i>	Feeds on tube dwelling burrowing anemone <i>Pachycerianthus fimbriatus</i> .

<i>Diaulula sandiegensis</i>	Feeds on both <i>Halichondria</i> and <i>Haliclona</i> sponges.
<i>Hermisenda crassicornis</i>	Feeds on hydroids, ascidians, other molluscs, eggs of various kinds and pieces of fish.
<i>Melibe leonina</i>	Feeds on zooplankton
<i>Janolus fuscus, Triopha catalinae</i>	Feeds on bryozoans.
<i>Onchidoris bilamellata</i>	Feeds on barnacles, sponges and bryozoans.
<i>Acanthodoris nanaimoensis</i>	Most likely feeds on solitary and colonial ascidians as well as bryozoans.
<i>Rostanga pulchra</i>	Feeds primarily on <i>Ophlitaspongia pennata</i> .
<i>Dirona albolineata</i>	Feeds on bryozoans, tunicates, sponges and possibly on opisthobranch gastropods.

Tank Cleaning:

Frequency: Once every two weeks.

Procedure:

1. The nudibranchs should be removed from the tank and placed into a holding bucket.
2. The tanks should be drained and the sides and bottom should be scrubbed and rinsed with warm freshwater.
3. The tanks should then be rinsed with cold seawater and allowed to refill, and the nudibranchs replaced.

Note: Nets or smooth gloves should be used when moving animals to avoid damaging them.

Animal Return:

Return to the site of collection.

DAILY ACTIVITIES:

1. Ensure water is flowing into the-tank at a reasonable rate.
2. Ensure the standpipe is in place and not blocked.
3. Check for and remove any dead animals.
4. Check for and remove any uneaten prey organisms.
5. Check for and remove any foreign organisms.

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