PROCEEDINGS OF THE CALIFORNIA ACADEMY OF SCIENCES

Volume 55, No. 2, pp. 11–54, 4 pls., 15 figs. April 22, 2004

Pacific Coast Nudibranchs, Supplement II
New Species to the Pacific Coast and
New Information on the Oldies

David W. Behrens

Department of Invertebrate Zoology, California Academy of Sciences, Golden Gate Park, San Francisco, CA 94118, U.S.A. Email: dave@seachallengers.com.

Pacific Coast Nudibranchs — A Guide to the Opisthobranchs Alaska to Baja California **(Behrens 1991) presented taxonomic and biological information on 217 species of opisthobranch molluscs found within the geographic range of the title. Only a few species were excluded at that time, because of depth or rarity. Since its printing many new species have been discovered and the ranges of others found to occur within the coverage of the original work. Researchers have learned a great deal about morphological variation and the ecology of many species. The goal of this supplement is to bring current the biological, biogeographical, morphological and taxonomic information concerning those species found along this coastline by incorporating both published material and confirmed observations of field workers and opishtobranch enthusiasts. The opisthobrach fauna of the Pacific Coast, from the Bering Strait of Alaska to Cabo San Lucas, Baja California Sur, Mexico, now totals some 252 documented species.**

This supplement is intended to update the contents of *Pacific Coast Nudibranchs*, second edition, (Behrens 1991) by providing information on newly discovered species, unknown at the time of publication of that edition, and new occurrences, range extensions and ecological information, as well as, changes to and additions of species names published since 1991.

This new information is compiled not only from the publication of recent scientific journal articles, but also from observations and collections shared with the author by opisthobranch researchers and enthusiasts up and down the Pacific Coast. Without this collaborative effort, accumulation of scientific knowledge in this area would certainly not be as extensive as it is today. Included here are 26 species new to the region covered by the 1991 edition. This supplement also includes species, previously undescribed, which now have names, several newly discovered foreign introductions, and 23 additional undescribed species, bringing the total number of opisthobranch species from the Bering Strait, Alaska to the tip of Baja California, Mexico, to 252 species.

Interest in opisthobranch mollusks has a broadening audience as indicated not only by the number of new publications featuring this taxonomic group, but by the media attention being given it. Nudibranch or sea slug is becoming a household word.

The recent report of the introduction of a *Philine* from New Zealand waters to San Francisco Bay and its rapid population spread to other coastal bays and estuaries in California received television and newspaper coverage across the country.

With the growth of the Internet has come its concomitant use by opisthobranch enthusiasts to share information. It all began with Bernard Picton and C. Morrow's entire book entitled *A Field*

Guide to the Nudibranchs of the British Isles presented on a Web Site. Since then, Nudibranch web sites have sprung up all over the World. On the West Coast of the United States, we have two web sites. "The Slug Site" features a collection of color photos from various regions around the world, whereas "The Opisthobranch" web site contains online editions of the current month's *Opisthobranch Newsletter*, a bibliography of Opisthobranchia, a nudibranch bibliography compiled by Gary McDonald with gopher search capabilities, a list of color illustrations of opisthobranchs on the net, a taxonomic and systematic list of Opisthobranchia, and the addresses of persons following this group of marine animals. Internationally, the Australian Museum's — "Sea Slug Forum" has become the largest and most active site providing realtime communication among sea slug enthusiasts and scientists alike. Lastly, Erwin Koehler's *Opisthobranchs of the World* is a list of every photograph of an opisthobranch on the world wide web.

New information was accepted for this supplement up until September 30, 2003.

Acknowledgements

I would like to acknowledge the generous sharing of observations, photographs and collections which make the publication of this supplement possible. My sincere thanks to each of the following:

Peter Ajtai
Jerry Allen
Jim Anderson
Kelvin Barwick
Clinton Bauder
Bob Bayer
Michael Behrens
Hans Bertsch
Robert Bolland
Peter Brueggeman
Don Cadien
Yolanda Camacho-Garcia
Orso Angulo-Campillo
Juan Lucas Cervera
Marc Chamberlain
Roger Clark
Kathy deWet
Sarah Douglass
Jack Engle
E. Daniel Erikson
Nora Foster
Steve Gardner
Donna and Charlie Gibbs
Jeff Goddard
Dale Marie Gonsalez
Terry Gosliner
Dan Gotshall
Constance Gramlick
Alan Grant
Herb Gruenhagen
Pete Haaker
Bernard Hanby
Gordon Hendler
Richard Hermann
Ali Hermosillo-González
Steve Horvath
Mary Ellen Hill
Paul Hughes
Derek Hutchinson
Jun Imanoto
Jerry Jacobs
Anthony Keefe
Darcy Kehler
Kirsty Kaiser
Erwin Koehler
Alan Kuzirian
Andy Lamb
Jim Lance
Lovell and Libby Langstroth
Doug Mason
Rosa Larralde Ridaura
Megan Lilly
Steve Long
Carlos Ramos Mantecon
Nishina Masayoshi
Neal McDaniel
Gary McDonald
Duke McPherson
Bill Merilees
Jane Middleton
Sandra Millen
Kathy Ann Miller
Mike Miller
Phanor Montoya
Kurtis Morin
Alan Murray
Ryan Murphy
Kathy Noonan
James Nybakken
Bill Pence
Bernard Picton
Rita O'Clair
Dan Richards
Jeff Rosenfeld
Bill Rudman
Maria Schaefer
Caroline Schooley
Marc Shargel
Paul Sin
Bob Sinclair
Hugh Erle Smith
George Spalding
Cynthia Trowbridge
Marli Wakeling
Bruce Wight
Ángel Valdés
Ron Veralde

Special thanks to the referees who gave their valuable time to review the information presented here and offer their candid comments. I would also like to thank my wife, Diana for her patience with my obsession for opisthobranchs.

Species New to the Pacific Coast

The following species were not known by the author to occur between Alaska and the tip of the Baja California peninsula during the preparation of the second edition of *Pacific Coast Nudibranchs* in 1991. Some are new discoveries, some were published in obscure publications, and some where purposely excluded from the 1991 edition due to their depth of occurrence below that of the average SCUBA diver. The new records are presented here in phylogenetic order.

Order Cephalaspidea
Family Acteonidae

***Acteon* sp.**

Gosliner (1996) reports an undescribed species of *Acteon* from the Santa Maria Basin, California.

Identification.— The shell is white and 3 mm long with 22 finely, punctate spiral lines on the body whorl (Gosliner 1996) (Fig. 1). It has three whorls. This species has a large operculum. The species is reported to be similar to *Acteon panamensis* Dall, 1908, but different from *A. traskii*, which has rose colored bands on the shell (Gosliner 1996).

Radula.— Each half row has more than 50 minute teeth, each with 16–18 denticles along the inner edge.

Size.— 1–3 mm in length.

Range.— Santa Maria Basin, off Purisima Point, California (Gosliner 1996).

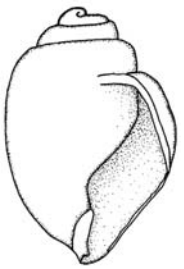


Figure 1. *Acteon* sp. Drawing of shell. (After Gosliner 1996.)

Family Hydatinidae

***Parvamplustrum* sp.**

Gosliner (1996) reports an undescribed species of *Parvamplustrum* from the Santa Maria Basin, California.

Identification.— A tiny species, the animal has a short, triangular foot (Gosliner 1996). It has bifid head tentacles. The shell is bulloid.

Radula.— Gizzard plates are absent and the jaws are unarmed polygonal rodlets (Gosliner 1996). The radular formula is 20 × 1.0.1. The lateral teeth are curved with broad denticles.

Size.— Less than 1 mm in length.

Range.— Santa Maria Basin, off Purisima Point, California (Gosliner 1996).

Family Cylichnidae

***Cylichna diegensis* (Dall, 1919)**

Gosliner (1996) reports *Cylichna diegensis* from the Santa Maria Basin, California.

Identification.— The shell is bulloid (Fig. 2A) with fine spiral striae and brown periostrical lines at each end (Gosliner 1996). The body of the animal is brown in the preserved state.

Radula.— The jaws have multifid rodlets (Fig. 2B). The radular formula is 13 × 3–4.1.1.1.3–4 (Gosliner 1996). The rachidian teeth are bifid with 5–7 denticles (Fig. 2C). The inner lateral teeth have 9–11 denticles (Fig. 2D). The three gizzard plates are equal in size and shape (Gosliner 1996).

SIZE.— The shell is 3–7mm in length.

RANGE.— Pt. Loma, San Diego, California (9–191 fathoms) to the Santa Maria Basin, off Point Sal, California (Gosliner 1996).

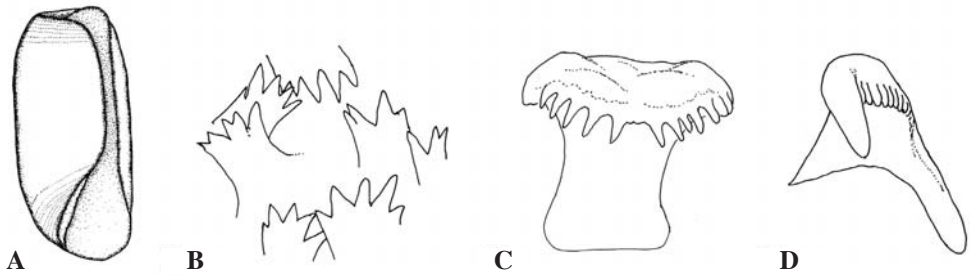


FIGURE 2. *Cylichna diegensis* (Dall, 1919). A. Drawing of shell. B. Jaw rodlets, C. Rachidian tooth, D. Lateral Tooth. (After Gosliner 1996.)

Acteocina eximia (Baird, 1863)

Gosliner (1996) discusses nomenclatural issues surrounding the subspecies originally assigned to *Acteocina culcitella*. He concludes that the subspecies, *Acteocina culcitella eximia*, is in fact a distinct species in the California fauna.

IDENTIFICATION.— Externally similar to *Acteocina culcitella* (Species #4 in Behrens 1991), but with a shorter spire and no columellar pleat (Gosliner 1996) (Fig. 3A).

RADULA.— The radular formula is 19–28 × 1.0.1 (Gosliner 1996). The lateral teeth have a strong central denticle, with 30–50 short denticles along the margin (Fig. 3B). There are three gizzard plates, two large and concave and one small one that is laterally compressed and concave (Gosliner 1996).

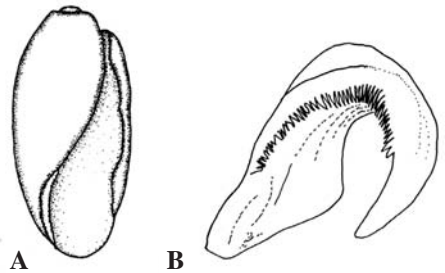


FIGURE 3. *Acteocina eximia* (Baird, 1863). A. Drawing of shell. B. Lateral Tooth. (After Gosliner, 1996.)

SIZE.— 4–10mm in length.

NATURAL HISTORY.— Found in deep water, 22 m in its northern range to 60 m in the southern areas.

RANGE.— Vancouver, British Columbia, to San Diego, California (Gosliner 1996).

Family Retusidae

Retusa zystrum Dall, 1919

Gosliner (1996) reports *Retusa zystrum* from the Santa Maria Basin, California.

IDENTIFICATION.— The shell is bulloid with numerous characteristic longitudinal striae (Gosliner 1996).

***Buccal Morphology*.**— Jaws are absent. The gizzard plates are not equal in size, one being larger than the other two (Gosliner 1996). The plates are covered with tubercles, the largest being on the inner side.

SIZE.— 1.5 mm in length.

RANGE.— Described from San Diego and San Pedro, California. Now known from the Santa Maria Basin off Point San Luis and Purisima Point, California (Gosliner 1996).

Volvulella californica Dall, 1919

Volvulella californica Dall, 1919, is reported by Gosliner (1996) from the Santa Maria Basin, Califonia, just north of its type locality.

Identification.— Shell smooth, without sculpture (Figure 4A). Widest in middle, tapered at both ends. Posterior project acute, elongate (Gosliner 1996).

Radula.— None

Natural History.— Little is known. Specimens were collected at between 90–345 m depth.

Size.— 1–3 mm in length.

Range.— Santa Cruz, California, to Todos Santos Bay, Baja California (Abbott 1974).

Etymology.— Named for the State of California, its type locality.

Volvulella panamica Dall, 1919

Volvulella panamica, on the other hand, was known only from Panama, and it too is noted because of its recent collection in the Santa Maria Basin (Gosliner, 1996).

Identification.— Shell smooth, without sculpture, and with a prolonged posterior projection (Fig. 4B). Posterior end of outer lip originating at base of posterior projection (Gosliner 1996).

Radula.— None

Natural History.— Little is known about the biology of this species. Specimens were collected from 90–197 m depth.

Size.— 2.5–5 mm in length.

Range.— Santa Maria Basin, California (Gosliner 1996), to Panama (Abbott 1974).

Etymology.— Named for the type locality, Panama Bay, Panama.

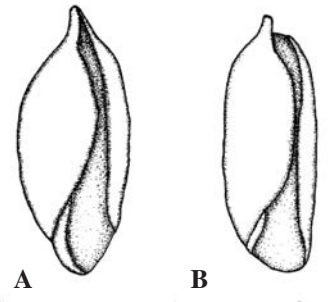


Figure 4. Drawings of shells of (left) *Volvulella californica* and (right) *Volvulella panamica*. (After Gosliner 1996.)

Family Philinidae

A white species of *Philine* was first noted in San Francisco Bay when it was observed in trawl samples collected in conjunction with the on-board educational program offered by the Marine Science Institute of Redwood City, in the summer of 1992. It was identified by Gosliner (1995) as *Philine auriformis* Suter, 1909. Rudman (*www.seaslugforum /philcali.htm*) refutes this identification, stating the California species is quite different in internal anatomy from the New Zealand *Philine auriformis*. Since that time, similar white *Philine* have become abundant along the entire California coastline. As a result of careful study, a total of four species of white *Philine* have now been identified throughout the region (see discussions on the Sea Slug Forum — *www.seaslugforum/philcali.htm*). Three more deepwater species are reported from the Santa Maria Basin, California, by Gosliner (1996).

Philine aperta (Linnaeus, 1767)

Identification.— The animal is white like *P. auriformis, P. orientalis* and *P. japonicus*.

Buccal Morphology.— Gizzard plates same as *P. orientalis* and *P. japonicus*, two larger mirror imaged and a third smaller plate. All have small holes in the center.

Size.— To 70 in length.

Range.— Atlantic coast of South Africa. California (T. Gosliner, pers. commun.).

Philine auriformis Suter, 1909

Identification.— The animal (Plate 1A) is transparent white to yellow in color. The Hancock's organs are reddish brown, and the darker visceral mass and gizzard plates are clearly visible through both the dorsal and ventral surfaces of the body (Gosliner 1995). This species also has a broad, shallow internal shell, with a spiral beaded sculpture.

Buccal Morphology.— There are equally sized spindle shaped gizzard plates with grooves on the outer surface (Gosliner 1995) (Fig. 5B). The radular formula is 21 × 1.1.0.1.1. There are 30–50 fine denticles along the inner masticatory edge on the inner lateral tooth (Fig. 5A). The outer tooth is smaller but similar in morphology.

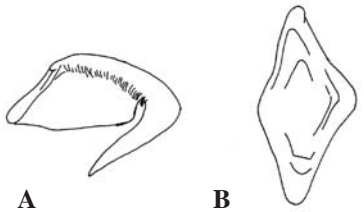


Figure 5. *Philine auriformis* Suter, 1909. A. Lateral radular tooth; B. Gizzard plate.

Natural History.— This species is found on muddy bottoms, intertidally to 15–20 ft. deep. Egg masses are large, ovoid, mucous masses attached to the substrate by a thread. They contain numerous spirals of egg capsules, each capsul containing two eggs (see Gosliner (1995) for details). This voracious carnivore feeds on the clam *Gemma gemma* and several species of *Transennella*.

Size.— 15–30mm in length.

Range.— South San Francisco Bay and Bodega Harbor, California (Gosliner 1995). Also reported from Dillon Beach (H.E. Smith, pers. commun.), Morro Bay (M. Behrens, pers. commun.) Elkhorn Slough (G. McDonald, pers. commun.), Mission Bay (D. Cadien, pers. commun.), and Coos Bay, Oregon (Jeff Goddard, pers. commun.), Barkley Sound, Vancouver Island, British Columbia (S. Millen, pers. commun.).

Philine japonica Lischke, 1872

Identification.— The animal is white like *P. aperta, P. auriformis, and P. orientalis*.

Buccal Morphology.— Gizzard plates same as *P. aperta and P. orientalis*, two larger mirror imaged and a third smaller plate. All have small holes in the center.

Size.— To 50 mm in length.

Range.— Japan and Tomales Bay, California (Gosliner, pers. commun.).

Philine orientalis A. Adams, 1854

Identification.— The animal is white similar to *P. aperta, P. auriformis, and P. japonicus*.

Radula.— Gizzard plates are relatively large. Two are mirror images of one another. The third is smaller and symetrical in shape. Each plate has a pair of pin holes in the center (Fig. 6A). The radular formula is 1.0.1. The teeth are hook-like with a denticulated edge, like that of *P. auriformis* (Fig. 6B).

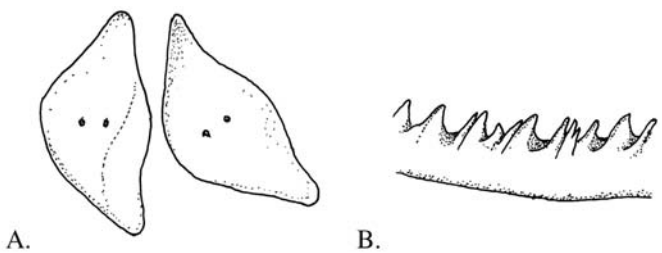


Figure 6. *Philine orientalis* A. Adams, 1854. A. Gizzard plate. B. Radular dentition.

Natural History.— Found on intertidal mudflats. Periodically in dense populations, dozens per square meter (M. Chow, pers. commun.).

SIZE.— To 50 mm in length.

RANGE.— Originally described from "eastern seas," it has been reported from the Philippines by Watson (1886) and from Hong Kong by Morton and Chiu (1990). Bodega Bay and San Francisco Bay, California (M. Chow and T. Gosliner, pers. commun.).

Philine polystrigma (Dall, 1908)

Orignally named *Clistaxis polystrigma* Dall, 1908, Gosliner (1996) reports this species from the Santa Maria Basin, California and reassigns the species to the genus *Philine*.

IDENTIFICATION.— Typical *Philine* body shape, the preserved specimens were light tan (Gosliner 1996). The anterior head shield is rounded at both ends. The posterior shield has a blunt lobe on either side (Figure 7A).

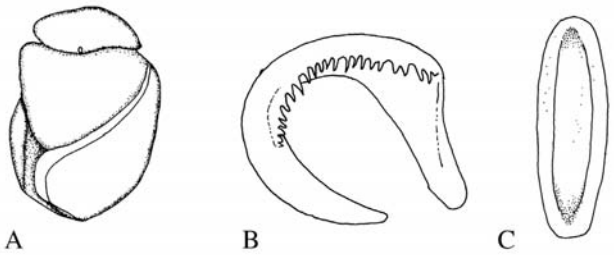


FIGURE 7. *Philine polystrigma* (Dall, 1908). A. Drawing of animal. B. Lateal tooth. C. Gizzard Plate. (After Gosliner 1996.)

RADULA.— The radular formula is 16 × 1.0.1. The lateral teeth have 25–30 fine, triangular denticles (Gosliner 1996) (Fig. 7B). The three gizzard plates are long, oval and equal in size and shape (Fig. 7C).

SIZE.— 0.5 to 3.0 mm in length.

RANGE.— Described from South Coronado Island. Gosliner extends the range to the Santa Maria Basin, off Point San Luis and Point Sal, California.

Philine sp. 1

Gosliner (1996) reports two undescribed species from the Santa Maria Basin, California.

IDENTIFICATION.— *Philine* sp. 1 is morphologically similar to *P. polystrigma* as discussed above (Gosliner 1996) (Fig. 8A). The shell has a characteristic pointed lobe (Fig. 8B).

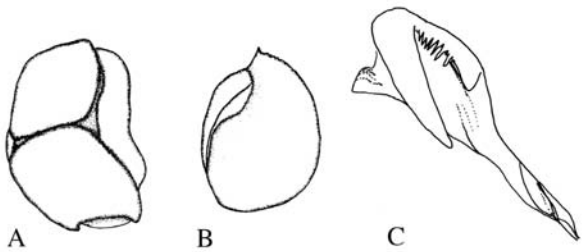


FIGURE 8. *Philine* sp. 1. A. Drawing of animal. B. Lobe of shell. C. Inner Lateral tooth. (After Gosliner 1996.)

RADULA.— The radular formula is 15 × 1.1.0.1.1. The inner lateral teeth have 22–34 elongate denticles (Gosliner 1996) (Fig. 8C). The outer lateral teeth are simple and smooth. The three gizzard plates are equal in size. They have a prominent ridge down the centerline (Gosliner 1996).

NATURAL HISTORY.— Collected only on fine soft sediments in 90–155 m of water. Probably feeds on Foraminifera (Gosliner 1996).

SIZE.— 1–5 mm in length.

RANGE.— Known from the Santa Maria Basin, off Point San Luis and Point Sal, California (Gosliner 1996).

***Philine* sp. 2**

Gosliner (1996) reports a second undescribed *Philine* from the Santa Maria Basin, California.

IDENTIFICATION.— A tiny species, the anterior shield is short and rounded posteriorly, whereas the posterior shield is elongate, terminating in skirt-like lobes (Gosliner 1996).

RADULA.— This species has a unique radular formula of 13 × 6.1.0.1.6 (Gosliner 1996). The inner lateral teeth are broad and hook-shaped and bear no denticles (Gosliner 1996). The outer lateral teeth are narrow hook-shaped and are also free of secondary denticles (Gosliner 1996).

SIZE.— Approximately 1 mm in length.

RANGE.— Known only from the Santa Maria Basin, off Point San Luis, California (Gosliner 1996).

Family Aglajidae

***Aglaja* sp.**

A new, undescribed species of *Aglaja* is reported from Santa Maria Basin, California (Gosliner 1996).

IDENTIFICATION.— The body is a uniform whitish brown. Both ends of the head shield are rounded. The posterior shield terminates in an elongate tail on the left side of the body and a shorter lobe on the right side (Gosliner 1996).

BUCCAL MORPHOLOGY.— There are no radula or gizzard plates (Gosliner 1996).

SIZE.— 0.5–1 mm in length.

RANGE.— Known only from the Santa Maria Basin, off Purisima Point and Point Sal, California (Gosliner 1996).

Family Philinoglossidae

***Philinoglossa* sp.**

Nine specimens of this undescribed species have been collected on a fine sand bottom in 65 ft. of water off San Diego (Cadien 1998). The specimens ranged in size from 1–2 mm in length, suggesting that this species may be quite common but overlooked due to its small size (Plate 1B). According to Cadien (1998), the species is ovate-elongate and lacks a head shield, parapodia, external gills, rhinophores, oral tentacles, attenuated foot corners, posterior mantle lobes surface eyes and an external shell.

The color is tan, with darker reddish brown visceral mass showing through. Internally there is no shell, jaws or gizzard plates. The radula formula is 15 × 2.1.0.1.2. The lateral teeth are flat and appressed, the cusp simple, curved and acute (Plate 1C). The lateral tooth is larger, stronger and strong shouldered. The central cusp is curved with some small marginal denticles.

Family Akeridae

***Akera* sp.**

The benthic monitoring program carried out in southern California, referred to a Bight ’98 EMAP project, has collected an unidentifiable species determined to belong to the genus *Akera* (Ron Veralde and Kelvin Barwick, pers. commun.). The specimen was collected in 40 m of water near the south western shore of Santa Catalina Island. As seen in Plate 1D, the body of the animal is cream colored. The internal organs can be seen through the external coiled shell, which has a depressed spire.

Order Anaspidea
Family Aplysiidae

***Aplysia parvula* Güilding in Mörch, 1863**

This species occurs worldwide in warm temperate waters and has recently been observed in southern California (Bruce Wright, pers. commun.).

IDENTIFICATION.— Typical sea hare body form. Mottled brown in color, the parapodia has a dark blue-black line along the edge of the parapodia (Plate 1E). The parapodia encloses the mantle cavity.

SIZE.— To 50 mm in length.

RANGE.— Worldwide tropical to sub-tropical. Along the Pacific Coast of North America from the Gulf of California to Galápagos Islands (Gosliner 1991), and San Clemente Island.

Order Notaspidea
Family Pleurobranchidae

***Pleurobranchus* cf. *areolatus* (Mörch, 1863)**

Although originally thought to be a new species of *Pleurobranchus*, because it was so far outside of the range of *P. areolatus* and because it lacked the characteristic white speckles on the rhinophores and white snow flakes over the notal tubercles, internal anatomical similarities suggest we should refer to it as a color variation of *P. areolatus* until further studies are conducted, suggesting otherwise.

IDENTIFICATION.— A large pleurobranch, the notal surface is covered with large smooth tubercles (see Plate 1F). The largest tubercles are brown whereas smaller ones are golden brown. In juveniles, the border between the tubercles is white whereas in larger specimens is ~~a~~ light tan to peach color. The rolled rhinophores are tan to orange.

RADULA.— 90 × 230.0.230.

SIZE.— To 190 mm in length (Angulo-Campillo et al. 2001).

RANGE.— The new occurrences outside the Gulf of California, include: Isla Revillagigedos, Mexico (K. Kaiser), San Benitos Island (E. Houcke), La Jolla (P. Hughes) and San Clemente Island (M. Tegner, K. Miller and C. Gramlick), San Diego County, Anacapa and Catalina Islands, California (J. Engle, E. Erikson, R. Herrmann and D. Richards). Previously, Atlantic coast, Florida and Caribbean to Canal Zone, Barbados and Curacao, and Gulf of California to Panama.

Order Sacoglossa
Family Stiligeridae

***Placida* sp.**

Discovered by Jim Lance and Wes Farmer, the species is undescribed.

IDENTIFICATION.— Aeolid-like in appearance, this sacoglossan has a cream colored head and green cerata covered with white specks and have white tips (Plate 1G). The long cephalic tentacles are also white at the tips.

RADULA.— Unknown

NATURAL HISTORY.— This species lives on intertidal mudflats and feeds on the green alga, *Codium magnum*.

SIZE.— To about 15 in length.

RANGE.— To date known only from Bahía San Quintin, Baja California, Mexico.

Order Nudibranchia
Suborder Doridacea (= Doridina)
Family Gnathodoridoidea

***Bathydoris aioca* Marcus and Marcus, 1962**

Originally described from Guadalupe Island, Baja California, Mexico, I was unaware of any photographs of this species and, due to its depth of occurrence, I excluded it from the 1991 edition of *Pacific Coast Nudibranchs*. The species has now been dredged off the Oregon coast.

Identification.— Valdés and Bertsch (2000) report that although the color of the living animal is unknown, the dorsum is smooth and preserved specimens give no evidence of spots or other color markings (Plate 1H). The rhinophores are quite long and bear 45 lamellae. The gill consists of 18 bipinnate branchial leaves.

Radula.— The radular formula is 53–64 × 64–81.1.64–81.

Natural History.— Dredged from depths of 2700–2850 m.

Size.— To 71 mm in length.

Range.— Known only from the type locality off Guadalupe Island, Mexico, and Oregon (Valdés and Bertsch 2000).

Family Goniodorididae

***Okenia* sp. 1**

A new species of *Okenia* has been showing up regularily in southern California (Plate 1I). It has been encountered at diver depths off Huntington Beach, Newport Beach, San Onofre and Redondo Beach on worm tubes on soft bottoms (Don Cadien, pers. commun.). Further south in San Diego, the species is found in association with the solitary tunicate, *Mogula* sp. (Ron Velarde and Megan Lilly, pers. commun.). Preliminary evaluations indicate that the species is undescribed but shares some anatomical features with *Okenia aspersa* (Alder and Hancock, 1845) from British waters (D. Cadien, pers. commun.).

***Okenia* sp. 2**

A second undescribed species of *Okenia* is reported from the Santa Maria Basin, California (Gosliner 1996).

Identification.— The notum has 3–4 papillae present along either lateral margin of the notum (Gosliner 1996). There are four gills arranged in a semi-circle (Gosliner 1996).

Radula.— The radula formula is 18 × 1.1.0.1.1. The inner lateral teeth are large, curved with 7–8 denticles on the inner side (Gosliner 1996). The outer lateral teeth are narrow and bicuspid.

Size.— 1 mm in length.

Range.— Known only from the Santa Maria Basin off Point Sal, California (Gosliner 1996).

Family Onchidorididae

***Calycidoris guentheri* Abraham, 1876**

The distribution of this species has previously been given as Arctic Seas to Bering Strait in 14–44 meters of water. Nora R. Foster and Rae Baxter were responsible for the first collections of this species in the northern Pacific, the southern most being from the central Bering Sea. It is a syn-

onym of *Doris* (*Adalaria*) *sibirica* Aurivillius, 1887 (= *Calycidoris guentheri*, *fide* T. Gosliner, pers. commun.). See complete description below.

IDENTIFICATION.— Typically doridoid in shape, the body is large, slightly wider in front and depressed. It is densely covered with small conical spiculose tubercles which vary in size. The ground color is tan to dark brown, often with reddish pink to purple. The head is a narrow, thick, veil. It has 18–23 pinnate gills in a circle around a central anus, which contract into a sheath.

RADULA.— The radular formula is 25–28 × 3.1.0.1.3.

NATURAL HISTORY.— Dredged from depths of 9–270 m, usually 9–60 m (Roginskaya 1972).

SIZE.— To 32 mm in length.

RANGE.— Widespread in the Arctic Ocean from the Barents Sea to the Chukchi Sea and Bering Strait (Roginskaya 1972); also found across the Beaufort Sea to Liverpool Bay, North WestTerritory (S. Millen, pers. commun.). Specimens are also reported from the Bering Sea (Goddard and Foster 2002).

ETYMOLOGY.— Named for Dr. Albert Günther of the British Museum of Natural History.

Family Discodorididae

Diaulula greeleyi (MacFarland, 1909)

Peltodoris nayarita Ortea and Llera, 1981, was described from the Nayarit coast of Mexico by Ortea and Llera (1981). Since then it has been collected within the coverage of *Pacific Coast Nudibranchs*, 2nd ed., at Punta Eugenia (Bertsch et al. 2000). Camacho-García and Valdés (2003) report that this species is synonymous with *Diaulula greeleyi* (MacFarland, 1909).

IDENTIFICATION.— An orange red dorid with brown blotches (Plate 2A). The dorsum is tuberculate, bearing caryophyllidia. The rhinophores and gills pockets are elevated.

RADULA.— The radular formula is 37 × 55.0.55. The lateral teeth are hamate, having a single cusp and lacking denticles.

Size.— To 100 mm in length.

RANGE.— Florida, Brazil, South Carolina, Isla Isabela, Nayarit, Mexico and Punta Eugenia, Baja California, Mexico, and the Pacific Coast of Costa Rica (Camacho-García and Valdés 2003).

Family Polyceratidae

A recent, deepwater study in the Santa Maria Basin of Central California has produced a number of previously undescribed species (Gosliner 1996). The following genus, new to the Pacific Coast of North America, was represented among specimens collected during that study. The new species has yet to be described.

Holoplocamus sp.

Among the new species collected in the Santa Maria Basin study (Gosliner 1996) was this primitive polyceratid. Coincidentally, Shrake (1977) reported the collection of five specimens taken in 600 ft of water at locations, also in the Santa Maria Basin (Platform Harvest and Platform Hildago), of a species identified at the time, as *Triopella* sp., another primitive polyceratid. Subsequent discussions with Don Cadien, who originally identified the specimens as *Triopella*, have led to the conclusion that those specimens were likely the same as Gosliner's species reported here as *Holoplocamus* sp.

IDENTIFICATION.— The body is elongate with 11–15 spiculate velar tentacles and 4–6 lateral appendages per side of the body (Fig. 9). The three gills are unipinate to bipinnate. The mouth is

flanked by a pair of elongate tentacles (Gosliner 1996).

RADULA.— The radular formula is 30 × 7–8.2.1.2.7–8. See Gosliner (1996) for SEMs of the radular morphology.

NATURAL HISTORY.— Collected by trawl net on both hard and soft bottoms.

SIZE.— To 0.5–1.5 mm.

RANGE.— Know only from the Santa Maria Basin, Platform Harvest and Platform Hildago (Shrake 1977) and off Morro Bay and Purisima Point, San Luis Obispo County, California (Gosliner 1996).

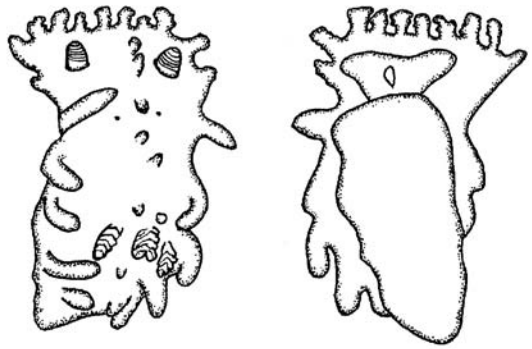


FIGURE 9. *Holoplocamus* sp. Drawings of preserved specimen. Dorsal and ventral views. (After Gosliner 1996.)

Colga pacifica Bergh, 1894

IDENTIFICATION.— This phanerobranch dorid looks very much like a *Triopha*. The notum has a pre-branchial notal processes. A main row of elongate processes runs down the middle of notum and usually a pair of rows of similar processes accompanied it along both sides. In some specimens these lateral rows are almost the same length as the middle row. Specimens vary from pure white with yellow gills and rhinophores shown above, and as described originally by Bergh, to specimens that are completely orange (Plate 2B).

RADULA.— The radular formula is 15 × 5–6.1.1.1.1.1.5–6. Drawings of the jaw and radula are presented in Fig. 10.

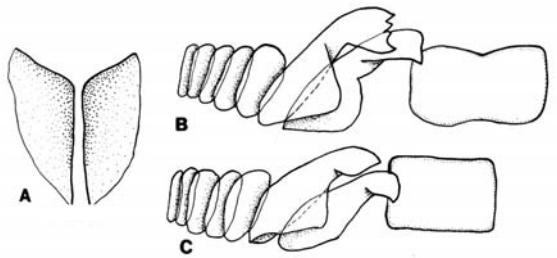


FIGURE 10. *Colga pacifica*. Drawing of jaw and radula. (After Martynov and Baranets 2002)

NATURAL HISTORY.— This species feeds on various bryozoans. The specimens shown here were collected between 90–275 m deep.

SIZE.— To about 20 mm.

RANGE.— Alaska to Shikotan Island (southern Kuril Islands); southwest Greenland.

Family Dendrodorididae

Doriopsilla spaldingi Valdés and Behrens, 1998

This recently discovered species has probably been passed over for years as a common yellow porostome (*Doriopsilla albopunctata* or *Dendrodoris fulva*) with a light margin. The collection of several specimens from the La Jolla area bearing a distinctive blue margin has drawn attention to the identity of this species (J. Lance, pers. commun.).

IDENTIFICATION.— As mentioned above, this species looks strikingly similar to *Doriopsilla albopunctata* (= *Dendrodoris fulva*). Gills and rhinophores are yellow-orange and the notum has evenly distributed low tubercles. The margin is the key identifying feature; it is highly undulated and white to iridescent blue in color (Plate 2C). Close analysis by Jim Lance indicates that in iridescent blue specimens, the tissue morphology is similar to that of the blue in the aeolid *Hermissenda*, being a concentration of coalesced sacs acting as vesicles that hold the color platelets together.

Radula.— None

Natural History.— Collected in depths of 200 feet in Scripp's Canyon, to 80 feet, and in the Channel Islands. This species lays a flat coiled egg mass, which produces direct development or lecithotrophic larvae (J. Lance, pers. commun.).

Size.— To 83 mm.

Range.— South Coronado Island, Baja California, La Jolla Submarine Canyon and Pt. Loma, San Diego County, and San Miguel Island, California. It has also been observed at 210 ft. at The Pinnacles, Carmel, California (Clinton Bauder, pers. commun.).

Etymology.— Named for George E. Spalding III of Solana Beach, California, who discovered this species.

Suborder Dendronotacea (= Dendronotina)

Family Tritoniidae

Tritonia pickensi Marcus and Marcus, 1967

Identification.— Similar in appearance to *Tritonia myrakeenae*, the body is translucent and bears an opaque white region mid-dorsally, which branches to extend to the base of each gill (Plate 2D). There are approximately 12 gill tufts.

Natural History.— Found on the red gorgoniam, *Lophogorgia chilensis*, to depths of 65 ft or more.

Size.— To about 25 mm.

Range.— La Jolla Canyon, San Diego and California Channel Islands, California; Bahía de los Ángeles to Cabo San Lucas, Baja California (Skoglund 2002), Puerto Vallarta, Mexico (Hermosillo-González 2003) and Costa Rica (INBIO 2003).

Etymology.— Named to honor Dr. Peter E. Pickens, University of Arizona, who collected extensively in the Gulf of California for the Marcus'.

Family Scyllaeidae

Crosslandia daedali Poorman and Mulliner, 1981

This species had been known only from the mainland of Mexico and the Gulf of California.

Identification.— The species has lobed parapodia, the first of which is largest (Plate 2E). The edges of the lobes are irregularly notched and digitate and have numerous branchial tufts along the edges. The color varies from orange to green and red. There are fine brown lines along the body as well as some brown spots. The species also has a series of 5–6 bight blue spots along the sides and dorsally.

Natural History.— On the mainland, the species was found on the alga *Padina* sp., where it grazes on small hydroids that live on the alga.

Size.— To 25 mm in length.

Range.— First reported on this coast from Punta Eugenia, Baja California (Bertsch et. al. 2000), the species is now known to range to Guaymas in the Gulf of California and south to Puerto Vallarta, Mexican mainland (Hermosillo-González 2003).

Family Dendronotidae

Dendronotus sp.

It is not known if this is the same as *Dendronotus* sp. 1, (Species #148), which is known from

Alaska and as far south as the California Channel Islands, as I have no specimens to make this determination. What is known is that this very large species, reaching over 7 inches, matches no other species recorded from along this coast. I have received several photographs of this species but as yet no specimens by which to set the record straight. Note the white specks on a red body as described for *Dendronotus* sp. 1, but the handsome specimen shown in Plate 2F has a wide patch of opaque white along its mid-dorsal line.

Identification.— A large, red-bodied *Dendronotus* with white specks covering the entire body. Some specimens may have a wide patch of opaque white along its mid-dorsal line.

Radula.— Unknown.

Natural History.— Nothing is known of this species' habits.

Size.— Large, to 180 mm in length.

Range.— Seymour Inlet, Tredwell Bay, Vancouver area, British Columbia.

Suborder Arminacea (= Arminina)
Family Arminidae

Armina cordellensis Gosliner and Behrens 1996

Identification.— Grey in color, the notum is granular with irregularly spaced, low, rounded tuberacles (Fig. 11).

Radula.— 46 × 42.1.69. The rachidian teeth are broad with a large triangular central cusp, flanked by 8–13 elongate denticles per side (Fig. 12). The lateral teeth are triangular with 7–9 short triangular denticles (Fig. 12).

Natural History.— The type specimen was collected at a depth of 46–52 m.

Size.— 60 mm.

Range.— Known only from Cordell Banks, 20 km off Point Reyes, California.

Etymology.— Named for the type locality, the Cordell Bank.

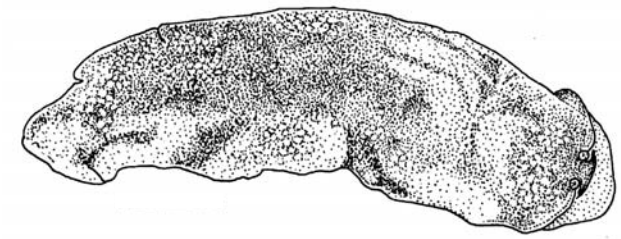


Figure 11. *Armina cordellensis* Gosliner and Behrens, 1996. Drawing of preserved specimen.

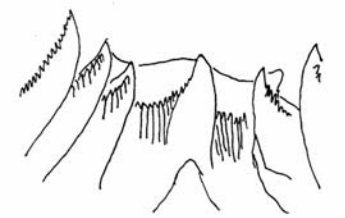


Figure 12. *Armina cordellensis* Gosliner and Behrens, 1996. Radular teeth.

Janolus sp.

Identification.— Similar in coloration to *Dirona pellucida* Volodchenko, 1941(= *Dirona aurantica* [Hurst, 1966]), the body being transparent to orange with white specks and a white line up each ceras and each rhinophore. The digestive gland is clearly seen within each ceras (Plate 3A), unlike *D. pellucida*, where the gland is absent.

Radula.— Unknown.

Natural History.— Nothing is known of this species' habits.

Size.— 30–40 mm.

Range.— Photographed in Quarry Bay, Nelson Island, British Columbia in 60 feet of water by Bernard P. Hanby (Andy Lamb, pers. commun.).

Suborder Aeolidacea (= Aeolidina)
Family Flabellinidae

***Flabellina bertschi* Gosliner and Kuzirian 1990**

Until recently, this species was known only from the Pacific coast of Panama and within the Gulf of California. Goddard and Schickel (2000) have reported the species from the outer coast of Baja California.

Identification.— This species is typically flabellinid in shape. The body is translucent with an opaque white band on the notum (Plate 3B). The cerata are orange-red with white tips. The rhinophores are smooth. The oral tentacles and rhinophores are tipped with white.

Radula.— The radular formula is 24–31 × 1.1.1. The rachidian tooth has 6–8 denticles, the laterals 9–11 denticles.

Natural History.— Little is known about this species.

Size.— To 30 mm length.

Range.— Known from Pacific coast of Panama (Gosliner 1994), Puerta Vallarta, Mexico (Hermosillo-González 2003), Costa Rica (INBIO 2003), Gulf of California (Gosliner and Kuzirian 1990), Punta Rosarita on the west coast of Baja California (Goddard and Schickle 2000), and Little Farnsworth, Catalina Island, California (E. Erikson, pers. commun.). Also from the Galápagos (Gosliner 1994).

Etymology.— Named to honor marine biologist and friend, Hans Bertsch.

***Flabellina* cf. *islandica* (Odhner, 1937)**

This species is possibly the same as *Flabellina islandica,* which is known from Iceland (Sandra Millen, pers. commun.).

Identification.— This species is typically flabellinid in shape, but slightly stouter and wider, an adaptation believed to be related to its soft bottom existence. The ground color is translucent pinkish cream with stubby red cerata (Plate 3C). Opaque white specks occur on the dorsal surface and cerata, the ends of the smooth rhinophores and the extremely long oral tentacles.

Radula.— The radular formula for specimens from Iceland is 15 × 2.1.1. The rachidian has 5–7 denticles, the laterals are smooth and there is a small outer lateral on the left side of some specimens.

Natural History.— Shallow subtidal on mud bottoms in the spring and summer.

Size.— To 22 mm length.

Range.— Known from southern British Columbia, Victoria Harbor (Vancouver Island) and Vancouver Harbor (mainland) (Neil McDaniel and Sandra Millen, pers. commun.). Similar animals have been found in the Sea of Japan (Sandra Millen, pers. commun.).

Family Tergipedidae

***Cuthona* sp.**

Identification.— Another transparent tergipedid with brown ceratal cores. Internal anatomy indicates it is a new species (J. Lance, pers. commun.). There are 8–9 rows of cerata, tipped with a white cnidosac. The tips of the rhinophores and cephalic tentacles are white encrusted.

RADULA.— Unknown.

NATURAL HISTORY.— Found on the hydroid, *Tubularia* sp., on boat docks (J. Lance, pers. commun.).

SIZE.— 5–9 mm in length.

RANGE.— San Diego, California (J. Lance, pers. commun.).

Family Aeolidiidae

Aeolidia herculea Bergh, 1894

Aeolidia farallonensis Gosliner and Behrens, 1996 (synonym).
Aeolidia grandis Volodchenko, 1941 (synonym).

Gosliner and Behrens (1996) described two new deepwater species from northern California. One was *Aeolidia farallonensis*, described from several specimens collected from 510 and 1400 m deep off the Farallon Islands, Gulf of the Farallons, California. At the time the authors described *A. farallonensis*, *A herculea* was regarded as a synonym of *Aeolidia papillosa* (Linnaeus, 1781) (Marcus 1961). At the suggestion of colleague A.V. Martynov, the authors reviewed Bergh's original description and found these species to be identical.

IDENTIFICATION.— Similar in external morphology to *Aeolidia papillosa* (Linnaeus, 1761) (Species no. 212) except the rhinophores are rugose (Fig. 13A) rather than smooth, and it has fewer rows of cerata, but with nearly twice the number of cerata per row (Gosliner and Behrens 1996). Internal anatomies clearly differentiate these two species. The color of the living animal is unknown.

RADULA.— 30 × 0.1.0. Each tooth bears 38–53 shallow triangular denticles (Fig. 13B). The jaws (Fig. 13C) are twice as long and more than twice as wide as those of a similar size *A. papillosa*. The jaws of *A. herculea* are similar in size and shape to those described for *A. farallonensis.*

NATURAL HISTORY.— Specimens have been collected from 510 and 1400 m deep.

SIZE.— 25 mm.

RANGE.— Originally described from Alaska. Gosliner and Behrens (1996) add the Farallon Islands, Gulf of Farallons, California. Additional collections have been recorded from Monterey Bay, 570–700 m deep (Jim Nybakken, pers. commun.).

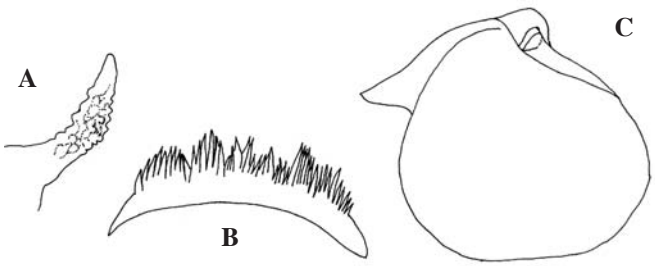
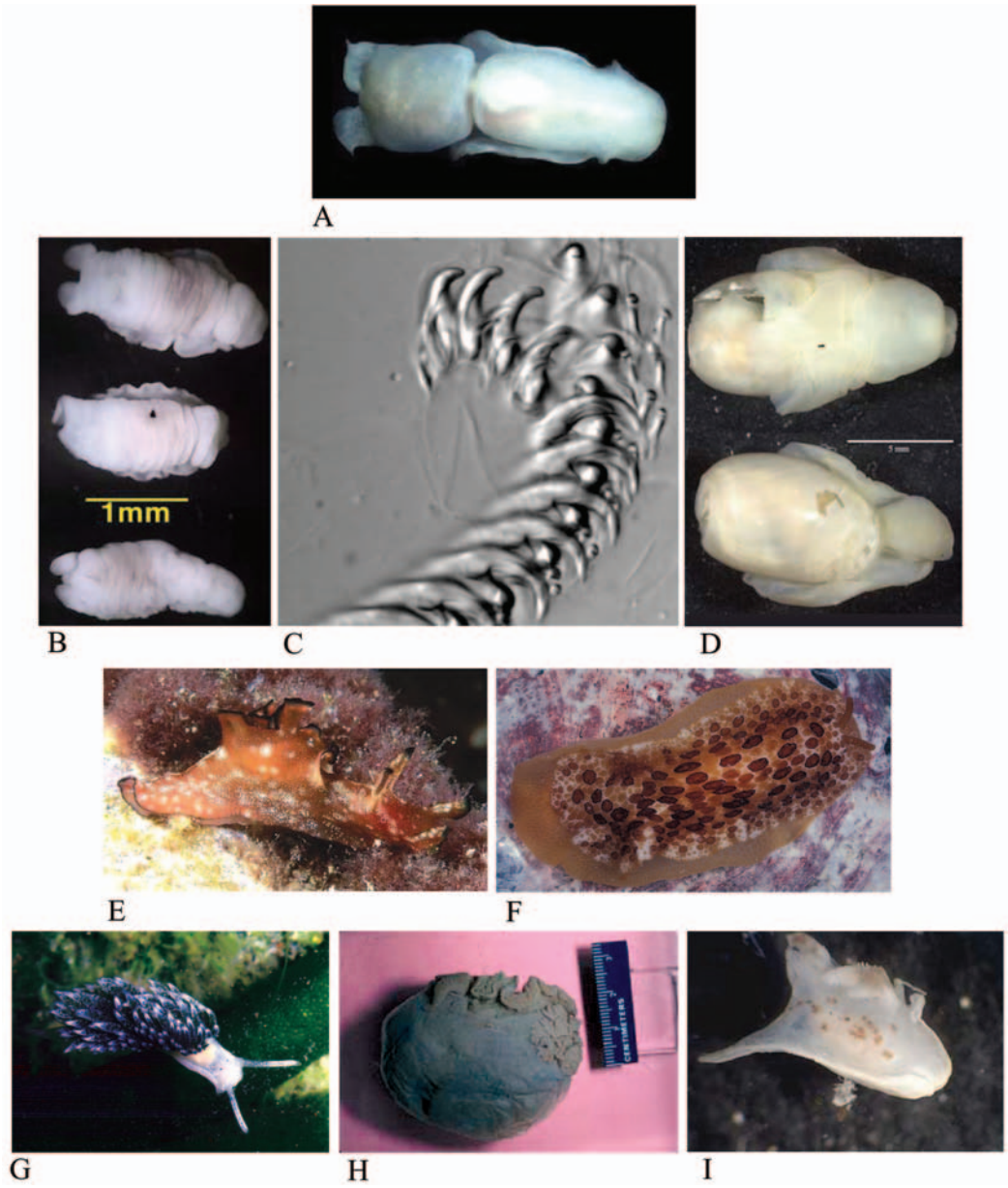


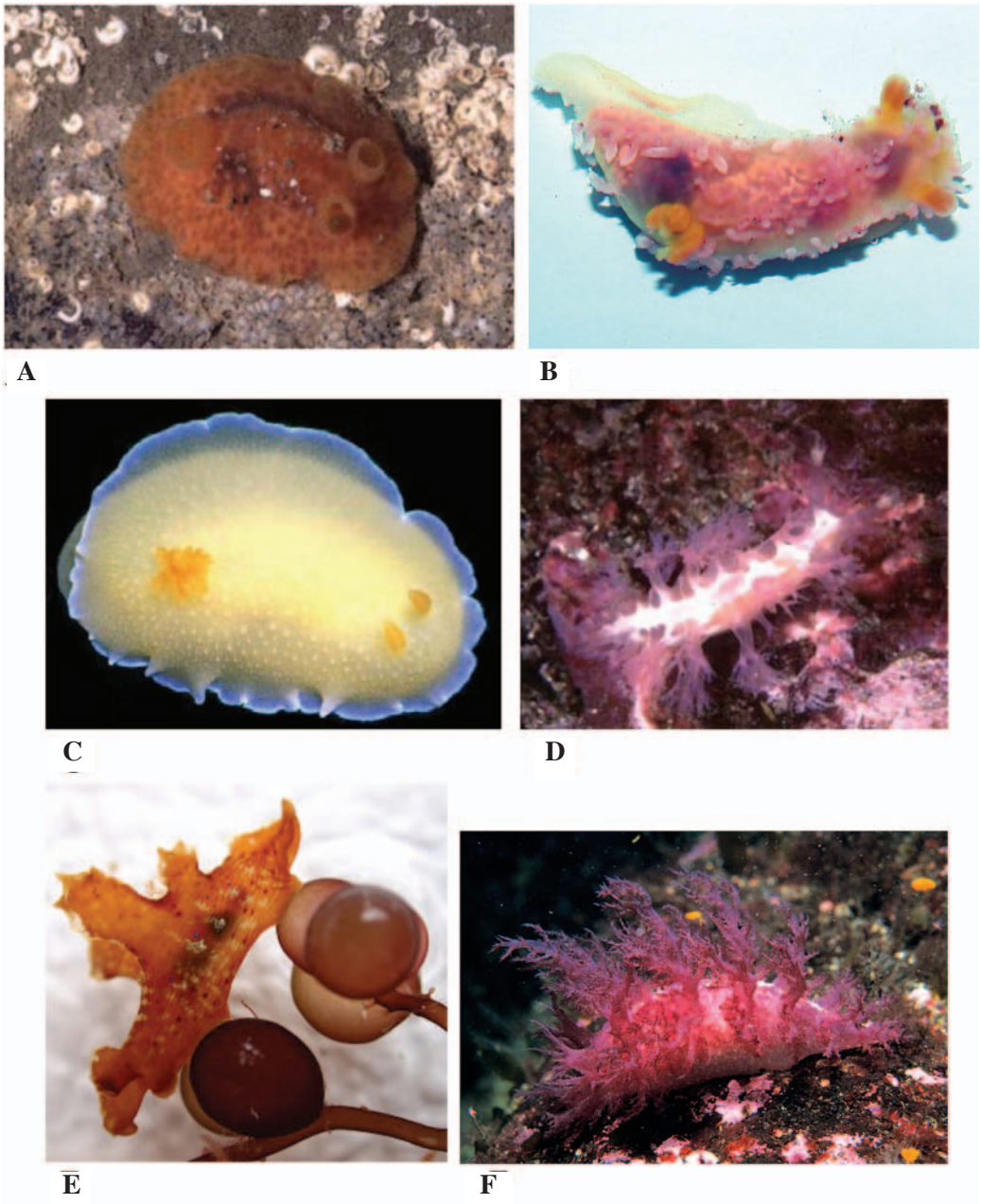
FIGURE 13. *Aeolidia herculea*, Bergh, 1894. A. Rhinophore; B. Radular tooth; C. Jaw. (Drawings after Gosliner and Behrens 1996.)

Plate 1



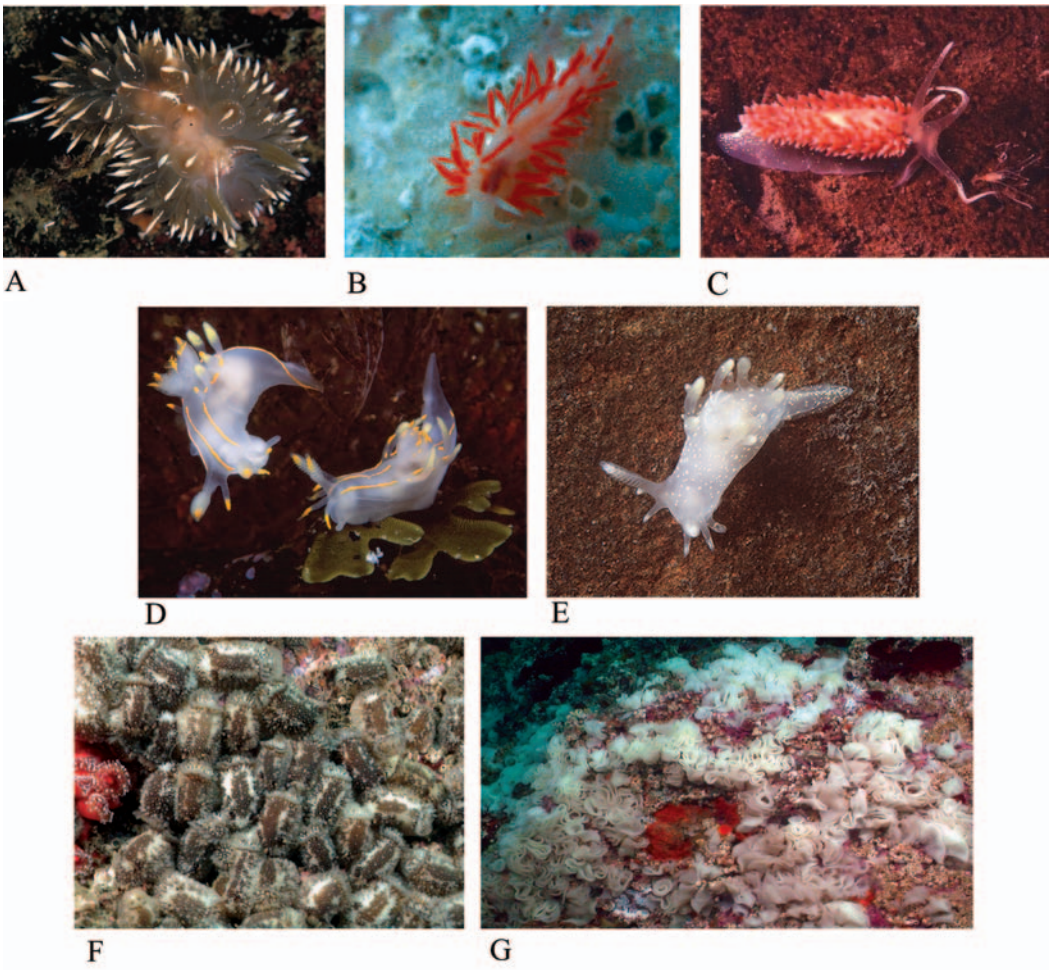
A. *Philine auriformis* Suter, 1909, living animal, San Francisco Bay, California (T. Gosliner); B. *Philinoglossa* sp. Dorsal and ventral views of preserved specimens, San Diego, California (Kelvin Barwick); C. *Philinoglossa* sp. Radula; D. *Akera* sp., preserved specimen, dorsal and ventral view, Santa Catalina Island, California (Kelvin Barwick); E. *Aplysia parvula*, living animal San Clemente Island, California (Bruce Wright). F. *Pleurobranchus* cf. *areolatus*, living animal, La Jolla, California (David Behrens); G. *Placida* sp., living animal, Bahía San Quintin, Baja California, Mexico (Wes Farmer and Jim Lance); H. *Bathydoris aioca*, preserved specimen, Oregon (Hans Bertsch); I. *Okenia* sp., freshly preserved specimen, Huntington Beach, California (Sarah Douglass).

Plate 2



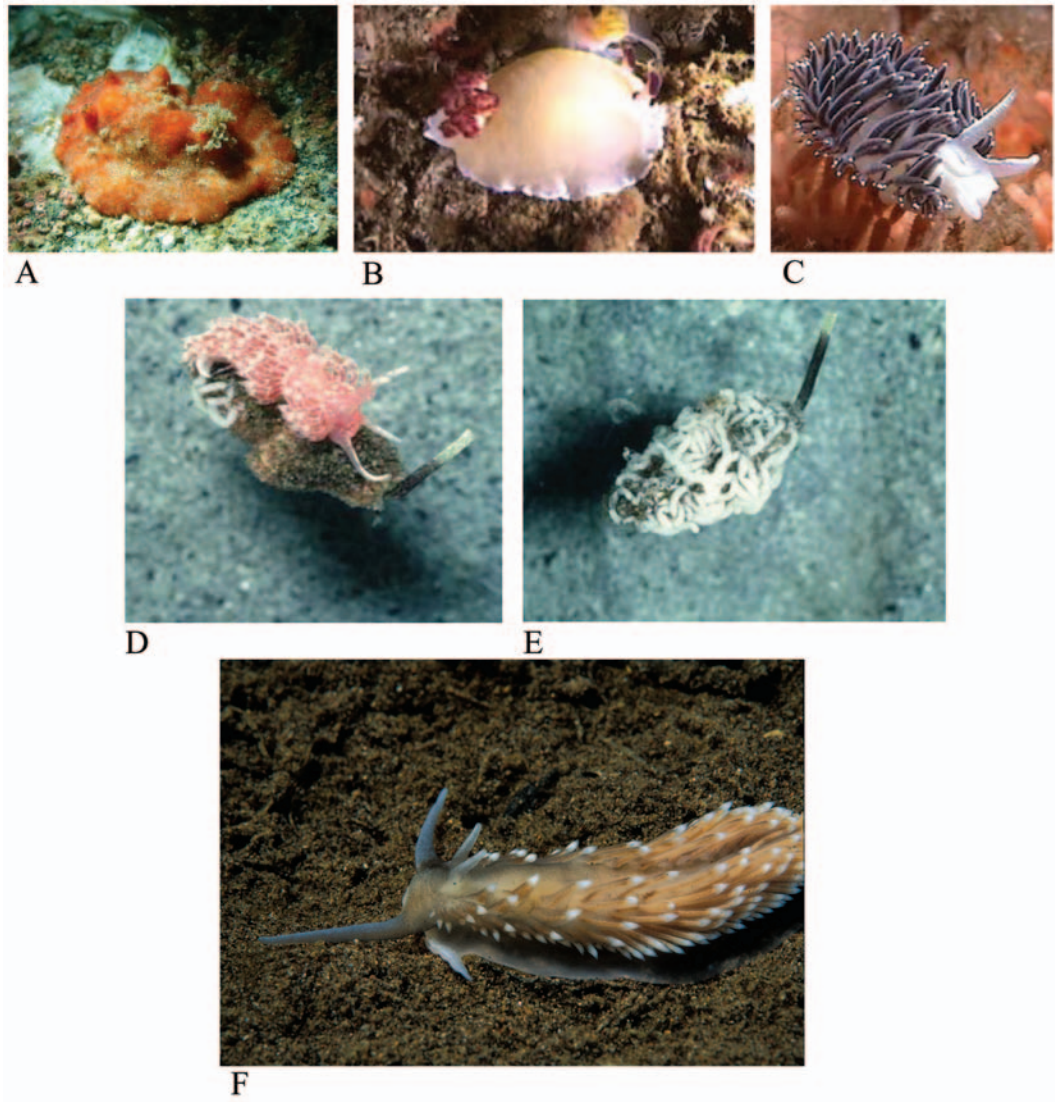
A. *Diaulula greeyeli* (MacFarland, 1909), living animal, Punta Eugenia, Baja California, Mexico (Hans Bertsch); B. *Colga pacifica*, living animal, Kuril Islands, Alaska (Roger Clark); C. *Doriopsilla spaldingi* Valdés and Behrens 1998, living animal, San Diego, California (Mike Miller); D. *Tritonia* cf. *pickensi*, living animals, Channel Islands, California (Kathy deWet); E. *Crosslandia daedali*, living animal, Puerto Vallarta, Mexico (Ali Hermosillo-González); F. *Dendronotus* sp., living animal, Seymour Inlet, Tredwell Bay, Vancouver, British Columbia (Bernard P. Hanby).

Plate 3



A. *Janolus* sp., living animal, Quarry Bay, Nelson Island, British Columbia (Bernard P. Hanby); B. *Flabellina bertschi*, living animal, Puerto Vallarta, Mexico (Ali Hermosillo-González). C. *Flabellina* cf. *islandica*, living animal, Victoria Harbor, Vancouver Island, BC, Canada (Neil McDaniel). D. *Ancula gibbosa*, living animals, Southern California (Bruce Wright); E. *Ancula gibbosa*, living animals, Vancouver, British Columbia area (Charlie Gibbs); F. *Onchidoris bilamellata*, mass feeding on barnacles in Monterey, California (Clinton Bauder); G. *Onchidoris bilamellata*, mass spawning in Monterey, California (Clinton Bauder).

Plate 4



A. *Taringa aivica*, living specimen, Puerto Vallarta, Mexico (Ali Hermosillo-González); B. *Dendrodoris* sp. 2., living animal (Clinton Bauder); C. *Flabellina trophina*, living dark color morph, Coronation Island, Alaska (Clinton Bauder); D. *Anetarca armata*, feeding on hydoids living on shell of living *Decipifus californicus*, Bahía de Los Angeles, Baja California, Mexico (James R. Lance); E. *Decipifus californicus* covered with *Anetarca* egg ribbon, Bahía de Los Angeles, Baja California, Mexico (James R. Lance); F. *Cerberilla* cf. *pungoarena*, living animal, Channel Islands, California (Kathy deWet).

New Information and Nomenclatural Changes

The following is an update to the information presented in the second edition of *Pacific Coast Nudibranchs* (Behrens 1991). The numbers listing the species below correspond to the species identification numbers used in that text. Included in brackets are new names given species that were reported as undescribed in 1991, synonymies and nomenclatural changes. New information on color variation and possible taxonomic confusion, and extensions of the known ranges are also presented.

A comprehensive study of the food preferences of nudibranchs worldwide was published by McDonald and Nybakken (1997) Referencing the prey species of the nudibranchs of this coast here would be too voluminous and the mere number of references would surely triple the length of this document. I refer you to the original document at — http://www.veliger.org/nudibranch_food.html.

Order Cephalaspidea

1. *Rictaxis punctocaelatus* (Carpenter, 1864)

Mikkelson (1996) reviewed the Cephalaspidea and proposed moving the Opisthobranch family Acteonidae from the Opisthobranchia, to the Gastropod subclass Heterobranchia. I do not support this move here. The range of this species should be extended into the Gulf of California to Bahía San Carlos, Sonora, Mexico (Poorman and Poorman 1988).

5. *Acteocina harpa* (Dall, 1871)

The range of this species is extended south to Rocas Alijos, Mexico (McLean and Coan 1996).

8. *Cylichna alba* (Brown, 1827)

This little known species has been observed recently in Boundary Bay, Vancouver, British Columbia on the estuary's mud flat, hidden in drying mats of drift eel grass (Bill Merilees, pers. commun.). This species has been found in the guts of western sandpipers.

11. *Diaphana californica* Dall, 1919

The range of this species is extended north to Kayostla Beach, Olympic Peninsula, Washington (Jeff Goddard et al. 1997).

21. *Navanax inermis* (Cooper, 1863)

The range of this species is extended north to Bolinas Lagoon, Marin County, California, where adult specimens were collected in December 1992 during that year's El Niño event.

22. *Navanax polyalphos* (Gosliner and Willaims, 1972)

The species is now reported as far south as Costa Rica (Camancho-Garcia, pers. commun.).

23. *Philine bakeri* Dall, 1919 [now: *Philine alba* Mattox, 1958]

The correct designation for the photo of the *Philine* shown in Behrens, 1991, photo 23, has been bantered back and forth. Due to the size of the specimen (15 mm), it should be listed as *Philine alba*.

Order Anaspidea
Family Aplysiidae

24. *Aplysia californica* Cooper, 1863

The range of this species has been extended to Hachijo Island, Japan where several 70-cm specimens have been collected (Jun Imamoto and Nishina Masayoshi, pers. commun.) and to El Salvador (Hernandez C. 1992).

Order Notospidea
Family Pleurobranchidae

30. *Berthella californica* (Dall, 1900)

A specimen closely matching *Berthella californica* was recently trawled from 400 feet in the Galápagos Islands (T. Gosliner, pers. commun.). This extension should be considered tentative, however. Martynov (1997) reports this species from Beringa Island, Peter the Great Bay, Sea of Russia.

32. *Berthella strongi* (MacFarland, 1966)

The range of this species is extended north from Moss Beach, California, to Nanaimo, British Columbia (Mike Miller, pers. commun.), and south from Santa Cruz Island to Punta Rosarito, Baja California (Goddard and Schickel 2000).

33. *Berthella engeli* (Gardner, 1936) [now: *Berthellina ilisima* Marcus and Marcus, 1967]

For sometime there has been uncertainty concerning the proper placement of the bright orange pleurobranchs on this coast and elsewhere. *Berthella engeli* and *B. citrina* have been used interchangably throughout the literature. A recent study of all the smooth orange *Berthella's* worldwide undertaken by Terrence Gosliner and Lucas Cervera concludes that the eastern Pacific species is *Berthellina ilisima* (Juan Lucas Cervera, pers. commun.).

Order Sacoglossa

A review of the natural history of the sacoglossans of the northeastern Pacific can be found in Trowbridge (2002).

36. *Elysia hedgpethi* Marcus, 1961

Hermosillo-González (2003) reports this species from Puerto Vallarta, Mexico.

38. *Ercolania boodleae* (Baba, 1938)

The range is extended into the Gulf of California at Puerto Peñasco (Trowbridge 2002).

39. *Placida dendritica* (Alder and Hancock, 1843)

The range of this species is extended north to Bertha Bay, Chichagof Island, Alaska, where it has been collected on *Codium fragile* (Rita O'Clair, pers. commun.), and south into Gulf of California at both Bahía de los Ángeles, Baja California, and Bahía San Carlos, Sonora, Mexico (Trowbridge 2002), on *Codium setchelli* (Cynthia Trowbridge, pers. commun.).

41. *Stiliger fuscovittatus* Lance, 1962

Please note that the photo in the 1991 edition of *Pacific Coast Nudibranchs* shows a specimen on the algae, *Microcladia*. This algal species is not fed upon by *Stiliger* and, additionally, is rarely associated with it (Cynthia Trowbridge, pers. commun.).

42. *Alderia modesta* (Loven, 1844)

This species was previously reported as far south as Newport Bay, California. It has now been reported from San Quintin, Baja California, Mexico (J. Lance, pers. commun.). The range is also extended north to Prince William Sound, Alaska (Goddard and Foster 2002).

Krug (1998) reports that *Alderia modesta* practices poecilogony, or the production of eggs of different sizes that yield either planktotrophic veligers or lecithotrophic veligers, depending on their available yolk supply. Back crosses of these two forms yield the same ratio of reproductive types seen initially and give evidence of their conspecificity. Starved individuals, which had previously spawned exclusively or primarily lecithotrophic larvae, switiched to production of planktotrophic larvae after a short period of no food. Whether larvae are planktonic or not significantly affects the dispersal potential of a spawning event.

43. *Aplysiopsis oliviae* (MacFarland, 1966) [now: *Hermaea oliviae* (MacFarland, 1966)]

The taxonomic placement of this species has changed several times. As I suspected (Behrens 1991), the morphology of the radular teeth places this species in *Hermaea* (Kathe Jensen, Sea Slug Forum, 7 November 2001).

The range of this species is extended south to El Morro, Isla Cedros (Bertsch et al. 2000) and north to Seymour Inlet, British Columbia (Marli Wakeling, pers. commun.).

44. *Aplysiopsis enteromorphae* (Cockerell and Eliot, 1905)

The color of the body in adults (15–25mm) is yellowish-white with patches of greenish black. Small specimens (<5–10mm in length) are much darker than their larger peers (Cynthia Trowbridge, pers. commun.). Trowbridge also points out that specimens feeding on *Chaetomorpha* are browner than those feeding on *Cladophora*, infact they shimmer with a golden-reddish reflectance. The range is extended south to Bahía San Quintin, Baja California (C. Trowbridge, per. comm.), and Puerto Vallarta, Mexico (Hermosillo-González 2003).

45. *Hermaea vancouverensis* (O'Donoghue, 1924)

This species feeds on *Isthmia nervosa* in Oregon (C. Trowbridge, per. comm.) as was previously documented by Williams and Gosliner (1973).

46. *Olea hansineensis* Agersborg, 1923

The range of this species is extended to Prince William Sound, Alaska (Goddard and Foster 2002), where it was found feeding upon the egg mass of the cephalaspidean, *Melanochlamys diomedea*. Specimens of this species may reach 13 mm (Chia and Skeel 1973).

Order Nudibranchia
Suborder Doridacea (= Doridina)

47. *Corambe pacifica* MacFarland and O'Donoghue, 1929

The genus *Corambe* has been subjected to several nomenclautural reviews and changes in recent years. Martynov (1994) divided *Corambe* into several newly defined genera and assigned *C. pacifica* to the genus *Gulbinia*. More recently, Valdés and Bouchet (1998) have reexamined the value of the characters Martynov used to differentiate the new genera and have simplified the taxonomy to three genera, reestablishing, this species as *Corambe pacifica*.

The range of this species is extended to the south to Mismaloya, Puerto Vallarta, Mexico (Hermosillo-González 2003).

48. *Corambe* sp. 1 [now: *Loy thompsoni* (Millen and Nybakken, 1991)]

This species has now been described in the scientific literature and given the name *Corambe thompsoni* by Sandra Millen and Jim Nybakken (1991). The trivial name *thompsoni* is given in recognition of the British opisthobranch researcher Dr. Thomas Thompson. Martynov (1994) reassigned the species to the genus *Psammodoris*. Valdés and Bouchet (1998), in their reorganization, placed it in the genus *Loy* Martynov (1994).

The radular teeth, which were not included in PCN Supplement I — Rabula (Behrens 1992), are shown here (Fig. 14). The radular formula for this species is 45–48 × 5–6.1.0.1.5–6. The lateral tooth has a rectangular base with a long, denticulate hook. Also shown is the arrangement of the spicules in the mantle tissue.

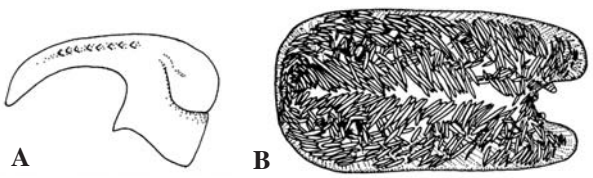


FIGURE 14. *Loy thompsoni* (Millen and Nybakken, 1991). A. Radular tooth. B. Drawing of arrangement of mantle spicules. (After Millen and Nybakken 1991.)

The range of the species is extended to Port Valdez, Alaska (Nora Foster, pers. commun.).

49. *Doridella steinbergae* (Lance, 1962) [now: *Corambe steinbergae* (Lance, 1962)]

Like other corambid species, *Doridella steinbergae* has also undergone some recent nomenclatural revision. Martynov (1994) created the genus *Suhinia* for *D. steinbergae*. Swennen and Dekken (1995, p. 104), placed this species in a newly established genus, *Paracorambe*. Here again, Valdés and Bouchet (1998), in their reexamination of the value of the characters used to differentiate the eleven proposed genera of Martynov (1994) and Swennen and Dekker (1995), simplified the taxonomy, referred this species to the genus *Corambe.*

The range of this species is extended north to Little Takli Island, Alaska (Goddard and Foster 2002).

50. *Okenia angelensis* Lance, 1966

The range of this species is extended south to Chile, South America (Fischer and Ortea 1996).

51. *Okenia plana* Baba, 1960

Rudman (1995), in his review of the Chromodorididae of New Caledonia and the *Noumea*

romeri color group, when describing *Cadlinella hirsuta*, he clarified some taxonomic confusion in this genus that resulted in the combination of a number of species, including *Okenia plana* Baba, 1960, under *Doris eolida* and its placement in the genus *Hopkinsia*. Gosliner (2004:144), however, places this species in the genus *Okenia*.

52. *Okenia vancouverensis* O'Donoghue, 1921

The range of this species is extended south to Sechelt Inlet, Vancouver, British Columbia (Donna Gibbs and Andy Lamb, pers. commun.).

54. *Ancula lentiginosa* Farmer *in* Farmer and Sloan, 1964

The range of this species is extended south to Islote Mosquera, Isla Galápagos, Ecuador (Fischer and Ortea, 1996). It has been collected on several occasions (1995 and 2002) in 2300 ft of water off San Diego, California (Ron Velarde, pers. commun.). This disjunct occurrence is likely related to water temperature similarities between shallow Canadian and deep California waters.

55. *Ancula pacifica* MacFarland, 1905 [now: *Ancula gibbosa* (Risso, 1818)]

This species has been synonymized with *Ancula gibbosa* (Risso, 1881) by Thompson and Brown (1984).

The range of this species is extended north to Prince William Sound (Goddard and Foster 2002) and Beringa Island, Sea of Russia (Martynov 1997).

On an ecological note, during the summer of 1996, hundreds of specimens were observed feeding on the entoproct, *Barentsia*, in Diablo Cove, San Luis Obispo, California (Mike Behrens, pers. commun.).

In the Vancouver area, specimens of two color variations occur together. The color form shown in Plate 3D is typical of the color originally described for *Ancula gibbosa* and has not been recorded from the southern part of the range on this coast. Plate 3E depicts the more typical southern color and the one shown in the 1991 edition of *Pacific Coast Nudibranchs*.

56. *Trapania velox* (Cockerell, 1901)

The range of this reasonably uncommon species is extended north to Morro Bay, San Luis Obispo County, California, where it has be observed and collected commonly in deep holes in this coastal estuary (Michael Behrens and Duke McPherson, pers. commun.).

57. *Trapania* sp. 1 [now: *Trapania goslineri* Millen and Bertsch, 2000]

This beautiful little goniodorid was named to honor my friend and opisthobranch researcher, Terrence Gosliner, invertebrate zoologist and Provost of the California Academy of Sciences. With the description now published, we can now cite the radular formula of 37–41 × 1.0.1. The spawn is a narrow, white, upright ribbon, of 1 ½ coils, 5–6 mm in diameter (Millen and Bertsch 2000).

Hermosillo-González (2003) extends the range to Puerto Vallarta, Mexico.

58. *Hopkinsia rosacea* MacFarland, 1905 [now: *Okenia rosacea* (MacFarland, 1905)]

In Gosliner's (2004) review of the genus *Okenia*, he concluded that the genus *Hopkinsia* and its included species had to be referred to *Okenia*, which is the senior synonym. Gosliner expressed

his regrets in having to take this action, but he believes it is justified based on recent phylogenetic analyses of the relevant morphological data (Gosliner, pers. commun.).

61. *Acanthodoris lutea* MacFarland, 1925

Publication of the northernmost collections of this species was overlooked during the preparation of the second edition of *Pacific Coast Nudibranchs*. Goddard (1987) reports this species occurrence as far north as Punta Gorda, Humboldt County, California. Goddard has now collected this species at North Cove, Cape Argo, Oregon, feeding on *Alcyonidium* sp. Subsequently, I have learned of this species occurrence in 60 feet of water at Indian Arm, near Vancouver, British Columbia (Andy Lamb, pers. commun.).

62. *Acanthodoris nanaimoensis* O'Donoghue, 1921

The range of this species is extended north to Kachemak Bay, Alaska, near Homer, where it has been collected intertidally (Jane Middleton, pers. commun.).

64. *Acanthodoris rhodoceras* Cockerell and Eliot, 1905

The range of this species is extended south into the Gulf of California, to Bahía de los Ángeles (Hans Bertsch, pers. commun.) where it occurs in January, and north to the mouth of the Umpqua River, Oregon (Jeff Goddard, pers. commun.).

65. *Adalaria jannae* Millen, 1987

The range of this species is extended north to Prince William Sound (Goddard and Foster 2002) where it was found feeding on the bryozoan *Membranpora*, which was living on the kelp *Laminaria*.

66. *Adalaria* sp. 1

The range of this species is extended north to Prince William Sound (Goddard and Foster 2002).

70. *Onchidoris bilamellata* (Linnaeus, 1767)

This barnacle-grazing dorid is not particularly common along the Pacific Coast, but when it is found, it is usually in large swarms. Clinton Bauder documented huge aggregations of this species in Carmel Bay, California, in December 2001 (Plate 3F). The presence of the nudibranch followed a massive settlement of the barnacle, *Balanus crenatus*. As the barnacle population declined, mass spawning by the nudibranchs occurred (Plate 3G). Similar observations of these large population explosions have been made by Bernard Picton (pers. commun.) in Galway, Ireland and by Jim Anderson (pers. commun.) off Scotland.

72. *Aegires albopunctatus* MacFarland, 1905

The range of this species is extended north to Mountain Point, Ketchikan, Alaska (Kurtis Morin and A. Murray, pers. commun.).

73. *Crimora coneja* Marcus, 1961

This is a rare species, previously reported to occur from Point Loma, San Diego, California, to Cape Arago, Oregon. Within this range it has only been found at two locations: rocky intertidal at Punta Gorda, California (Jeff Goddard pers. commun.) and subtidally within Morro Bay, California (Michael Behrens, pers. commun.). Goddard reports that it has been found in abundance only once, when 66 specimens were collected on a single low tide. In that area, *Crimora* feeds on the encrusting bryozoan, *Hincksina minuscule*.

74. *Laila cockerelli* MacFarland, 1905 [now: *Limacia cockerelli* (MacFarland, 1905)]

The genus *Laila,* described by MacFarland in 1905, has been synonymized with the older *Limacia* Müller, 1781 (Vallés et al. 2000).

Limacia cockerelli has several color morphs and it has been speculated that these might represent distinct species. The distinctive color form of *Limacia* with the large red blotches was thought to occur just in California as reported previously. Darcy Kehler (pers. commun.) photographed specimens exhibiting this color pattern at the very northernmost extreme of its range, in Bedwell Bay, Vancouver, British Columbia. Additionally, its range must now be extended north to Mountain Point, Ketchikan, Alaska (K. Morin and A. Murray, pers. commun.).

75. *Polycera alabe* Collier and Farmer, 1964

The range of this species has been extended south to Puerto Vallarta, Mexico, Costa Rica (INBIO, 2003), and Chile (Schrödl 2003) and north, within Baja California to the Coronado Islands (Jerry Allen, pers. commun.), La Jolla Canyon (G. Spalding and M. Miller, pers. commun.), and Catalina, Anacapa, and Santa Barbara Islands (Erik Erikson, Dan Richards, and Kathy deWet, pers. commun.; also Lonhart and Tupen 2001).

77. *Polycera hedgpethi* Marcus, 1964

The range of this species is extended to Balboa, Panama (D. Cadien, pers. commun.) and to the Izu Pennisula and Suruga Bay, Japan (Okutani 2000).

78. *Polycera tricolor* Robillard, 1971

The range of this species is extended north to Hayden Passage, British Columbia (Jeff Rosenfeld, pers. commun.) and to Settler Cove, Ketchikan, Alaska (K. Morin and A. Murray, pers. commun.).

79. *Polycera zosterae* O'Donoghue, 1924 [now: *Palio dubia* (M. Sars, 1829)]

Polycera zosterae has been reassigned to the genus *Palio* by Rivest (1984). Goddard and Foster (2002) report *P. zosterae* as a junior synonym of the northern Sea of Japan species, *Palio dubia* (M. Sars 1829). Angulo-Campillo (2002) reports *P. zosterae* from La Paz, Baja California Sur, Mexico. Because this species is clearly temperate, further study is necessary to confirm the identity of the Mexican species.

80. *Polycerella glandulosa* Behrens and Gosliner, 1988

This species is now reported along the Pacific Coast of Central America to Costa Rica (INBIO 2003).

81. *Tambja eliora* (Marcus and Marcus, 1967)

Recently, members of the University of California at San Diego dive club, The Sea Deucers, have documented large numbers of this species as far north as Ensenada Bay. Individuals varied in size from 45–68 mm (Mike Miller, pers. commun.). The species is also reported from Puerto Vallarta (Hermosillo-González 2003) and Costa Rica (INBIO 2003).

82. *Tambja fusca* Farmer, 1978 [now: *Tambja abdere* Farmer, 1978]

Tambja fusca and *T. abdere* were both described by Farmer in 1978. These two species have been determined to be color variations of a single species; the name *T. abdere* takes precedence as it appears first in the publication. With the synonymy, it should be noted that the range of the species now extends south to Huatulco, Oaxaca, Mexico. Hermosillo-González (2003) reports it from Puerto Vallarta, and INBIO (2003) reports the species from Costa Rica.

83. *Triopha catalinae* (Cooper, 1863)

The range of this species is extended northwest to Slemya Island in the Aleutians (Goddard and Foster 2002).

In a laboratory study, Geiger and Holyoak (1996) demonstrated that *T. catalinae* prefers shaded area over lighted conditions even though its primary prey, erect bryozoans, occurs in both light and shaded environments.

84. *Triopha maculata* MacFarland, 1905

The range of this species is extended from Punta Cono to Punta Rosarito, Baja California (Goddard and Schickel 2000), and Beringia and Mednyi Islands, Sea of Russia (Martynov 1997).

85. *Triopha* sp. 1 [now: *Triopha catalinae* (Cooper, 1863)]

The correct location of the collection that includes the specimen shown in the photograph (Behrens 1991) for this species is Boardman State Park, Oregon (Jeff Goddard, pers. commun.). Since his original collection, other specimens have been photographed by Steve Horvath and Marli Wakeling at Seymour Narrows, British Columbia, Canada.

Based on an examination of the internal anatomy of specimens that were colleceted from Washington, British Columbia, and Alaska, Sandra Millen determined it to be a color morph of *Triopha catalinae*.

86. *Cadlina flavomaculata* MacFarland, 1905

The range of this species is extended to La Paz, Baja California Sur (Angulo-Campillo, 2002) and to Costa Rica (INBIO 2003). The specimens from Costa Rica may prove to be a new species (R. Johnson, pers. commun.).

90. *Cadlina sparsa* (Ohdner, 1921)

Although this species was reported from the Juan Fernandez Island, far offshore of Chile, it has now been collected from the Chilean shoreline at Bahía de Coliumo, Chile (Schrödl 1997), and Argentina (Schrödl 2003).

91. *Chromodoris galexorum* Bertsch, 1978

Previously known only as far north as Guadalupe Island, Baja California, this species quite surprising showed up at Catalina Island, California (Jack Engle and Erik Erikson, pers. commun.).

92. *Chromodoris macfarlandi* Cockerell, 1901

Goddard (2000b) reports that this dorid feeds on both the pink sponge, *Aplysilla glacialis* and the deep red sponge, *Aplysilla polyraphis* in the La Jolla, California, portion of its range.

94. *Glossodoris dalli* (Bergh, 1879)

Gosliner (1991), reports two specimens collected intertidally on Isla Fernandina and Isla Santa Cruz, Galápagos Archipelago.

99. *Tyrinna evelinae* (Marcus, 1958)

The range of this species has been extended south to Costa Rica (Camacho-Garcia, pers. commun.) and to El Rubio, Peru (Schrödl and Millen 2001).

101. *Jorunna pardus* Behrens and Henderson, 1981

Since its original description, collection of numerous additional specimens has shown some degree of color variation. Individual specimens have been collected ranging from white with sparse black speckling to deep yellow with large round spots, the largest of which being dorso-medially positioned. A few specimens have been collected with no spots on the foot or tail. The degree of black pigment on the gills also varies from dense black to white tipped only slightly with black.

103. *Aldisa albomarginata* Millen, 1985 *in* Millen and Gosliner 1985

The range of this species is extended to Agamemnon Channel, Vancouver, British Columbia (D. Gibbs and A. Lamb, pers. commun.).

105. *Aldisa sanguinea* (Cooper, 1863)

The northernmost range of this species has been extended by Jeff Goddard, who has collected three specimens at Otter Crest, Lincoln County, Oregon.

107. *Rostanga pulchra* MacFarland, 1905

Some clarification of the sponges *Rostanga* feeds upon should note that *R. pulchra* is chemically attracted to and feeds on *Ophlitaspongia pennata* Labbe. Anderson (1971) adds *Esperiopsis originalis* and *Plocamia karykina* to the list of authenticated prey sponges.

108. *Atagema alba* (O'Donoghue, 1927)

This species was recently collected from a depth of 120 feet in Scripps Canyon, San Diego County, California. (Jim Lance, pers. commun.).

109. *Sclerodoris tanya* (Marcus, 1971)

This species has been collected in Puerto Vallarta, Mexico (Hermosillo-González, 2003).

110. *Archidoris montereyensis* (Cooper, 1862) [now: *Doris montereyensis* Cooper, 1863]

Bergh (1878) introduced the genus *Archidoris* based on *Doris tuberculata*, *Doris montereyensis* and others. *Doris montereyensis* has simple round tubercles, with spicules that do not protrude from the dorsal surface. For this reason, Valdés (2002) referred *Archidoris* to the synonymy of *Doris* Linnaeus, 1758.

Aside from the obvious presence of this species' preferred food, the encrusting sponges *Haliclona* sp. and *Halichondria* sp. in shaded habitats, a study reported by Geiger and Holyoak (1996) indicates that intertidally this dorid unquestionably prefers shaded over lighted conditions. Geiger and Holyoak's study was conducted in the high intertidal and did not take into account the effects of current strength. Ryan Murphy (pers. commun.) suggests in his study, in an area of strong currents, that no preference was found between shaded and unshaded conditions.

111. *Archidoris odhneri* MacFarland, 1966 [now: *Doris odhneri* (MacFarland, 1966)]

As reported above for *Doris montereyensis*, because *Doris odhneri* also has simple round tubercles, with spicules that do not protrude from the dorsal surface, it has been transferred to *Doris* Linnaeus, 1758 (Valdés 2002).

The range of this species is extended north to the Bering Sea side of the Alaska Peninsula (Goddard and Foster 2002).

112. *Anisodoris lentiginosa* Millen 1982 [now: provisionally listed as cf. *Peltodoris lentigi nosa* (Millen 1982)]

The placement of *Anisodoris lentiginosa* is problematic (see the discussion below for *Peltodoris nobilis*). Because *Anisodoris lentiginosa* is also not a caryophyllidia-bearing species, it is provisionally listed here as *Peltodoris* until a more complete analysis of this species is published.

113. *Anisodoris nobilis* (MacFarland, 1905) [now: *Peltodoris nobilis* (MacFarland, 1905)]

Anisodoris nobilis was originally placed in the genus *Montereina* (MacFarland 1905) and later transferred to the genus *Anisodoris*. Valdés and Gosliner (2001), having conducted a careful review of caryophyllidia-bearing dorid nudibranchs, noted that the type species of *Anisodoris* was caryophyllidia-bearing and they, therefore, transferred it to *Diaulula*. *Anisodoris nobilis*, however, unlike the type species of the genus, has small rounded tubercles with no protruding spicules on the dorsal surface. Because it does not have caryophyllidia, this species recently has been transferred to the genus *Peltodoris* Bergh, 1880 (Valdés 2002).

115. *Diaulula sandiegensis* (Cooper, 1863)

The range of this species is extended northward to Kachemak Bay, Alaska (Jane Middleton, pers. commun.) and the central Aleutian Islands (Goddard and Foster 2002), and to Peter the Great Bay (Martynov 1997). In a study by Geiger and Holyoak (1996), this species prefers shaded over lighted conditions. Ryan Murphy's findings mentioned above dispute this preference.

Behrens and Valdés (2001) in their examination of the *Doris* (*s.l.*) species described the variability in radular morphology of *D. sandiegensis* and presented evidence that the hamate teeth of *Diaulala* may have denticles in some specimens.

116. *Diaulula* sp. 1 [now: *Diaulula sandiegensis* (Cooper, 1863)]

In the 1980 edition of *Pacific Coast Nudibranchs*, I referred to this species as *Doris* (*s.l.*)

species MacFarland (1966). In the 1991 edition, it was suggested that this species more properly belongs in the genus *Diaulula*. Behrens and Valdés (2001) examined the single specimen of *Doris* (*s.l.*) species referred to in MacFarland (1966) and other material collected from southern California that matched the external coloration of *Doris* (*s.l.*) species. The internal anatomy was found to be identical to that of *Diaulula sandiegensis*. In that study, *Doris odonoghuei* Steinberg 1963 (= *Doris echinata* O'Donoghue, 1922) was also found to be a junior sysnomym of *D. sandiegensis*.

117. *Discodoris* sp. 1 [now: *Diaulula aurila* (Marcus and Marcus, 1967)]

In their review of caryophyllidia-bearing dorids, Camacho-García and Valdés (2003) placed *Discodoris aurila* in the genus *Diaulula* based on the presence of caryophyllidia. During their study, they were unaware of the specimen collected by T. Gosliner and shown in Behrens (1991). This specimen is identical of *D. aurila* (T. Gosliner, pers. commun.).

The range of this species is now extended north from Ft. Kobbe Beach, Canal Zone, Panama (Camacho-García), to Punta Rosarito, Baja California, Mexico (Goddard and Schickel 2000).

119. *Geitodoris heathi* (MacFarland, 1905)

The range of this species is extended north to Prince William Sound (Goddard and Foster 2002).

120. *Taringa aivica timia* Marcus and Marcus, 1967 [now: *Taringa aivica* Marcus and Marcus, 1967)

The subspecies *T. a. timia* appears to be a color morph of the nominal species *T. aivica*, so this subspecific designation is dropped (Camacho-García and Valdés 2003). The range is extended to Puerta Vallarta, Mexico (Hermosillo-González 2003). Hermosillo-González (2003) reports that the color varies widely from that reported in Behrens (1991) (see Plate 4A).

123. *Thordisa rubescens* Behrens and Henderson, 1981

Valdés (2002) provides a much more detailed description of the internal anatomy of this species than given by Behrens and Henderson (1981), adding information on the central nervous and reproductive systems, as well as SEMs of the radula, dorsal papillae and penial armature.

The range of this species has been greatly extended to the south with the collection of a 6 mm specimen at Punta Eugenia, Baja California by Hans Bertsch (pers. commun.).

124. *Peltodoris* sp. 1 [now: *Peltodoris mullineri* Millen and Bertsch, 2000]

The descriptive material in the 1991 edition of *Pacific Coast Nudibranchs* is unchanged, but we now have the radular formula which is 23–24 × 42–63.0.42–63. Sandra Millen and Hans Bertsch named this species to honor their friend Dave Mulliner of San Diego, California.

The range of this species is extended north to Santa Barbara and Anacapa Islands (Marc Shargel, pers. commun.), and south to Isla de Malpelo, Columbia (Kaiser and Bryce 2001). It has also been found in the Gulf of California at Bahía de los Ángeles (Hans Bertsch and Allen Grant, pers. commun.).

126. *Platydoris macfarlandi* Hanna, 1951

This rare species had only been collected once since its description in 1951 (Behrens and Henderson 1983). With the collection of two additional specimens, the range is extended south to Bahía San Cristobal, Baja California (Bertsch et al. 2000).

127. *Dendrodoris fulva* (MacFarland, 1905) [now: *Doriopsilla albopunctata* (Cooper, 1863)]

After years of fielding questions concerning the identification of this species and difficulty distinguishing *Dendrodoris fulva* from *Doriopsilla albopuntata*, a careful study of the internal anatomy, has shown the two to be synonymous (Gosliner, Schaefer, and Millen 1999). *D. albopunctata*, being the older of the two names, takes precedence.

128. *Dendrodoris krebsii* (Mörch, 1863) [now: *Dendrodoris fumata* Rüppell and Leuckart, 1830]

The Caribbean and Eastern Pacific species referred to as *Dendrodoris krebsii* are actually distinct species (Valdés, Ortea, and Ballestros 1996). Brodie, Willan and Collins (1997) refer to color photographs in Valdés et al. (1996) labeled as *D. nigra* (Stimpson, 1855), that the Pacific coast species should be referred to as *D. fumata* Rüppell and Leuckart, 1830. Gosliner (1991) and Valdés et al. (1996) report this species from the Galápagos Islands, and Kaiser and Bryce (2001) at Isla de Malpelo, Columbia.

129. *Dendrodoris nigromaculata* (Cockerell *in* Cockerell and Eliot, 1905)

This species is reported south to Costa Rica (INBIO 2003).

130. *Dendrodoris* sp. 1 [now: *Doriopsilla gemela* Gosliner, Schaefer, and Millen, 1999]

The photograph of species #130 *Dendrodoris* sp. 1 was taken of an intertidal specimen collected in San Luis Obispo, California. Since the publication of Behrens (1991), several "yellow gilled" porostomes have been discovered along this coast. *Doriopsilla gemela*, is the species shown in photograph #130, but is thought to be distinct from an identical looking deep water species found in La Jolla Canyon (Jim Lance, pers. commun.).

Identification.— Identical in color to *Doriopsilla albopunctata* except that the branchial plume is orange. The body and gills are bright yellow to orange or orange-brown. The minute tubercles on the surface of the notum have small white specks.

Radula.— None

Natural History.— Found intertidally (Bertsch 2002). The egg mass is distinctive and differs from that of *D. ablopunctata.* The coil consists of about three whorls of yellow eggs which lie flat on the substrate, rather than on edge, as in *D. ablopunctata*. Bertsch (2002), in some detail, also describes its ecology and natural history in Bahía de los Ángeles.

Size.— To 40 mm in length.

Range.— Gulf of California and along the Pacific coast of North America from Bahía Tortugas, Baja California Sur, Mexico, to Elkhorn Slough, Monterey County, California.

Etymology.— The name *gemela* comes from the Spanish for twin, as the species is so close in appearance to *D. albopunctata*.

131. *Dendrodoris* sp. 2

Two additional sightings of this still undescribed species have been made in 150 and 170 feet of water in La Jolla Canyon (George Spalding, pers. commun.). Additionally, a specimen was photographed by Clinton Bauder in Carmel Bay, at 180 ft. on July 12, 2000 (Plate 4B). The specimen measured 30 mm in length. Bauder's photograph is a much better representation of the living animal than the moribund specimen figured in Behrens (1991). This species remains undescribed.

132. *Dendrodoris* sp. 3

This yet undescribed porostome species (currently under study by Sandra Millen and Hans Bertsch) is becoming increasingly more common along the mainland coast where it has been collected south to Bird Rock, La Jolla, California (Jim Lance, pers. commun.). Subtidal observations have also been made at Quast Rock at 60 feet (George Spalding, pers. commun.).

Suborder Dendronotacea (= Dendronotina)

136. *Tritonia diomedea* Bergh, 1894

An unpublished doctoral thesis by James Murray (1966) presents fascinating new information on *Tritonia diomedea*. The following notes are extracted from from Murray (1966):

Tritonia diomedea feeds on pennatulacean cnidarians — the sea pen *Ptilosarcus gurneyi* (unpublished), and the sea whips *Virgularia* (McDonald and Nybakken 1978), *Stylatula elongata* (Willows, pers. commun.) in Washington and British Columbian waters, and *Acanthoptilum* in Californian waters as deep as 200 m (Rim Fay, pers. commun.). *T. diomedea* will also feed on the sea pansy, *Renilla köllikeri* (G. Brown, R. Longley, pers. commun.), in the laboratory, although it is unknown if they do so in nature. It appears that geographically isolated groups of *Tritonia* will eat only one prey species, and this prey species varies among groups. *Virgularia* beds tend to be found in silty mud at greater depths (>25 m) than the sandy beds of *Ptilosarcus* (<20 m).

Tritonia diomedea found among *Virgularia* tend to be smaller (0.5–20 cm) than those found among *Ptilosarcus* (8–30 cm). Also, those found among *Ptilosarcus* tend to be orange (like *Ptilosarcus*), with distinct tubercles on the dorsum, whereas those found among *Virgularia* tend to be redder in hue, from brick red to pale pink, and have a smoother dorsum (MacFarland 1966 for color illustration). There also appears to be variation in the number of embryos per egg mass capsule among geographically separated groups that is not related to prey items (C.E. Lee, unpublished).

Tritonia diomedea lives among beds of these soft corals on flat or gently sloping soft bottoms of sand or silt. The silty surface of *Virgularia* beds (~30 m deep) is softer than the sandy surface of *Ptilosarcus* beds (4–18 m deep), presumably due to lower water flow rates in the deeper *Virgularia* beds that allow the finer silt to settle out of suspension. This correlates with the observation that *T. diomedea* found among *Virgularia* can orient to lower flow rates than those found among *Ptilosarcus* (unpublished). *T. diomedea* can grow to 30 cm in length and to a mass of 1700 g.

137. *Tritonia festiva* (Stearns, 1873)

James Murray also reports that during the studies described above on *Tritonia diomedea*, he collected *T. festiva* up to 10 cm in length near Tofino, British Columbia.

138. *Tritonia myrakeenae* Bertsch and Mozqueira, 1986

This species has been collected as far south as Costa Rica (INBIO, 2003).

139. *Hancockia californica* Macfarland, 1923

The range of this species is extended to Fort Bragg, California (C. Schooley and M. Ellen Hill, pers. commun.), inside the Gulf of California at Bahía de los Angeles (Hans Bertsch and Jim Lance, pers. commun.), and south to Puerto Vallarta (Hermosillo-González 2003) and Costa Rica (INBIO 2003).

145. *Dendronotus iris* (Cooper, 1863)

The range of this species is extended to Cabo San Lucas, Baja California (Jim Lance, pers. commun.).

The color of this species varies widely. Behrens (1980) described three distinct morphs, but later (Behrens 1991) he mentions only the red and white morphs. The color of this species varies tremendously from white through grey, orange and red. The color of the gill tufts is also variable — white, orange or purple, depending on the overall body color. The most distinctive character is the white line along the edge of the foot. This characteristic is found in every specimen.

148. *Dendronotus* sp. 1

La Jolla Shores, San Diego County can be added to locations at which this undescribed species has been photographed (Steve Gardner, pers. commun.). Also, see the description of a new *Dendronotus* in "Newly Discovered Species" section.

149. *Doto amyra* Marcus, 1961

Goddard (1996) provides an excellent study of the larval development of this species. In this paper, he points out that *D. amyra*, as currently accepted, may include at least two and possibly four distinct species. The following is a brief review of the distinctions Goddard reports for the four forms:

Doto amyra Marcus, 1961 — Feeds on the hydroids *Abietinaria* sp., *Garveia* sp., *Coryne* sp., and *Sertularia furcata* and reaches a length of 14 mm. The larvae are lecithotrophic. The body and head are translucent white and occasionally have an irregular scattering of fine-grain subcutaneous brown to black pigment. The five to eight pairs of cerata have pale yellow to light pinkish-orange or orange-brown colored cores. The cerata possess four to seven rings of tuberacles and lack dark pigment. The rhinophores are translucent and contain opaque white grains.

Doto form A — Feeds on small athecate hydroids and measures up to 7 mm. This form is similar in color to the previous, but with no dark pigment. It has five to six pairs of cerata, usually with orange to pinkish cores. Because of the presence of semi-translucent white glands in the tuberacles, they appear whiter that in the previous form. The larvae are planktotrophic.

Doto form B — This form occurs on *Aglaophenia*. It differs from the above two in having dark pigment on the cerata, which are smooth or bear only low tuberacles. Specimens lack the opaque white grains in the rhinophores. It is similar to *D. columbiana* O'Donoghue, 1921.

Doto form C (from La Jolla, California) — Similar to *Doto* form A, above, it has planktotrophic larvae and feeds on short, unidentified hydroids.

Hermosillo-González (2003) extends the range of this species to Puerto Vallarta, Mexico.

152. *Doto lancei* Marcus and Marcus, 1967

The range of this species is extended northward from Mission Bay, California to Monterey Bay (Lovell and Libby Langstroth, pers. commun.). Lovell and Libby Langstroth's specimen was dark in color, similar to the species referred to as *Doto columbiana* in Behrens (1980, Species #92). The range of this species is extended south to Puerto Vallarta, Mexico Hermosillo-González (2003) and Costa Rica (INBIO, 2003).

Suborder Arminacea (= Arminina)

156. *Armina californica* (Cooper, 1863)

The range of this species is extended to the Aleutian Akutan Islands (Goddard and Foster 2002).

158. *Dirona aurantia* Hurst, 1966 [now: *Dirona pellucia* Volodchenko, 1941]

Dirona aurantia was reported to be a junior synonym of *D. pellucida* (Martynov 1997). The species complete range now would include Charleston, Oregon (Jeff Goddard, pers. commun.) to Norton Sound, Alaska, across the Bering Sea and the Sea of Japan to Russia (Martynov 1997). It is found to 60 m. In Oregon, the individuals were found on the bryozoan *Bugula pacifica,* living on floating boat docks (Jeff Goddard, pers. commun.).

159. *Dirona picta* MacFarland *in* Cockerell and Eliot, 1905

Previously known only to Charleston, Oregon, this species has now been collected on the south side of Cape Mearnes, Tillamook County, OR (Jeff Goddard, pers. commun.).

160. *Janolus barbarensis* (Cooper, 1863)

The range of this species is extended south to Puerta Vallarta, Mexico (Hermosillo-González 2003).

161. *Janolus fuscus* (O'Donoghue, 1924)

The range of this species is extended north to Homer, Alaska (Goddard and Foster 2002). It has also been documented from Sado island, Sea of Japan and Onagawa and Hokkaido, Pacific Ocean side in Japan (Nishina Masayoshi, pers. commun.).

Suborder Aeolidacea (= Aeolidina)

163. *Chlamylla* sp. 1 [now: *Flabellina* sp. and/or *Flabellina intermedia* (Bergh 1899)]

Currently, there is some confusion concerning whether we have one or two new species of *Chlamylla* in the 1991 edition of *Pacific Coast Nudibranchs.* On review, the species in the photograph probably belongs to the genus *Flabellina* (S. Millen, pers. commun.).

The specimen shown in the photograph as species #163 of the 1991 edition was collected in the Strait of George, British Columbia, was 9 mm in length, and was found on a solitary *Tubularia* sp. This specimen is considered to be an undescribed *Flabellina* (S. Millen, pers. commun.). The rhinophores can be extended the length of the body, although they are contracted in the 1991 photo. The ground color is transparent grey with pale peach suffused on the dorsum. Lanceolate cerata are

continuous and irregularly arranged on notal flange. Ceratal cores are peach-pink with white cnidosacs, inside a clear sheath. The rhinophores, and long, cylindrical oral tentacles are dusted with opaque white at the ends.

The other specimens referred to in the 1991 edition are nearly identical to this photo but have been collected in deep water trawl nets off the coast Oregon by Goddard (1990), and in Alaska. These specimens are yellow in color and are considered to be *Flabellina intermedia* (Bergh 1899) (Alan Kuzirian, pers. commun.).

165. *Flabellina fusca* (O'Donoghue, 1921) [now: *Flabellina trophina* (Bergh, 1894)]

Flabellina fusca (O'Donoghue, 1921) is a junior synomyn to *Flabellina trophina* (Bergh, 1894) (Roginskaya 1990).

Flabellina trophina is often confused with *Flabellina verrucosa*, both species having reddish ceratal cores. The primary distinguishing characters are that *F. triopina* has a pointed snout, which is often upturned, and the cerata are continuous on a flange rather than in clusters inserted directly on the notum. Plate 4C shows a dark color morph of the species from Alaska.

In a message to the Sea Slug Forum from Irina Roginskaya, it appears that this species has a wide diet feeding on other aeolid nudibranchs as well as polychaete worms.

166. *Flabellina iodinea* (Cooper, 1862)

The range of this species is extended to San Benitos Islands, Baja California, Mexico (Hermosillo-González 2003).

167. *Flabellina marcusorum* Gosliner and Kuzirian, 1990

This species is known from the Pacific and Atlantic Oceans. Its range along this coast has been extended south to the Gulf of Chiriqui, Panamá and to Islas Galápagos, Ecuador (Gosliner 1994), and along the Atlantic Coast, it ranges north to Venezuela and Curacao in the Caribbean and to Santa Marta Bay, Columbia, and to Brazil (P. Montoya, pers. commun.; Humann and DeLoach 2002; Sea Slug Forum).

169. *Flabellina salmonacea* (Couthouy, 1838) [now: *Flabellina japonica* (Volodchenko, 1941)]

According to Sandra Millen (pers. commun.), Pacific Coast specimens differ from the Atlantic Coast sibling species, *F. salmonacea*, by their yellow cerata and penial morphology; they are actually *Flabellina japonica*. Thus, the range should be changed to Sea of Japan and British Columbia, Canada. The species was named for the Japan Sea.

172. *Flabellina* sp. 1

It has been suggested that this species might be a *Cumanotus* due to its wide body and basally joined rhinophores (S. Millen, pers. commun.). The photo in the 1991 edition of *Pacific Coast Nudibranchs* is of a specimen collected at Mission Bay, California. The reference to the British Columbia specimens was likely to a similar looking *Cumanotus*.

This species has a unique swimming style, where the cerata move in unison, forward and backwards in a rowing manner (Neil McDaniel, pers. commun.).

173. *Flabellina* sp. 2 [now: *Flabellina vansyoci* Gosliner, 1994]

This colorful aeolid from the southern portion of this coast has been recently described by Terry Gosliner (Gosliner 1994), and given the name *Flabellina vansyoci*; the name honors California Academy of Sciences' biologist Robert Van Syoc.

The radular formula for the species is 36 × 1.1.1. The rachidian tooth bears 5–6 triangular denticles as shown here (Fig. 15). The margin teeth bear 15–20 denticles.

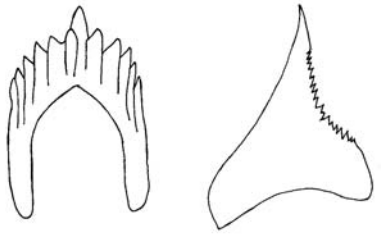


FIGURE 15. *Flabellina vansyoci* Gosliner, 1994. Radular teeth.

The size of the species ranges from 15–30mm. Originally, the species was documented to occur at Magdelena Bay, Baja California and Islas Ladrones, Panama. Bertsch *et al.* (2000) extended the range northward to Punta Eugenia, Baja California. The species has also been observed further south, at La Paz, Baja California Sur (Angulo-Campillo 2002) and Puerto Vallarta (Hermosillo-González 2003), Mexico, and along the west coast of Costa Rica (INBIO 2003).

174. *Flabellina* sp. 3 [now: *Flabellina amabilis* Hirano and Kuzirian, 1991]

This species is *Flabellina amabilis* from northern Sea of Japan (Sandra Millen, pers. commun.). Its radula is triseriate, with a formula of 13–17 × 1.1.1. The rachidian teeth have 4–8 denticles and the lateral teeth 5–8 denticles.

175. *Babakina festiva* (Roller, 1972)

Redfern (2001) documents the presense of *Babakina festiva* in the tropical Atlantic, in the Bahamas.

178. *Eubranchus olivaceus* (O'Donoghue, 1921) [now: *Eubranchus rupium* (Möller, 1842)]

Just and Edwards (1985) and Martynov (1998) indicated that the northeast Pacific *Eubranchus olivaceus* is a synonym of the north Atlantic *Eubranchus rupium*. The range of this species on this coast is thus extended to Amalga Harbor, north of Juneau, Alaska. It has been observed feeding on the hydroid species *Obelia* (Rita O'Clair, pers. commun.). More recently, the range has been extended to Homer, Alaska (Goddard and Foster 2002).

181. *Eubranchus steinbecki* Behrens, 1984

The range of this species is extended to La Paz, Baja California Sur, Mexico (Angulo-Campillo 2002).

184. *Catriona rickettsi* Behrens, 1984

Previously known only from San Francisco Bay and La Jolla, California, Jeff Goddard reports large numbers of this species were found on large patches of *Tubularia* sp. on the ocean side of the south jetty, Umpqua River, Douglas County, Oregon, during February 1994, 1996 and 1997. Also, Bertsch *et al.* (2000) extended the range south to Punta Eugenia, Baja California, Mexico.

[**Note concerning *Cuthona***: Martynov (2002) recommends a number of taxonomic changes for Pacific coast *Cuthona* returning several species to the genus *Trinchesia*. I cannot support these recommendations and do not follow them here.]

186. *Cuthona albocrusta* (MacFarland, 1996)

The range of this species is extended north to Cordova Marina, Prince Williams Sound, Alaska, and south to Bird Rock, La Jolla, California (Goddard 2000a), Bahía Tortugas (Bertsch et al. 2000) and La Paz, Baja California Sur, Mexico (Angulo-Campillo 2002)

187. *Cuthona cocoachroma* Williams and Gosliner, 1979

The northern limit of this species is extended from Oregon to Kayostla Beach, Olympic Peninsula, Washington (Goddard et al. 1997).

190. *Cuthona flavovulta* (MacFarland, 1996)

The northern limit of this species is extended from Oregon to Kayostla Beach, Olympic Peninsula, Washington (Goddard et al. 1997).

191. *Cuthona fulgens* (MacFarland, 1996)

The northern limit of this species is extended from Oregon to Kayostla Beach, Olympic Peninsula, Washington (Goddard et al. 1997).

193. *Cuthona lagunae* (O'Donoghue, 1926)

The range of this species is extended north to Humbug Mountain, Curry County, Oregon (Jeff Goddard, pers. commun.), and south to Bahía Tortugas, Baja California (Bertsch et al. 2000).

194. *Cuthona perca* (Marcus, 1958)

Perrone (1995) reports the occurrence of this species in the Mediterranean, and he discusses taxonomic variation between several of the populations of this global species.

195. *Cuthona phoenix* Gosliner, 1981

This species has now been reported from Costa Rica (INBIO 2003).

197. *Cuthona pustulata* (Alder and Hancock, 1854)

The range of this species is extended northward to Homer, Alaska (Goddard and Foster 2002) where it was found feeding on the hydroid, *Sarsia* sp.

198 *Cuthona rolleri* Behrens and Gosliner, 1988

A recent deepwater study conducted in the Santa Maria Basin in Central California collected a specimen of *C. rolleri* at a depth of 575 m. This is the first subtidal collection of this species, which previously was known only from intertidal collections, and it extends the range south to Point Sal, San Luis Obispo County, California (Gosliner 1996).

200. *Cuthona viridis* (Forbes, 1830)

The range of this species is extended south to Bremerton, Washington (Andy Lamb, pers. commun.). Roginskaya (2000) reports that in summer *C. viridis* is the most common nudibranch in the intertidal zone of the Murman coast of the Barents Sea. Roginskaya also gives a detailed account of this species' reproductive biology and development.

203. *Fiona pinnata* (Eschscholtz 1831)

Schrödl (2003) reports this species from the southern hemisphere along the coast of Chile.

204. *Anetarca armata* Gosliner, 1991

Since the description of the species in 1991, it has been determined that it occurs on both coasts of Baja California. Farmer (1990) describes studies conducted by Jim Lance in Bahía de los Angeles, Gulf of California, Mexico that report a fascinating association of this nudibranch i.e., where it lives, feeds, and lays its eggs, on a symbiotic hydroid species (Plate 4D), which occurs solely on the shelled gastropod, *Decipifus californicus* (Plate 4E). Reported also from Puerto Vallarta, Mexico (Hermosillo-González 2003) and Costa Rica (INBIO 2003).

206. *Facelina stearnsi* Cockerell, 1901

Specimens have been recently collected at a depth of 110 ft. in La Jolla Canyon, San Diego, California (Peter Brueggeman and George Spalding, pers. commun.). The range of the species is extended southward to La Paz, Baja California where numerous specimens have been observed on an offshore shipwreck (Bob Sinclair, pers. commun., and Angulo-Campillo 2002).

208. *Hermosita sangria* Gosliner and Behrens, 1986

This species has been reported from Costa Rica (INBIO, 2003).

209. *Noumeaella rubrofasciata* Gosliner, 1991

The range is extended to Puerto Vallarta (Hermosillo-Gonzales 2003) and Guanacaste, Costa Rica (Peter Ajtai, pers. commun.).

210. *Phidiana hiltoni* (O'Donoghue, 1927)

The range of this species is extended northward to Duxbury Reef, Marin County, California (T. Gosliner, pers. commun.).

212. *Aeolidia papillosa* (Linnaeus, 1761)

Goddard and Schickel (2000) extend the geographic range of this cosmopolitan species along the Pacific Coast south to Punta Rosarito, Baja California. Schrödl (1997) reports a variation of *Aeolidia papillosa*, *Aeolidia papillosa* var. *serotina* from Bahía de Coliuma, Chile and in the Falkland Islands and Argentina (Schrödl 2003).

213. *Aeolidiella chromosoma* (Cockerell and Eliot, 1905)

Along the West Coast, the range of this species is extended to Costa Rica (INBIO 2003); in

the eastern Pacific it has recently been reported from the Izu Peninsula and Sagami Bay, Japan (Jun Imanoto and Nishina Masayoshi, pers. commun.).

214. *Aeolidiella indica* Bergh, 1888 [now: *Anteaeolidiella indica* (Bergh, 1888)]

Aeolidiella indica is placed in a new genus, *Anteaeolidiella*. Miller (2001) reviewed the aeoid nudibranchs of New Zealand. His review included the report of *A. indica* from that region. Because of internal anatomical features found in *A. indica*, which separated it from other species in *Aeolidiella*, he created a new genus *Anteaeolidiella* for it.

The range for this species should include the Galápagos Islands, Ecuador (Hickman and Finet 1999).

216. *Cerberilla mosslandica* McDonald and Nybakken, 1975

Jeff Goddard (pers. commun.) reports a single specimen matching the description of *C. mosslandica* from 65 m of water, 6.4 km west of Bandon State Beach, Oregon.

217. *Cerberilla* sp. 1 [now: *Cerberilla* cf. *pungoarena* Collier and Farmer, 1964]

This species has become common in the Channel Islands. (Plate 4F) (Kathy deWet, pers. commun.). This speciesis considered to be *Cerberilla pungoarena* Collier and Farmer, 1964, from Puerto Refugio, Isla Ángel de la Guardia, Gulf of California**,** Mexico.

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