

APPENDIX A

Site Descriptions and Representative Species

Intertidal

Detailed descriptions and species lists have been published for two sites along west Pt. Loma and two in La Jolla (Stewart and Myers 1980, Stewart 1982). Here, we briefly contrast some major differences between the two areas.

Generally the Pt. Loma beaches are wide, gently sloping, wave-cut platforms where midtidal areas are covered with *Corallina*-anchored algal turf, mostly less than about 7 cm high; beds of *Phyllospadix torreyi* extend from the low intertidal into shallow subtidal regions. The intertidal platform at Cabrillo Tide Pools is broken by channels, loose boulders or slabs, and algal assemblages appear more often dominated by weedy or seasonally abundant, short-lived species (e.g., *Ulva*, *Lithothrix*). Just to the north, below Ladera St., the platform is more unbroken, with extensive uniform cover of perennial *Corallina* species that provide substrate for large numbers of epiphytic taxa. Here, *Binghamia forkii* and *Heterosiphonia erecta* are abundant seasonally, while uncommon or absent on La Jolla beaches. Interactions between algae and the seagrass within the border region where *Corallina*-anchored turf meets *Phyllospadix* beds, and mechanisms by which *Corallina* establishes and maintains dominance on algal-covered rocks have been described (Stewart 1989a,b).

Pacific Beach Pt. (also referred to as False Pt. or Gunnery Pt.), north of Mission Bay but south of the La Jolla beaches, is an irregular, sloping rocky beach, mostly cobble-boulder substrate, with little or no sand beach at base of cliffs. Abundant *Pelvetia* grows on sides of rocks; coralline-anchored turf is less widespread. *Sargassum agardhianum* and *S. muticum* both occur here. Erect corallines other than *Corallina* species (*Lithothrix*, *Jania* spp., *Amphiroa*) are often conspicuous. Limited census data suggest that algal abundances and diversity are lower here than along ocean-facing beaches of Pt. Loma or on La Jolla beaches. Smaller epiphytic taxa include *Chondria arcuata*, common at La Jolla but mostly absent on Pt. Loma, and *Binghamia forkii*, more characteristic of Pt. Loma.

Compared with the Pt. Loma sites, the La Jolla beaches in studies cited above have proportionally less *Corallina* in the algal turf, with *Pterocladia capillacea* a second dominant alga and very conspicuous during winter and spring months. *Gelidium coulteri* and *G. pusillum* also are more common here than at Pt. Loma localities. Among the epiphytes, *Ceramium flaccidum* is very abundant (and rare or absent from Pt. Loma turf) during fall months, *Hypnea* is often conspicuous entangled with *Pterocladia* axes, *Lithothrix* is usually less abundant on La Jolla beaches, and *Chondria arcuata* is common seasonally while rare on Pt. Loma.

Subtidal

On rocky subtidal outcroppings at the southern end of the county offshore from Imperial Beach, *Botryocladia neushullii*, often very abundant *Polyneura*, *Cryptopleura* (*Botryoglossum*) *farlowiana*, large blades of *Kalymenia* or *Halymenia* species, and *Sargassum palmeri* are notably present and elsewhere rare or absent. The few collections we have seen of *Microcladia coulteri* (on *Gigartina exasperata*), *Pterochondria woodii* var. *pygmaea* (on *Pelagophycus*), and *Phycodrys setchellii* have been from this area.

Loma Sea Cliff algal collections are as rich in small taxa as any from other parts of the California coasts; probably more than 50 species can be recognized in any single day's sampling. *Desmarestia ligulata*, *Agarum*, *Pterygophora*, *Laminaria farlowii*, *Macrocystis*, *Pelagophycus*, two species of *Dictyota*, *Dictyopteris*, *Cystoseira osmundacea*, *Sciadophycus*, *Plocamium cartilagineum*, *Gelidium nudifrons*, *G. purpurascens* and *G. robustum*, *Gigartina exasperata*, *Cryptopleura violacea*, *Cryptonemia obovata*, *Calliarthron cheilosporioides*, *Corallina officinalis* var. *chilensis*, *Bossiella orbigniana*, *Prionitis* sp. (*australis/cornea/linearis*), and prostrate *Codium* are among the larger easily-recognized taxa on rocky substrates. Filaments or small blades of *Sorella* spp., *Nienburgia andersoniana*, *Nitophyllum hollenbergii*, *Phycodrys profunda*, *Branchioglossum undulatum*, *Griffithsia pacifica*, *Callithamnion catalinense* (?), *Antithamnion defectum*, *Platythamnion villosum*, *Pleonosporium* spp., *Pterosiphonia dendroidea*, *Herposiphonia plumula*, and *Tiffaniella* are frequently found on tunicate stalks, sponges, scallop and abalone shells, and on larger specimens of *Gelidium* and *Calliarthron*. Nests of garibaldi fish additionally may include tiny thalli of *Bryopsis* sp., *Cladophora* spp., *Dasya sinicola* var. *abyssicola*, *Veleroa subulata*, *Pterocladia caloglossoides*, and germlings of what probably are *Faucheia laciniata* thalli. These taxa are not restricted to any single association, but are easily recognized among the low-growing turf that is maintained by the fish when eggs are being "incubated." *Ptilothamnionopsis* grows on *Calliarthron* stipes, and *Gelidium* axes often are conspicuously covered with encircling attached blades of *Cryptopleura* and *Nitophyllum hollenbergii*.

Sarcodiotheca Pt. extends seaward into the shoreward head of the La Jolla Submarine Canyon in La Jolla Bay. This head of the canyon is a popular destination for scuba divers, a short swim from the beach, and 20–25 m deep. The narrow sloping terraces that drop into the canyon here are often densely covered with clumps of *Acrosorium* interspersed with *Stenogramma*, *Sarcodiotheca furcata* and *S. gaudichaudii*. Seasonally, *Dictyopteris*, *Agarum* and scattered *Desmarestia* of all sizes are common. Mats of filamentous diatoms often appear as a brown film over large areas of fine-grained mud. The red "fuzz" that one observes on worm tubes, pieces of broken shells, or larger

attached algae includes species of *Polysiphonia*, *Ceramium*, and *Antithamnion*. This is one of the few sites where large, to 1 m high, specimens of *Sarcodiotheca* (*Neoagardhiella*) *gaudichaudii* can be found. Juvenile, occasionally larger, plants of *Macrocystis* have been noted nearby, but are not consistently present; *Sargassum muticum* also is occasionally present, not abundant. Many of the species noted as characteristic of the Loma Sea Cliff (*Rhodomenia* and *Prionitis*, for example) are generally absent.

The head of the North Branch of the Scripps Canyon at about 30–40 m, just a short distance north of Scripps Institution of Oceanography and also within La Jolla Bay, differs markedly in its algal flora. Predictably *Maripelta* can be seen here; *Ozophora*, abundant *Rhodomenia*, several forms or species of *Callophyllis*, *Dictyopteris*, *Schizymenia dawsonii*, and large red blades that variously represent *Halymenia*, *Gigartina exasperata*, *Polyneura* or other species are conspicuous while typically absent or more rare in the La Jolla Canyon nearby, just to the south. The sponges, rock surfaces, and stalks of gorgonian are often bare of epiphytes. Characteristically, there is little *Acrosorium* (compared with the large clumps in La Jolla Canyon), and no *Sarcodiotheca furcata* or *Stenogramma*. (These two latter taxa are restricted to the head of the La Jolla Canyon in our experience.) In shallower water, about 20 m deep and north of the North Branch Canyon rim, a stable rocky bottom supports algal assemblages very similar to those on the Loma Sea Cliffs at the same depths.

APPENDIX B

Name Changes Relevant to San Diego County Marine Algae Since Publication of Marine Algae of California (MAC). (Several others are discussed in text but are not accepted at this time.) Numbers refer to pages in MAC. References are listed in Literature Cited.

CHLOROPHYTA

Pseudulvella applanata Setch. and Gardn. (61) to: *Ulvella applanata* (Setch. and Gardn.) South and Tittley, South and Tittley 1986

PHAEOPHYTA

Giffordia species (122-146) to: *Hincksia* species. Silva *et al.* 1987

Cylindrocarpus rugosus Okam. (177) to: *Petrospongium rugosum* (Okam.) Setch. and Gardn. [It is unclear why the older name of this alga was cited in Abbott and Hollenberg 1976]

Sphacelaria furcigera Kütz. (218) to: *S. rigidula* Kütz., Prud'homme van Reine 1982

Laminaria dentigera Kjellm. (229) to: *L. setchellii* Silva, Druehl 1979

RHODOPHYTA

Asterocytis ramosa (Thwaites) Schmitz (283) to: *Chroodactylon ornatum* (C. Ag.) Basson, Basson 1979

Goniotrichum alsidii (Zan.) Howe (280) to: *Stylonema alsidii* (Zan.) Drew, Drew 1956

Bangia fusco-purpurea (Dillw.) Lyngb. (294) to: *B. vermicularis* Harv., Sheath and Cole 1984

Pseudogloiophloea confusa (Setch.) Levr. (335) to: *Scinaia confusa* (Setch.) Huisman, Huisman 1985

Pseudoscinaia snyderae Setch. (333) to: *Scinaia snyderae* (Setch.) Huisman, Huisman 1985

Amphiroa zonata Yendo (400) to: *A. beauvoisii* Lamour., Norris and Johansen 1981

Halymenia coccinea (Harv.) Abb. (425) to: *H. gardneri* (Kylin) Parkinson, see Lindstrom 1986

Choreocolax polysiphoniae Reinsch (470) to: *Leachiella pacifica* Kugrens, Kugrens 1982

Neoagardhiella baileyi (Kütz.) Wynne and Taylor (483) to: *Sarcodiotheca gaudichaudii* (Mont.) Gabrielson, Gabrielson 1982

- Gracilaria sjoestedtii* Kyl. (498) to: *G. lemaneiformis* (Bory) Weber-van Bosse, Abbott 1983
- Gracilaria verrucosa* (Huds.) Papenf. (500) to: *G. pacifica* Abb., Abbott 1985
- Gracilaria andersonii* (Grun.) Kyl. (495) to: *G. papenfussii* Abb., Abbott 1983
- Gymnogongrus platyphyllus* Gardn. (508) to: *G. chiton* (Howe) Silva and DeCew, Silva 1979
- Gigartina spinosa* (Kütz.) Harv. (525) to: *G. ornithorhynchos* J. Ag., Silva 1979
- Gigartina papillata* (C. Ag.) J. Ag. (523) to: *Mastocarpus papillatus* (C. Ag.) Kütz., Guiry *et al.* 1984
- Petrocelis franciscana* Setch. and Gardn. (476): see *Mastocarpus papillatus*
- Coeloseira compressa* Hollenb., *C. parva* Hollenb. (566) to: *Gastroclonium compressum* (Hollenb.) Chang and Xia, *G. parvum* (Hollenb.) Chang and Xia, Chang and Xia 1978
- Gastroclonium coulteri* (Harv.) Kyl. (567) to: *G. subarticulatum* (Turner) Kütz., Hawkes 1986
- Antithamnionella breviramosa* (Daws.) Wom. and Bail. (580) to: *A. elegans* (Berthold) Price and John, Price *et al.* 1986 (and see Cormaci and Furnari 1988)
- Ceramium gracillimum* var. *byssoides* (Harv.) Maz. (597) to: *C. flaccidum* (Kütz.) Ardissonne, Womersley 1978
- Ceramium taylorii* Daws. (598) to: *C. flaccidum* (Kütz.) Ardissonne, Womersley 1978
- Scagelia occidentale* (Kyl.) Woll. (584) to: *S. pylaisaei* (Mont.) Wynne, Wynne 1985c
- Acrosorium uncinatum* (Turn.) Kyl. (659) to: *A. venulosum* (Zan.) Kyl., Wynne 1989
- Botryoglossum farlowianum* (J. Ag.) DeToni (671) to: *Cryptopleura farlowiana* (J. Ag.) Ver Steeg and Josselyn, Ver Steeg and Josselyn 1983
- Herposiphonia tenella* f. *secunda* (C. Ag.) Hollenb. (702) to: *H. secunda* f. *tenella* (C. Ag.) Wynne, Wynne 1985a
- Pterosiphonia clevelandii* (Farl.) Hollenb. (708) to: *P. farlowii* Hollenb., Hollenberg 1976
- Murrayellopsis dawsonii* Post (701) to: *Veleroa subulata* Daws., Stewart 1989

LITERATURE CITED

- Abbott, I.A. 1968. Studies in some foliose red algae of the Pacific coast. III. Dumontiaceae, Weeksiaceae, Kallymeniaceae. *J. Phycol.* 4:180-198.
- Abbott, I.A. 1978. Morphologic and taxonomic observations on *Neoagardhiella* (Gigartinales, Rhodophyta), with emphasis on Pacific populations. *J. Phycol.* 14:48-53.
- Abbott, I.A. 1983. Some species of *Gracilaria* (Rhodophyta) from California. *Taxon* 32:561-564.
- Abbott, I.A. 1985. New species of *Gracilaria* Grev. (Gracilariaceae, Rhodophyta) from California and Hawaii. In: *Taxonomy of Economic Seaweeds*, I.A. Abbott and J.N. Norris, eds., pp. 115-121. California Sea Grant College Program Report No. T-CSGCP-011.
- Abbott, I.A. and G.J. Hollenberg. 1976. *Marine Algae of California*. Stanford University Press. 827 pp.
- Aguilar Rosas, L.E. and I. Pacheco Ruíz. 1985. New records and range extensions for marine algae of the Pacific coast of Baja California, México. II. *Ciencias Marinas* 11:69-76.
- Aguilar Rosas, R., I. Pacheco Ruíz, and L.E. Aguilar Rosas. 1984. New records and some notes about the marine algal flora of the northwest coast of Baja California, México. *Ciencias Marinas* 10:159-166.
- Aguilar Rosas, R. and M.A. Aguilar Rosas. 1986. New records of marine algae for the flora of Baja California, México. *Ciencias Marinas* 12:17-20.
- Basson, P.W. 1979. Marine algae of the Arabian Gulf Coast of Saudi Arabia (second half). *Bot. Mar.* 22:65-82.
- Blair, S.M. 1983. Taxonomic treatment of the *Chaetomorpha* and *Rhizoclonium* species (Cladophorales; Chlorophyta) in New England. *Rhodora* 85:175-211.
- Chastain, R.A. and J.G. Stewart. 1985. Studies on *Berkeleya hyalina* (Round & Brooks) Cox, a marine tube-forming diatom. *Phycologia* 24:83-92.
- Chang, C.F. and B.M. Xia. 1978. A new species of *Gastroclonium* from the Xisha Islands, Guangdong Province, China. *Oceanologia & Limnologia Sinica* 9:213-214.
- Cleveland, D. 1885. Algae. Species collected at San Diego by Daniel Cleveland. (pp. 12-13) In: C.R. Orcutt, *Flora of Southern and Lower California*. San Diego.
- Cormaci, M. and G. Furnari. 1988. *Antithamnionella elegans* (Berthold) Cormaci et Furnari (Ceramiaceae, Rhodophyta) and related species, with the description of two new varieties. *Phycologia* 27:340-346.

- Dahl, A.L. 1971. Development, form and environment in the brown alga *Zonaria farlowii* (Dictyotales). *Bot. Mar.* 14:76–112.
- Dawson, E.Y. 1941. A review of the genus *Rhodymenia* with descriptions of new species. *Allan Hancock Pacific Expeditions*, 3:123–80, 13 pl.
- Dawson, E.Y. 1944. The marine algae of the Gulf of California. *Allan Hancock Pacific Expeditions* 3:189–453, 47 pls.
- Dawson, E.Y. 1945a. Notes on Pacific coast marine algae. I. *Bull. So. Calif. Acad. Sci.* 43:95–101, 1 pl.
- Dawson, E.Y. 1945b. Notes on Pacific coast marine algae. II. *Bull. So. Calif. Acad. Sci.* 44:22–25, 2 pls.
- Dawson, E.Y. 1945c. Notes on Pacific coast marine algae. III. *Madroño* 8:93–97, 1 pl.
- Dawson, E.Y. 1945d. An annotated list of the marine algae and marine grasses of San Diego County, California. *Occ. Pap. San Diego Natural History Soc. No.* 7:1–97 (reprinted with corrections May 1952).
- Dawson, E.Y. 1946. New and unreported marine algae from southern California and northwestern Mexico. *Bull. So. Calif. Acad. Sci.* 44:75–91, 6 pls.
- Dawson, E.Y. 1949a. Contributions toward a marine flora of the Southern California Channel Islands. I–III. *Allan Hancock Foundation Publ. Occ. Pap.* 7:1–105, 25 pls.
- Dawson, E.Y. 1949b. Studies of northeast Pacific Gracilariaceae. *Allan Hancock Foundation Occ. Pap.* 7, 54 pp., 25 pl.
- Dawson, E.Y. 1950. Notes on Pacific coast marine algae. V. *Am. J. Bot.* 37:337–344.
- Dawson, E.Y. 1953a. Notes on Pacific coast marine algae. VI. *Wasmann Jour. Biol.* 11:323–351, 7 pls.
- Dawson, E.Y. 1953b. Marine red algae of Pacific Mexico. I. Bangiales to Corallinaceae subf. Corallinoideae. *Allan Hancock Pacific Expeditions* 17:1–239, 33 pls.
- Dawson, E.Y. 1954. Marine red algae of Pacific Mexico. II. Cryptonemiales (cont.). *Allan Hancock Pacific Expeditions* 17:241–397, 44 pls.
- Dawson, E.Y. 1958. Notes on Pacific coast marine algae. VII. *Bull. So. Calif. Acad. Sci.* 57:65–80, 5 pls.
- Dawson, E.Y. 1960. Marine red algae of Pacific Mexico. III. Cryptonemiales, Corallinaceae subf. Melobesioideae. *Pacific Naturalist* 2:1–125, 50 pls.
- Dawson, E.Y. 1961. Marine red algae of Pacific Mexico. IV. Gigartinales. *Pacific Naturalist* 2:191–341, 61 pls.

- Dawson, E.Y. 1962. Marine red algae of Pacific Mexico. VII. Ceramiales: Ceramiaceae, Delesseriaceae. Allan Hancock Pacific Expeditions 26:1–207, 50 pls.
- Dawson, E.Y. 1963a. Marine red algae of Pacific Mexico. VI. Rhodymeniales. Nova Hedwigia 5:437–476, 19 pls.
- Dawson, E.Y. 1963b. Marine red algae of Pacific Mexico. Part 8. Ceramiales: Dasyaceae, Rhodomelaceae. Nova Hedwigia 6:401–481, 46 pls.
- Dawson, E.Y. 1966. New records of marine algae from the Gulf of California. J. Ariz. Acad. Sci. 4:55–66.
- Dawson, E.Y., C. Acleto, and N. Foldvik. 1964. The seaweeds of Peru. Nova Hedwigia Beihefte 13:1–111, 81 pls.
- Dawson, E.Y. and M. Neushul. 1966. New records of marine algae from Anacapa Island, California. Nova Hedwigia 12:173–187, 3 pls.
- Dawson, E.Y., M. Neushul, and R.D. Wildman. 1960. Seaweeds associated with kelp beds along southern California and northwestern Mexico. Pacific Naturalist 1:1–81, 43 pls.
- Dayton, P.K., V. Currie, T. Gerrodette, B.D. Keller, R. Rosenthal, and D.V. Tresca. 1984. Patch dynamics and stability of some California kelp communities. Ecol. Monogr. 54:253–289.
- Deysher, L. and T.A. Norton. 1982. Dispersal and colonization in *Sargassum muticum* (Yendo) Fensholt. J. Exp. Mar. Biol. Ecol. 56:179–195.
- Drew, K. 1956. *Conferva ceramicola* Lyngbye. Botanisk Tidsskrift 53:67–74.
- Druehl, L.D. 1979. Note on the taxonomy of California *Laminaria* (Phaeophyta). J. Phycol. 15:337–338.
- Fan, K.C. and G.F. Papenfuss. 1959. Red algal parasites occurring on members of the Gelidiales. Madroño 15:33–38.
- Fredericq, S. and M.H. Hommersand. 1989. Comparative morphology and taxonomic status of *Gracilariopsis* (Gracilariales, Rhodophyta). J. Phycol. 25:228–241.
- Gabrielson, P. 1982. Morphological studies of members of the tribe Agardhielleae (Solieriaceae, Rhodophyta). II. *Sarcodiotheca gaudichaudii* (Montagne) comb. nov. Phycologia 21:86–96.
- Gardner, N.L. 1913. New Fucaceae. Univ. Calif. Publ. Bot. 4:317–374.
- Gardner, N.L. 1927a. New Rhodophyceae from the Pacific coast of North America, IV. Univ. Calif. Publ. Bot. 13:373–402.
- Gardner, N.L. 1927b. New Rhodophyceae from the Pacific coast of North America, V. Univ. Calif. Publ. Bot. 13:403–434.

- Gonzalez, M.A. and L.J. Goff. 1989. The red algal epiphytes *Microcladia coulteri* and *Microcladia californica* (Rhodophyceae, Ceramiaceae). I. Taxonomy, life history and phenology. *J. Phycol.* 25:545–558.
- Guiry, M.D., J.A. West, D.–H. Kim, and M. Masuda. 1984. Reinstatement of the genus *Mastocarpus* Kützing (Rhodophyta). *Taxon* 33:53–63.
- Gunnill, F.C. 1980. Demography of the intertidal brown alga *Pelvetia fastigiata* in southern California, USA. *Mar. Biol.* 59:169–179.
- Hawkes, M.W. 1977. A field, culture and cytological study of *Porphyra gardneri* (Smith & Hollenberg) comb. nov., (= *Porphyrella gardneri* Smith and Hollenberg), (Bangiales, Rhodophyta). *Phycologia* 16:457–469.
- Hawkes, M.W. 1986. Lectotypification of species names of Rhodymeniales (Rhodophyta) for the red algal flora of British Columbia and northern Washington. *Taxon* 35:329–333.
- Hollenberg, G.J. 1961. Marine red algae of Pacific Mexico. Part 5. The Genus *Polysiphonia*. *Pacific Naturalist* 2:345–367, 7 pls.
- Hollenberg, G.J. 1972. Phycological notes VII. Concerning three Pacific coast species, especially *Porphyra miniata* (C. Ag.) C. Ag. (Rhodophyceae, Bangiales). *Phycologia* 11:43–46.
- Hollenberg, G.J. 1976. Correction of algal binomial. *Taxon* 25:122.
- Hollenberg, G.J. 1978. Phycological Notes VIII. Two brown algae (Phaeophyta) new to California. *Bull. So. Calif. Acad. Sci.* 77:28–35.
- Hollenberg, G.J. and I.A. Abbott. 1968. New species of marine algae from California. *Canad. J. Bot.* 46:1235–1251.
- Huisman, J.M. 1985. The *Scinaia* assemblage (Galaxauraceae, Rhodophyta): a reappraisal. *Phycologia* 24:403–418.
- Kim, D.–H. 1976. A study of the development of cystocarps and tetrasporangial sori in Gigartinaceae (Rhodophyta, Gigartinales). *Nova Hedwigia* 27:1–146.
- Kugrens, P. 1982. *Leachiella pacifica*, gen. et sp. nov., a new parasitic red alga from Washington and California. *Am. J. Bot.* 69:306–319.
- Lee, I.K., J.A. West, and M.H. Hommersand. 1988. *Binghamiopsis caespitosa* gen. et sp. nov. (Lomentariaceae, Rhodophyceae) from the Eastern Pacific. *Korean J. Phycol.* 3:1–13.
- Lewin, R.A. and J.A. Robertson. 1971. Influence of salinity on the form of *Asterocytis* in pure culture. *J. Phycol.* 7:236–238.
- Lindstrom, S.C. 1986. Nomenclatural and taxonomic notes on species of the red algal genera *Halymenia* (Cryptonemiaceae) and *Weeksia* (Dumontiaceae). *Taxon* 35:531–533.

- Lindstrom, S.C. and R.F. Scagel. 1987. The marine algae of British Columbia, northern Washington, and southeast Alaska: division Rhodophyta (red algae), class Rhodophyceae, order Gigartinales, family Dumontiaceae, with an introduction to the order Gigartinales. *Can. J. Bot.* 65: 2202–2232.
- Littler, M.M. and D.S. Littler. 1983. Heteromorphic life–history strategies in the brown alga *Scytosiphon lomentaria* (Lyngb.) Link. *J. Phycol.* 19:425–431.
- Lobban, C.S. 1985. Marine tube–dwelling diatoms of the Pacific coast of North America. 1. *Berkeleya*, *Haslea*, *Nitzschia*, and *Navicula* Sect. *Microstigmaticae*. *Canad. J. Bot.* 63:1779–1784.
- Maggs, C.A. and C.M. Pueschel. 1989. Morphology and development of *Ahnfeltia plicata* (Rhodophyta): Proposal of Ahnfeltiales ord. nov. *J. Phycol.* 25: 333–351.
- Maggs, C.A., J.L. McLachlan, and G.W. Saunders. 1989. Infrageneric taxonomy of *Ahnfeltia* (Ahnfeltiales, Rhodophyta). *J. Phycol.* 25:351–368.
- McBride, D.L., P. Kugrens, and J.A. West. 1974. Light and electron microscopic observations on red algal cells. *Protoplasma* 79:249–264.
- Mower, A. and T. Widdowson. 1969. New records of marine algae from Southern California. *Bull. So. Calif. Acad. Sci.* 68:72–81.
- Nakahara, H. 1984. Alternation of generations of some brown algae in unialgal and axenic cultures. *Fac. Sci. Inst. of Algological Res., Hokkaido Univ. Sci. Pap.* 7:77–194, 12 pls.
- Norris, J.N. and H.W. Johansen. 1981. Articulated Coralline Algae of the Gulf of California, Mexico, I: *Amphiroa* Lamouroux. *Smithsonian Contrib. to Mar. Sci.* No. 9.
- Norris, R.E. 1988. Two new red algal parasites on *Kuetzingia natalensis* (Rhodomelaceae, Rhodophyta). *Bot. Mar.* 31:345–352.
- O'Kelley, C.J. 1983. Observations on marine Chaetophoraceae (Chlorophyta). IV. The structure, reproduction, and life history of *Acrochaete geniculata* (Gardner) comb. nov. *Phycologia* 22:13–21.
- O'Kelly, C.J., G.L. Floyd, and M.A. Dube. 1984. The fine structure of motile cells in the genera *Ulvaria* and *Monostroma*, with special reference to the taxonomic position of *Monostroma oxyspermum* (Ulvophyceae, Chlorophyta). *Pl. Syst. Evol.* 144:179–199.
- Pacheco Ruíz, I. and L.E. Aguilar Rosas. 1984. Distribución estacional de Rhodophyta en el noroeste de Baja California. *Ciencias Marinas (Mex.)* 10:67–80.

- Parke, M. and P.S. Dixon. 1976. Check-list of British marine algae —Third Revision. *J. Mar. Biol. Ass. U.K.* 56:527–594.
- Parkinson, P.G. 1981. *Phycologiae Historiae Analecta Autodidactica*. 3rd fascicle. Pettifogging Press, Auckland, N.Z. 28 pp.
- Polanshek, A.R. and J.A. West. 1977. Culture and hybridization studies on *Gigartina papillata* (Rhodophyta) *J. Phycol.* 13:141–149.
- Post, E. 1962. *Murrayellopsis dawsonii* gen. et. spec. nov. *Kiel.* 4 pp., 3 figs. (published by author).
- Price, J.H., D.M. John, and G.W. Lawson. 1986. Seaweeds of the western coast of tropical Africa and adjacent islands: a critical assessment. IV. Rhodophyta (Florideae). I. Genera A–F. *Bull. Br. Museum (Nat. Hist.) Botany* 15:1–122.
- Prud'homme van Reine, W.F. 1982. *A Taxonomic Revision of the European Sphacelariaceae (Sphacelariales, Phaeophyceae)* Leiden Univ. Press. 287 pp., 6 pls.
- Scagel, R.F., D.J. Garbary, L. Golden, and M.W. Hawkes. 1986. A synopsis of the benthic marine algae of British Columbia, northern Washington and southeast Alaska. *Phycological Contrib.* 1, University of British Columbia.
- Setchell, W.A. and N. L. Gardner. 1920. The marine algae of the Pacific coast of North America. II. Chlorophyceae. *Univ. Calif. Publ. Bot.* 8:139–374, 25 pls.
- Setchell, W.A. and N. L. Gardner. 1925. The marine algae of the Pacific coast of North America. III. Melanophyceae. *Univ. Calif. Publ. Bot.* 8:383–739, 73 pls.
- Sheath, R.G. and K.M. Cole. 1984. Systematics of *Bangia* (Rhodophyta) in North America. I. Biogeographic trends in morphology. *Phycologia* 23:383–396.
- Silva, P.C. 1951. The genus *Codium* in California. *Univ. Calif. Publ. Bot.* 25:79–114, 6 pls.
- Silva, P.C. 1979. The benthic algal flora of central San Francisco Bay. In: *San Francisco Bay—The Urbanized Estuary*. (ed.) T.J. Conomos. pp. 287–345, Pacific Division AAAS, San Francisco.
- Silva, P.C. 1990. *Hesperophycus* Setchell & Gardner, nom. cons. prop., a problematic name applied to a distinctive genus of Fucaceae (Phaeophyta). *Taxon* 39:1-8.

- Silva, P.C., E.G. Meñez, and R.L. Moe. 1987. Catalog of the Benthic Marine Algae of the Philippines. Smithsonian Contr. Mar. Sci. No. 27.
- Smith, G.M. 1944. *Marine Algae of the Monterey Peninsula, California*. Stanford, Calif. 622 pp., 98 pls.
- South, G.R. and I. Tittley. 1986. A checklist and distributional index of the benthic marine algae of the North Atlantic Ocean. Huntsman Marine Laboratory and British Museum (Natural History), St. Andrews and London.
- Sparling, S.R. 1977. *An Annotated List of the Marine Algae (Chlorophyta, Phaeophyta, Rhodophyta) of San Luis Obispo County, California, with keys to genera and species*. 88 pp.
- Spencer, K.G., M-H. Yu, J.A. West, and A.N. Glazer. 1981. Phycoerythrin and interfertility patterns in *Callithamnion* (Rhodophyta) isolates. Br. Phycol. J. 16:331-343.
- Steneck, R.S. and R.T. Paine. 1986. Ecological and taxonomic studies of shallow-water encrusting Corallinaceae (Rhodophyta) of the boreal northeastern Pacific. Phycologia 25:221-240.
- Stewart, J.G. 1974. *Phrix*: a new genus in Delesseriaceae (Rhodophyta). Phycologia 13:139-147.
- Stewart, J.G. 1976. Development of morphological patterns in three species of Delesseriaceae. Madroño 23:438-448.
- Stewart, J. G. 1977. Morphology of *Sorella* in natural habitats and under laboratory conditions. Bull. So. Calif. Acad. Sci. 76:5-15.
- Stewart, J.G. 1982. Anchor species and epiphytes in intertidal algal turf. Pacific Science 36: 45-59.
- Stewart, J.G. 1989a. Maintenance of a balanced, shifting boundary between the seagrass *Phyllospadix* and algal turf. Aquatic Bot. 33:223-241.
- Stewart, J.G. 1989b. Establishment, persistence, and dominance of *Corallina* (Rhodophyta) in algal turf. J. Phycol. 25:436-446.
- Stewart, J.G. 1989c Notes on Marine Algae of San Diego County including merger of *Murrayellopsis* with *Veleroa*. Bull. So. Calif. Acad. Sci. 88:103-116.
- Stewart, J. G. and B. Myers. 1980. Assemblages of algae and invertebrates in *Phyllospadix*-dominated intertidal habitats. Aquatic Bot. 9:73-94.
- Stewart, J.G. and J.N. Norris. 1981. Gelidiaceae (Rhodophyta) from the northern Gulf of California, México. Phycologia 20:273-284.

- Tanner, C.E. 1980. *Chloropelta* gen. nov., an Ulvaceous green alga with a different type of development. *J. Phycol.* 16:128–137.
- Ver Steeg, J. and M.N. Josselyn. 1983. Taxonomic and morphological studies of *Cryptopleura* (Rhodophyta: Delesseriaceae). *The Wasmann J. of Biol.* 41:97–107.
- Vinogradova, K.L. 1969. K. sistematike porjadka Ulvales (Chlorophyta), s.l. *Risunkom. Botanicheskii Zhurnal [Leningrad]* 54:1347–1355. [A contribution to the taxonomy of the order Ulvales (Chlorophyta).]
- Vinogradova, K.L. 1973. *Nov. Sist. Nizsh. Rast.* [Bot. Inst. Akad. Nauk SSSR] 10:28–32.
- West, J.A., A.R. Polanshek, and D.E. Shevlin. 1978. Field and culture studies on *Gigartina agardhii* (Rhodophyta). *J. Phycol.* 14:416–426.
- Woelkerling, W.J. 1983. The *Audouinella* (*Acrochaetium*–*Rhodochorton*) complex (Rhodophyta): present perspectives. *Phycological Review* 8. *Phycologia* 22:59–92.
- Woelkerling, W.J., Y.M. Chamberlain, and P.C. Silva. 1985. A taxonomic and nomenclatural reassessment of *Tenarea*, *Titanoderma* and *Dermatolithon* (Corallinaceae, Rhodophyta) based on studies of type and other critical specimens. *Phycologia* 24:317–337.
- Womersley, H.B.S. 1978. Southern Australian species of *Ceramium* Roth (Rhodophyta). *Aust. J. Mar. Freshwater Res.* 29:205–257.
- Wynne, M.J. 1985a. Notes on *Herposiphonia* (Rhodomelaceae, Rhodophyta) in South Africa, with a description of a new species. *Cryptogamie: Algol.* 5:167–177.
- Wynne, M.J. 1985b. Taxonomic notes on some Delesseriaceae (Rhodophyta) occurring in southern California and México. *Bull. So. Calif. Acad. Sci.* 84:164–171.
- Wynne, M.J. 1985c. Concerning the names *Scagelia corallina* and *Heterosiphonia wurdemannii* (Ceramiales, Rhodophyta). *Cryptogamie: Algol.* 6:81–90.
- Wynne, M.J. 1989. Towards the Resolution of Taxonomic and Nomenclatural Problems Concerning the Typification of *Acrosorium uncinatum* (Delesseriaceae: Rhodophyta). *Br. Phycol. J.* 24:245–252.
- Zedler, J. B. 1982. Salt marsh algal mat composition: Spatial and temporal comparisons. *Bull. So. Calif. Acad. Sci.* 81:41–50.

INDEX

Presently accepted binomials for species that are documented for the San Diego flora, or that are likely to be present, are marked • (•? if the record cannot be verified).

- Acrochaete geniculata* 24
- ACROCHAETIACEAE 64
- Acrochaetium* 64
- Acrosorium uncinatum* 138
- *A. venulosum* 11, 138
- Aegira virescens* 42
- Agardhiella coulteri* 101
- Agardhiella tenera* 101
- *Agarum fimbriatum* 11, 53
- *Aglaothamnion cordatum* 123
- *A. endovagum* 123
- Ahnfeltia fastigiata* 106
- A. gigartinoides* 106
- A. plicata* 106, 107
- ALARIACEAE 54
- *Amphiroa beauvoisii* 80, 87
- A. crassa* 80
- A. nodulosa* 81
- A. tuberculosa* 81
- A. zonata* 80
- *Amplisiphonia pacifica* 25, 76, 153
- Anabaena* 36
- *Anisocladella pacifica* 108, 137, 138, 140, 143, 147, 153, 169
- Antithamnion* 101
- *A. defectum* 123, 135
- *A. hubbsii* 124
- *A. kylinii* 124
- A. scrippsiana* 125
- A. secundatum* 124
- *A. tenuissimum* 124
- *Antithamnionella* sp. 124
- A. breviramosa* 125
- *A. elegans* 125, 135, 136
- A. glandulifera* 125
- A. pacifica* 126
- *Apoglossum gregarium* 13, 139, 140
- *A. taxiformis* 68
- *Asterocolax gardneri* 103, 140
- Asterocytis ornata* 61
- A. ramosa* 61
- *Audouniella* 64, 65
- BANGIACEAE 63
- Bangia fusco-purpurea* 63
- *B. vermicularis* 63
- Batis maritima* (angiosperm) 27, 32
- *Berkeleya hyalina* 13, 23
- *B. rutilans* 23, 38
- *Binghamia forkii* 119, 120, 121
- Blossevillea brandegeei* 58
- BONNEMAISONIACEAE 68
- ? *Bonnemaisonia hamifera* 68
- Bossea gardneri* 82
- B. orbigniana* 82
- Bossiella* 95, 144, 145
- B. californica* ssp. *californica* 81
- *B. californica* ssp. *schmittii* 81
- *B. chiloensis* 81
- B. gardneri* 82
- B. insularis* 81
- *B. orbigniana* 81, 82
- B. pachyclada* 81
- *B. plumosa* 81, 82
- Botryocladia* 100
- *B. neushulii* 10, 115

- *B. pseudodichotoma* 116
- *Botryoglossum farlowianum* 142, 144
- *Branchioglossum undulatum* 140, 141, 150
- ? *Branchioglossum woodii* 140, 141
- BRYOPSIDACEAE 33
- *Bryopsis* 34
- *B. corticulans* 33, 34
- *B. hypnoides* 34
- *B. pennatula* 33, 34
- *Bulbocoleon piliferum* 24

- *Calliarthron* 11, 136, 141, 144, 145, 149, 158
- *C. cheilosporioides* 82
- *C. regenerens* 83
- *C. schmittii* 81
- ? *C. tuberculosum* 81, 83
- *Callithamnion* 64, 123, 126, 135
- *C. biserialatum* 126
- *C. breviramsum* 127
- *C. catalinense* 126
- *C. endovagum* 123
- *C. ramosissimum* 126
- *C. rigidum* 127
- *C. rupicolum* 127
- *Callocolax fungiformis* 95
- *C. globulosis* 95
- *Callophyllis* 95, 96
- *C. dissecta* 96
- *C. firma* 95, 96
- *C. flabellulata* 95, 149
- *C. marginifructa* 95
- *C. thompsonii* 96
- *C. violacea* 96, 105
- *Calothrix* 36
- *Carpopeltis bushiae* 89, 142
- *Centrocerus clavulatum* 127, 130

- CERAMIACEAE 123
- *Ceramium* 36, 127, 128, 129, 131
- *C. californicum* 101, 127, 128
- *C. clarionense* 127, 128
- *C. codicola* 128, 129
- *C. eatonianum* 128, 129, 130, 165
- *C. fimbriatum* 130
- *C. flaccidum* 127, 129
- *C. gardneri* 128
- *C. gracillimum* var. *byssoides* 129, 130
- *C. masonii* 130
- *C. pacificum* 128, 129, 131
- *C. sinicola* 128, 131
- *C. taylorii* 129
- *C. zaca* 127, 131, 132
- *Chaetomorpha* 29, 33
- *C. aerea* 29
- *C. californica* 24, 29
- *C. linum* 29
- *C. spiralis* 30
- CHAETOPHORACEAE 24
- CHAMPIACEAE 119
- ? *Champia parvula* 121
- ? *Chilionema ocellatum* 40
- *Chloropelta caespitosa* 13, 26
- *Chondria* 24, 154
- *C. arcuata* 155
- *C. californica* 155, 159
- *C. dasyphylla* 155, 157
- *C. decipiens* 156
- *C. nidifica* 61, 156, 159
- *C. oppositoclada* 155, 156
- *C. pacifica* 156
- *C. telmoensis* 156
- CHORDARIACEAE 41, 42
- CHOREOCOLACACEAE 97

- Choreocolax polysiphoniae* 97
- *Choreonema thuretii* 78
- *Chroodactylon ornatum* 61
- CLADOPHORACEAE 29
- Cladophora* 30, 31, 51
- *C. albida* 30
- *C. columbiana* 30
- *C. delicatula* 30
- *C. flexuosa* 32
- *C. graminea* 31
- *C. hemisphaerica* 31
- *C. microcladioides* 31
- *C. microcladioides* f. *stricta* 31
- *C. sericea* 31, 32
- *C. stimpsonii* 31, 32
- *C. trichotoma* 31
- CODIACEAE 35
- CODIOLACEAE 33
- *Codium cuneatum* 35, 36
- *C. fragile* 36, 38, 121, 129
- *C. hubbsii* 37
- *C. johnstonei* 37
- *C. setchellii* 37
- *C. simulans* 36
- *C. tomentosum* 36
- Coeloseira* 121
- *C. compressa* 121
- *C. parva* 121
- COILODESMACEAE 43
- *Coilodesme californica* 43
- *C. rigida* 43
- *Colacodasya californica* 151
- Colpomenia* 41, 45
- *C. peregrina* 44
- *C. sinuosa* 44
- *C. tuberculata* 44, 45, 46
- Compsonema* 40
- CORALLINACEAE 77
- Corallina* 78, 80, 83, 86, 88, 127, 131, 141, 145, 162, 165, 168
- ? *C. frondescens* 82, 83
- *C. gracilis* 86
- *C. gracilis* f. *densa* 86
- *C. officinalis* var. *chilensis* 84, 158
- *C. pinnatifolia* 83, 84, 85, 165
- *C. pinnatifolia* var. *digitata* 83
- ? *C. polysticha* 84
- *C. vancouveriensis* 83, 84, 85, 86, 88, 165
- Costaria costata* 53
- CRUORACEAE 76, 97
- ? *Cruoria profunda* 76, 97
- Cruoriopsis aestuarii* 76, 77
- Cryptonemia* 90, 96
- *C. angustata* 89
- *C. borealis* 89
- *C. obovata* 75, 89, 90
- *C. ovalifolia* 90
- Cryptopleura* 78, 138, 142, 145, 146, 149
- *C. corallinara* 141, 143
- *C. crispa* 141, 142, 143
- *C. farlowiana* 142, 144
- *C. lobulifera* 141
- ? *C. rosacea* 142
- *C. violacea* 142, 143
- *Cumagloia andersonii* 65
- CUTLERIACEAE 42
- *Cutleria cylindrica* 13, 42, 43
- Cylindrocarpus rugosus* 41
- CYSTOSEIRACEAE 58
- Cystoseira* 44, 59
- *C. neglecta* 58
- *C. osmundacea* 43, 58, 168
- *C. setchellii* 58
- DASYACEAE 151
- Dasya californica* 152
- *D. sinicola* var. *abyssicola* 151

- *D. sinicola* var. *californica* 151, 152
- D. sinicola* var. *sinicola* 151
- DELESSERIACEAE 138
- *Derbesia marina* 35
- Dermocorynus occidentalis* 76, 91
- Dermatolithon* 80
- D. canescens* 80
- D. dispar* 80
- DESMARESTIACEAE 52
- Desmarestia herbacea* 52
- *D. ligulata* var. *firma* 53
- *D. ligulata* var. *ligulata* 11, 52, 100
- D. munda* 52
- D. tabacoides* 53
- *Dictyoneuroopsis reticulata* 55
- *Dictyopteris undulata* 48, 78
- DICTYOTACEAE 48
- Dictyota* 48, 49, 78
- *D. binghamiae* 48, 49
- *D. flabellata* 48, 49, 50
- *Diplura simulans* 40
- DUMONTIACEAE 73

- ECTOCARPACEAE 38
- Ectocarpus* 38
- E. conferfvoides* var. *parvus* 38
- E. coniferus* 39
- E. cylindrica* 38, 39
- E. flocculiformis* 38
- E. mucronatus* 39
- *E. parvus* 38
- E. simpliciusculus* 39
- Egrecia* 25, 54, 157
- *Egrecia menziesii* 7, 54
- *Eisenia arborea* 25, 54, 78, 154
- *Endarachne binghamiae* 45, 46
- ENDOCLADIACEAE 88
- *Endocladia muricata* 57, 88
- Endophyton ramosum* 24
- *Endoplura aurea* 40
- *Enteromorpha* spp. 26
- E. clathrata* 26
- E. clathrata* var. *crinita* 27
- E. compressa* 26, 27
- E. crinita* 27
- E. flexuosa* 26, 27
- E. intestinalis* 27
- E. linza* 17
- E. prolifera* 26
- E. torta* 27
- E. tubulosa* 27
- Entocladia* 24
- *E. cingens* 24
- E. codicola* 25
- E. viridis* 25
- Erythrocladia* sp. 156
- *E. subintegra* 61
- E. irregularis* 61
- *Erythrocytis saccata* 157
- *Erythroglossum californicum* 10, 143
- ERYTHROTRICHIACEAE 61
- *Erythrotrichia* spp. 62
- E. carnea* 62
- E. tetraseriata* 62
- Eudesme virescens* 42

- Farlowia crassa* 74
- F. compressa* 74
- *F. mollis* 10, 74
- *Fauchea laciniata* 117
- F. laciniata* f. *pygmaea* 117
- Feldmannia* 38
- *F. cylindrica* 38
- F. flocculiformis* 38
- *F. globifera* 39
- *F. hemispherica* 38, 39

- *F. irregularis* 39
- Fosliella ascripticia* 80
- F. intermedia* 80
- F. nicholsii* 78
- F. paschalis* 78

- ? *Fryeella gardneri* 117
- FUCACEAE 57
- Fucus* 57

GALAXAURACEAE 67

- Gardneriella tuberifera* 99
- Garibaldi (fish) 11, 31, 126, 133, 134, 137, 139, 149, 170, 171
- Gayralia oxysperma* 26
- *Gastroclonium compressum* 121
 - G. coulteri* 122
 - *G. parvum* 121
 - *G. subarticulatum* 122, 143
 - *Gelidiocolax microsphaerica* 97

GELIDIACEAE 69, 97

- Gelidium* 69, 72, 80, 97, 141
- G. caloglossoides* 72
- G. cartilagineum* 71
- *G. coulteri* 69, 71, 97
 - G. crinale* 71, 73
 - *G. nudifrons* 61, 69, 70, 89, 97, 158
 - G. pulchrum* 70
 - *G. purpurascens* 70, 97
 - G. pyramidale* 73
 - *G. pusillum* 69, 70, 71
 - *G. robustum* 11, 64, 69, 70, 71, 89, 97, 123, 141, 145, 149, 168
- Giffordia* 38, 39
- G. conifera* 39
- G. granulosa* 39
- G. irregularis* 39
- G. mitchelliae* 39
- G. sandriana* 39
- G. saundersii* 39

GIGARTINACEAE 110

- Gigartina agardhii* 115
- G. armata* 112
- G. binghamiae* 111
- G. californica* 111
- *G. canaliculata* 79, 110, 133, 160
 - G. corymbifera* 110
 - G. eatoniana* 112
 - G. echinata* 112
 - *G. exasperata* 100, 110, 111, 112, 113, 133
 - G. farlowiana* 112
 - *G. harveyana* 111
 - G. jardinii* 115
 - *G. leptorhynchus* 94, 111
 - G. montereiensis* 114
 - *G. ornithorhynchus* 112
 - G. papillata* 115
 - G. serrata* 110
 - G. spinosa* 112, 115
 - *G. tepida* 112
 - ? *G. volans* 113
- Gloiosiphonia capillaris* 77
- *Gonimophyllum skottsbergii* 143
 - Goniotrichum alsidii* 61
 - G. elegans* 61
- GRACILARIACEAE 104
- Gracilaria* 101, 104, 105
- G. andersonii* 104, 105, 106
 - G. confervoides* 104
 - G. cunninghamii* 105
 - *G. lemaneiformis* 104, 105
 - *G. pacifica* 105
 - *G. papenfussii* 105, 106
 - G. robusta* 104
 - G. sjoestedtii* 104
 - G. textori* var. *cunninghamii* 105
 - G. turgida* 105
 - G. veleroae* 106

- G. verrucosa* 104, 105
- *Gracilariophila gardneri* 106
- G. oryzoides* 106
- Gracilariopsis* 104, 105
- Grateloupia abbreviata* 91, 123
- G. californica* 91
- *G. doryphora* 91, 113, 123
- G. maxima* 91
- *G. prolongata* 91, 92, 94
- G. schizophylla* 91
- *Griffithsia furcellata* 132
- G. multiramosa* 132
- *G. pacifica* 132
- Gymnogongrus* 79
- *G. chiton* 107
- *G. leptophyllus* 107
- G. linearis* 107
- G. platyphyllus* 107
- Gymnothamnion elegans* 124

- *Haematocelis rubens* 76, 98
- *H. zonalis* 76, 98
- Halicystis ovalis* 35
- *Halidrys dioica* 44, 58
- *Haliptilon gracile* 84, 86
- Halosaccion* 116
- HALYMENIACEAE 76, 89
- Halymenia* 10, 90, 93, 96
- ? *H. californica* 92
- H. coccinea* 92
- *H. gardneri* 92
- *H. hollenbergii* 92
- *Haplogloia andersonii* 41
- *Hapalospongidion gelatinosum* 40
- *Hapterophycus canaliculatus* 40
- Hecatonema* 40
- H. streblonematoides* 40
- HELMINTHOCLADIACEAE 65
- *Helminthocladia australis* 39, 66
- *Helminthora stricta* 66
- *Herposiphonia littoralis* 157
- H. parva* 158
- *H. plumula* 157
- H. secunda* 158
- *H. secunda* f. *tenella* 158
- H. tenella* f. *secunda* 158
- *H. verticillata* 158
- *Hesperophycus californicus* 57
- *H. harveyanus* 57
- *Heteroderma nicholsii* 78
- *Heterosiphonia erecta* 151, 152
- *H. japonica* 152
- HILDENBRANDIACEAE 76, 77
- Hildenbrandia dawsonii* 76, 77
- H. occidentalis* 76, 77
- H. prototypus* 76, 77
- Hincksia* 38
- *H. granulosa* 39
- H. mitchelliae* 39
- *H. sandriana* 39
- *H. saundersii* 38, 39
- *Holmesia californica* 143
- Hormiscia* 33
- *Hydroclathrus clathratus* 45, 46
- *Hydrolithon decipiens* 78
- H. setchellii* 79
- Hymenena* species 144
- H. flabelligera* 144
- Hymeniacidon ungodon* (sponge) 89
- HYPNEACEAE 101
- Hypnea* 102, 103, 126
- H. adunca* 102
- H. californica* 102
- H. johnstonii* 101
- *H. valentiae* var. *gardneri* 102
- *H. valentiae* var. *valentiae* 102, 120
- *H. variabilis* 102
- Hypneocolax stellaris* 102

- Hypoglossum* 139, 140
Hypsypops rubicunda (fish) 11
- Ilea fascia* 46
Iridaea 114
- Janczewskia* 61
- *J. gardneri* 159, 161
 - *J. lappacea* 156, 159
- Jania* 57, 86, 87
- *J. adhaerens* 86, 87
 - *J. crassa* 81, 86, 87
 - *J. natalensis* 87
 - *J. tenella* 86, 87
- Jantinella verrucaeformis* 155, 159
Joculator pinnatifolius 84
- KALLYMENIACEAE 95
- *Kallymenia pacifica* 90, 95, 96
- LAMINARIACEAE 53
- Laminaria dentigera* 54
- *L. farlowii* 53
 - *L. setchellii* 12, 53
 - *Laurencia* 79, 154, 157
 - *L. diegoensis* 161
 - *L. lajolla* 159
 - *L. masonii* 160
 - *L. maxineae* 162
 - *L. pacifica* 157, 160
 - *L. papillosa* 160
 - *L. scrippsensis* 161
 - *L. sinicola* 160
 - *L. snyderae* 161
 - *L. spectabilis* 79, 154, 157, 159, 160, 161
 - *L. spectabilis* var. *diegoensis* 161
 - *L. splendens* 159, 162
 - *L. subdisticha* 162
 - *L. subopposita* 162
- Leachiella pacifica* 97
- LEATHESIACEAE 40, 41
- *Leathesia difformis* 41
 - *L. nana* 12
 - *Leptocladia binghamiae* 74, 75
 - *Leptofauchea* 117
- LESSONIACEAE 55
- *Levringiella gardneri* 162
 - ? *Liagora californica* 67
 - *Lithophyllum decipiens* 78
 - *L. impressum* 78
 - *L. grumosum* 78
 - *L. imitans* 78
 - *L. lichenare* 78
 - *L. proboscideum* 78
 - *Lithothamnion aculeiferum* 78
 - *L. australe* 78
 - *L. californicum* 79
 - *L. crassiusculum* 79
 - *L. giganteum* 79
 - *L. lamellatum* 79
 - *L. microsporum* 79
 - *L. pacificum* 79
 - *L. phymatodeum* 79
 - *L. vulcanum* 79
 - *Lithothrix aspergillum* 78, 81, 88
 - *Littorina planaxis* (mollusc) 25
 - *Lobocolax deformans* 93
 - *Lola lubrica* 32, 33
- LOMENTARIACEAE 122
- *Lomentaria caseae* 122
 - *L. hakodatensis* 122
 - *Lophosiphonia villum* 167
 - *Macrocystis pyrifera* 10, 11, 54, 56, 118, 125, 145,
 - *Maripelta rotata* 12, 117, 118
 - *Mastocarpus* 98, 115

- M. papillatus* 12, 115
- *Melobesia marginata* 79
- *M. mediocris* 79
- *Membranoptera weeksiae* 144, 150
- Meredithia californica* 96
- *Mesophyllum lamellatum* 79
- Microcladia californica* 133
- *M. coulteri* 133
- Monanthochloe littoralis*
(angiosperm) 33
- MONOSTROMATACEAE 25
- Monostroma oxyspermum* 25
- M. quaternarium* 26
- Murrayellopsis dawsonii* 170, 171
- Myriogloia* 41, 42
- ? *Myriogramme caespitosa* 144, 146
- Myrionema* 40
- MYRIONEMATACEAE 39

- NAVICULACEAE 23
- NEMALIACEAE 65
- *Nemalion helminthoides* 57, 65
- NEMASTOMATACEAE 98
- Neoagardhiella baileyi* 101
- N. gaudichaudii* 101, 128, 131
- *Neogoniolithon setchellii* 79
- *Neopolyporolithon reclinatum* 79
- Neoptilota* 133
- N. californica* 134
- *N. densa* 133
- Nereocystis* 126
- *Nienburgia andersoniana* 103, 108, 138, 145, 147, 153, 169
- *Nitophyllum hollenbergii* 138, 144, 145, 149

- *Ophidocladus simpliciusculus* 162, 163
- *Opuntiella californica* 97, 99
- *Ozophora clevelandii* 7, 10, 108, 109
- O. latifolia* 108
- *Pachydictyon coriaceum* 49
- Pachygrapsus* (crab) 45
- *Pelagophycus porra* 11, 56, 118
- *Pelvetia fastigiata* 39, 40, 57, 88
- P. fastigiata* f. *gracilis* 57
- Petalonia binghamiae* 45
- *P. fascia* 45, 46
- PETROCELIDACEAE 76, 98, 115
- Petrocelis* 98, 115
- P. franciscana* 76, 115
- P. haematis* 76, 115
- P. middendorffii* 115
- Petroglossum pacificum* 109
- *P. parvum* 108, 153
- *Petrospongium rugosum* 40, 41
- PEYSSONNELIACEAE 76, 77
- Peyssonnelia meridionalis* 77
- P. pacifica* 77
- P. profunda* 77
- P. rubra* var. *orientalis* 76, 77
- Phormidium* 36
- Phrix gregarium* 139, 140
- Phycodrys* 150
- *P. cerratae* 13, 146
- *P. profunda* 138, 139, 140, 147, 150
- P. isabellae* 146
- *P. setchellii* 10, 147
- PHYLLOPHORACEAE 106
- Phyllophora clevelandii* 108
- Phyllospadix* 9, 27, 28, 62, 66, 73, 79, 86, 89, 94, 101, 102, 108, 109, 110, 111, 122, 138, 141, 143, 145, 152, 153, 156, 161, 162, 165, 169, 173
- *Phyllospadix scouleri* 64, 173
- *Phyllospadix torreyi* 84, 173
- *Pikea californica* 74, 75
- P. pinnata* 75

- *P. robusta* 10, 75
- *Pilinella californica* 25
- *Platysiphonia clevelandii* 7, 148
- *P. decumbens* 148
- *Platythamnion pectinatum* 134
- *P. villosum* 134
- *Pleonosporium polycarpum* 135
- *P. pygmaeum* 135
- *P. squarrulosum* 135
- *P. vancouverianum* 64, 135
- PLOCAMIACEAE 103
- *Plocamiocolax pulvinata* 103
- *Plocamium cartilagineum* 103, 104
- *P. violaceum* 104
- *Pogonophorella californica* 137, 152
- *Polyneura latissima* 149
- *Polysiphonia* 36, 61, 70, 97, 101, 163, 165, 167, 169
- *P. acuminata* 163
- *P. bajacali* 163
- *P. brodiaei* 164
- *P. californica* 166
- *P. collinsii* 97, 165
- *P. confusa* 163, 164, 165
- *P. decussata* 164
- *P. flaccidissima* 164, 165, 166
- *P. gardneri* 165
- *P. hendryi* 97, 165, 167
- *P. indigena* 165
- *P. johnstonii* 165
- *P. johnstonii* var. *concinna* 165
- *P. minutissima* 167
- *P. mollis* 165, 166
- *P. nathaniellii* 166
- *P. pacifica* 166
- *P. pacifica* var. *delicatula* 166
- *P. paniculata* 166
- *P. savatieri* 167
- *P. scopulorum* var. *villum* 163, 167
- *P. simplex* 167
- *P. snyderae* 166
- *Porphyra* 12
- *P. perforata* 63, 64
- *Porphyrella californica* 63
- *P. gardneri* 64
- PORPHYRIDIAEAE 61
- *Postelsia* 55
- *Prionitis* 93, 100
- *P. angusta* 93
- *P. australis* 93
- *P. cornea* 93, 94
- *P. lanceolata* 91, 92, 94, 113
- *P. linearis* 93, 94
- *P. lyallii* 94
- *Pseudodictyon geniculatum* 24
- *Pseudogloiophloea confusa* 67, 68
- *Pseudoscinaia snyderae* 68
- *Pseudolithoderma nigra* 40
- *Pseudolithophyllum* 78
- *P. neofarlowii* 79
- *Pseudulvella applanata* 25
- *Pterochondria woodii* var. *pygmaea* 10, 97, 168
- *Pterocladia* 71, 72
- *P. caloglossoides* 71
- *P. capillacea* 24, 64, 72, 89, 120, 127, 129, 131, 141, 143, 155, 165, 168
- *P. media* 73
- *P. parva* 72
- *Pterosiphonia* 97
- *P. baileyi* 162, 168
- *P. clevelandii* 7, 168, 169
- *P. dendroidea* 162, 168, 169, 170
- *P. farlowii* 168, 169
- *P. pennata* 169

- *Pterygophora californica* 11, 55, 90, 134
- Ptilota californica* 133, 134
- *Ptilothamnionopsis lejolisea* 136
- *Pulvinia epiphytica* 76, 77

- RALFSIACEAE 40
- *Ralfsia confusa* 40
- *R. hesperia* 40
- *R. integra* 40
- R. occidentalis* 40
- *R. pacifica* 40, 47
- Reticulobotrys catalinae* 100, 116
- Rhizoclonium lubrica* 32
- *R. riparium* 29, 32, 33
- Rhodochorton* 64, 65
- *R. purpureum* 64, 65
- R. rothii* 65
- Rhodoglossum* 115
- *R. affine* 92, 94, 113, 114
- R. americanum* 114
- ? *R. californicum* 114
- *R. roseum* 111, 114, 115
- RHODOMELACEAE 76, 153
- Rhodophysema elegans*
 var. *polystromatica* 76, 77
- R. minus* 76, 77
- *Rhodoptilum plumosum* 153
- RHODYMENIACEAE 95, 115
- Rhodymenia* 64
- *R. arborescens* 118
- *R. californica* 118, 119
- *R. pacifica* 118, 119
- *R. rhizoides* 119
- *Rhodymeniocolax botryoides* 119
- *Ruppia (maritima)* 173

- *Sarcodiotheca furcata* 11, 100, 109, 131
- *S. gaudichaudii* 11, 61, 99, 101, 128, 131
- SARGASSACEAE 59
- *Sargassum agardhianum* 59, 161
- *S. muticum* 44, 59, 60
- *S. palmeri* 7, 60
- Scagelia occidentale* 136
- *S. pylaisaei* 136
- *Sciadophycus stellatus* 119
- *Schizymenia dawsonii* 98
- *S. epiphytica* 98, 99
- *S. pacifica* 99
- *Scinaia confusa* 67, 68
- *S. johnstoniae* 67, 68
- *S. snyderae* 68
- SCYTOSIPHONACEAE 44
- *Scytosiphon dotyi* 47
- *S. lomentaria* 47
- *Smithora naiadum* 62
- S. naiadum* f. *minor* 62
- SOLIERIACEAE 99, 116
- Sorella* 123, 143, 144, 149, 150
- *S. delicatula* 64, 143, 149, 150
- *S. pinnata* 150
- SPHACELARIACEAE 51
- *Sphacelaria californica* 51
- *S. didichotoma* 51, 52
- S. furcigera* 51
- *S. rigidula* 51
- *Spyridia filamentosa* 57, 136
- *Stenogramma interrupta* 11, 100, 109
- Stolonophora brandegeei* 58
- *Streblonema investiens* 39
- Stromatocarpus gardneri* 162
- *Stylonema alsidii* 61

- *Taonia lennebackeriae* 50
- *Tenarea ascripticia* 79

- T. canescens* 80
- T. dispar* 80
- Tethya* (sponge) 123, 124
- *Tiffaniella snyderae* 64, 135, 137, 138, 153, 163, 169
- *Tinocladia crassa* 42
- Titanoderma* 80
- Tylotus cunninghamii* 105

ULVACEAE 26

- Ulva* 26, 27, 28
- U. angusta* 29
- *U. californica* 26, 27, 28, 29
- U. costata* 28
- *U. dactylifera* 27, 28
- *U. expansa* 25, 27, 28
- U. lactuca* 29
- U. lobata* 29
- *U. rigida* 27, 28
- U. taeniata* 28

ULVELLACEAE 24

- *Ulvella applanata* 25
- *U. setchellii* 25
- Urospora* 33
- U. penicilliformis* 33
- U. wormskioldii* 33

VAUCHERiaceae 24

- *Vaucheria* sp. 24
- V. longicaulis* 24
- *Veleroa subulata* 170, 171
- ? *Weeksia digitata* 75
- Zanardinula* 94
- Z. andersoniana* 94
- *Zonaria farlowii* 50
- Zostera* 10, 30, 35, 38, 62, 79, 122, 173
- *Z. marina* 173
- *Z. marina* var. *latifolia* 61, 173