

**SEAWEEDS OF CABRILLO NATIONAL MONUMENT:
AN ANNOTATED LIST**

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This list summarizes the seaweed species that we (Kathy Ann Miller and Steven N. Murray) encountered during our surveys at Cabrillo National Monument on 24 January, 9-10 March and 28 June 2005. We did not search for tiny, inconspicuous species, although I noted a few in our examination of seaweeds in the lab. We also did not collect and identify most of the calcified and uncalcified crusts that occur there. Most species were found in all three management zones, except where noted.

For each species, the current name is given with synonyms below it, in brackets. I've compared our findings to those of Zedler *et al.* (1976, 1978); because they did not keep vouchers, I cannot comment on some of their records. In these notes, I refer to Stewart (1991), the most recent comprehensive treatment of San Diego County seaweeds, and Abbott & Hollenberg (1976) for relevant additional information.

CHLOROPHYTA

Bryopsis pennatula J. Agardh

Encountered once, in a pool in the low zone (Zone 2). It was listed in the 1978 report as *Bryopsis pinnatula*.

Chaetomorpha aerea (Dillwyn) Kützing

[*Chaetomorpha linum* (Müller) Kützing according to some authors; see Blair 1983]

Straight green filaments lining shallow pools, middle zone.

Chaetomorpha spiralis Okamura

Not reported in 1976-78. Epiphytic on other seaweeds and *Phyllospadix* in the low zone, Zones 1 and 3. Bright green, curling and spiraling around host axes.

Cladophora microcladioides Collins

Encountered once, in a pool in the low zone (Zone 3). This may be one of the species listed in 1976 as *Cladophora* spp.; it is small, with conspicuous pectinate (unilateral) branching.

Codium fragile (Suringar) Hariot

Occasional on the tops and sides of boulders in the low zone. This is the sole species of *Codium* observed at CNM.

Ulva spp.

[*Enteromorpha* spp.]

Several small tubular ulvoids occur in the high zone on the damp faces of sandstone boulders and cliffs. They are especially prominent in Zones 1 and 2. Our samples are unbranched and compressed. One is larger (1 cm) and dark green; the other is smaller (5 mm) and light green. Both aggregate to form patches or fringes.

This complex may include what was listed in 1976 as *Enteromorpha flexuosa* (now *Ulva flexuosa* Wulfen).

Ulva californica Wille

Forming turfs on the surface of upper and middle zone rocks, possibly in response to disturbance.

Ulva angusta, listed in 1976, is a synonym of *Ulva californica* (Tanner 1986). We did not observe specimens that we identified as *Ulva rigida*, which was listed in 1978. This genus in California needs work, including molecular data.

Phyllospadix torreyi Watson

With narrow (1 mm wide) leaves. Common in low pools; bearing characteristic epiphytes (*Smithora*, *Melobesia*). Listed as *Phyllospadix scouleri* in 1976-78 reports. Stewart (1991) says that *P. torreyi* alone dominates between Ocean Beach and Point Loma. We did not observe inflorescences (flower stalks) which are diagnostic.

HETEROKONTOPHYTA, CLASS PHAEOPHYCEAE

Colpomenia sinuosa (Mertens ex Roth) Derbès & Solier

Growing on coralline turf.

Colpomenia tuberculata Saunders

Not reported in 1976-78. Occasional in Zones 2 and 3; epiphytic on coralline turf. Distinctive thick, warty thallus.

Dictyopteris undulata Holmes

Occasional in low zone pools.

Egregia menziesii (Turner) Areschoug

Low zone, and in drift.

Eisenia arborea Areschoug

Juveniles occurred occasionally in low pools; adult thalli in drift.

Endarachne binghamiae J. Agardh

Narrow thalli were common in the high zone, on cliff and boulder faces and scattered through the middle zone. The medulla of a few wider specimens was checked to be sure that they were not *Petalonia fascia*; they were not.

Halidrys dioica Gardner

Some may confuse the vegetative portion of this species with *Cystoseira* species, although *Halidrys* typically in the low intertidal while *Cystoseira* is more characteristic of the shallow subtidal zone. We observed neither *C. osmundacea* nor *C. setchellii* in our surveys, although they may occur in water deeper than where we worked. The former was listed in 1976 and the latter in 1978.

Macrocystis pyrifera (L.) C. Agardh

Common in the drift. *M. integrifolia* was listed in 1976, but this species does not occur south of central California.

Pachydictyon coriaceum (Holmes) Okamura

This species and *Taonia lennebackerae* are the most common members of the Dictyotales at CNM. We found a few small specimens resembling *Dictyota flabellata* that were probably young *Pachydictyon*.

Pelagophycus porra (Leman) Setchell

Infrequent in the drift.

Petrospongium rugosum (Okamura) Setchell & Gardner

[*Cylindrocarpus rugosus* Okamura]

Soft, corrugated, dark brown crust in upper zone.

Pseudolithoderma nigrum Hollenberg

[*Pseudolithoderma nigra* Hollenberg]

Not reported in the 1976-78 lists, but certainly present at that time. This is a black, extensive/irregular, tightly adherent, thin crust that is common in the barnacle zone.

Pterygophora californica Ruprecht

In the drift, after a storm.

Ralfsia spp.

This represents a complex of brown crustose species, some of which are the alternate stage of upright phases (e.g., *Scytosiphon lomentaria*). We observed light brown and chocolate brown crusts.

Sargassum agardhianum J. Agardh

Infrequent, Zones 2-3. This species is highly seasonal, eroding back during the winter and growing in the late spring-summer.

Sargassum muticum (Yendo) Fensholt

Common in middle and low pools. This species is also seasonal, growing during the winter and eroding back to holdfasts in late summer-fall. It is non-native. It was reported from Quivera Basin, Mission Bay in 1958-59 (Stewart 1991). This could represent a separate introduction from the Puget Sound introduction described in Abbott & Hollenberg (1976).

Scytosiphon dotyi Wynne

Narrow tubular, unbranched thalli in small clusters in the upper zone, on cliff faces.

Silvetia compressa (J. Agardh) Serrão, Cho, Boo & Brawley

[*Pelvetia fastigiata* (J. Agardh) DeToni]

Forming canopies on middle zone rocks. Important habitat engineer, and susceptible to trampling damage.

Sphacelaria californica Sauvageau

Common on rock in shallow middle zone pools. This, the larger of the two species (tufts > 1 cm), can be conspicuous and is frequent.

Sphacelaria rigidula Kützing

[*Sphacelaria furcigera* Kützing]

This species is epiphytic, forming small (< 1 cm) tufts of filaments, usually on corallines. *Sphacelaria didichotoma* was listed in 1978; this report may well have represented *S. rigidula*, which is far more common in intertidal habitats (Stewart 1991).

Taonia lennebackerae J. Agardh

Listed as rare in 1976; frequent in 2005. Its occurrence is related to sand movement, so its populations may fluctuate year to year (Stewart 1991).

Zonaria farlowii Setchell & Gardner

Not reported in 1976-78. We found a single specimen in a low intertidal pool, although we expected to see more since it occurs in sand-influenced sites, as does *Taonia*.

RHODOPHYTA

Acrosorium ciliolatum (Harvey) Kylin

[*Acrosorium uncinatum* (Turner) Kylin, *Acrosorium venulosum* (Zanardini) Kylin]

Epiphytic on other seaweeds, and on rock, low zone and in drift.

Ahnfeltiopsis leptophylla P.C. Silva & DeCew

[*Gymnogongrus leptophyllus* J. Agardh]

Not reported in 1976-78. Occasional in sandy pools.

Amphiroa beauvoisii Lamouroux

[*Amphiroa zonata* Yendo]

Not reported in 1976-78. Rare; one specimen observed in Zone 2. Terete intergenicula, dichotomous branching. More common in warm-water years (Stewart 1991).

Bangia vermicularis Harvey

[*Bangia fusco-purpurea* (Dillwyn) Lyngbye]

Not reported in 1976-78. Fine dark red to brown-black hair-like thalli plastered in patches to upper zone rock walls. This species is a winter-spring annual in San Diego County (Stewart 1991).

Bossiella orbigniana ssp. *orbigniana* (Decaisne) Silva

Frequent in the low zone and subtidal (common in drift). These thalli are almost strictly dichotomous with a zig-zag outline – sharply pointed with gaps between successive intergenicula.

Stewart (1991) does not report *B. orbigniana* ssp. *dichotoma* from San Diego County; we suspect that the report of this taxon in 1976 can be included in *B. orbigniana* ssp. *orbigniana*.

Callophyllis violacea. J. Agardh

Not reported in 1976-78. Small thalli, usually epiphytic on corallines in the low zone. More common in the subtidal zone.

We observed no other species in the genus *Callophyllis*. Stewart (1991) reports only one subtidal specimen of *Callophyllis firma* (listed in 1976); she says that small, peltate subtidal thalli represent germlings of *Callophyllis flabellulata* or species in the Rhodymeniaceae. We cannot evaluate the 1976 report of *Callophyllis firma* in the absence of a voucher specimen.

Caulacanthus ustulatus (Mertens ex Turner) Kützing

Not reported in 1976-78; not in Abbott & Hollenberg 1976. Common in the upper zones and into the middle zone. Creeping, terete, brick-red axes with short pointed branches. This species is increasingly common in southern California, and recently observed in central and northern California.

Centroceras clavulatum (C. Agardh) Montagne

Common constituent of middle zone turf.

Ceramium sinicola Setchell & Gardner

Not reported in 1976-78. Epiphytic on *Codium fragile*; fully corticated.

Chondracanthus canaliculatus (Harvey) Guiry in Hommersand, Guiry, Fredericq & Leister

[*Gigartina canaliculata* Harvey]

Occasional, usually small thalli, in middle zone, especially under *Silvetia* and in pools and crevices.

Chondracanthus spinosus (Kützing) Guiry in Hommersand, Guiry, Fredericq & Leister

[*Gigartina spinosa* (Kützing) Harvey]

Not reported in 1976-78. Frequent, mostly under canopy of *Silvetia* or sides of rocks or in pools in middle and low zone.

Stewart (1991) considers this species, in its many forms, common in San Diego County (as did Dawson), while *C. tepida*, which it may resemble, is rare and inconspicuous. In the Herbarium of the Allan Hancock Foundation, there are many specimens of this species from the Gulf of California, but only 5 from California (Balboa Harbor, Orange County and the Long Beach breakwater). It is difficult to evaluate the 1976 report of *C. tepida* (as *Gigartina tepida*) without a voucher specimen.

Chondria acrorhizophora Setchell & Gardner

[*Chondria californica* (Collins) Kylin]

Epiphytic on *Phyllospadix*.

Chondria sp.

We agree with the 1976 report and Stewart (1991): Species in *Chondria* (*C. dasyphylla*, *C. oppositoclada*, *C. nidifica*) are difficult to distinguish.

Chondria nidifica Harvey

This robust and distinctive species is frequent in the low zone.

Corallina chilensis Decaisne

[*Corallina officinalis* var. *chilensis* (Decaisne) Kützing]

Occasional, low zone.

Corallina pinnatifolia (Manza) Dawson

This very abundant and polymorphic species, the foundation of the middle and low zone turfs, likely includes *C. polysticha* and *C. frondescens*, both listed in 1976 (Stewart 1991).

Corallina vanouveriensis Yendo

Part of the coralline turf, middle and low zones.

Corallophila eatoniana (Farlow) DeToni

[*Ceramium eatonianum* (Farlow) DeToni]

Common along the edges of pools, in middle zone turf.

Cryptopleura crista Kylin / *Cryptopleura corallinara* (Nott) Gardner

This species are very similar, both epiphytic on corallines and other seaweeds, with thin blades, microscopic veins, ruffled margins and tetrasporangia borne on the margins or on marginal proliferations (Stewart 1991). The type localities of both species are in San Diego County; *C. corallinara* is the older epithet.

C. rosacea was listed in 1978. Stewart (1991) says "...specimens similar to the forms described for *C. rosacea* are occasionally found; the collections we have seen probably represent dense clumps of *C. crista*. Published records for *C. rosacea* refer only to drift specimens at Carmel in central California."

Cryptopleura ruprechtiana (J. Agardh) Kylin

[*Botryoglossum farlowianum* (J. Agardh) DeToni]

Frequent in the drift..

Cryptopleura violacea (J. Agardh) Kylin

Epiphytic, but narrower, linear (ribbon-like), and lacking a ruffled margin (compared to *C. Cryptopleura corallinara* / *Cryptopleura crispera*). However, Abbott and Hollenberg (1976) mention that this species is “perhaps not clearly distinct from *C. crispera*”. This complex needs work!

Cumagloia andersonii (Farlow) Setchell & Gardner

In patches, on tops of boulders in the high zone (zone 1). In 1976, it was listed as occurring in the low intertidal in *Phyllospadix* pools. a very anomalous habitat. This report may be in error.

Dasya binghamiae A.J.K. Millar

[*Pogonophorella californica* (J. Agardh) P.C. Silva]

Occasional under *Phyllospadix*, in sand.

Erythrocytis saccata (J. Agardh) Silva

On *Laurencia pacifica*.

Erythroglossum californicum (J. Agardh) J. Agardh

[*Anisocladella pacifica* Kylin]

In *Phyllospadix* pools, in sand.

Gastroclonium compressum (Hollenberg) Chang & Xia

[*Coeloseira compressa* Hollenberg]

Gastroclonium parvum (Hollenberg) Chang & Xia

[*Coeloseira parva* Hollenberg]

We found it difficult to distinguish these species. Frequent, often with a white-ish iridescence; epiphytic on the middle and low turfs.

Gastroclonium subarticulatum (Turner) Kützing

[*Gastroclonium coulteri* (Harvey) Kylin]

Occasional, in pools in low zone.

Gelidium coulteri Harvey

Small thalli, in crevices and pools in the upper zone, and scattered into the middle zone. This species was added to the list in 1978.

Gelidium purpurascens Gardner

Not reported in 1976-78. Could be confused with *G. robustum*, which is generally larger, with large apices and naked lower axes. Low zone.

Gelidium pusillum (Stackhouse) LeJolie

Constituent of the middle zone turf.

Gelidium robustum (Gardner) Hollenberg & Abbott

Occasional in the low zone and in the drift.

Gymnogongrus chiton (Howe) P.C. Silva & DeCew in Silva

[*Gymnogongrus platyphyllus* Gardner]

Not reported in 1976-78. Flat, broad, dichotomous axes, with conspicuous nemathecium (fertile bumps); low zone.

Haliptilon gracile (Lamouroux) Johansen

[*Haliptylon*]

In pools, low zone.

Herposiphonia verticillata (Harvey) Kylin

Epiphytic on corallines and other seaweeds, low zone turf.

Heterosiphonia erecta Gardner

Occasional epiphyte, middle and low zones.

Hildenbrandia sp.

Uncalcified, dark red crusts, especially in upper pools.

Hypnea valentiae (Turner) Montagne

With spiny, terete (cylindrical) axes; abundant between June and October (Stewart 1991).

H. johnstonii was listed in 1978; it has not been found in San Diego County, according to Stewart (1991).

Hypnea variabilis Okamura

With narrow, flattened (compressed) axes. Considered rare by Stewart (1991).

Jania crassa Lamouroux

Occasional in pools, middle and low zones. We would expect to see *Janai tenella*, listed in 1976, as well but did not during these surveys.

Laurencia masonii Setchell & Gardner

Stewart (1991) includes this species in her circumscription of *L. pacifica*. We distinguish *L. masonii* on the basis of its longer, less branched/congested branches, especially in the lower portion. Its anatomy (medullary thickenings) is distinctive in some cases.

Laurencia pacifica Kylin

Common in the middle and low zones.

Laurencia subopposita (J. Agardh) Setchell

Occasional, on other seaweeds and *Phyllospadix*; low zone.

Leptocladia binghamiae J. Agardh

Collected in the drift.

Lithophyllum neofarlowii Setchell & Mason

[*Pseudolithophyllum neofarlowii* (Setch. & Mason) W.H. Adey]

Not reported in 1976-78 but probably present. Pale lavender calcified crust, growing in upper zone tide pools and crevices.

Lithothrix aspergillum Gray

Occasional in pools and turf, low zone.

Lomentaria hakodatensis Yendo

Not reported in 1976-78. However, the description of *Binghamia californica* in the 1978 list is very similar to that of *Lomentaria* and does not resemble *B. californica*, which, according to Stewart (1991), does not occur in San Diego County. *Binghamia forkii* is reported to be common in the San Diego area (Stewart 1991), but this species is conspicuously flattened rather than filiform, as is stated in the 1978 description. We did not encounter *Binghamia*.

Pink-orange tubular thalli without septa, irregularly branched but often with apices shaped like saguaro cacti. Tiny, creeping, epiphytic on middle zone algal turfs. Non-native.

Mazzaella affinis (Harvey) Fredericq in Hommersand, Guiry, Fredericq & Leister

[*Rhodoglossum affine* (Harvey) Kylin]

Small thalli, occasional at the bases of boulders, in crevices, middle and low zones.

Mazzaella leptorhyncus (J. Agardh) Leister in Hommersand, Guiry, Fredericq & Leister
[*Gigartina leptorhynchus* J. Agardh]

Mostly small thalli, occasional at the bases of boulders, in crevices, middle and low zones.

Melobesia marginata Setchell & Foslie

Not reported in 1976-78. Small, calcified crusts on low zone species, especially *Osmundea*.

Melobesia mediocris (Foslie) Setchell & Mason

Common pink, calcified crust on *Phyllospadix* leaves.

Nienburgia andersoniana (J. Agardh) Kylin

Not reported in 1976-78. Low zone; creeping, forming upright thin pink blades with distinct midribs and dentate margins.

Ophiocladus simpliciusculus (Crouan & Crouan) Falkenberg

Not reported in 1976-78. Part of the mixture of epiphytic filaments (with *Polysiphonia*, *Herposiphonia*, *Centroceras*), occurring in the middle and low zone turfs. Resembles *Polysiphonia*, but with 16-18 pericentral cells and 2-3 tetrasporangia per segment..

Osmundea spectabilis var. *diegoensis* (Dawson) Nam

[*Laurencia spectabilis* var. *diegoensis* Dawson]

O. spectabilis exhibits a morphological cline from north to south. Most specimens (including our vouchers) fit the description of var. *diegoensis*, with narrow, irregular thalli, but some grade into *O. spectabilis* var. *spectabilis* (Postels & Ruprecht) Nam, a form common in the north and in upwelling areas south of Point Conception.

Osmundea sinicola (Setchell & Gardner) Nam

[*Laurencia sinicola* Setchell & Gardner]

Common in the middle zone turf.

Plocamium pacificum Kylin

[*Plocamium cartilagineum* (Linnaeus) P.S. Dixon; *Plocamium cartilagineum* ssp. *pacificum* Silva]

Frequent in *Phyllospadix* pools.

Polysiphonia scopulorum var. *villum* (J. Agardh) Hollenberg

Forming short velvety mats on rock in the middle zone.

Polysiphonia spp.

At least two other species of *Polysiphonia* are present, but we did not collect vouchers.

Porphyra perforata J. Agardh

Not reported in 1976-78. Small blades growing on rock in the upper zone.

Porphyrella californica was listed in 1978 as growing on “upper intertidal barnacle rocks” in the spring of 1977. This species, occurring on mussels and gooseneck barnacles, was tentatively identified in areas where *P. perforata* grew on rocks San Diego County by Stewart (1991). The specimens reported in 1978, growing on rock, may represent *P. perforata*.

Prionitis angustata (Okamura) Okamura

Not reported in 1976-78. Resembles *Carpopeltis*, but with broader axes, not crisped. Regularly dichotomous, dark brown-red, flattened axes, short internodes; low zone. This fits the description in Abbott & Hollenberg (1976), but may not be the *P. angustata* of Japan. It is a recognizable entity throughout the Southern California Bight, especially in warmer parts (including islands). Needs work.

Prionitis lanceolata (Harvey) Harvey

In low pools and subtidal (in drift). Polymorphic.

Pterocladia capillacea (S.G.Gmelin) Santelices & Hommersand

[*Pterocladia capillacea* (S.G.Gmelin) Bornet]

Common in middle zone pools, under *Silvetia*, and in the low zone.

Pterosiphonia baileyi (Harvey) Falkenberg

Occasional in the low zone.

Pterosiphonia dendroidea (Montagne) Falkenberg

Inconspicuous but frequent, especially associated with *Phyllospadix* and middle-low zone turf.

Rhodymenia californica Kylin

Narrow, regularly dichotomous blades. Low zone, on the shaded sides of boulders.

Rhodymenia pacifica Kylin

Broader blades, blunt apices; low zone, on the shaded sides of boulders.

Schizymenia pacifica (Kylin) Kylin

Not reported in 1976-78. Single specimen from face of boulder on the southern edge of Zone 1, low. Slippery, brown-red, entire blade, without a stipe. Gland cells evident as tiny bright spots with hand lens.

Scinaia confusa (Setchell) Huisman

[*Pseudogloiophloea confusa* (Setchell) Levring]

Not reported in 1976-78. Single specimen collected in low pool in Zone 1. Small, regularly dichotomous, tubular thallus, dark red.

Smithora naiadum (Anderson) Hollenberg

On *Phyllospadix* leaves; reduced to small brown basal cushions in some seasons.

Spyridia filamentosa (Wulfen) Harvey

Not reported in 1976-78. Patchy but locally abundant, especially in warm-water periods (Stewart 1991). Deep red, fuzzy-looking because of abundant, short branches.

Tiffaniella snyderae (Farlow) Abbott

Not reported in 1976-78. Frequent in filamentous patches in *Phyllospadix* pools or as an epiphyte in middle and low turfs.

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