A Guide to the
PLANT & ANIMAL DEBRIS
of **southern California sand beaches**

Robert Perry - UCLA OceanGLOBE & Malibu High School
with original illustrations by Hayley O'Neill

name_____

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Image Citations:

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Distribution Maps for Angiophytes (page 3): USDA, NRCS. 2002. The PLANTS Database, Version 3.5 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

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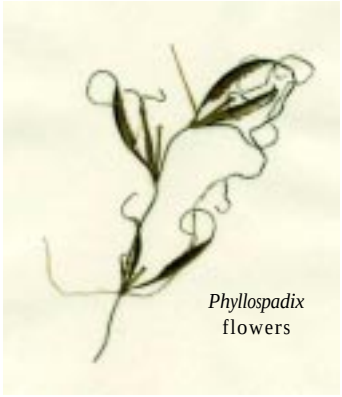
KINGDOM PLANTAE:
DIVISION ANGIOPHYTA

(mostly terrestrial; only 2 marine species in Calif; flowering plants - roots, stems, leaves, flowers, seeds)



Phyllospadix torreyi
Seagrass or Surf Grass

(lives in between rocks in intertidal zone 4 and shallow subtidal areas)

Zostera marina
Eel Grass

(lives in sheltered subtidal sand areas)

DIVISION CHLOROPHYTA

(mostly freshwater; a few species live in shallow ocean waters)

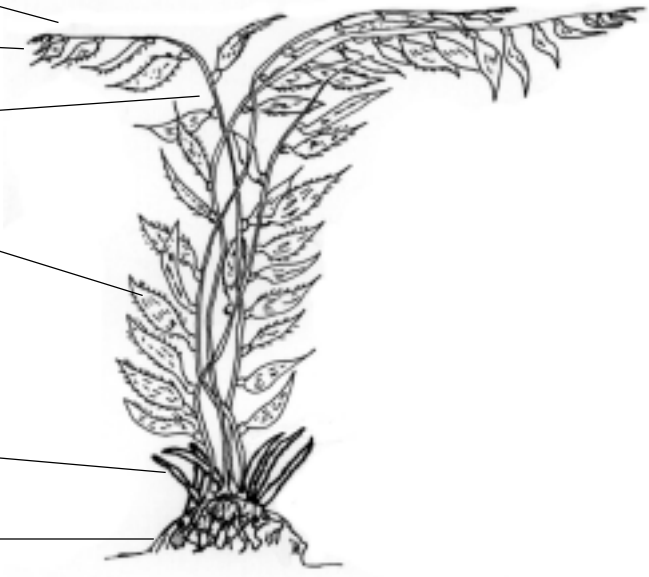
Ulva californica
Sea Lettuce

Enteromorpha ***intestinalis***
String lettuce or sea "hair"

Codium fragile
Spongeweed, or
Dead Man's Fingers

DIVISION PHAEOPHYTA

(“brown algae,” the largest plants in the sea; the kelps)



Macrocystis pyrifera
Giant Kelp

(Grows attached to subtidal rocks to form its own rich ecosystem; during storms, pieces drift ashore on our sand beaches)

Macrocystis - holdfast on rock

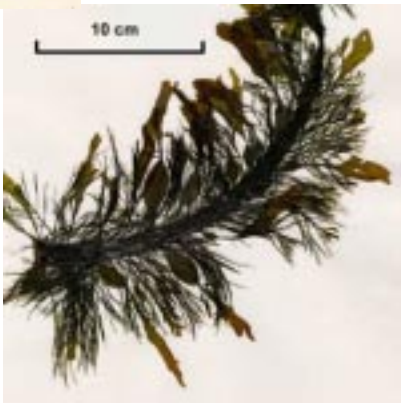
Macrocystis - stipes with fronds

Macrocystis - fastest growing apical fronds

Macrocystis - stipe with fronds

Macrocystis - reproductive sporophylls

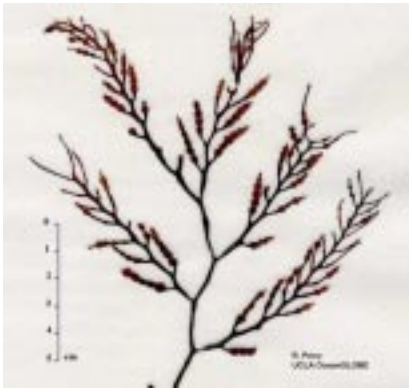
DIVISION PHAEOPHYTA - continued
("brown algae," the largest plants in the sea; the kelps)



Egregia spp.
Ribbon Kelp or
Feather Boa Kelp

Cystoseira base

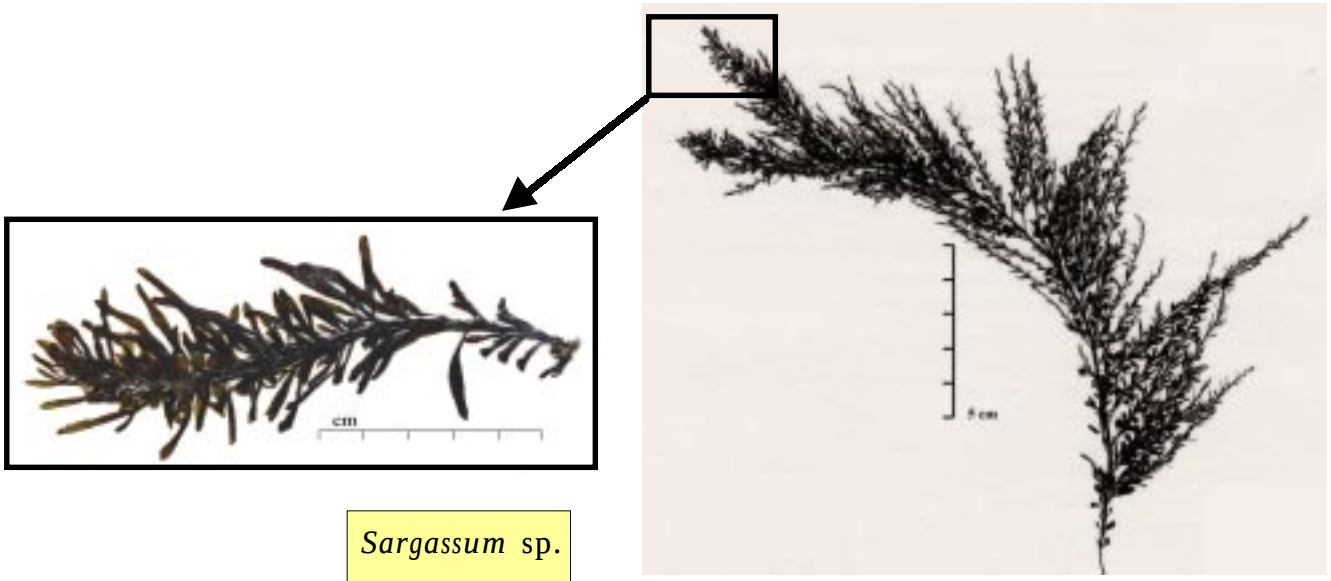
Cystoseira top



Cystoseira osmundacea
Bladder Chain Kelp

DIVISION PHAEOPHYTA - continued

(“brown algae,” the largest plants in the sea; the kelps)



Sargassum sp.

DIVISION RHODOPHYTA

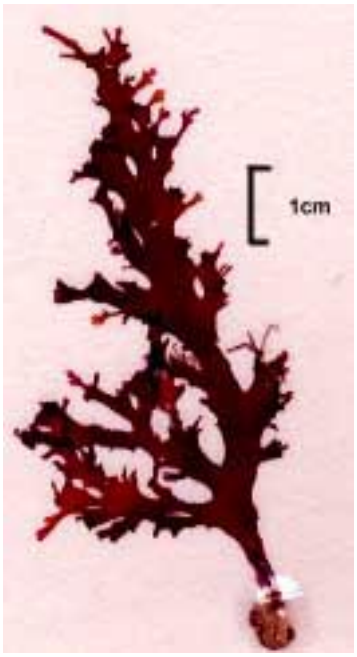
("red algae," in the sea; medium sized)

Two crunchy calcified rhodophytes

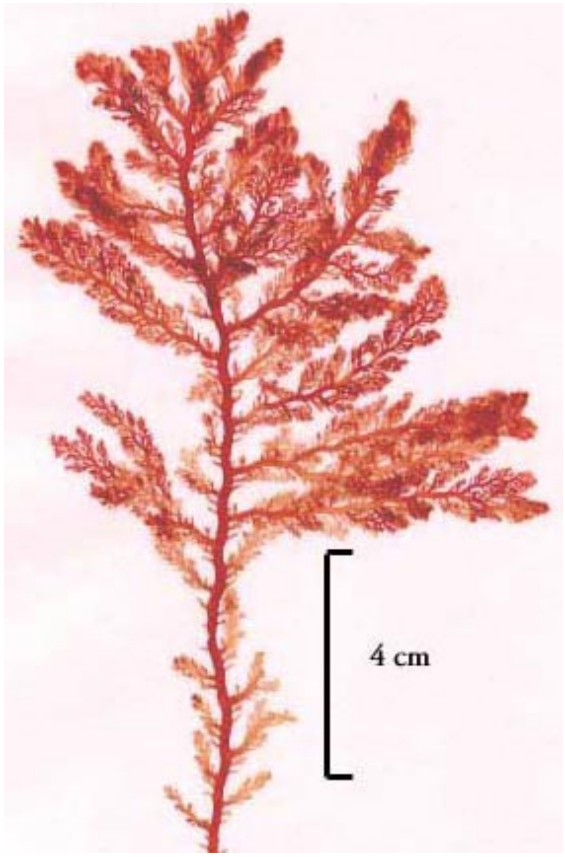
Bossiella californica

Calliarthron sp.

Gigartina spinosa



Callophyllis spp.



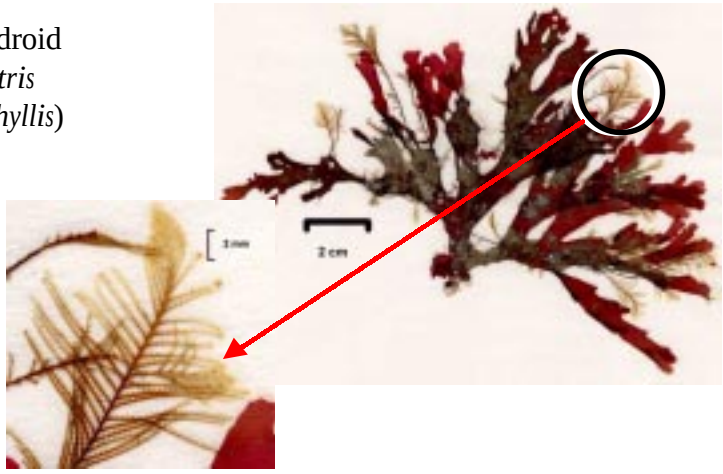
Microcladia spp.

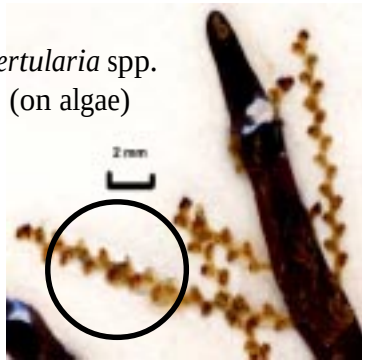
Pterocladia spp.

KINGDOM ANIMALIA:
PHYLUM CNIDARIA
CLASS HYDROZOA

(Hydroids are colonial cnidarians that attach to rocks, shells and seaweed; mark species but do not attempt to count numbers.)

"Ostrich Plume" Hydroid
Aglaophenia latirostris
(on red algae, *Callophyllis*)





Sertularia spp.
(on algae)

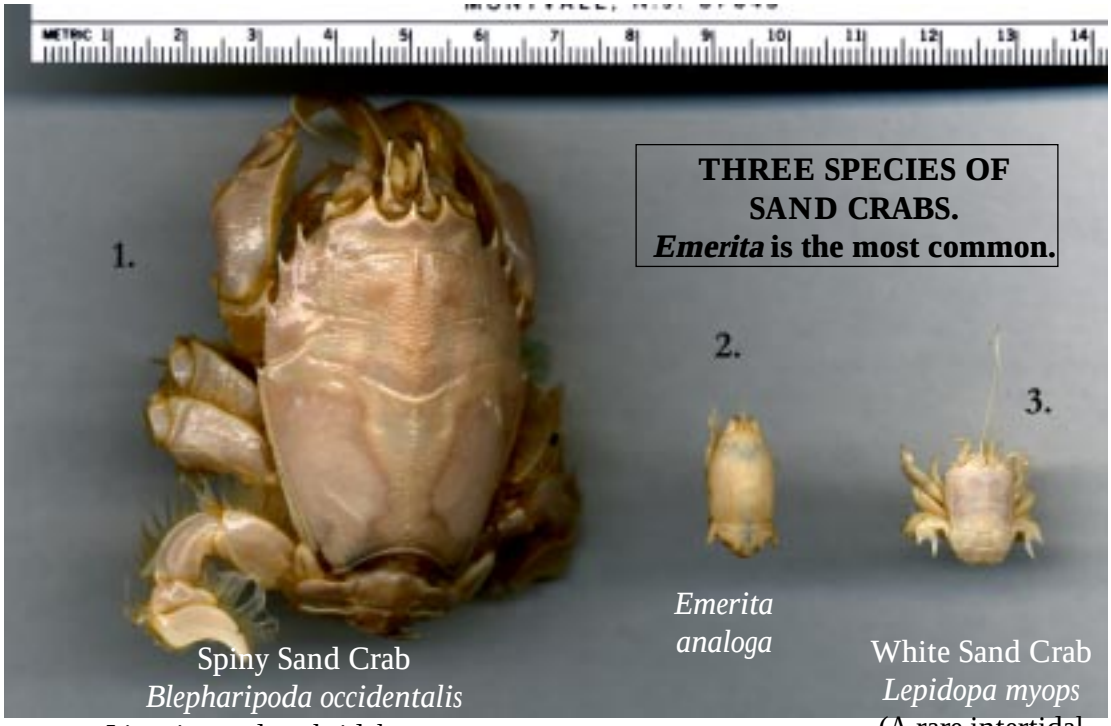
Obelia spp.
(on algae)

PHYLUM CNIDARIA
CLASS SCYPHOZOA

Purple Jelly
Pelagia colorata
(Scyphozoans, or "jellies" are one group of the many gelatinous planktonic animals that wash up on the beach.)

PHYLUM ARTHROPODA
CLASS CRUSTACEA
(crabs, shrimps, lobsters, barnacles, not to mention lots of zooplankton)

Grey or "mole"
sand crab
Emerita analoga
(Like all crustaceans,
it sheds its exoskeleton
to grow. These "moults"
are bleached white
by the sun.)
Seasonally the most abundant
species of the sandy intertidal
macrofauna.



Spiny Sand Crab
Blepharipoda occidentalis
Lives in sandy subtidal zone one
where it eats *Emerita*.

White Sand Crab
Lepidopa myops
(A rare intertidal
species.)

Pelagic "stalked" Barnacles
Lepas spp.
(Attached to drift *Macrocystis*)

misc. Barnacles
Balanus spp.

PHYLUM MOLLUSCA
CLASS GASTROPODA
(marine snails)

Purple Olive - *Olivella biplicata*
Lives in Subtidal Zone One of sand beaches.

California cone - *Conus californicus*
(another carnivore)

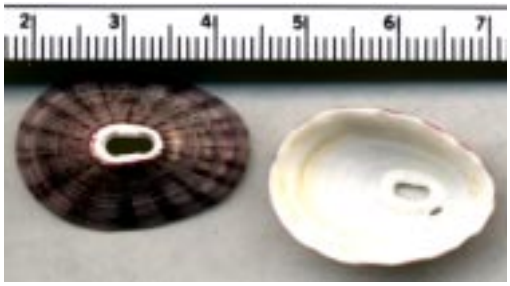
Worm shells (or tube snails) - *Serpulorbis squamigerus*

Slipper shell - *Crepidula* sp.

Carpenter's Turret - *Megasercula carpenterianus*
Lives in Subtidal Zone Three of sand beaches.

Owl Limpet - *Lottia gigantea*

Brown Turban or
"Kelp snail"
Norrisia norrisii



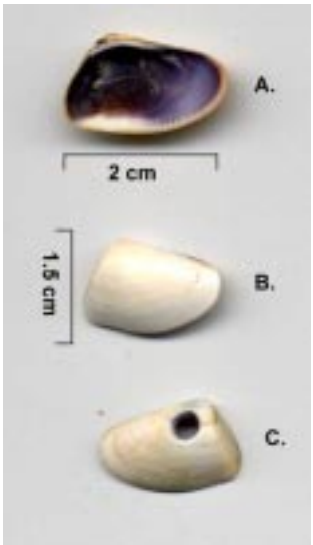
Volcano Limpet - *Fissurella volcano*

PHYLUM MOLLUSCA
CLASS GASTROPODA
(marine snails, continued)

Moon Snail - *Pollinices* sp.

A carnivore that lives in Subtidal Zones Two & Three of sand beaches.
(See the circular hole in *Donax gouldii* below? It was drilled by *Pollinices* !)

PHYLUM MOLLUSCA
CLASS BIVALVIA
(clams, mussels, oysters, scallops, etc.)



Bean Clam - *Donax gouldii*
Lives in low intertidal
zone of sand beaches.

THESE ARE THE TWO MOST COMMON SANDY BEACH BIVALVES

Pismo clam - *Tivela stultorem*
Shells are very thick and heavy.
Juveniles live in low intertidal, adults in
Subtidal Zone One of sand beaches.

PHYLUM MOLLUSCA
CLASS BIVALVIA
(clams, mussels, oysters, scallops, continued)

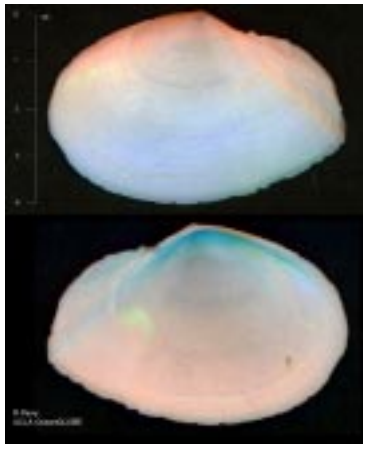
Pacific Calico Scallop
Argopecten ventricosus
(fresh shells are orange-tan)

Purple-hinged or giant rock scallop - *Crassidoma gigantea*
*(*formerly *Hinnites multirugosus)*

Bay Mussel
Mytilus edulis

California Mussel
Mytilus californianus

Littleneck clam
Protothaca staminea
(a juvenile is shown here)



White sand clam - *Macoma secta*
(shell is very thin & fragile)

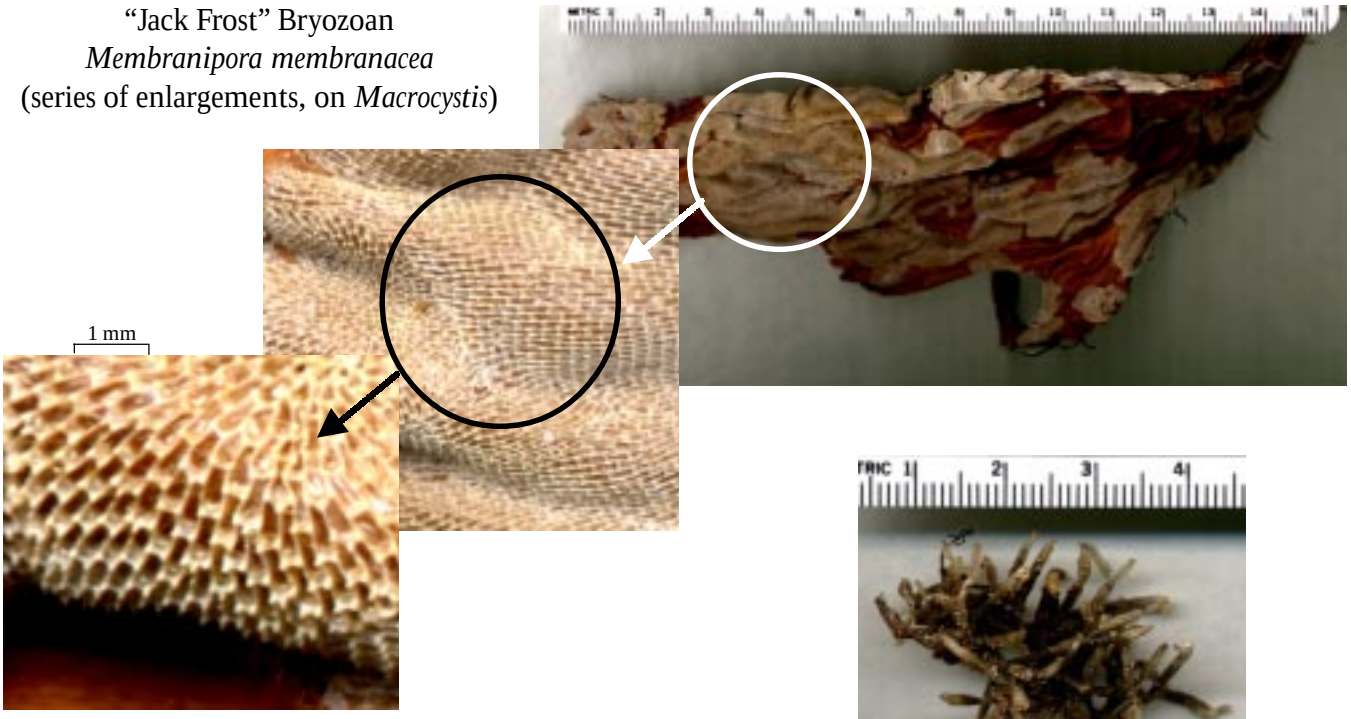
"Secret Jewelbox"
(rock oyster)
Chama arcana

PHYLUM BRYOZOA
(also known as ECTOPROCTA)

(Bryozoans are colonial benthic animals; individuals live in box-like zoecia; mark species but do not attempt to count numbers.)

Bugula neritina
(often mistaken for a seaweed)

“Jack Frost” Bryozoan
Membranipora membranacea
(series of enlargements, on *Macrocystis*)



Thalmoporella californica

PHYLUM ECHINODERMATA
(Sea stars, urchins, sand dollars, sea cucumbers, etc.)

Western Sand Dollar
Dendraster excentricus
Dominant species of sandy subtidal Zone Two.
(photo of tests; live animal has tiny purple spines.)

Purple Sea Urchin
Stongylocentrotus purpuratus
(photo of tests; live animal has long purple spines.)

PHYLUM CHORDATA - SUBPHYLUM UROCHORDATA - ORDER SALPIDA
(Salps)

Cyclosalpa affinis
Salps are one group of the many gelatinous planktonic animals that wash up on the beach.

This was a fragment of *Cyclosalpa*------>