Station List—Collecting Trip
To Washington, Oregon,
California and Baja California,

JR-1-78  June 11, 1978 - 1:00 P.M.
Puget Sound
Lincoln Park
Seattle, King County
Washington

Cobble beach between Point Williams and Brace Pt.; low tide, 0.8' at 1:16 P.M. - at Seattle - Vashon Id, ferry terminal.
ca. 47.28 N; 122.20 W

JR-2-78  June 12, 1978 - 8:00 A.M.
Puget Sound
Port Townsend
Jefferson County
Washington

Opposite Port Townsend Motel off State Route 20;
Cobble - boulder beach; area is at mouth of Puget Sound where it flows into Strait of Juan de Fuca water temp. 14°C, Salinity 27%.
48.07 N; 122.46 W

JR-3-78  June 12, 1978 - 12:30 P.M.
Strait of Juan de Fuca
Sekiu
Clallam County
Washington

low tide 11:15 A.M. Water temp. 18°C, Salinity 28%.
Littorina from rocky breakwater - on rocks and seaweed.
48.16 N; 124.18 W

JR-4-78  June 12, 1978 - 1:30 P.M.
Strait of Juan de Fuca
about 4-5 miles west of Sekiu
Clallam County, Washington
rising tide, rocky beach
ca. 48.16 N; 124.19 W
-2-

JR-5-78 June 12, 1978 - 2:45 P.M.
Strait of Juan de Fuca
Neah Bay
Clallam County
Washington

rocky shore, west side of bay, Fucus; water temperature 18°C, salinity 26%.
48.22 N; 124.37 W

JR-6-78 June 13, 1978 - 10:30 A.M.
Mouth of Grays Harbor
Point Chehalis
Westport
Grays Harbor County
Washington

rocky revetment and groin, south entrance to Grays Harbor;
low tide at 12:00 Noon
ca 46.53 N; 124.06 W

JR-7-78 June 13, 1978 - 12:00 Noon - 12:30 P.M.
south side Grays Harbor, 1/4 mile west of Elk River
Bridge on state route 105
south of Westport
Grays Harbor County
Washington

Salt/Salicornia Marsh; few Alexia at bases of plants in mud, no littorina, water temperature 20°C, salinity 16%.
ca 46.48 N; 124.03 W

JR-8-78 June 13, 1978 - 12:30 P.M. - 1:30 P.M.
mouth of Elk River, south of bridge over state route 105
Grays Harbor, south of Westport
Grays Harbor County
Washington

edge of tidal river channel; Salicornia marsh with Fucus at margin near channel. Littorina and eggs from on and under Fucus and on mud beneath. Salinity 16%.
ca 46.48 N; 124.03 W
JR-9-78  June 13, 1978 - 4:00-4:30 P.M.
Willapa Bay, off State Route 101
about 6 miles N.E. of Ilwaco
Pacific County
Washington

stony beach margin of bay Littorina and eggs associated
with Fucus
c
61.19 N; 124.03 W

JR-10-78  June 14, 1978 - 9:00 A.M.
Pacific Ocean
Cape Meares
Tillamook County
Oregon

outer coast, high energy beach, large cobbles; no
Littorina seen; goose barnacles, Physalia stranded on beach.
c
55.29 N; 123.59 W.

JR-11-78  June 14, 1978 - 9:45 A.M.
Tillamook Bay (outer-west-side)
west of Bay City and between Tillamook and Cape Meares
Tillamook County
Oregon

rocks, muddy shore with Fucus patches and Salicornia, at base
of jetty and near mouth of Tillamook River
no Littorina, Salinity 1%.
c
55.30 N; 123.53 W

JR-12-78  June 14, 1978 - 10:15 A.M.
Tillamook Bay - outer (west) side
west of Bay City
Tillamook County
Oregon

about 1/4 mile out on jetty from stall.; rocks, boulders
with Fucus - low salinity Littorina and eggs, few Mytilus,
isopods, dead Mya.  Salinity 0%.
c
55.30 N; 123.53 W
JR-13-78 June 14, 1978 - 12:00 Noon
Netarts Bay
Netarts
Tillamook County
Oregon
just south of City; rocky fill on shore side (inside) of bay. *Littorina scutulata* on and under rocks; water temperature 15°C; salinity 15%.
45.26 N; 123.57 W

JR-14-78 June 14, 1978 - 2:15 P.M.
Siletz Bay
just South of Lincoln City
Lincoln County
Oregon
near mouth of Siletz Bay on rocky promontory just South of river, low tide (low tide was about 1:00 P.M.)
*L. sitchana* and low salinity form, *L. scutulata*, banded form from on and under rocks
44.59 N; 123.59 W

Pacific Ocean
Sunset Bay State Park
South west of Charleston, ca. 2 miles
Coos County
Oregon
*Littorina scutulata* from rocks from mid-tide line to 6-8 feet above High tide line; larger specimens higher on shore; *Fucus* and *Ulva*; *Tegula "Murex", Anemones, crabs etc. in pools; salinity 25% (*L. sitchana* and *L. planaxis* not seen although were reported by S. Behrens to have distributional end points here).
ca. 43°.20; 124.18 W

JR-16-78 June 15, 1978 - 11:30-12:15 P.M.
Pacific Ocean
South cove, Cape Arago State Park
cia. 5 miles southwest of Charleston
Coos County
Oregon
*Littorina scutulata* from rocks, abundant stranded *Physalia* low tide ca. 12:30 P.M.
ca. 43°.20 N, 124.18 W
JR-17-78  June 15, 1978 - 2:30 P.M.
Pacific Ocean at Mouth of Coquille River, north jetty
Bandon
Coos County
Oregon

Littorina scutulata, Thais on rocks
43.07 N; 124.25 W

JR-18-78  June 15, 1978
Pacific Ocean
1-2 miles south of Port Orford
Curry County
Oregon

Littorina scutulata only on rocks; salinity 33%
42.45 N; 124.30 W

JR-19-78  June 15, 1978
Pacific Ocean
near Lighthouse Point, Crescent City
Del Norte County
California

Littorina scutulata from rocks on rising tide Salinity 33%
41.45 N; 124.12 W

JR-20-78  June 16, 1978 - 9:15 A.M.
Pacific Ocean
near Lagoon Creek, ca 15 miles South of Crescent City on
US Route 101
Del Norte County
California

Littorina scutulata, only, on rocks
ca. 41°.35 N; 124°.10 W

JR-21-78  June 16, 1978 - 10:30 A.M.
Pacific Ocean
1 mile southwest of Orick
Humboldt County
California

Littorina scutulata only on large rocks at south end of
beach; on ocean side of US route 101 across road from
freshwater lagoon.
41.17 N; 124.04 W
JR-22-78  June 16, 1978 - 11:45 A.M.
Pacific Ocean
Trinidad State Park, Trinidad
Humboldt County
California

Ocean beach; **Littorina scutulata** from rocks covered with seaweed.
ca. 41°10' N; 124.08 W

JR-23-78  June 16, 1978 - 12:15 P.M.
Bay side of point
Trinidad State Park, Trinidad
Humboldt County
California

**Littorina scutulata** from rocks
ca. 41°10' N; 124.08 W

JR-24-78  June 16, 1978 - 2:45-4:15 P.M.
West side Humboldt Bay
about 1 mile north of Samoa
Humboldt County, California

along *Salicornia* marsh fringe and mud interface;
**Littorina newcombiana, alexia** some *L. scutulata* at base of plants and under *Fucus* — Salinity 25% on damp mud.
ca. 40.47 N; 124.11 W

JR-25-78  June 17, 1978
Pacific Ocean
about 4 miles, North at Bodega Bay on State Route 1
Sonoma County
California

**Littorina scutulata** only on rocks
ca. 38°15' N; 123.05 W.

JR-26-78  June 17, 1978
Pacific Ocean
about 15 miles north of Sausalito and south east of Bolinas, on inlet along State Route 1
Marin County
California

**Littorina scutulata** only on and under small stones and cobbles.
ca. 37.54 N; 122.42 W
JR-27-78 June 18, 1978
West side San Francisco Bay
along U.S. Route 101, about 1 mile North of Oyster
Point and ca 2 miles south San Francisco city line.
San Mateo County
California
falling tide; *Littorina scutulata* on and under rocks
along water line; salinity 25%.
ca 37.41 N; 122.24 W

JR-28-78 June 18, 1978 - 5:00 P.M.
Mouth of San Francisco Bay
Fort Point, at south end Golden Gate Bridge, San Francisco
San Francisco County, California
high energy beach; *Littorina scutulata* from rocks,
sparse; salinity 30%
37.48 N; 122.28 W

JR-29-78 June 19, 1978 - 8:30 A.M.
San Francisco Bay, under Bay Bridge
West side Treasure Island,
San Francisco County
California
on algae covered rocks: *L. scutulata*, *Thais* sp.; high energy
coast; mid tide, rising; on Naval Base
37.50 N; 122.22 W

JR-30-78 June 19, 1978 9:00 A.M.
San Francisco Bay, under Bay Bridge
East Side Treasure Island
San Francisco County
California
algae covered rocks (*Fucus*) and under rocks; protected
side of island; *Littorina scutulata* under rocks and on
*Fucus*
37.50 N; 122.22 W

JR-31-78 June 19, 1978 - 12:00 Noon
Monterey Bay
rock jetty, south entrance harbor
Moss Landing
Monterey County
California
Littorina planaxis, First seen here, on damp boulders at top of tide line in spray zone; tide falling, low at 2:30 P.M. salinity 36 %.
36.48 N; 121.47 W

JR-32-78 June 19, 1978 - 4:00 P.M.
Pacific Ocean
Asilomar State Beach
West at Pacific Grove
Monterey County
California

Littorina scutulata from mid to upper tide level; Littorina planaxis in upper tide level to Spray zone above high tide line—on granitic multitexured rock—animals showing color and marking variations adaptive to substrate ca. 36.38 N; 121.56 W

JR-33-78 June 20, 1978 - 1:00 P.M.
(1-3)
Pacific Ocean
on rock jetty just south of Morro Rock
Morro Bay
San Luis Obispo County
California

substation
1: - from beach side of jetty, mid and high tidal levels
" 2: - from top and outside of jetty in ocean spray zone
" 3: - from low tide line on rocks where very young, probably recently meta morphosed Littorina (2 species) living. about low tide - 35.22 N; 120.51 W

JR-34-78 June 20, 1978 - 4:00-5:00 P.M.
Pacific Ocean
Shell Beach, south part of town
San Luis Obispo County
California

Littorina scutulata and L. planaxis on rocks rising tide - 35.09 N; 120.40 W
JR-35-78 June 21, 1978 - 10:00 A.M.
Pacific Ocean
El Capitan Beach State Park
ca 15 miles west of Santa Barbara
Santa Barbara County
California
on rocks in spray and upper intertidal zone; nearly
high tide; Salinity 31%.
37.43 N; 119.38 W

JR-36-78 June 21, 1978 - 12:00 Noon
Pacific Ocean
South end of State Beach, Carpinteria
Santa Barbara County
California
Littorina scutulata and L. planaxis from rocky outcrop,
falling tide
34.24 N; 119.31 W

JR-37-78 June 22, 1978 - 12:00 Noon
Pacific Ocean
South of State Beach, jetty at entrance to lagoon, Carlsbad,
San Diego County
California
33.10 N; 117.21 W

JR-38-78 June 22, 1978 2:30 - 3:30 P.M.
Pacific Ocean
Ocean side, tide pool area,
Point Loma, San Diego County
California
Littorina scutulata and L. planaxis in spray zone; some
L. planaxis ca 30 feet above water on vertical cliff face,
in spray zone and in pock holes in rock
32.41 N; 117.14 W
JR-39-78 June 24, 1978 - 7:00 P.M.
Bahia De La Paz (east side)
about 4 miles north of La Paz
Baja California Sur
Mexico

Route Mex 11., on shore rocks just above water *Littorina penicillata* and *Nerita*
24.10 N; 110.18 W

JR-40-78 June 25, 1978 - 5:30 P.M.
Bahia De La Paz (south side)
about 8 miles west of La Paz
El Centenario
Baja California Sur
Mexico

Route Mex. 1, west of La Paz; pebble and sand conglomerate shore, low tide, dead shells only, no *Littorina*.
ca 24.10 N; 110.18 W

JR-41-78 June 26, 1978 12:00 Noon - 1:30 P.M.
Pacific Ocean
Punto Lobos Beach, about 2.5 miles south of Todos Santos, beyond end of paved road Mex. 9.
Baja California Sur
Mexico

*Littorina modesta, pullata, penicillata, and aspera* in crevices of rocky promontory at south end of beach
ca 23.27 N; 110.13 W

JR-42-78 June 26, 1978
Pacific Ocean
San Pedrito, ca 4.3 miles south of Todos Santos, beyond end of paved road, Mex. 9.
Baja California Sur
Mexico

4 species of *Littorinidae*, as in JR-41-78, actively crawling in surf; rocky headland at south end of beach; nearly high tide-Salinity 34% in open surf; 12% in hypo saline lagoon behind beach
ca 23.27 N; 110.13 W
JR-43-78 June 27, 1978
Bahia de Palmas, Gulf of California
Los Barriles
Baja California Sur
Mexico

large boulders scattered on sandy beach, *Littorina penicillata* on sunny side of rocks; *Siphonaria* with spiral egg masses on wave-splashed rocks—egg masses about 1" across (Kodachromes taken).
23.39 N; 109.42 W

JR-44-78 June 27, 1978 - 11:45 A.M.
Bahia San Lucas
Cabo San Lucas
Baja California Sur
Mexico

on jetty near ferry landing and next to canning factory.
4 species of *Littorina* on rocks and in cracks of rocks;
*L. pullata* in wetter situations
22.53 N; 109.54 W

JR-45-78 June 27, 1978 1:00-2:00 P.M.
Pacific Ocean, public beach between Cabo San Lucas and San Jose Del Cabo
Baja California del Sur
Mexico

4 species of *Littorina* on rocks
ca 22.53 N; 109.54 W

JR-46-78 June 29, 1978 – 8:30 - 10:00 A.M.
Bahia De La Paz
Public Beach north of Pichilingue
about 11 miles North of La Paz
Baja California del Sur
Mexico

*Littorina penicillata*, *Littorina* sp., and various other mollusks from rocks on, under and in cracks) along rocky headland north of beach; many *Nerita* eggs. Few mangroves with few *L. penicillata* at base of trunk.
Salinity 32-33%.
24.15 N; 110.20 W
JR-47-78  June 29, 1978 - 11:00 A.M.
Bahia De La Paz
about 2 miles south of Pichilingue
Baja California Sur
Mexico
sheltered bay with mangrove fringe;
Littorina penicillata rare on rocks
salinity 35%
ca 24.15 N; 110.20 W

JR-48-78  June 29, 1978 - 12:00 Noon
Same locality as JR-39-78
24.10 N; 110.18 W

JR-49-78  June 29, 1978
south side Bahia De La Paz
ferry dock, end Sinaloa St.
La Paz
Baja California Sur
Mexico
Pecten Shells from fishery; Salinity 33%
ca 24.10 N; 110.18 W
Station List-Collecting Trip
To Washington, Oregon,
California and Baja California,

JR-1-78 June 11, 1978 - 1:00 P.M.
Puget Sound
Lincoln Park
Seattle, King County
Washington
Cobble beach between Point Williams and Brace Pt.; low
tide, 0.8' at 1:16 P.M. – at Seattle - Vashon Id. ferry
terminal.
ca. 47.28 N; 122.20 W

JR-2-78 June 12, 1978 - 8:00 A.M.
Puget Sound
Port Townsend
Jefferson County
Washington
Opposite Port Townsend Motel off State Route 20;
Cobble – boulder beach; area is at mouth of Puget
Sound where it flows into Strait of Juan de Fuca water
temp. 14°C, Salinity 27%.
48.07 N; 122.46 W

JR-3-78 June 12, 1978 - 12:30 P.M.
Strait of Juan de Fuca
Sekiu
Clallam County
Washington
low tide 11:15 A.M. Water temp. 18°C, Salinity 28%.
Littorina from rocky breakwater – on rocks and seaweed.
48.16 N; 124.18 W

JR-4-78 June 12, 1978 - 1:30 P.M.
Strait of Juan de Fuca
about 4-5 miles west of Sekiu
Clallam County, Washington
rising tide, rocky beach
ca. 48.16 N; 124.19 W
JR-5-78  June 12, 1978 - 2:45 P.M.
Strait of Juan de Fuca
Neah Bay
Clallam County
Washington
rocky shore, west side of bay Fucus; water temperature 18°C, salinity 26%.
48.22 N; 124.37 W

JR-6-78  June 13, 1978 - 10:30 A.M.
Mouth of Grays Harbor
Point Chehalis
Westport
Grays Harbor County
Washington
rocky revetment and groin, south entrance to Grays Harbor; low tide at 12:00 Noon
ca 46.53 N; 124.06 W

JR-7-78  June 13, 1978 - 12:00 Noon - 12:30 P.M.
south side Grays Harbor, 1/4 mile west of Elk River Bridge on state route 105
south of Westport
Grays Harbor County
Washington
Salt/Salicornia Marsh; few Alexia at bases of plants in mud, no Littorina, water temperature 20°C, salinity 16%.
ca 46.48 N; 124.03 W

JR-8-78  June 13, 1978 - 12:30 P.M. - 1:30 P.M.
mouth of Elk River, south of bridge over state route 105
Grays Harbor, south of Westport
Grays Harbor County
Washington
edge of tidal river channel; Salicornia marsh with Fucus at margin near channel. Littorina and eggs from on and under Fucus and on mud beneath. Salinity 16%.
ca 46.48 N; 124.03 W
JR-9-78 June 13, 1978 - 4:00-4:30 P.M.
Willapa Bay, off State Route 101
about 6 miles N.E. of Ilwaco
Pacific County
Washington

stony beach margin of bay Littorina and eggs associated
with Fucus
ca 46.19 N; 124.03 W

JR-10-78 June 14, 1978 - 9:00 A.M.
Pacific Ocean
Cape Meares
Tillamook County
Oregon

outer coast, high energy beach, large cobbles; no
Littorina seen; goose barnacles, Physalia stranded on beach.
ca 45.29 N; 123.59 W.

JR-11-78 June 14, 1978 - 9:45 A.M.
Tillamook Bay (outer-west-side)
west of Bay City and between Tillamook and Cape Meares
Tillamook County
Oregon

rocks, muddy shore with Fucus patches and Salicornia, at base
of jetty and near mouth of Tillamook River
no Littorina, Salinity 1%
ca 45.30 N; 123.53 W

JR-12-78 June 14, 1978 - 10:15 A.M.
Tillamook Bay - outer (west) side
west of Bay City
Tillamook County
Oregon

about 1/4 mile out on jetty from stall.; rocks, boulders
with Fucus - low salinity Littorina and eggs, few Mytilus,
isopods, dead Mya. Salinity 0%
45.30 N; 123.53 W
JR-13-78  June 14, 1978 - 12:00 Noon
Netarts Bay
Netarts
Tillamook County
Oregon

just south of City; rocky fill on shore side (inside) of bay. Littorina scutulata on and under rocks; water temperature 15°C; salinity 15%. 45.26 N; 123.57 W

JR-14-78  June 14, 1978 - 2:15 P.M.
Siletz Bay
just South of Lincoln City
Lincoln County
Oregon

near mouth of Siletz Bay on rocky promontory just South of river, low tide (low tide was about 1:00 P.M.) L. sitchana and low salinity form, L. scutulata, banded form from on and under rocks 44.59 N; 123.59 W

Pacific Ocean
Sunset Bay State Park
South west of Charleston, ca. 2 miles
Coos County
Oregon

Littorina scutulata from rocks from mid-tide line to 6-8 feet above High tide line; larger specimens higher on shore; Fucus and Ulva; Tegula "Murex", Anemones, crabs etc. in pools; salinity 25% (L. sitchana and L. planaxis not seen although were reported by S. Behrens to have distributional end points here). ca. 43°.20; 124.18 W

JR-16-78  June 15, 1978 - 11:30-12:15 P.M.
Pacific Ocean
South cove, Cape Arago State Park
ca. 5 miles southwest of Charleston
Coos County
Oregon

Littorina scutulata from rocks, abundant stranded Physalia
low tide ca. 12:30 P.M.
ca. 43°.20 N, 124.18 W
JR-17-78  June 15, 1978 - 2:30 P.M.
Pacific Ocean at Mouth of Coquille River, north jetty
Bandon
Coos County
Oregon
Littorina scutulata, Thais on rocks
43.07 N; 124.25 W

JR-18-78  June 15, 1978
Pacific Ocean
1-2 miles south of Port Orford
Curry County
Oregon
Littorina scutulata only on rocks; salinity 33%
42.45 N; 124.30 W

JR-19-78  June 15, 1978
Pacific Ocean
near Lighthouse Point, Crescent City
Del Norte County
California
Littorina scutulata from rocks on rising tide Salinity 33%
41.45 N; 124.12 W

JR-20-78  June 16, 1978 - 9:15 A.M.
Pacific Ocean
near Lagoon Creek, ca 15 miles South of Crescent City on
US Route 101
Del Norte County
California
Littorina scutulata, only, on rocks
ca. 41.35 N; 124.10 W

JR-21-78  June 16, 1978 - 10:30 A.M.
Pacific Ocean
1 mile southwest of Orick
Humboldt County
California
Littorina scutulata only on large rocks at south end of
beach; on ocean side of US route 101 across road from
freshwater lagoon.
41.17 N; 124.04 W
June 16, 1978 - 11:45 A.M.
Pacific Ocean
Trinidad State Park, Trinidad
Humboldt County
California
Ocean beach; Littorina scutulata from rocks covered with seaweed.
ca. 41°10' N; 124.08 W

June 16, 1978 - 12:15 P.M.
Bay side of point
Trinidad State Park, Trinidad
Humboldt County
California
Littorina scutulata from rocks
ca. 41°10' N; 124.08 W

June 16, 1978 - 2:45-4:15 P.M.
West side Humboldt Bay
about 1 mile north of Samoa
Humboldt County, California
along Salicornia marsh fringe and mud interface;
Littorina newcombiana, alexia some L. scutulata at base of plants and under Fucus; Salinity 25% on damp mud.
ca. 40°47' N; 124.11 W

June 17, 1978
Pacific Ocean
about 4 miles north of Bodega Bay on State Route 1
Sonoma County
California
Littorina scutulata only on rocks
ca. 38°15' N; 123.05 W.

June 17, 1978
Pacific Ocean
about 15 miles north of Sausalito and south east of Bolinas, on inlet along State Route 1
Marin County
California
Littorina scutulata only on and under small stones and cobbles.
ca. 37°54' N; 122.42 W
West side San Francisco Bay along U.S. Route 101, about 1 mile North of Oyster Point and ca 2 miles south San Francisco city line. San Mateo County, California

falling tide; Littorina scutulata on and under rocks along water line; salinity 25%
ca 37.41 N; 122.24 W

Mouth of San Francisco Bay Fort Point, at south end Golden Gate Bridge, San Francisco, San Francisco County, California

high energy beach; Littorina scutulata from rocks, sparse; salinity 30%
37.48 N; 122.28 W

San Francisco Bay, under Bay Bridge West side Treasure Island, San Francisco County, California

on algae covered rocks: L. scutulata, Thais sp.; high energy coast; mid tide, rising; on Naval Base
37.50 N; 122.22 W

San Francisco Bay, under Bay Bridge East Side Treasure Island, San Francisco County, California

algae covered rocks (Fucus +) and under rocks; protected side of island; Littorina scutulata under rocks and on Fucus
37.50 N; 122.22 W

Monterey Bay rock jetty, south entrance harbor Moss Landing Monterey County, California

L. keeneae 794259 (M)
Littorina planaxis, First seen here, on damp. boulders at top of tide line in spray zone; tide falling, low at 2:30 P.M. salinity 36%. 36.48 N; 121.47 W

JR-32-78 June 19, 1978 - 4:00 P.M.
Pacific Ocean
Asilomar State Beach West of Pacific Grove
Monterey County California
Littorina scutulata from mid to upper tide level;
Littorina planaxis in upper tide level to Spray zone above high tide line—on granitic multitexured rock—animals showing color and marking variations adaptive to substrate ca. 36.38 N; 121.56 W

JR-33-78 June 20, 1978 - 1:00 P.M.
Pacific Ocean
on rock jetty just south of Morro Rock
Morro Bay
San Luis Obispo County California
substation 1: - from beach side of jetty, mid and high tidal levels
2: - from top and outside of jetty in ocean spray zone
3: - from low tide line on rocks where very young, probably recently metamorphosed Littorina (2 species) living, about low tide - 35.22 N; 120.51 W

JR-34-78 June 20, 1978 - 4:00-5:00 P.M.
Pacific Ocean
Shell Beach, south part of town
San Luis Obispo County California
Littorina scutulata and L. planaxis on rocks rising tide - 35.09 N; 120.40 W
JR-35-78  June 21, 1978 - 10:00 A.M.
Pacific Ocean
El Capitan Beach State Park
ca 15 miles west of Santa Barbara
Santa Barbara County
California
on rocks in spray and upper intertidal zone; nearly
high tide; Salinity 31%
37.43 N; 119.38 W

JR-36-78  June 21, 1978 - 12:00 Noon
Pacific Ocean
South end of State Beach, Carpinteria
Santa Barbara County
California
Littorina scutulata and L. planaxis from rocky outcrop,
falling tide
34.24 N; 119.31 W

JR-37-78  June 22, 1978 - 12:00 Noon
Pacific Ocean
South of State Beach, jetty at entrance to lagoon, Carlsbad,
San Diego County
California
33.10 N; 117.21 W

JR-38-78  June 22, 1978  2:30 - 3:30 P.M.
Pacific Ocean
Ocean side, tide pool area,
Point Loma, San Diego County
California
Littorina scutulata and L. planaxis in spray zone; some
L. planaxis ca 30 feet above water on vertical cliff face,
in spray zone and in pock holes in rock
32.41 N; 117.14 W
JR-39-78  June 24, 1978 - 7:00 P.M.

Bahia De La Paz (east side)
about 4 miles north of La Paz
Baja California Sur
Mexico

Route Mex 11., on shore rocks just above water Littorina
penicillata and Nerita
24.10 N; 110.18 W

JR-40-78  June 25, 1978 - 5:30 P.M.

Bahia De La Paz (south side)
about 8 miles west of La Paz
El Centenario
Baja California Sur
Mexico

Route Mex. 1, west of La Paz; pebble and sand conglomerate
shore, low tide, dead shells only, no Littorina.
ca 24.10 N; 110.18 W

JR-41-78  June 26, 1978  12:00 Noon - 1:30 P.M.

Punto Lobos Beach, about 2.5 miles south of Todos Santos,
beyond end of paved road Mex. 9.
Baja California Sur
Mexico

Littorina modesta, pullata, penicillata, and aspera in
crevices of rocky promontory at south end of beach
ca 23.27 N; 110.13 W

JR-42-78  June 26, 1978

San Pedrito, ca 4.3 miles south of Todos Santos, beyond
day of paved road, Mex. 9.
Baja California Sur
Mexico

4 species of Littorinidae, as in JR-41-78, actively crawling
in surf; rocky headland at south end of beach; nearly high
tide-Salinity 34% in open surf; 12% in hypo saline lagoon
behind beach
ca 23.27 N; 110.13 W
JR-43-78  June 27, 1978  
Bahia de Palmas, Gulf of California  
Los Barriles  
Baja California Sur  
Mexico  

large boulders scattered on sandy beach, Littorina penicillata on sunny side of rocks; Siphonaria with spiral egg masses on wave-splashed rocks—egg masses about 1" across (Kodachromes taken).  
23.39 N; 109.42 W  

JR-44-78  June 27, 1978 - 11:45 A.M.  
Bahia San Lucas  
Cabo San Lucas  
Baja California Sur  
Mexico  

on jetty near ferry landing and next to canning factory. 4 species of Littorina on rocks and in cracks of rocks; L. pullata in wetter situations  
22.53 N; 109.54 W  

JR-45-78  June 27, 1978  1:00-2:00 P.M.  
Pacific Ocean, public beach between Cabo San Lucas and San Jose Del Cabo  
Baja California del Sur  
Mexico  

4 species of Littorina on rocks  
ca 22.53 N; 109.54 W  

JR-46-78  June 29, 1978 - 8:30 - 10:00 A.M.  
Bahia De La Paz  
Public Beach north of Pichilingue  
about 11 miles North of La Paz  
Baja California del Sur  
Mexico  

Littorina penicillata, Littorina sp., and various other mollusks from rocks on, under and in cracks) along rocky headland north of beach; many Nerita eggs. Few mangroves with few L. penicillata at base of trunk.  
Salinity 32-33%.  
24.15 N; 110.20 W
JR-47-78  June 29, 1978 – 11:00 A.M.  
Bahia De La Paz  
about 2 miles south of Pichilingue  
Baja California Sur  
Mexico  
sheltered bay with mangrove fringe;  
*Littorina penicillata* rare on rocks  
salinity 35%  
ca 24.15 N; 110.20 W

JR-48-78  June 29, 1978 – 12:00 Noon  
Same locality as JR-39-78  
24.10 N; 110.18 W

JR-49-78  June 29, 1978  
south side Bahia De La Paz  
ferry dock, end Sinaloa St.  
La Paz  
*Baja California Sur*  
Mexico  
Pecten Shells from fishery; Salinity 33%  
ca 24.10 N; 110.18 W
Station List—Collecting Trip
To Washington, Oregon,
California and Baja California,

JR-1-78 June 11, 1978 — 1:00 P.M.
Puget Sound
Lincoln Park
Seattle, King County
Washington

Cobble beach between Point Williams and Brace Pt.; low tide, 0.8' at 1:16 P.M. — at Seattle — Vashon Id. ferry terminal.
ca. 47.28 N; 122.20 W

JR-2-78 June 12, 1978 — 8:00 A.M.
Puget Sound
Port Townsend
Jefferson County
Washington

Opposite Port Townsend Motel off State Route 20; Cobble — boulder beach; area is at mouth of Puget Sound where it flows into Strait of Juan de Fuca water temp. 14°C, Salinity 27%.
48.07 N; 122.46 W

JR-3-78 June 12, 1978 — 12:30 P.M.
Strait of Juan de Fuca
Sekiu
Clallam County
Washington

low tide 11:15 A.M. Water temp. 18°C, Salinity 28%.
Littorina from rocky breakwater — on rocks and seaweed.
48.16 N; 124.18 W

JR-4-78 June 12, 1978 — 1:30 P.M.
Strait of Juan de Fuca
about 4-5 miles west of Sekiu
Clallam County, Washington
rising tide, rocky beach
c. 48.16 N; 124.19 W
JR-5-78 June 12, 1978 - 2:45 P.M.
Strait of Juan de Fuca
Neah Bay
Clallam County
Washington
rocky shore, west side of bay; Fucus; water temperature 18°C, salinity 26%
48.22 N; 124.37 W

JR-6-78 June 13, 1978 - 10:30 A.M.
Mouth of Grays Harbor
Point Chehalis
Westport
Grays Harbor County
Washington
rocky revetment and groin, south entrance to Grays Harbor;
low tide at 12:00 Noon
ca 46.53 N; 124.06 W

JR-7-78 June 13, 1978 - 12:00 Noon - 12:30 P.M.
south side Grays Harbor, 1/4 mile west of Elk River
Bridge on state route 105
south of Westport
Grays Harbor County
Washington
Salt/Salicornia Marsh; few Alexia at bases of plants in mud, no Littorina, water temperature 20°C, salinity 16%
ca 46.48 N; 124.03 W

JR-8-78 June 13, 1978 - 12:30 P.M. - 1:30 P.M.
mouth of Elk River, south of bridge over state route 105
Grays Harbor, south of Westport
Grays Harbor County
Washington
edge of tidal river channel; Salicornia marsh with Fucus at margin near channel. Littorina and eggs from on and under Fucus and on mud beneath. Salinity 16%
ca 46.48 N; 124.03 W
JR-9-78  June 13, 1978 - 4:00-4:30 P.M.
Willapa Bay, off State Route 101
about 6 miles N.E. of Ilwaco
Pacific County
Washington

stony beach margin of bay Littorina and eggs associated
with Fucus
ca 46.19 N; 124.03 W

JR-10-78  June 14, 1978 - 9:00 A.M.
Pacific Ocean
Cape Meares
Tillamook County
Oregon

outer coast, high energy beach, large cobbles; no
Littorina seen; goose barnacles, Physalia stranded on beach.
ca 45°.29 N; 123°.59 W.

JR-11-78  June 14, 1978 - 9:45 A.M.
Tillamook Bay (outer-west-side)
west of Bay City and between Tillamook and Cape Meares
Tillamook County
Oregon

rocks, muddy shore with Fucus patches and Salicornia, at base
of jetty and near mouth of Tillamook River
no Littorina, Salinity 1%.
ca 45.30 N; 123.53 W

JR-12-78  June 14, 1978 - 10:15 A.M.
Tillamook Bay - outer (west) side
west of Bay City
Tillamook County
Oregon

about 1/4 mile out on jetty from stull.; rocks, boulders
with Fucus - low salinity Littorina and eggs, few Mytilus,
isopods, dead Mya.  Salinity 0%.
45°.30 N; 123°.53 W
JR-13-78  June 14, 1978 - 12:00 Noon
Netarts Bay
Netarts
Tillamook County
Oregon
just south of City; rocky fill on shore side (inside) of bay. Littorina scutulata on and under rocks; water temperature 15°C; salinity 15%.
45.26 N; 123.57 W

JR-14-78  June 14, 1978 - 2:15 P.M.
Siletz Bay
just South of Lincoln City
Lincoln County
Oregon
near mouth of Siletz Bay on rocky promontory just South of river, low tide (low tide was about 1:00 P.M.)
L. sitchana and low salinity form, L. scutulata, banded from on and under rocks
44.59 N; 123.59 W

Pacific Ocean
Sunset Bay State Park
South west of Charleston, ca. 2 miles
Coos County
Oregon
Littorina scutulata from rocks from mid-tide line to 6-8 feet above High tide line; larger specimens higher on shore; Fucus and Ulva; Tegula "Murex", Anemones, crabs etc. in pools; salinity 25% (L. sitchana and L. planaxis not seen although were reported by S. Behrens to have distributional end points here).
ca. 43°.20; 124.18 W

JR-16-78  June 15, 1978 - 11:30-12:15 P.M.
Pacific Ocean
South cove, Cape Arago State Park
ca. 5 miles southwest of Charleston
Coos County
Oregon
Littorina scutulata from rocks, abundant stranded Physalia
low tide ca. 12:30 P.M.
ca. 43°.20 N, 124.18 W
JR-17-78  June 15, 1978 - 2:30 P.M.
Pacific Ocean at Mouth of Coquille River, north jetty
Bandon
Coos County
Oregon

Littorina scutulata, Thais on rocks
43.07 N; 124.25 W

JR-18-78  June 15, 1978
Pacific Ocean
1-2 miles south of Port Orford
Curry County
Oregon

Littorina scutulata only on rocks; salinity 33%
42.45 N; 124.30 W

JR-19-78  June 15, 1978
Pacific Ocean
near Lighthouse Point, Crescent City
Del Norte County
California

Littorina scutulata from rocks on rising tide Salinity 33%
41.45 N; 124.12 W

JR-20-78  June 16, 1978 - 9:15 A.M.
Pacific Ocean
near Lagoon Creek, ca 15 miles South of Crescent City on
US Route 101
Del Norte County
California

Littorina scutulata, only, on rocks
c. 41°.35 N; 124°.10 W

JR-21-78  June 16, 1978 - 10:30 A.M.
Pacific Ocean
1 mile southwest of Orick
Humboldt County
California

Littorina scutulata only on large rocks at south end of
beach; on ocean side of US route 101 across road from
freshwater lagoon.
41.17 N; 124.04 W
JR-22-78  June 16, 1978 - 11:45 A.M.
Pacific Ocean
Trinidad State Park, Trinidad
Humboldt County
California

Ocean beach; Littorina scutulata from rocks covered with seaweed.
ca. 41°10' N; 124.08 W

JR-23-78  June 16, 1978 - 12:15 P.M.
Bay side of point
Trinidad State Park, Trinidad
Humboldt County
California

Littorina scutulata from rocks
ca. 41°10' N; 124.08 W

JR-24-78  June 16, 1978 - 2:45-4:15 P.M.
West side Humboldt Bay
about 1 mile north of Samoa
Humboldt County, California

along Salicornia marsh fringe and mud interface;
Littorina newcombiana, alexia some L. scutulata at base of plants and under Fucus/; Salinity 25% on damp mud.
cia. 40.47 N; 124.11 W

JR-25-78  June 17, 1978
Pacific Ocean
about 4 miles, North at Bodega Bay on State Route 1
Sonoma County
California

Littorina scutulata only on rocks
ca. 38°15' N; 123.05 W.

JR-26-78  June 17, 1978
Pacific Ocean
about 15 miles north of Sausalito and south, east of Bolinas, on inlet along State Route 1
Marin County
California

Littorina scutulata only on and under small stones and cobbles.
cia. 37.54 N; 122.42 W
JR-27-78  June 18, 1978  10:30 A.M.
West side San Francisco Bay
along U.S. Route 101, about 1 mile North of Oyster Point and ca 2 miles south San Francisco city line.
San Mateo County
California
falling tide; Littorina scutulata on and under rocks along water line; salinity 25%
ca 37.41 N; 122.24 W

JR-28-78  June 18, 1978 - 5:00 P.M.
Mouth of San Francisco Bay
Fort Point, at south end Golden Gate Bridge, San Francisco
San Francisco County, California
high energy beach; Littorina scutulata from rocks, sparse; salinity 30%
37.48 N; 122.28 W

JR-29-78  June 19, 1978 - 8:30 A.M.
San Francisco Bay, under Bay Bridge
West side Treasure Island,
San Francisco County
California
on algae covered rocks: L. scutulata, Thais sp.; high energy coast; mid tide, rising; on Naval Base
37.50 N; 122.22 W

JR-30-78  June 19, 1978  9:00 A.M.
San Francisco Bay, under Bay Bridge
East Side Treasure Island
San Francisco County
California
algae covered rocks (Fucus +) and under rocks; protected side of island; Littorina scutulata under rocks and on Fucus
37.50 N; 122.22 W

JR-31-78  June 19, 1978 - 12:00 Noon
Monterey Bay
rock jetty, south entrance harbor
Moss Landing
Monterey County
California
Littorina planaxis. First seen here, on damp boulders at top of tide line in spray zone; tide falling, low at 2:30 P.M.
salinity 36 
36.48 N; 121.47 W

JR-32-78 June 19, 1978 - 4:00 P.M.
Pacific Ocean
Asilomar State Beach
West at Pacific Grove
Monterey County
California

Littorina scutulata from mid to upper tide level;
Littorina planaxis in upper tide level to Spray zone above high tide line—on granitic multitexured rock—animals showing color and marking variations adaptive to substrate ca. 36.38 N; 121.56 W

JR-33-78 June 20, 1978 - 1:00 P.M.
(1-3)
Pacific Ocean
on rock jetty just south of Morro Rock
Morro Bay
San Luis Obispo County
California

substation 1: - from beach side of jetty, mid and high tidal levels
" 2: - from top and outside of jetty in ocean spray zone
" 3: - from low tide line on rocks where very young, probably recently meta morphosed Littorina (2 species) living, about low tide - 35.22 N; 120.51 W

JR-34-78 June 20, 1978 - 4:00-5:00 P.M.
Pacific Ocean
Shell Beach, south part of town
San Luis Obispo County
California

Littorina scutulata and L. planaxis on rocks rising tide - 35.09 N; 120.40 W
JR-35-78  June 21, 1978 - 10:00 A.M.
Pacific Ocean
El Capitan Beach State Park
ca 15 miles west of Santa Barbara
Santa Barbara County
California

on rocks in spray and upper intertidal zone; nearly high tide; Salinity 31%o
37.43 N; 119.38 W

JR-36-78  June 21, 1978 - 12:00 Noon
Pacific Ocean
South end of State Beach, Carpinteria
Santa Barbara County
California

Littorina scutulata and L. planaxis from rocky outcrop,
falling tide
34.24 N; 119.31 W

JR-37-78  June 22, 1978 - 12:00 Noon
Pacific Ocean
South of State Beach, jetty at entrance to lagoon, Carlsbad,
San Diego County
California
33.10 N; 117.21 W

JR-38-78  June 22, 1978  2:30 - 3:30 P.M.
Pacific Ocean
Ocean side, tide pool area,
Point Loma, San Diego County
California

Littorina scutulata and L. planaxis in spray zone; some L. planaxis ca 30 feet above water on vertical cliff face,
in spray zone and in pock holes in rock
32.41 N; 117.14 W
JR-39-78 June 24, 1978 - 7:00 P.M.
Bahia De La Paz (east side)
about 4 miles north of La Paz
Baja California Sur
Mexico

Route Mex II., on shore rocks just above water Littorina penicillata and Nerita
24.10 N; 110.18 W

JR-40-78 June 25, 1978 - 5:30 P. M.
Bahia De La Paz (south side)
about 8 miles west of La Paz
El Centenario
Baja California Sur
Mexico

Route Mex. 1, west of La Paz; pebble and sand conglomerate shore, low tide, dead shells only, no Littorina.
ca 24.10 N; 110.18 W

JR-41-78 June 26, 1978 12:00 Noon - 1:30 P.M.
Pacific Ocean
Punto Lobos Beach, about 2.5 miles south of Todos Santos, beyond end of paved road Mex. 9.
Baja California Sur
Mexico

Littorina modesta, pullata, penicillata, and aspera in crevices of rocky promontory at south end of beach
ca 23.27 N; 110.13 W

JR-42-78 June 26, 1978
Pacific Ocean
San Pedrito, ca 4.3 miles south of Todos Santos, beyond end of paved road, Mex. 9.
Baja California Sur
Mexico

4 species of Littorinidae, as in JR-41-78, actively crawling in surf; rocky headland at south end of beach; nearly high tide; Salinity 34% in open surf; 12% in hypo saline lagoon behind beach
cr 23.27 N; 110.13 W
JR-43-78  June 27, 1978
Bahia de Palmas, Gulf of California
Los Barriles
Baja California Sur
Mexico

large boulders scattered on sandy beach, *Littorina penicillata* on sunny side of rocks; *Siphonaria* with spiral egg masses on wave-splashed rocks—egg masses about 1" across (Kodachromes taken).
23.39 N; 109.42 W

JR-44-78  June 27, 1978 - 11:45 A.M.
Bahia San Lucas
Cabo San Lucas
Baja California Sur
Mexico

on jetty near ferry landing and next to canning factory. 4 species of *Littorina* on rocks and in cracks of rocks; *L. pullata* in wetter situations
22.53 N; 109.54 W

JR-45-78  June 27, 1978  1:00 - 2:00 P.M.
Pacific Ocean, public beach between Cabo San Lucas and San Jose Del Cabo
Baja California del Sur
Mexico

4 species of *Littorina* on rocks
ca 22.53 N; 109.54 W

JR-46-78  June 29, 1978 - 8:30 - 10:00 A.M.
Bahia De La Paz
Public Beach north of Pichilingue
about 11 miles North of La Paz
Baja California del Sur
Mexico

*Littorina penicillata*, *Littorina* sp., and various other mollusks from rocks on, under and in cracks) along rocky headland north of beach; many *Merita* eggs. Few mangroves with few *L. penicillata* at base of trunk.
Salinity 32-33%.
24.15 N; 110.20 W
<table>
<thead>
<tr>
<th>JR-47-78</th>
<th>June 29, 1978 - 11:00 A.M.</th>
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<tbody>
<tr>
<td>Bahia De La Paz</td>
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<tr>
<td>about 2 miles south of Pichilingue</td>
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<tr>
<td>Baja California Sur</td>
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<td>Mexico</td>
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<tr>
<td>sheltered bay with mangrove fringe;</td>
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<tr>
<td><em>Littorina penicillata</em> rare on rocks</td>
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<tr>
<td>salinity 35%</td>
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<td>ca 24.15 N; 110.20 W</td>
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<tr>
<th>JR-48-78</th>
<th>June 29, 1978 - 12:00 Noon</th>
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<td>Same locality as JR-39-78</td>
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<tr>
<td>24.10 N; 110.18 W</td>
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<th>JR-49-78</th>
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<tr>
<td>south side Bahia De La Paz</td>
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<tr>
<td>ferry dock, end Sinaloa St.</td>
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<td>La Paz</td>
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<td>Baja California Sur</td>
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<td>Mexico</td>
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<td>Pecten Shells from fishery; Salinity 33%</td>
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Station List - Collecting Trip
To Washington, Oregon,
California and Baja California,

JR-1-78  June 11, 1978 - 1:00 P.M.
Lincoln Park, Puget Sound
King County
Seattle, Washington
Cobble beach between Point Williams &
Bride Ph, low tide, 0.6' at 1:16 P.M. -
at Seattle - Washo Id. ferry terminal.
c. 47.28 N, 122.20 W

JR-2-78  June 12, 1978 - 8:00 AM
Puget Sound
Jefferson County
Washington
Opposite Fort Townsend Motel off State Route
20, cobble - boulder beach, area is at mouth
of Puget Sound where it flows into Strait of
Juan de Fuca Water Temp 14°C, Salinity
27%
48.07 N, 122.46 W

JR-3-78  June 12, 1978 - 12:30 P.M.
Strait of Juan de Fuca
SeKiu
Clallam County
Washington
Low tide 11:15 A.M. Temp. & Water 18°C
Salinity 26.5%, Lithening from rocky
breakwater - on rocks and seaweed
48.16 N, 124.18 W

JR-4-78  June 12, 1978 - 1:30 P.M.
Strait of Juan de Fuca
about 4-5 miles west of SeKiu
Clallam County, Washington
High tide, rocky beach
ca. 48.16 N, 124.19 W
JR-5-78  June 12, 1978 - 7:45 P.M.
Strait of Juan de Fuca
Neah Bay
Clallam County
WASHINGTON

- West side of bay
- Rocky shoreline
- Water temperature 18°C
- Salinity 26.66
- 48.22N, 124.37W

JR-6-78  June 13, 1978 - 10:30 A.M.
Mouth of Grays Harbor
Point Chehalis
Westport
GRAYS HARBOR County
Washington

- Rocky revetment and groin south entrance to Grays Harbor
- Low tide at 12:00 Noon
- ca. 46.53N, 124.06W

JR-7-78  June 13, 1978 - 12:00 Noon - 12:30 P.M.
Elk River, south side Grays Harbor

- ½ mile west of Elk River Bridge on state route 105
- South of Westport
- Grays Harbor County
- Washington

- Salt Salicornia Marsh, few Alexia at bases of plants in mud, no littorina, water temperature 20°C
- Salinity 16.66
- ca. 46.48N, 124.03W
JR-8-78

June 13, 1978 12:30 Pm - 1:30 Pm
mouth of Elk River, south of bridge over
state route 105
Grays Harbor, South of Westport
Grays Harbor County
Washington
divide of tidal river channel, Salicornia
marsh with Fucus at margin near channel.
Littorina + eggs from on & under Fucus.
mud beneath. Salinity 16.00%
ca 46.48 N, 124.03 W

JR-9-78

June 13, 1978 4:00 - 4:30 Pm.
Willapa Bay, off State Route 101
about 6 miles NE of Ilwaco
Pacific County
Washington
strong beach margin of bay. Littorina
+ eggs associated with Fucus
ca 46.18 N, 124.03 W

JR-11-78

June 14, 1978 9:45 AM
Tillamook Bay (outer west side)
west of Bay City & between Tillamook and
Cape Meares
Tillamook County
OREGON
rocks, muddy shore with Fucus patches
+ Salicornia. At base of jetty +
A near north of Tillamook River.
No Littorina. Salinity 1.00%
ca 45.30 N, 123.53 W

Lift Next station First
June 14, 1978 9:00 A.M.
Pacific Ocean
Cape Meares
Tillamook County
OREGON
outer coast, high energy beach, large cobbles, no hittorini, seagull, goose
vvermicles, Phoebalus stranded on
beach.

June 14, 1978 10:15 A.M.
Tillamook Bay - outer (west) side
west of Bay City
Tillamook County
Oregon
about 1/4 mile out on jetty from
stable, rocks, boulders with Fucus
low salinity hittorini and eggs, few
Mytilus, Ligustrum dead Brys. Salinity 0%
45°30' N; 123°53' W.

June 14, 1978 12:00 Noon
Netarts Bay
Netarts
Tillamook County
OREGON
just south of City, rocky fill on
shore side (inside) of bay, hittorini
scutulae on + under rocks; water
Temperature 15°C; Salinity 15.700
45°26' N; 123°57' W.
June 14, 1978 2:15 P.M.
Siletz Bay
just south of Lincoln City
Lincoln County
Oregon

near mouth of Siletz Bay on rocky promontory just south of river
low tide + (low tide was about 10:00 P.M.)
h. sitchiana + low salinity form, h.
scutulata, banded form on and under rocks
44.59 N; 123.59 W

June 15, 1978 9:30 A.M. - 10:30 A.M.
Pacific Ocean
Sunset Bay State Park
South west of Charleston, ca. 2 miles
Coos County
Oregon

littorina scutulata from rocks from mid-tide
line to 6-8 feet above high tide line, larger
specimens higher on shire; Fucus + Alf, Tegula
"Murex", anemones, crabs etc in pools, salinity
25‰ (h. sitchiana + h. planaxis not seen
although were reported by S. Behrens to
have distributional end points here).
ca 43°20'; 124°18 W

June 15, 1978 11:30 - 12:15 P.M.
Pacific Ocean
South cove Cape Arago State Park
ca. 5 miles south west of Charleston
Coos County
Oregon
ca 43°20'; 124°18 W

Littorina scutulata from rocks; abundant stranded
low tide ca. 12:30 P.M.
June 15, 1978 2:30 P.M.
Pacific Ocean at
Mouth of Coquille River, north jetty
Bandon
Coos County
Oregon
Littorina scutulata, Thais on rocks
43°07'N, 124°25'W

June 15, 1978
Pacific Ocean
1-2 miles south of Port Orford
Curry County
Oregon
Littorina scutulata only on rocks, Salinity 33.700
42°45'N, 124°30'W

June 18, 1978
Pacific Ocean
near Lighthouse Point, Crescent City
Del Norte County
California
Littorina scutulata from rocks on rising tide, Salinity 33.700
41°45'N, 124°12'W

June 16, 1978 9:15 A.M.
Pacific Ocean
near Lagoon Creek, ca 15 miles south of
Route Cresent City on US 101
Del Norte County
California
Littorina scutulata, only, on rocks
ca. 41°35'N, 124°10'W
JR-21-78  June 16, 1978  10:20 AM
Pacific Ocean
1 mile southwest of Orick
Humboldt County
California
Littorina scutulata only on large rocks
at south end of beach, on ocean side
of US route 101 across road from freshwater
lagoon.

H. 17°N; 124°04’W.

JR-22-78  June 16, 1978  11:45 AM
Pacific Ocean
Trinidad State Park, Trinidad
Humboldt County
California
Ocean beach, Littorina scutulata from
rocks covered with seaweed.
ca. 41°15’N, 124°08’W

JR-23-78  June 16, 1978  12:15 PM
Bay side of point
Trinidad State Park, Trinidad
Humboldt County
California
Littorina scutulata from rocks.
ca. 41°10’N, 124°08’W

JR-24-78  June 16, 1978  2:15-4:15 PM
West side Humboldt Bay
about 1 mile north of Samoa
Humboldt County, California
ca. 40°47’N; 124°11’W
along California marsh fringe & mud interface,
Littorina neocombiens valve same discuteata at
base of plants and under Tidman’s Salinity 25%
JR-25-78  June 17, 1978
Pacific Ocean
about 4 miles North of Bodega Bay
Sonoma County
California

Lithoria scutulata only on rocks
ca 38.15 N, 123.05 W.

JR-26-78  June 17, 1978
Pacific Ocean
about 15 miles North of Sausalito
Southeast of Bolinas, on inlet along State Route 1
Marin County
California

Lithoria scutulata only on and under small stones and cobbles.

ca 37.54 N, 122.42 W

JR-27-78  June 18, 1978  10:36 AM
West side San Francisco Bay
along U.S. Route 101 about 1 mile North of Oyster Point & ca 2 miles South of San Francisco city line.
San Mateo County
California

Falling tide; Lithoria scutulata on and under rocks along water line; salinity 25.7°C

ca 37.41 N, 122.24 W

JR-28-78  June 18, 1978  5:00 PM
Mouth of San Francisco Bay
Fort Point, at south end Golden Gate Bridge, San Francisco,
San Francisco County, California

High energy beach; Lithoria scutulata from rocks sparse; salinity 30%
June 15, 1978 8:30 AM
San Francisco Bay, under Bay Bridge
West side Treasure Island
San Francisco County
California

on algae covered rocks; h. scutulata
This sp.; high energy coast, mid tide, rising; on Naval Base.
37.50 N; 122.22 W

June 19, 1978 9:00 AM
San Francisco Bay, under Bay Bridge
East side Treasure Island
San Francisco County
California

algae covered rocks (Fucus +) and under
rocks; protected side of island; h. scutulata
under rocks and on Fucus.
37.50 N; 122.22 W

June 19, 1978 12:00 Noon
Monterey Bay
rock jetty, south entrance harbor
Moss Landing
Monterey County
California

bithynia planaxis. First seen here, on damp
boulders at top of tide line in spray
zone; tide falling, low at 2:30 PM.
Salinity 36.76
36.48 N; 121.47 W.
June 19, 1978 4:00 P.M.
Pacific Ocean
Asilomar State Beach
west of Pacific Grove
Monterey County
California

Littorina scutata from mid to upper tide level
Littorina planaxis in upper tide level to spray zone above high tide line — on granitic multi-textured rock — animals showing color and marking variations adaptive to substrate.

June 20, 1978 1:00 P.M.
Pacific Ocean
on rock jetty just south of Morro Rock
Morro Bay
San Luis Obispo County
California

Substation 1: from beach side of jetty, mid + high tidal levels
" 2: from top and outside of jetty in ocean spray zone
" 3: from low tide line on rocks where very young, probably recently metamorphosed
Littorina (2 species) living about low tide — 35.22 N, 121.58 W

June 20, 1978 4:00 - 5:00 P.M.
Pacific Ocean
Shell Beach, south part of town
San Luis Obispo County
California

Littorina scutata and L planaxis on rocks rising tide — 35.09 N, 120.40 W,
June 21, 1978 10:00 A.M.  Pacific Ocean  
El Capitan Beach State Park  
a 15 miles west of Santa Barbara  
Santa Barbara County  
California 37.43 N; 119.38 W.  
on rocks in spray + upper intertidal  
zone, nearly high tide, salinity 31.700

June 21, 1978 12:00 Noon  Pacific Ocean  
South end of State Beach, Carpinteria  
Santa Barbara County  
California  
Hernia scutulata and H. planaxis from rocky  
outcrop, falling tide.  
34.24 N; 119.31 W  

June 22, 1978 12:00 Noon  Pacific Ocean  
South of State Beach, jetty at entrance  
to Lagoon, Carlsbad,  
San Diego County  
California 33.10 N; 117.21 W

June 22, 1978 2:30 - 3:30 P.M.  Pacific Ocean  
ocean side, tide pool area,  
Point Loma, San Diego County  
California 32.41 N; 117.14 W

Hernia scutulata and H. planaxis in spray  
zone; some H. planaxis in 30 feet above  
water on vertical cliff face in spray  
zone and in rock holes in rock.
June 24, 1978 7:00 P.M.,
Bahia De La Paz (east side)
about 4 miles north of La Paz
Baja California Sur
Mexico

Route Mex II, on shore rocks just above
water, *littorina* penicillata and *Nerita*
24°10' N, 110°16' W.

June 25, 1978 5:30 P.M.
Bahia De La Paz (south side)
about 8 miles west of La Paz
El Centenario
Baja California Sur
Mexico

Route Mex. I, west of La Paz, pebble and
sand conglomerate shore, low tide, dead
shells only, no *littorina*.
Ca. 24°10' N, 110°16' W.

June 26, 1978 12:40 Noon - 1:30 P.M.
Pacific Ocean
Punta Lobos Beach, about 2.5 miles
south of Todos Santos, beyond end
of paved road Mex.9,
Baja California Sur
Mexico

*littorina* modesta, *pullata* penicillata,
and agera in crevices of rocks about
tide line, rocky promontory at south
end of beach,
c.a. 23°27' N, 110°13' W.
Jr-42-78
Pacific Ocean
San Pedrito, ca. 4.3 miles south
of Todos Santos, beyond end of
paved road, Mex. 9.
Baja California Sur
Mexico
4 species of litterinidae, as in Jr-41-78,
actively crawling in surf, rocky headland
at south end of beach, nearly high tide
Salinity 34%o in open surf, 12%o in
hypso saline lagoon behind beach,
ca. 23°27'N., 110°13'W.

Jr-43-78
June 27, 1978
Bahia de Palmas, Gulf of California
Los Barriles
Baja California Sur
Mexico
Large boulders scattered on sandy beach;
litterinids 'penicillate' on sunny side of
rocks, siphenaria with spiral egg
masses on wave-splashed rocks — egg
masses about 1" across (Kodachromes
taken).
23°39'N., 109°42'W.

Jr-44-78
June 27, 1978 11:45 A.M.
Bahia San Lucas
Cabo San Lucas
Baja California Sur, Mexico
on jetty near ferry landing and next to
canning factory. 4 species of littering on
rocks and in cracks of rocks, siphenaria in water
JR-45-78  June 27, 1978  1:00 - 2:00 PM
Pacific Ocean, public beach
between Cabo San Lucas and
San Jose Del Cabo
Baja California del Sur
Mexico

☑ 4 species of litornina on rocks
ca 22.53 N, 109.54 W.

JR-46-78  June 29, 1978  8:30 - 10:00 A.M.
Bahia De La Paz (P)
Public Beach north of Pichilingue
about 11 miles North of La Paz
Baja California del Sur
Mexico

litornina penicillata, litornina sp., and various
other mollusks from rocks on, under and in
cracks along rocky headland north of beach.
many Nervia sp.. Few mangroves with few
l. penicillata at base of trunk. Salinity 31-33%

24.15 N, 110.20 W

JR-47-78  June 29, 1978  11:00 A.M.
Bahia De La Paz
about 2 miles south of Pichilingue
Baja California Sur
Mexico

sheltered bay with mangrove fringe;
litornina penicillata rare on rocks

☑ salinity 35 ppt

ca 24.15 N, 110.20 W
June 29, 1978
12:00 Noon

Same locality as JK-39-78
24.10 N, 110.18 W

June 29, 1978

South side Bahía de la Paz
terry dock, end Sinaloa St.
la Paz
Bahía California del Sur
Mexico

Peten shells from fishery, salinity 33%.
ca. 24.10 N, 110.18 W