LAMBERT

Mead

notebook

9½ IN x 6 IN
24.1 CM x 15.2 CM
80 Sheets
College Ruled
06654
The Mead Corporation, Dayton, Ohio 45463

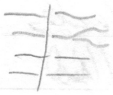
15°C, 29‰

8/21/98 Shilshole Marina – noon low tide
boat launch docks north end of marina
Botryllids
small Distaplia occid. on mussel

Pier T (locked)
Long rope on slip #45
Corella inflata +++
Botrylloides ~~sp.~~ violaceus on mussels, orange +++

Rope – slip # 40
Lots of the above + Distaplia +
Rope – slip # 16
The above, also very small Styela gibbsii +

Orange botryllid
16 tentacles
many tadpoles
ampullae – 27, 34, ~36 etc
~11 rows stigmata
pt dorsal " rows 2 + 3 not complete



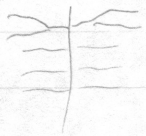
10 stomach folds

15°C, 32‰

8/23/98 Edmonds Marina 10AM

N23 rope
Corella inflata +++ or more; large
Distaplia occid. ++
Botrylloides +++ Colonies all one color, but many colors: yellow, orange, lavender, deep purple
many mussels
1 small Diplosoma
Big hose by boat winch - huge numerous colonies of Distaplia ++++
Next to Buds bait house
Aplidium calif. - 1 colony
Covered marina H
Corella ++++
G. covered unlocked float G16
S. gibbii ++
Corella ++++

Botrylloides:
8 oral tentacles - 2 long, 2 short, 4 rudim.
black + grey, oval stars small: .4 mm
Many tadpoles overnight. 8 ampullae
1. B. schlosseri orange stars 8 oral tentacle
2. Botrylloides sp. with zooids w/ many ampullae
orange or yellow colonies
16 oral tentacles 8 rows stigmata
3. Dark purple Botrylloides
8 oral tentacles



~10 rows stigmata
1 & 2 (or 2 & 3) incomplete on both sides.

high tide 10:15 AM water clear 15°C

Elliott Bay Marina 32‰

8/28/98 B. schlosseri ++ - both orange + black/grey

G pier C. inflata ++ - esp on sabell.d tubes

Botryllides sp.

orange, brick red, yellow

Many B. schlosseri on a ~~B~~ kelp frond - various colors

+ small Distaplia on kelp & many small ones on a floating bumper

Lots of sabell.ds

+ Diplosoma - one small on a mussel

A pier - far west

Many sabell.ds

+ 1 large Boltenia on a sabell.d

Many very small Corella "

+ 1 very small Styela gibbsii

Orange Botryllus schlosserii ÷ star shaped

8 oral tentacles

2 long 6 short

small tadpole, 3 papillae 8 ampullae

big eyespot

9/1/98 Des Moines 16.5°C
32‰

Covered float - Pier L unlocked; yacht sales

Slip 37 long rope Also slip 42

+++ Corella w/ Eurylepta

+++ Styela gibbsii

++++ Crona savignyi (?) Many 10+cm long

+++ Botrylloides sp violaceus

++ Distaplia (?)

++ B. schlosseri - orange stars and brown stars

uncovered rope at slip 51 - near end of dock

Crona savignyi w/ more pigment white flecks

Bell Harbor Marina

9/1/98 Downtown Seattle 16°C

29-30‰

++ Corella

+++ Botrylloides sp violaceus

+++ B. schlosseri

10:15 AM very low tide

21°C
28‰

9/3/98 Blaine
1) end of rd - commercial docks
++++ B. violaceus - all colors - orange, yellow, purple
+++ S. clava

9/4/98 French Creek Marina 2PM
+++ S. clava 20°C
+++ B. violaceus 27‰
+ Distaplia - 1 small - on tire
+ Corella inflata 1 small "
+++ B schlosseri - both color morphs grey/black, & orange
also all black
+ Molgula manhattensis - 4 small, on tire

9/4/98 Nanoose Bay - Snaw-Naw-Was
+++ B schlosseri - esp orange - huge colonies 21°C
+ Corella inflata Also black ones, small 27‰
+ S clava - 1 very small
Dominated by mussels
small Strongylocent. droebachi, Pisaster
+++ B. violaceus

9/8/98 70 mi

1) Everett Marina 16.5° 22‰
Covered floats - 24‰ ~1 ft down
long rope sl. p. 41 dom by mussels
+ small Corella inflata
+ Styela gibbsii -

2) Edmonds 15°, 32‰ long rope
+++ Botryllodes violaceus } on gas float
+++ Dist. occid } long rope
+ Diplosoma listerianum - on mussel
++ S. gibbsii - H covered float
+++ Corella inflata esp H covered float

3) Des Moines L dock covered 16.5°, 32‰
+++ Bischlosseri - orange, & dark } several long ropes
+++ B violaceus
+++ Ciona savignyi
++ Corella
++ Distaplia - some very large colonies
++ S. gibbsii esp on rope
+ Botrylloides violaceus - 1

Corella inflata - from Prince Wm Sound, Alaska Sept. 1998 coll. by Jim Carlton for Smithsonian.
Evans Island, Chenega Village Small Boat Harbor 9/7/98. Just west of Montague Island.
ex-SERC panels (Greg Ruiz)

4) Harbor Marina, south end of Harbor Dr. 16.5°, 25‰

+ Several small Corella inflata on a crab trap at end of rope

5) Elliott Bay - 5 30 PM, high tide
6 pier (unlocked), 15°C
Botrylloides violaceus 32‰
B. schlosseri

9/9 Tacoma - O/e + Charles' Marina on Marine
1) Dr. 10AM 15.5°C, 25‰

Photos of schloss. + marine

Botrylus schlosseri - orange on a crab trap covered dock - very large lobate, very long rope on covered float -
S. gitkii - small
1 Distaplia (?)

2) Steilacoom 32‰, 15°
+ Botrenia villosa } on a net full of oysters
+ S. gitkii }
1 A. ~~callosa~~ columbiana - on a mussel

3) Olympia 17°C
Boston Hbr Marina 30‰
Distaplia occid. - huge w/2 large flatworms on a long rope
alg covering bottom of ~~styrofoam~~ floats

4) Shelton Yacht Club 20° 29‰ 30‰ down 1ft
+++ Molgula manhattensis
++ Botryllus schlosseri orange & black
+ Botrylloides violaceus - yellow mottled
++ Distaplia occid.

1st year to be large colonies according to 17 yr residents. Also warmer water this yr than previous. ~~the East~~

5) Fairharbor Marina 7PM, high tide
Grapeview 19°C, 31‰
+++ Botrylloides violaceus - every color morph possible

9/10 Kitsap Marina
Port Orchard 8AM 18°C 31‰
+ Styela gibbsii - on rope + floats
+ Botryllus schlosseri - saw 4 1 small colony on mussel orange

10AM 17°
32‰

2) Brownsville Yacht Club
+++ Botrylloides violaceus orange, yellow — somehage colonies
+++ Diplosoma
+ Corella inflata
+ Distaplia occid.
+ Styela gibbsii
+ Clona savignyi 3 big ones in sabellid/clumps mussel

3) Seabeck Marina - on Hood Canal
noon 19°C
++++ Botryllodes violaceus 29‰
+++ B. schlosseri - orange, black 27.5‰ at inner part of marina

4) Port Ludlow 3:15PM 15.5°
+ Pyura haustor - 1 33‰
+ Styela gibbsii - few
++++ Corella inflata
++++ Botrylloides violaceus
++ Distaplia
+ B. schlosseri
++ Diplosoma

---

5) Port Hadlock 5PM 14°C 34‰
+ Pyura haustor ++ Distaplia
+++ Botrylloides violaceus 1 Aseidia callosa
+++ Corella inflata 1 Boltenia villosa
+++ Diplosoma listerianum
+++ Styela gibbsii

14°, 34‰

6) Port Townsend 6PM
+++ Diplosoma
+++ Botrylloides violaceus
++ Cholyosoma productum
+++ Corella inflata
++ Styela gibbsii
+ Ascidia ~~callosa~~ columbiana
+ Distaplia – abundant on a long rope
+ Peraphora – on a Corella

9/11

1) Cornet Bay, Whidbey Is. 8:45AM
1 Corella small 13°, 33.5‰
~3 Boltenia villosa "icky, lace"
lots of scyphistome, fil. diatoms, Metrid.

2) Blaine – unlocked float by office 11:20AM
Dredging in full operation – water very muddy. 17°, 30‰
+++ Long rope – lots of B. violaceus, large colonies, various colors
++ Sclera
++ Distaplia occid. } on rope
++ Corella inflata }

3) Bellingham 19°C, 25‰ – but 21‰ nearshore
only mussels + barnacles
3 small Bot. violaceus at end of long rope

4) Elizon 18.5°C, 5‰
Botryloides violaceus on Ulva - drift?

5) Cap Sante Marina - Anacortes 15°
++ Perophora 31‰
++++ Botryll. violaceus
++ Corella inflata - esp in a covered float
S. gibbsii
+++ Distaplia - on a long line in a covered float. Huge colonies

---

9/12 Friday Harbor
1. Old lab floats
++++ Corella inflata
++ Botrenna villosa
+++ Styela gibbsii
++ Chelyosoma productum
++ Distaplia occid.
+ Aplidium californicum very large colonie on a bucket on a rope
++ Pyura haustor

2) Shipyard Cove + Jensen 4:30 PM 13.5°C, 32‰
+ Distaplia occid
+++ Chelyosoma + A callosa
++ S. gibbsii
++ Pyura haustor
+ Corella

12°C, 33‰

9/13 1) Town Docks 9:30 AM

++++ Chelyosoma
+++ Bolteria
+++ S. gibbsii
++ Corella
+ A callosa
++ Distaplia occid
+++ Pyura haustor
+ Aplid. calif - large on sabellid tube - Spring St docks

2) Lonesome Cove 12°, 32‰

+ Chelyosoma production
+ S. gibbsii
+ Pyura
+ Distaplia

3) Roche Hbr 12.5°, 33‰

++ Bolteria - old - esp on hoses
++++ Corella esp new floats !! Huge one 6.2cm long x 5cm across siphons largest one
++ Pyura - old
+++ Distaplia
++ S. gibbsii - old
++++ Chelyosoma - old floats
+++ Dyplosoma
++++ Botrylloides violaceus - new floats
++ Aplid. calif. - hoses

3PM

4) Westcott Bay Sea Farm 16°C, 32‰
++++ Botryll. violaceus - lots of tadpoles

5) Snug Harbor 13°, 32‰
++ Distaplia
+ S. gibbsii
+++ Aplid calif.
++++ Diplosoma
++ Botryll. violaceus
++ Corella
+ Pyura haustor

Photo #9
Distaplia on a Sakellid

6) Lab docks 12°, 32‰ 4:30PM
+++ Aplid. calif. - both yellow + opaque white colonies
+++ Distaplia - numerous but small very large
+ Corella inflata
++++ Chelyosoma - esp on a long rope & trap
+++ S. gibbsii - on a long rope
+ A. callosa - ~4, some large on a trap
++++ Boltenia - + on a long rope
++ Aplid. solidum w/ tadpoles

Photos 10+11
gibbsii
Boltenia

9/14 Orcas Island
1. West Sound Marina 9:30AM 15° 32‰
++++ Botryll. violaceus - several colors lots of Sakellids
+++ Diplosoma + Pyura
+ Corella ++ S. gibbsii - mostly small
+++ Distaplia - many small + Chelyosoma

14°
33‰

2) Deer Harbor Marina 10:20AM

+++ Botryll. violaceus
++++ Diplosoma
+++ Corella
} new floats - installed April '98

+++ S. gibbsii - old floats w/ lots of mussels in water. 1yr

+ Cnemidocarpa finmarkiensis - 1 older float
+ Botrenia v. llosa - 1 "

3) Cayou Quay Marina - also Deer Hbr
old floats mostly, a few new ones

++++ Distaplia - small colonies lots of satellites
+++ Corella
+ Botrenia
+ Halocynthia calif.
+++ Diplosoma
++++ Botryll. violaceus
S. gibbsii
+++ Pyura - old floats
+ Cnemidocarpa - 1

4) West Beach Resort noon
14°, 31‰
Barnacles, hydroid, Zostera

3) North Beach Smugglers Cove 14°, 31‰

+++ S. gibbsii
++ Botrenia
++++ Distaplia
+ Corella w/ Emplectonema
} on ropes

+ Botryll. violaceus
1 colony on mussel

6) Rosario 15°, 31.5‰
++ Distaplia
+++ Corella } ropes
+++ Botryll. violaceus
+ Boltenia -1
+ Pyura haustor -1 lots of mussels & barnacles
Diplosoma sabellids

7) Orcas Ferry dock 12° 32‰
++ Corella 3:45 PM
++ Distaplia lots of big sabellids
+ Boltenia
Pyura haustor
Chelyosoma
S. gibbsii
A. ~~callosa~~ columbiana
Aplid calif.

Bill Paterson - caretaker 378-4992

9/15 1) Fish Creek 9:45 AM
+ Distaplia 12°, 33.5‰
+++ S. gibbsii
+++ Pyura haustor Floats are 9 yrs old
++ Chelyosoma
+ Boltenia -1

2) Jacksons Beach floats 13°, 33‰
Diplosoma Boltenia
Distaplia S. gibbsii

Low tide 9:30 AM 13°, 32.5‰

9/16 Lopez Is. - Fisherman's Bay

+++ Corella inflata

+++ Aplid. calif

++++ Biophora annectens

++ Pyura haustor

++++ Aplid. solidum

+++ Diplosoma

++++ Distaplia occid.

+ Boltenia villosa

++ Botrylli violaceus - on big kelp esp. many colors

+ Chelyosoma - large old ones

Metridium 4+

water very green, "thick"

9/16 Anacortes 13° 33‰

1. Skyline Marina - across from Shannon Pt noon

+++ Corella - 4+ on bottoms

+++ B. violaceus - abund on some floats, not others

++ Diplosoma

++ Distaplia

+ Pyura haustor - 1 large

2. Down Dakota St. 13°, 32‰

++ Corella

+ S gibbsii

+ Distaplia

+ Botryll. violaceus

31‰, 15°C (from PSX report)

3. Anacortes Marina 2PM

++++ Botyll. violaceus !!

+++ Corella – esp covered floats

++ Distaplia – very large

Metridium – 4+

Water very green

9/23 Vancouver

Port Moody Reed Pt. Marina 26‰ mussels, barnacles

9/24 1) Granville Sq. Marina 25‰ " "

2) Royal Vancouver Yacht Club 29‰

Stanley Park

+ Corella – a few on a line ~6' down

mostly barnacles + mussels, a few sponges, hydroids, 1 Pisaster

3) Horseshoe Bay 24‰

mussels + barnacles

4) Nanaimo 16.5°, 29‰

Brechin Pt boat launch

+++ Botrylus schlosseri

++++ Botrylloides violaceus all colors

+ Styela clava – 2

+ Corella inflata

} lines

16°, 30‰

5) Pacific Biol Sta
++++ Botryll violaceus all colors
huge colonies
++ Corella inflata
Metridium - huge #s mussels,
Pisaster, sabellids, Pugettia - large

9/26/98 Port Alberni 8‰, 19°
Mouth of Somass River
only a few barnacle

10/3/98 (1) Kingston Marina 10AM
Low tide 13°, 33‰
~~++++ Botryllopes violaceus~~
+++ Corella inflata
lots of sabellids, P. Baster, Metridium
mussel
+++ Distaplia long line on
slip #11 - covered float
next to fuel dock

(2) Port Gamble — no floats
(3) Poulsbo Y.C. 15°, 32‰
water very muddy - apparently normal at low tide
Long line across from slip A39:
+ Distaplia
+++ Botrylloides violaceus
++ Styela gibbsii
} on line
Lots of big Metridium on floats
(*) Didemnum sp A? + Didemnum carnulentum - very large colony
end of page

San Juan Islands Summer 1999

5/14/99 ① Roche Hbr - newer floats only
+ Botrylloides violaceus - small colonies
++ Chelyosoma productum
+ Boltenia villosa

② Snug Hbr
1 Corella inflata large
++++ Distaplia occid - solid wall on everything
Huge colonies
1 Chelyosoma productum - large

③ Shipyard Cove
Lots of jellyfish + Beroe
++ Pyura haustor
++++ Chelyosoma productum
++ Boltenia villosa
+++ Styela gibbsii
2 Ascidia callosa - large
++ Distaplia occid

④ Old lab floats - Cypron's Landing
+++ Styela gibbsii
+++ Pyura haustor
+ Corella - few
+ Aplidium calif. - on bucket
+ Distaplia occid
1 Ascidia ~~callosa~~ columbiana - on bucket; large
+ Boltenia villosa
++++ Chelyosoma productum

Also Tubularia ++ large

FHL docks – with Brad Moore + Joelen

June 5, 1999 Aplid. calif. and
Aplid solidum
esp. abundant in live tanks on floats
attached to the floats & tubular frames
Also a didemnid with very stubby-
spined spicules
Styela gibbsii
Pyura haustor
Chelyosoma productum
Ascidia callosa – several large
Distaplia occid. – not common

June 9, 1999 Dredging on Nugget –
CCL and Steve Stricker w/ Dave Duggins
40 fathoms – 240 ft – off Rock Pt., Lopez Is.

1)? Aplidiopsis pannosum 3 colonies
2 white, one yellowish
Zooids with many large embryos – are
hatching. As many as 5/zooid
Also a "nest" of veligers in the tunic of
the largest colony.
Colonies 27 mm in diam × 17 mm tall
21 mm wide × 16 mm tall
18 " ×
Atrial languet wide, cowl-like, w/ 3 small clefts or teeth.
Attached by small area basally – a short thick peduncle
Tunic clear, no sand
12–13 rows stigmata, no papillae on transverse vessels
As many as 8 embryos in one zooid

Aplidium

2) One grey colony ~ 6 cm long x 2 cm wide
Somewhat crushed.
Zooids very contracted but tiny.
Many have larvae in atrial chamber.
Tunic completely impregnated with sand grains, is quite tough, colorless.
Zooids colorless but stomach yellow/orange, larvae very pale pink.
Zooids densely crowded.
Atrial lanquet
Parasitic copepods present

July 1, 1999 Rock Pt off Lopez, dredge
10 colonies of Aplidiopsis pannosum collected by Nugget - Dave Duggins - also Brad Davidson of Moody's lab, UW, off Lopez.

One small colony is attached to some barnacles.

Largest colony has 2 heads. These larger colonies are definitely capitate. Largest is 4 cm across in widest diam, x 2.5 across, x 3.4 cm tall of which the stalk is 1.4 cm. Attached to sabellaid tubes. Small Boltenia or Halocynthia hispida (= igaboja) attached to base of one colony.

2 colonies are a little more yellowish than the others; all have a globular shape & translucent tunic. The zooids are yellower in the 2 colonies. One has embryos (veligers?) in the basal portion & is dead but released tadpoles on its surface. A small colony

has many zooids with apparently 1 larva/zooid, incubated in zooids' atrial chamber.

Zooids arranged in more or less circular systems around the common cloacal opening, which is obscure in contracted zooids.

The 3 tadpoles have very yellow body, esp one part which is probably the stomach. Very wide tail fin. 3 adhesive papillae. Instead of lateral ampullae, the tadpoles have numerous small ectodermal vesicles (see Kott '92 p. 508). They are scattered over most of the lateral + anterior regions: corresponding to Kott's "multiple arc of vesicles". One of the tadpoles has begun metamorphosis — tail totally withdrawn, the 2 little siphons are visible.

Another colony (small, alive, in great condition) of the mystery Aplidium found in lab from June 9 dredge. Has a copepod, live, bright red w/ green eggs - given to Shizeko. Botryllophyllus. Colony relaxed, preserved. Growing on apiece of barnacle shell. One oblong flat system of 31 zooids with 1 cloacal opening. 9 rows of stigmata but probably immature. Stomach longit. plicated. Zooids very transparent except stomach + ascending intestine yellow. Tunic with embedded sand but not encrusted. Tunic soft, gelatinous, transparent. Atrial languet

when fully extended very long, broad, tongue-like & single - no lateral tongues.

~ July 20 - Brad Davidson, grad student at UW Moorings lab says there are lots of Ciona savignyi at Edmonds Marina esp. on covered floats.

Aug. 2 - Charley coll. Perophora annectens at Fisherman's Bay floats, Lopez Is. See disc. by Nishikawa 91. Some zooids have a definite short 5th row of stigmata. In all the largest zooids (4mm max. length) the 4th row is much longer than the others + there are a few stigmata subdivided into 2.

Aug. 3 Dredge hauls from Rock Pt off Lopez; more colonies of Aplidiopsis pannosum most small. Largest one 2cm across. Many larvae, + swimming tadpoles which are huge - body elongate, ~1.3 mm long. 3 very large sausage like bulbous adhesive organs, no ampullae. Some colonies have reddish brown pigment here & there.

Aug. 4 Dredge at Peavine Pass for Balanus nubilis for Chris Ashley. Many colonies of Aplidium sp. - colorless or grey with embedded sand. Zooids have

a large # of longitudinal stomach plications ~14

In one colony, 2 kinds of parasitic copepods: the same red/green Botryllophyllus and also Haplostoma - several. at least 6
~12-14 rows stigmata

8/3/99 Dredge Rock Pt off Lopez - also collected an unid. didemnid, reddish brown w/ white spirules, on a small clam. Mytilimeria
Didemnid colony is full of a red parasitic copepod w/ red eggs.

8/4/99 - Large colonies of Metandrocarpa taylori with brooded embryos + tadpoles on the Balanus nubilis. Tadpoles also bright red. The 3 adhesive papillae are very short

Some of the Aplidiopsis pannosum colonies have scattered reddish brown pigment in the surface. These are opaque colonies. One colony is yellow, with zooids + embryos quite yellow. Numerous colonies coll. 8/3, up to 4cm across. Many shapes, sizes, + subtle color variations but all full of embryos. One colony has a Haplostoma type parasitic copepods - given to Shizuko.

Peavine Pass - fs between Blakely Is (northend) and Obstruction Is. - always dredge at 9-10 fathoms for the Balanus nubilis.
At Rock Pt - about ½ way up west side of Lopez - always dredge at 46 fath.

8/4/99 some colonies of Aplidium sp sandy tunic on the Balanus nubilis. Also a large A. callosa.
Aplidium grown in lab, fixed 8/30. Lives well in water table.
8/28/99 Cystodytes lobatus white & orange/pink color morphs from 40 fath. San Juan Channel in front of Strathmanns'.

11°C 5/25/2000 Orcas Is. marina
33‰ near ferry dock
Baghead Marina

mussels, a few large sabellids, barnacles, algae + fil diatoms. No visible tunicates

---

Ferry landing fuel dock
Distaplia — lots on a strip of burger
a few Tubularia
Balanus nubilis on floats
Mytilus } common
Metridium }
big sabellids — common

5/27/00 Rocky Hbr "new" floats
++ B. violaceus several colors
Boltenia villosa
Chelyosoma productum
Styela gibbsii
Pyura haustor 2

5/27/00 Sauq Hbr
+++ Distaplia bacci
Corella inflata - 2, 1 large
Diplosoma listerianum on a sabellid

Claudia's PSX 2000 expedition

(1) Taylor Mussel Rafts, Totten Inlet 5/19/00
Didemnid - Didemnum sp. A ~~carnulentum~~
Corella inflata
Boltenia villosa
Botrylloides violaceus w/ tadpoles

(2) Steamboat Island, Totten Inlet 5/20/00
Didemnid - Didemnum sp. A ~~carnulentum~~

(3) Palix Mouth 5/21/00 Willapa Bay
Botrylloides violaceus - purple

(4) Palix #3 5/21/00
Botrylloides violaceus - purple

(5) Nahcotta, WA 5/22/00 Long Beach Peninsula
Botrylloides violaceus - several colors

Aug. 7, 2000 Boston Hbr

1) Botrylloides violaceus ++++ various colors — 22.5 °C, 31 ‰
mussels
gapellids
B. schlosseri black + yellow
Ascidiella aspersa - some are pink very small
Ciona intestinalis
Styela clava
[sides of a tall steel float]
Molgula manhattensis sm. - on large tree

2) Boston Harbor Hotel Rowes Wharf — 20.5 °C, 30 ‰
S. clava ++
B. schlosseri +++
Botrylloides +++ in many colors violaceus
Molgula manhattensis ++
Ascidiella ++++ aspersa
Ciona intestinalis +++

3) Deer Island sewage treatment plant dock — lots of mussels
lots of Tubularia Not many ascidians
Dock high sided — 20.5 °C
Next to sandy beach - open exposure — 31.5 ‰
++ Botrylloides
+ Botrylus schlosseri black
++ Ascidiella aspersa - a few various sizes

1 Ciona small

(4) Constitution Hbr on Charles River
Very rich in ascidians - lots of boats
Big marina

HH S. clava - at end of rope
HH Botryllodes 22°C
HH Botrylloides schlosseri 18‰ surface, 29.6‰ bottom
HHH Ascidiella/Ascidia on ropes + on S. clava
HH Ciona intestinalis very large
~~HH Ciona savignyi~~
1 Molgula

Lab U Mass Boston on Dorchester Bay

Aug. 8, 2000

① Gloucester floats State Pier & float

++++ S. clava

++++ Botrylloides violaceus various colors

++++ Ascidiella aspersa

++ Molgula manhattensis

+++ Botryllus schlosseri black

+ Molgula citrina 4

Photo slide #11 - S. clava w/ assorted other ascidians on it held by Andy Cohen

② Cape Ann Marina 22°C

++++ Botrylloides violaceus 30.5‰

+++ S. clava not as many as site ①

++++ Molgula manhattensis large

++++ Ascidiella aspersa huge

+++ B. schlosseri

++++ C. intestinalis - some orange

+ Molgula citrina 3 specimens

③ Beverly - Tuck's Pt. (town dock)

+++ S. clava 21°C

+++ B. violaceus 32‰

lots of mussels, Asterias forbesi, sm. brown Metridium

+ C. intestinalis

+++ Molgula manhattensis esp. on hydroids

+ Ascidiella aspersa

++ B. schlosseri

+ Molgula citrina w/ larvae, 2 specimens

(4) Hawthorn Marina Salem 21.5°C
+++ B schlosseri 31‰
+++ B. violaceus
+++ M. manhattensis large extremely abundant
+++ C. intestinalis
+++ S. clava
+++ Diplosoma listerianum
++ Ascidilla aspera

Aug. 9 2002 22°C 31‰

(2) Baypoint Marina, Quincy
++++ B. violaceus very abund
++++ B. schlosseri very abund. the most so far
++++ Molgula manhattensis very abundant + very large
++++ S. clava esp on outer floats
many are young right at water's edge
not many large ones
largest one 35mm across = max recorded size

(3) Public pier, Duxbury 22.5°C
++++ B. violaceus 32‰
+++ Molgula manhattensis esp. under dock
+++ Styela clava
+ B. schlosseri
+ Ciona intestinalis 1 large

(4) Town wharf floats, Plymouth 21.5°C
31‰

++ Botrylloides violaceus
+++ Molgula manhattensis
+++ B. schlosseri - yellowish beige and
++ Styela clava also black

(1) MWRA Pellet Plant, Quincy - coll. by J. Carlton
collected off big barge - not a good site.

+++ Styela clava - many small + ½ grown
Botryllus schlosseri - both black + cream
Botrylloides violaceus
Molgula manhattensis
Had to climb down a ladder

Aug. 10, 2000 23°C
31‰

(1) Woods Hole Coast Guard
+++ Styela clava
+++ B. violaceus
++ B. schlosseri
cunnar (a wrasse) eats Molgula + young Ciona - according to Larry Harris who has done stomach contents. This is published.

++ Aplidium consellatum? esp. on mussels. Has appeared only in the past few yrs according to Carlton

D. demnum ~~tetranum (?) sp~~ verrillum

1 Ascidiella - small

~~Distaplia? - overgrown on mussel~~

1 Ciona - on same mussel

1 Molgula - overgrown by beige ~~Didemnum tutarium~~ sp

2 Molgula not overgrown

~~Perophora~~ - 1 sm. colony on mussel

(2) Eel Pond, Woods Hole 24°C 30‰

+++ Ascidiella aspersa both pink & colorless

+++ Ciona intestinalis

++++ Molgula manhattensis

++++ Aplidium stellatum

+++ Botrylloides violaceus w/larvae

+++ Styela clava

+++ Diplosoma a lot on one tire outer side

(3) Barnstable Hbr 23.5°C, 27-28‰

++++ Molgula manhattensis

++++ Botryllus schlosseri black

+++ Styela clava - towards bottom of rope

+++ Botrylloides violaceus a huge mat on a crab trap

photo # 19 slide + 18 - Molgula on a rope

Largest Molgula 41mm across, w/ 1mm siphons, coll by J. Carlton

19.5°C
31‰

(4) Sandwich Hbr
++++ S. clava on ropes huge
++++ B. violaceus
++++ Ascidiella aspersa huge
++ Ciona intestinalis
++++ Botryllus schlosseri many color morphs
++++ Diplosoma
++++ didemnid - large beige colonies
Molgula sp. (1) small citrina
Aplidium constellatum 1 sm. colony
Aplidium stellatum 1 or more sm. colonies

Didemnid: huge mats
8-9 coils of sperm duct
spicules densest in superficial layer, small
like Van Name p. 87
No spicules basally. Didemnum sp
~~lutarium~~

Aplidium stellatum
13 stomach folds apparently regular
10-11 rows stigmata
no sand embedded

Dock put in in March

Aug. 11, 2000

23°C

(1a) Mass Maritime Acad floats 32‰

++++ B. violaceus

++++ Didemnum ~~sp~~ vexillum huge mats lower down on a piling

+ Molgula manhattensis

++ Ciona intestinalis

+++ Botryllus schlosseri

+ Styela clava 1 sm.

(1b) Bourne Marina 23.5°C, 31‰

++++ B. violaceus

+++ S. clava

+++ Molgula manhattensis

++ Ciona intestinalis

+++ Botryllus schlosseri

+ Ascidiella aspera, 1 small

(2) New Bedford state pier float

++++ B. violaceus

+++ S. clava

+++ B. schlosseri

+ Molgula manhattensis 1 small

(3) Tipps Marina, Westport, Mass. 25.5°C

+ Ciona intestinalis 26-27‰

+ Styela clava

++++ Didemnum ~~lutarium~~ vexillum sp slide photo #20

++++ Botrylloides violaceus

++ Botrylloides schlosseri

+ Perophora viridis 2 colonies, one on a dead mussel

+ ~~Styela canopus~~

+ Molgula manhattensis

salinity very stratified — bottom 23.5 °C 29‰
25°C, 17‰ surface

(4) Fall River - Battleship cove - old wood float and off the side of a submarine
++ Molgula manhattensis - at end of rope
+++ Botryllodes violaceus
+ Ascidiella aspersa
++ Botryllus schlosseri

Rhode Island
8/14/00

(1) Portsmouth Melville Marina East Passage Yachting Center
++++ Molgula manhattensis
+++ Ciona intestinalis
++++ Botrylloides violaceus many colors
+++ Styela clava
++++ Ascidiella aspersa
++++ Botryllus schlosseri
Huge biomass of ascidians everywhere in marina

(2) Narragansett Boat Club 21°C
No ascidian 20‰

(3) India Point Providence - Bootleggers Marina 21°C
+++ Molgula manhattensis 30‰
Photos of 2 swans & a mallard

(4) Edgewood Yacht Club 20°C, 27‰
on rope, hanging bumpers;
+++ Molgula manhatt
+ Botryllus schlosseri
+ Botrylloides violaceus - 1 sm.

21.5°C
30‰

(5) Cove Haven Marina
++++ Molgula manhattensis hugetts
+ Botrylloides ? 2 small colonies
+ Botrylus schlosseri

Aug. 15, 2000 by Mary Case
(1) ~~Newport~~ Coasters Harbor Is. 20°C, 33‰
++++ Styela clava 41°30'16.5"N, 71°19'34.3" W
++++ Dendrodoa very abundant
+++ ~~Botrylloides~~ Botrylloides violaceus
+++ Ascidiella aspersa
++ Ciona intestinalis common
+++ Didemnum ~~fulcum~~ vexillum - outer end of outer docks by entrance

(2) Roger Wms Univ 21°C, 31‰
Crab trap: large mats of
Botrylloides violaceus
+ Ascidiella aspersa

(3) Bristol - Colt State Park 21°
++++ Ascidiella aspersa (small) 31.5‰
++ Botrylus schlosseri
+ Styela clava - small 2
+ Molgula manhattensis

vexillum

Notes of Didemnum lutarium?
8/11/00 sta. 1 - Mass Maritime
Has tadpoles, ~ 6 lateral ampullae/side
3 adhesive papillae
Zooid - about 8 spirals of sperm duct
Single testis
Thorax firmly attached to tunic by
oral siphon.
Apparently no atrial tongue?
4 rows stigmata
Atrial opening a gaping hole

Aug. 16, 2000

(1) Wickford - west side 21.5°C
+++ Botrylloides violaceus 30‰ surface
+++ Molgula manhattensis
+++ Styela clava mostly small - mostly at end of marina facing away from harbor entrance
+++ Botryllus schlosseri

(2) Allen Harbor, N. Kingstown 21.5°C, 29.5‰
++ Styela clava
+++ Molgula manhatt
++ Botrylloides violaceus

(3) Warwick Cove Marina 21.5°C, 30‰
Warwick RI

++++ Molgula
+++ Styela clava - some huge
++++ Botryllus schlosseri
+ Botrylloides violaceus
+++ ~~Styela canopus~~ - on a quahog bag and an old piece of Styrofoam

(4) Fort Getty pier
+++ Botrylloides violaceus on rocks
full of larvae
also on mussels on pilings
+++ Styela clava

8/17/00 Prudence Do. Tuhanf 20°C
Dominated by mussels 32‰
+ Ascidiella aspera a few small
+ Ciona intestinalis 1 sm.
++ Botrylloides violaceus - on rocks
on shore also

8/17/00 Prudence Do. - Potters Cove 21.5°C, 32‰
+ Molgula manhattensis - few on a net
+ Ascidiella aspera rare (1) small & on bag float

8/24/00 Southern Calif. 19.5°C
35‰

(1) Cabrillo Marine Museum float

+++ Botrylloides violaceus several colors, larvae
+++ Styela clava
++ Symplegma reptans
+++ Ascidia ceratodes
+++ Ciona savignyi
+++ Botryll. diegensis
+++ Styela plicata
++ Botryllus schlosseri black
no S. canopus
++ Ciona intestinalis small mostly on side of floats
some larger
+ Styela gibbsii plain red siphons; no stripes
+ Microcosmus squamiger

(2) Watchorn Marina - now Cabrillo Way Marina 21°
2 color morphs
Diplosoma listerianum +++
Botrylloides diegensis ++++ 34‰
slide photos 21, 22, & 23 of a large piece of rug covered w/ plicata, clava etc
Styela plicata +++
Styela clava +++
Ascidia ceratodes ++
Photos 24 + 25 = A. ceratodes on mussel - note ridge of tunic
++++ Aplidium sp. ~9 rows stigmata many larvae both orange & white morphs
+++ Ascidia ceratodes
+++ Ciona intestinalis
+++ B. schlosseri black
++++ B. violaceus
++ Molgula ~~verrucifera~~ ficus
++ Ascidia zara
+ Ciona savignyi
+ Distaplia occidentalis small heads w/ larvae, purple colonies

34‰, 21.5°

(3) Newmark's Marina, Wilmington
+ Ascidia ceratodes
+++ Botrylloides violaceus also white
++ B. diegensis
++ Aplidium calif. big whitish colonies
+++ Styela clava huge
+++ Ciona intestinalis huge
++++ Styela plicata huge
++++ Diplosoma listerianum
++ Aplidium sp. red zooids w/ transparent tunic
+ Molgula - ~~verrucifera~~ sicus
+ Ciona savignyi !
+ Microcosmus squamiger
+ Ascidia zara

Island Yacht Anchorage, Wilmington

(4) Ciona intestinalis +++ huge 32‰
Styela plicata +++ 23°C
+++ Ciona savignyi
+++ Diplosoma listerianum Photos
+++ B. violaceus sl. des 10+11
+++ B. diegensis C. intest + C. savignyi under water
++ Ascidia zara
++ Molgula - manhattensis
+ Styela clava young
+ Styela gibbsii plain red siphons
small, 3 or 4 but w/ gonads

19.5°C
36‰

8/25/00 Port Hueneme

(1) ~~Jack's Landing~~ (on Victoria St.) Renamed Cisco's

+++ Botryllus schlosseri black
+++ Ciona intestinalis
~~+ Molgula~~
+ Botrylloides diegensis
+ Styela clava
+++ Ascidia ceratodes
+ Styela plicata
+ Diplosoma
+ Molgula ~~verrucifera~~ ficus C. Monniot 11/30/05
+ Chelyosoma productum (1)
++ Aplidium californicum
++ Botrylloides violaceus large colony on Ulva

(2) Anacapa Isle Marina D dock 20°C
36‰

+++ Botrylloides diegensis
+++ Botrylloides violaceus
+++ Ascidia ceratodes
+++ Aplidium californicum white pinkish or
++++ Styela clava esp on outer docks. large ones & very many smallones!
++++ Diplosoma - 2 color morphs
+ Microcosmus squamiger
++++ Molgula ~~verrucifera~~ ficus esp on our docks
++ Ascidia zara
+ Botryllus schlosseri black
++ ++ Styela plicata most abundant & huge on outer docks
+ Ciona savignyi
+++ Ciona intestinalis

24th St. Natl City
inner ~~[illegible]~~ upriver corner of
junction of ramp & float

J St Boat launch floats Chula Vista
2 ropes one at ② end of the 2 floats
north rope OK 2000 on N side near end of float

Fiddlers Cove 2 ropes
NE corner of C19 & at very end.

~~Bonnie Hill~~ Charlie's Harbor Do
on float straight out from office E7
also a wide at E&7

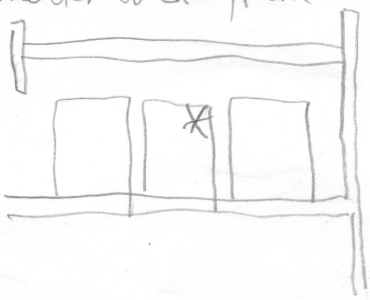
Shelter Do, ← see diagram

Coronado Yacht Club rope at C19

South Shores boat ramp Mission Bay
Rope at end of south float

Bahia Pt Mission Bay
Santa Clara – rope by concrete pier at left end of float

Shelter to diagram



very open coast here - purple urchins, sea stars, large anemones

(3) Port of Hueneme 19°C 35‰
+ Ciona intestinalis
+ Styela gibbsii 1 small
++ Styela clava
+ Ascidia ceratodes
++ Botryllodes violaceus

Photos slide #11, 12, 13 Ascidia ceratodes from the 3 sites in 1 dish

8/26 San Diego Bay
(1) J St. Chula Vista 27°C
north rope OK on N side near end of float 37‰
++++ Diplosoma listerianum
++++ Microcosmus squamiger
++++ S. plicata
++++ Ciona savignyi
+++ Polyclinum constellatum 2 color morphs brownish purple + blackish
++++ Ascidia sp A green short siphons, large animal
++ Perophora on Zoobotryon
++++ Molgula ~~verrucifera~~ ficus
++++ Styela canopus
+ Styela clava few but large
+ Botrylloides diegensis rare, small
+ Ciona intestinalis large but rare
+++ Polyandrocarpa large colonies on rope esp on rope, but also on north float
+ Botrylloides violaceus small, rare

26°C, 36‰

(2) Fiddlers Cove Navy Yacht Club C19 ropes both OK

++++ Styela clava
++++ Polyandrocarpa sp on rope but everywhere extremely abundant
++ Botrylloides diegensis
+++ Diplosoma listerianum
++++ Microcosmus squamiger
+ Botrylloides violaceus
+++ Styela canopus
++ Ciona intestinalis
+ Symplegma reptans on our end rope
+++ Styela plicata
+ Distaplia occidentalis 1 sm. colony
+ Perophora
+ Botryllus schlosseri large black colony
+++ Ciona savignyi near shore esp on line
++++ Molgula ~~verrucifera~~ ficus
+ Aplidium calif yellow - on a buoy
+ Ascidia sp. A 2 large ones on "
+ Botryllus sp.

---

(3) Shelter do. Rope OK 23°, 35‰

++ Botrylloides perspicuum huge colony on rope
++ Botrylloides violaceus some w/ larvae
+++ Botrylloides diegensis
++++ Styela plicata
++ Polycleinum constellatum
+++ Polyandrocarpa zorritensis
++ Aplidium sp. large yellow
+++ Botryllus schlosseri

+ Ascidia ceratodes (1)
++ Distaplia occidentalis both orange & mottled purple
+++ Styela clava
+ Ascidia zara
++ Symplegma rapta
++ Perophora
+++ Aplid. calif.
++++ Molgula ~~verrucifera~~ ficus
+++ Ciona intestinalis
+++ Ciona savignyi
+ Diplosoma
++ Ascidia sp. inner floats
++ Styela canopus
No Microcosmus - searched thoroughly

Botrylloides perspicuum (= firmus) has many tadpoles. Each has 8 very long ampullae. 4 per side Heart is beating in the tadpoles, which are incubated inside the zooids. Body of tadpole ~ 0.8-0.9 mm in length. 3 pointed adh papillae

Adult systems in small ovals. 2nd row of stigmata is complete. Testis anterior to ovary.

At Shelter Island on outermost float was a round float or buoy covered with numerous spp of ascidians + other invert. Several photos taken (slides).

8/27/00 Baja California 22.5°C
35‰

(1) Ensenada Sportfishing Marina
Juanitas dock dominated by mussels
oil scum on water
But floats full of invert

+++ Ciona intestinalis
++++ Styela plicata
++++ Styela clava } esp on ropes & pilings 1m + below water line
+++ Aplidium californicum
+++ Botrylloides violaceus
+++ Botryllus schlosseri
++ Botrylloides diegensis
+++ Diplosoma
+++ Polyandrocarpa

(2) Coral Hotel & Marina 21.5°C
35‰
Water much cleaner than (1)

++++ Styela clava - esp on pilings
+++ Botrylloides diegensis
++++ Styela plicata - esp on pilings
+++ Polyandrocarpa - on floats
+ Botryllus schlosseri
+ Ciona intestinalis (2)
+++ Diplosoma
+ Aplidium calif 1 sm colony
+ Microcosmus (1)
+ Ascidia ceratodes on rope + on mussel
3 small

8/28/00 20.5°C, 36‰

(1) Seaforth, Mission Bay - by Hyatt
lots of old rope here Quivira Basin

+++ Styela plicata
++ Botrylloides perspicuum (= B. firmus)
+++ Diplosoma
+++ Botrylloides diegensis
+ Botrylloides violaceus (1)
+++ Ascidia cerratodes
+++ Styela clava
+++ Molgula ~~vermifera~~ ficus
++ Botryllus schlosseri
+++ Ciona intestinalis
+++ Ascidia sp?
++ Polyandrocarpa
+ Aplidium californicum
+ Ascidia zara (2)
++ Ciona savignyi very large, abundant - inside a large crab trap
+ Microcosmus

---

(2) San Dieguito Lagoon - no ascidians. 18.5‰

(3) Agua Hedionda Lagoon - Snug Harbor
Marina - just east of Hwy 5
Dominated by mussels

++ Aplid. californicum 22.5°C
+++ Didemnum vexillum on mussels 36‰
+ Botrylluss schlosseri has systems like D. perlucidum
++ Diplosoma
+ Styela clava (1 large)
+ Microcosmus (2 large, 1 sm)

(4) Oceanside Hbr 35.5 ‰, 22°C

a. Police floats & nearby

++ Styela clava

++++ Polyandrocarpa

++++ Botrylloides diegensis

+++ Styela plicata

+++ Diplosoma

+ Botryllus sp. tubular, lt. siphon w/ 11 row stigmata orange

+++ Ascidia ceratodes on mussels & ropes

++ Microcosmus

++++ Molgula ~~vermifera~~ ficus

++ Botryllus schlosseri

Lots of heavy ropes someone installed. Full of large S. plicata & other stuff

Most of these ascidians on long ropes installed by someone (?) quite a while ago. Maybe 1 yr

8/29/00 Marina del Rey - Bora Bora

Float A 1501-1528 OK Ropes ① A 701

+++ Styela plicata esp on ropes! OK ② Betw 706 & 708 on float A 525

++ Ascidia ceratodes ② rope stripped.

22.5°C, 35‰

+++ Botrylloides diegensis

++ Molgula ~~vermifera~~ ficus on ropes

+ Botryllus schlosseri - black, "orange, "calico" colonies

+ Botrylloides violaceus 1 colony w/ tadpoles

+++ Ciona intestinalis small - red eggs!

+++ Aplidium californicum - both the white & the clear w/ orange zooids

+++ Diplosoma

Aplidium sp.

+ Ascidia zara
~~Ascidia ceratodes?~~
+ Styela clava very rare

(2) King Hbr Redondo Beach 23°C, 36‰
Rope D30, F11 - Did not get onto F float
D30 OK

+++ Styela plicata
++ Ciona intestinalis
++ Aplidium Calif.
+ Styela clava
++ Botryllus schlosseri
+++ Botrylloides oregensis
++++ Diplosoma
+ Microcosmus
~~+ Ascidia ceratodes~~
+++ Polyandrocarpa
+ Botrylloides violaceus

Longhose E18 - excellent

Largest = 4cm
several large on long hose

on a long hose E18

lots of garibaldi around rocks as always

8/30/00 Long Beach 19.5°C, 36‰

(1) F pier by Long Beach Fire Dept floats
close to LA hbr entrance Several very long ropes

+++ Aplidium calif.
++ Ciona intestinalis
++ Botrylloides diegensis
++ Styela plicata
+ Styela clava
+ Distaplia occidentalis full of larvae sm. colonies orange, & mottled purple
+ Diplosoma
+ Microcosmus 2 very small

(2) Long Beach downtown marina JKL floats
21°C, 36‰

++++ Diplosoma
+++ Botrylloides diegensis - incl. 1 colony all orange but w/ thin ring around one siphon
++++ Styela plicata
+++ Botryllus schlosseri - several color morphs
+++ Ciona intestinalis small
++ Styela clava
+++ Aplidium calif on outer floats
+ Molgula ~~verrucifera~~ sieg (2)
+ Ascidia ceratodes
+++ Molgula manhattensis

(3) Hyatt LB - shallow pond Rainbow Lagoon
+++ Microcosmus full salinity
+++ Botrylloides diegensis
+++ Styela plicata
+ Ciona intestinalis
+ Aplidium calif
+ Molgula manhattensis

35‰
20.5°C

(4) Impound Marina

++++ Bot. diegensis
++++ S. clava
++++ S. plicata
++ Aplidium calif.
++++ Ciona intestinalis
+++ Ascidia ceratodes quite large
+++ Diplosoma
+++ Bot. violaceus - orange colony w/ larvae
also purple + other colors
++ Polyandrocarpa
++ Botryllus schlosseri
++ Distaplia occidentalis orange, also mottled
~~+ Aplidia zara?~~
+ Molgula ~~verrucifera~~ ficus
+ Styela gibbsii (2) on a line

No Microcosmus or Symplegma
Tons of tunicates.

B. diegensis - one orange + brown colony with embryos in early tailbud. 2 embryos / zooid, incubated inside the body

8/31/00 Alamitos Bay 22°C, 35‰

① Colorado Lagoon – upper end of Alamitos Bay

++++ Styela plicata
++++ Molgula manhattensis on Zostera
+++ Aplidium californicum
++ Ciona intestinalis

② Alamitos Bay LB Yacht Club 21°C 35‰

Near to but not the same floats as our Sea Grant site

+++ Styela clava
+++ Botrylloides violaceus
+++ Botrylus schlosseri
+++ Botrylloides diegensis
+ Ciona savignyi
+ Ascidia ceratodes
++ Ciona intestinalis
+ Ascidia sp. A (yellow eggs)
++ Distaplia occidentalis variegated w/ purple
+++ Molgula ~~verrucifera~~ ficus
+ Polyandrocarpa on long rope
++ Microcosmus "
+ Styela plicata
+ Styela canopus 1 large

③ Huntington Hbr Yacht Club Corner of PCH & Warner

++++ Ciona intestinalis 22.5°, 35‰
+++ Molgula ~~verrucifera~~ ficus
++ Styela plicata
++ Botrylloides diegensis

++ Botryllus schlosseri
++ Ascidia zma
++ Microcosmus
+ Diplosoma listerianum
+ Aplidium calif
+ Ciona savignyi
++ Botrylloides violaceus

(4) Inner Huntington Hbr at Edinger & Bonaire Circle
+++ Styela plicata
++ Diplosoma
++ Botrylloides diegensis
++ Molgula ~~vernicifera~~ ficus
++ Aplidium calif
++ Botrylloides violaceus
+ Styela clava
++ Botryllus schlosseri
++ Ciona intestinalis
+ Ciona savignyi
+ Ascidia
++ Microcosmus

Las Fuentes subdivision

Feb. 17, 2001

Parksville, Vanc. Is.
NO Styela clava at French Creek Marina

April 9, 2001 Des Moines Marina
Lots of Ciona savignyi on covered floats. Very abundant. Many sizes small to large.

Friday Harbor summer 2001

May 28, 2001 2 colonies Tridemnum sp on a yellow rope & a mussel FH town dock. Rusty brown in color - new species. With larvae.

May 25, 2001 Ascidia columbiana large Shipyard Cove float. Also 6 June.

June 29 (1) Dredge Rock Pt off west side of Lopez Is. C. Lambert coll. 33-42 fath. gravel
Aplidiopsis pannosum both yellow & white colonies & a clear one. 11 colonies The largest is 16mm across.
3 Ascidia paratropa, 1 small, with large tunic pagillae over the entire test. 2.5 cm in length. Tunic very clear, clean. Also a large one 4.5 cm in length, pagillae not so long or numerous. + a fat one 3.5 cm long.

48° 29.6' N, 122° 57' W

(2) Second dredge haul, Flat Pt off Lopez on sand. One *Aplidiopsis pannosum* very clear; small on a hard substrate.
48° 32.9' N, 122° 55.4' W 10-25 fath

On first dredge haul also collected a large colony of the *Aplidium* n. sp. – grey or nearly colorless, tunic with embedded sand grains. Pink egg masses are in some of the zooids (not copepods). Relaxed in menthol (not too well) + fixed in 10% SW buffered formalin.

Notes on *Aplidium* sp. coll. 6/29

Zooids in more or less circular systems

Sand grains embedded are mostly clear (quartz) and black. Are densest at base.

Up to 13 bright pink eggs are at the base of the thorax under the branchial sac in many zooids; others have large larvae in the atrial chamber at an advanced stage.

Longest zooids (preserved) are 8mm but thoraxes contracted somewhat.

10 rows of stigmata in the largest mature zooids – is a very consistent #.

Unhatched tadpoles only ~600 μm long.

Zooids completely colorless + transparent

except stomach + lower part of ascending intestine which are a deep yellow.

Stomach has 11-12 regular longit plications that are parallel + run the full length of the stomach.

Anus bilobed

About 12 stigmata / ½ row; anterior rows have 10-12.

Larva — a few vesicles between the adh. organs

Zooid: 2 large muscle bands run longit. the full length of the zooid ventrally.

All of the Aplidiopsis colonies collected 6/29 are not yet reproductive, but appear to be coming out of a resting state. The guts + intestines are empty (=not feeding) and the abdomen posterior to the gut loop is filled with opaque white nutritive? cells. In one colony the thorax is fully formed but gut still empty, though most of the nutritive cells seem to be used up.

July 11, 2001 One large Styela coriacea on a canvas strap, ~2m depth, hanging off FHL floating dock. Preserved.

8 cm long in longest direction. Has larvae

July 24, 2001 Collect several colonies of *Trididemnum alexi* n. sp. from the same yellow rope on the town dock, boat slip E 33, at a depth of 0.5–2 m. Largest darkest colony was near the end of the rope, overgrown a *Pyura haustor*. Another colony on a *Chelyosoma productum*. Some colonies on the rope itself. At least a dozen colonies were observed, most of them small + left *in situ*.

July 25 Dredge San Juan Channel 1 colony *Cystodytes lobatus* - very clear hard tunic, not many spicules. Superficially looks a lot like the dredged *Aplidium californicum*. Also a pale pink *C. lobatus* colony. See entry for 8/28/99, same location 40 fath. - both colors.

Aug. 2 SEM of *T. alexi* spicules - focus not great, background junky on plain stub. New prep of spicules from 5/28/01 colony still alive in lab. After burning 10 min, treated with bleach 5 min, rinse ethanols. Drops in 100% EtOH placed on a double stick carbon stub cover, and dried spicules sprinkled on the other carbon sticky stub cover.

Aug. 6 SEM using TMax 100 roll film. No photos - could not focus.

Aug. 6 Dredge for Balanus nubilis
Upright Channel, 5 fathoms. No
Aplidiopsis but 2 large grey thick
colonies of Aplidium, apparently A. solidum,
with ~15 rows of stigmata, long postabdomen,
total zooid length 1-1.4 mm maybe. No
larvae.

Also 2 didemnid colonies, very
thin, slightly pale pink. Didemnum
cannulentum? Single testis w/ ~9
turns of the sperm duct. 4 rows stigmata,
atrial opening but no siphon, common cloacal
cavity thoracic. Spicules with rounded short
points, ~7 in a focal plane at widest diameter.
Many sizes of spicules in tunic, but most ~28-
40 μm. One large one seen, 70 μm, and many
smaller than 28 μm also. Living zooids yellow.
Branchial siphon w/ 6 pointed lobes.

Aug. 8 Dredge Pt. Caution San Juan Channel. 62-52 fath.
1 small colony Aplidiopsis pannosum.
Rounded head 16 mm in diameter, 20 mm tall.
Several circular systems. No larvae.
Mud-sand-shell bottom. Dredged north from
Strathmanns'. This colony has a wider base than
most. Tunic transparent - can see zooids.

Aug. 29 Collect 2 large colonies of Trididemnum alexi from the yellow rope at the 7th town dock, slip E 33. About 15 m from the water surface, near and at the lower end of the rope.

Zooids have a full sperm duct + testis, a few have an egg; no larvae seen.

8/30 Many color slide photos taken of colony surface of new T. alexi colonies. Distance between oral siphons is ~ 1mm.

8/31 Took roll of Tmax 100 120 film on SEM of T. alexi spicules. Technician worked on it all day Wed — seems to work great for focus but JEOL 35 negs unusable because of streaking - diff. light values.

9/5/01 French Creek Marina

++++ Styela clava big! Very abundant

++++ B. violaceus - many colors

++++ Corella inflata - in ropes esp.

++ Distaplia occid. purple - some colonies very large

Botryllus schlosseri (?) lobes - 2 color

morphs: bright orange, and black. The latter comes in 2 patterns - either brownish black around the oral siphons and white in the center or vice versa.

9/7/01 Blaine Marina

++++ Styela clava - many sizes including many that are very large

+++ Botryllus schlosseri orange

+ Distaplia occid.

+++ Botrylloides violaceus - many colors

+++ Corella inflata - only in heavily shaded surfaces between the concrete float sections, as on the innermost floats (Gate 1). This is a newest set of floats, added < 3 yrs ago.

Heavy cover of mussels.
Gates 1 + 2 are locked but #3 has no lock yet.

Very different situation at Fr. Creek + Blaine from St. Island where B. violaceus has been noticeably absent this year or nearly so.

Vashon Island

Quartermaster, 31.5‰
9/23/2001 Burton Marina 15°C

+++ Botrylloides violaceus
many colors
some large sabellids
Very abundant mussels + barnacles
white small anemone
" " cucumbers
1 small Styela sp.

(2) Dockton Park
water a lot cleaner but
same invert. community. More
abundant large sabellids. Only
ascidian is B. violaceus.
2 Styela sp. small
+ Distaplia occid. - few sm. colonies

9/23/01 Pt Defiance Pk Tacoma ferry ~~dock~~ area -
Yacht Club 15°C, 32‰
Covered float - on rope:
++ Corella inflata - also on other ropes
+++ + Ciona savignyi Very abundant on a metal cross piece for a berth in a covered float
++ Distaplia occid. on various ropes
Also Botrylloides violaceus on various floats
D. plosoma listerianum on another rope

4/6/02 Sandwich town beach
washed up didemnids - sent by
Mary Carman - see emails 4/4/02
4/8/02
5/8/02
apparently Didemnum sp.
badly preserved, very contracted
yellow, 4 rows stigmata
no testis, no larvae
spicules superficial only, sparse
most of colony semi translucent, thick,
w/o spicules.
mcarman@whoi.edu

Brittany, France
7/22/02 Perros-Guirec 18.5°C
+++ S. clava Ciona intestinalis with red spot
++++ A. aspersa Molgula socialis
+++ B. schlosseri many color morphs # Diplosoma listerianum black & tan colonies
+ Didemnum sp. eggs, no larvae + Botrylloides leachi bright orange
all very abundant on ropes
also Corella eumyota
Lissoclinum purpuratum
[For rest of records from France, see 8 pages further on in this book.]

Aplidium glabrum (1) small round clear cushion
Trididemnum cereum large, thick, dark mottled
+ Lissoclinum perforatum greyish or light lavender, flat, 5cm

Vancouver Island

(1) 9/23/02 French Creek Marina 3/4 high tide 11AM
+++ Styela clava +++. 30‰, 14.5°C
++ Corella inflata
+++ Botrylloides violaceus - large w/larvae many colors

+++ B. schlosseri - orange, black + tan
+++ Distaplia occid purple, ochre
1 Styela gibbsii on tire

(2) Nanoose Bay First Nations Marina 3PM
+ Styela clava 28‰, 15°C (? - refractometer 28‰ too high on 9/27/02)
++ Botryllus schlosseri - orange
+++ Aurelia jellyfish
many mussels + Metridium - dominants
Pisaster on outer floats
++ Corella inflata } ~2m down on long
1 Boltenia } rope

(3) Pacific Biol. Sta. - Nanaimo 3:30PM
Corella
Botrylloides violaceus

(4) Nanaimo marina
++ B. schlosseri - grey + black + orange
+++ Botryll. violaceus
1 Corella inflata small
Pisaster + mussels

Vanc. Is. - continued

9/24/02 30‰, ~~B~~14.5°C

(1) Ladysmith - Dog Green 10AM covered & uncovered floats

+++ B. violaceus - mostly small, many colors

~~botryllid ? unknown 2 colors~~

++ B. schlosseri - sm. colonies orange

+ Molgula (5) - on a float Largest 3cm x 3cm

++ Styela clava 4 large on a piece of fire hose + 1 tiny on a rope

Dominated by mussels + huge Metridium

(2) Maple Bay Marina noon

Styela clava covered & uncovered floats

B. violaceus

Corella inflata

5 Molgula. Largest 3cm across and 3.7cm tall including expanded long oral siphon

15°C, 29‰

(3) Cowichan Bay Maritime Centre 2PM

old floats - almost 100% mussels

At end of long rope:

~12-15 stolidobranchs - S. truncata with larvae

1 Distaplia occid. tiny

(4) Mill Bay Marine 14.5°C, 30‰

Dominated by mussels

+++ B. violaceus - esp on old concrete float

Some Balanus nubilus

Seals (harbor seals) on some old floats

also 5 Styela truncata on long hose. Largest one dissected 4cm long x 1.5 wide has possibly 3 broods. Embryos from 2 cell to hatched tadpole

11.5°C, 31‰

(5) Canoe Bay Marina
many covered floats
on hose:

+++ Distaplia occid - many small with large basal portions
+++ Coella inflata
+ Styela gibbsii 1
+++ Chelyosoma productum
+ B. violaceus
+ Botrenna villosa 1
+ Styela truncata?
+ Cnemidocarpa 1
Diplosoma listerianum
Aplidium calif
Trididemnum valeyi 1
Ascidia columbiana 1

on a large black float bumper

on Mytilus & on Chelyosoma on the Mytilus

wrapped around the Mytilus - ~10cm in length

Total Heavily silt trated by burrowing amphipods.
Apparently no larvae.

14.5°C, ~32‰

(6) North Saanich (N. Sidney) marina
+++ B. violaceus - with larvae many colors
+++ Coella inflata
+++ Diplosoma

Victoria

Sal = 33‰
T = 11.5°C

9/25/02

(1) West Bay Marina 9AM

+++ B. violaceus - large colonies, many colors
+++ Perophora - many colonies on a float
+++ Distaplia - bright orange, & purple
slide photos br. orange Distaplia
" " Perophora
digital - small float w/ Botrylloides
" Perophora
Styela gibbsii
Pyura haustor

(2) Johnson St. Wharf floats 10AM Sal. 33‰ T 11.5°C

+++ B. violaceus
huge #s of large Sabellid Eudistylia
+ Molgula manhattensis 5 small
+++ Corella inflata
+ Distaplia occid. small
+ Styela gibbsii several very small on Sabellid tube
+ Ascidia columbiana - 1 small
++ Perophora - on sabellid tube
+ Diplosoma - on " "

T = 11°C
Sal = 33‰

(3) Fisherman's Wharf finger #1 (oldest)

on long line
- B. violaceus +++
- Corella inflata +++
- Styela gibbsii +++
- Perophora +++
- Distaplia occid. +++
- Boltenia +
- Pyura haustor ++

Also several Styela truncata 2.3 cm long with brooded larvae + single larvae between long. vessel between folds. 3 collected

Digital of Corella
Lots of big Eurylepta in Corella
3 Trid. dermum alexi on plastic on finger between #6 & 7, south side

Ascidia columbiana ++ some very large
→ Largest colony 2 cm thick, 5½ cm long in longest direction, No larvae
All 3 colonies close tog. on white plastic - overgrowing some moribund Distaplia and lots of worm tubes

T 10°C

(4) Oak Bay Marina - 1:30 PM Sal. 33‰

+++ Distaplia occid. - on sabellids
many large sabellids
lots of cyphystomae - Aurelia? esp on sabellids + under docks
++ Perophora on sabellids
Chelyosoma productum +++ on crab traps
+ Corella - 2 large
+ Boltenia villosa

11°C, 33‰

(5) Sooke area
Becher Bay - Pacific Lions Marina
+++ Distaplia occid. - mainly purple
some colonies encrusting, no stalk
~~+ unknown compound - see Single~~ (Distaplia regressed)
1 Corella inflata large
+ Perophora

(6) Cheanuh Marina 4:15 PM
Becher Bay - protected inner area
Pyura haustor } on old cargo
Boltenia villosa }
Styela gibbsii }

(7) Pedder Bay Marina
4 Styela truncata

(8) Sunny Shores Marina - v. red tide + lots of diatom mat on surface
T = 16°C
Sal = 33‰
Long line - Distaplia +++
- few small Distaplia colonies
- otherwise all mussels ++++

Ciona - live - collected by
Cathy + Yogi Carolsfeld
4/13/02 + 4/16/02 Meyers Pass +
Smith Inlet (central coast) BC
50 ft All C. savignyi. ID verified 11/7/02
Endostylar appendage absent, pharyngeo-epicardiac openings close to appendage + far from esophagus.

Multiple refractive droplets in blue cells.

8/23/02 Sechelt Inlet BC, 40 ft
several hundred collected, some with
hydroids in oral siphon (Entocupta, now
called Bythotiara huntsmani)

9/28/02 Many photos taken w/ 200 ASA
35 mm Kodachrome and with
Nikon digital of the Cionas.
Largest on stick 9 cm long
2nd 5.3 cm long
3rd 6.9 cm long
Photos w/ 2 animals: 9 cm + 6.9 cm

10/2/02 Installed 4 15 ft ropes at
town dock, with a wt at the end
of each. Slips C 32, C 48, E 35, E 51.

France

18.5°C

Aug. 8, 2002 Perros-Guirec floats + ropes
++++ Ciona intestinalis very large + abundant
+++ Didemnum sp aff vexillum - with mature larvae
Diplosoma listerianum
Trididemnum cereum
Botryllus schlosseri
Ascidiella aspersa
2 pink stolidobranchs → dig. photos taken by Svota
Corella - eumyota
+++ Styela clava

8/14/02 Camaret-sur-Mer 16°C
long ropes high tide
++++ Phallusia mammillata huge
Molgula socialis
++ Styela clava - few
Ascidiella aspersa
+++ Ciona intestinalis
+ Didemnum sp. aff vexillum
++ Lissoclinum perforatum - greyish lavender
+++ Corella eumyota some dense clumps. Siphons very orange, fairly long.
+ Diplosoma listerianum
no botryllids seen, no Trididemnum cereum

7/22/02 Perros Guirec 18.5°C
S. clava
A. aspersa
B. schlosseri
Diplosoma - black & tan forms
+ Botrylloides leachi bright orange
Didemnum sp.
C. intestinalis - red spot
Molgula socialis
Lissoclinum purpuratum

New England
for Nahant Workshop

Oct. 10, 2002

① Sandwich Harbor, Cape Cod with Bob Miller, grad student U Mass Boston

15.5°C
33.5‰

+++ Ascidiella aspersa
++++ B. violaceus - many colors, w/ larvae
+++ Diplosoma listerianum
+++ Didemnum sp. - the mystery one - esp. abundant + large on lower pilings
++ Ciona intestinalis
++ B. schlosseri - black form

② Woods Hole - from the collectors
white encrusting didemnid on rocks + shells
Aplidium pellucidum - huge sandy colonies looking exactly as Van Name described them (after Verrill)
dredged 60 ft
Aplidium stellatum - "sea pork" - several huge pale yellowish-white cakes, thick, attached as Verrill said, "as if by the edge of a thick plate" - so they are upright.
Didemnum sp - long lobes growing around algae etc
Ascidiella aspersa
Ciona intestinalis
Molgula manhattensis large colonies growing with Didemnum sp
Aplidium constellatum - reddish with purple embryos - exactly as described by Van Name

Collected on Oct 7 by Bob Miller in Maine around Nahant:

Diferrum sp
Molgula manhattensis
Molgula citrina — with broods (some tadpoles) bright orange embryos
Ciona
Ascidiella
Styela clava
Aplidium glabrum

① Town dock Beverly
Oct. 13 — with Larry Harris raining
HH Ciona intestinalis
HHH Diplosoma listerianum
HHH Styela clava
HH Ascidiella aspersa
HHH B. violaceus
H B. schlosseri — black & grey
lots of mussels, sm. brown Metridium, filament. diatoms all over everything
a few Asterias forbesi

② Hawthorn Marina Salem 16.5°C 35‰ checked refractometer
HHH B. violaceus — many colors
HH Molgula manhattensis large esp abundant on long ropes
HHH S. clava
HH Diplosoma listerianum
HH Ciona intestinalis
HH Ascidiella aspersa
H B. schlosseri

36 ‰ – ?
13°C Newcastle Coast Guard pier float (will soon be torn down)

Oct. 14 ① Portsmouth NH

~~HHH~~ Didemnum sp – since winter 2001
~~HH~~ Ciona intest.
~~HHH~~ Diplosoma – since 1993
~~HH~~ B. violaceus
+ B. schlosseri black & grey
lots of mussels

② Rye Harbor State Marina 13°C 36 ‰?
~~HHH~~ Diplosoma
~~HHH~~ B. violaceus – many colors
~~HH~~ B. schlosseri – black + grey
lots of mussels
~~H~~ Molgula – many small on mussels
" " probably M. citrina

Oct. 15 Darling Marine Center
~~HH~~ Didemnum sp
~~HH~~ B. violaceus
B. schlosseri
~~HHH~~ Molgula provisionalis
~~HHH~~ Ciona intestinalis – reproductive, orange eggs

Oct. 16 Huntsman Mar Sci Centre, NB
① Ciona intestinalis reproductive orang eggs
Molgula
Ascidia callosa
} on trees at St Andrews Biol Sta

10.5°C

(2) Town pier floats – on kelp
B. schlosseri – 2 large colonies black & grey
C. intestinalis
Molgula – orange

Jack Fife

Items for collecting

Kneel pad + cushion
Thermometer
refrigerometer + plastic pipette
plastic bags
ice chest
towels
bucket
camera - OM2 w/ slide film
digital
paper towels
notebook + pencil
disposable plastic gloves
label paper
magnifier loop

Mileage

8/21	Shilshole	10 mi
8/23	Edmonds	40 mi
8/28	Elliot Bay Marina	25 mi
9/1	Des Moines Marina + downtown	53 mi
9/8	Everett	70 mi
9/9-9/14	Puget Snd Exp.	373 mi.
9/14-9/16	"	175 mi
10/3	Poulsbo	54 mi
		840

5/12/99 Seattle to THL start 78420

1 Newport

$$\frac{40}{64} = \frac{x}{800}$$

$$64\overline{)40.0}\ \ .6$$
$$\underline{384}$$

$$\frac{32000 = 64x}{64}$$

320

Whittaker
First Asciella
aspera ~20 yrs
ago
Clara - right after
Korean war

95 = 7mm

Aug. 7 { 0806 Molgula manx
0804 " "
0816 Molgula " Styela

California State University, Fullerton
Fullerton, California 92634-9480

Photos

Aug. 3 0593 B. viol many colors
0595 "

0602 B schloss
0567 "

0680 S clava
Aug 5 0683 " +
0704 A. stellatum

Aug 6 0722 B schlosseri
0735 D lahillei

LAUREDT

Mead

notebook

9½ In. x 6 In.
80 Sheets
College Ruled

06654

0 43100 06654

THE MEAD CORPORATION, DAYTON, OHIO 45463