Maria Scaperrotta Stefano Bartolini Cesare Bogi

ACCRESCIMENTI

STADI DI ACCRESCIMENTO DEI MOLLUSCHI MARINI DEL MEDITERRANEO

Stages of growth of the marine molluscs of the Mediterranean Sea

Volume XI

Famiglia: Neoleptonidae Thiele, 1934

Neolepton sulcatulum (Jeffreys,1859)

Habitat: predilige fondali detritici di bassa profondità ma è stata trovata vivente su alghe coralline in acque molto basse.

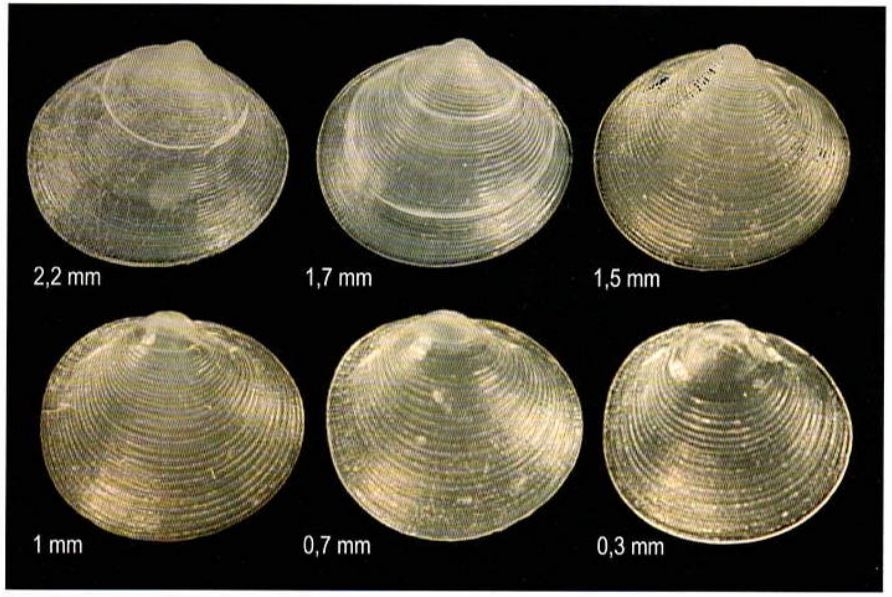
Distribuzione: vive in tutto il Mediterraneo.

Provenienza esemplari: tutti dall'isola di Pantelleria -50 m.

Note: specie di forma rotondeggiante, leggermente inequilaterale, valve poco convesse, con scultura costituita da fitte strie concentriche regolari.
Gli esemplari giovanili sono più rotondeggianti e possono essere confusi con *Arculus sykesi* (Chaster, 1895) che però ha una cerniera ben diversa, infatti in *sulcatulum* è presente, in entrambe le valve, un dente ad "uncino" posto anteriormente.
Le dimensioni medie raggiungono 1,5 mm di diametro.

Bibliografia essenziale:

- Aartsen van J.J., 1996 - Galeommatacea e Cyamacea: Part II. *La Conchiglia*, 28 (281).
- Aartsen van J.J., 1996 - Galeommatacea e Cyamacea. *La Conchiglia*, 28 (279).
- Sala C.& Gofas S., 1998 - Description of four new species of Neolepton Monterosato,1875 (Mollusca:Bivalvia:Neoleptonidae), with comments on the genus and on its affinity with the Veneracea. *Ophelia* 48(1):35-70.
- Tebble N., 1966 - *British Bivalve Seashells*. Trustees of the British Museum (Natural History), 212pp, 12 tavole.



Famiglia: Psammobiidae Fleming, 1828

Gari costulata (Turton, 1822)

Habitat: vive nei piani infra e circalitorale su fondali sabbioso fangosi.

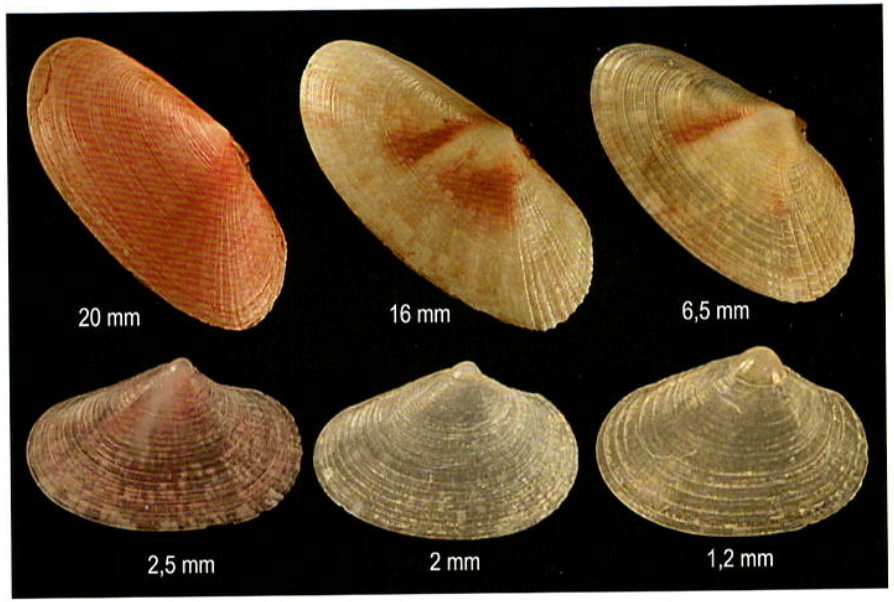
Distribuzione: conosciuta per tutto il Mediterraneo dove non è molto comune.

Provenienza esemplari: tutti raccolti al largo dell'isola di Capraia (Arcipelago Toscano) a 120/150 m di profondità.

Note: conchiglia fragile, con profilo ovale allungato, leggermente inequivalve, la valva sinistra è di poco più convessa della destra. L'umbone è di poco spostato nella parte posteriore rispetto alla linea mediana. Caratteristica della scultura sono una ventina di coste radiali che partono dall'umbone e ricoprono la zona posteriore il cui margine assume un aspetto leggermente angoloso, il resto della superficie è ornato da linee concentriche. Il bordo ventrale è quasi dritto, mentre anteriormente è arrotondato. Le valve sono ricoperte da un fine periostraco giallognolo. La cerniera della valva destra è costituita da due denti cardinali bifidi, di cui l'anteriore più grande, mentre la valva sinistra ha due denti cardinali di cui l'anteriore largo e bifido e il posteriore sottile e prominente, non ci sono denti laterali. La colorazione è varia: su fondo biancastro o giallognolo sono presenti sfumature o macchie rossastre, specialmente nella zona umbonale, ma non sono rari esemplari completamente color rosso o giallo uniforme. La specie è facilmente distinguibile dalle congeneri per la presenza delle coste radiali posteriori, già visibili anche negli esemplari immaturi. Questi hanno un profilo più rotondeggiante e l'umbone più prominente. *Psammobia vatovai* Coen, 1933, descritta per l'alto Adriatico, è posta dal CLEMAM in sinonimia con *G. costulata*.
Le dimensioni medie degli esemplari adulti si aggirano intorno ai 20-25 mm di larghezza.

Bibliografia essenziale:

- Tebble N., 1966 – *British Bivalve Seashells*. Trustees of the British Museum (Natural History), 212pp, 12 tavole.



Bivalvia of the SCB Adult-Subadult-Juvenile (Part IV)

Order Galeommatida (Family Galeommatidae)

Order Cardiida (Families Donacidae, Psammobiidae, Semelidae, Solecurtidae)

Order Venerida (Families Chamidae, Vesicomyidae, Ungulinidae, Veneridae, Neoleptonidae, Petricolidae)

Order Adapedonta (Families Hiatellidae, Basterotiidae, Solenidae, Pharidae)

as Listed in SCAMIT Edition 13 and Valentich-Scott et al. 2020

Order Galeommatida
Family Galeommatidae

1. **Hinge plate edentate or variable with tiny cardinal teeth and obscure lateral tooth**
2. **Ligament internal**
3. **Pallial line entire**
4. **Valves very thin, transparent**
5. **Some species commensal on heart urchins**

Cymatioa cookae Valentich-Scott&Goddard 2022

Left valve

Right valve

Photos courtesy of Dr. Paul Valentich-Scott

Cymatioa cookae Valentich-Scott&Goddard 2022

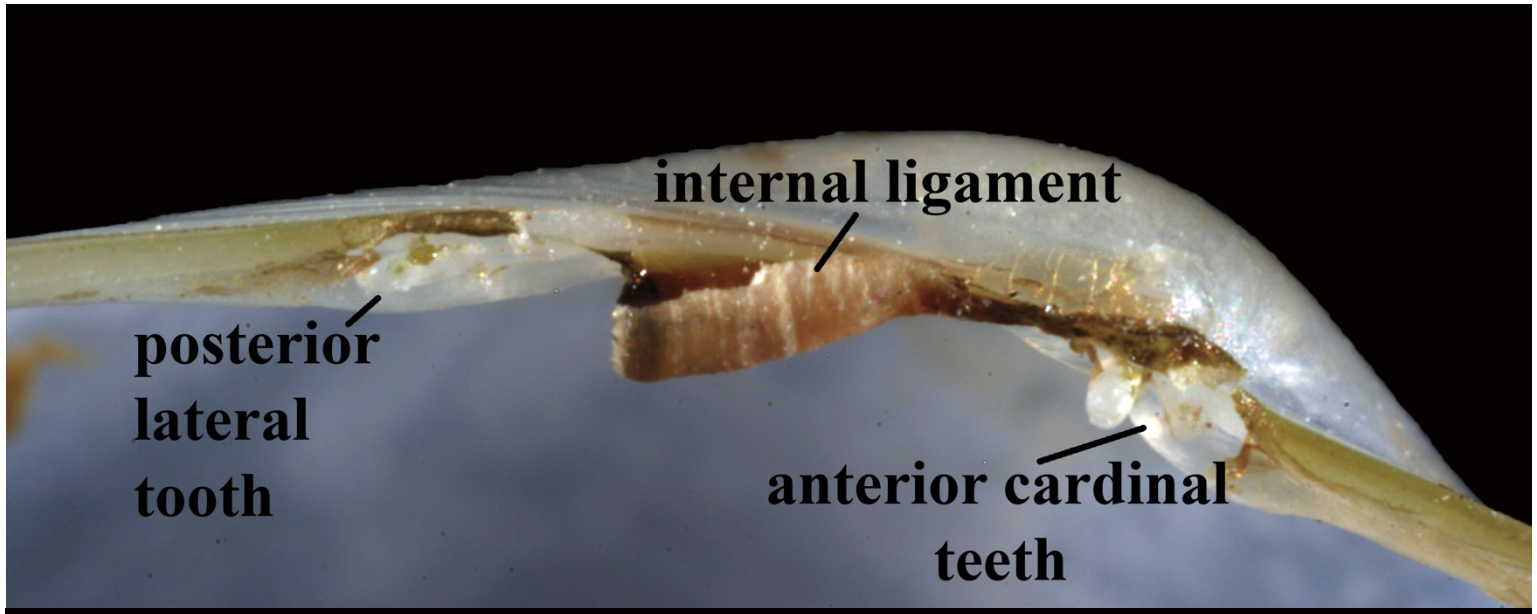
Left valve

Right valve

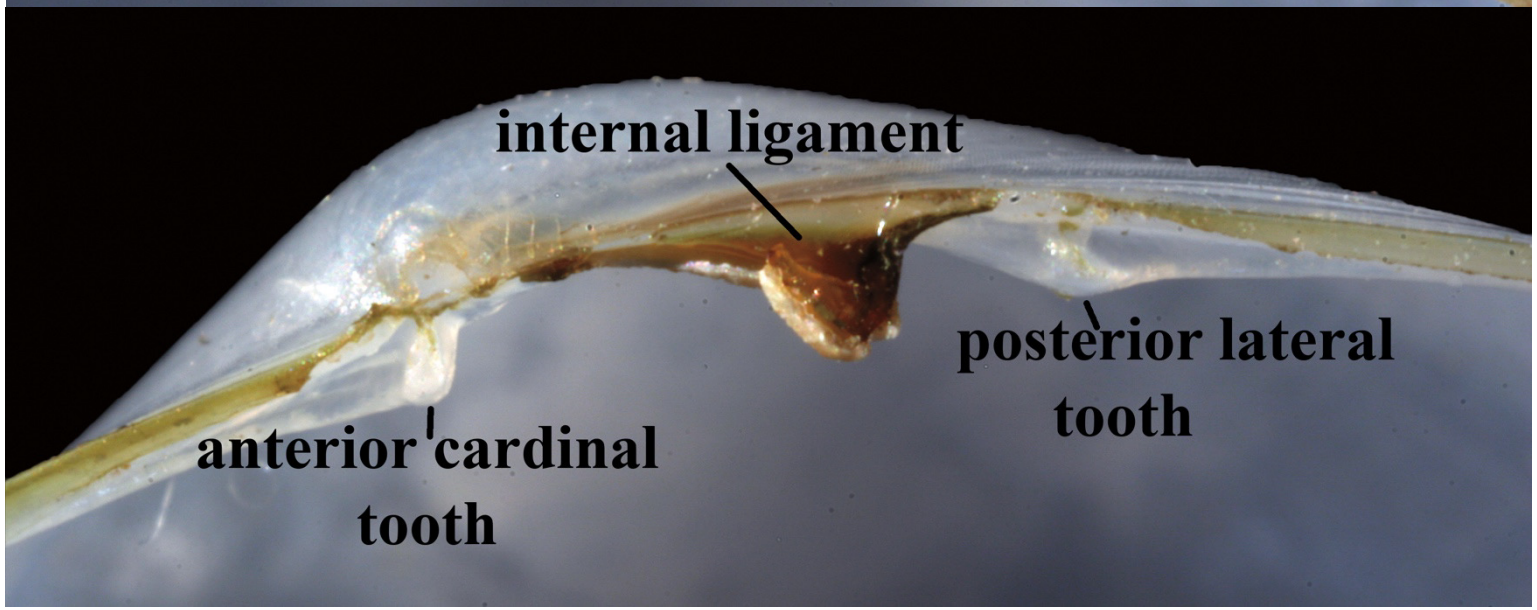
Photos courtesy of Dr. Paul Valentich-Scott

Cymatioa cookae Valentich-Scott&Goddard 2022

Left hinge

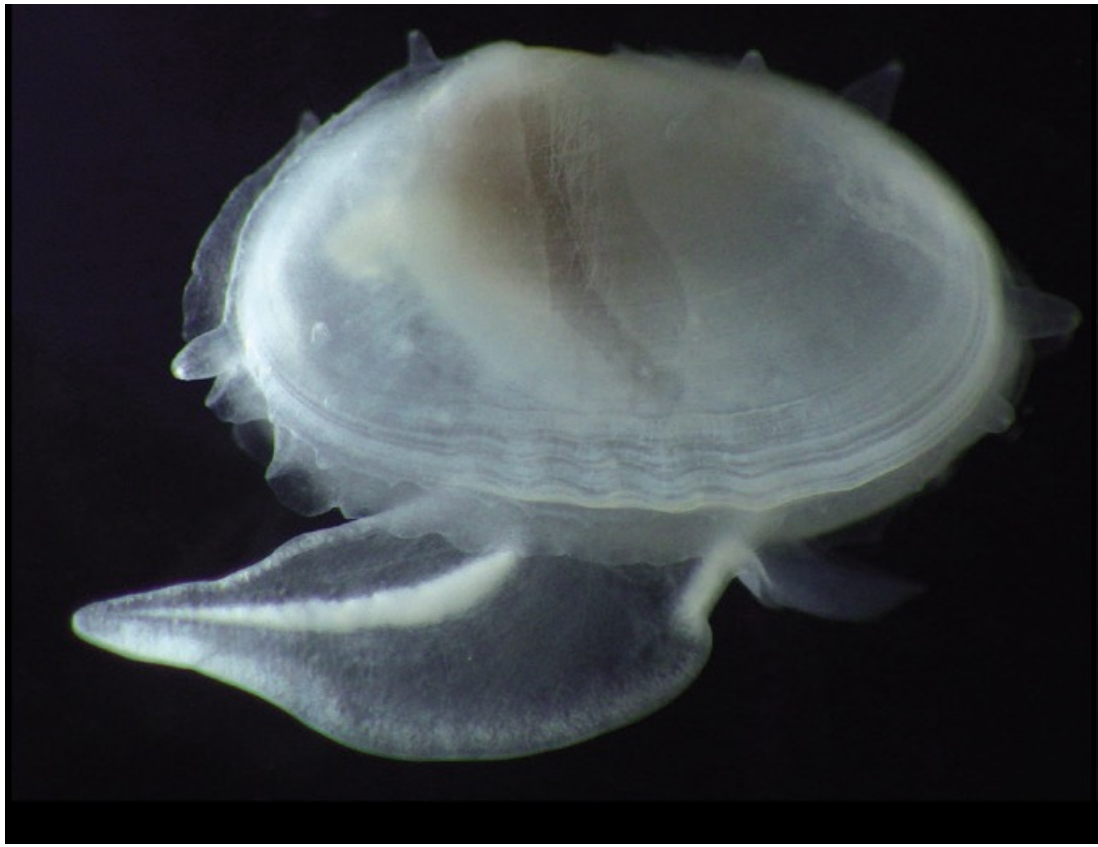


Right hinge

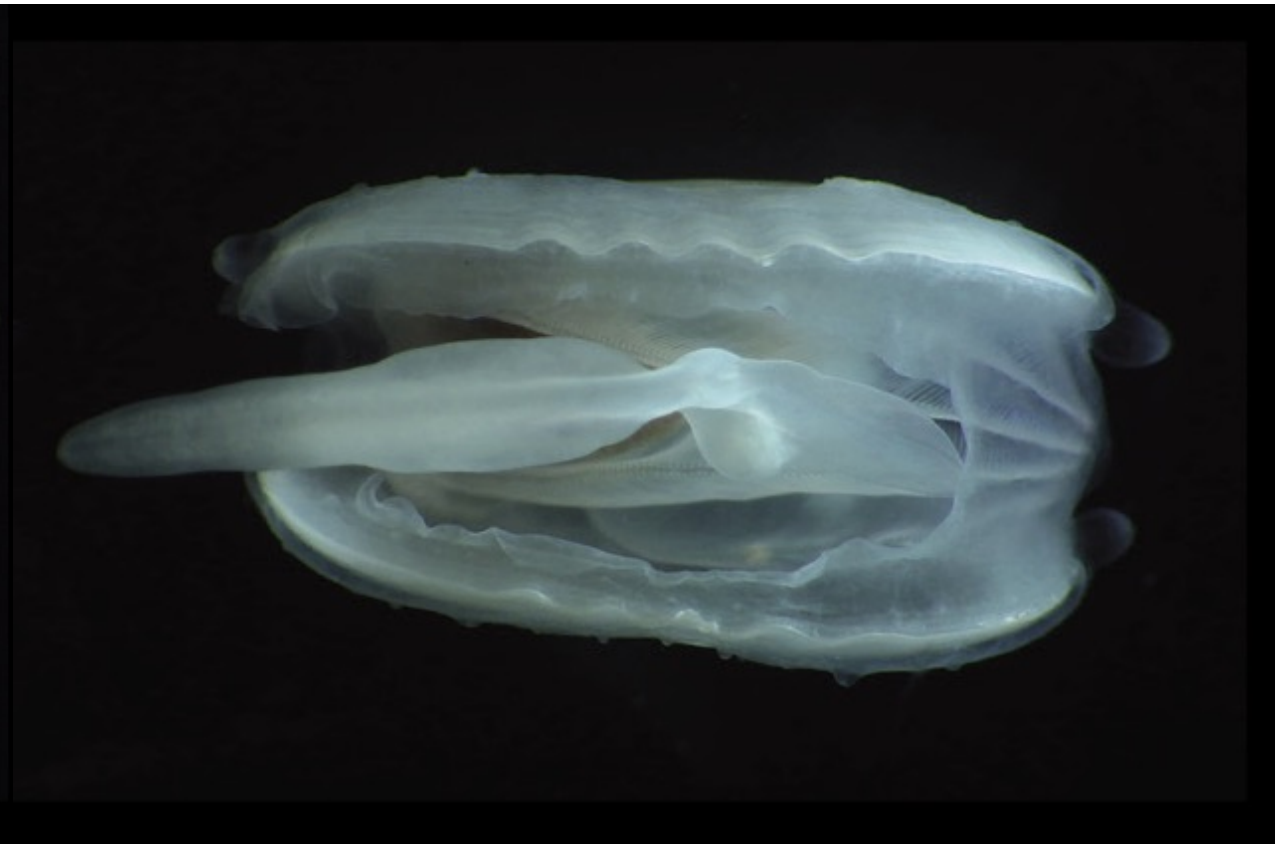


Photos courtesy of Dr. Paul Valentich-Scott

Cymatioa cookae Valentich-Scott&Goddard 2022



Live lateral view

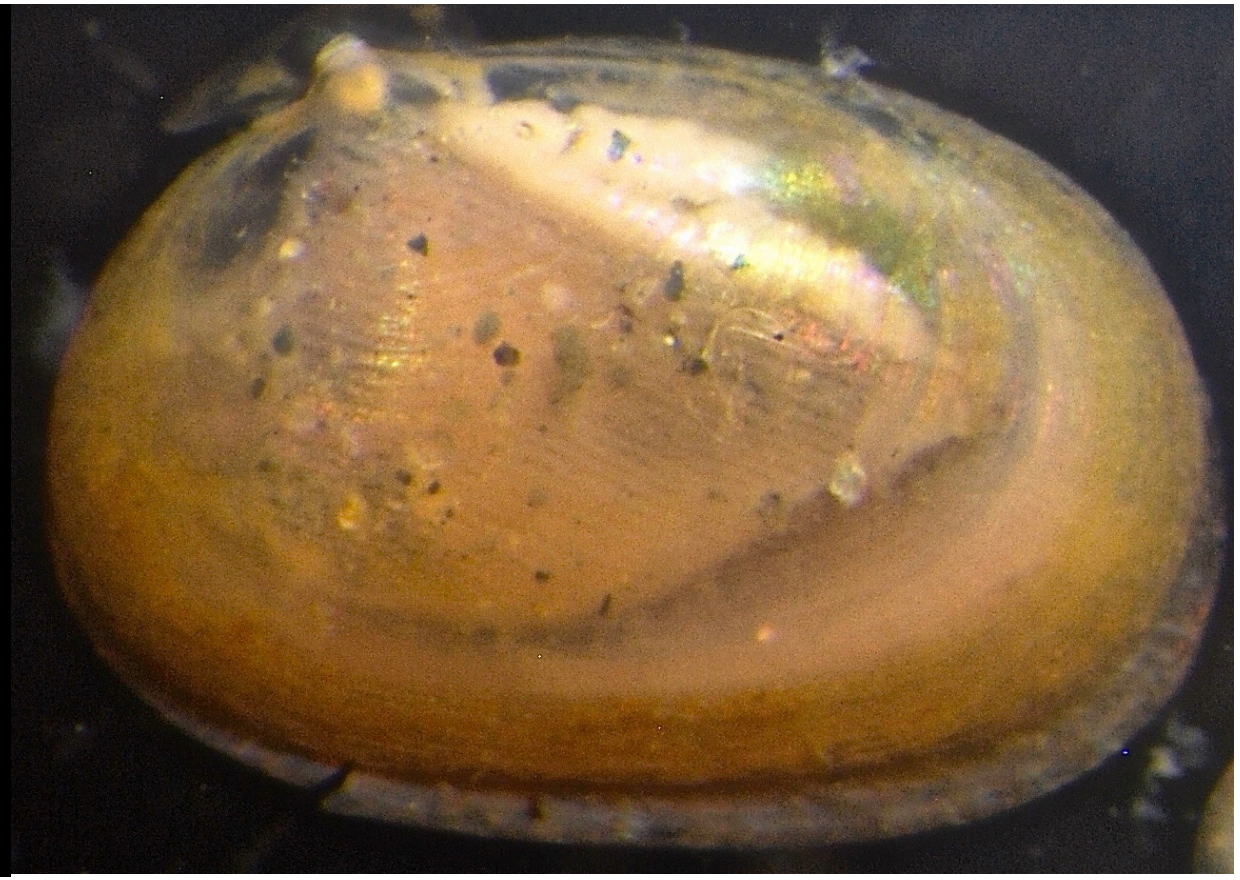


Live ventral view
ventral undulations evident

Photos courtesy of Dr. Paul Valentich-Scott

Cymatioa cookae/Kurtiella coani

Left valve

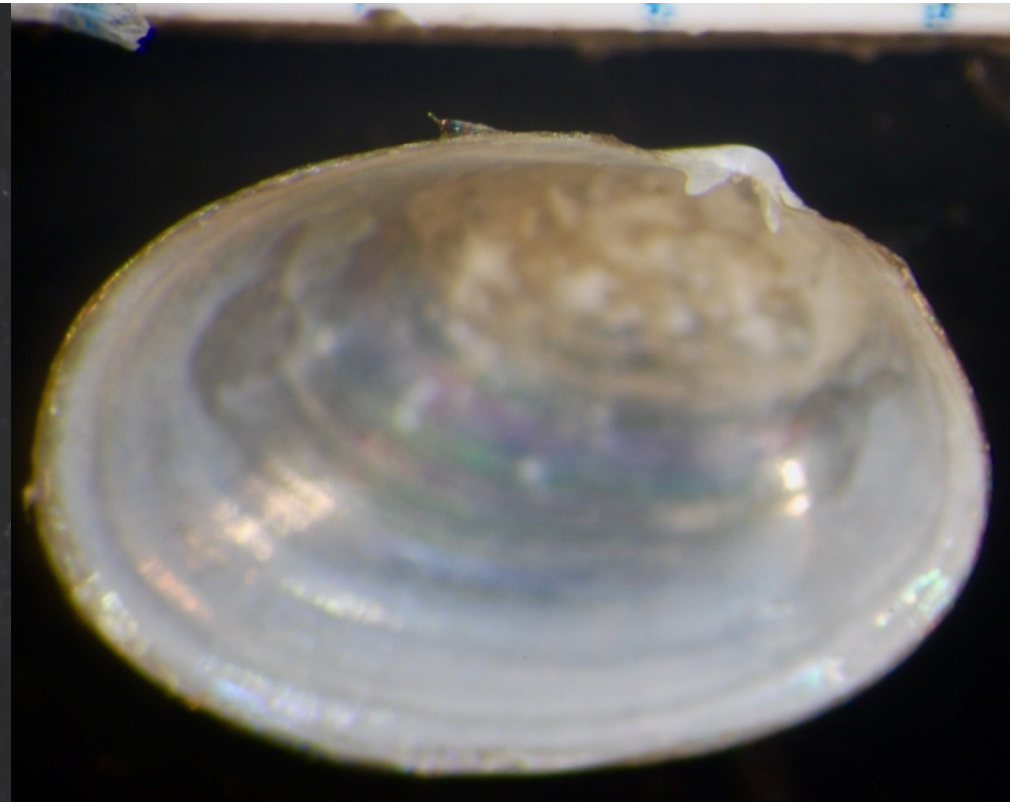


Left valve

Photo on left courtesy of Dr. Paul Valentich-Scott

Cymatioa cookae/Kurtiella coani

Left valve

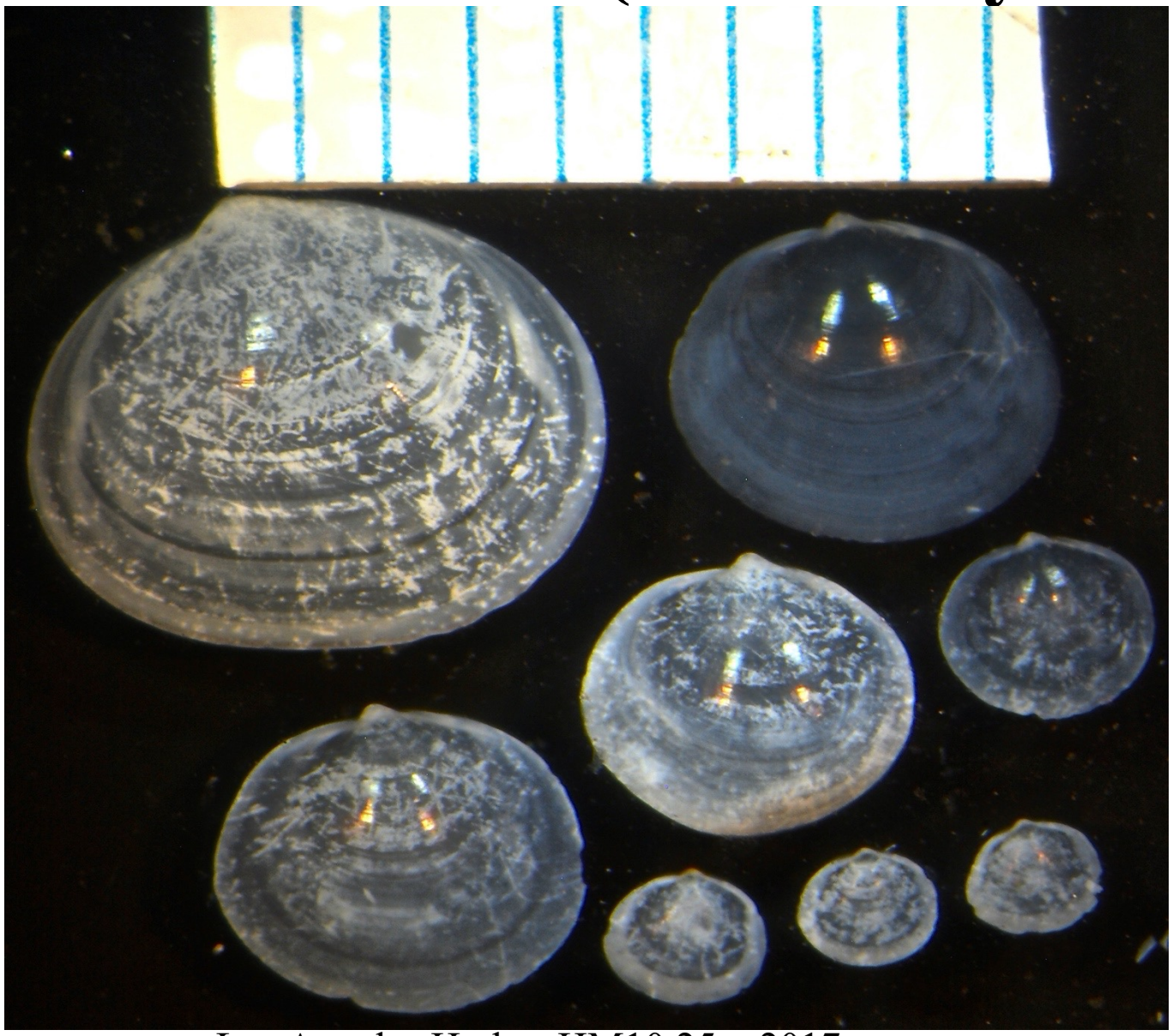


Left Valve

Photo on left courtesy of Dr. Paul Valentich Scott

Specimen courtesy of Carol Paquette MBC

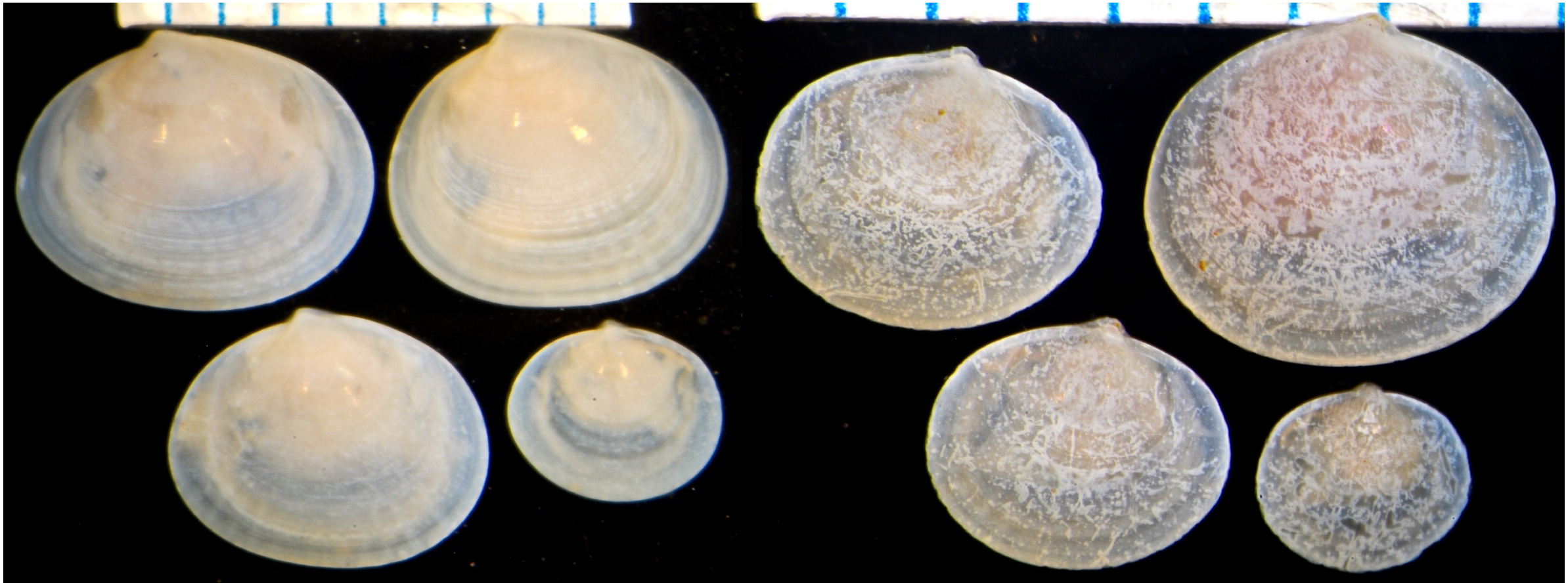
Cymatioa electilis (S.S. Berry 1963)



Los Angeles Harbor HM10 25m 2017

Specimens courtesy of Greg Lyon CLAEMD

Cymatioa electilis (S.S. Berry 1963)

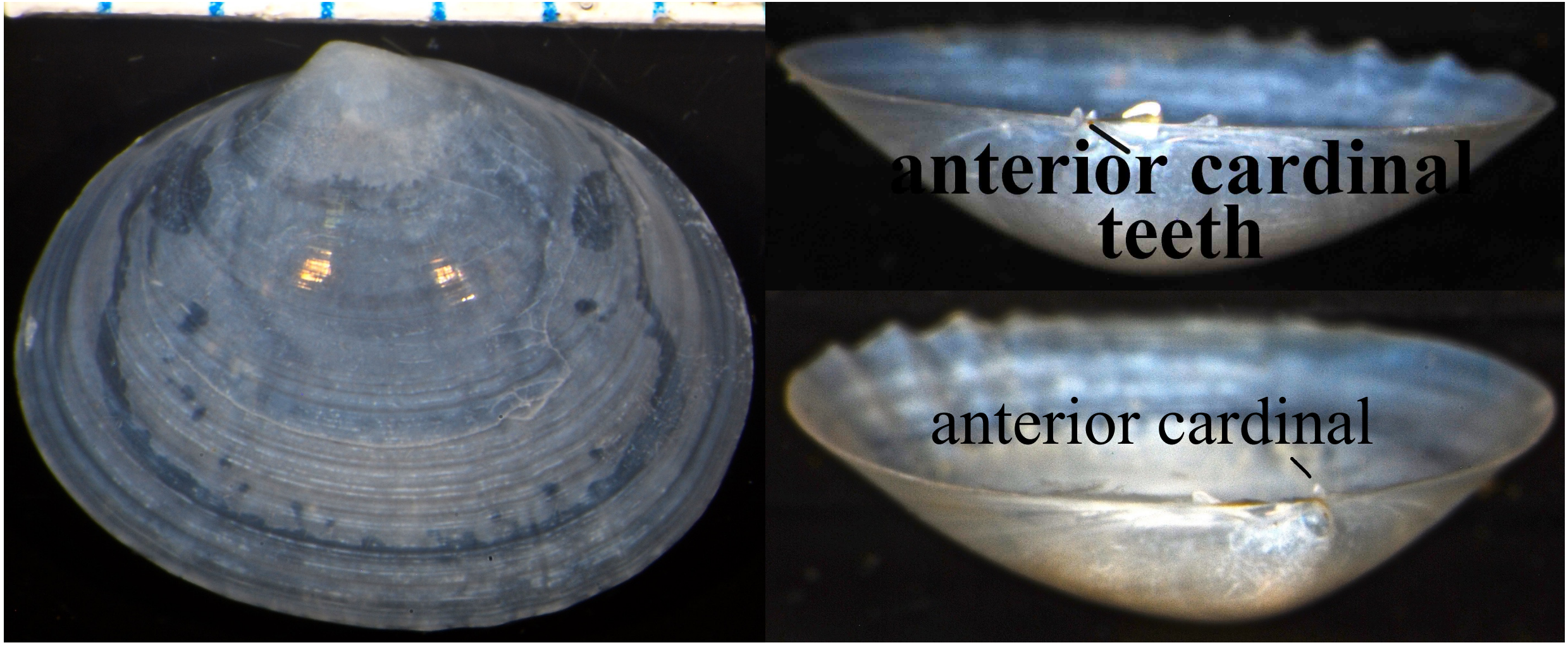


LACSD 3D 30m 1997

LACSD 4D 30m 2017

Specimens courtesy of Don Cadien LACSD

Cymatioa electilis (S.S. Berry 1963)

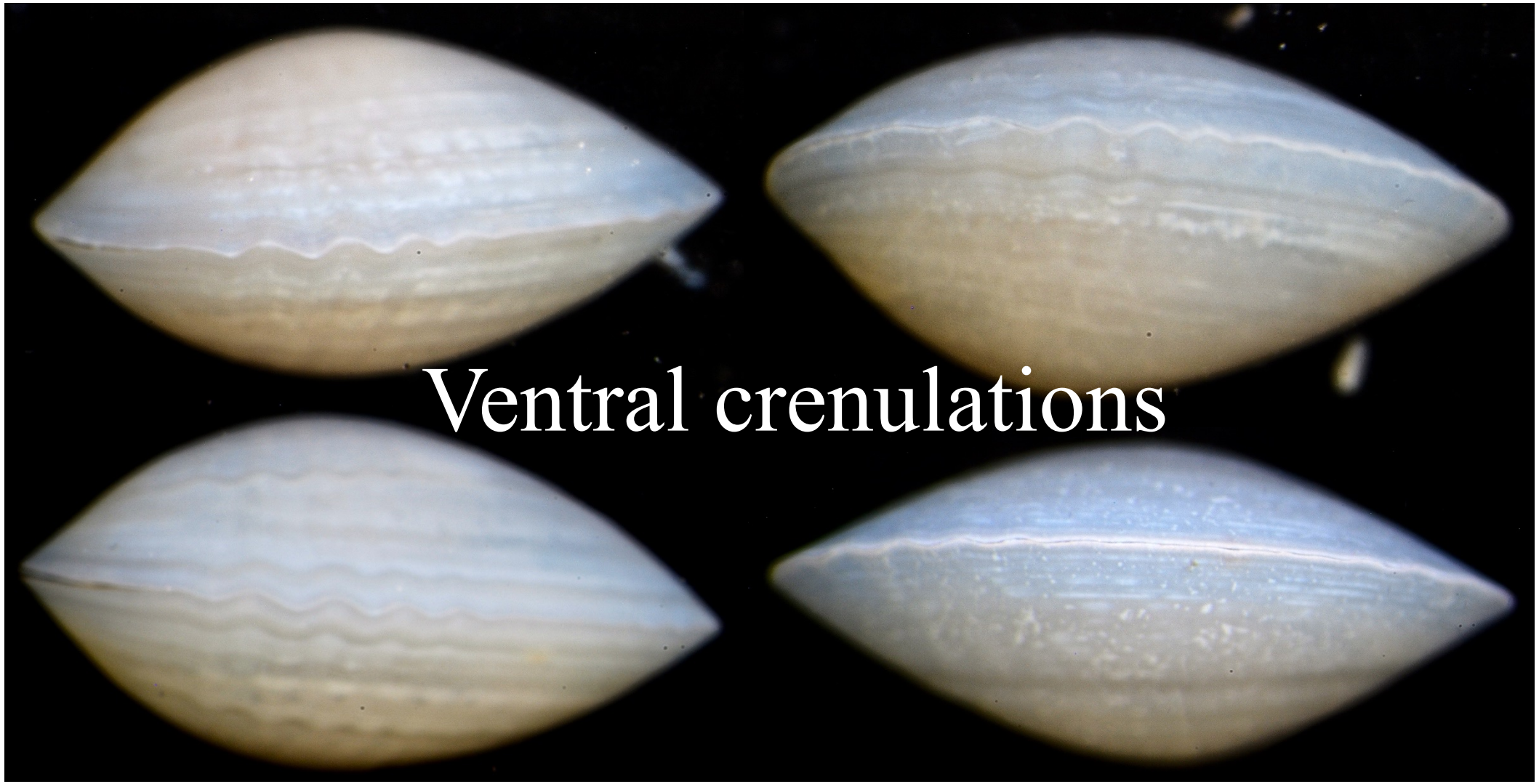


LACSD 4D 30m 2017

left valve (above) right valve (below)

Specimen courtesy of Don Cadien LACSD

Cymatioa electilis (S.S. Berry 1963)



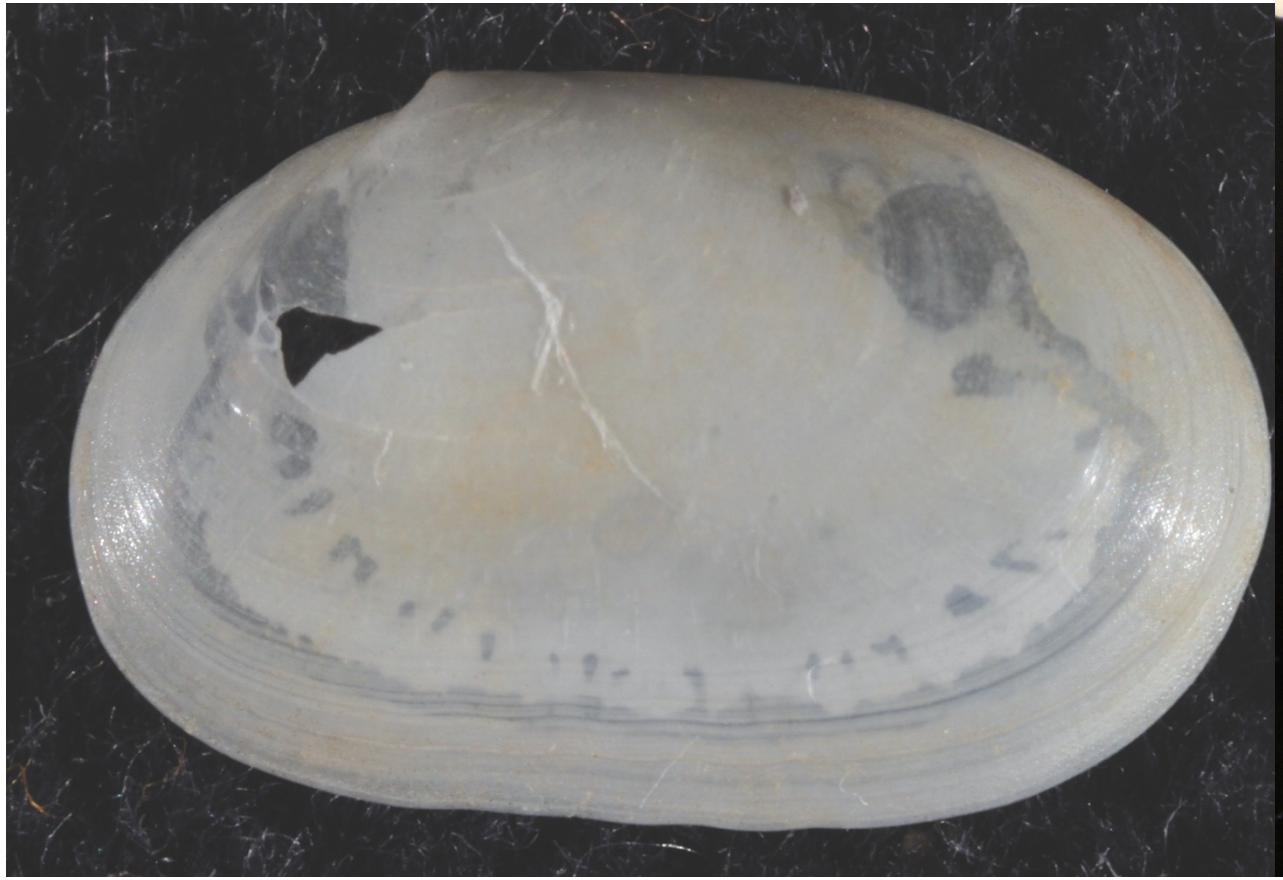
LACSD 3D 30m 1997

6.5 mm above left, 6.0 mm below left

5.0 mm above right, 4.0 mm below right

Specimens courtesy of Don Cadien LACSD

Cymatioa cookae/Cymatioa electilis



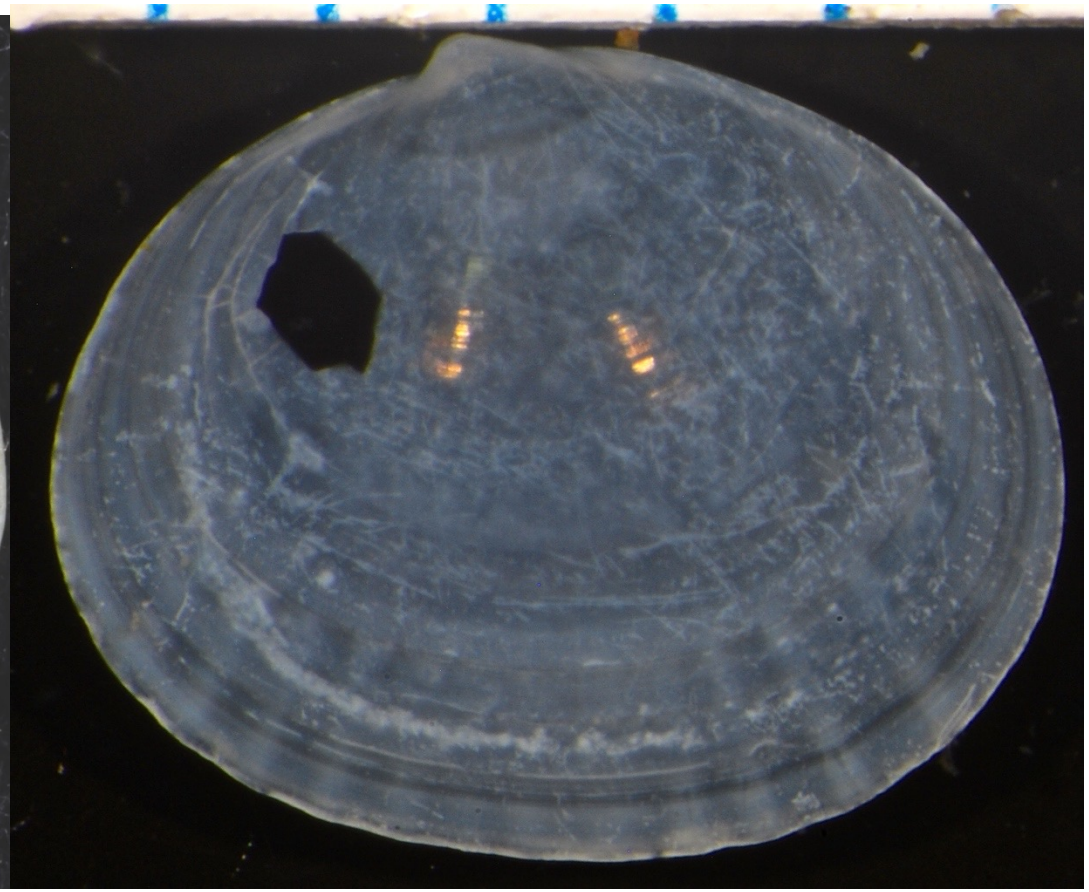
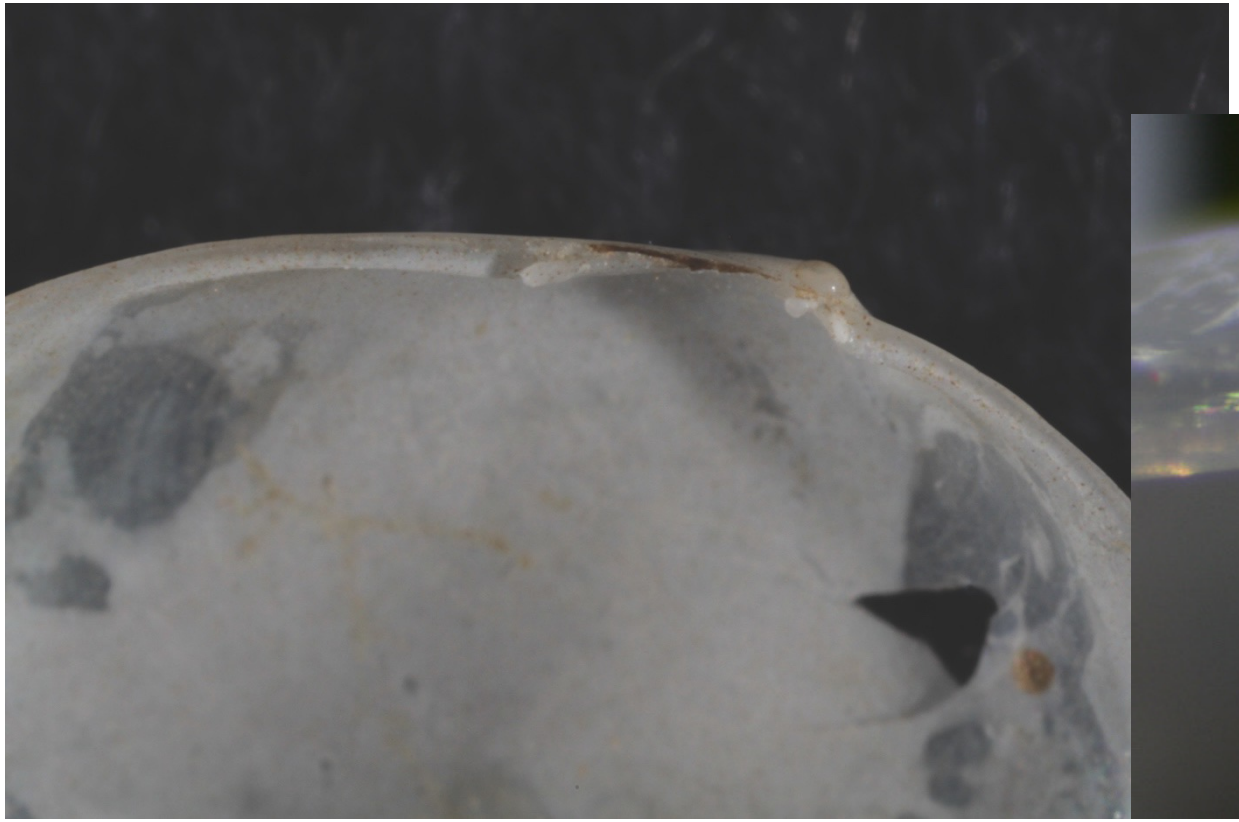


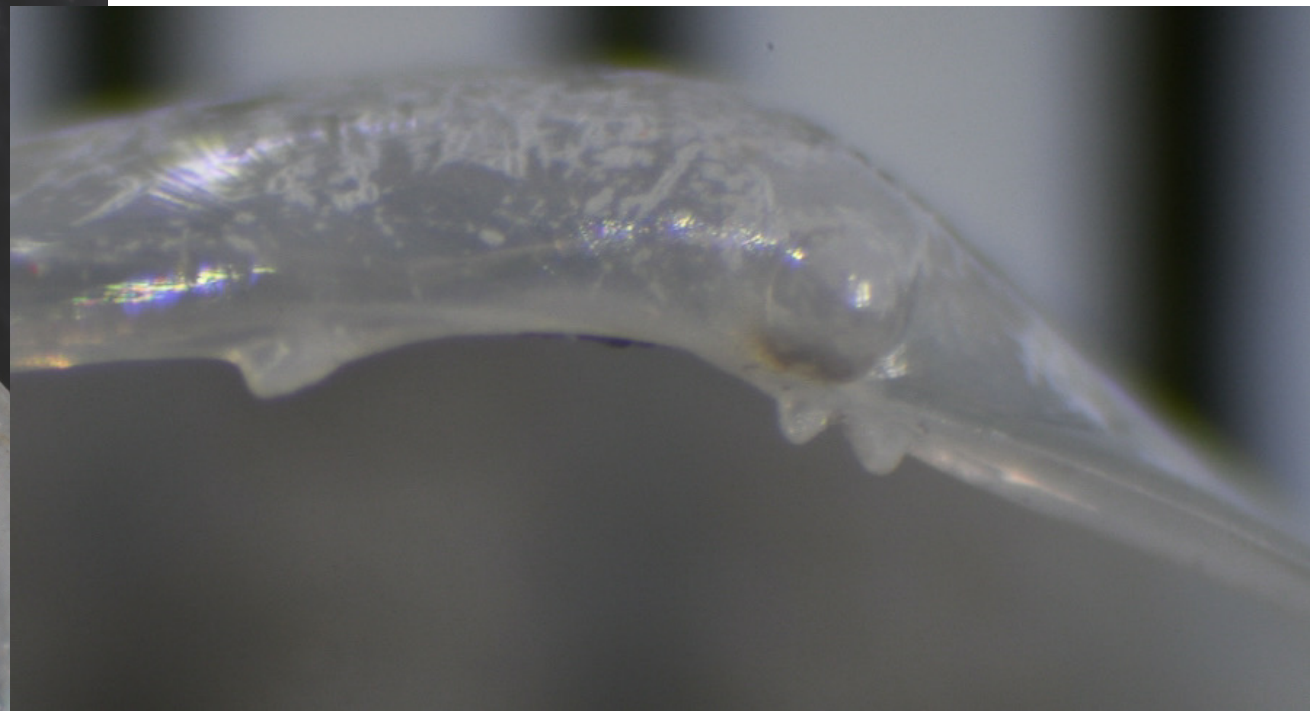
Photo of *Cymatioa cooki* courtesy of Dr. Paul Valentich-Scott

Photo of *Cymatioa electilis* courtesy of Greg Lyon

Cymatioa cookae/Cymatioa electilis



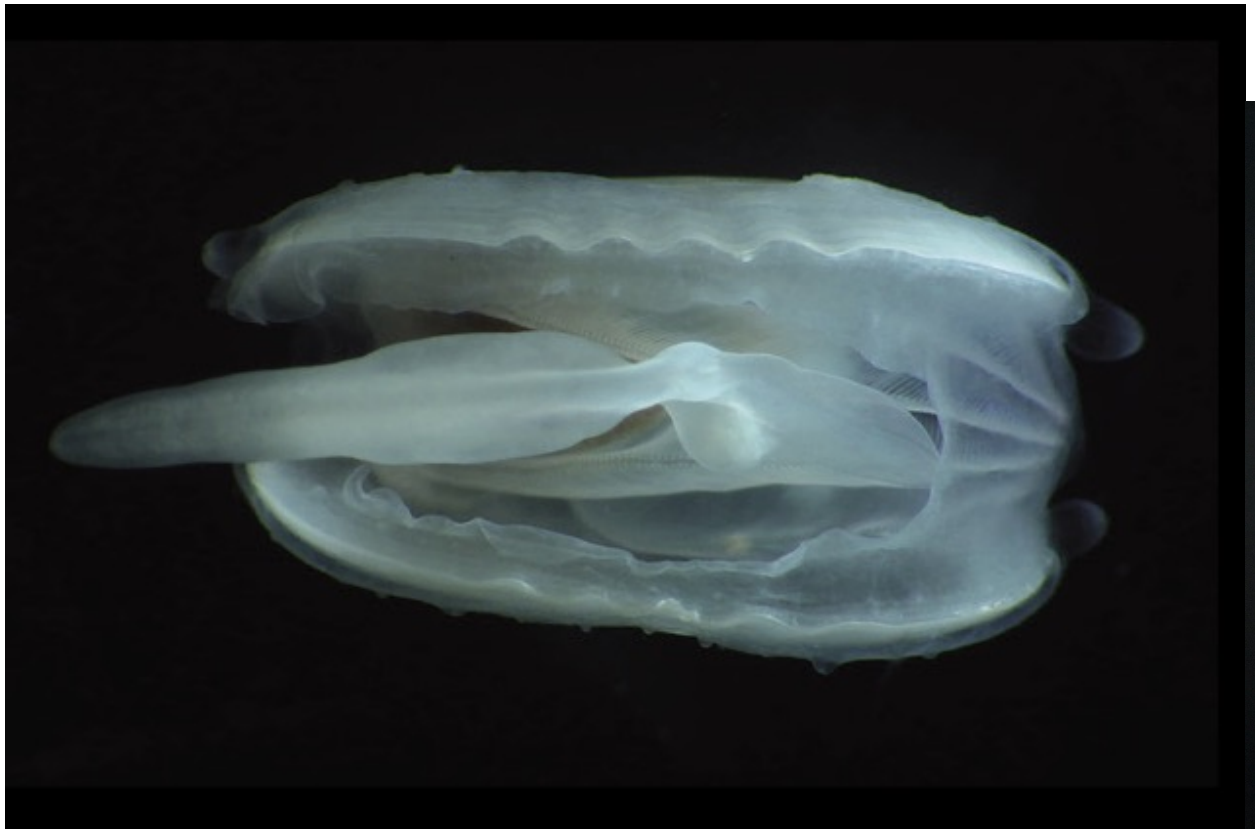
Left hinge



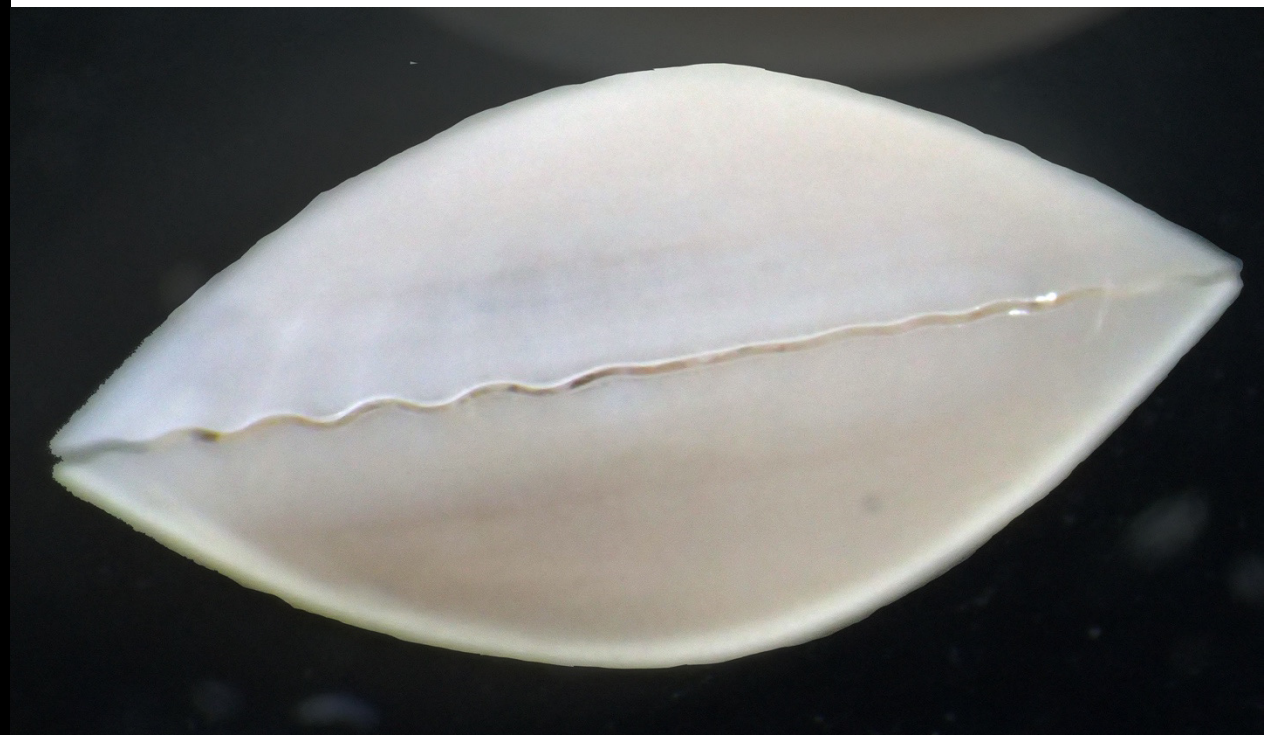
Left Hinge

Photo of Cymatioa cooki courtesy of Dr. Paul Valentich-Scott Photo of Cymatioa electilis courtesy of Greg Lyon CLAEMD

Cymatioa cookae/Cymatioa electilis



Valve ventral crenulations

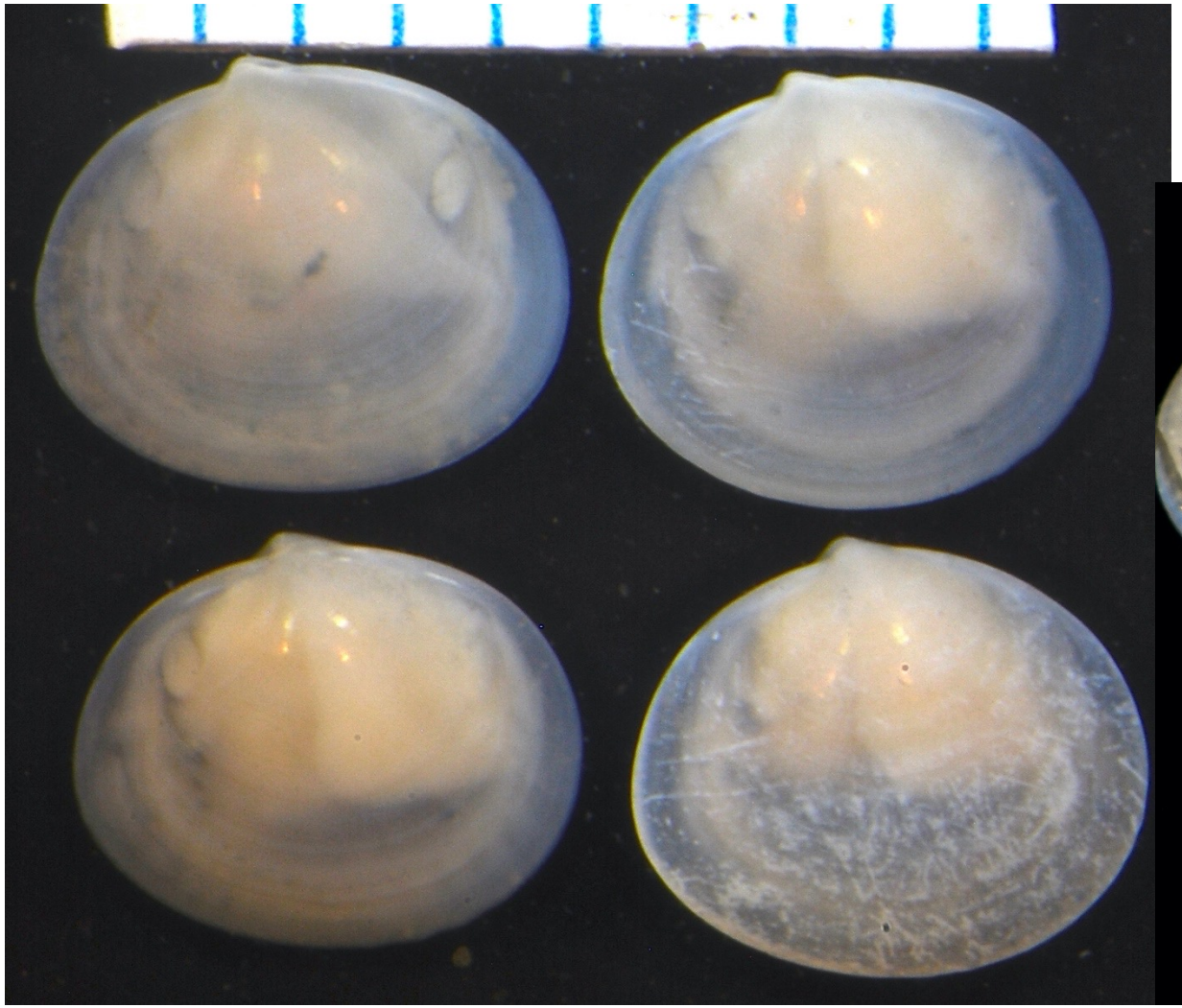


Valve ventral crenulations

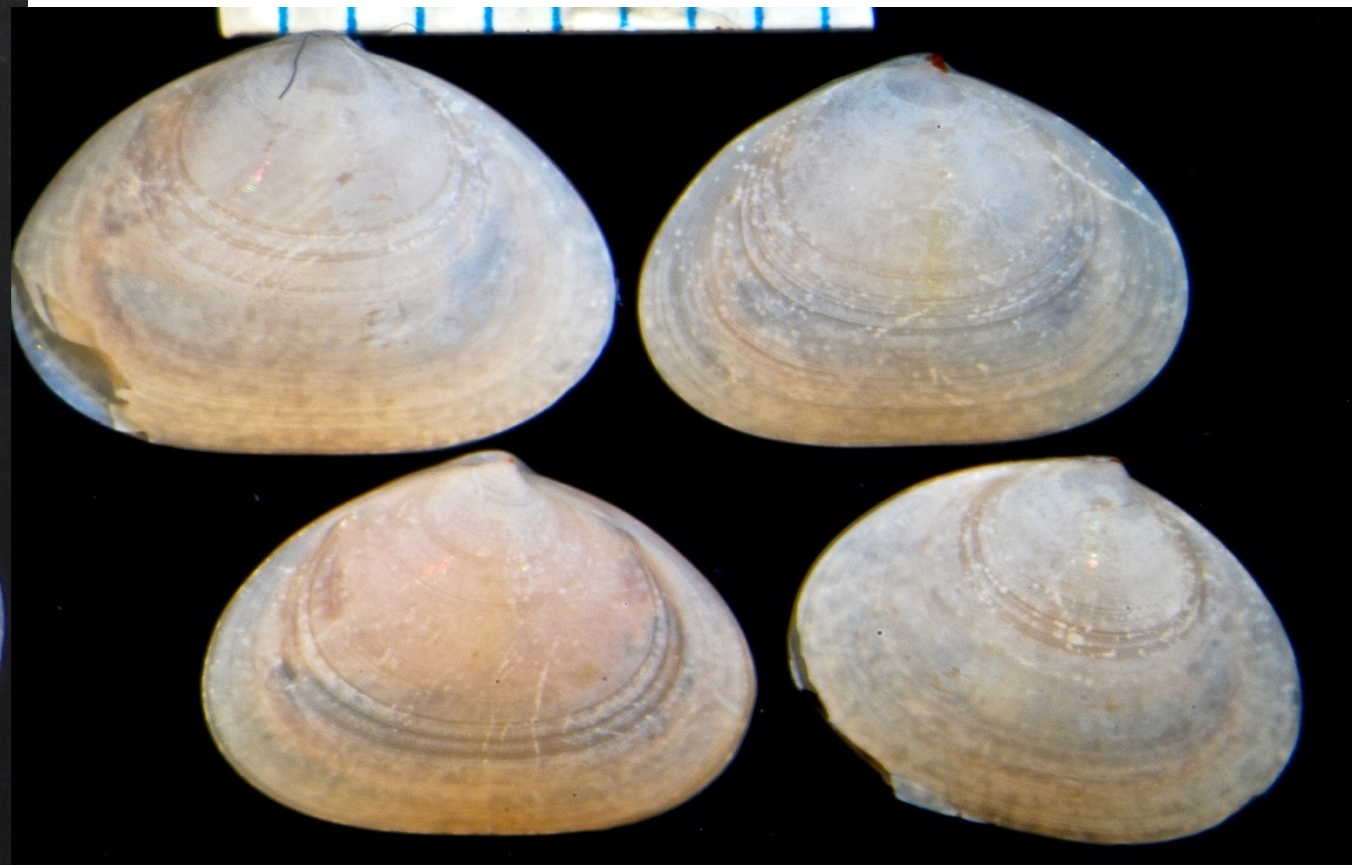
Photo of Cymatioa cooki courtesy of Dr. Paul Valentich-Scott

Photo of Cymatioa electilis courtesy of Greg Lyon CLAEMD

Cymatioa electilis vs *Rhamphidonta* (adult)

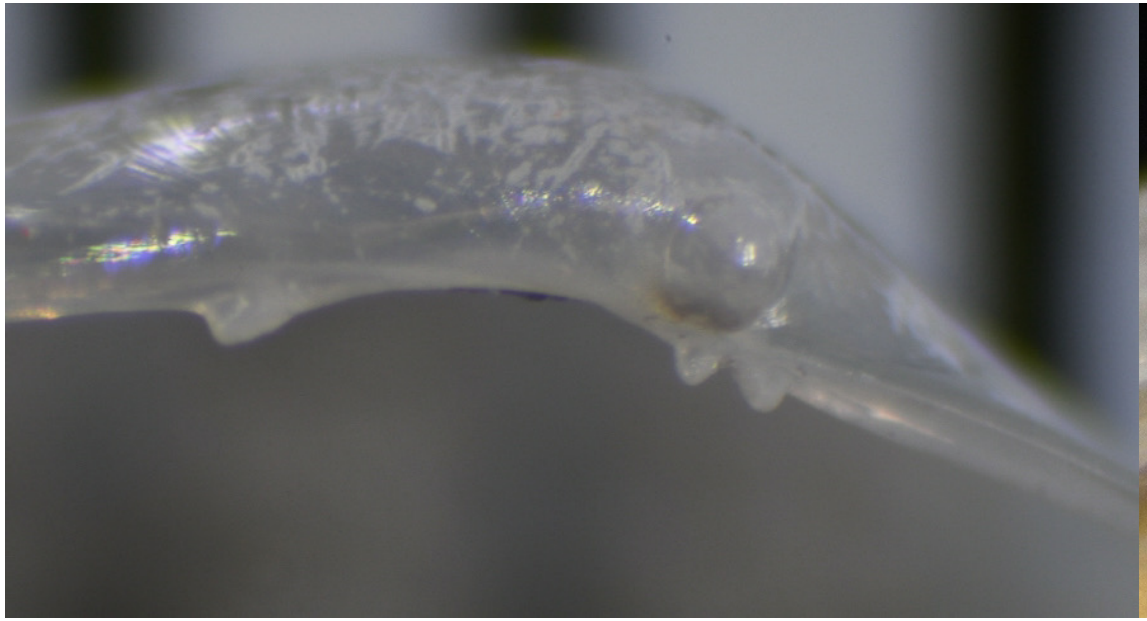


Outer Los Angeles Harbor HM10 21m 2017

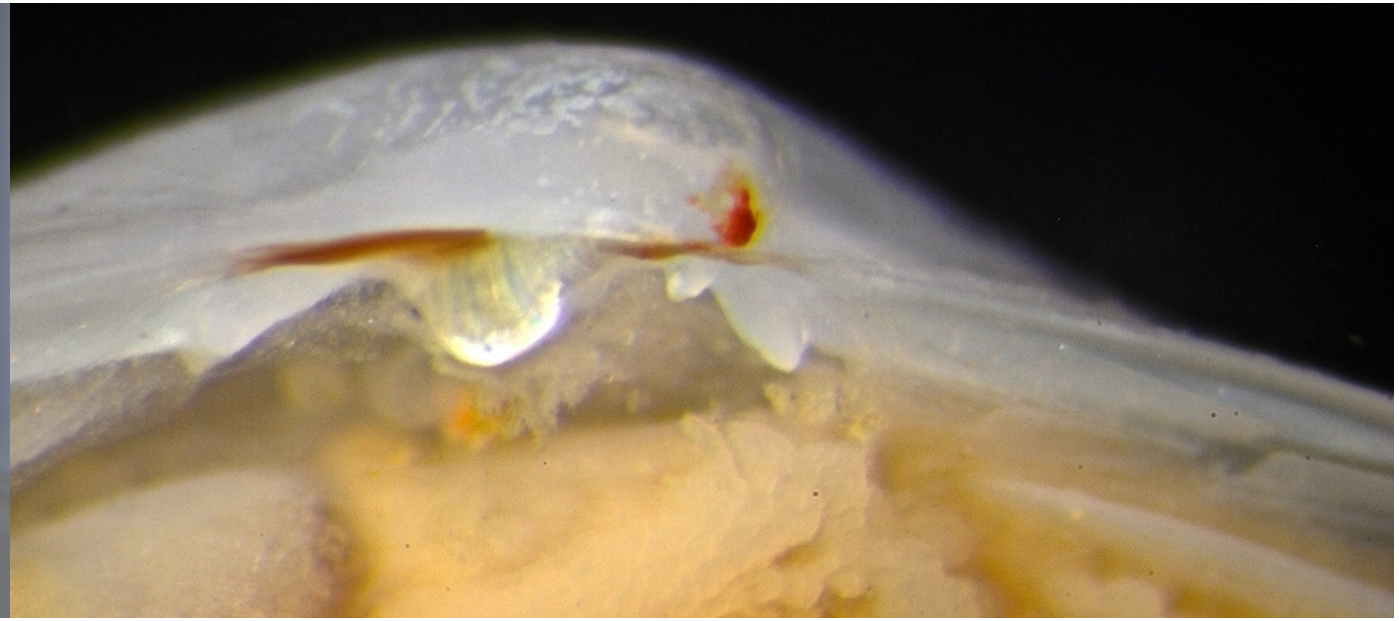


LACSD 5D 30m 1994

Cymatioa vs *Rhamphidonta* (hinge)



Left valve

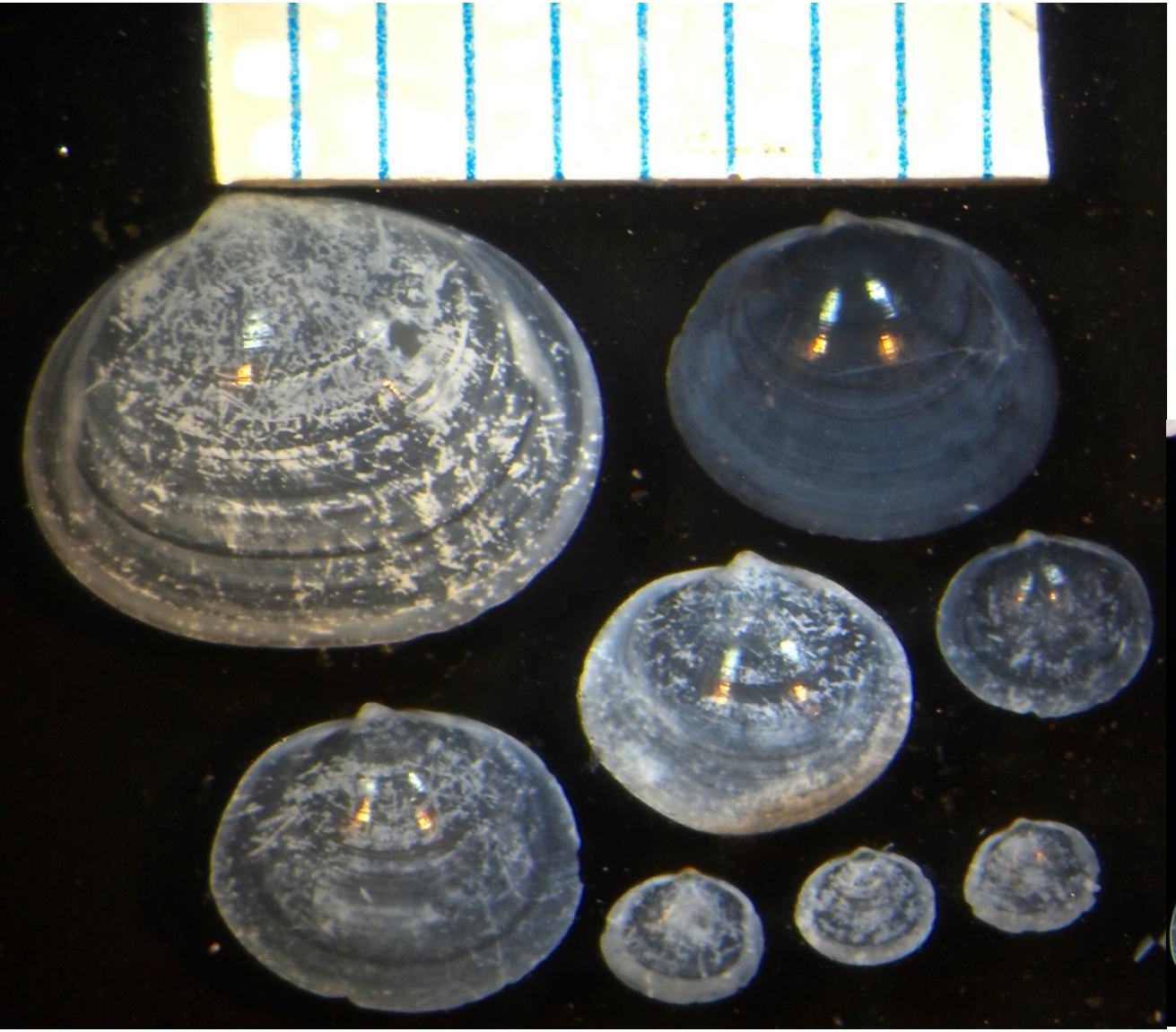


left valve

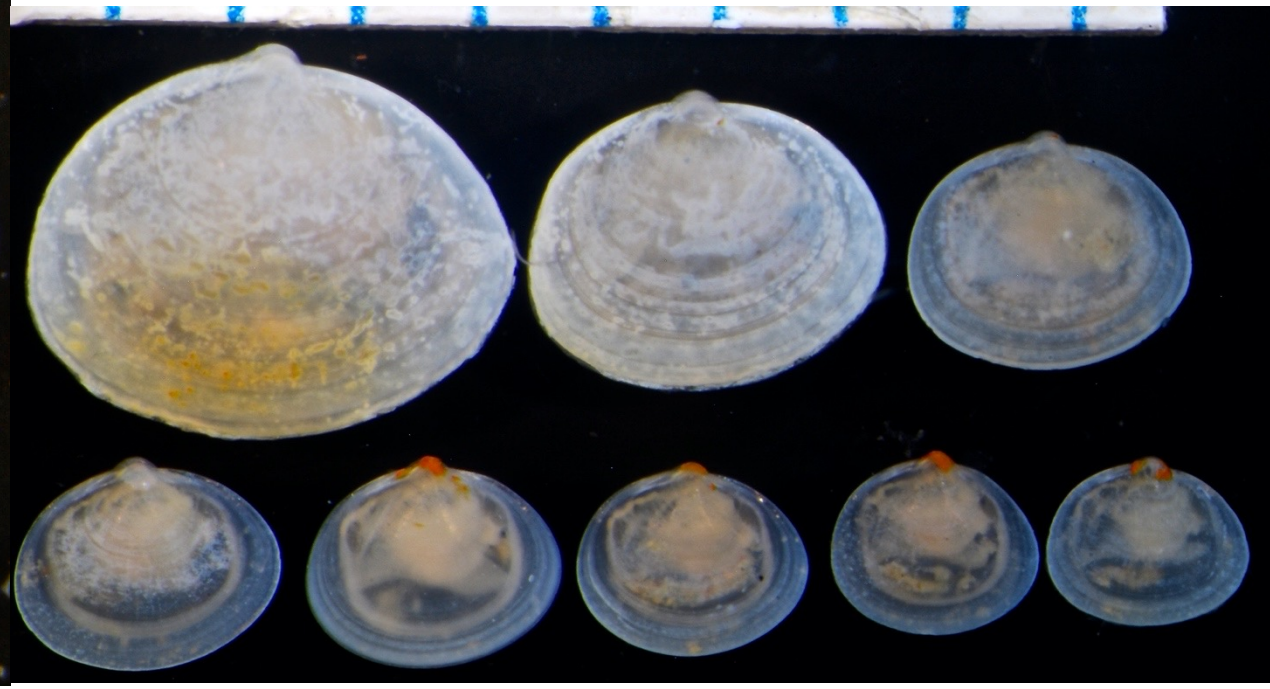
Specimen and photo courtesy of Greg Lyon CLAEMD

Specimen courtesy of Don Cadien LACSD

Cymatioa vs *Rhamphidonta* (juvenile)



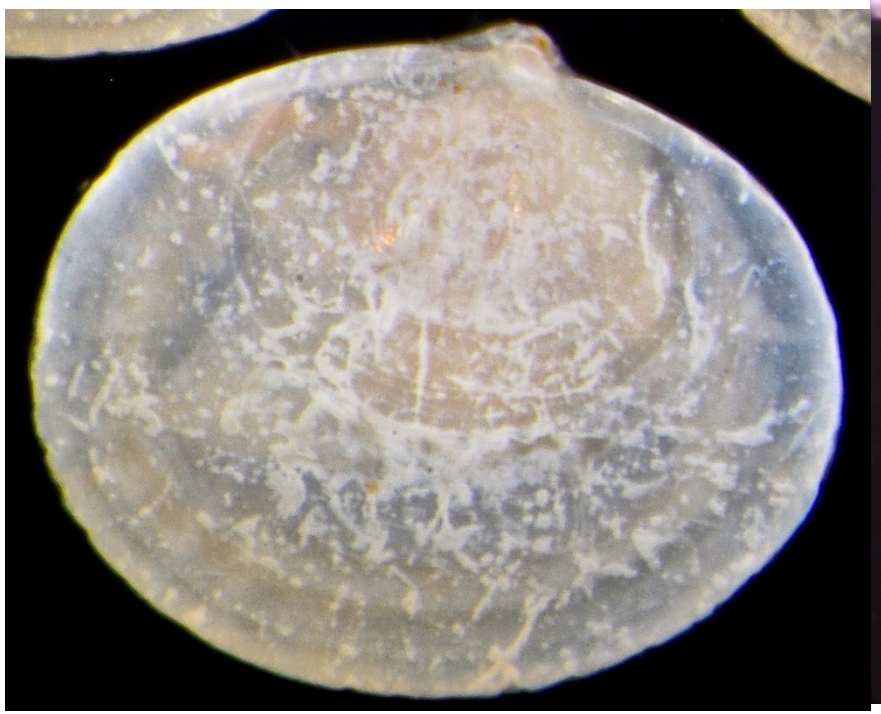
Los Angeles Harbor HM10 21m 2017



LACSD 5D 30m 1994

Cymatioa/Rhamphidonta juvenile dissection

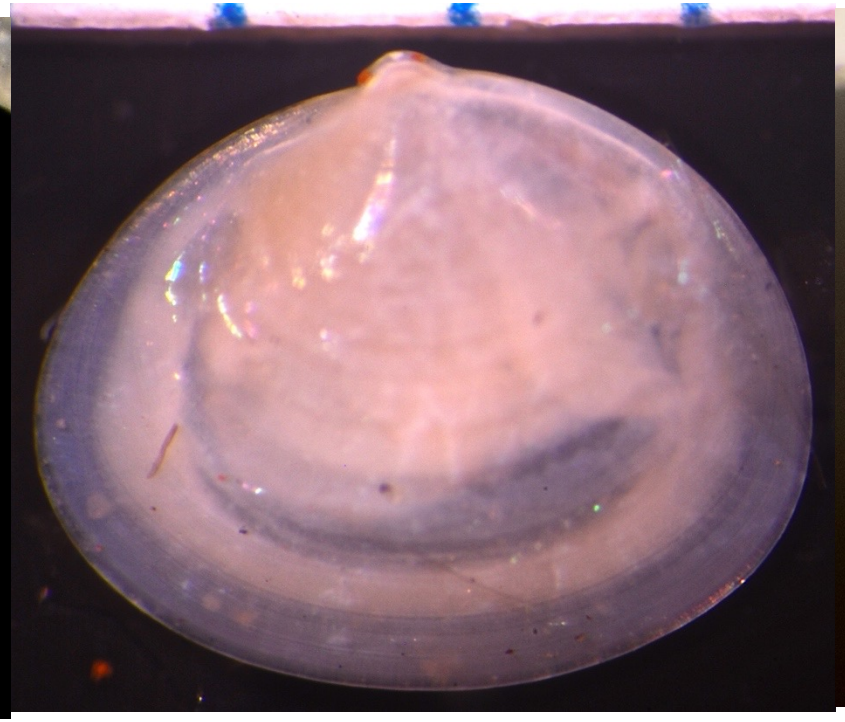
Cymatioa



LACSD 4D 2017

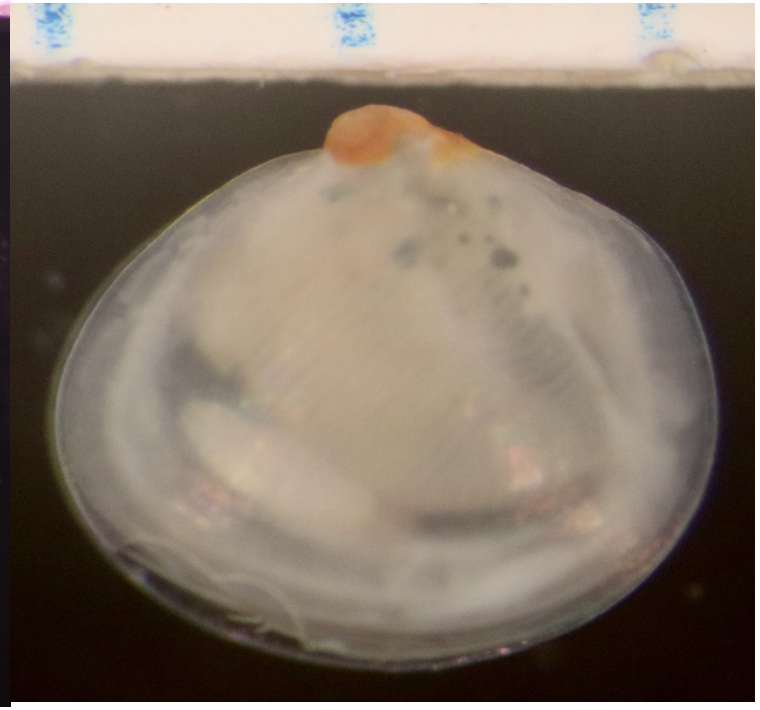
Specimen courtesy of Don Cadien

Rhamphidonta



Santa Barbara Harbor 10m 2018

Rhamphidonta

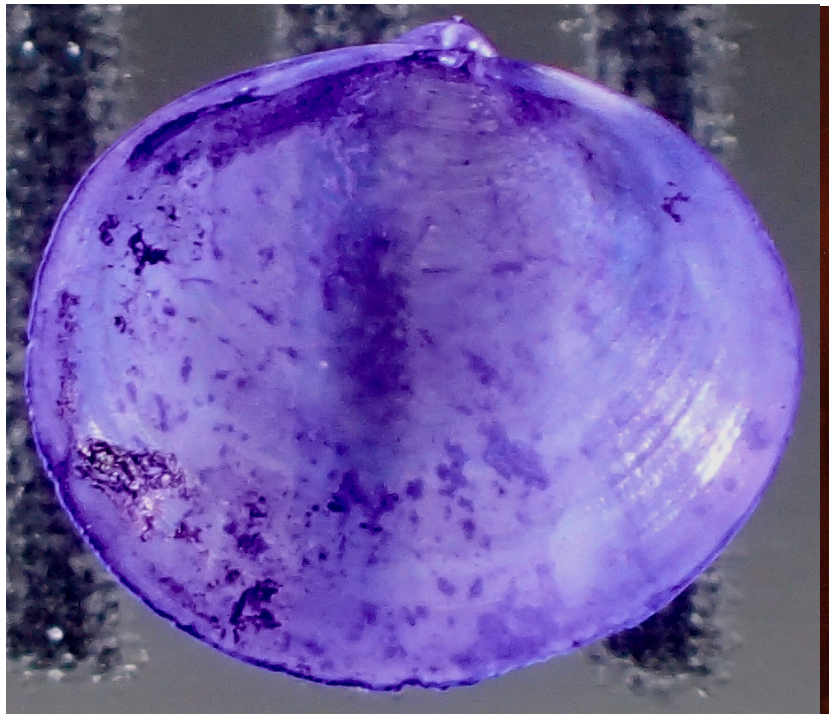


CCSF SW0034 24.5m 2018

Specimen courtesy of Heather Petersen

Cymatioa/Rhamphidonta juvenile dissection

Cymatioa

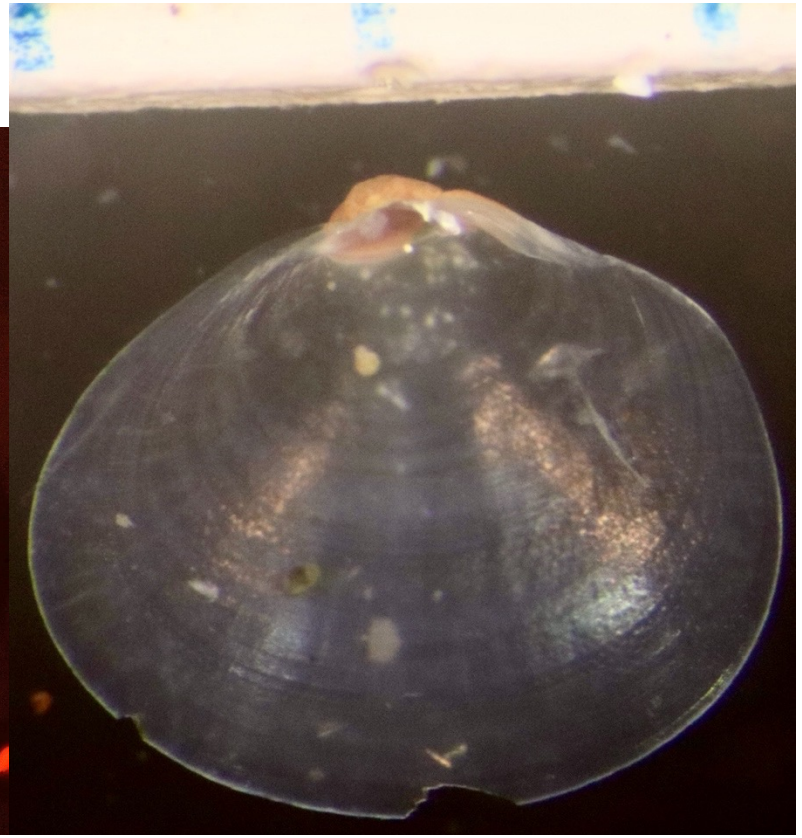


LAH HM10 16m 2017
left valve

Rhamphidonta

Santa Barbara Harbor 10m 2018
left valve

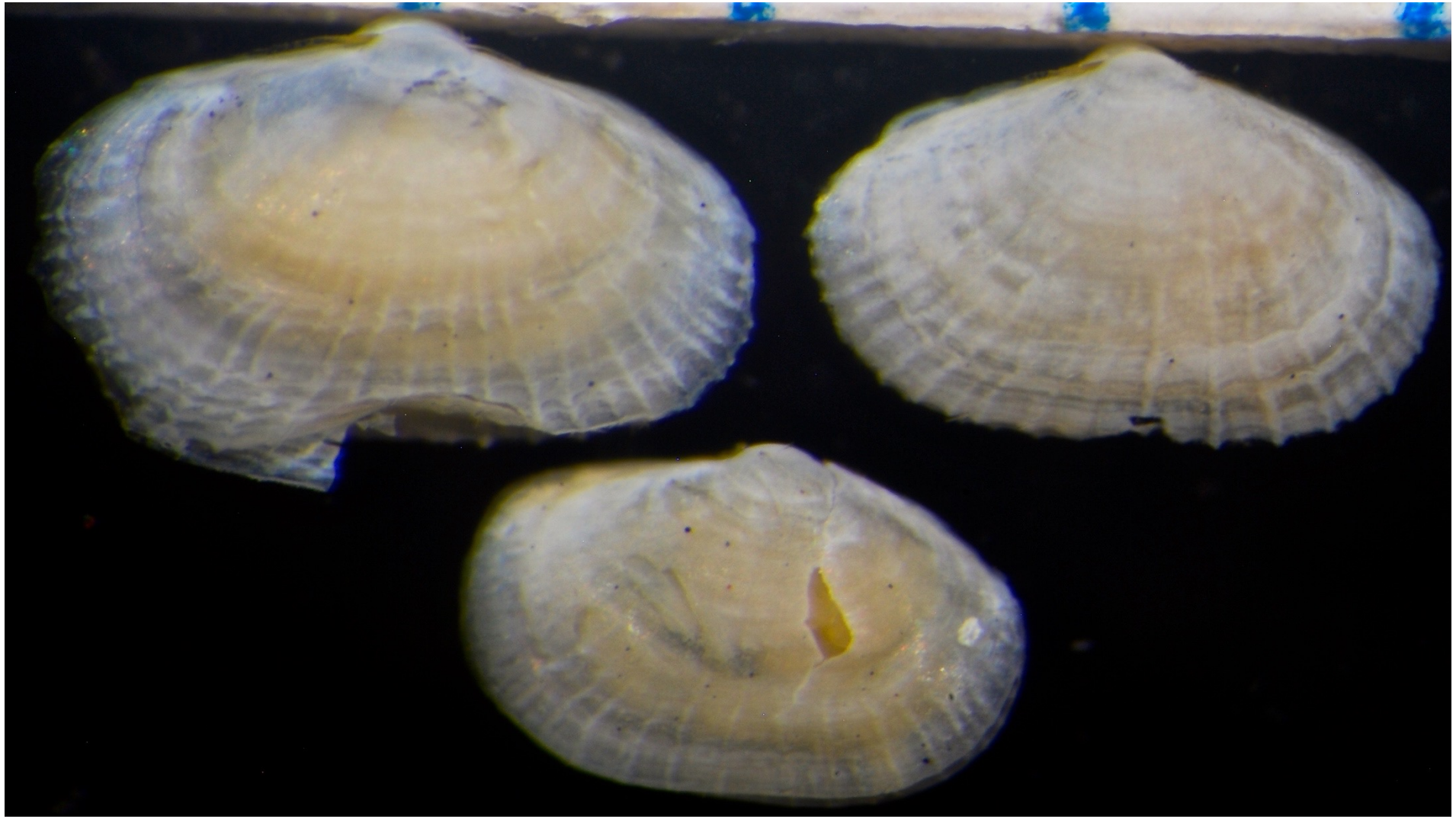
Rhamphidonta



CCSF SW))34 24.5m 2018
right valve

Photo courtesy of Greg Lyon

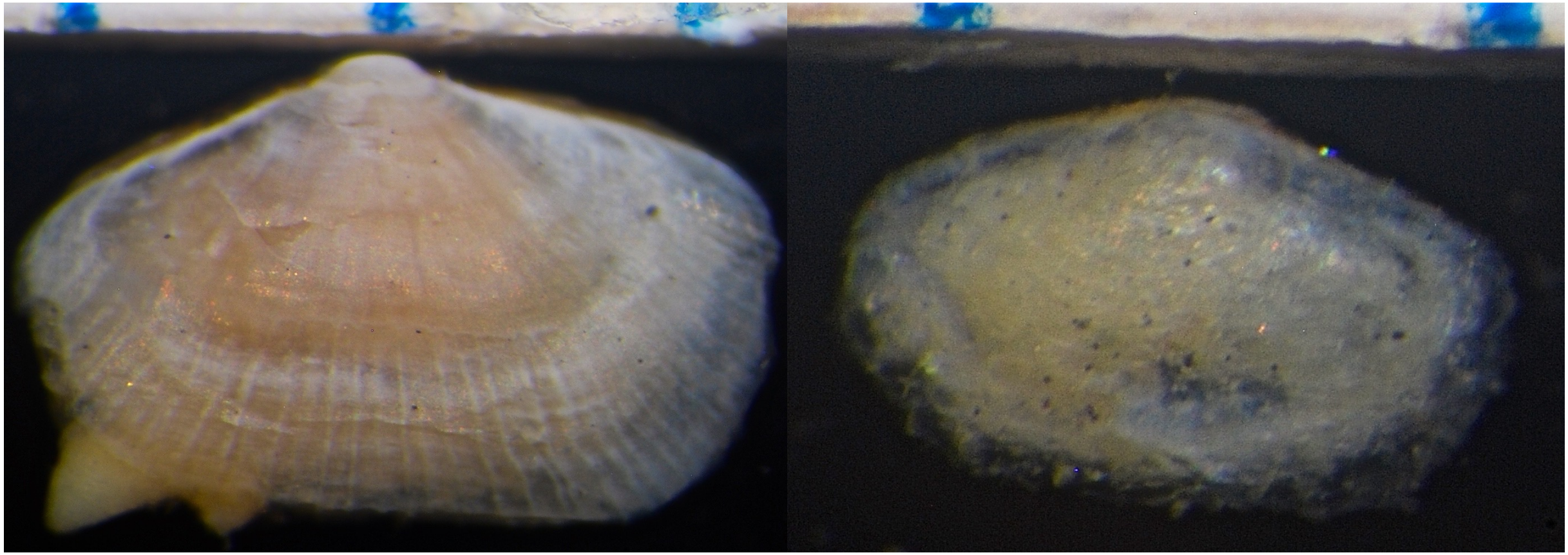
Waldo arthuri Valentich Scott et al 2013



ACE LA-2 BR2-4 305m 1983 (found on *Brisaster*)

Specimens courtesy of Carol Paquette MBC

Waldo arthuri Valentich Scott et al 2013



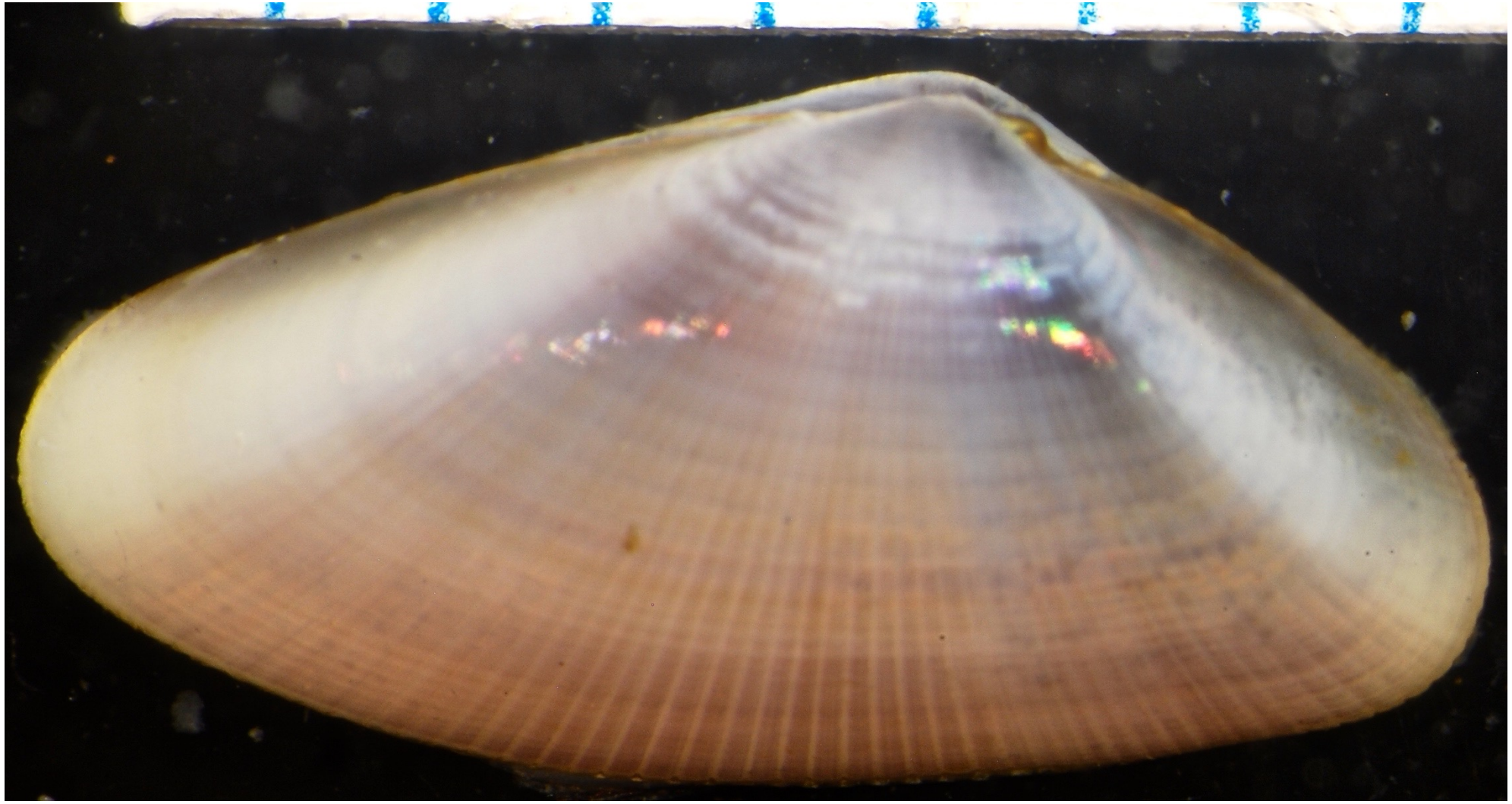
ACE LA-2 BD2-3 197m 1984 (found on *Brisaster*)

Specimens courtesy of Carol Paquette MBC

Order Cardiida
Family Donacidae

1. **Valve shape subtrigonal to elongate, equivalve**
2. **External ligament**
3. **Hinge with two cardinal teeth in each va**lve
4. **Ventral inner margin crenulate**

Donax californicus Conrad 1837

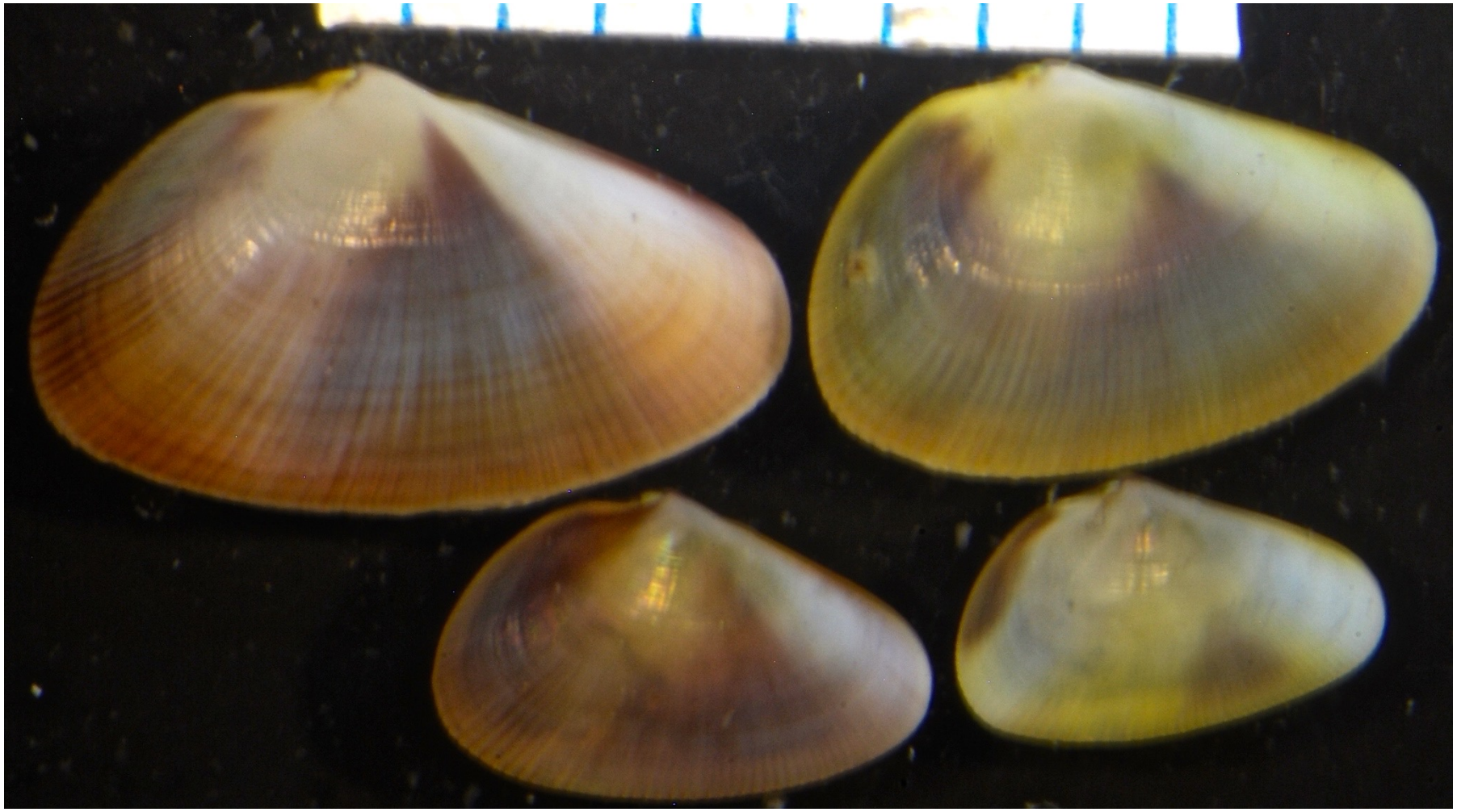


B’18 10167 Santa Margarita Estuary 1m

Donax gouldii Dall 1921

Oxnard 10m 2014

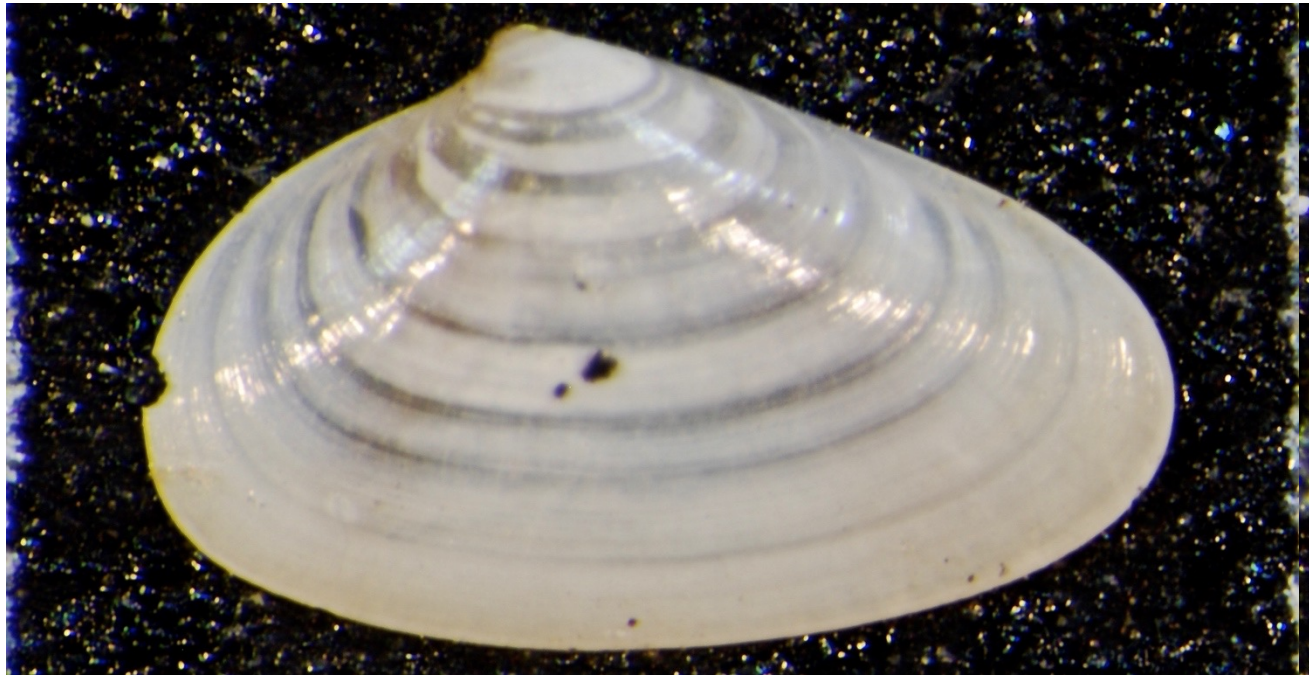
Donax gouldii Dall 1921



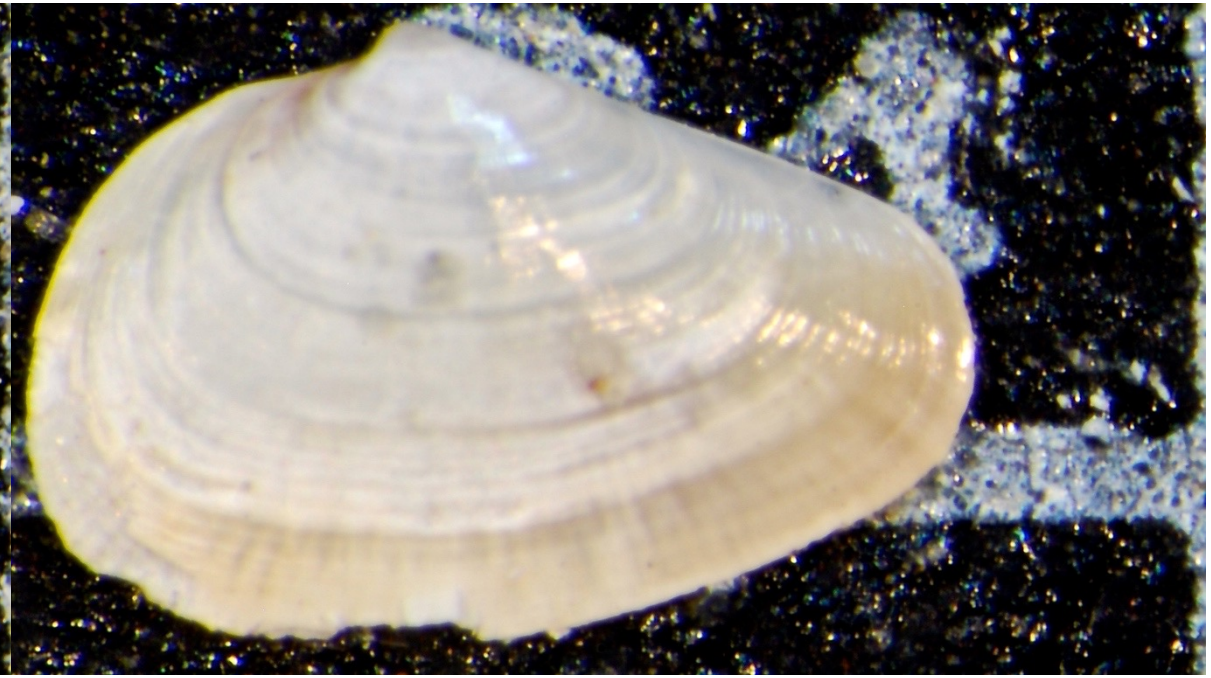
SGSS Intertidal 2019

Specimens courtesy of Carol Paquette MBC

Donax californicus/gouldii juvenile



MBC Voucher Collection

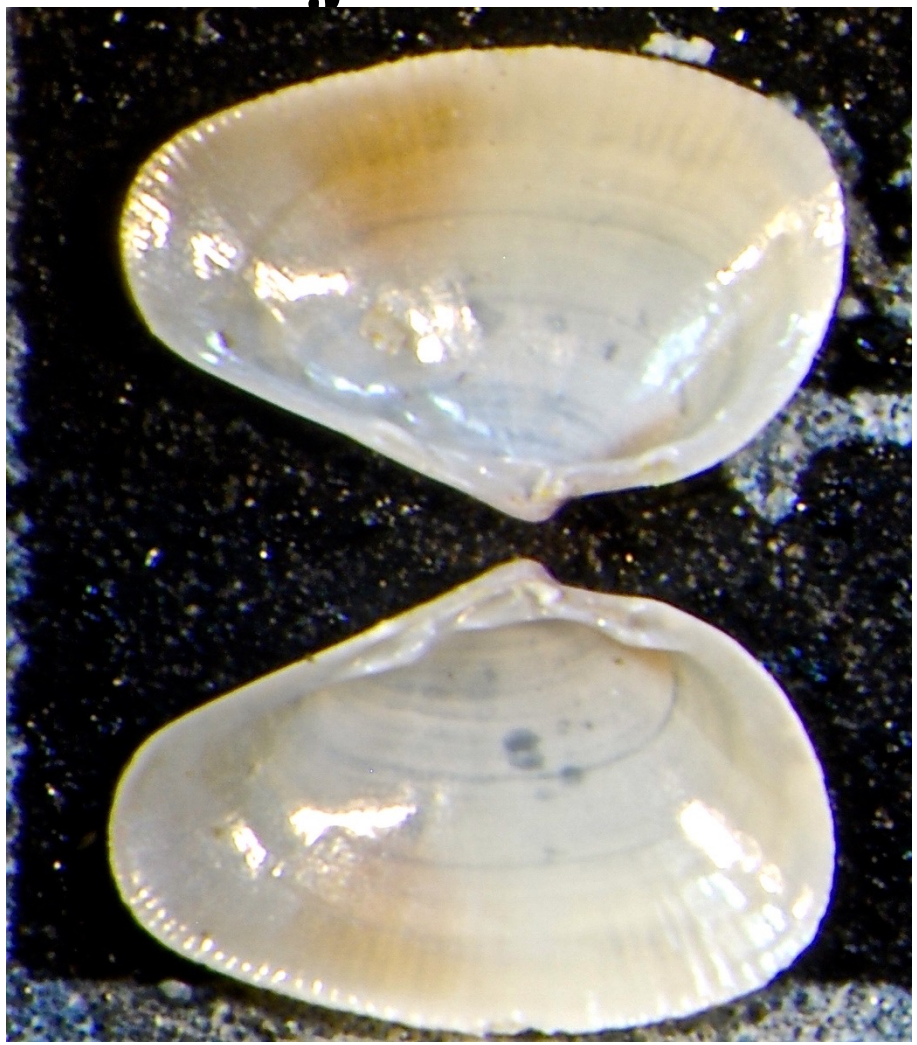


Trestles Intertidal 1978

Specimens courtesy of Carol Paquette MBC

Donax californicus/gouldii juvenile

MBC Voucher Collection



Trestles Intertidal 1978

Specimens courtesy of Carol Paquette MBC

Family Psammobiidae

1. Valve outline oval to elongate, subequilateral to inequilateral, shell relatively thin
2. Ligament external, attached to strong nymph
3. One to three cardinal teeth per valve, lateral teeth absent

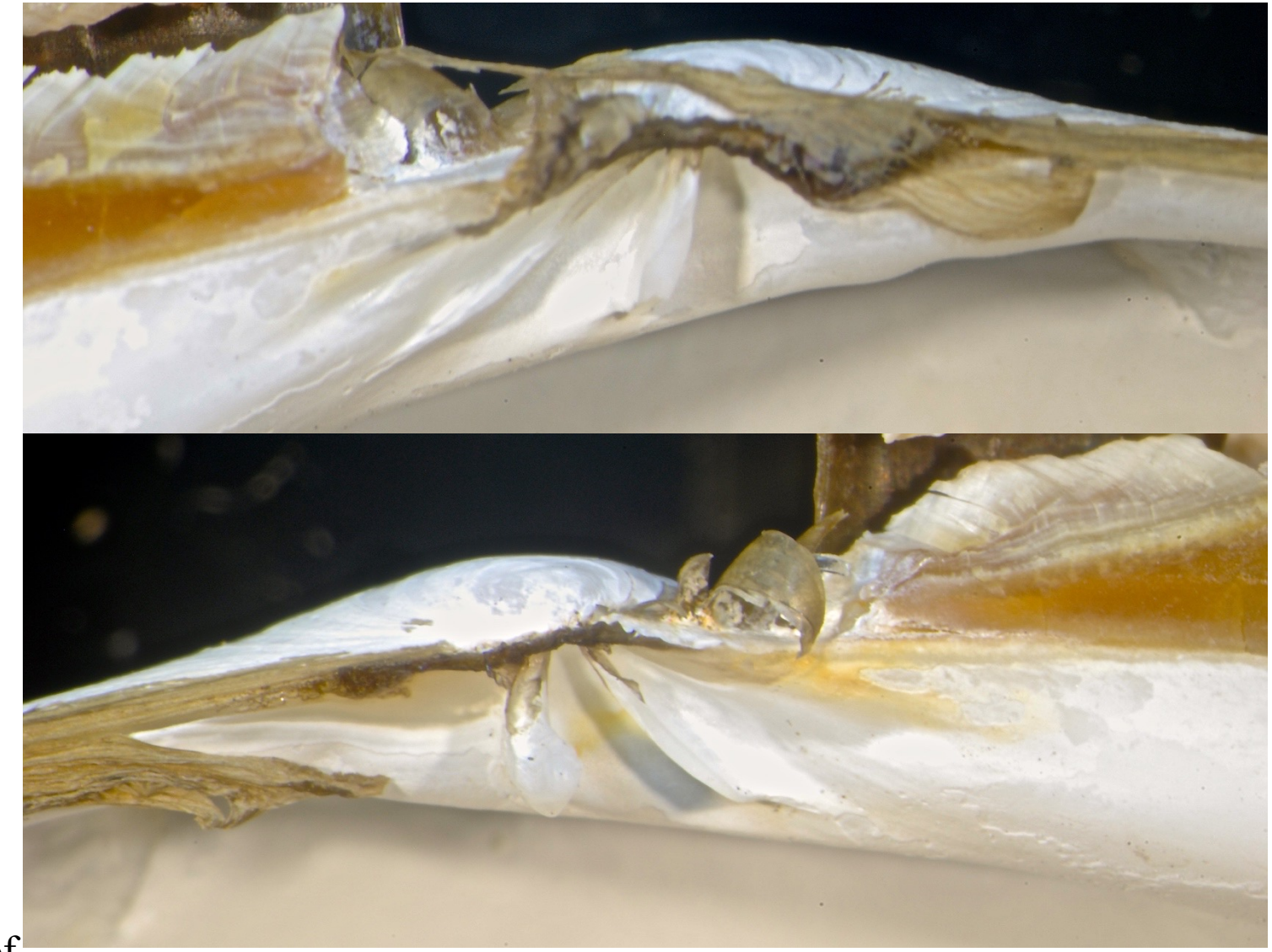
Gari californica (Conrad 1849)

Photo courtesy of Dr. Paul Valentich Scott

left external valve

right internal valve

Gari californica (Conrad 1849)



Specimen courtesy of
Carol Paquette MBC

53mm Trestles Beach Drift 2000

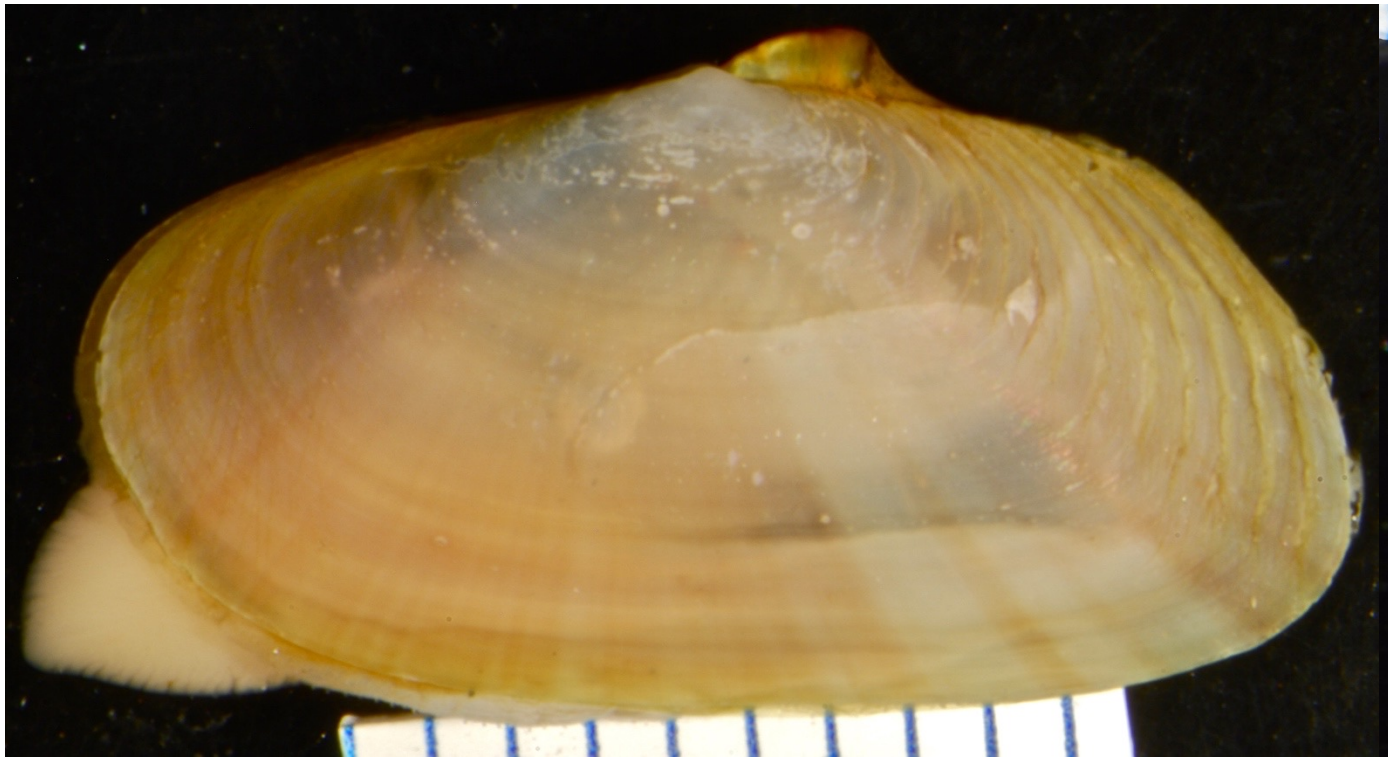
left hinge above

right hinge below

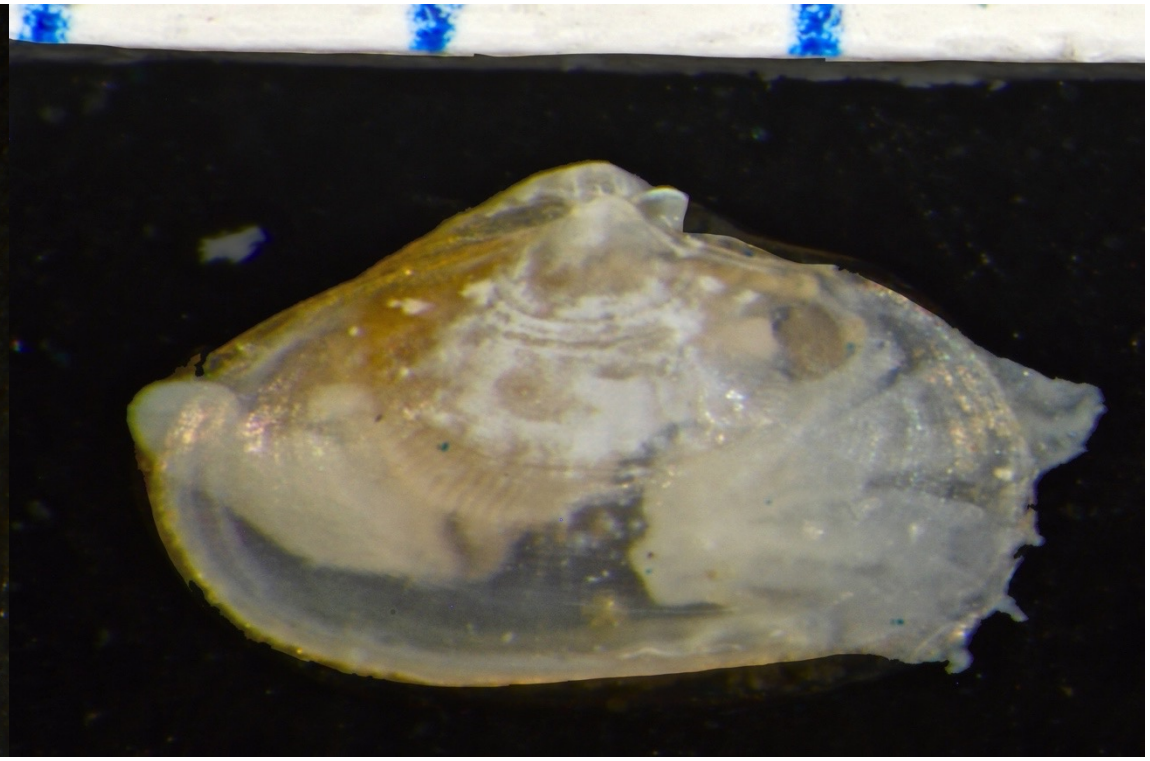
Gari fucata (Hinds 1845)

Specimen courtesy of Carol Paquette MBC Goleta B3 30m 1993

Gari fucata (Hinds 1845)

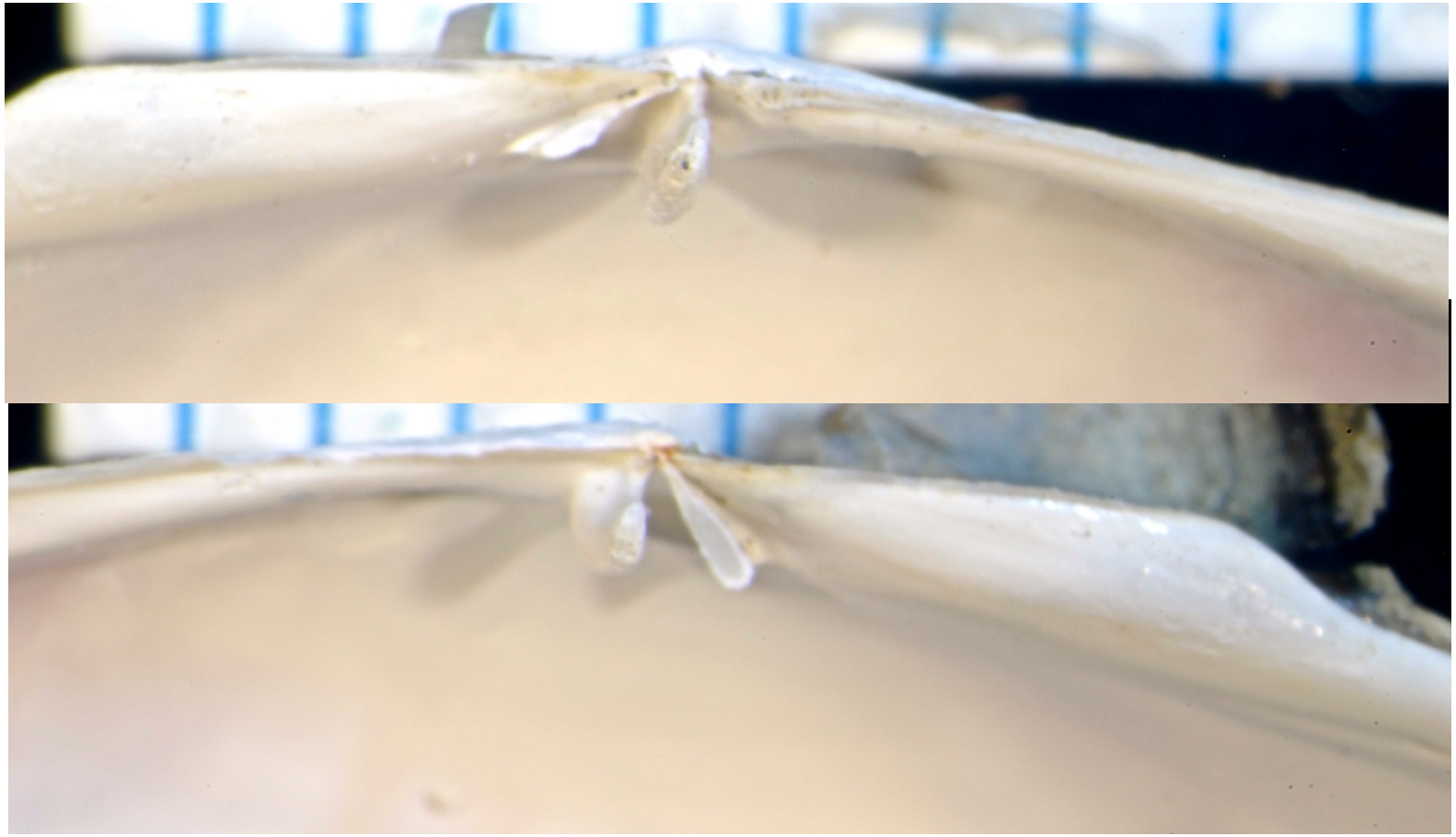


B’13 San Juan Creek Outfall 32m



B’13 Oceanside Harbor 38m

Gari fucata (Hinds 1845)

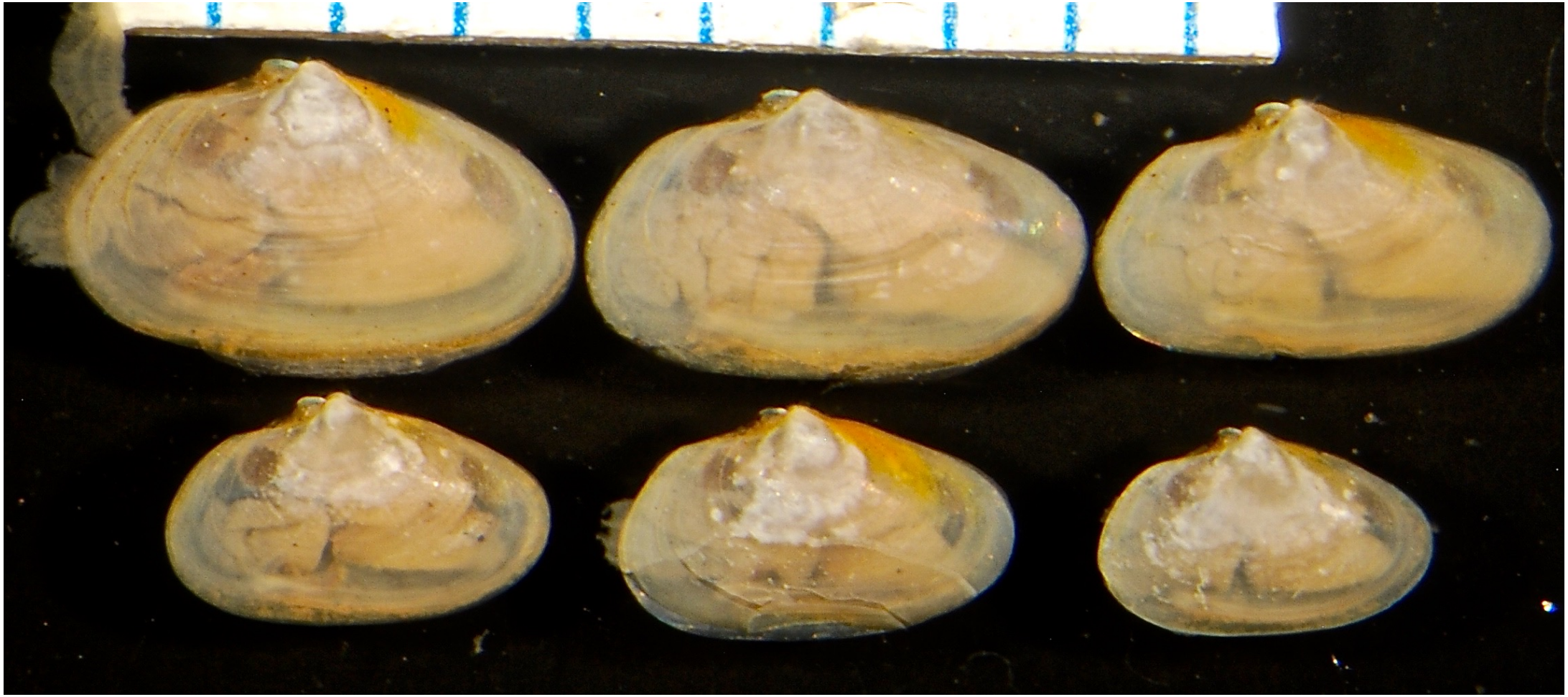


Encina 35m 2004

left hinge above right hinge below

Specimen from John Ljubenkov Voucher collection

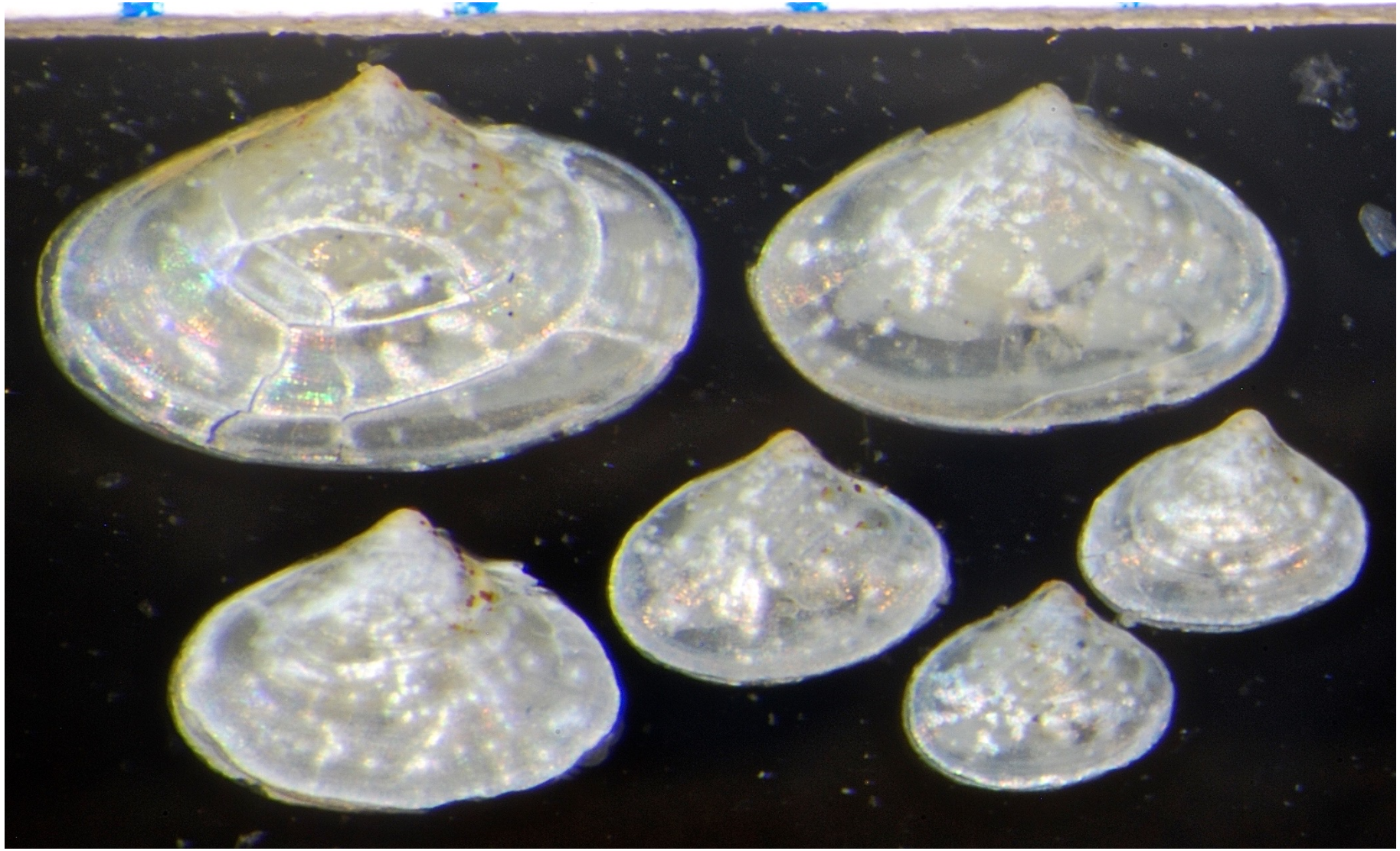
Gari fucata (Hinds 1845)



Goleta B3 30m 1993

Specimens courtesy of Carol Paquette MBC

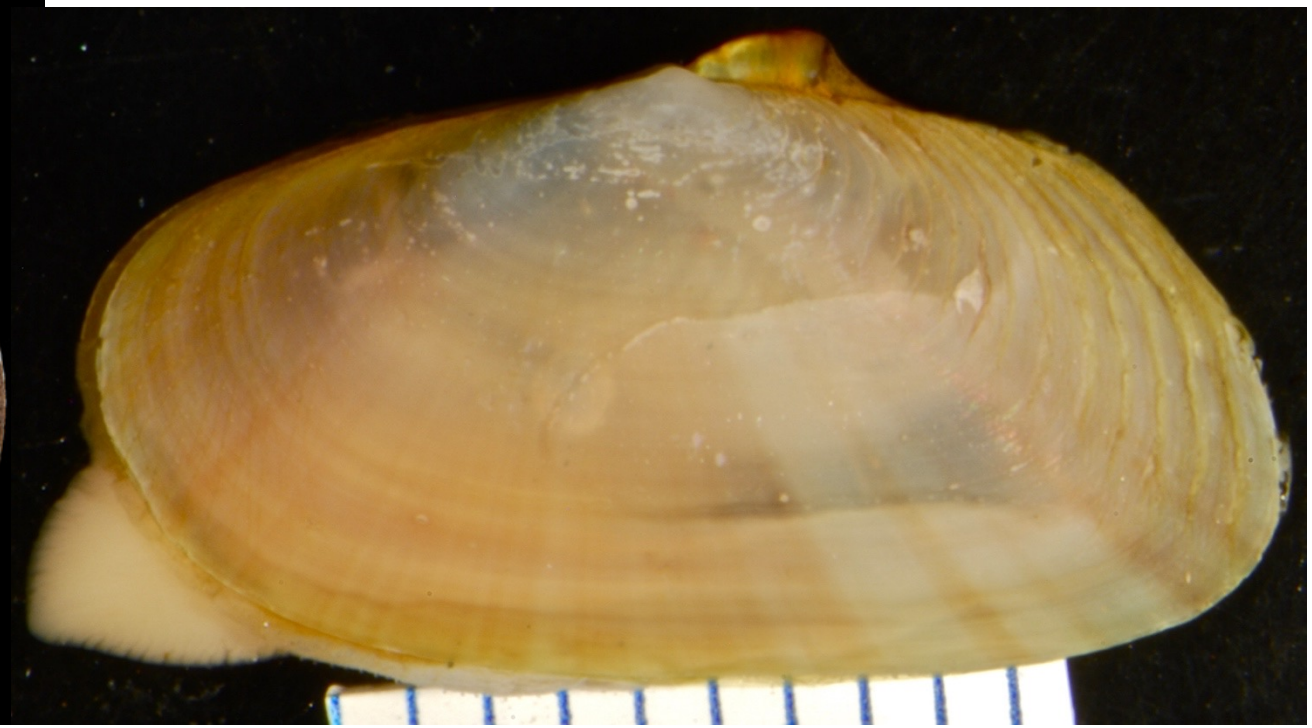
Gari fucata (Hinds 1845)



Huntington Harbour 10m 2015

Gari californica/Gari fucata

Photo courtesy of Dr. Paul Valentich Scott

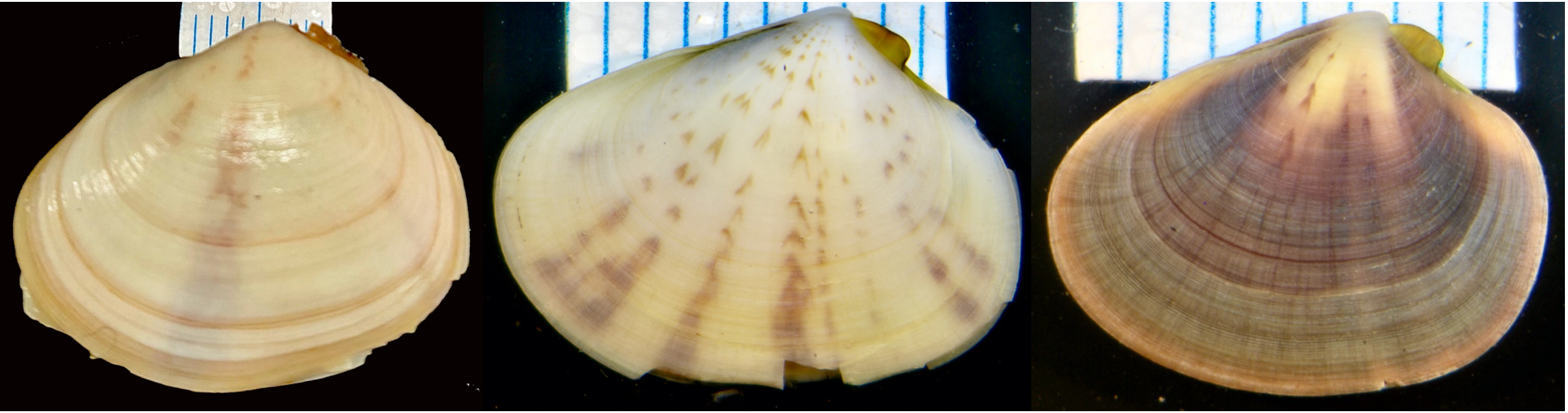


San Juan Outfall 32m 2013

Heterodonax pacificus (Conrad 1837)

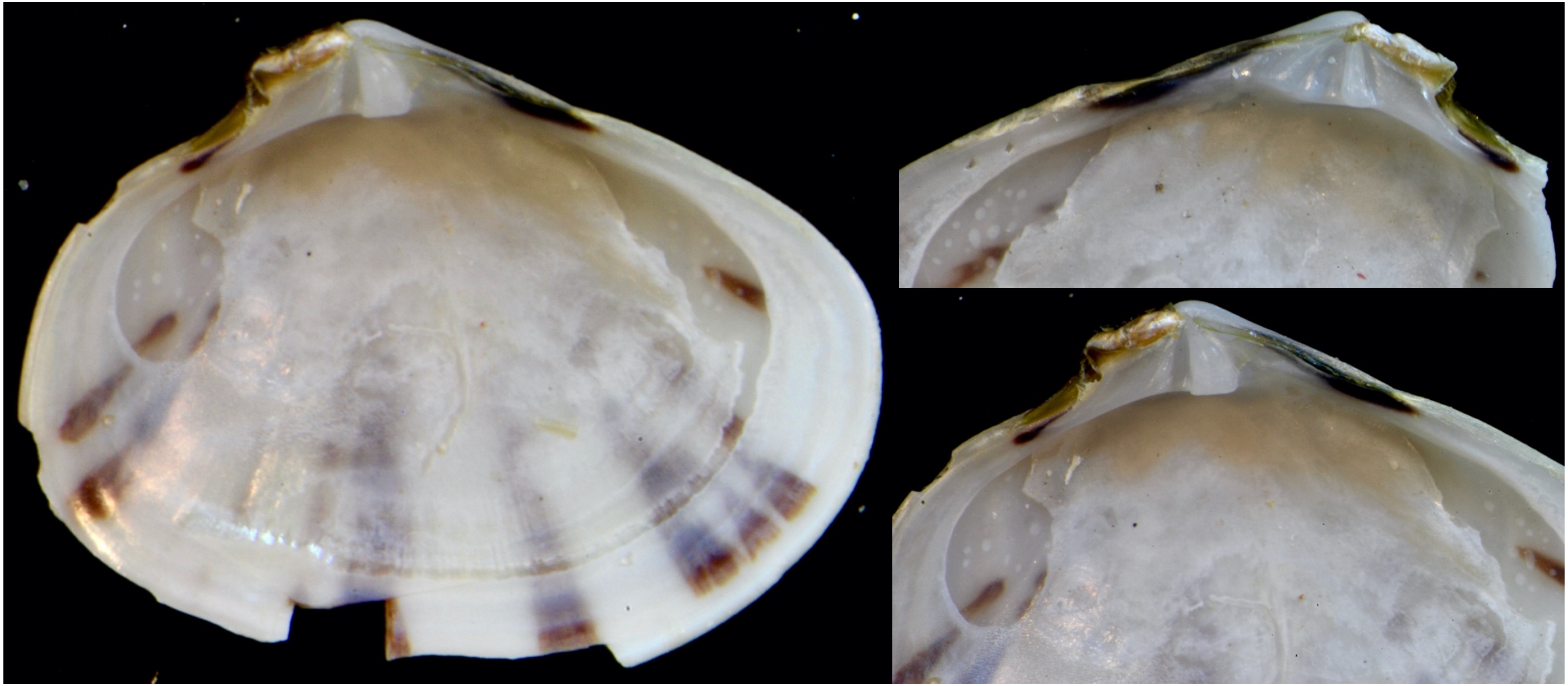
WoodBAE San Diego Bay G1-Alt 5m 2019

Heterodonax pacificus (Conrad 1837)



San Diego Bay NB-M1 Intertidal 2020

Heterodonax pacificus (Conrad 1837)

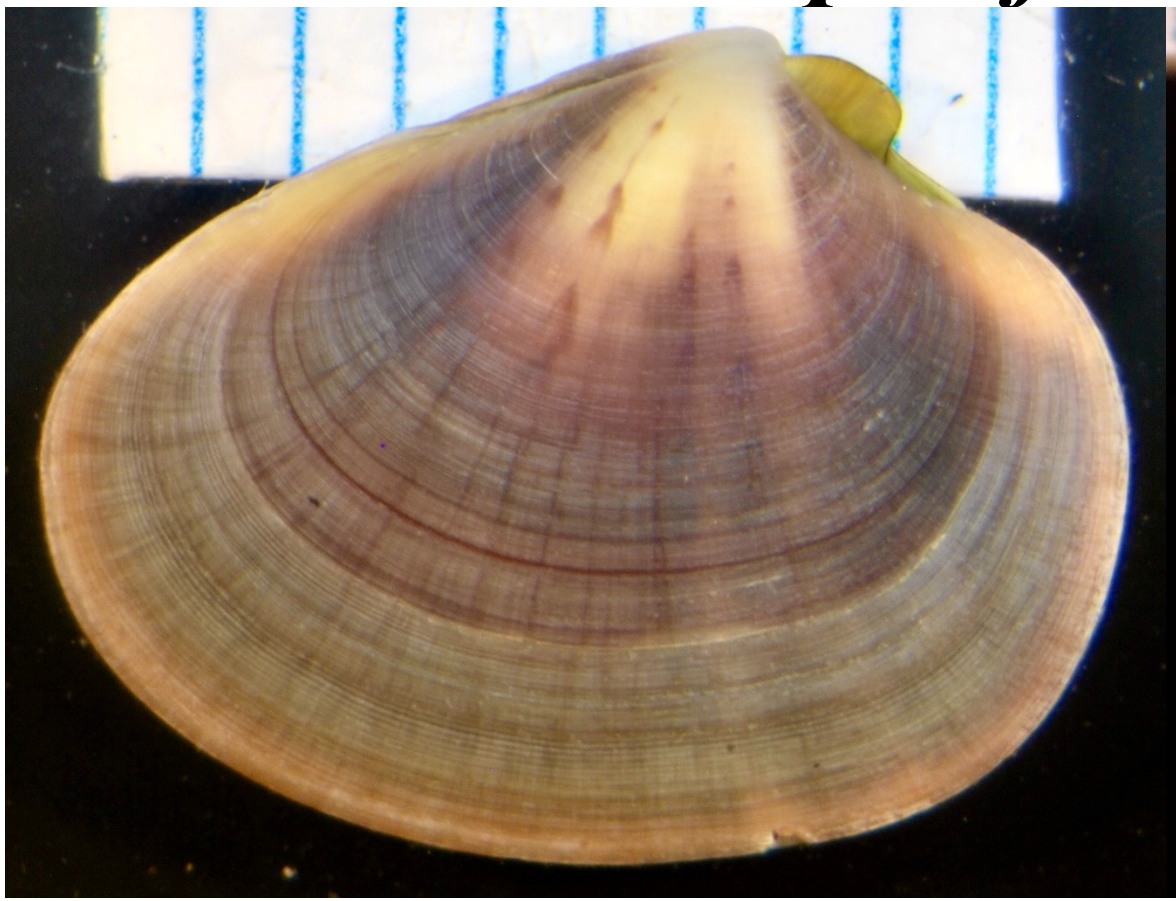


San Diego Bay NB-MI Intertidal 2020

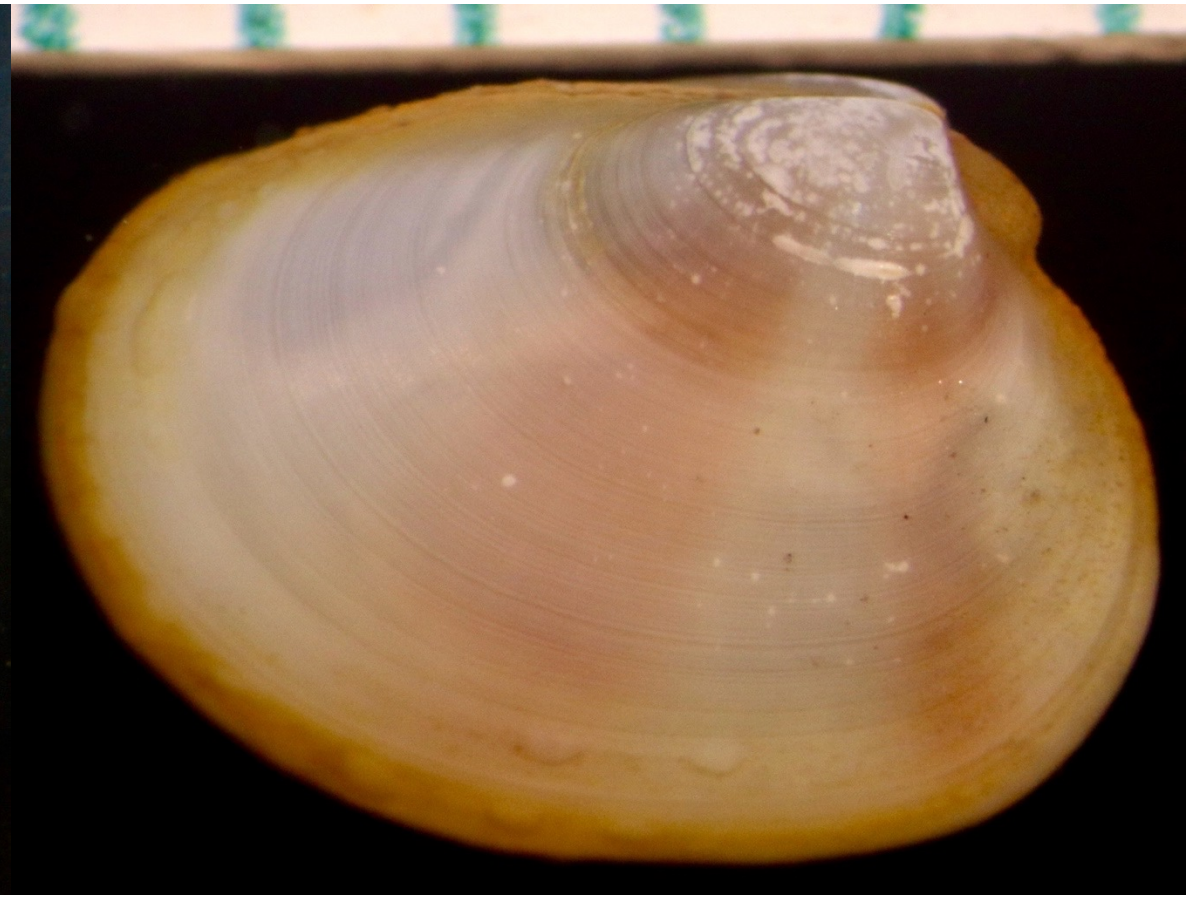
right valve

left hinge above
right hinge below

Heterodonax pacificus/Tellina nuculoides

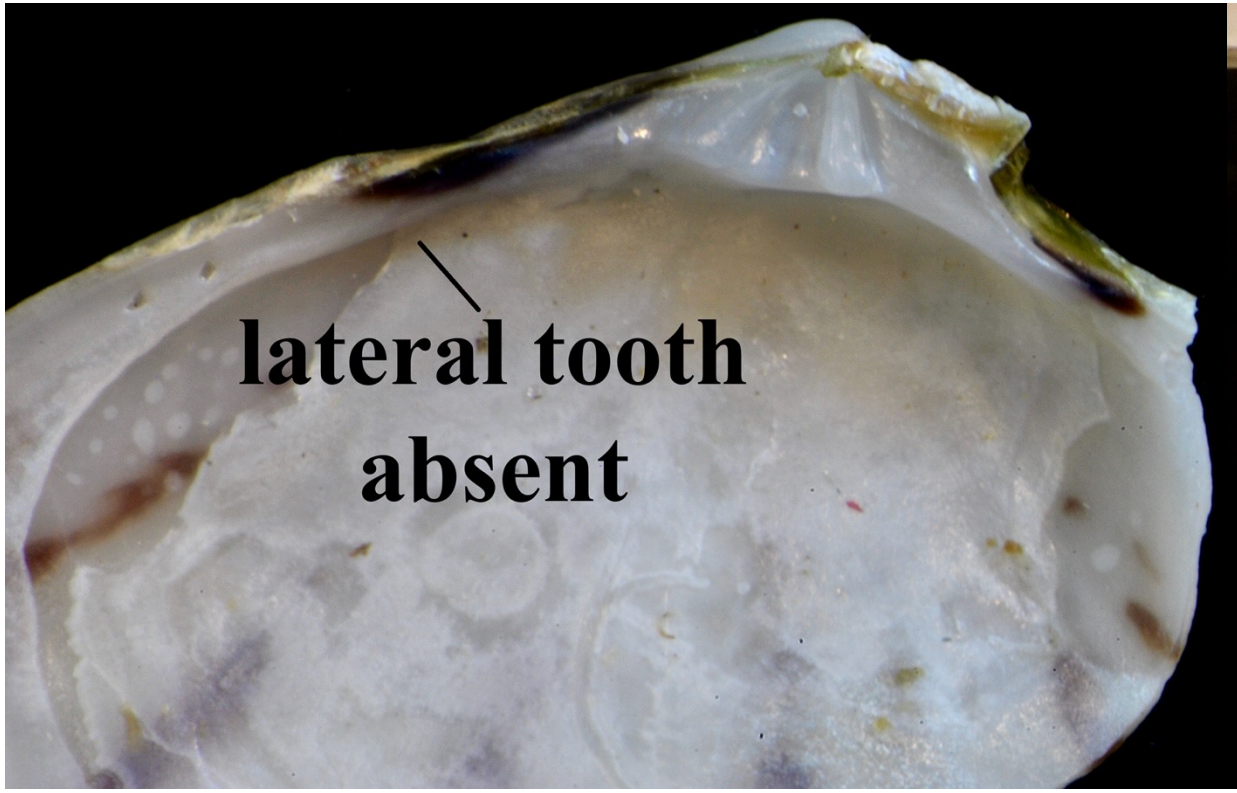


San Diego Bay NB-M1 Intertidal 2020

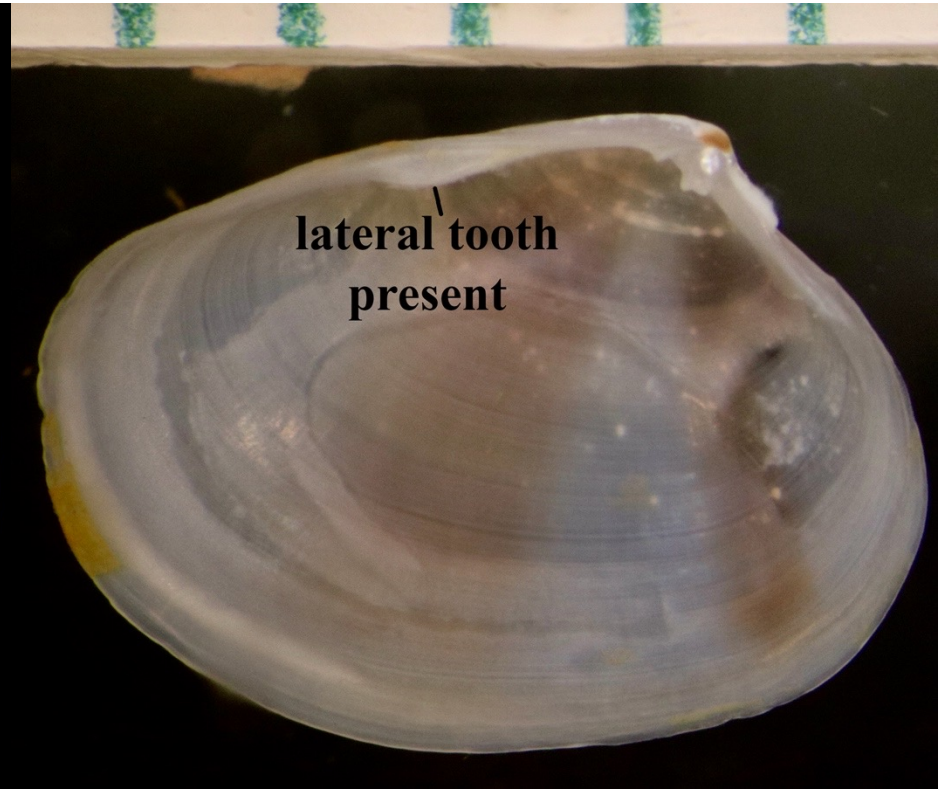


Bodega Bay South Intertidal 5/11/2022

Heterodonax pacificus/Tellina nuculoides

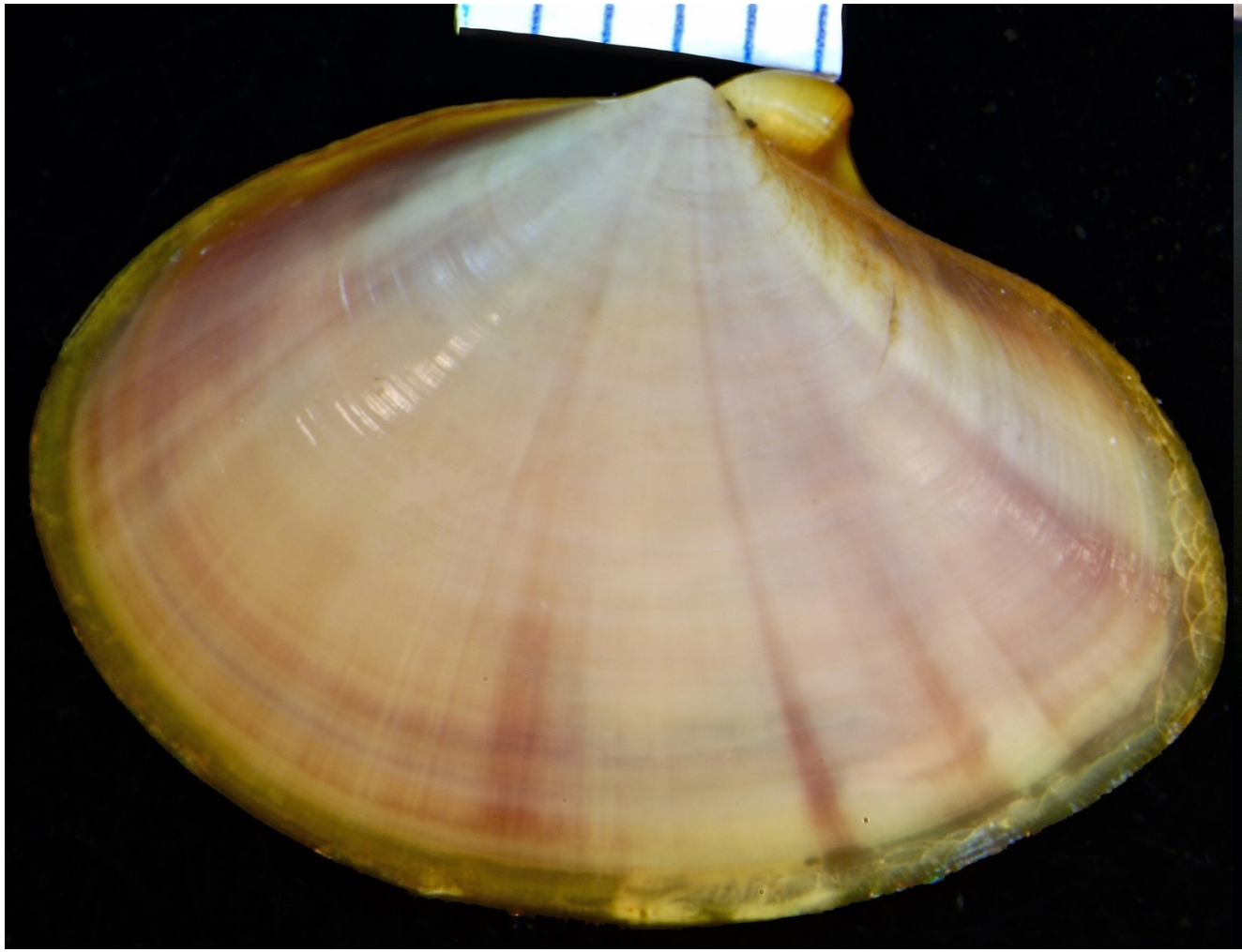


Left valve



left valve

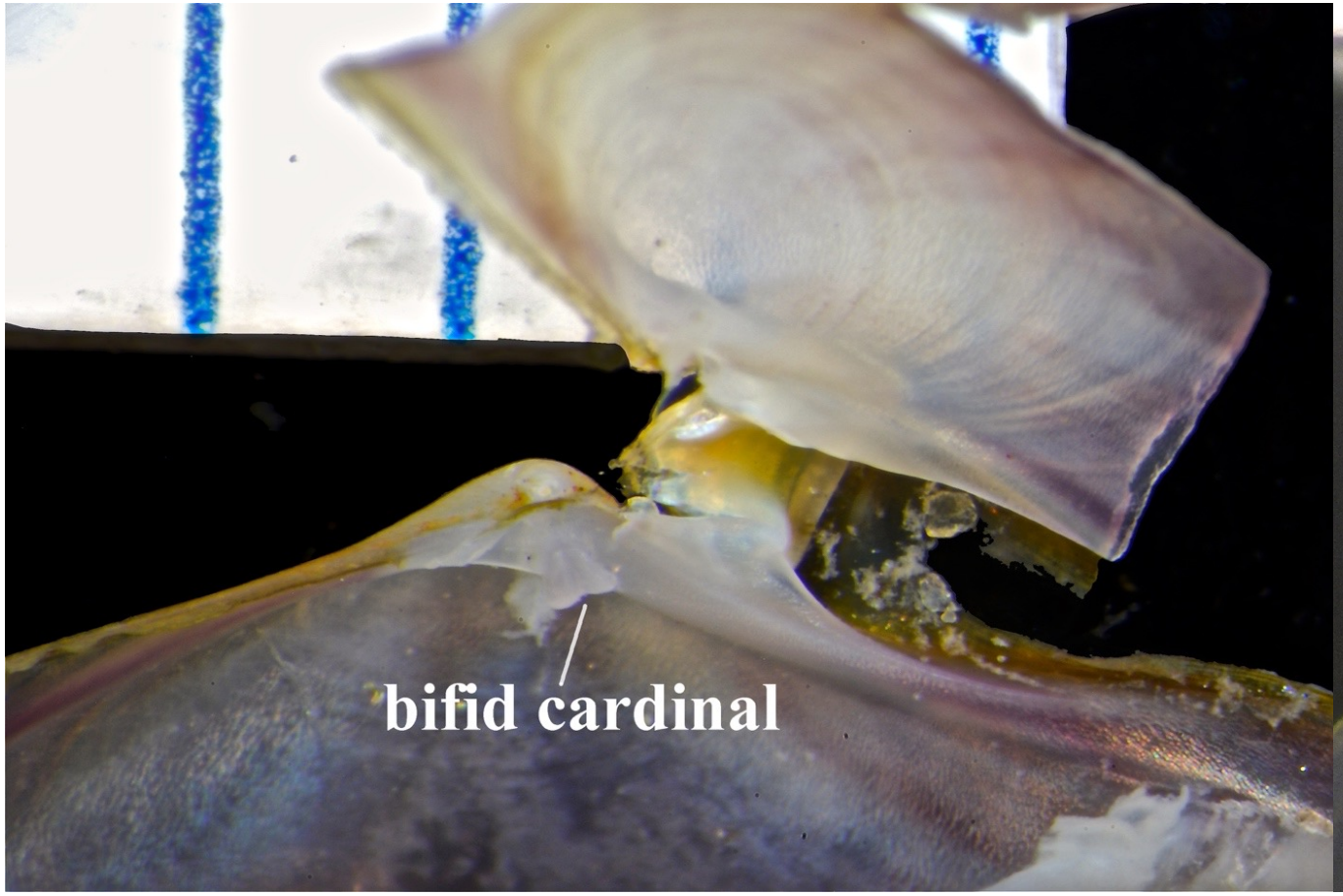
Nuttallia nuttallii (Conrad 1837)



B’13 8002 Tijuana River Estuary 1m

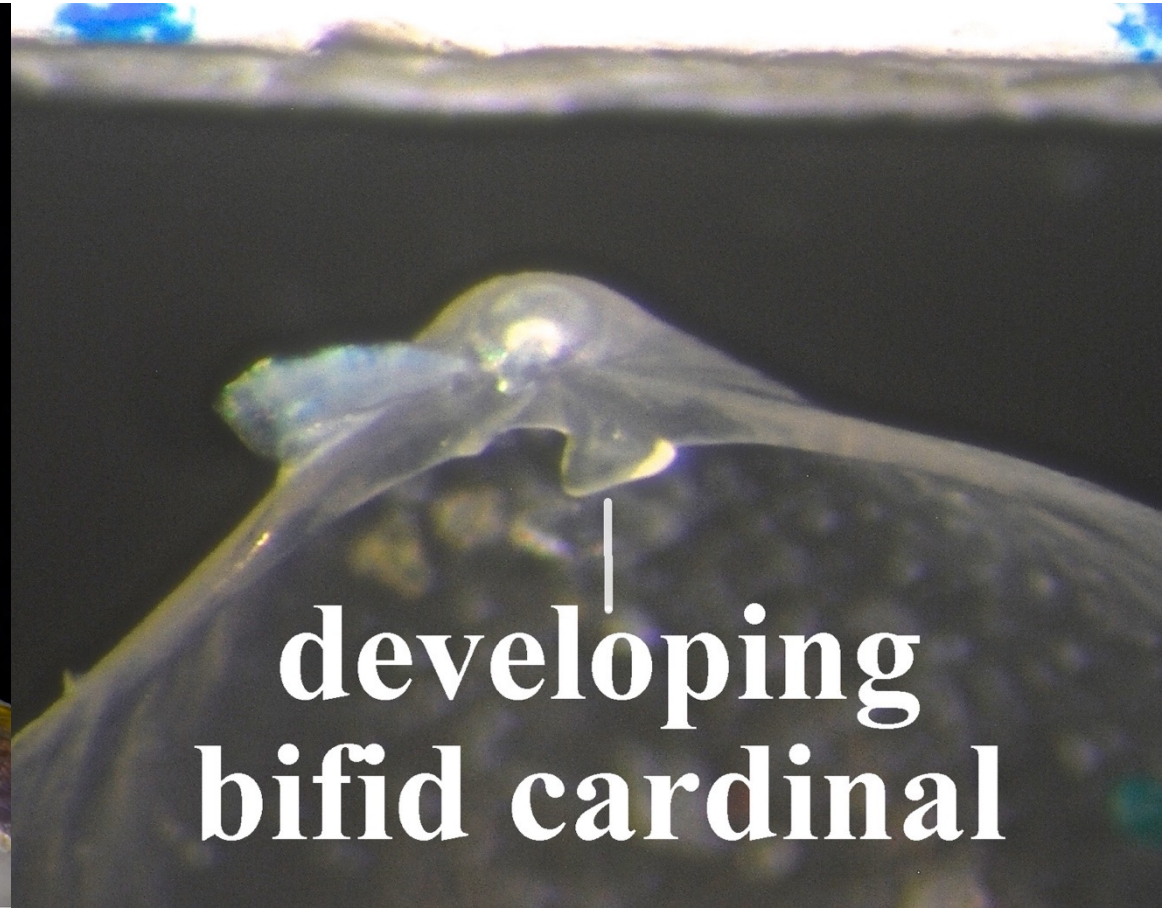
Carpenteria RW1 10m 2020

Nuttallia nuttallii (Conrad 1837)



B’13 8002 Tijuana River Estuary 1m

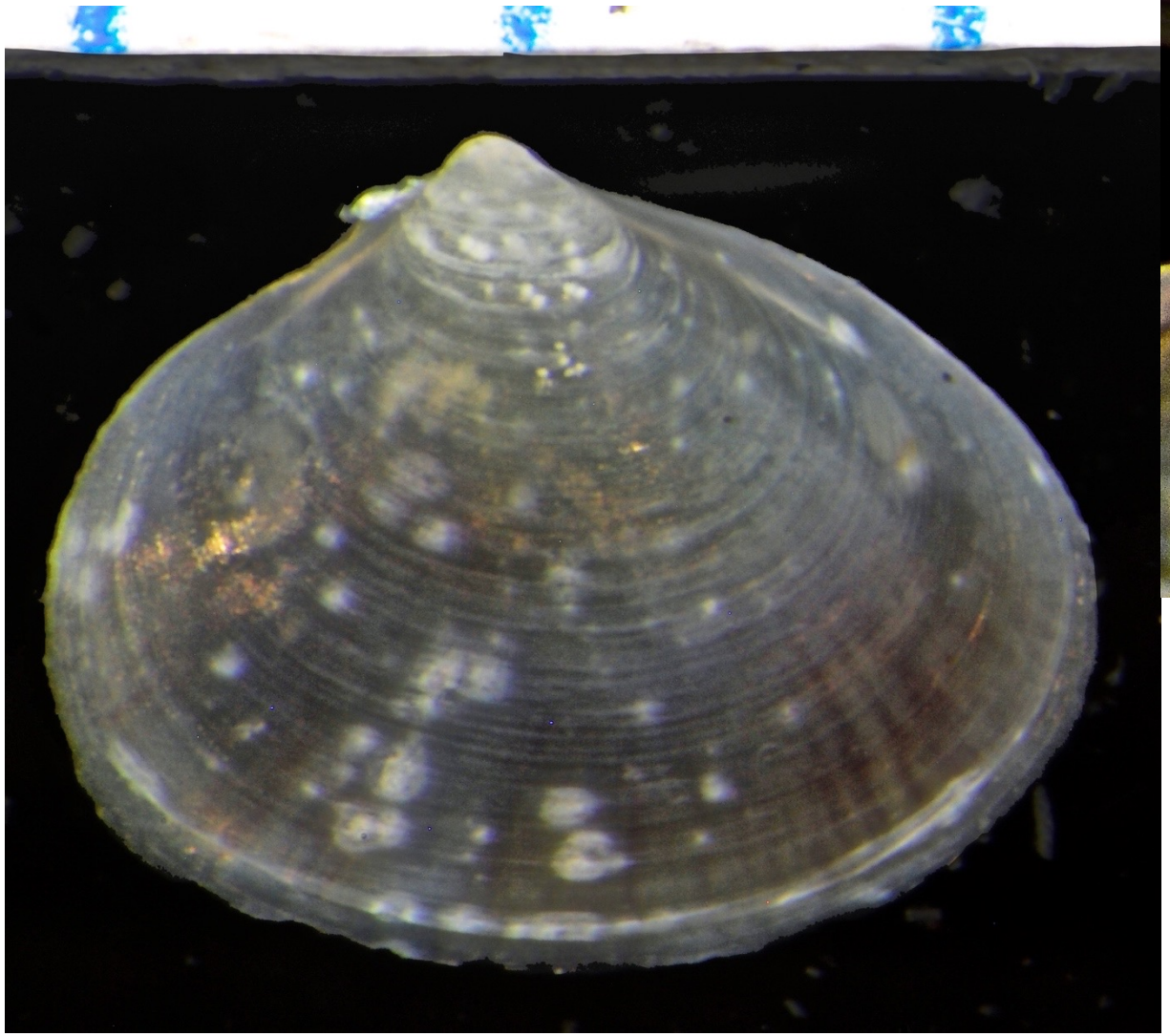
left hinge



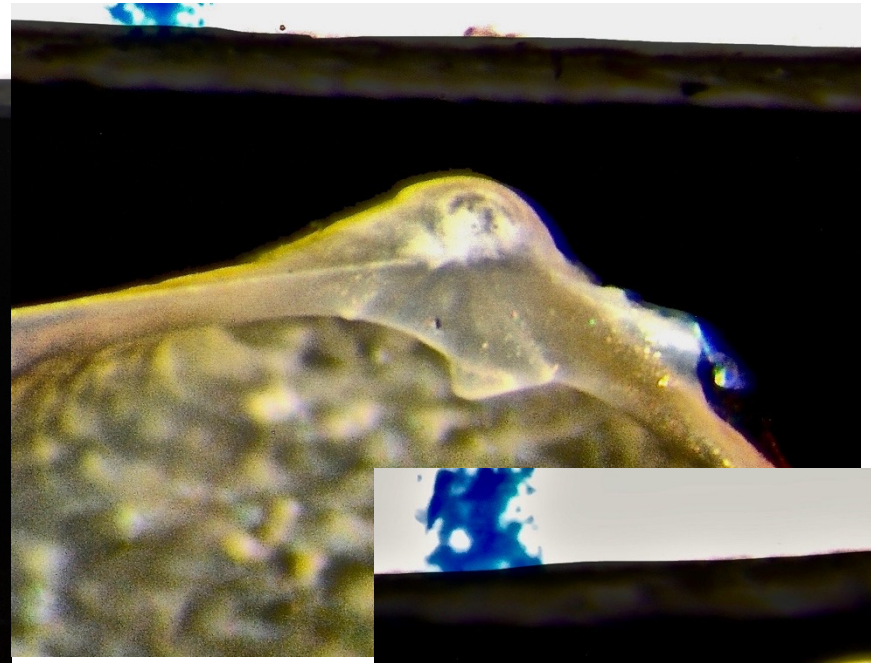
Oxnard R310m 2020

right hinge

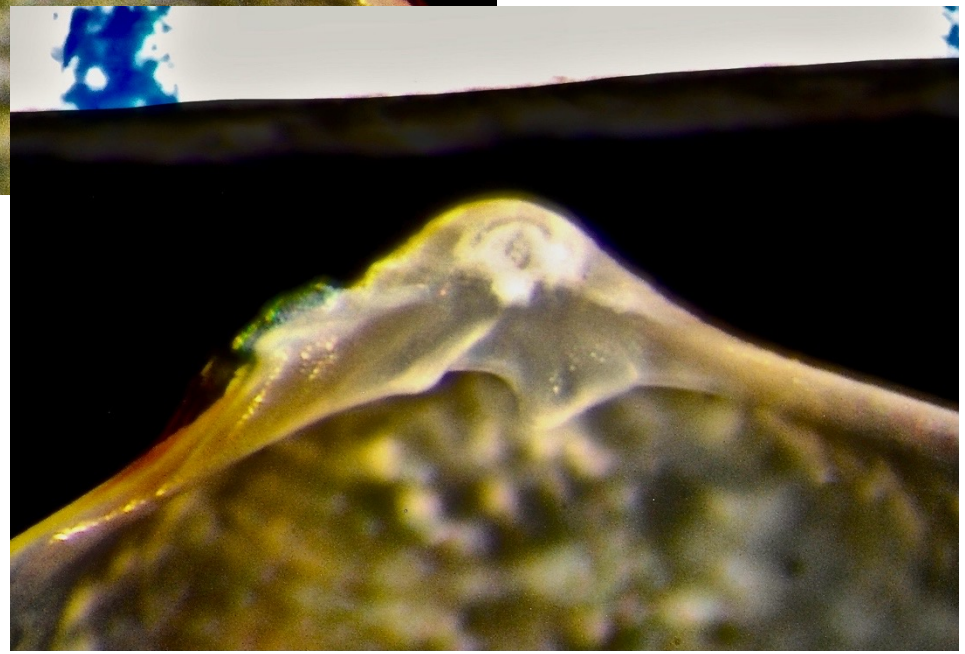
Nuttallia obscurata (Reeve 1857)



NCAA15 Alsea River Oregon 2015

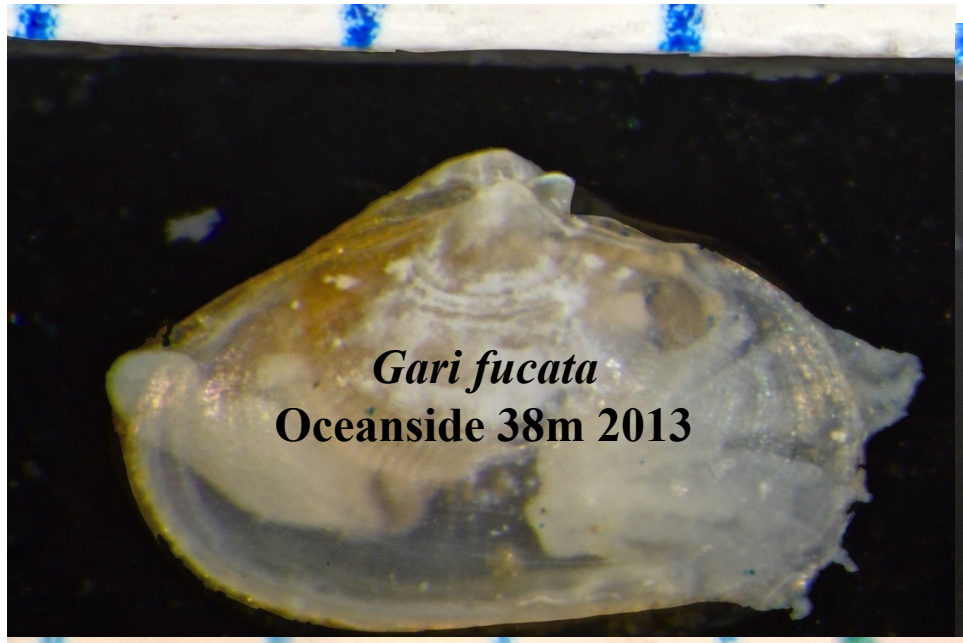


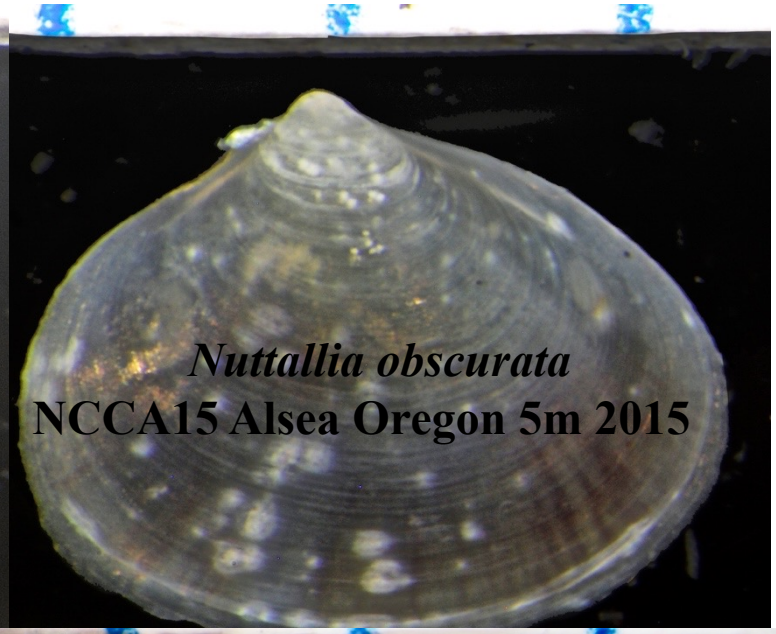
left hinge



right hinge

Psammobiidae juveniles?





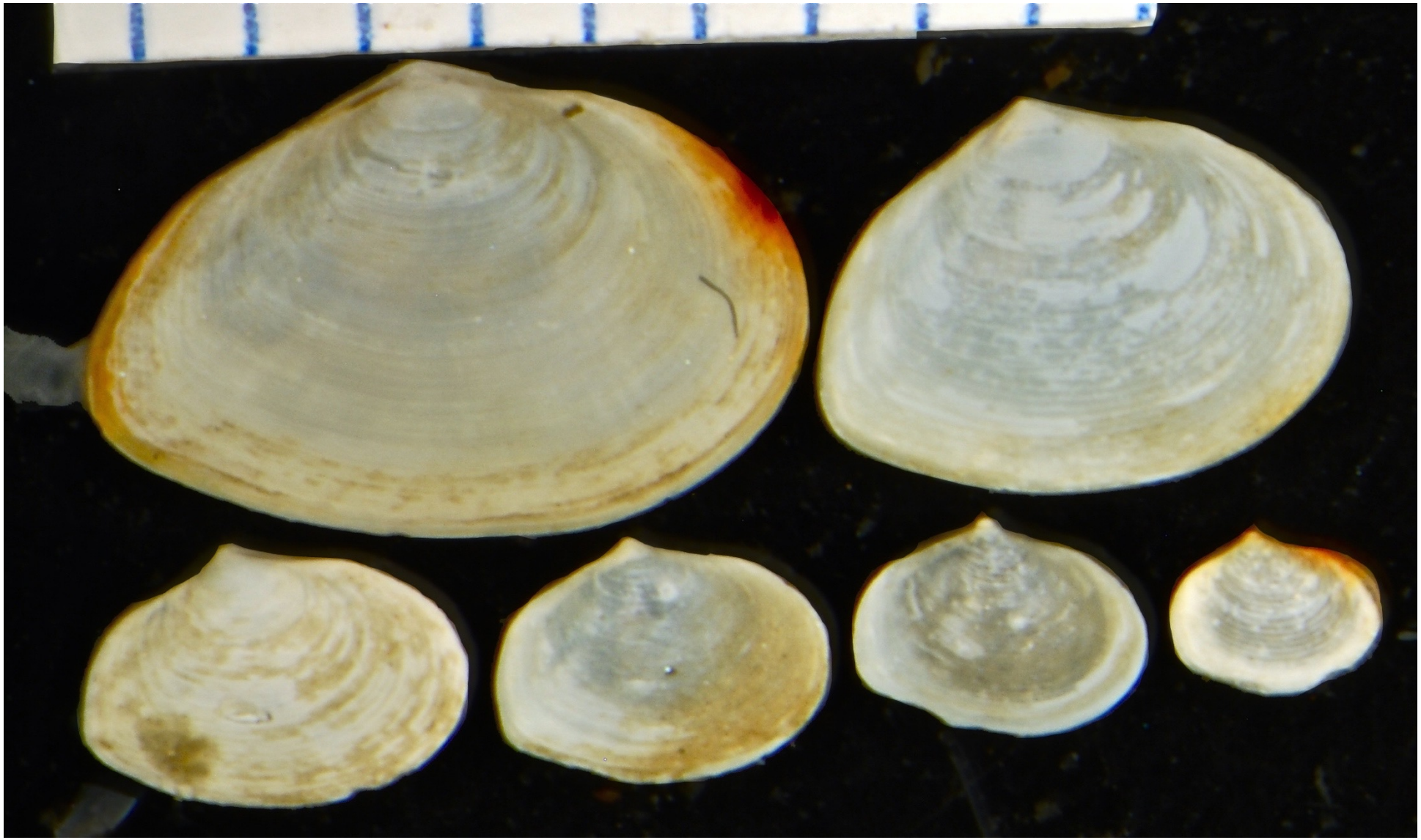
Family Semelidae

1. Sculpture absent or strongly commarginal
2. Ligament partially external, partially internal on elongate resilifer or projection chondrophore
3. Hinge usually with two inconspicuous cardinal teeth, lateral teeth usually present
4. Valves usually sub-equilateral to equilateral; anterior end rounded; posterior end truncate, rounded to rostrate, frequently twisted

Cumingia californica Conrad 1837

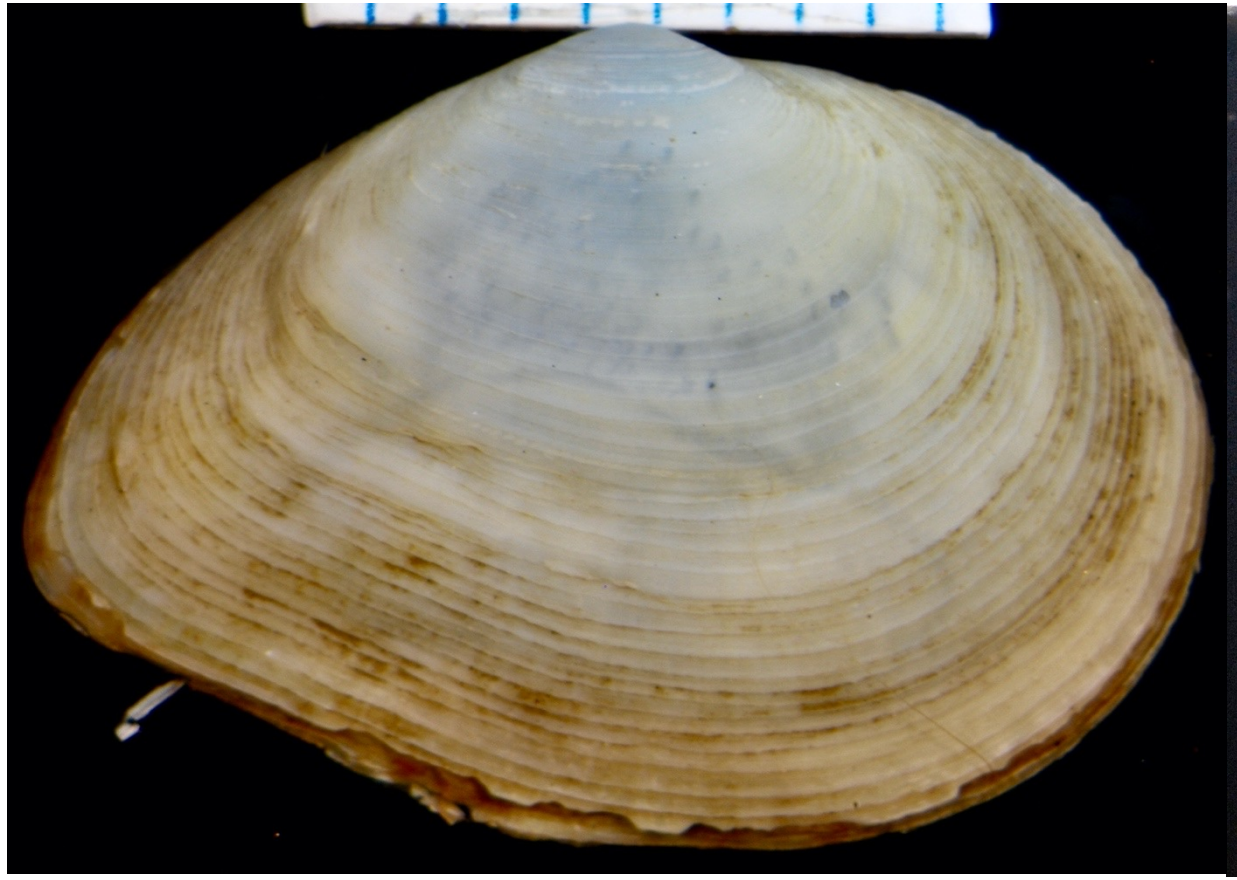
Huntington Harbor 5m 2012

Cumingia californica Conrad 1837



B’13 8145 Mission Bay 7.7m

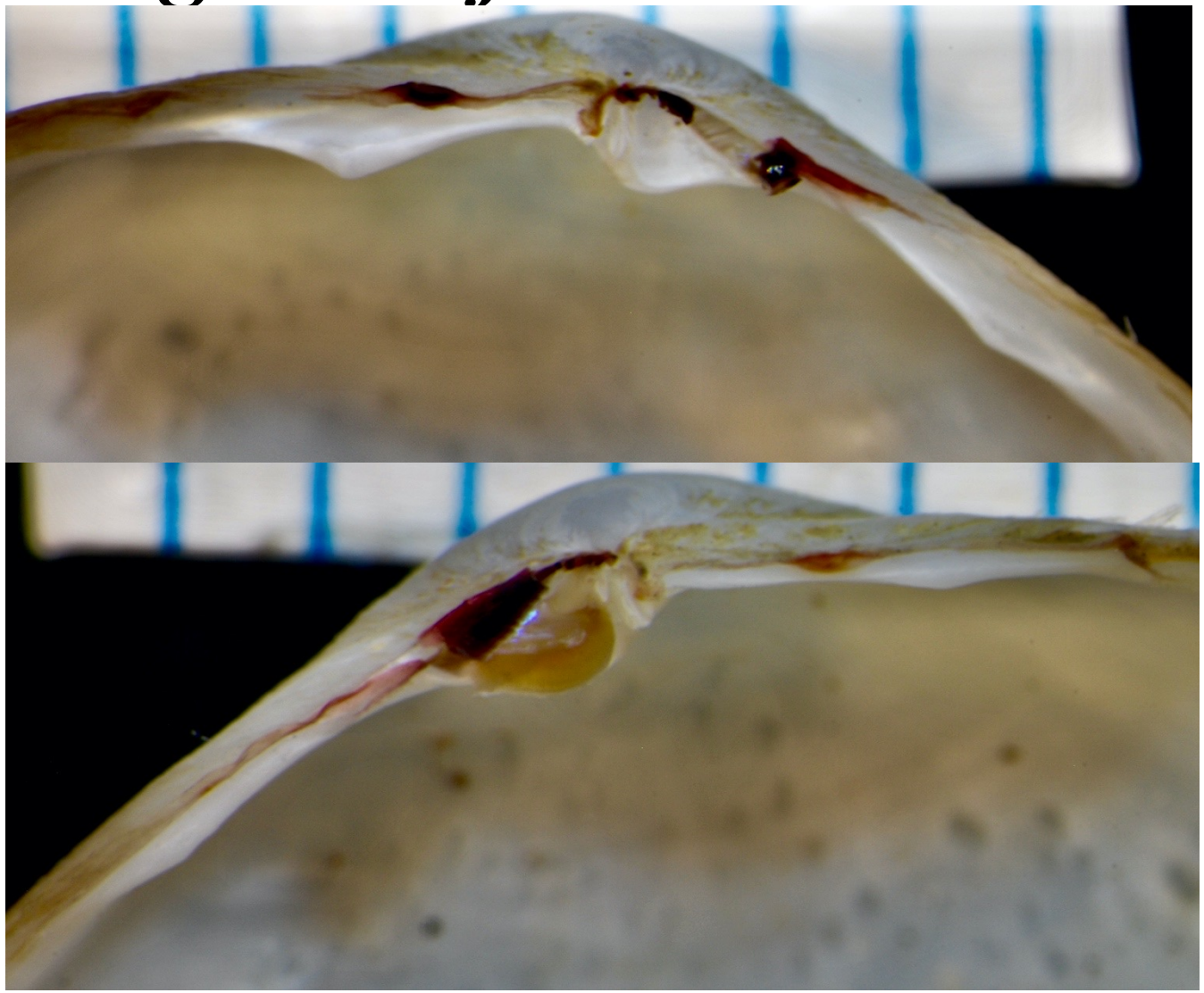
Cumingia californica Conrad 1837



ISS Los Angeles/Long Beach Harbor 3245QX13 8/21/06

B’18 10164 Newport Bay 1m

Cumingia californica Conrad 1837



ISS Los Angeles/Long Beach Harbor 3245QX13 8/21/06

left hinge above right hinge below

Cumingia californica/Psammotreta obesa

B’18 10164 Bolsa Chica 5m

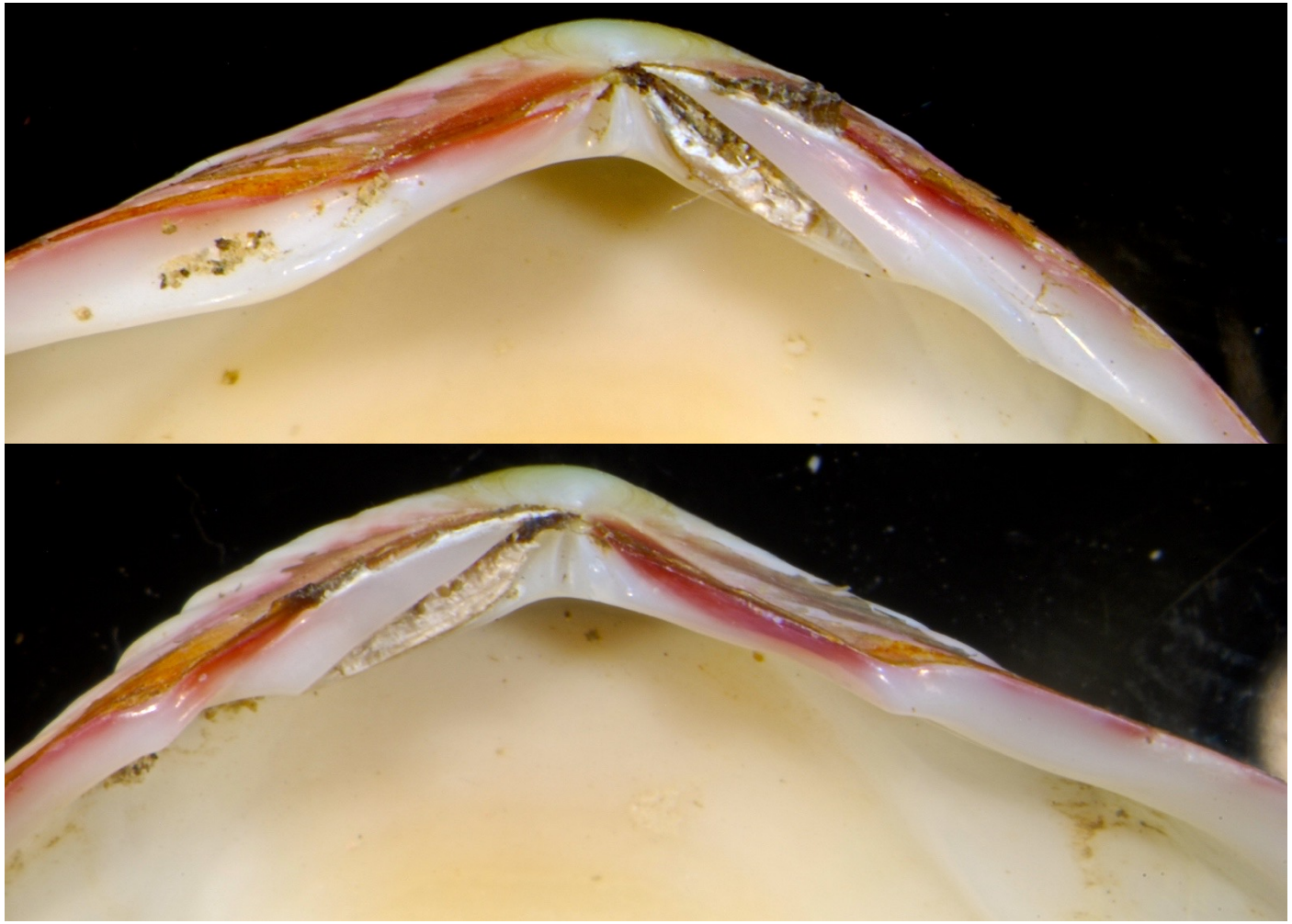
Los Angeles Harbor GWMALE-SS-22 10m 2018

Semele decisa (Conrad 1837)

Point Vicente 10m 1976

Specimen courtesy of Carol Paquette MBC

Semele decisa (Conrad 1837)

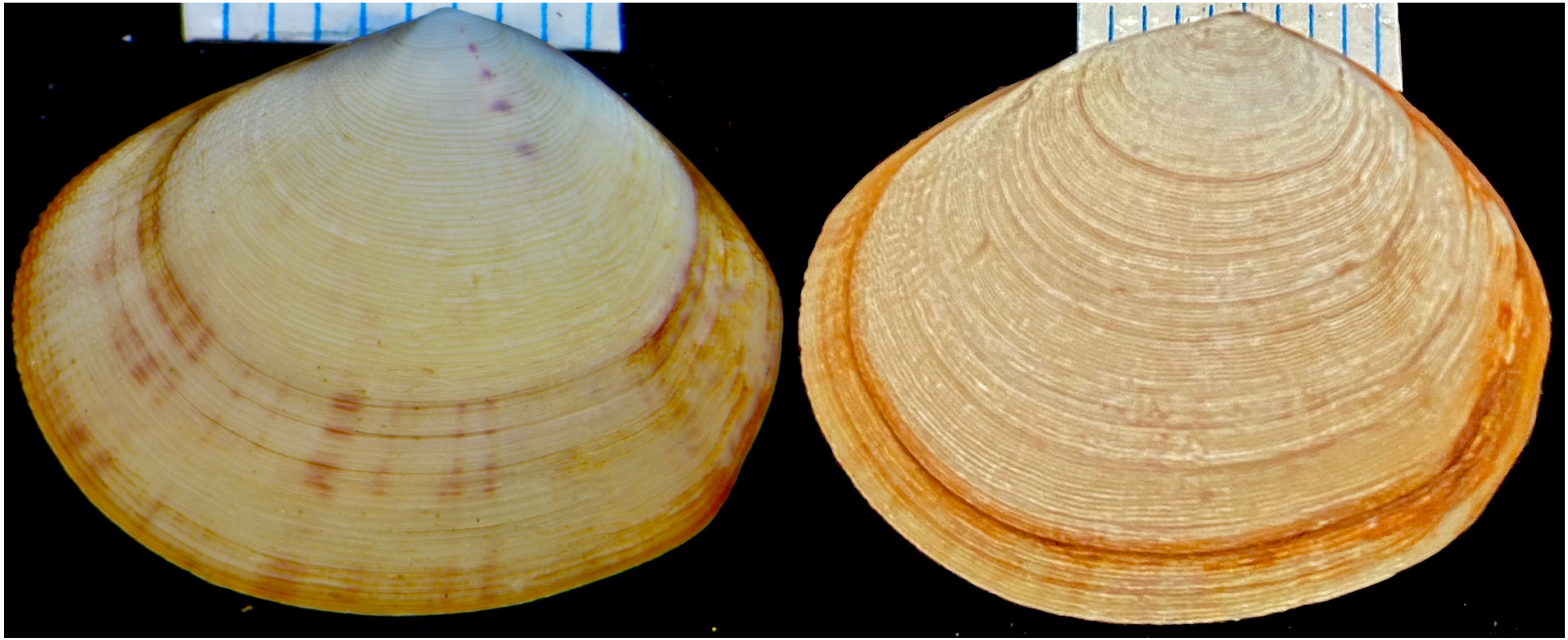


Point Vicente 10m 1976

left hinge above right hinge below

Specimen courtesy of Carol Paquette MBC

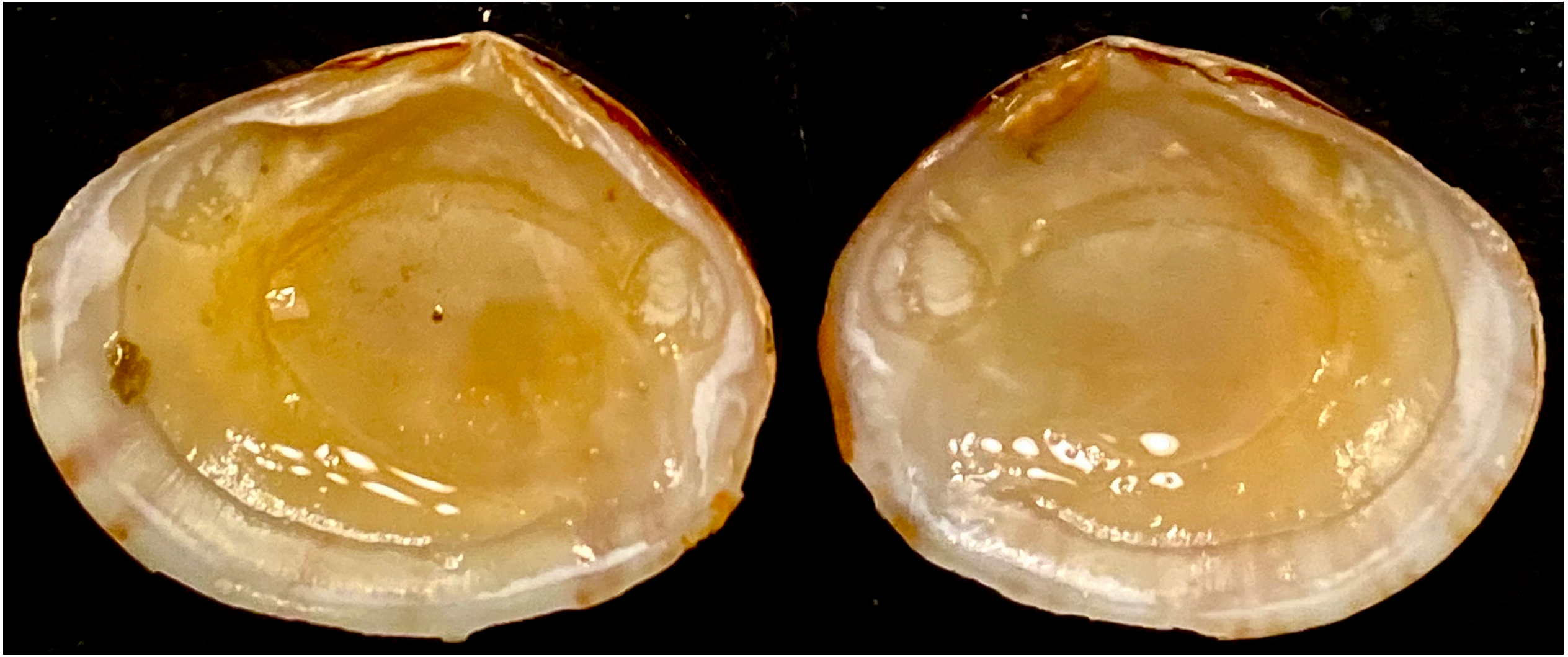
Semele rubropicta Dall 1871



San Diego Bay Merkel CB-DS (R2) 15m 2020

San Diego Bay Merkel CB-MD (R3) 7m 2020

Semele rubropicta Dall 1871

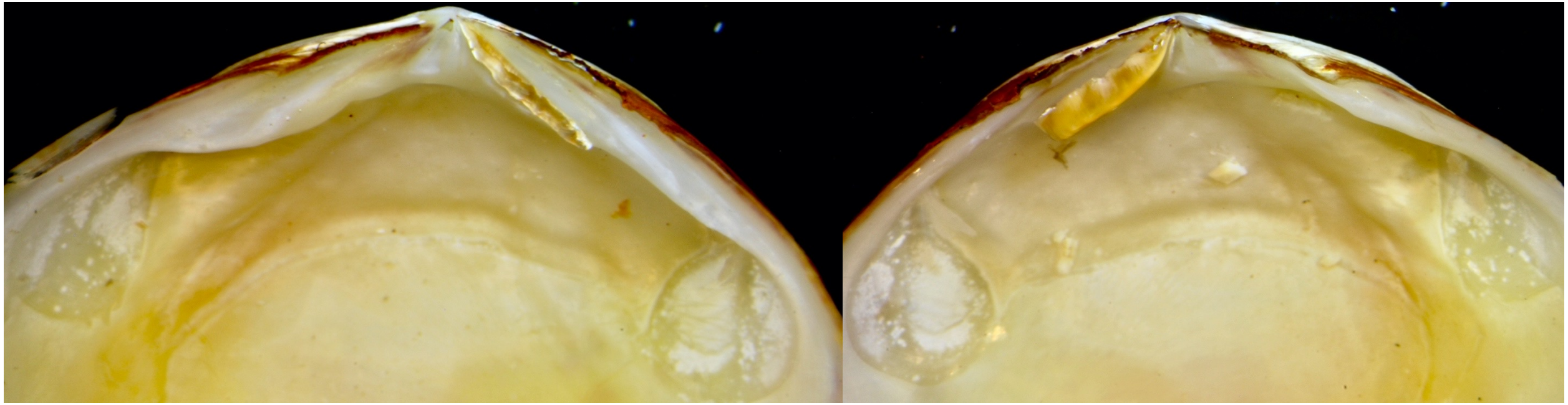


San Diego Bay 7m 2020

left valve

right valve

Semele rubropicta Dall 1871

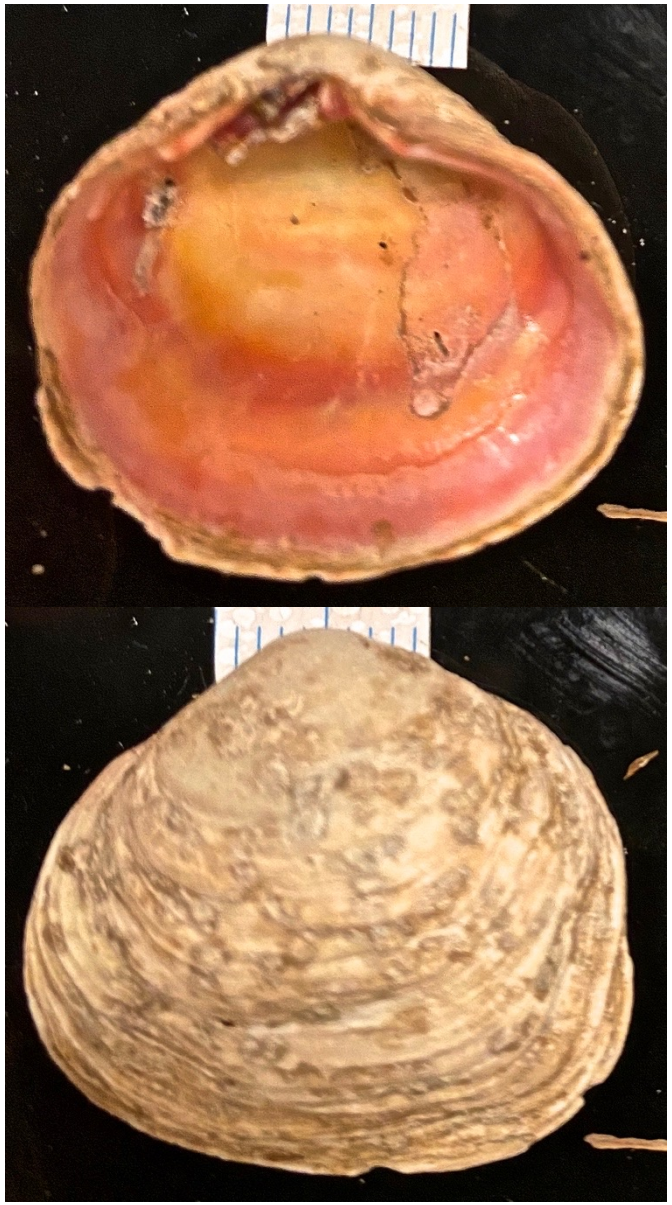


San Diego Bay 7m 2020

left hinge

right hinge

Semele rupicola Dall 1915



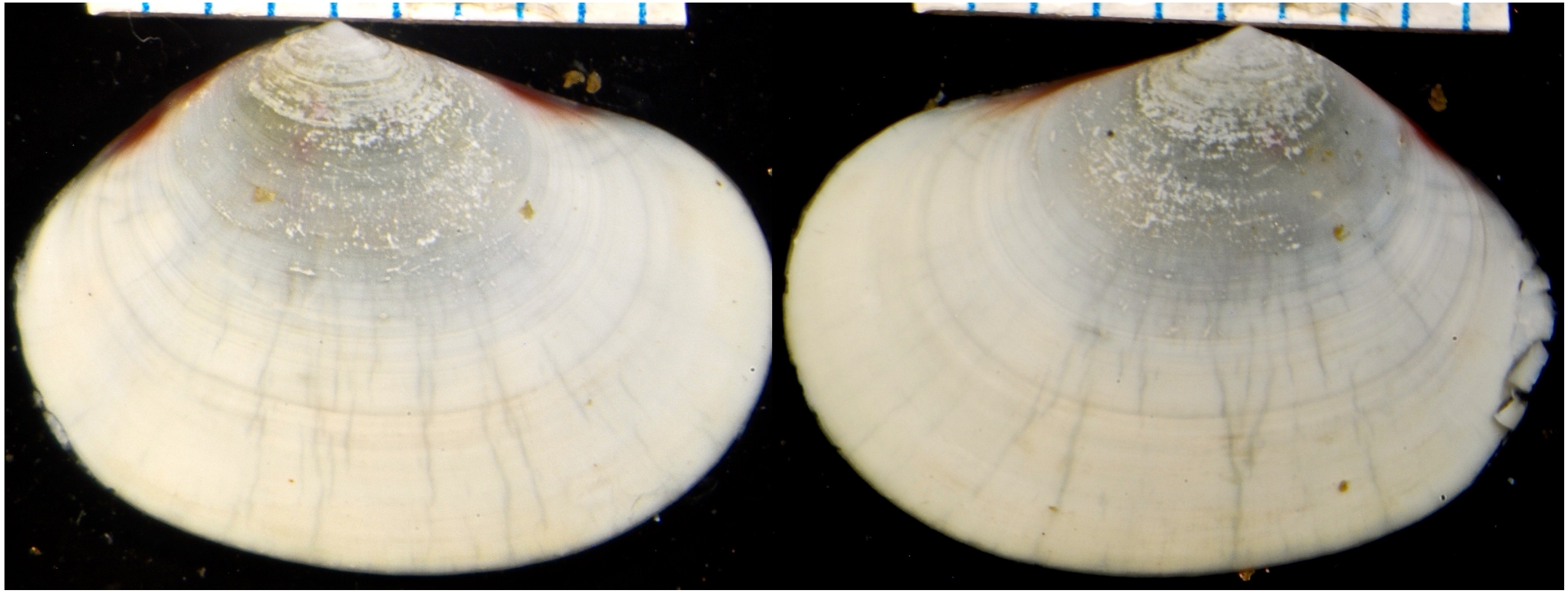
SONGS Heat Treatment
Unit 2 1992

left valve (left)

right valve (right)

Specimen courtesy of Carol Paquette MBC

Semele venusta (Reeve 1853)



Santa Monica Bay A3 18m 1990

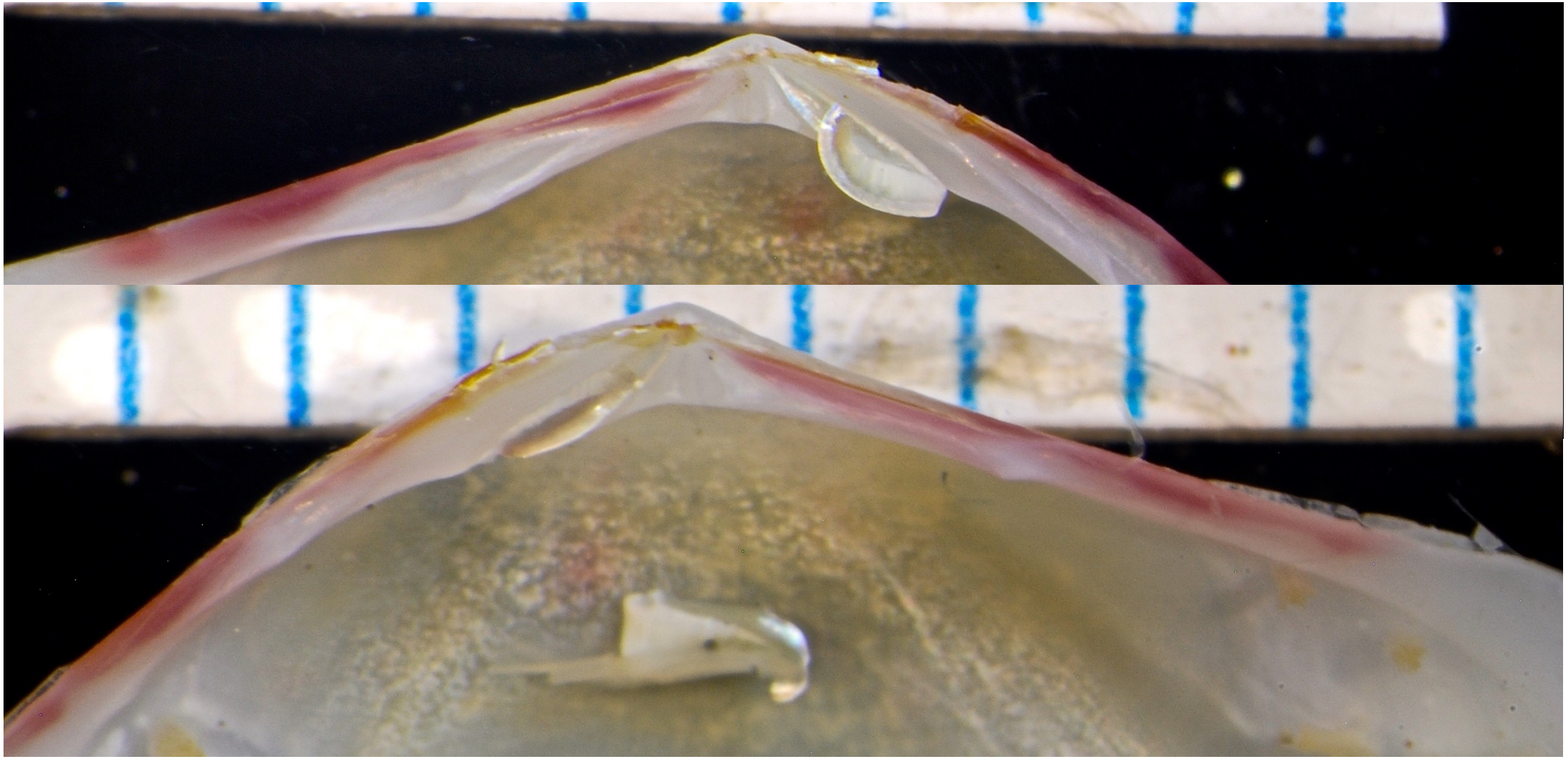
Semele venusta (Reeve 1853)

Avalon 006 30m 2020

Semele venusta (Reeve 1853)

Avalon 003 30m 2011

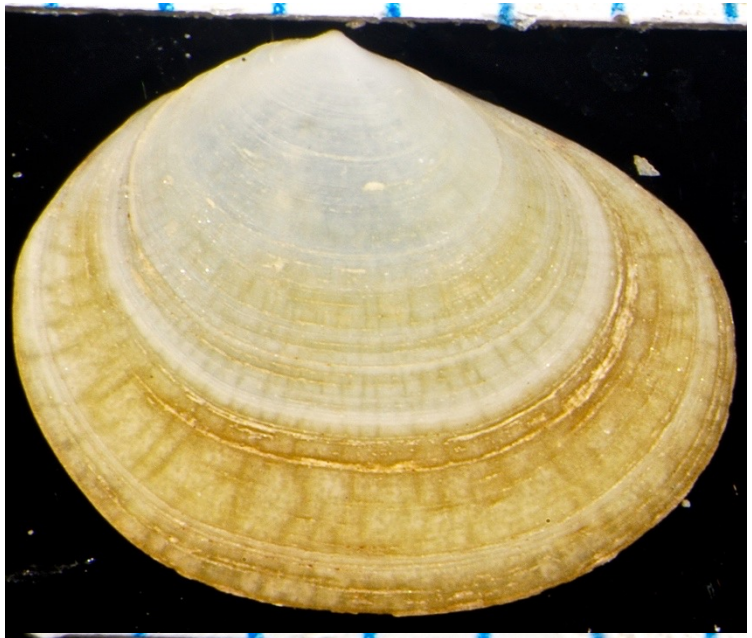
Semele venusta (Reeve 1853)



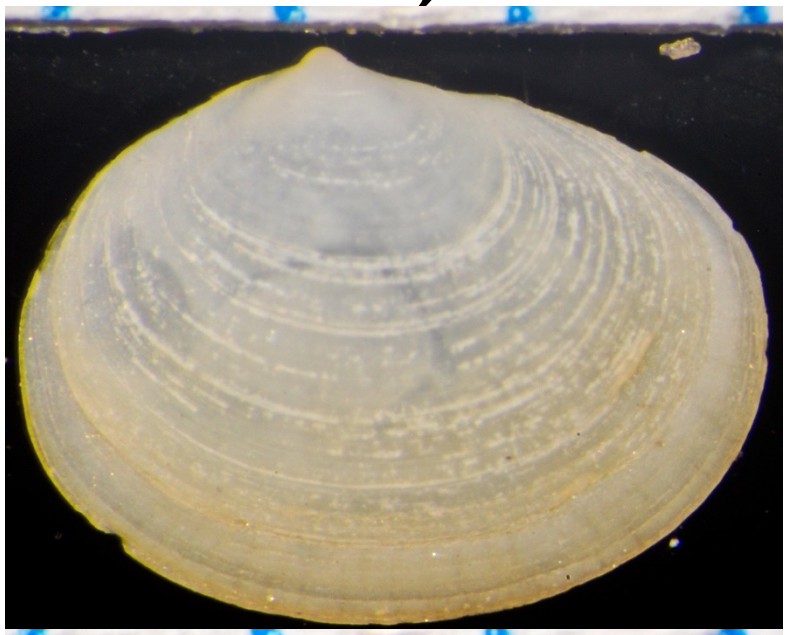
Santa Monica Bay A3 18m 1990

left hinge (above) right hinge (below)

Semele venusta (Reeve 1853)

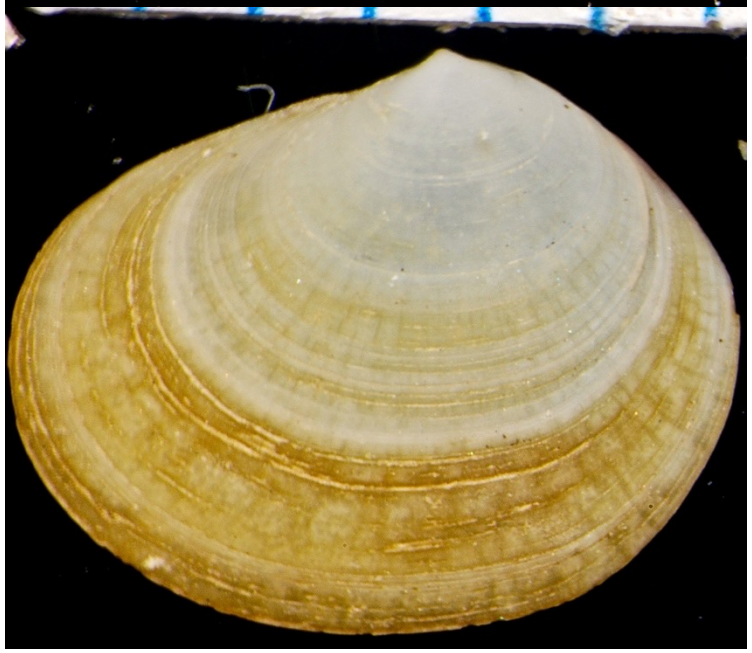


right valve left



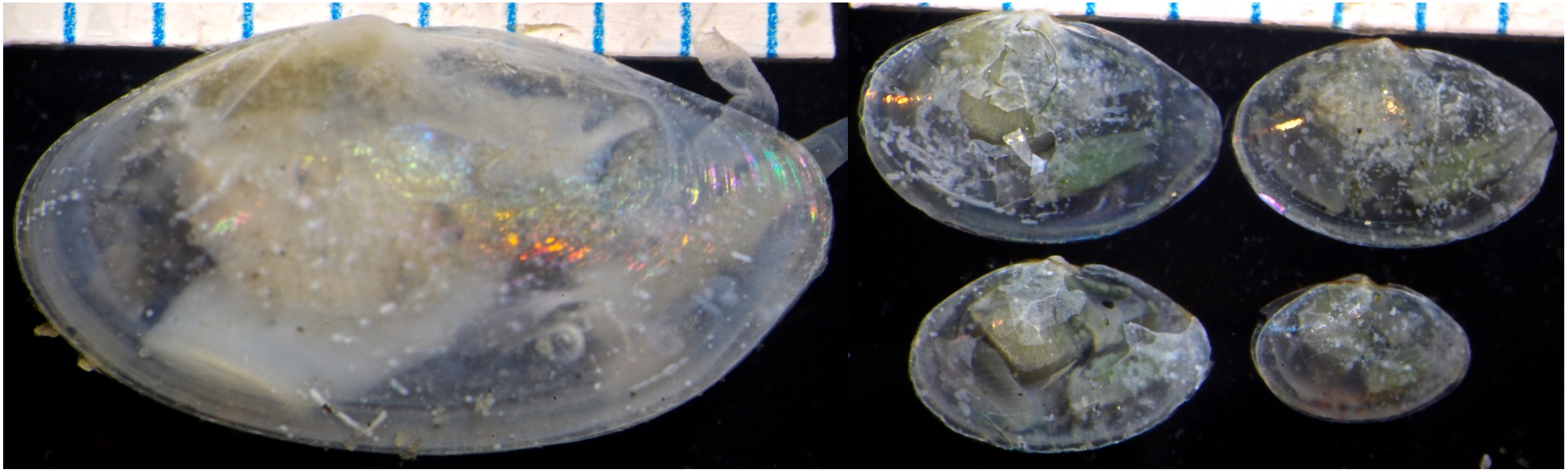
King Harbor 1983

Specimens courtesy of Carol Paquette MBC



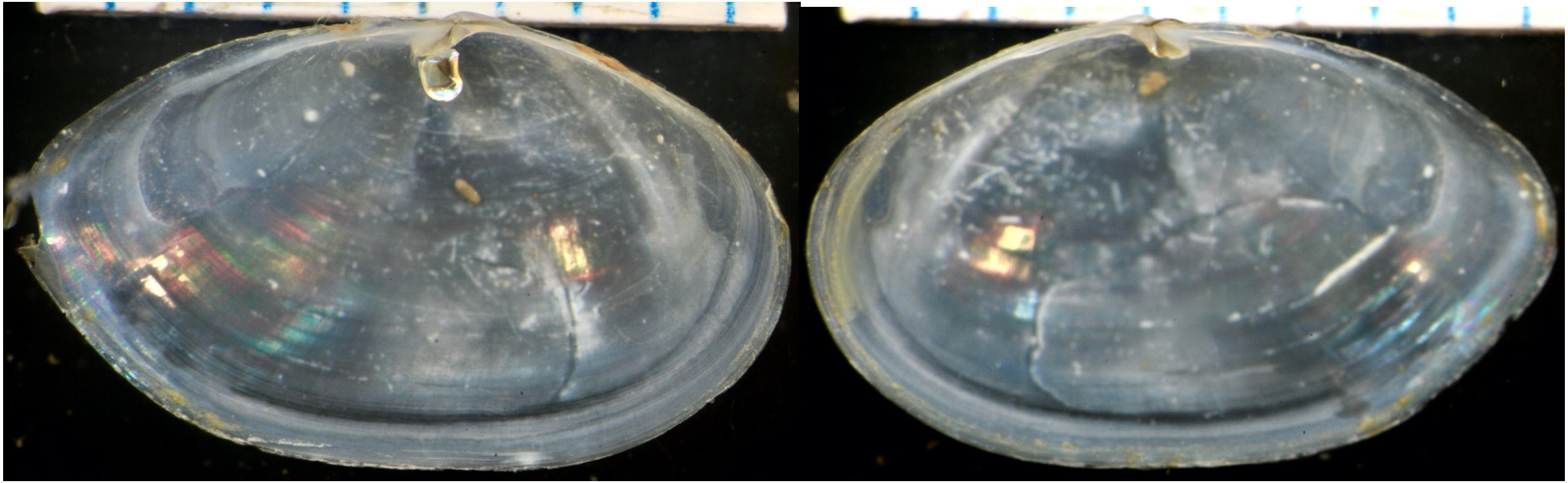
Right valve right

Theora lubrica Gould 1861



Long Beach Harbor Anchor Ports 5m 2018

Theora lubrica Gould 1861



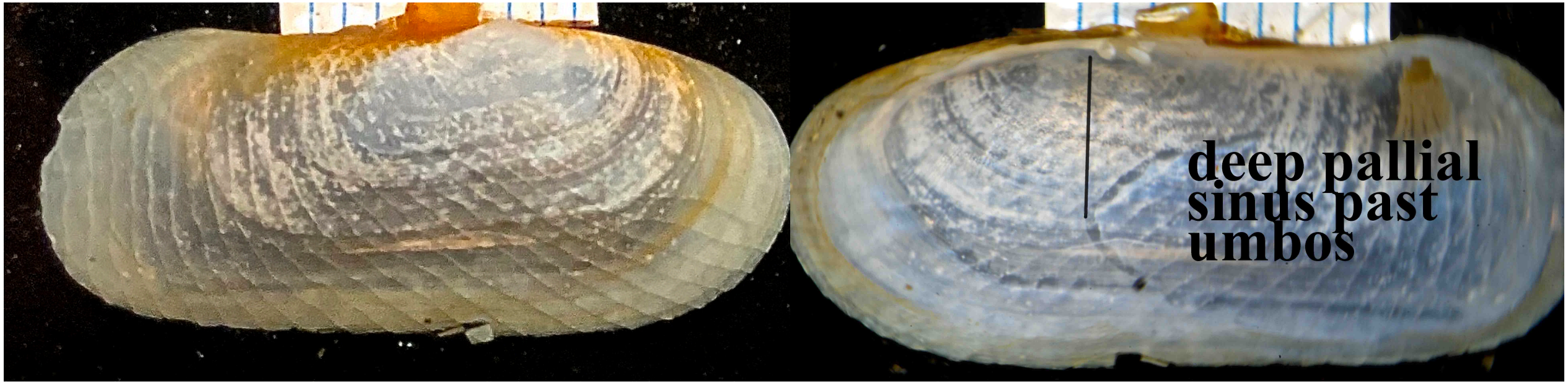
San Diego Bay Merkel NB-EB (rep3) 5m 2020

left valve right valve

Family Solecurtidae

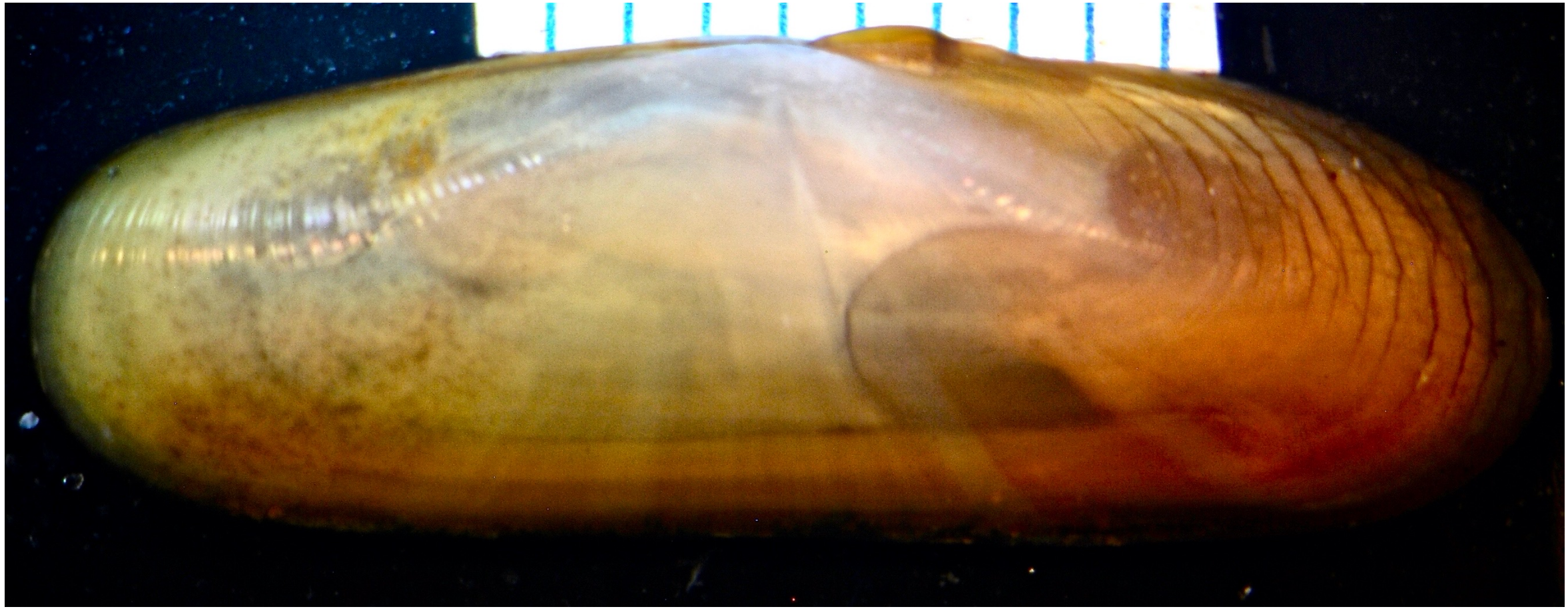
1. Valves elongate, mostly equilateral; shell relatively thin
2. Ligament external
3. One to two cardinal teeth in each valve
4. Pallial sinus deep, confluent with pallial line

Solecurtis guaymasensis (Lowe 1935)



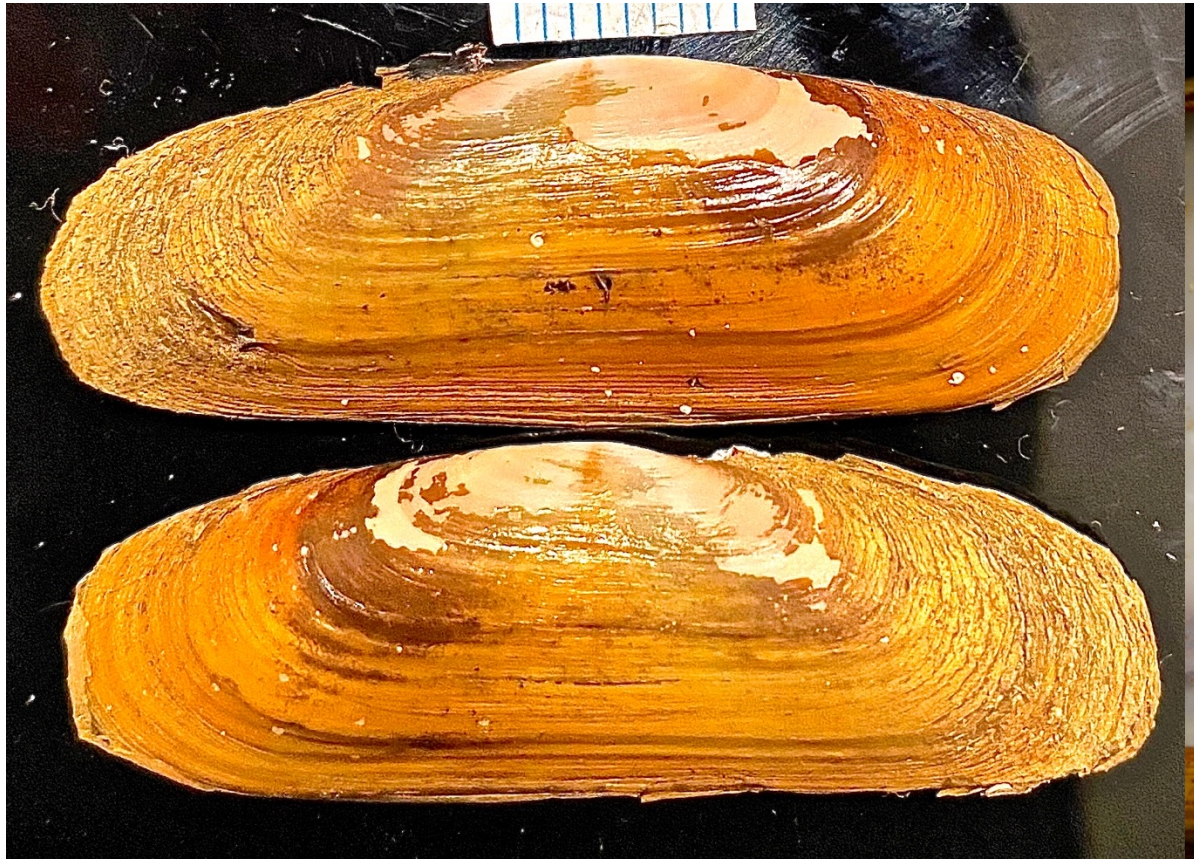
Santa Monica Bay D4 85m 1996

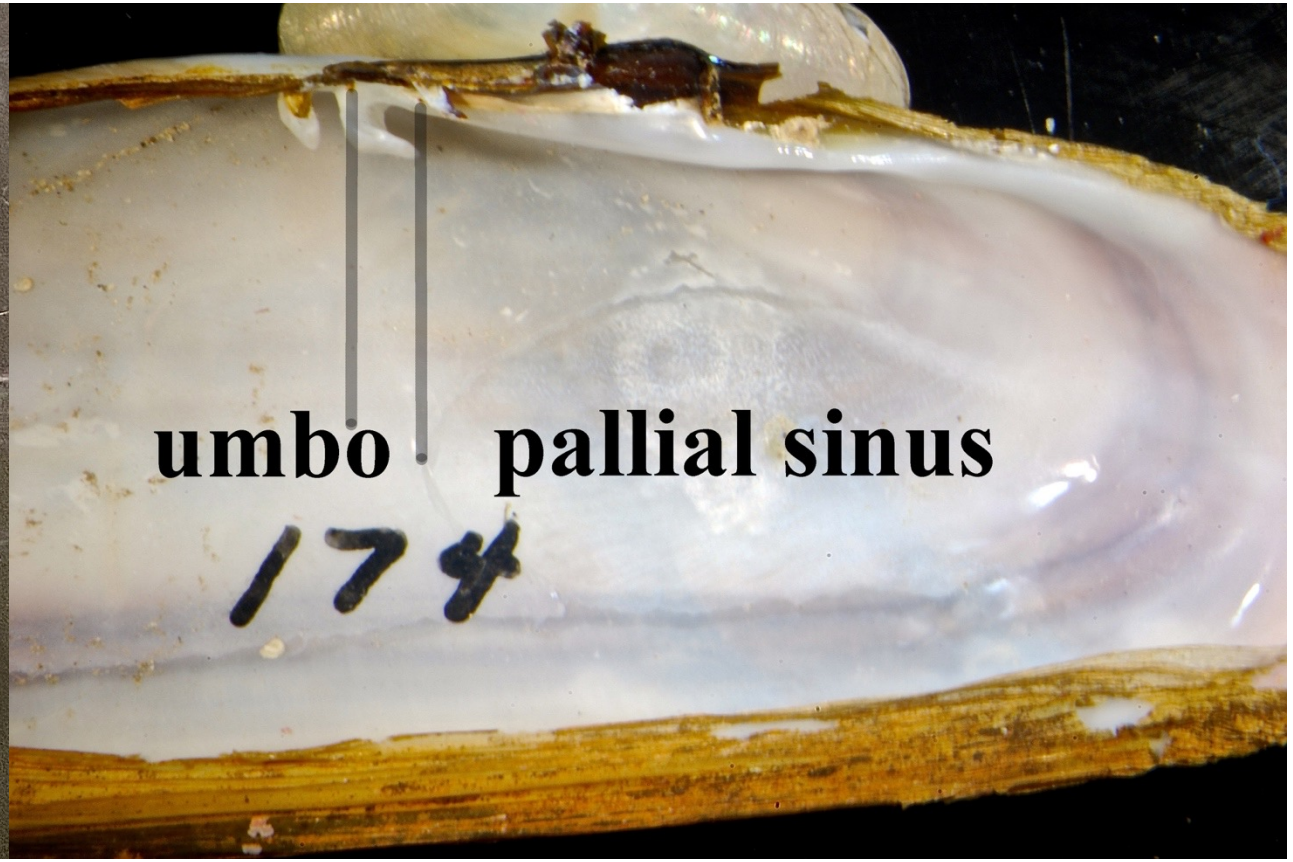
Tagelus affinis (C.B. Adams 1852)



B’18 10155 Bolsa Chica 0m

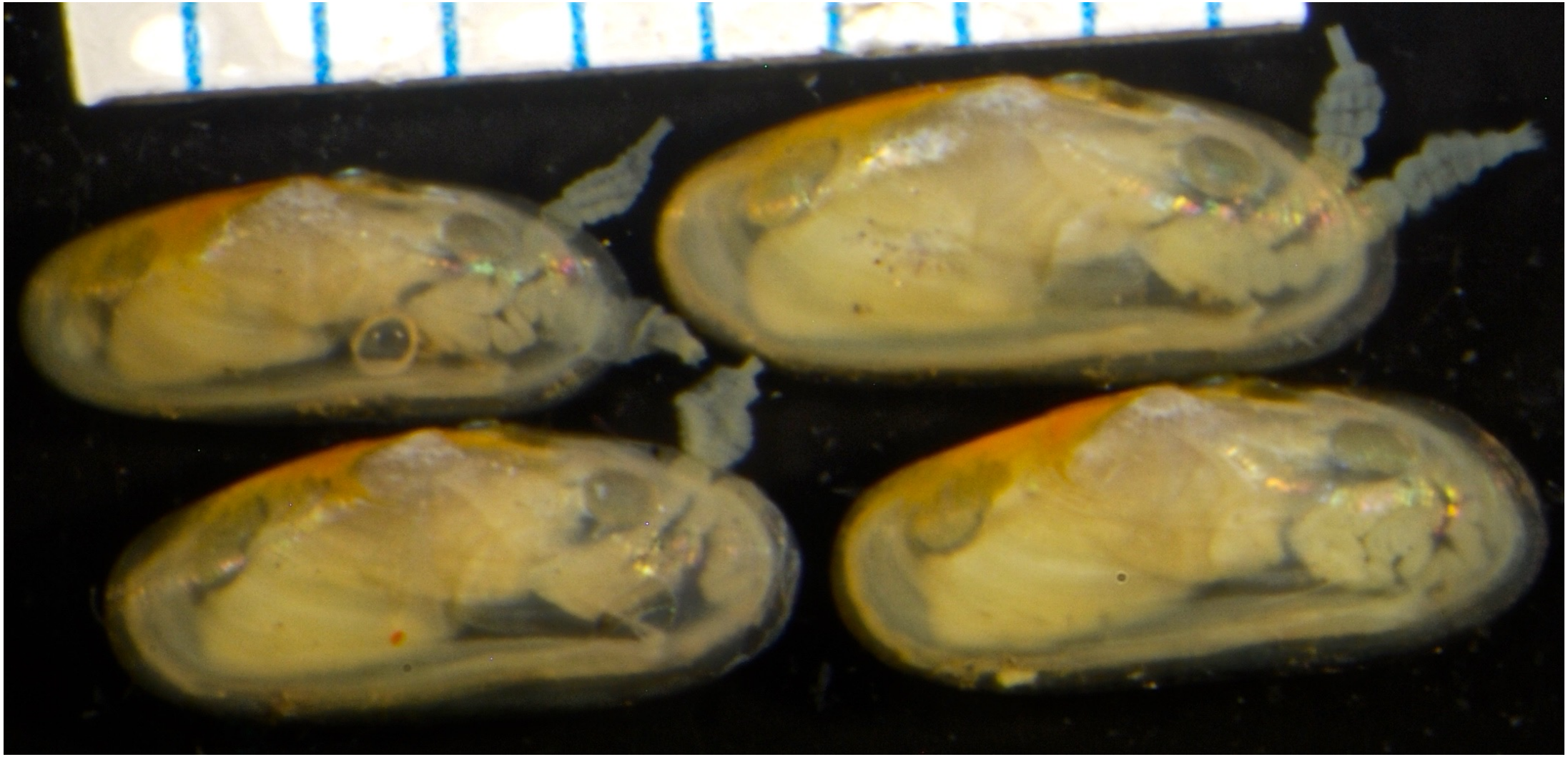
Tagelus affinis (C.B. Adams 1852)





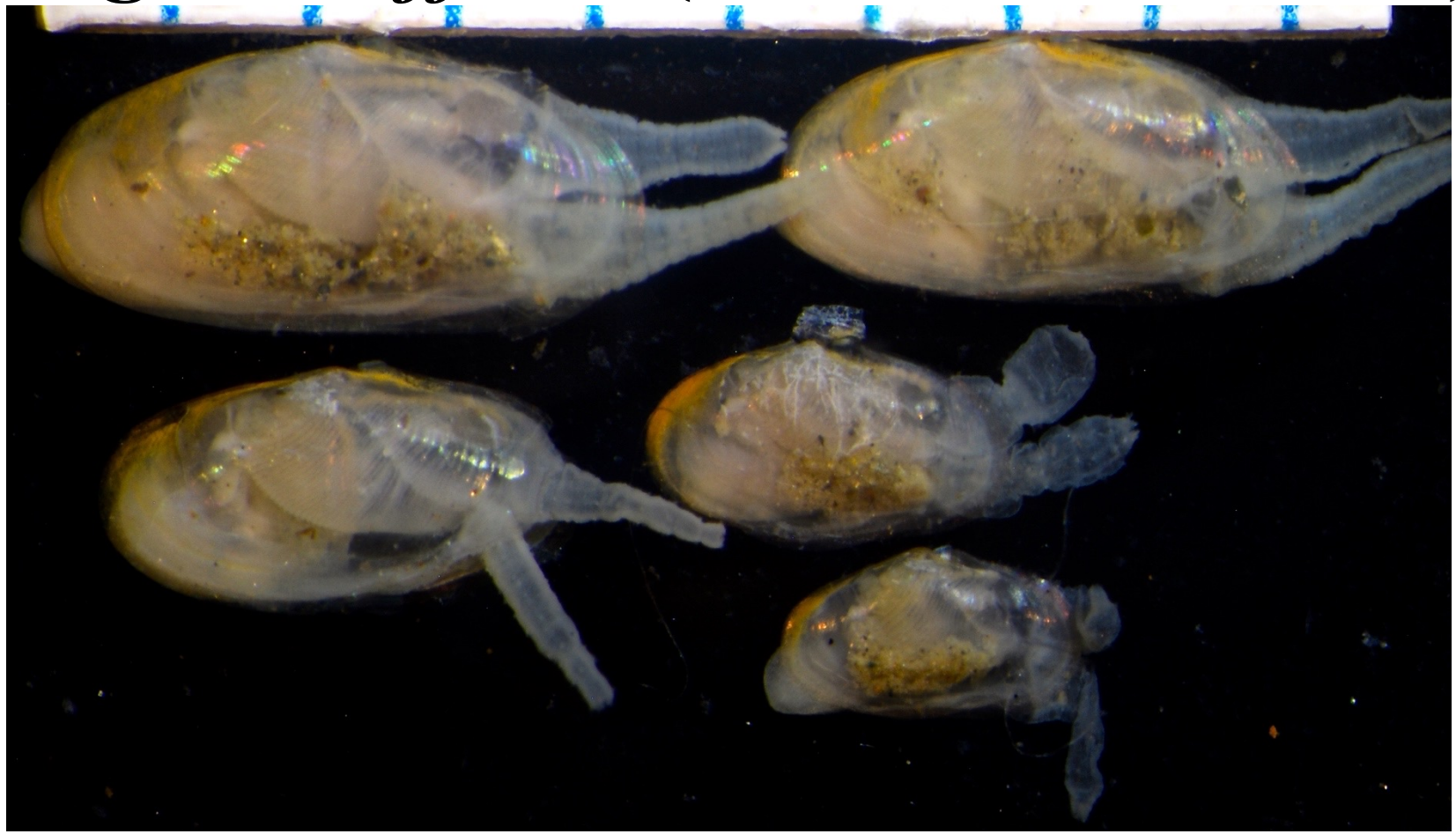
San Gabriel River 007 10m 2015

Tagelus affinis (C.B. Adams 1852)



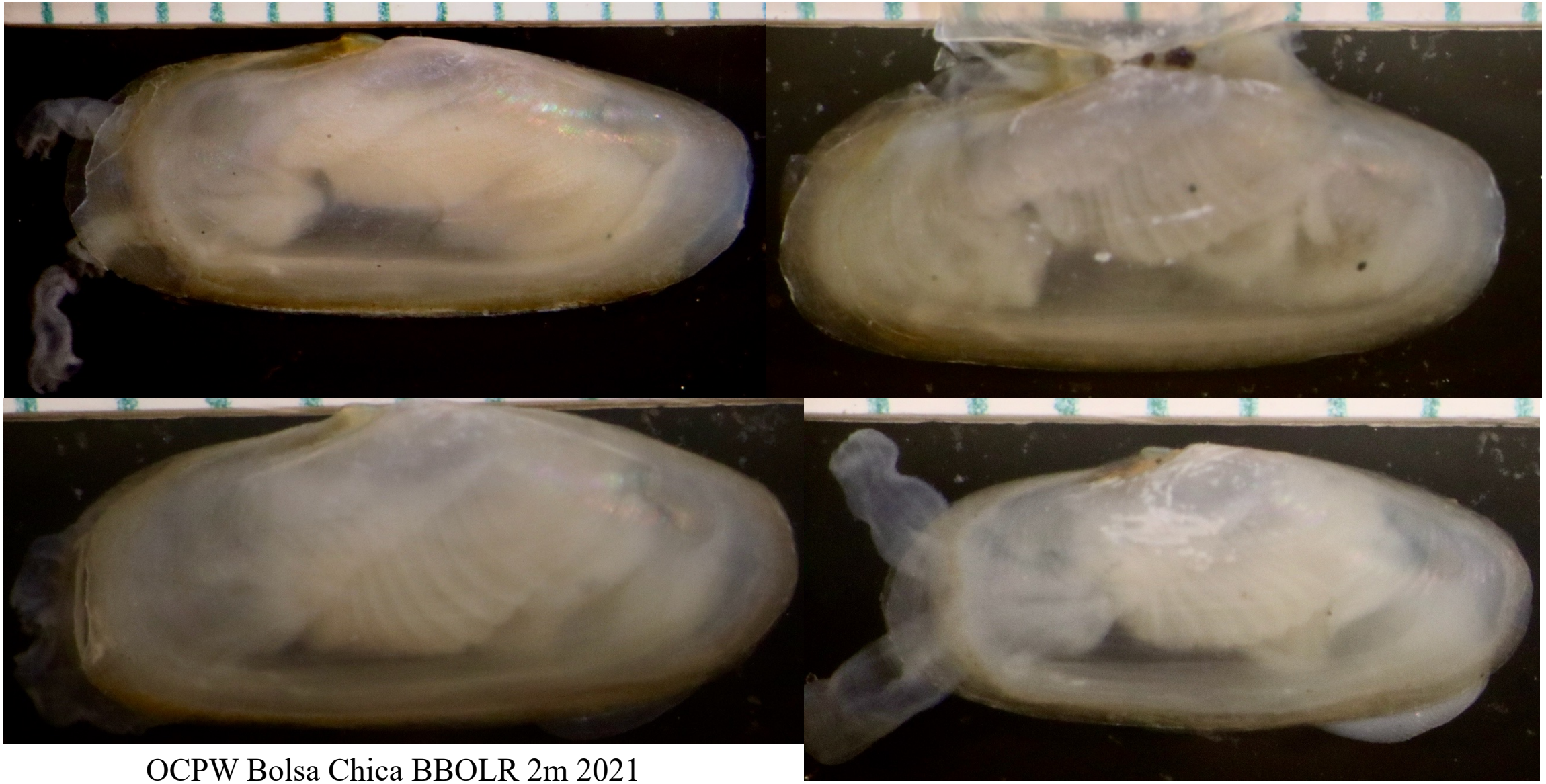
Redondo Beach Generating Station NPDES B-2 10m 2012

Tagelus affinis (C.B. Adams 1852)



B’18 10068 Dana Point Harbor 2m

Tagelus affinis (C.B. Adams 1852)



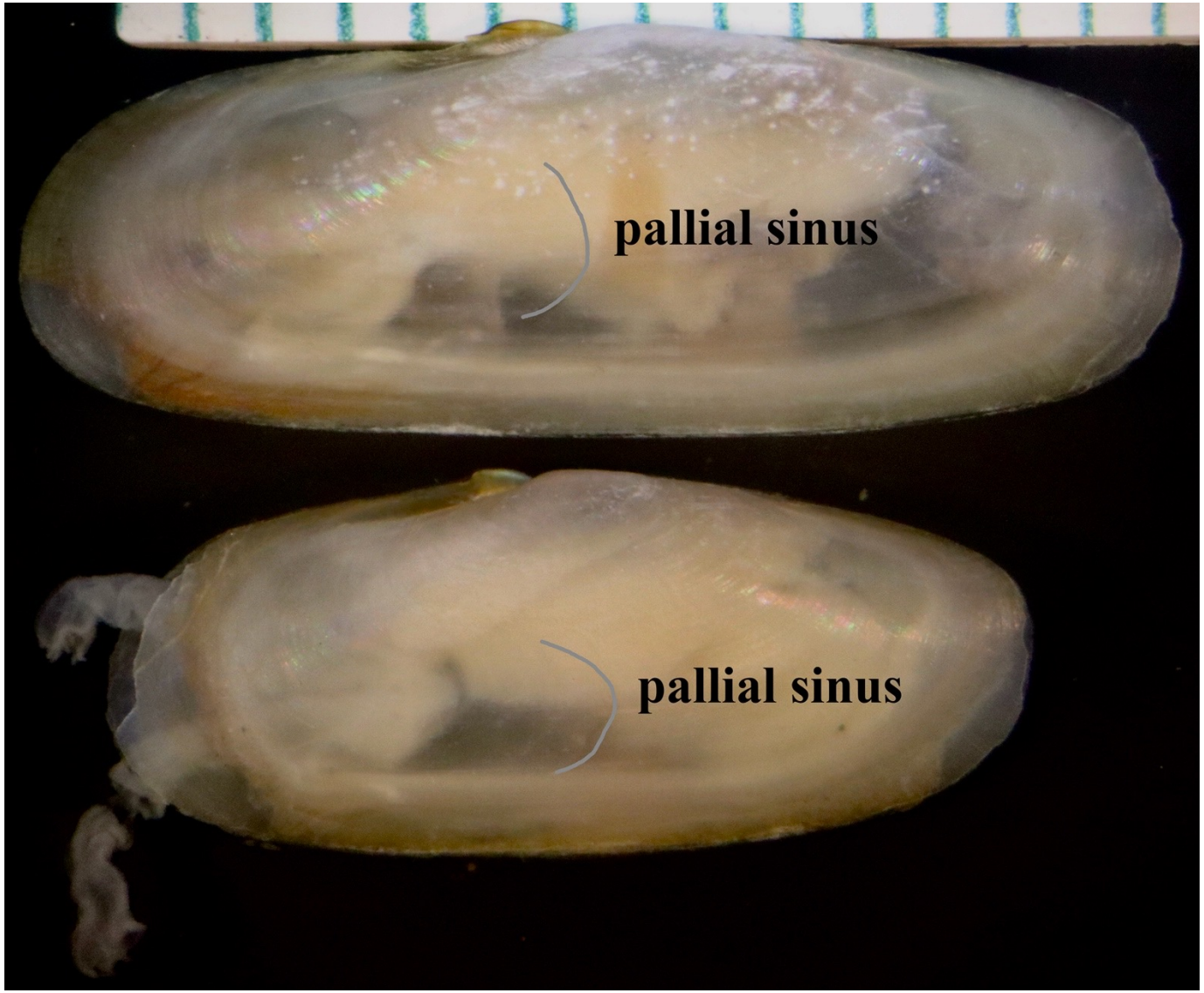
OCPW Bolsa Chica BBOLR 2m 2021

Tagelus affinis (C.B. Adams 1852)

B’18 10155
Bolsa Chica 0m

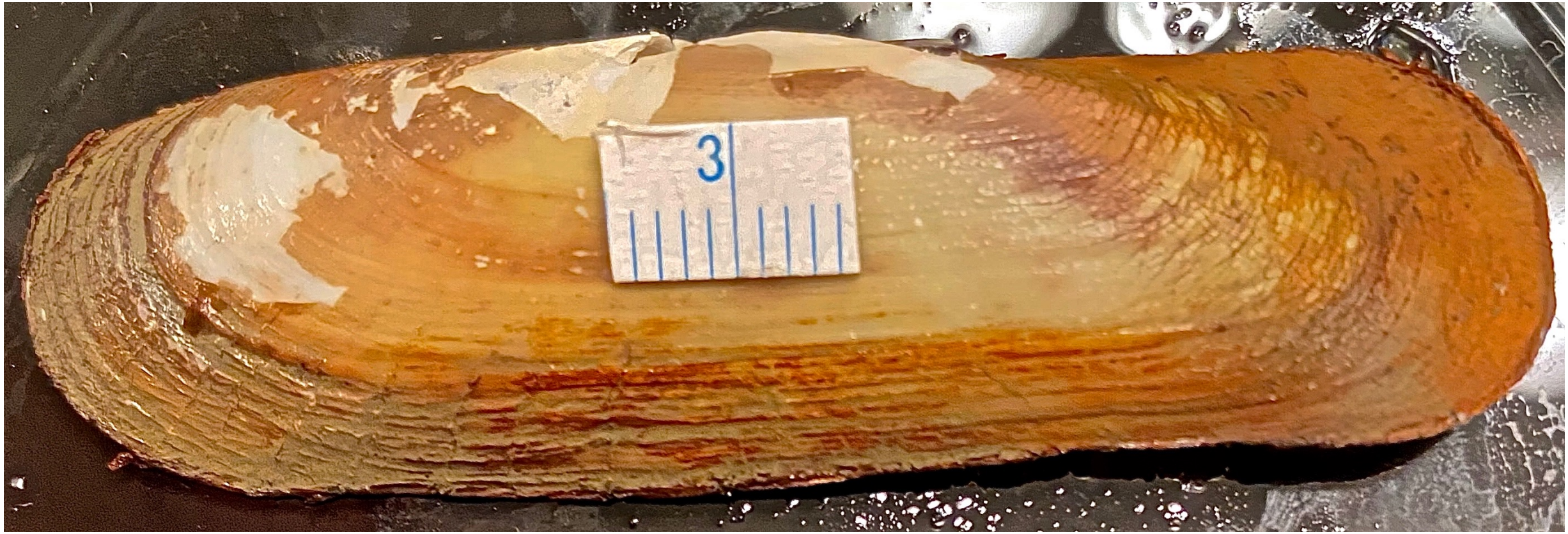
OCPW BBOLR
Bolsa Chica 2m
2021

Tagelus affinis (C.B. Adams 1852)



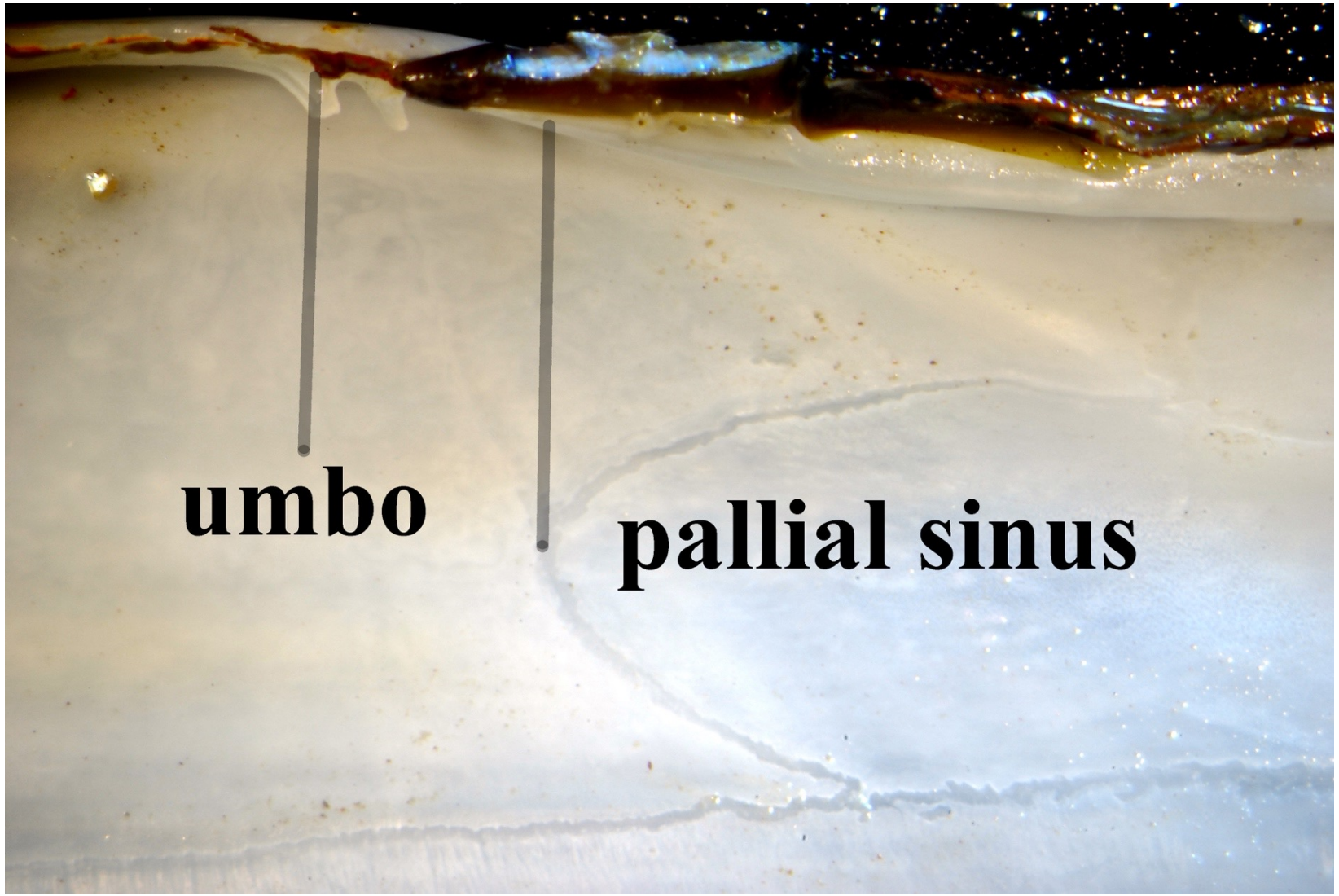
OCPW BBOLR Bolsa Chica 2m 2021

Tagelus californianus (Conrad 1837)



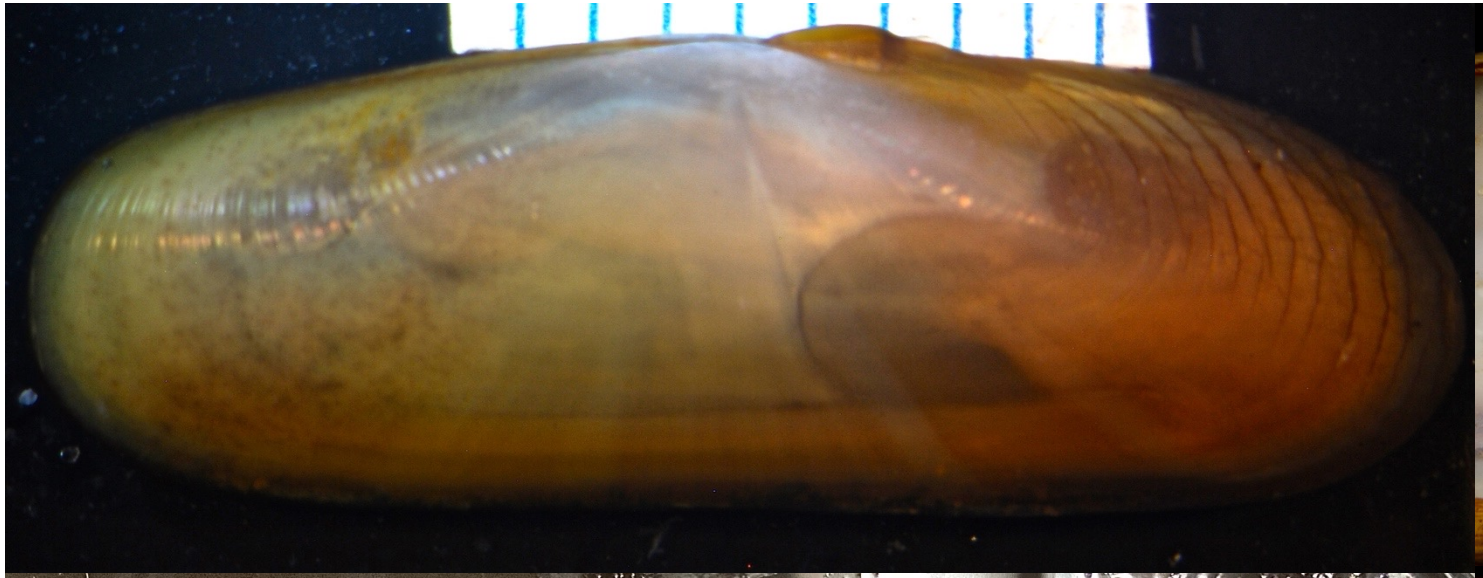
B’18 10206 Campus Point (Goleta) 29m

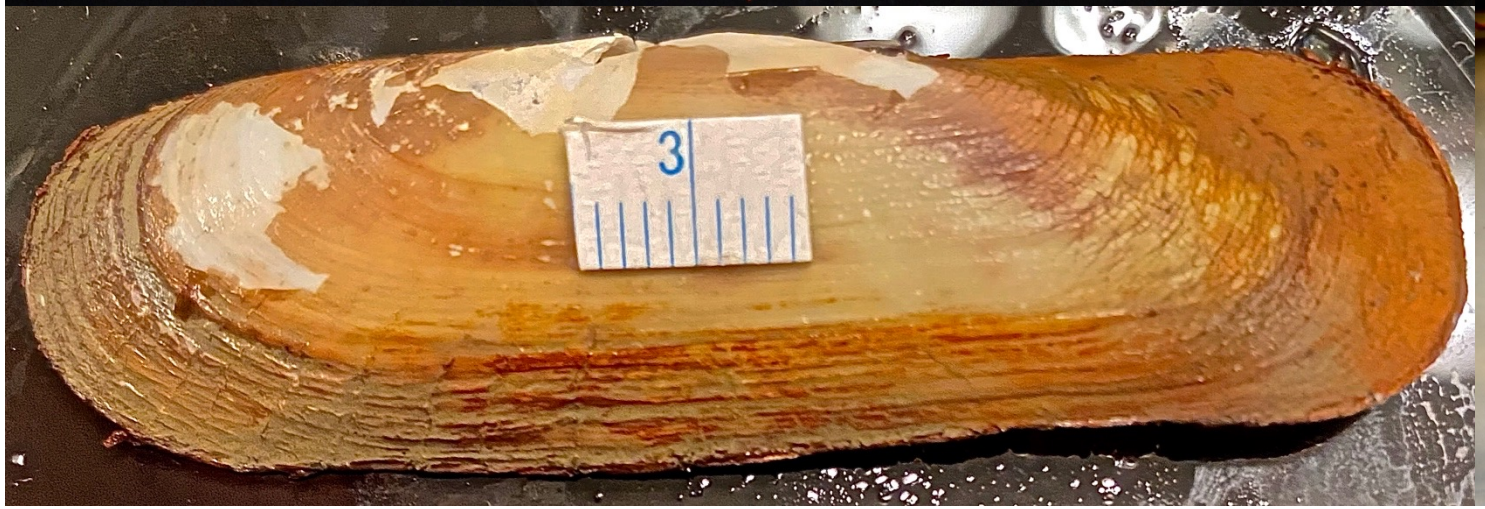
Tagelus californianus (Conrad 1837)

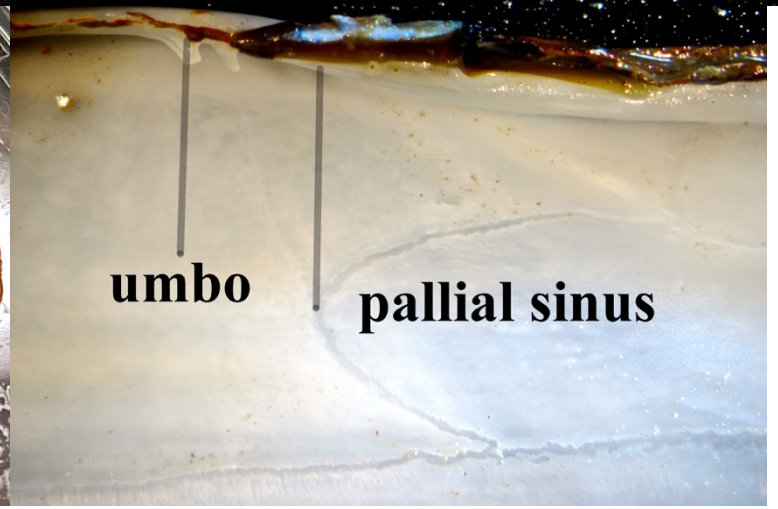


B’18 10206 Campus Point (Goleta) 29m

Tagelus affinis/californianus

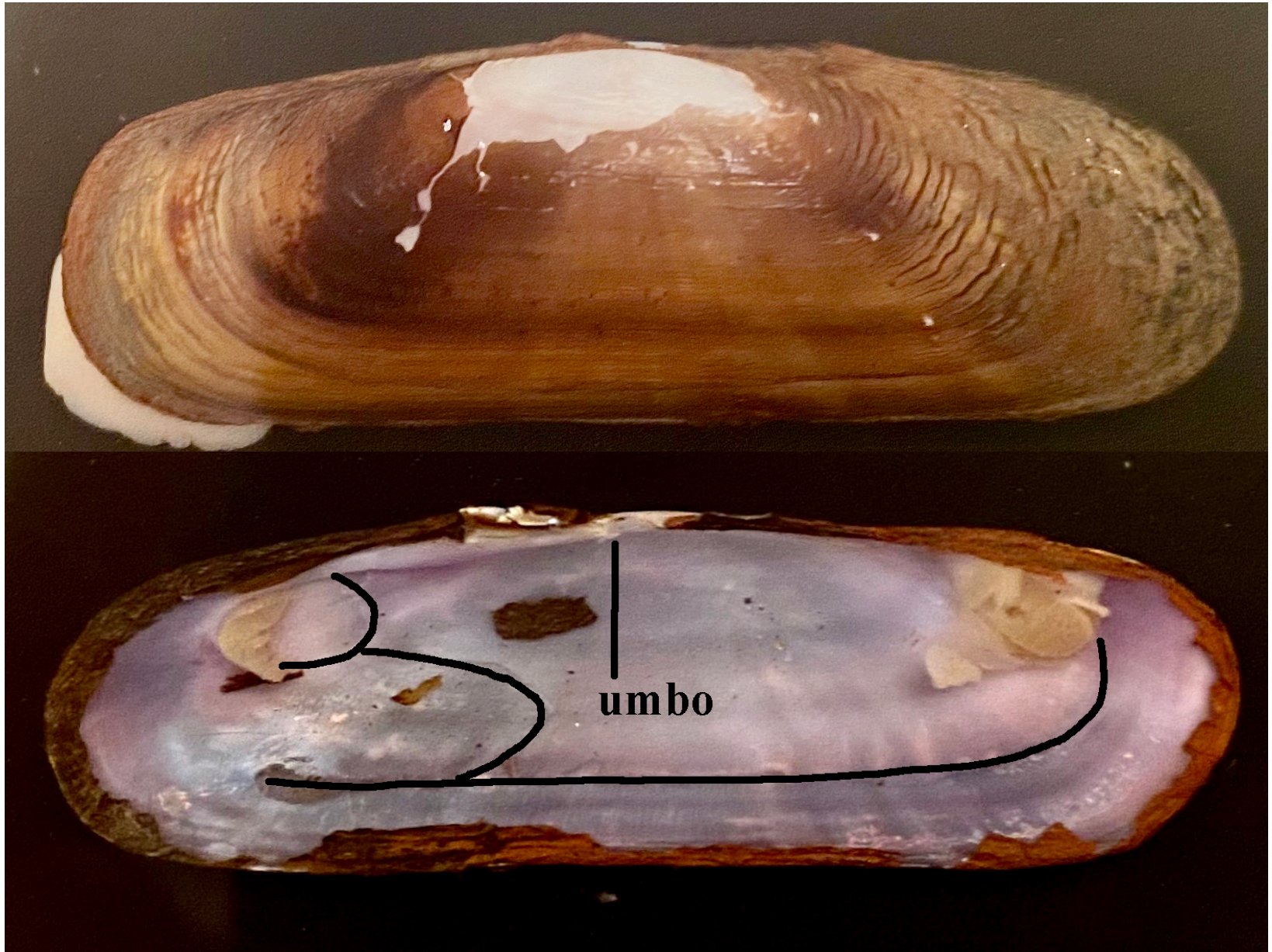






Tagelus affinis (above) Tagelus californianus (below)

Tagelus subteres (Conrad 1837)

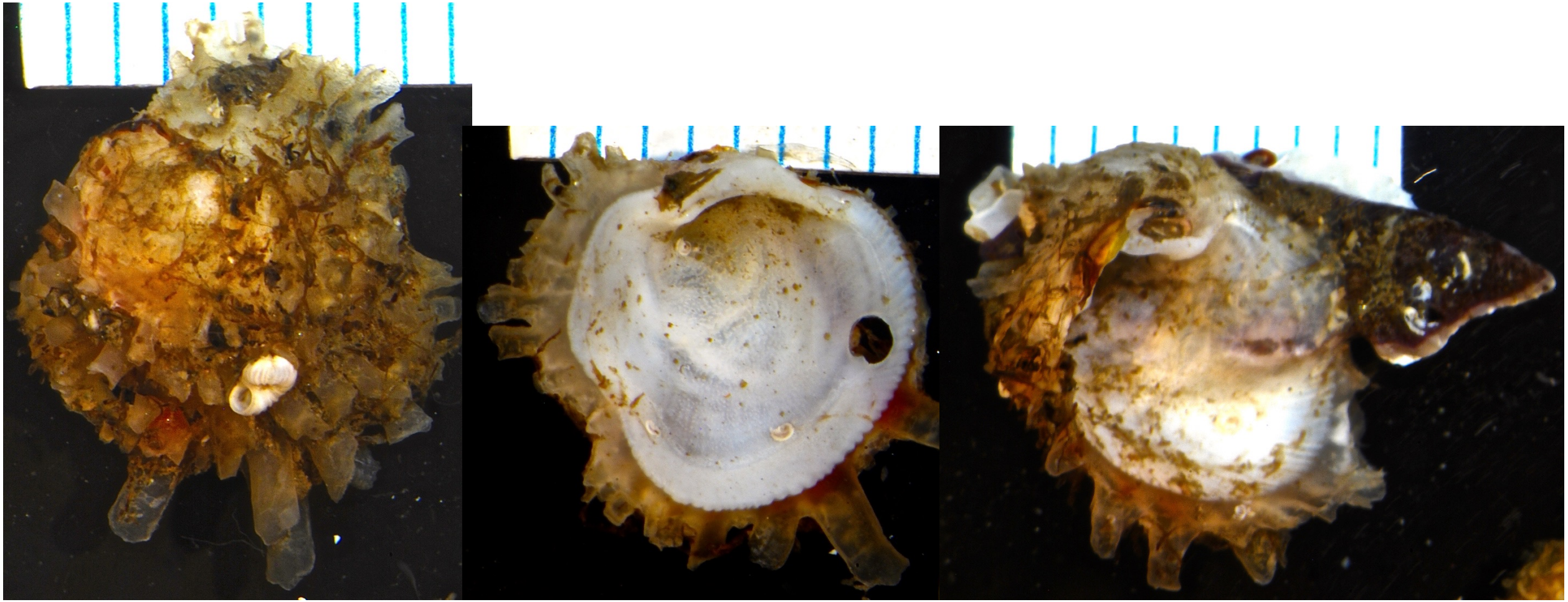


San Diego Bay
Merkel CB-DS (rep3) 15m 2020

Order Venerida
Family Chamidae

1. **Right or left valve cemented to substratum**
2. **Ligament external**
3. **Ventral margin finely crenulate or smooth**

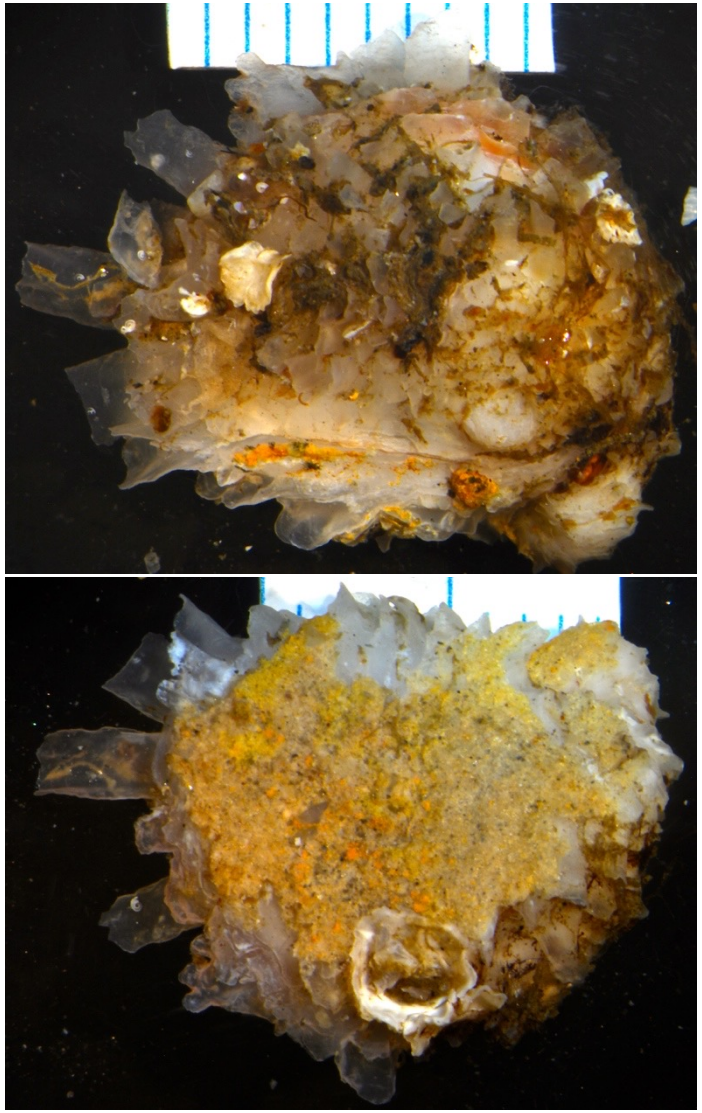
Chama arcana F.R. Bernard 1976

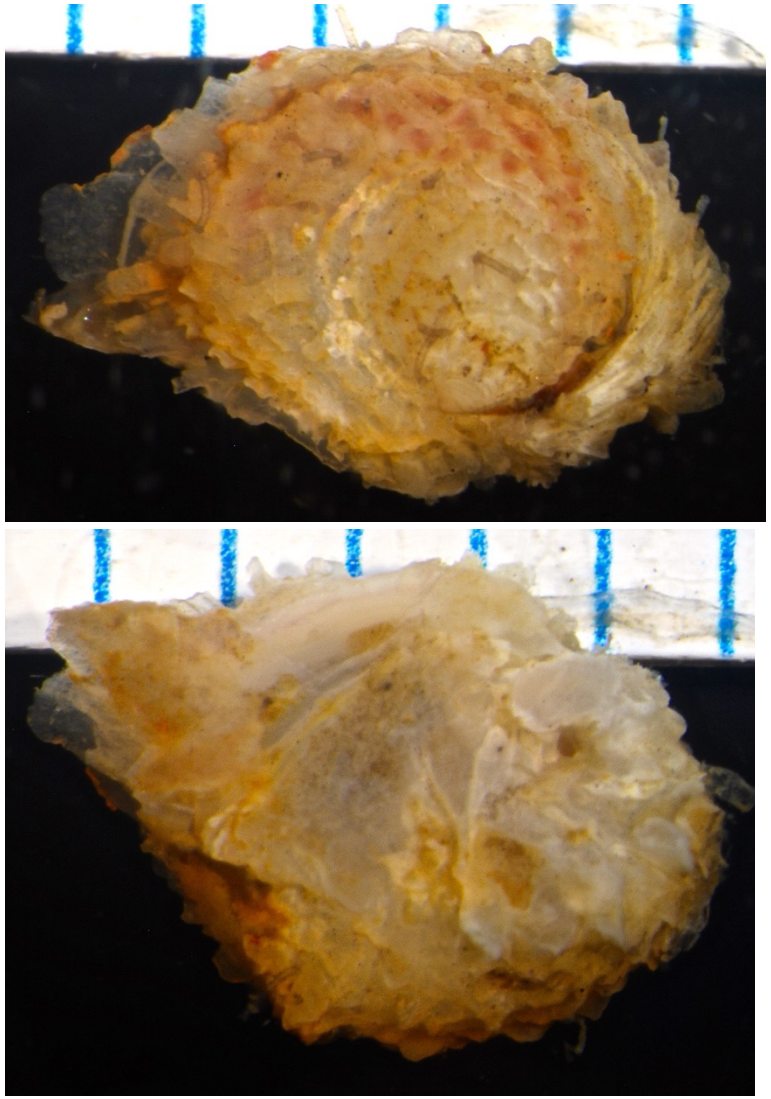


B’98 2151 Dana Point Harbor 5m

dorsal exterior | dorsal interior | ventral interior

Chama arcana F.R. Bernard 1976

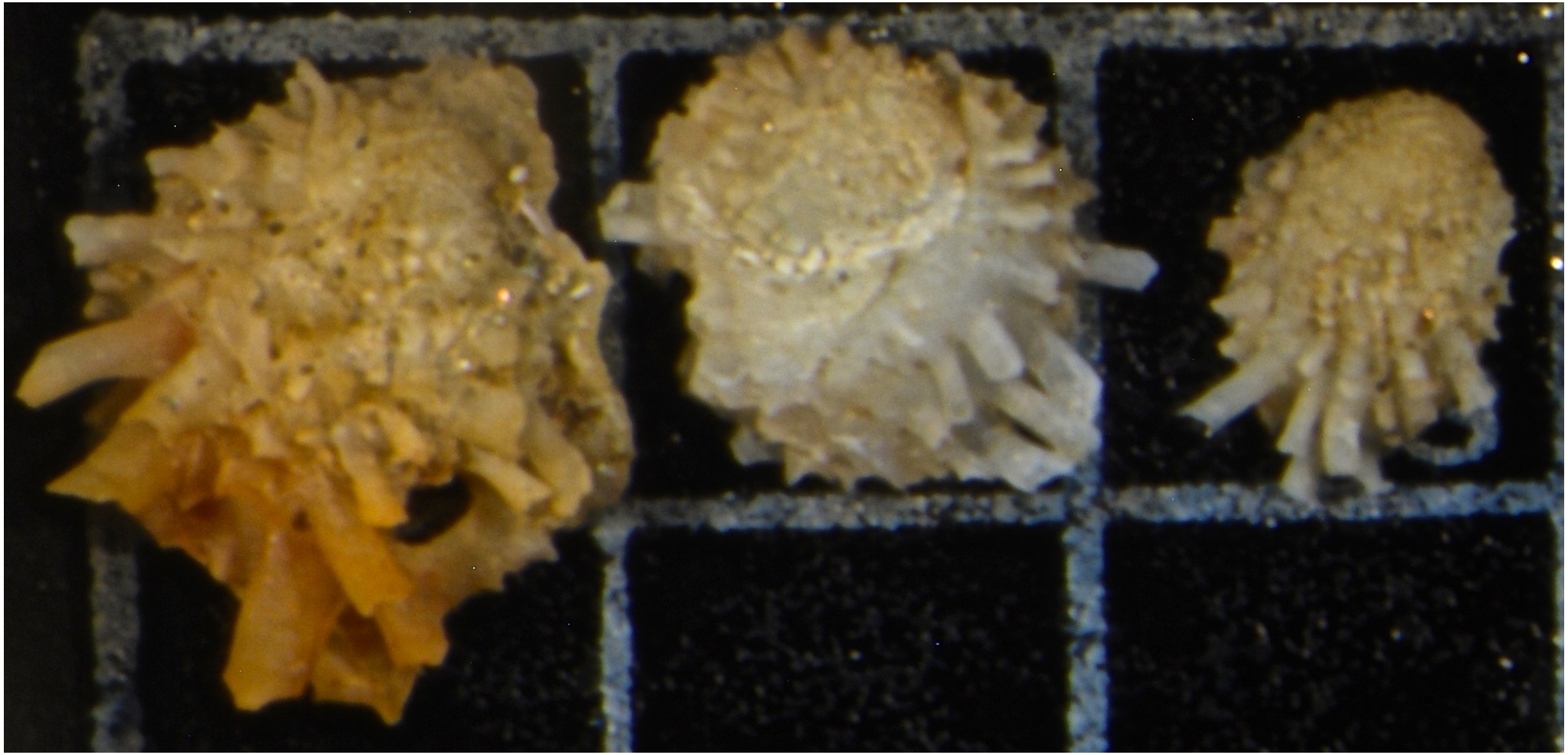




B’98 2151 Dana Point Harbor 5m

dorsal (above) ventral (below)

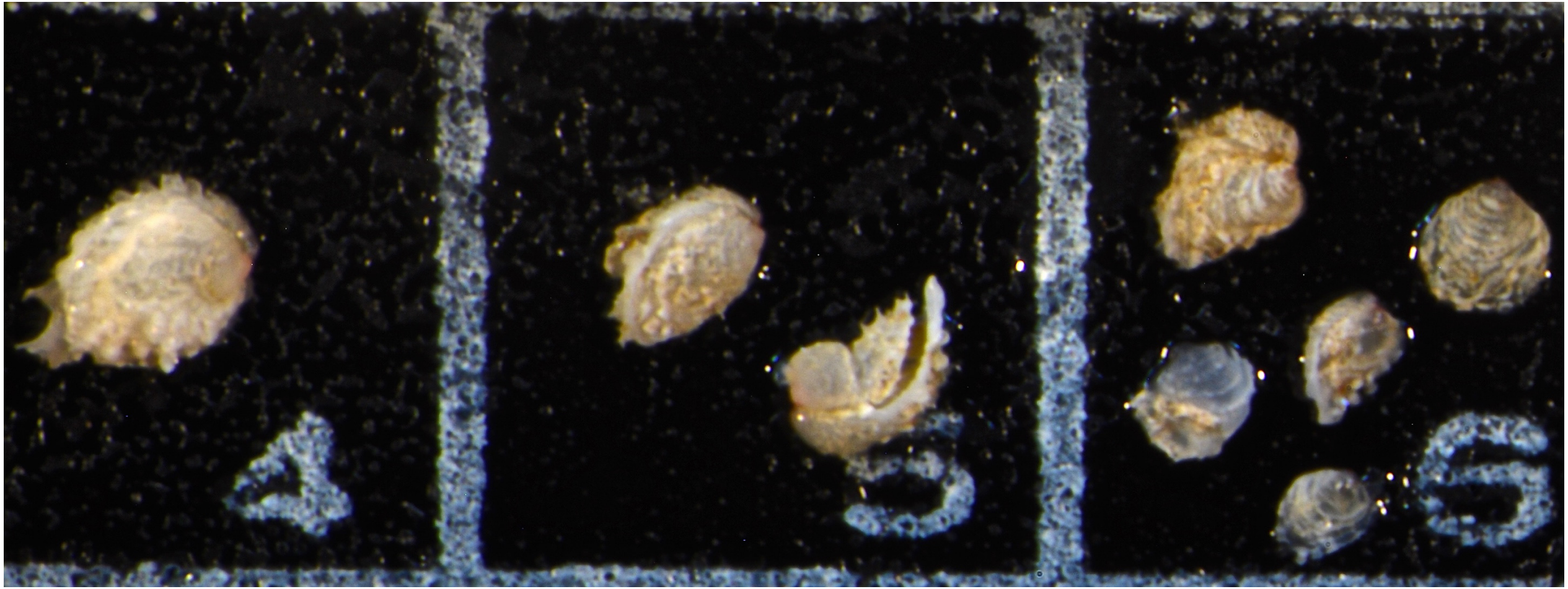
Chama arcana F.R. Bernard 1976



MBC Voucher Collection

Specimens courtesy of Carol Paquette MBC

Chamidae juveniles



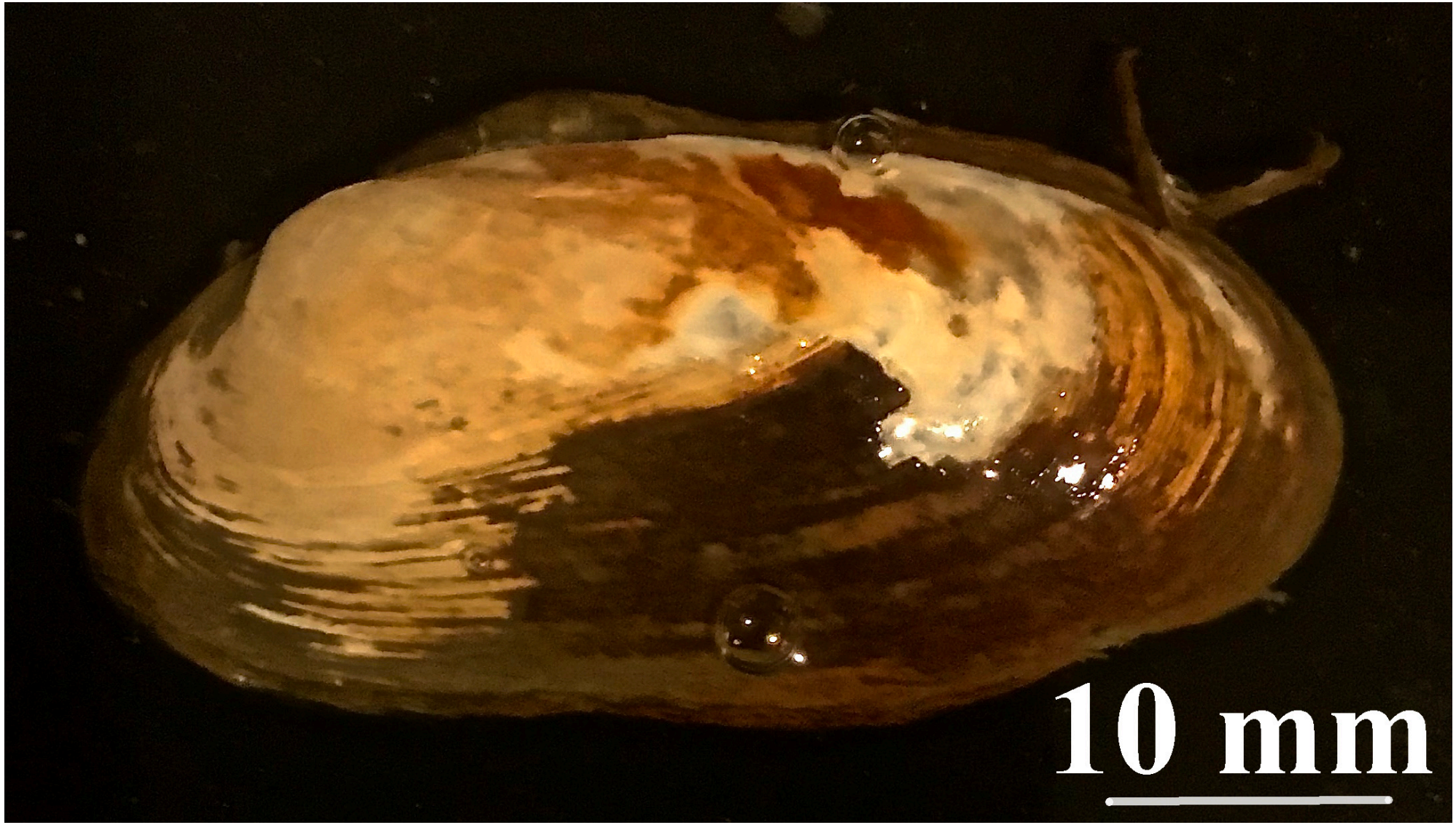
MBC Voucher Collection

Specimens courtesy of Carol Paquette MBC

Family Vesicomyidae

1. **Found deeper than 300 meters**
2. **Ligament external**
3. **Hinge plate strong, with divergent teeth**

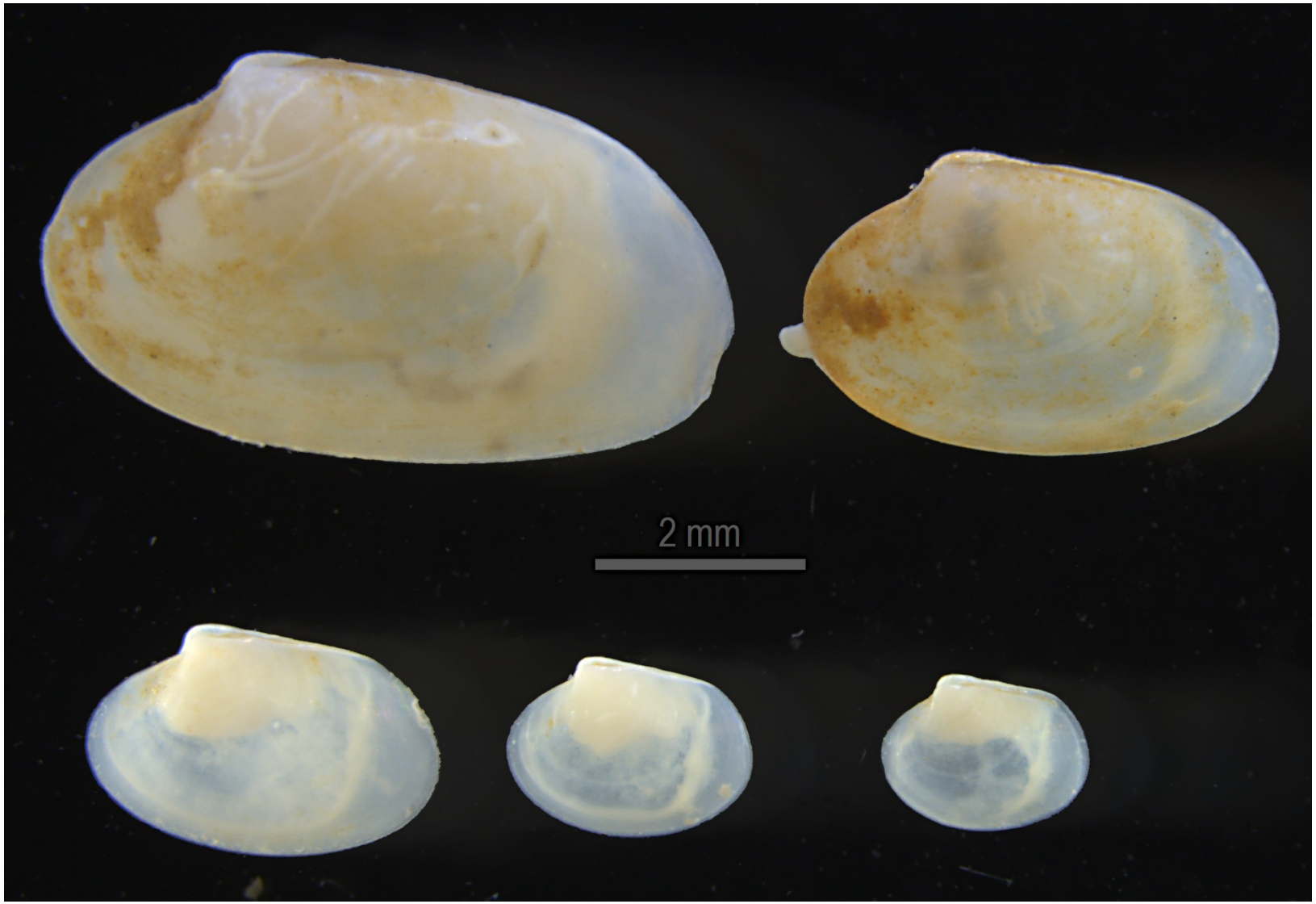
Ectenagena elongata (Dall 1916)



Specimen courtesy of Don Cadien LACSD

Palos Verdes Margin 790m 2003

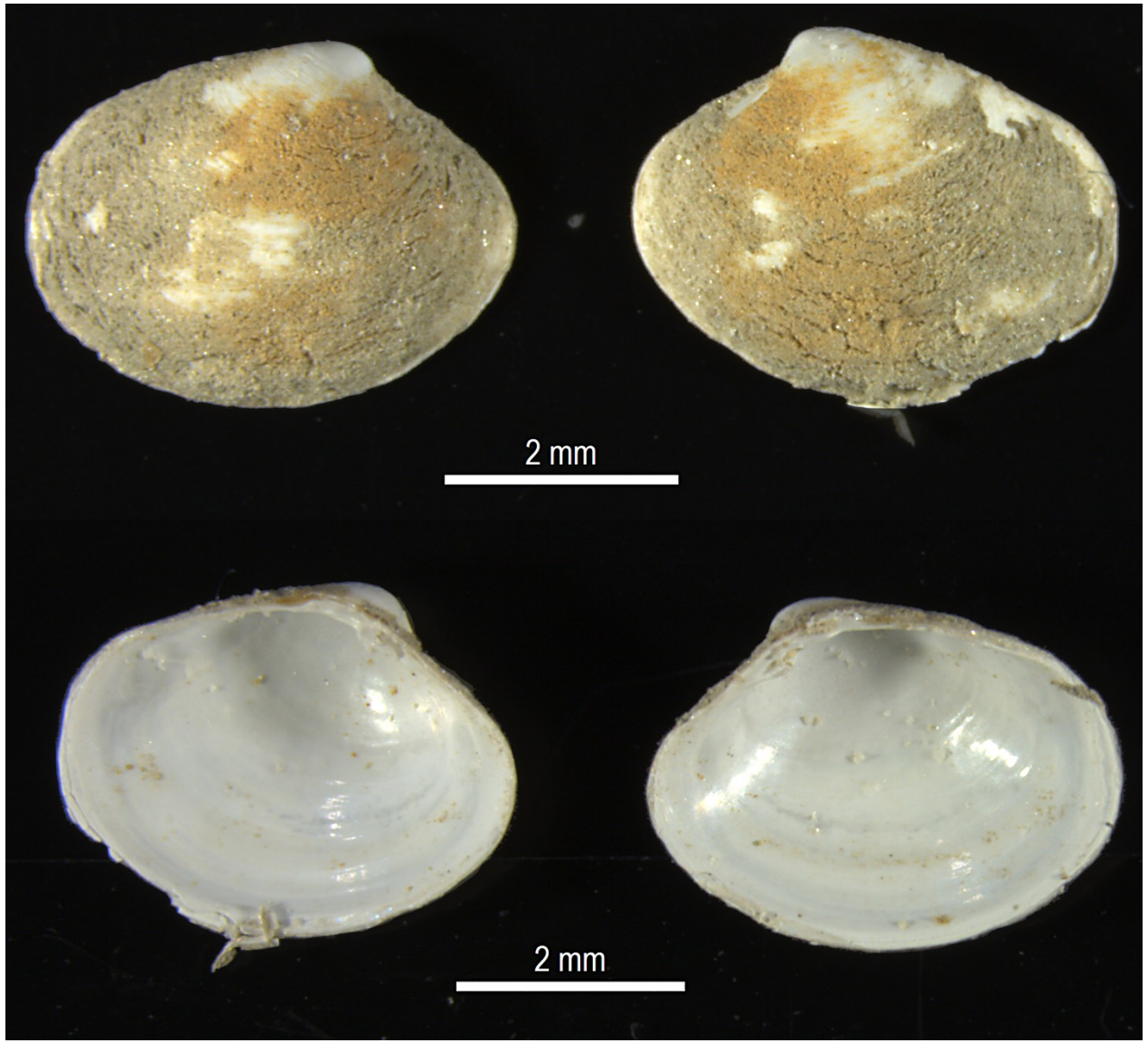
Ectenagena elongata (Dall 1916)



Palos Verdes Margin 790m 2003
Photo courtesy of Kelvin Barwick

Specimens courtesy of Don Cadien LACSD

Pliocardia stearnsii (Dall 1895)



Specimen courtesy of Don Cadien LACSD

Palos Verdes Margin 790m 2003
Photos by Kelvin Barwick

Pliocardia stearnsii (Dall 1895)

Palos Verde Margin 790m 2003

left valve

right valve

Specimen courtesy of Don Cadien LACSD
Photos courtesy of Kelvin Barwick

Pliocardia stearnsii (Dall 1895)

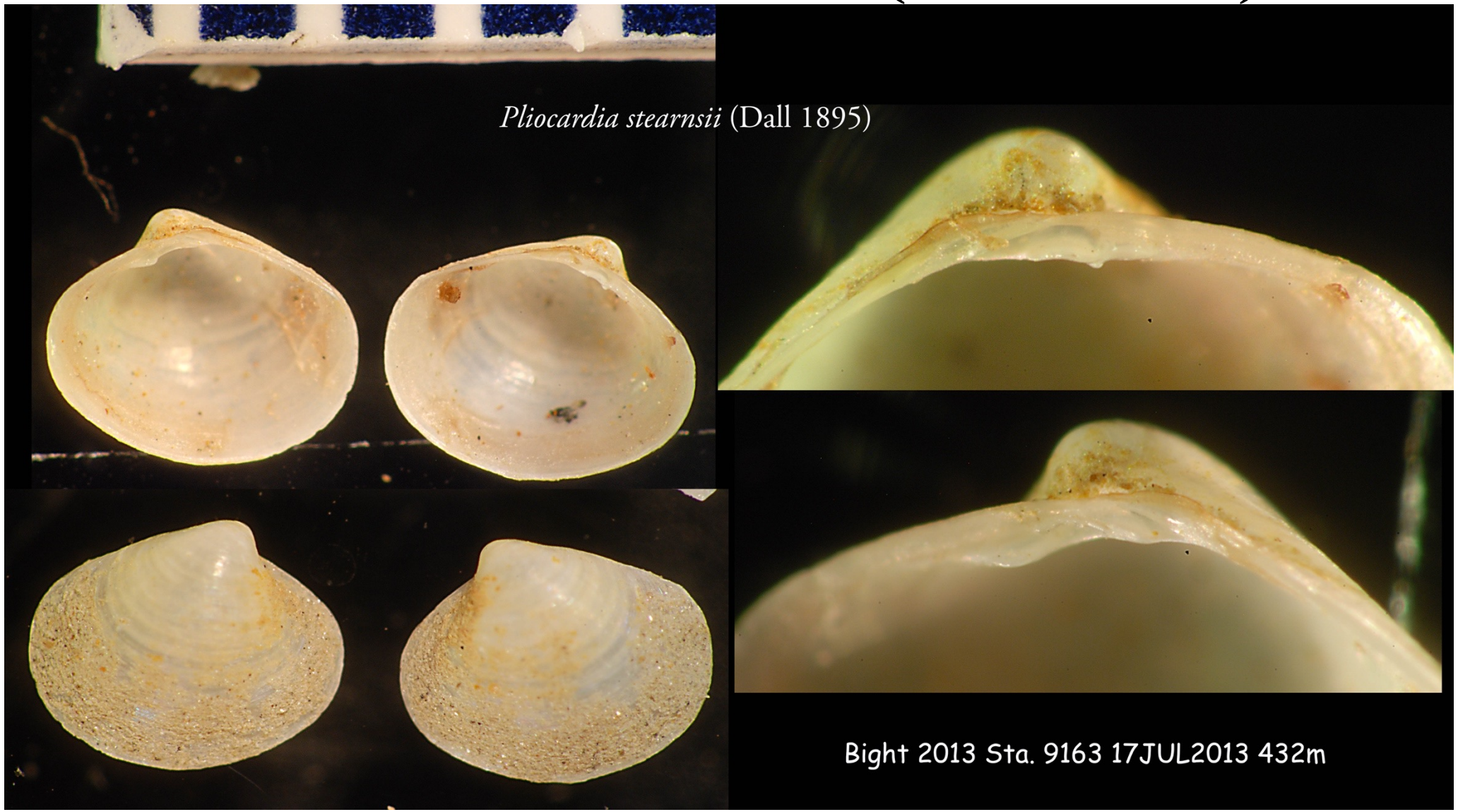


Photo courtesy of Kelvin Barwick

Family Ungulinidae

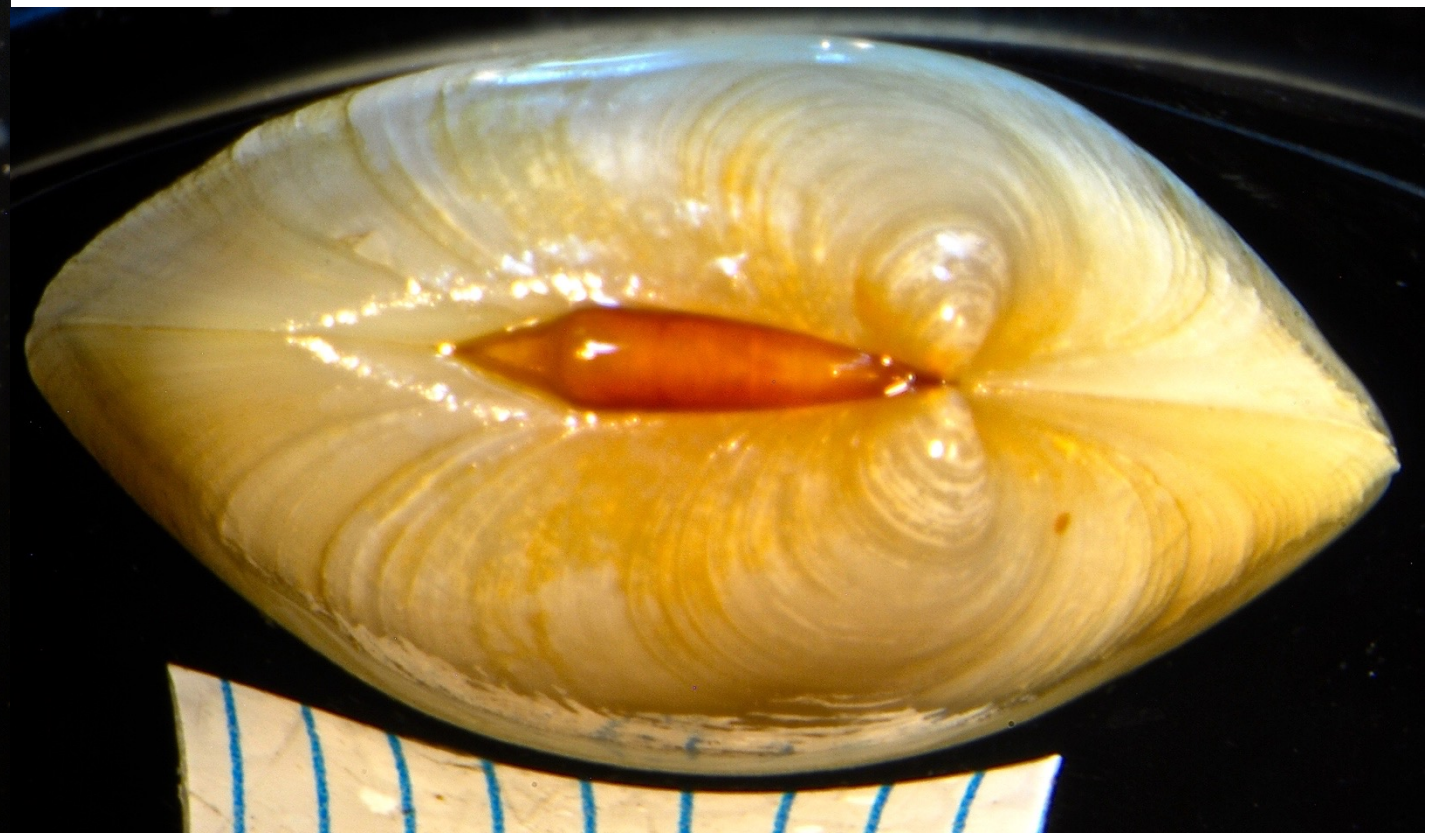
1. Valves round to ovate
2. Ligament external
3. Hinge with two cardinal teeth in each valve, one bifid

Diplodonta orbella (Gould 1851)

Point Conception Jalama Beach Intertidal 1973

Specimen courtesy of Carol Paquette MBC

Diplodonta orbella (Gould 1851)



King Harbor 17 mm 2007

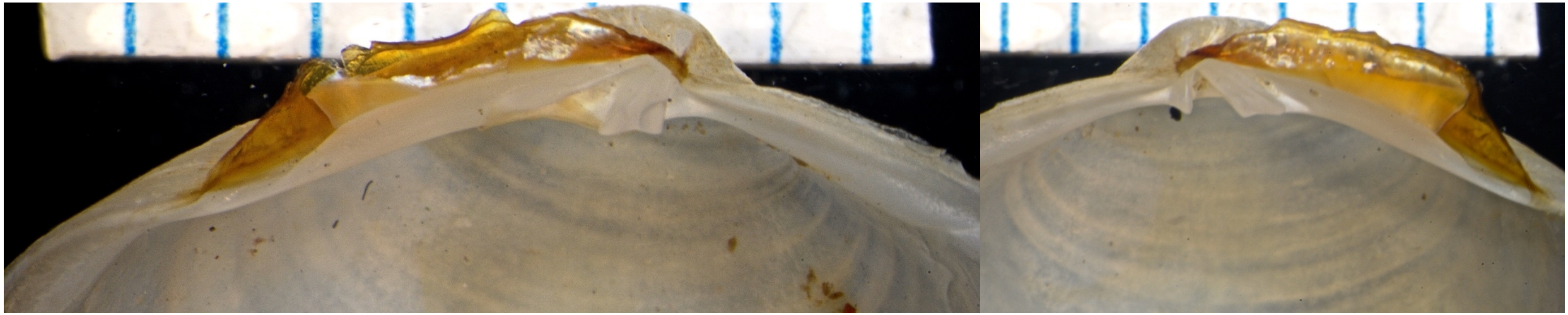
Specimen courtesy of Carol Paquette MBC

Diplodonta orbella (Gould 1851)

King Harbor 10m 2007

Specimen courtesy of Carol Paquette MBC

Diplodonta orbella (Gould 1851)



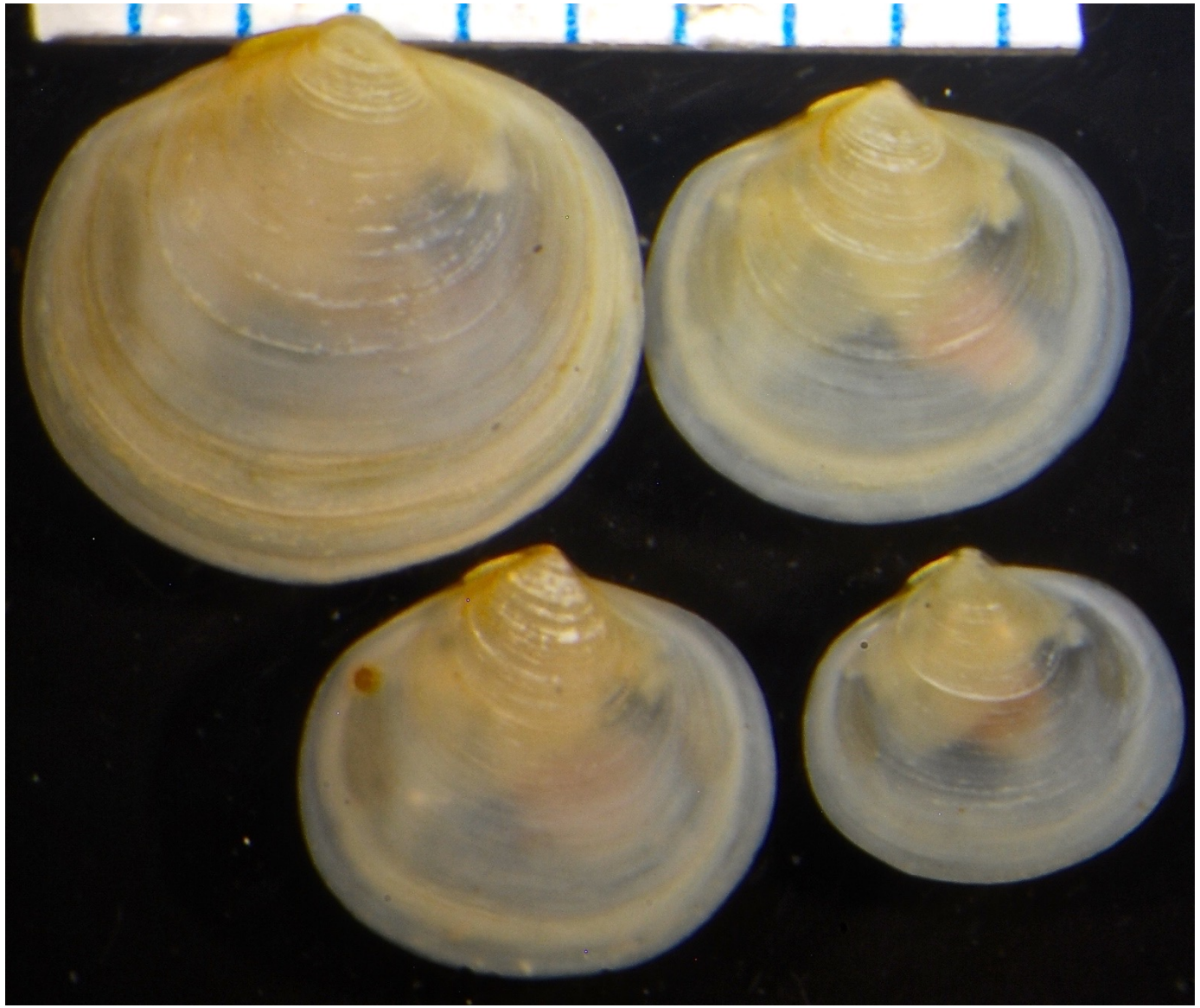
Specimen courtesy of Carol Paquette MBC

Diplodonta orbella (Gould 1851)

King Harbor 11mm 2007 King Harbor 7mm 2007

Specimens courtesy of Carol Paquette MBC

Diplodonta orbella (Gould 1851)



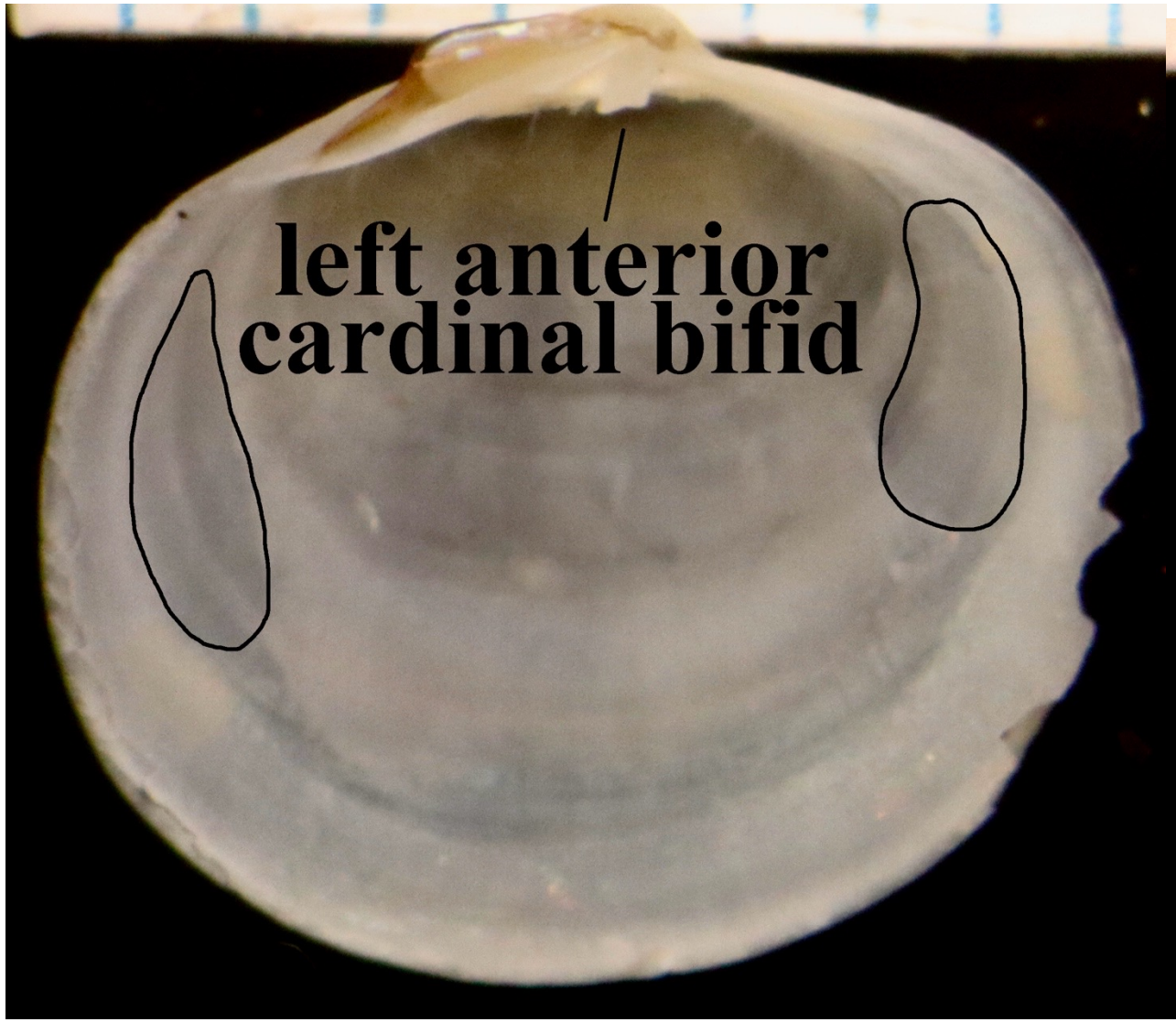
Specimens courtesy of Carol Paquette MBC

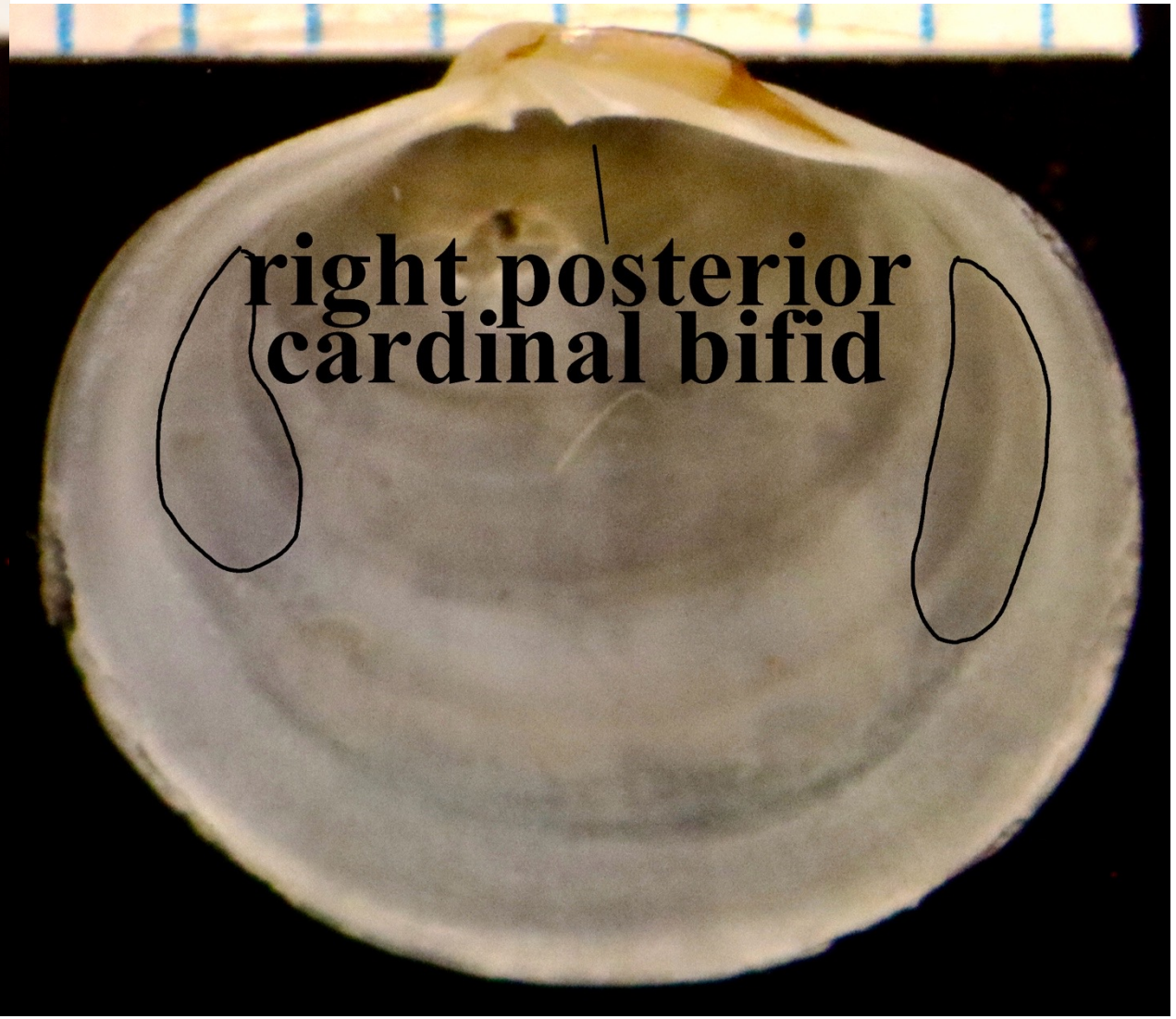
King Harbor B1 10m 2007

Diplodonta orbella (Gould 1851)

B’18 10030 San Diego Bay 1m

Diplodonta orbella (Gould 1851)



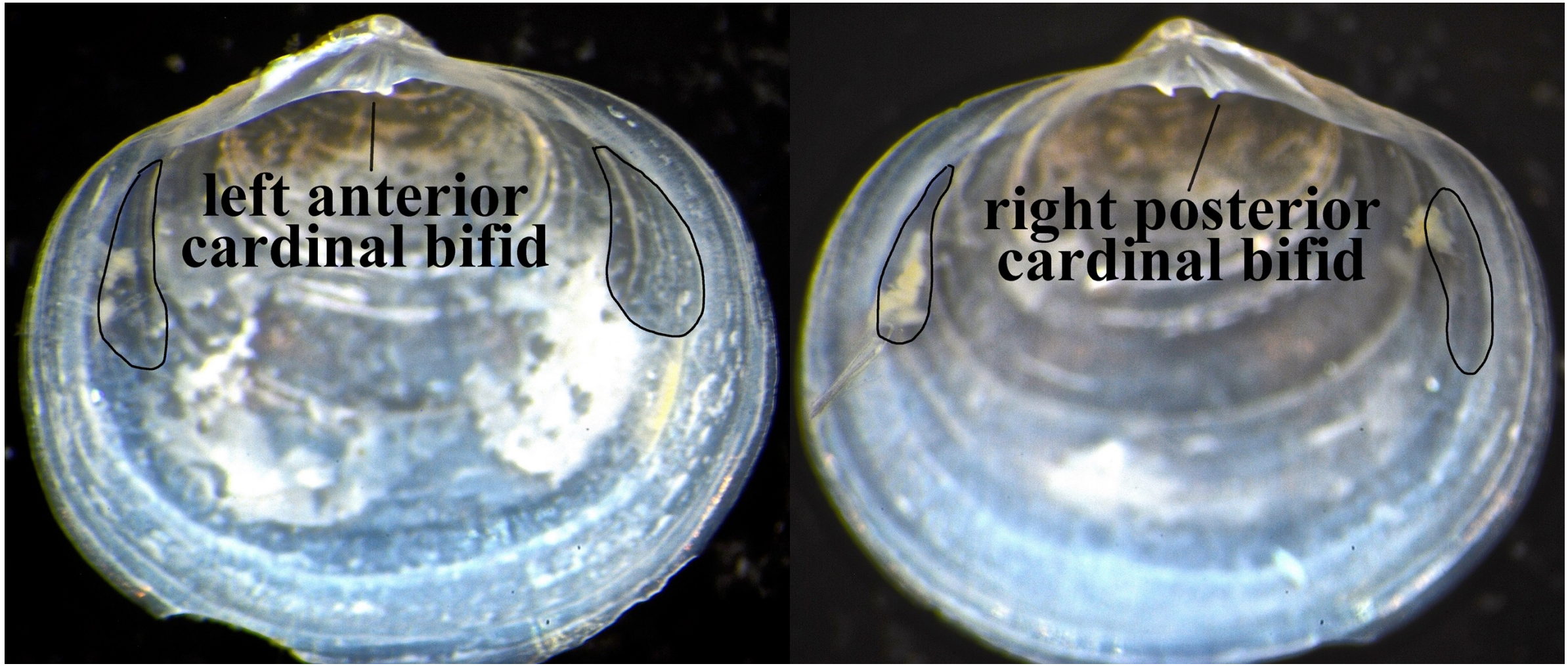


ISS Avalon 6257 QX13 5/6/2011

9 mm left valve

9 mm right valve

Diplodonta orbella (Gould 1851)

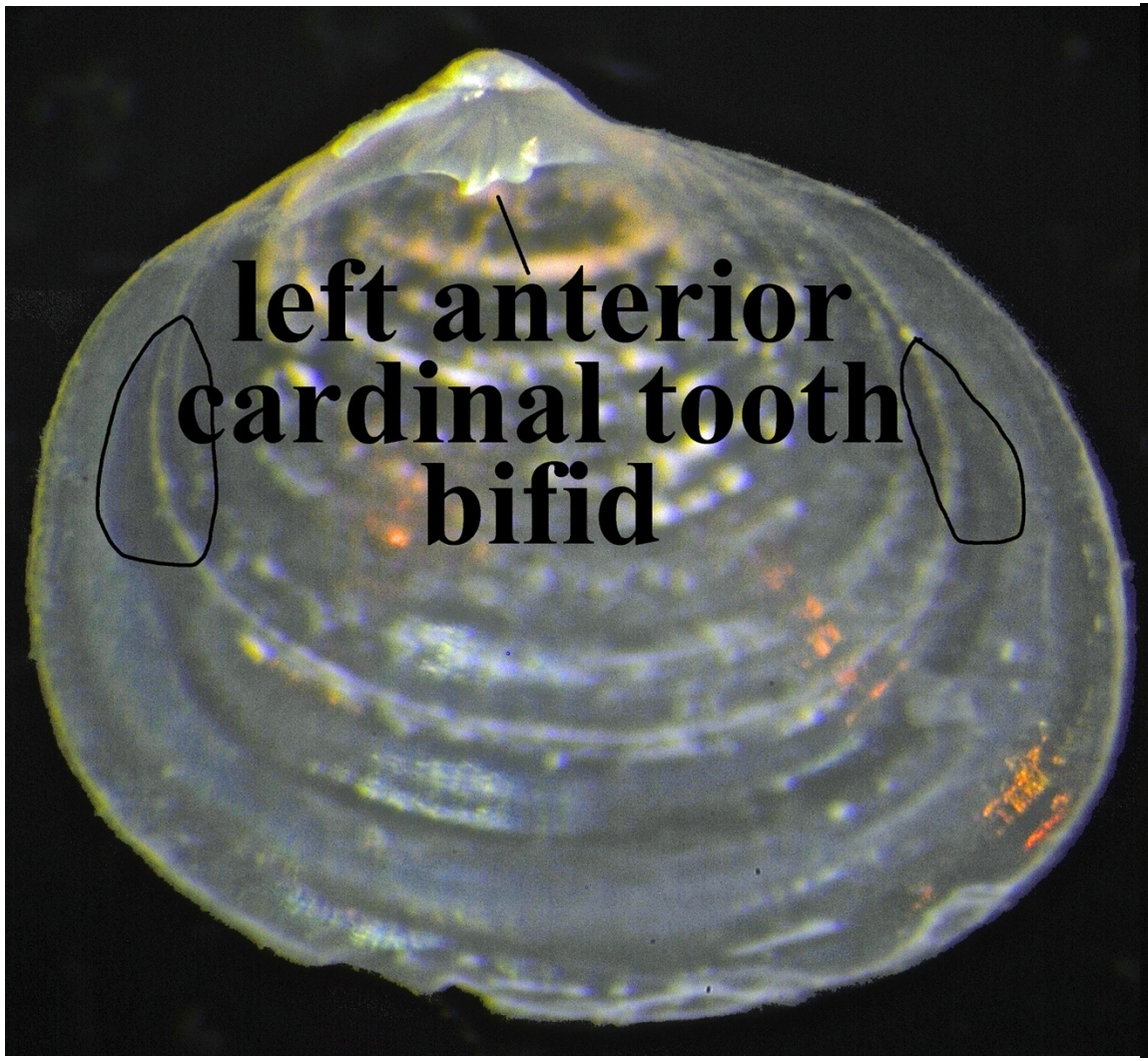


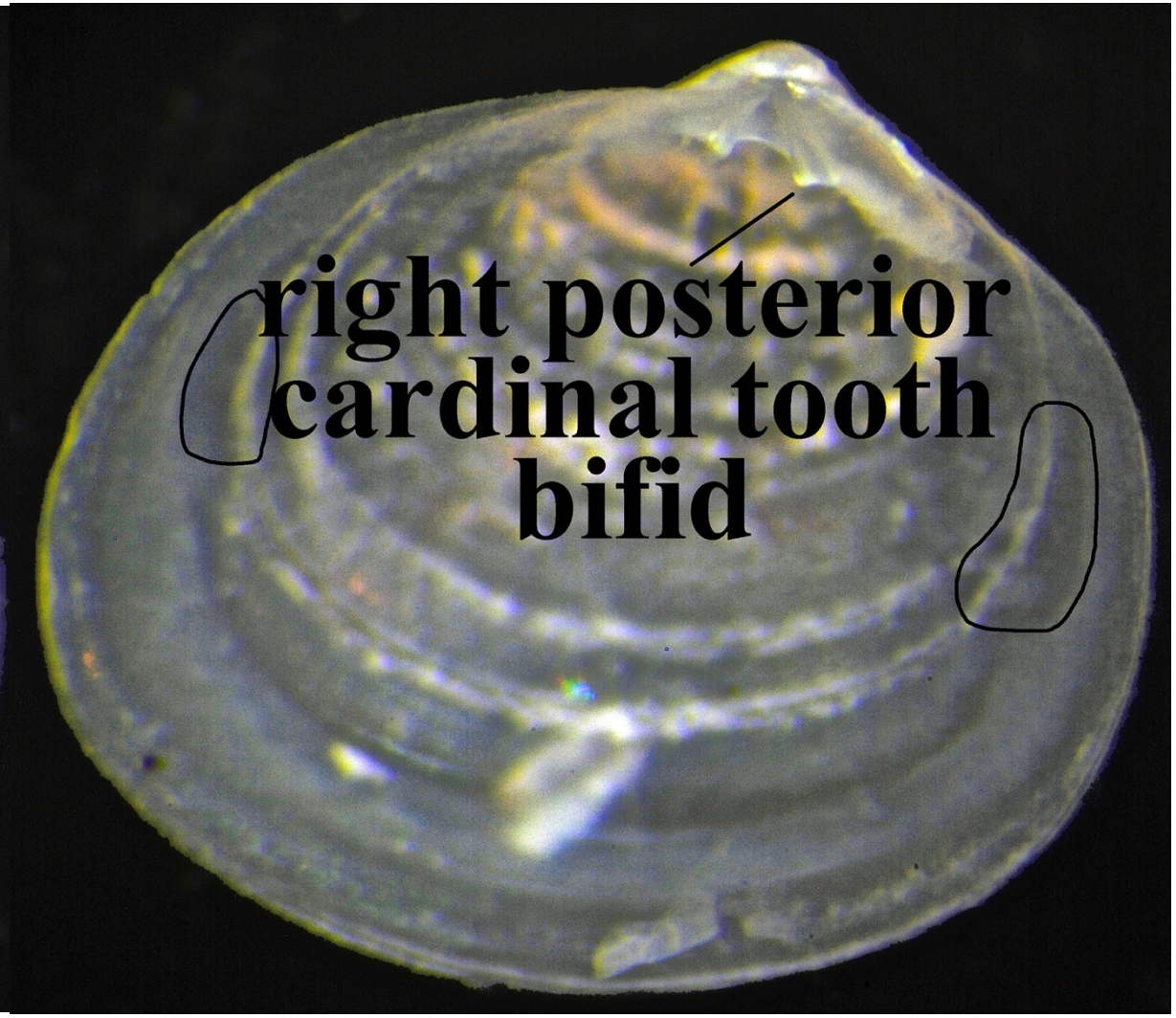
B18 10030 San Diego Bay 1m

4mm left vavle

4 mm right valve

Diplodonta orbella (Gould 1851)





B18 10030 San Diego Bay 1m

2mm left valve

2mm right valve

Family Veneridae

1. Valves ovate to suborbicular or subtrigonal, inequilateral, equivalve
2. Ligament external
3. Three cardinal teeth in each valve

Amiantis callosa (Conrad 1837)

Trestles Beach Drift 1976

Specimens courtesy of
Carol Paquette MBC

Amiantis callosa (Conrad 1837)

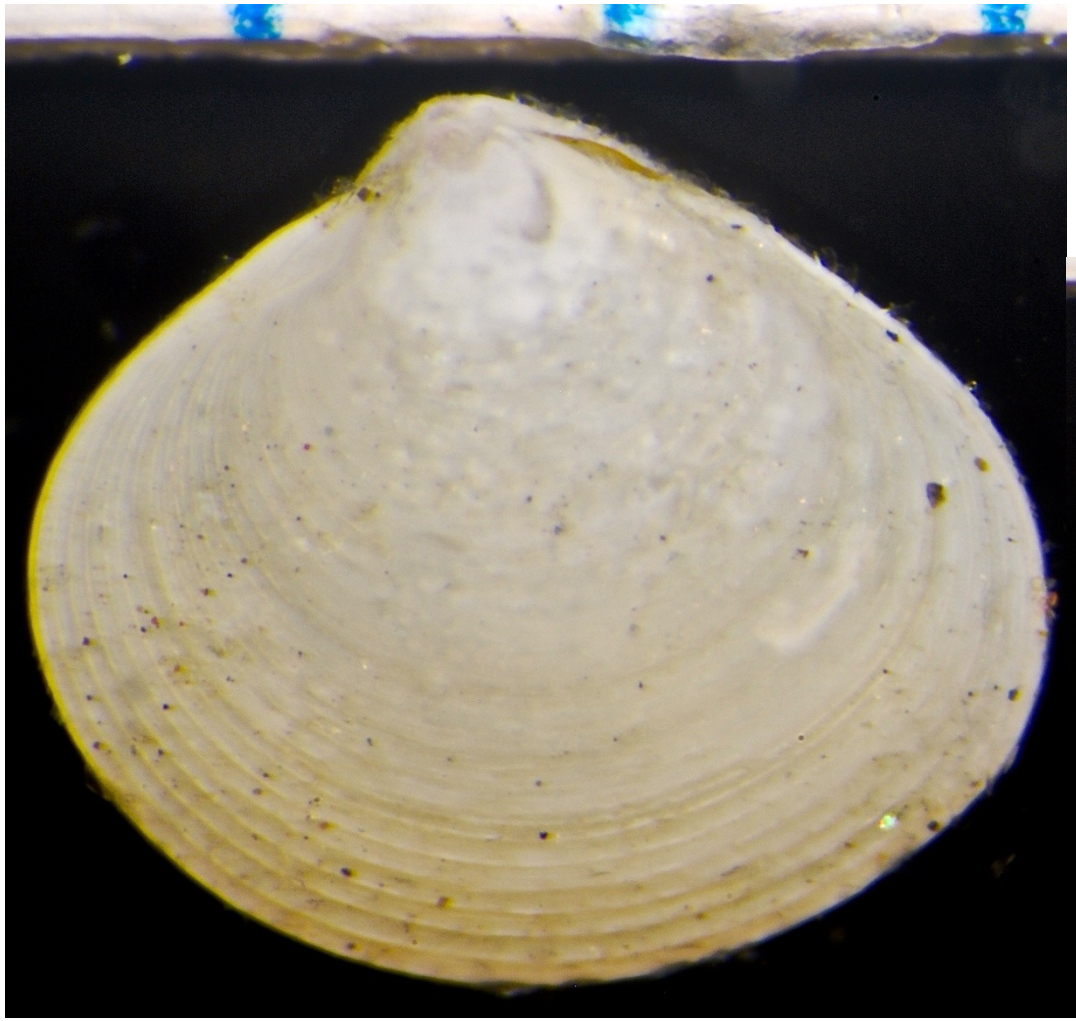
Trestles Beach Drift 1976

left valve

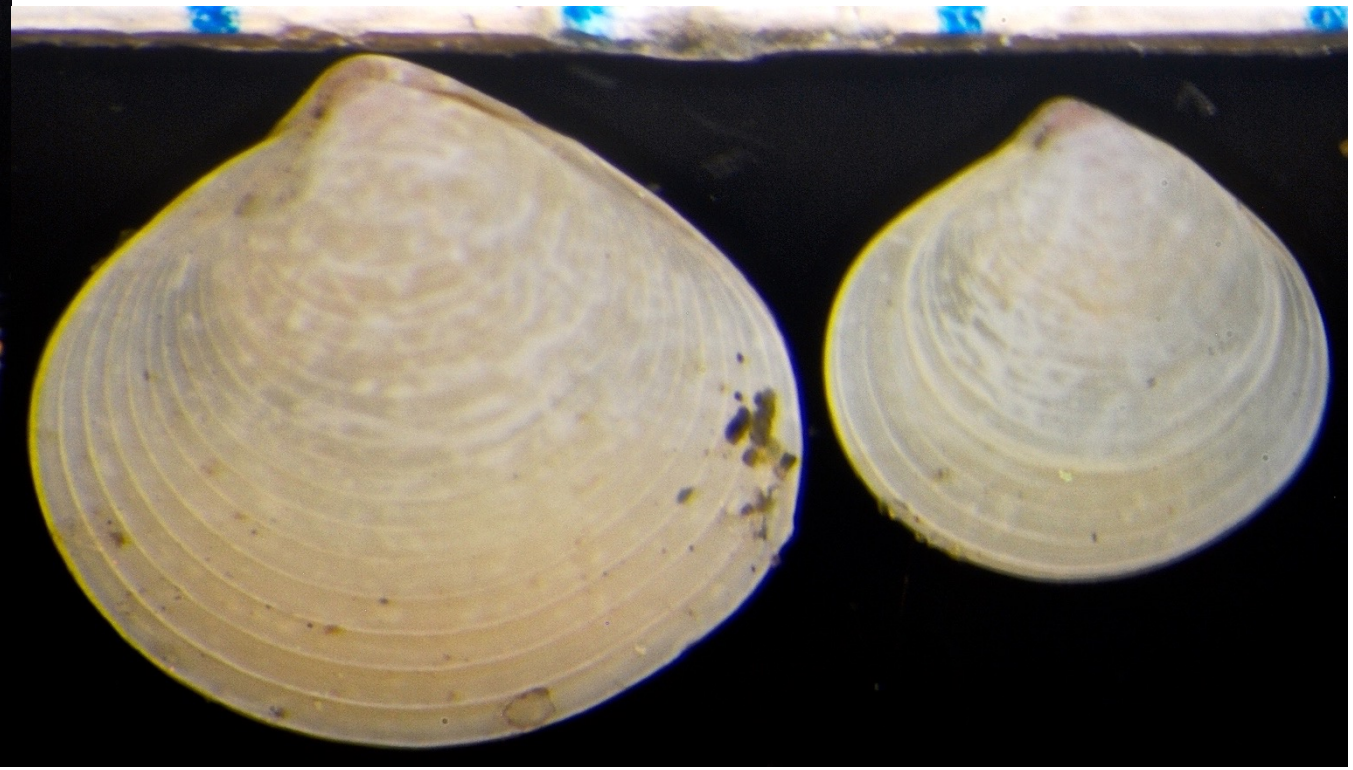
right valve

Specimen courtesy of Carol Paquette MBC

Amiantis callosa (Conrad 1837) juvenile

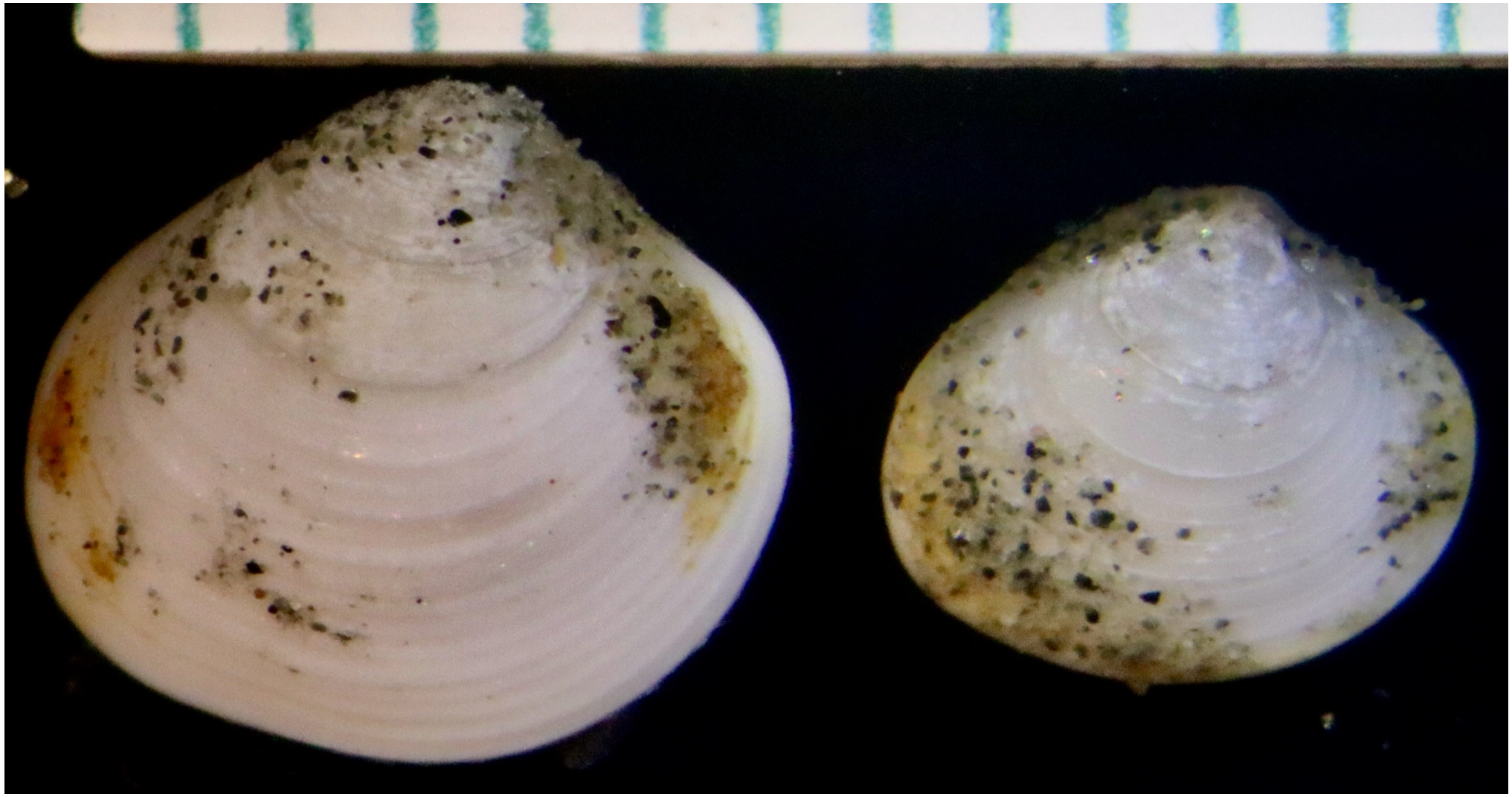


Chevron 7m 1991



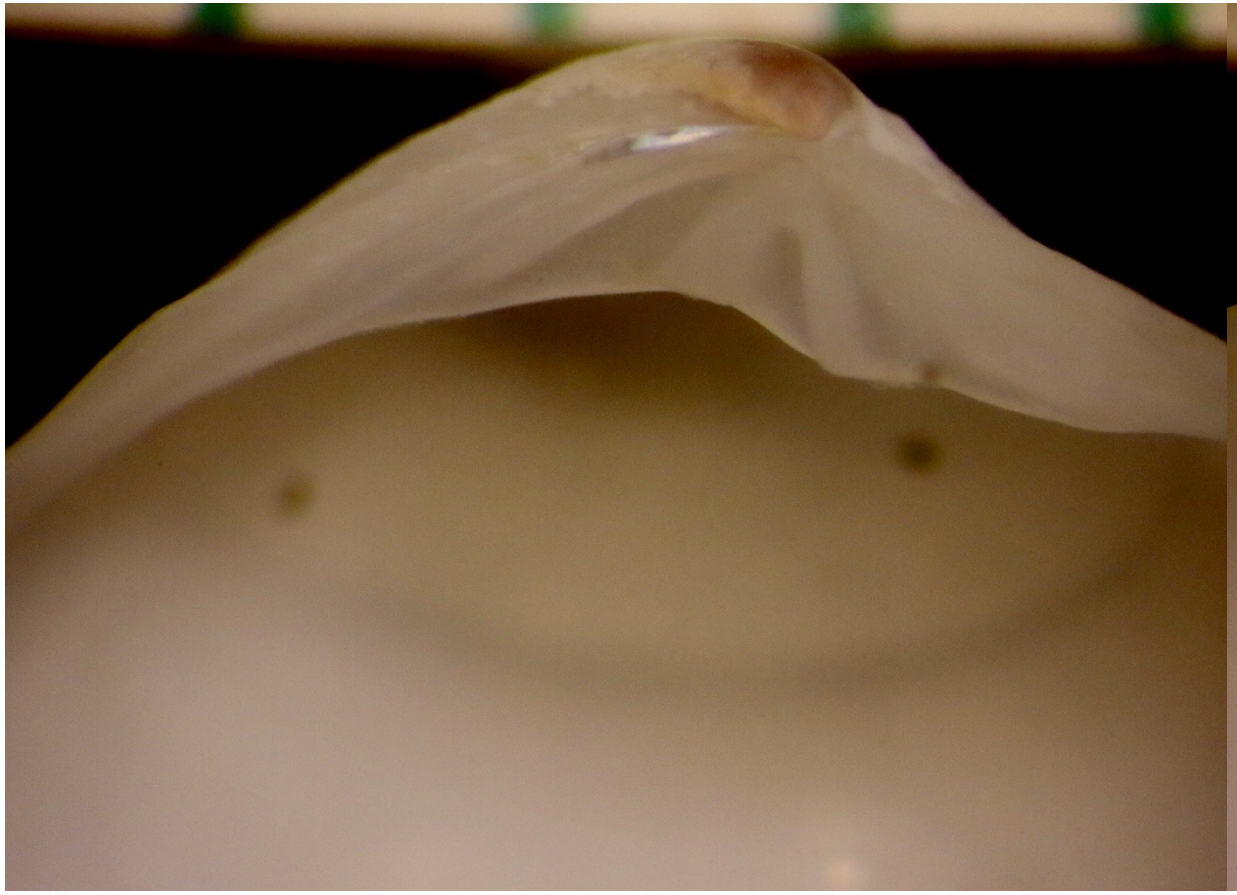
Scattergood 7m 2004

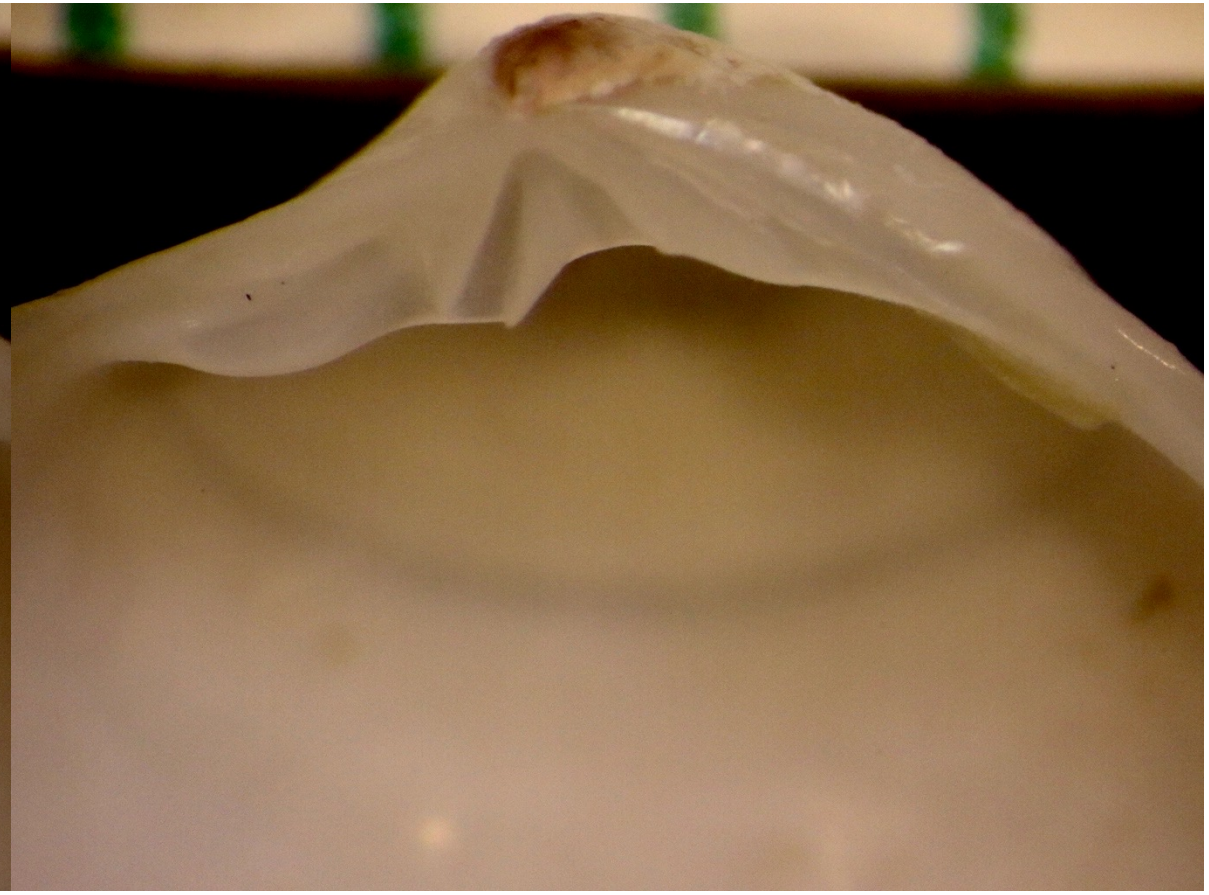
Amiantis callosa (Conrad 1837) juvenile



Chevron B5 15m August 2022

Amiantis callosa (Conrad 1837) juvenile



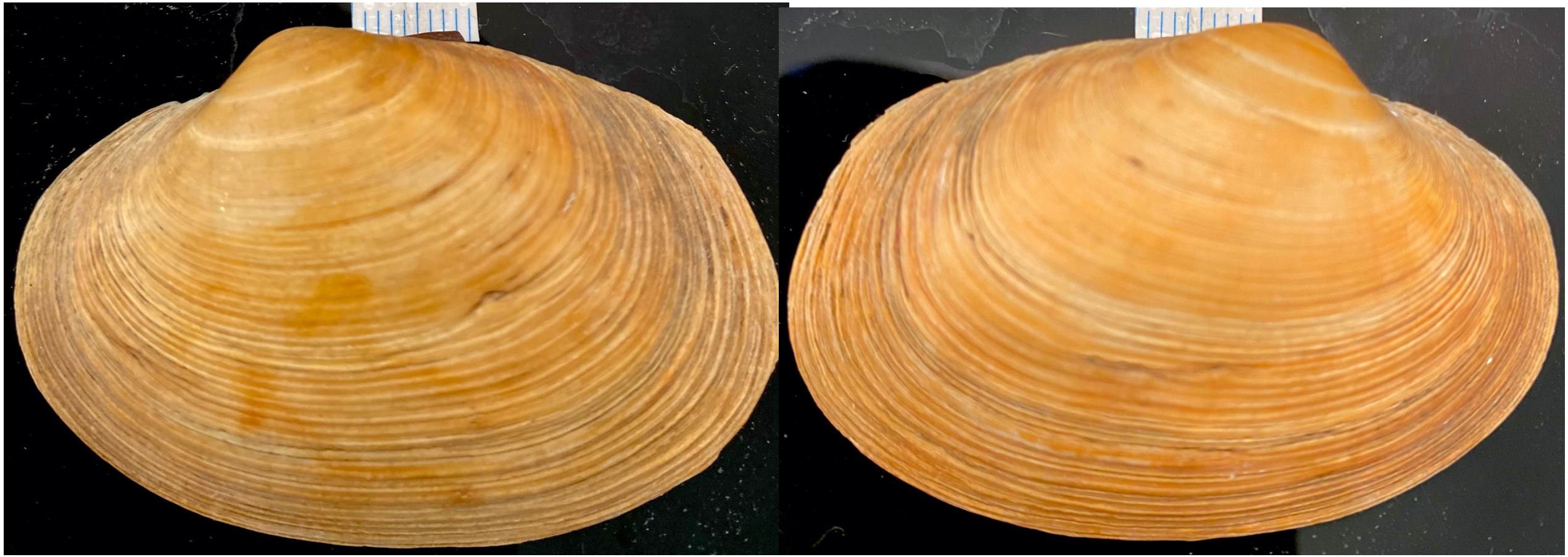


Chevron B5 15m August 2022

left valve

right valve

Callithaca tenerrima
Carpenter, in A.A. Gould and Carpenter 1857



Imperial Beach Intertidal beach drift 1969

left valve

right valve

Specimen courtesy of Carol Paquette MBC

Callithaca tenerrima
Carpenter, in A.A. Gould and Carpenter 1857

Imperial Beach beach drift 1969

left valve

right valve

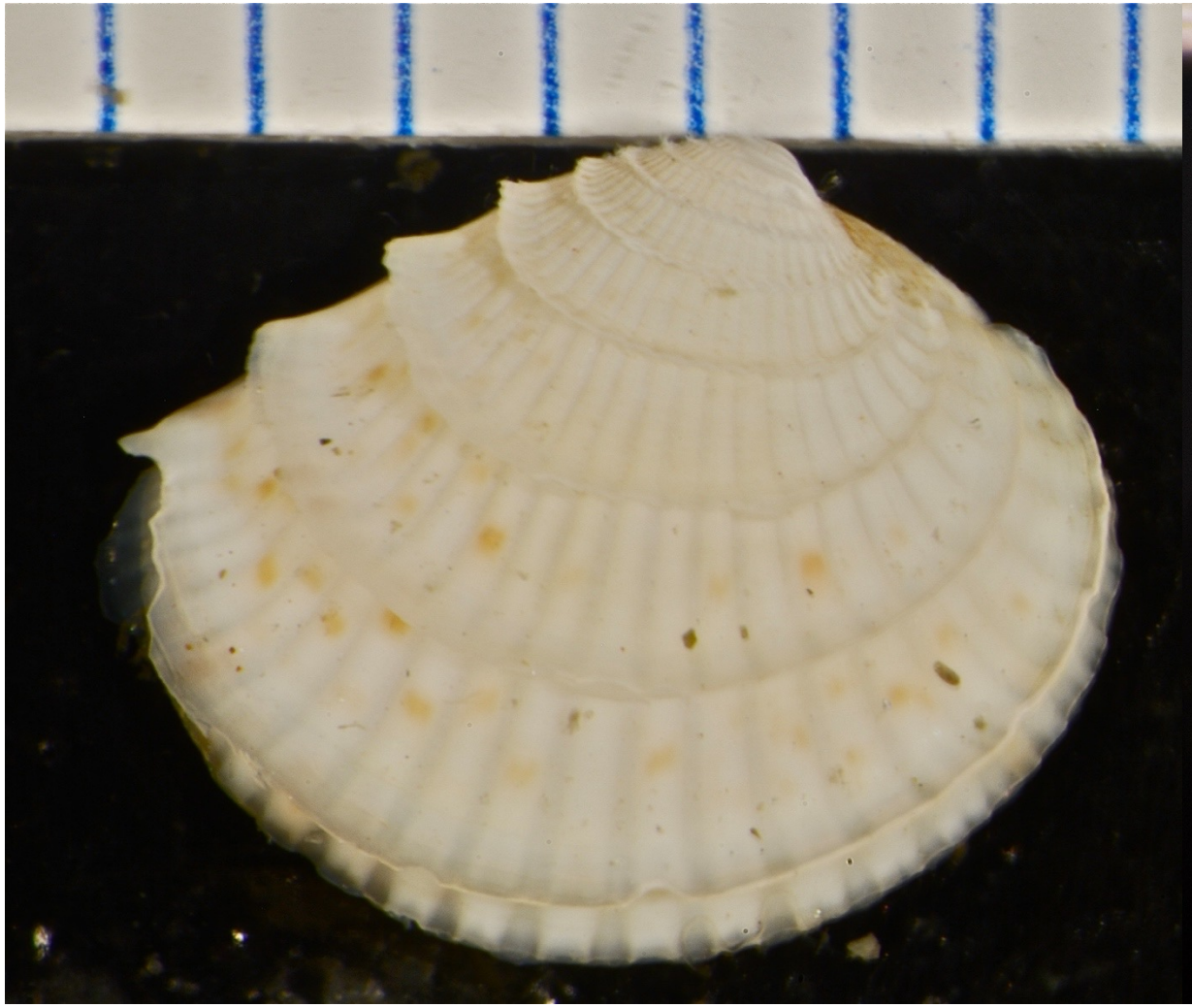
Specimen courtesy of Carol Paquette MBC

Chione californiensis
(Broderip in Broderip & G.B. Sowerby I 1835)

San Diego Bay CB-DS(Rep2) 15m 2020

BAE NPDES San Diego Bay G1-Alt 5m 2019

Chione californiensis
(Broderip in Broderip & G.B. Sowerby I 1835)



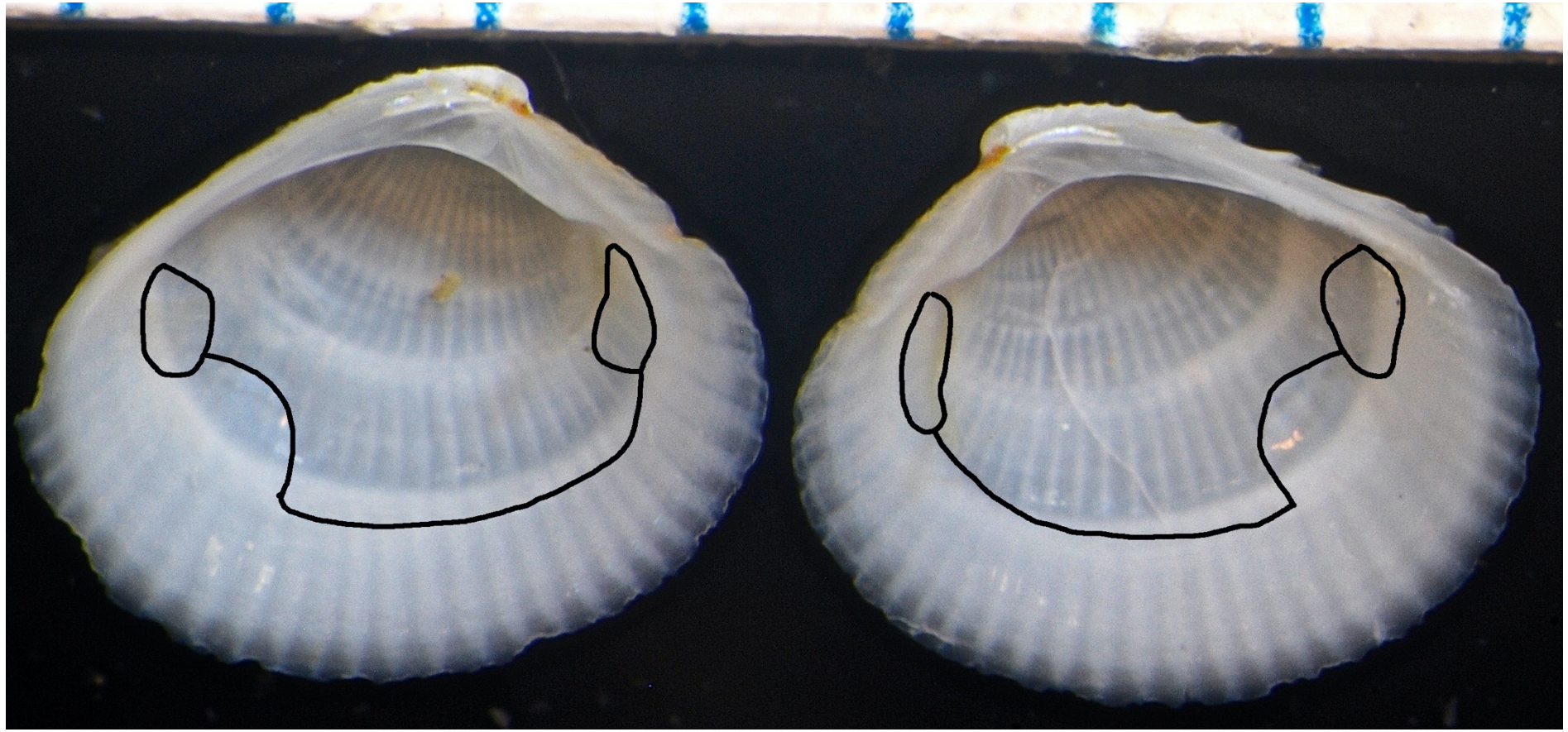
B’13 8328 Huntington Harbour 6m

B’18 10056 Los Alamitos Bay 2m

Chione californiensis
(Broderip in Broderip & G.B. Sowerby I 1835)

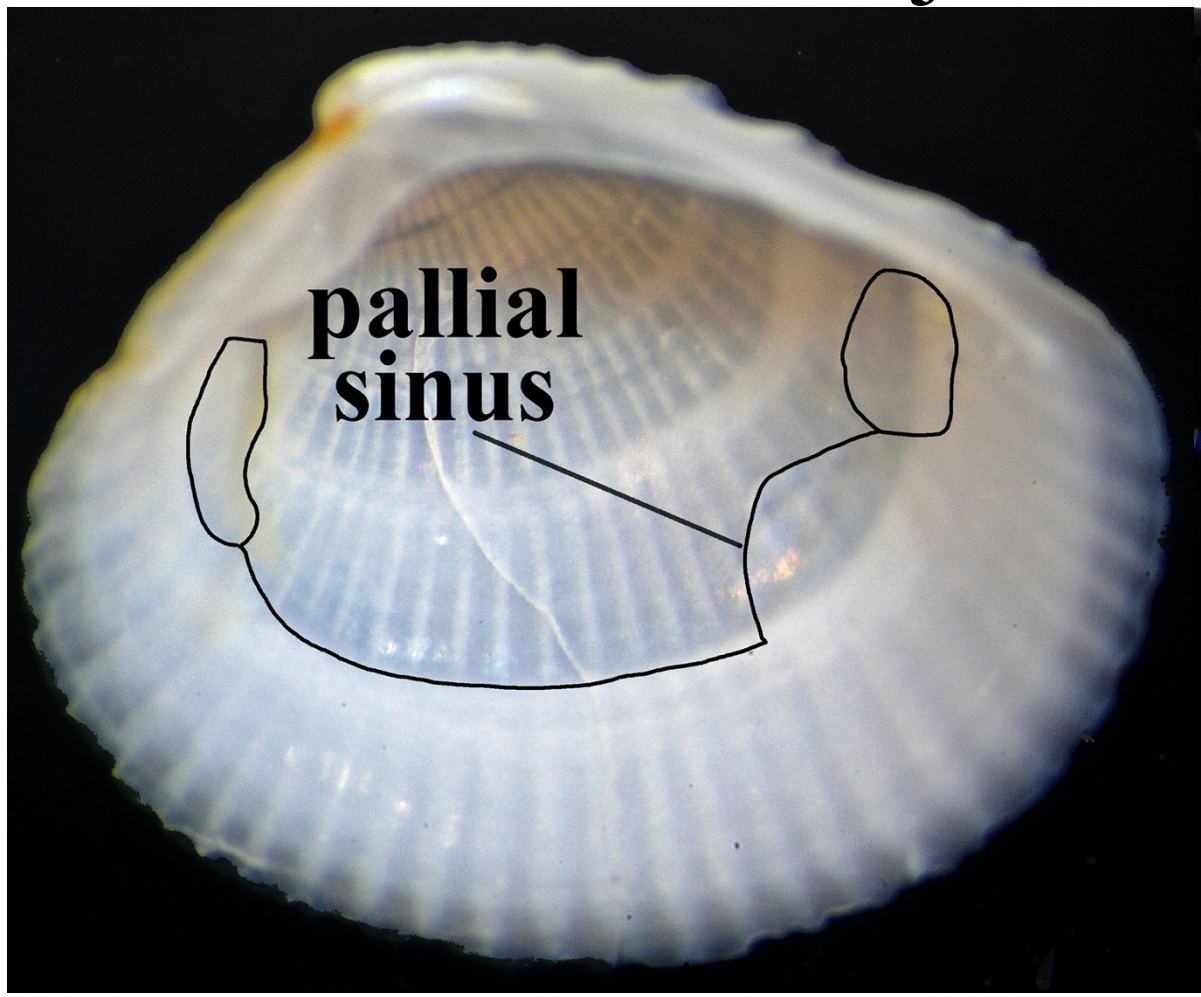
B’18 10058 Huntington Harbour 0m

Chione californiensis
(Broderip in Broderip & G.B. Sowerby I 1835)

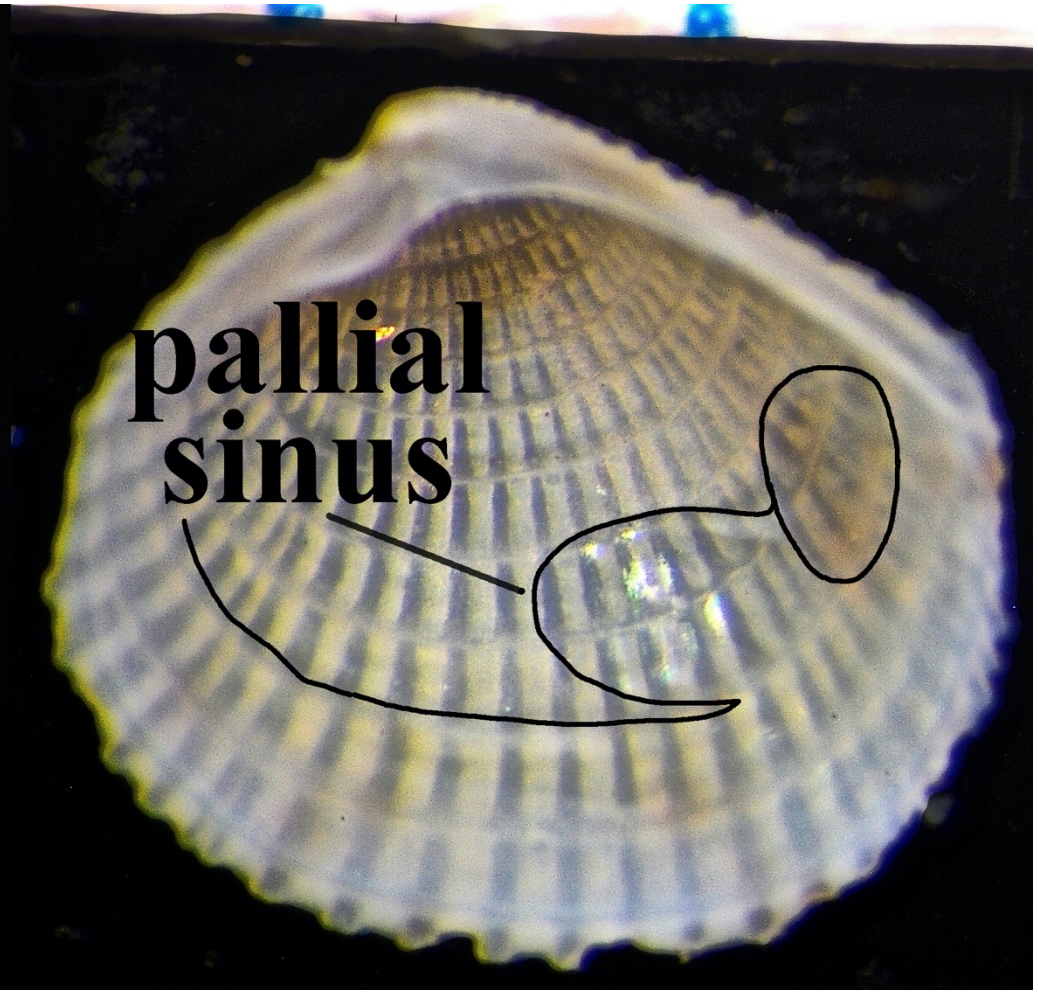


B’18 10056 Los Alamitos Bay 2m

Chione californiensis – Leukoma laciniata juveniles



B’18 10056 Los Alamitos Bay 2m



B’18 10062 Newport Bay 6m

Chione californiensis – Leukoma laciniata juveniles

B’18 10056 Los Alamitos Bay 2m

B’18 10062 Newport Bay 6m

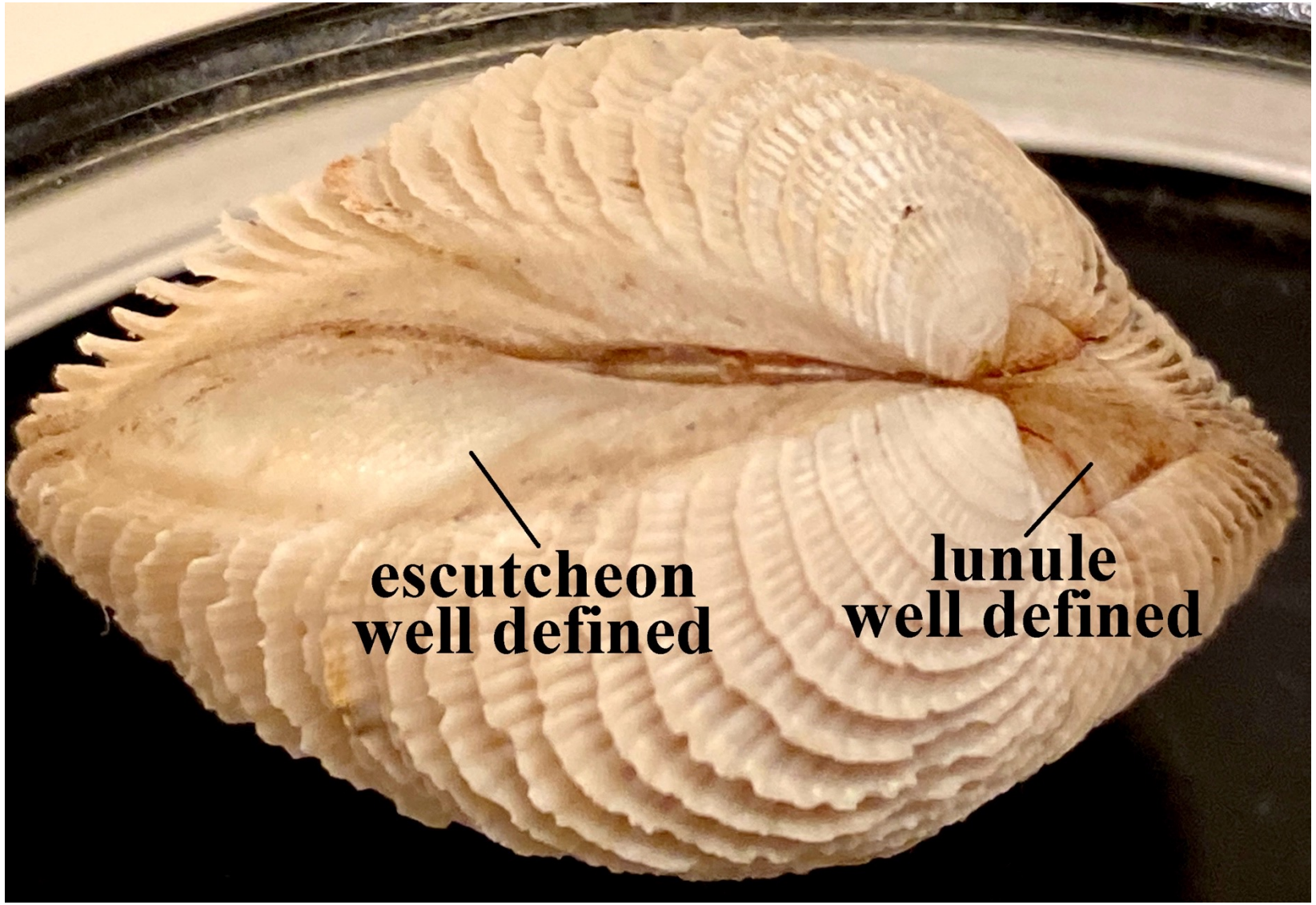
Chione undatella (G.B. Sowerby I 1835)

San Diego Bay Wood BAE-NPDES G-5 5m 2020

OCPW TBTMAR Talbot Marsh 5m 2020

San Diego Bay Wood BAE-NPDES G-5 5m 2020

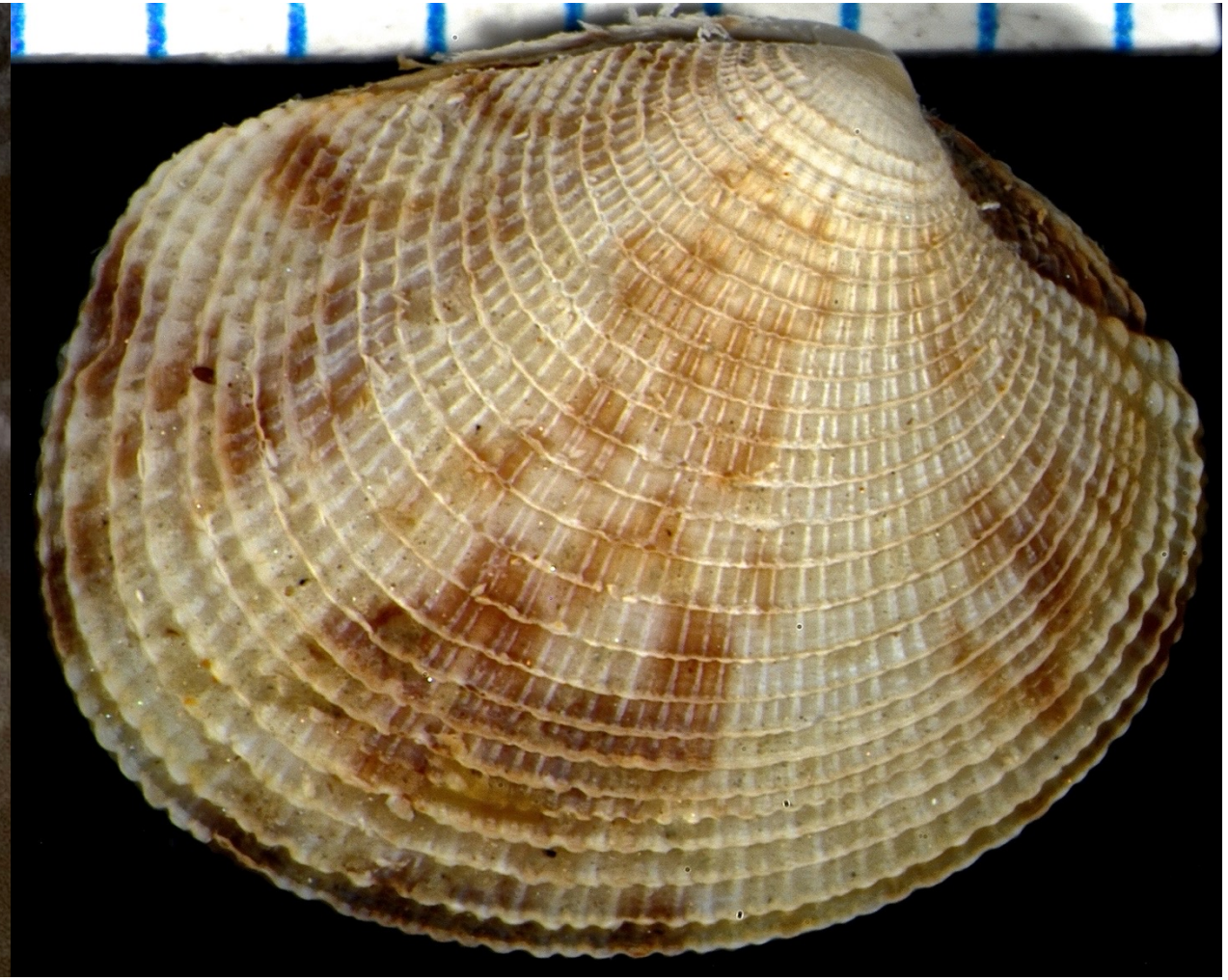
Chione undatella (G.B. Sowerby I 1835)



San Diego Bay BAE-NPDES G-5 5m 2020

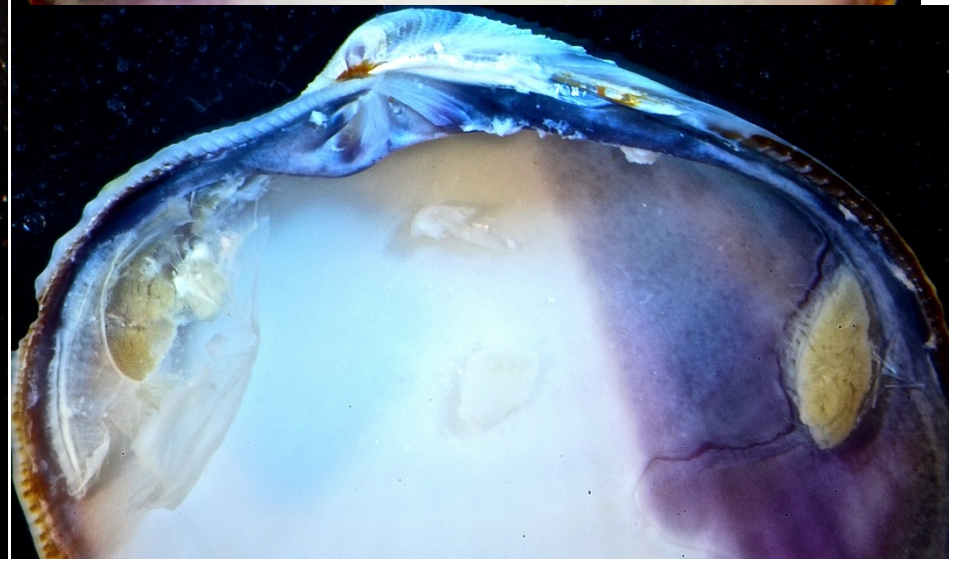
Chione undatella/Leukoma lacianata

San Diego Bay Wood BAE-NPDES G-5 5m 2020



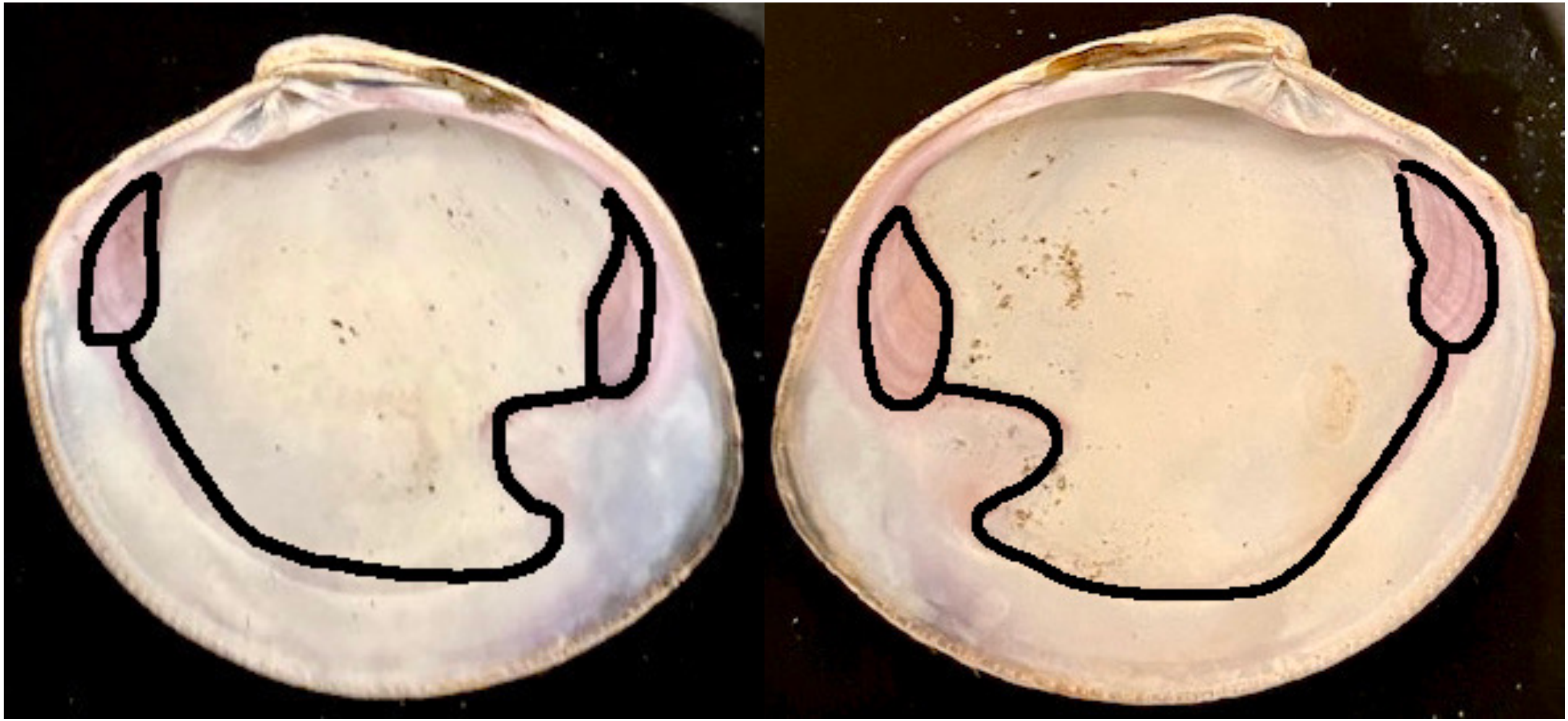
Colorado Lagoon W3 5 m 2017

Chionista fluctifraga (G.B. Sowerby II 1853)



B’18 10199 Sweetwater River 0m

Chionista fluctifraga (G.B. Sowerby II 1853)

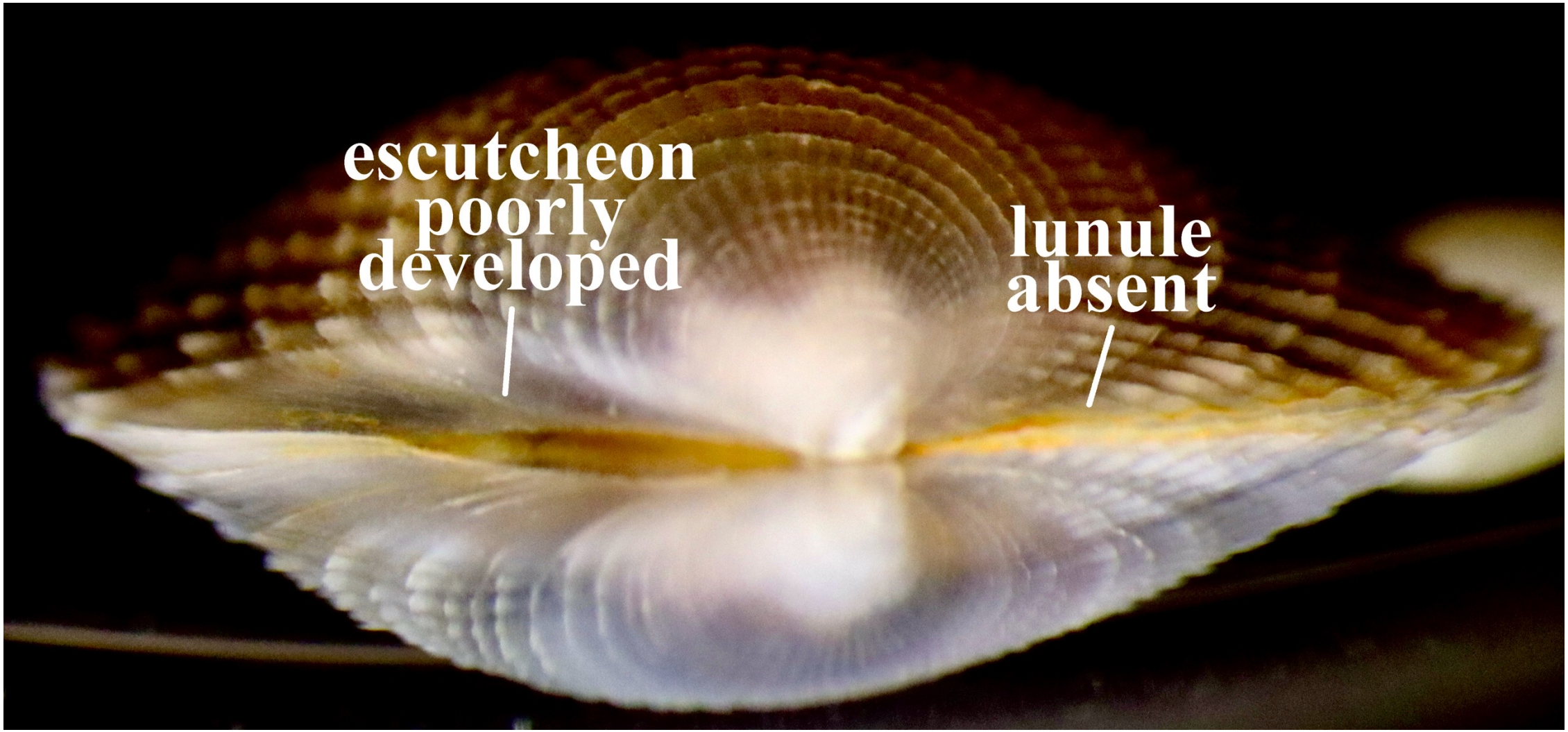


OCPW BBOLR Bolsa Chica 5m 2020

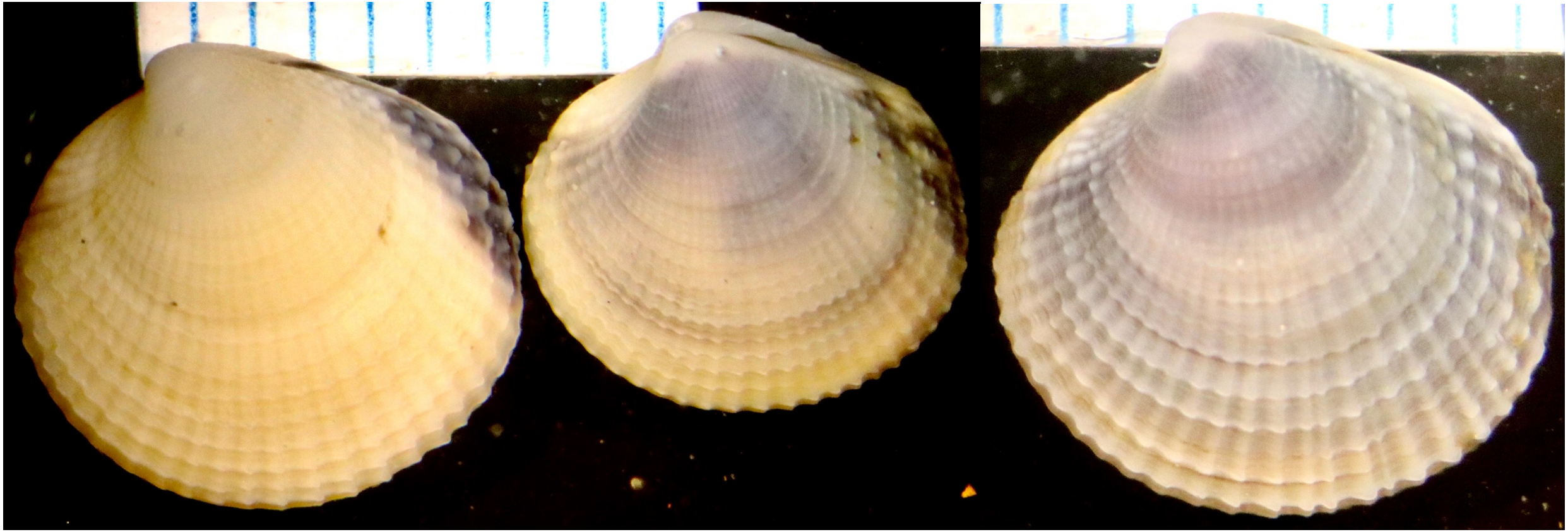
left valve

right valve

Chionista fluctifraga (G.B. Sowerby II 1853)



Chionista fluctifraga (G.B. Sowerby II 1853)



OCPW BBOLR Bolsa Chica 5m 2020

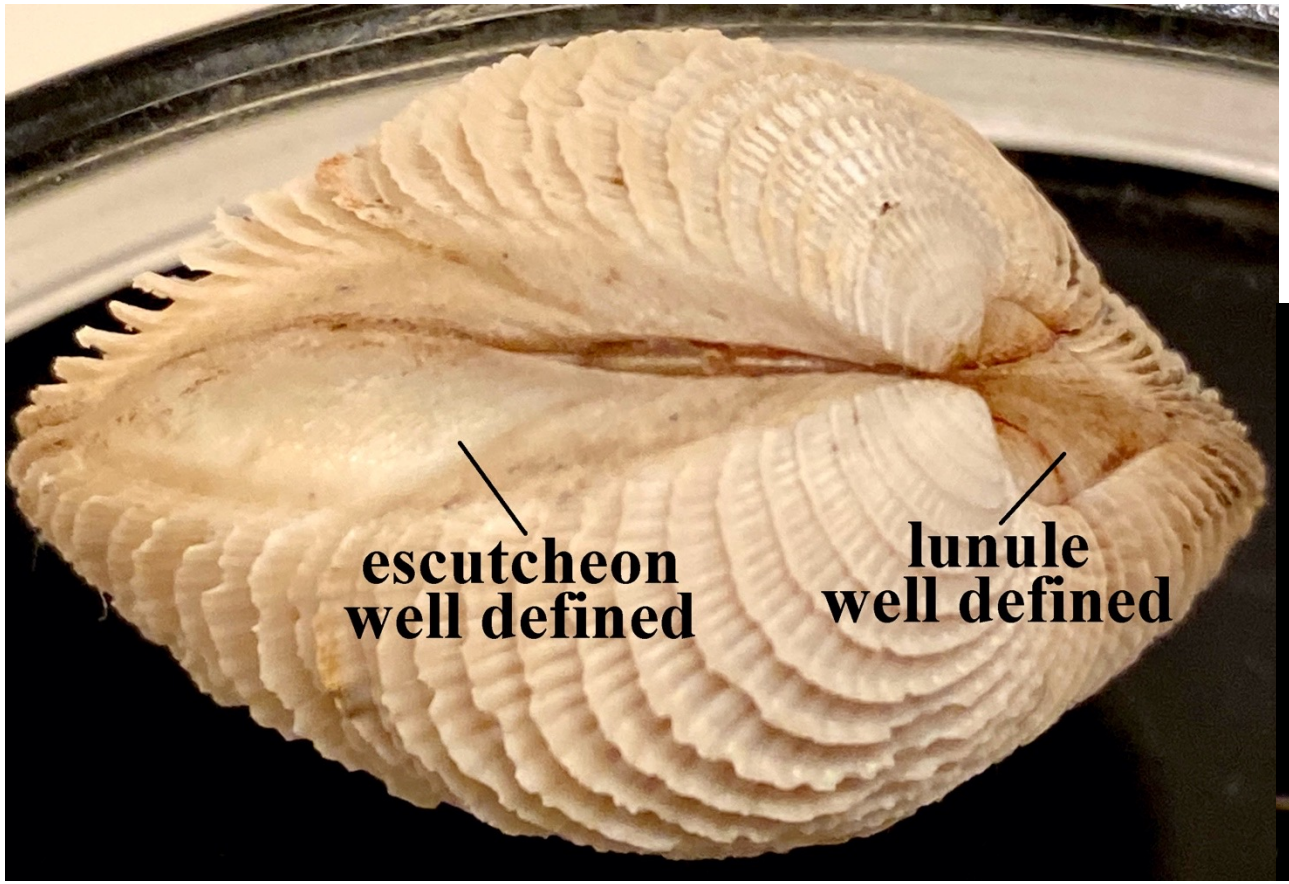
Chione/Chionista

Chione californiensis
San Diego Bay 5m

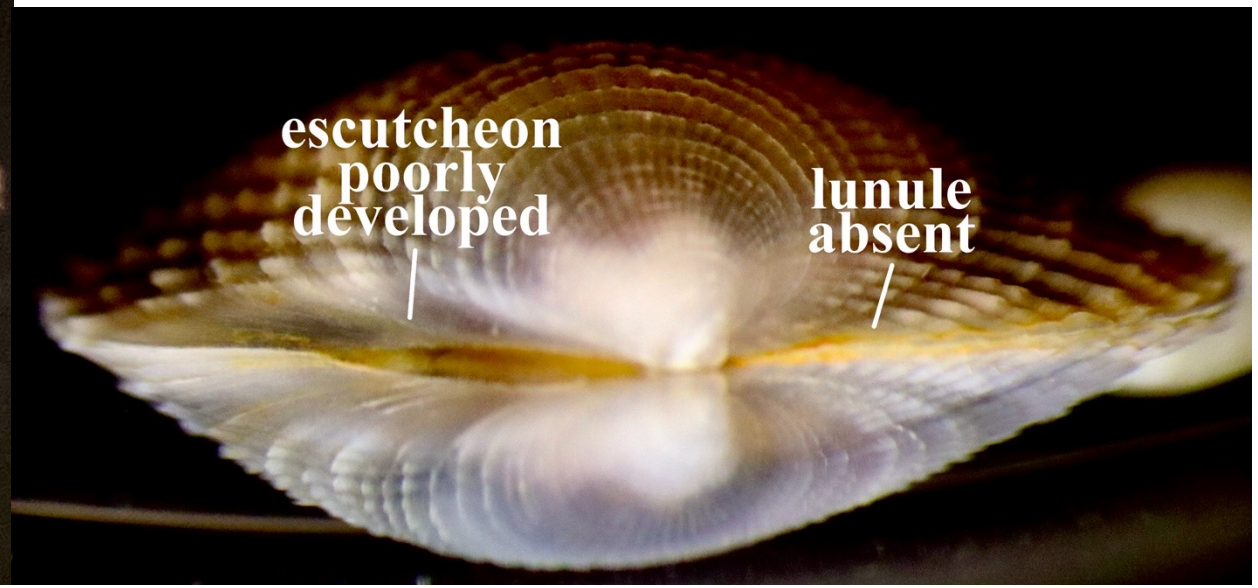
Chione undatella
San Diego Bay 5m

Chionista fluctifraga
Sweetwater River 0m

Chione/Chionista



Chione undatella

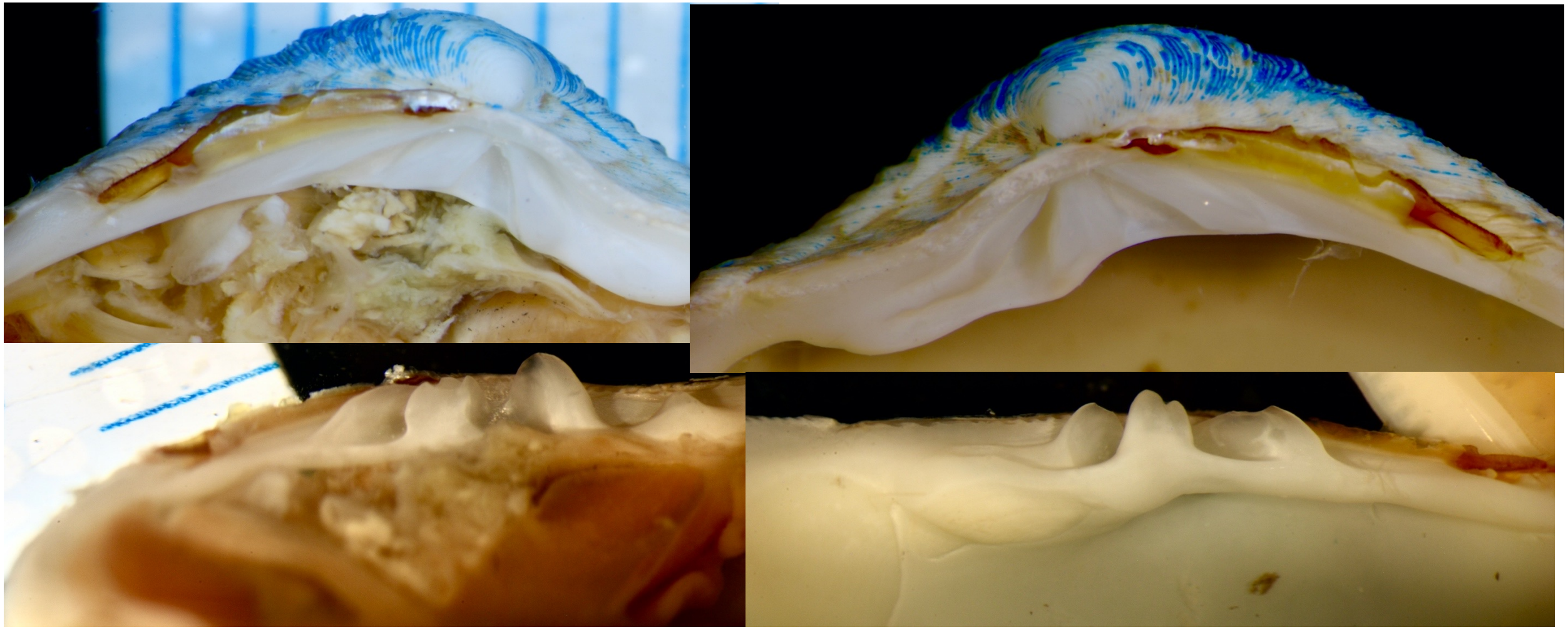


Chionista fluctafraga

Globivenus fordii (Yates 1890)

Avalon 005 30m 2005

Globivenus fordii (Yates 1890)



B’08 7527 42m

left hinge

right hinge

Globivenus fordii (Yates 1890)

Catalina
Two Harbors
Beach Drift 1976

Left hinge

Specimens courtesy of
Carol Paquette MBC

Globivenus fordii (Yates 1890)

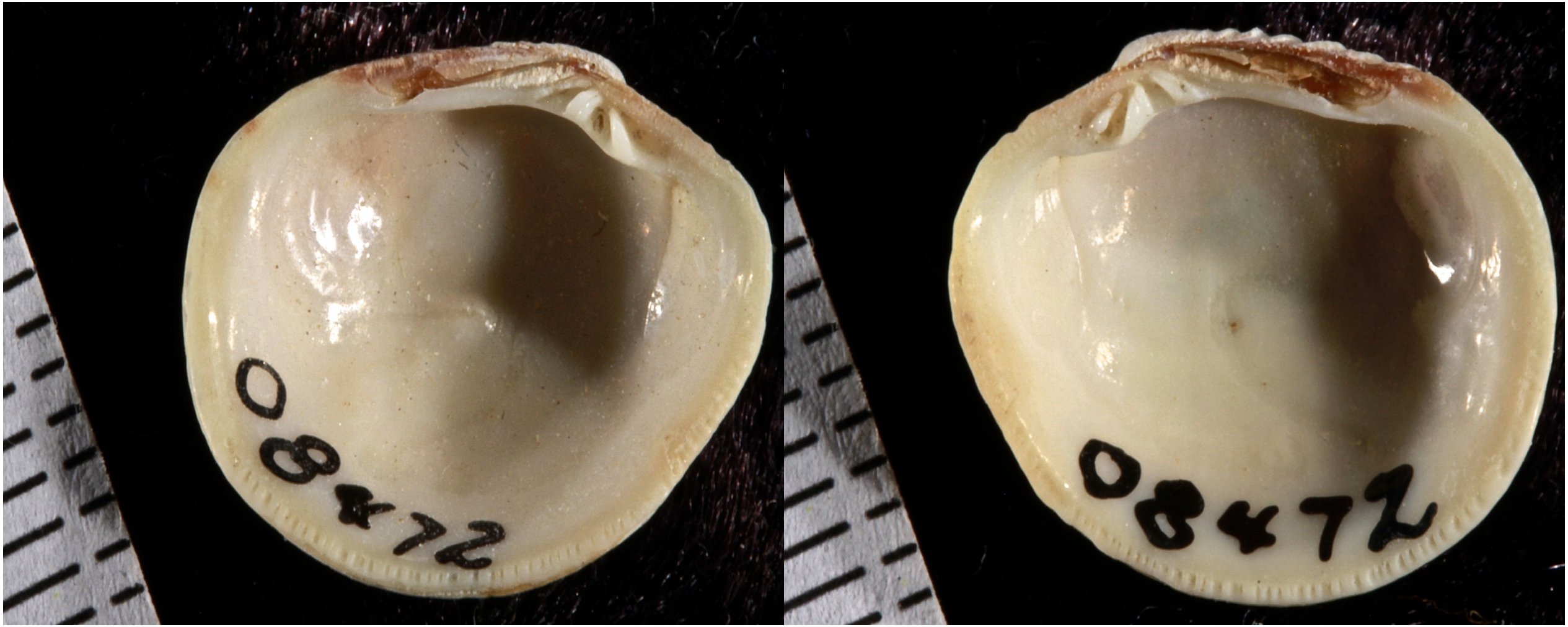
Catalina
Two Harbors
Beach Drift

Right hinge

Irusella lamellifera (Conrad 1837)

SBMNH 08742 San Pedro 1940's
Photos courtesy of Dr. Paul Valentich-Scott

Irusella lamellifera (Conrad 1837)



left valve SBMNH 08742 San Pedro 1940's right valve

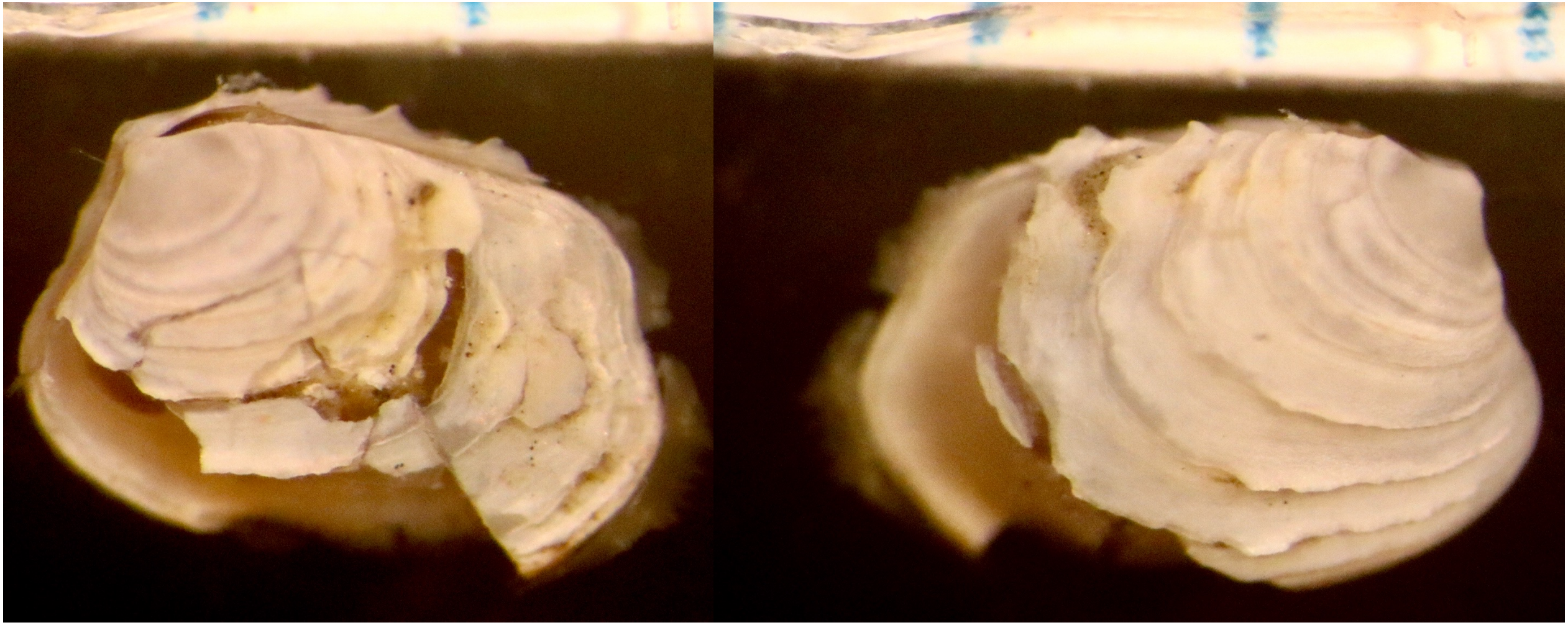
Photos courtesy of Dr. Paul Valentich-Scott

Irusella lamellifera (Conrad 1837)

WLNG Subtidal B-12 18m 1980

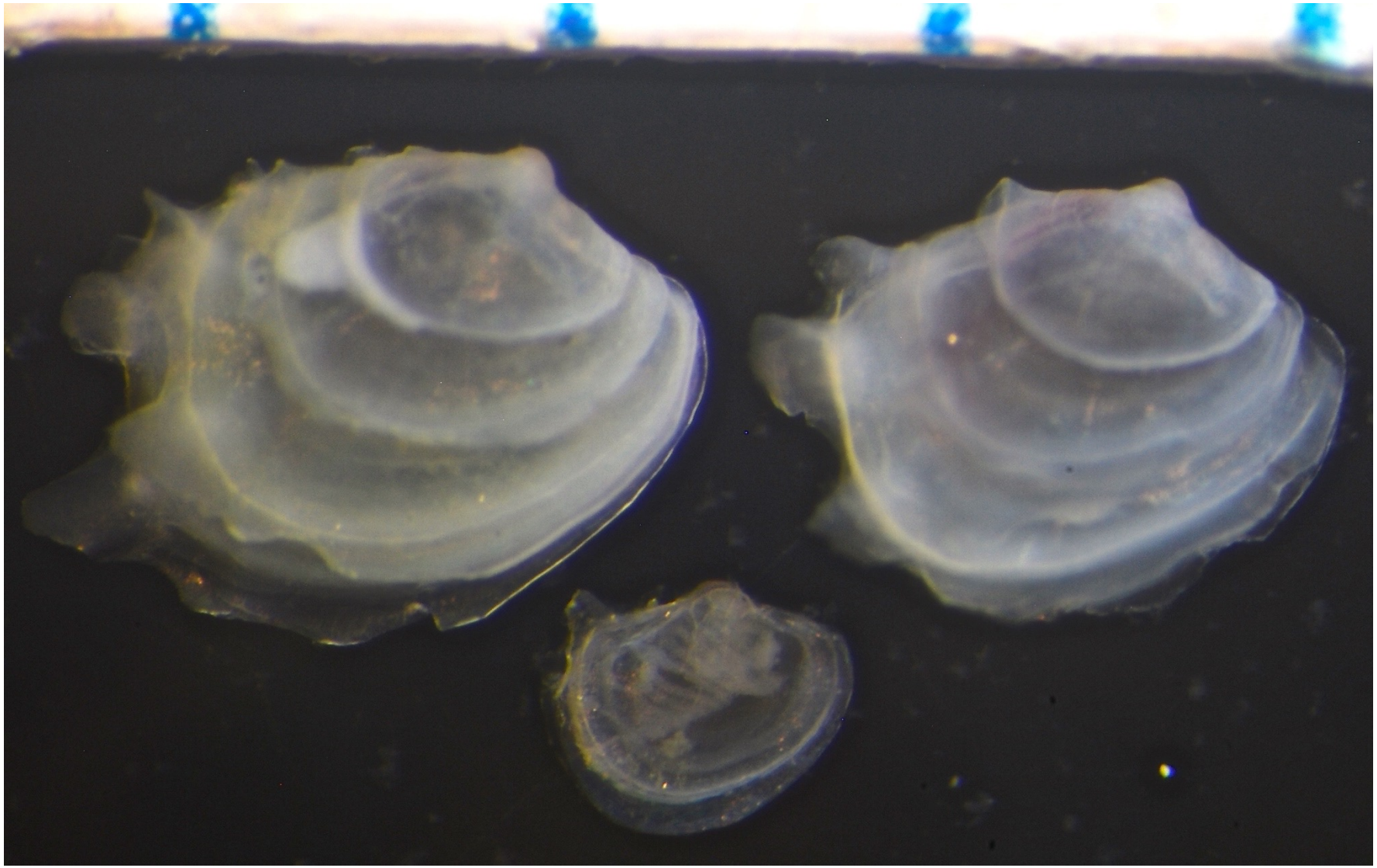
Specimen courtesy of Carol Paquette MBC

Irusella lamellifera (Conrad 1837)



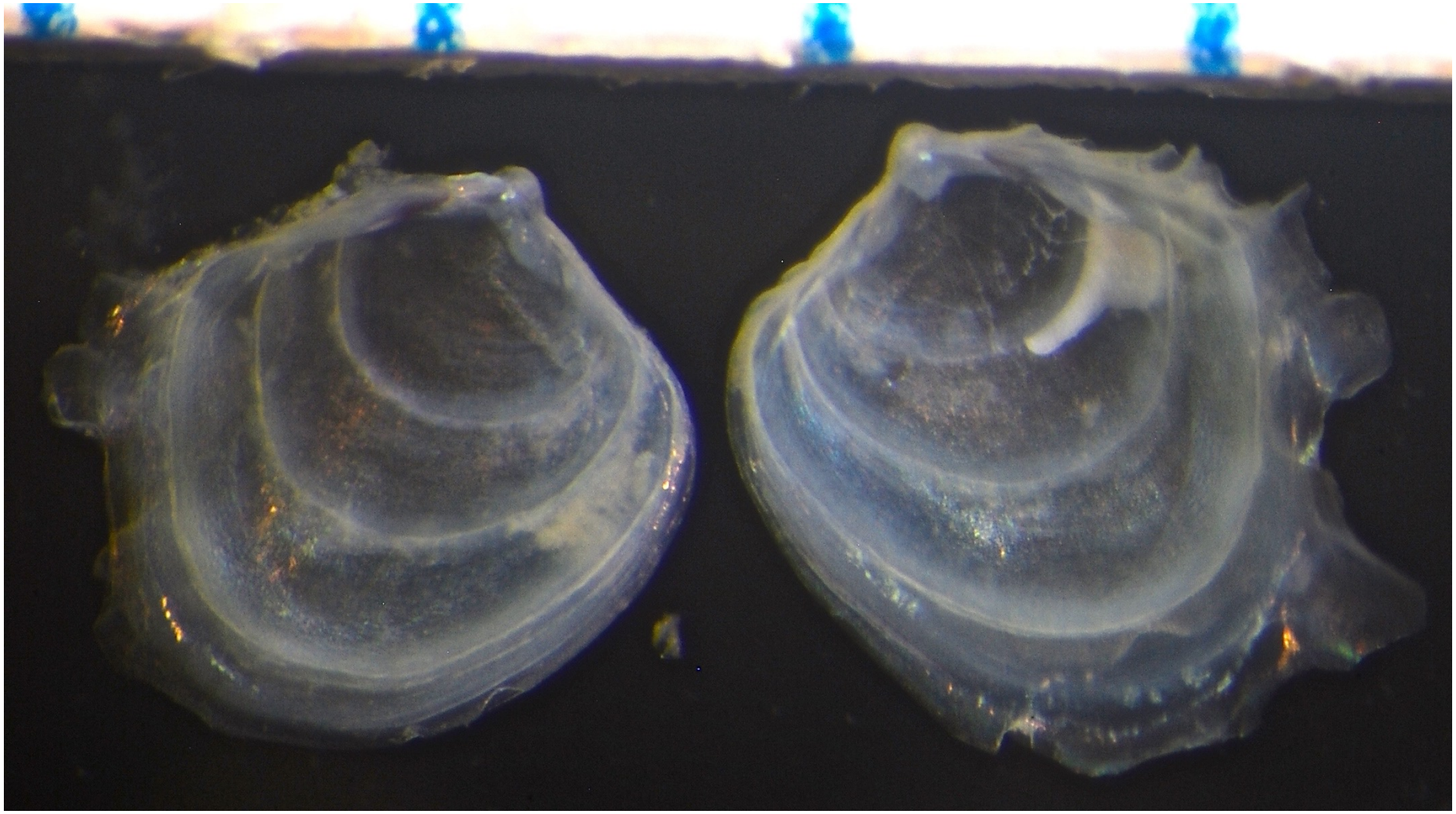
Ballona Creek Estuary Pacific Bridge 5m 2020

Irusella lamellifera (Conrad 1837)



Long Beach Harbor Breakwater Rip-Rap LBRR1/Q1-2B 2018

Irusella lamellifera (Conrad 1837)

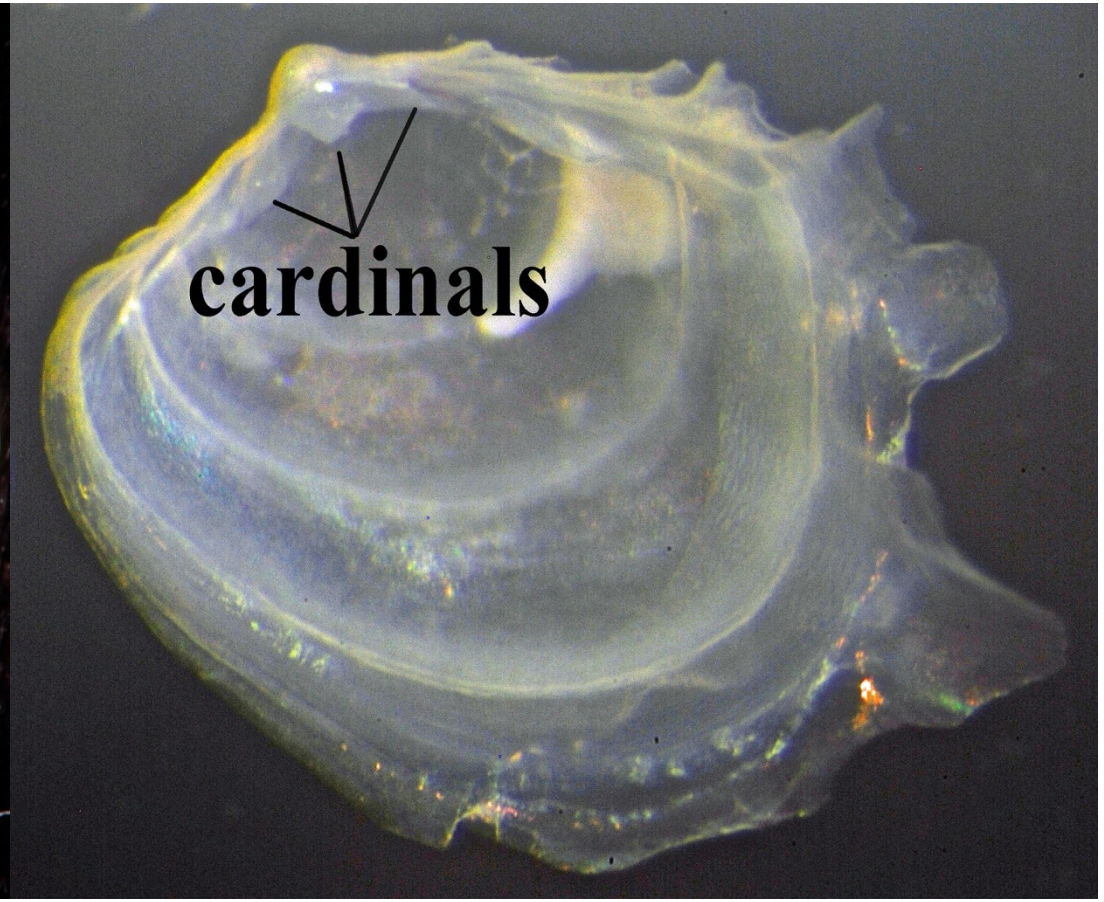


Long Beach Harbor Breakwater Rip-Rap LBRR1/Q1-2B 2018

left valve right valve

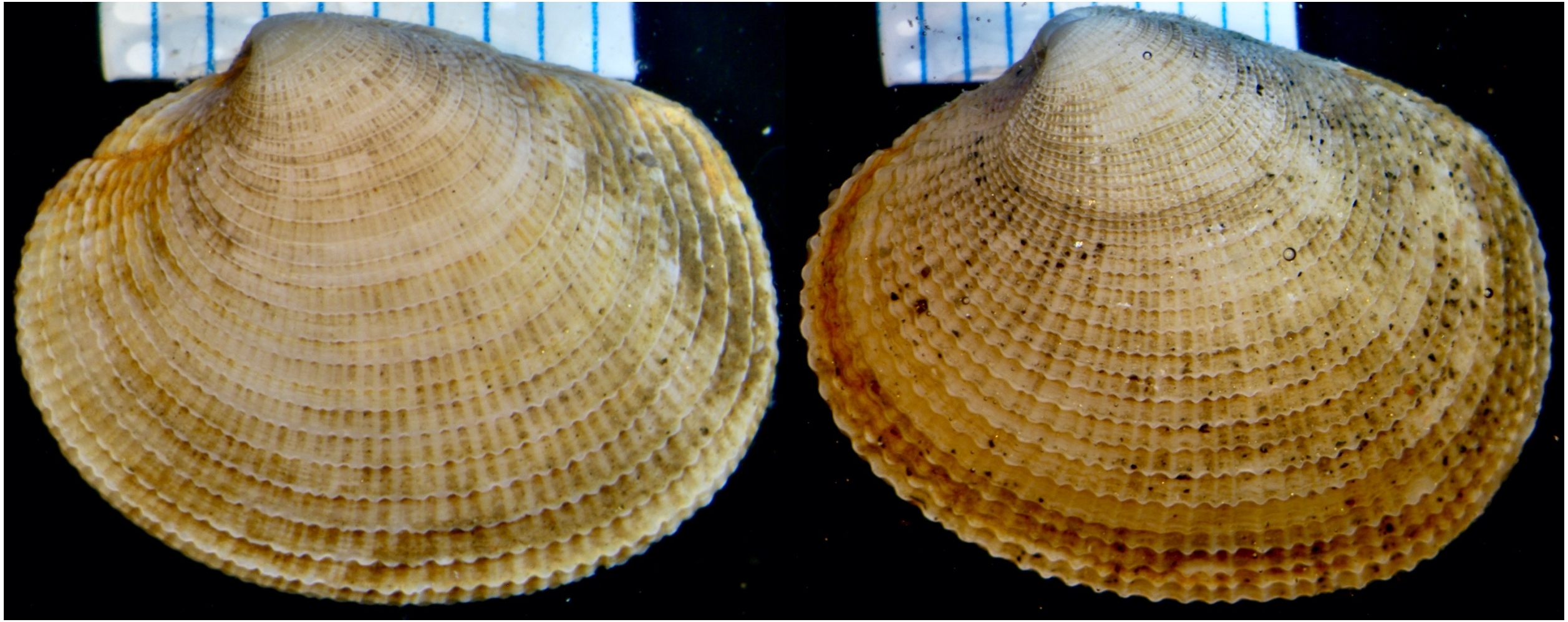
Irusella lamellifera (Conrad 1837)

Right valve subadult



Right valve juvenile

Leukoma laciniata (Carpenter 1864)



ISS Voucher Port Hueneme 3047QX13.01 7/26/2006

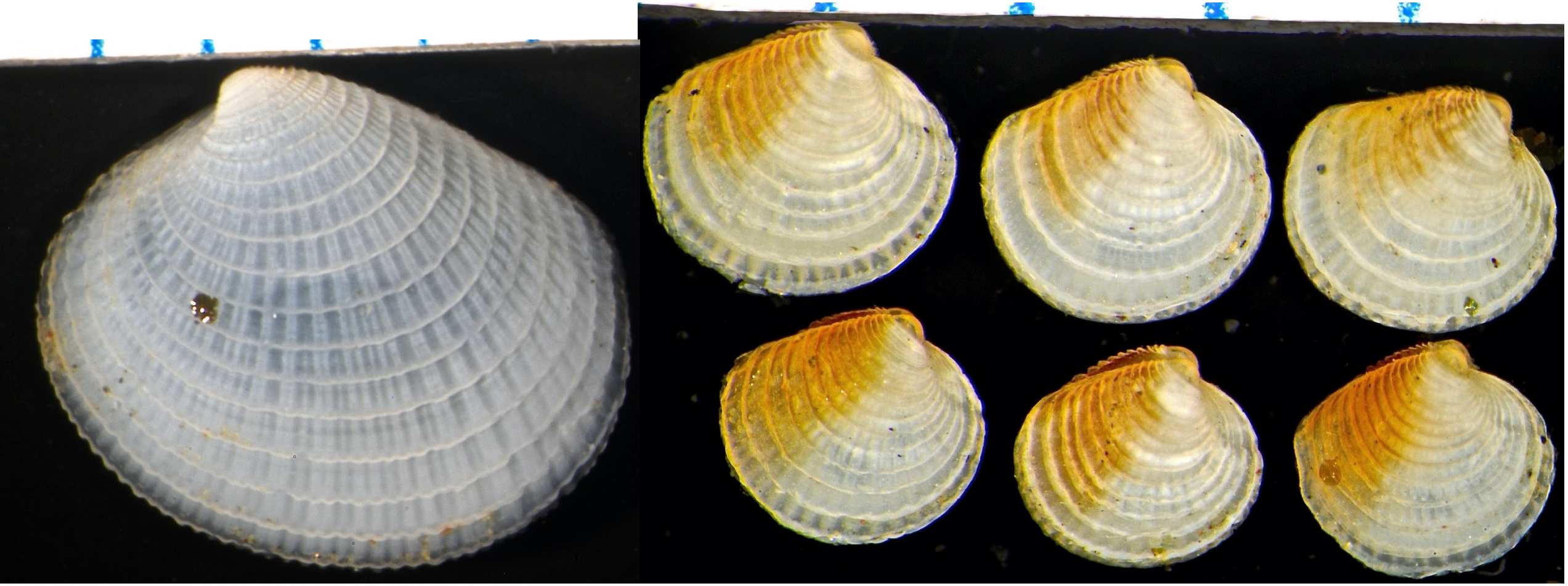
San Diego Bay Merkel CB-ES (rep3) 1m 2020

Leukoma laciniata (Carpenter 1864)

Colorado Lagoon 2m 2017

B’18 10165 Newport Bay 1m

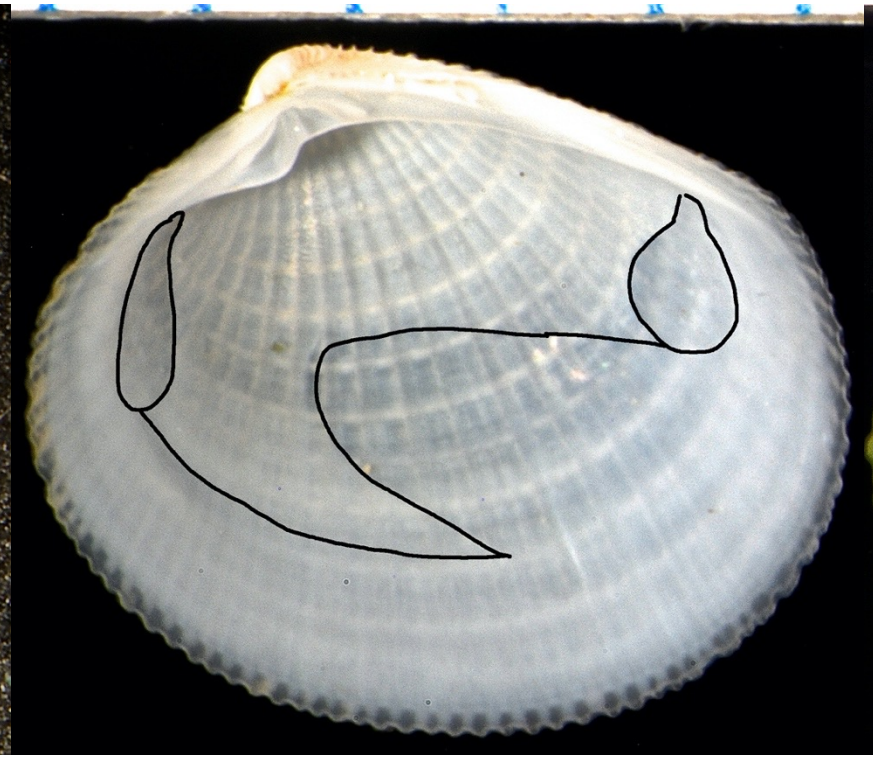
Leukoma laciniata (Carpenter 1864)



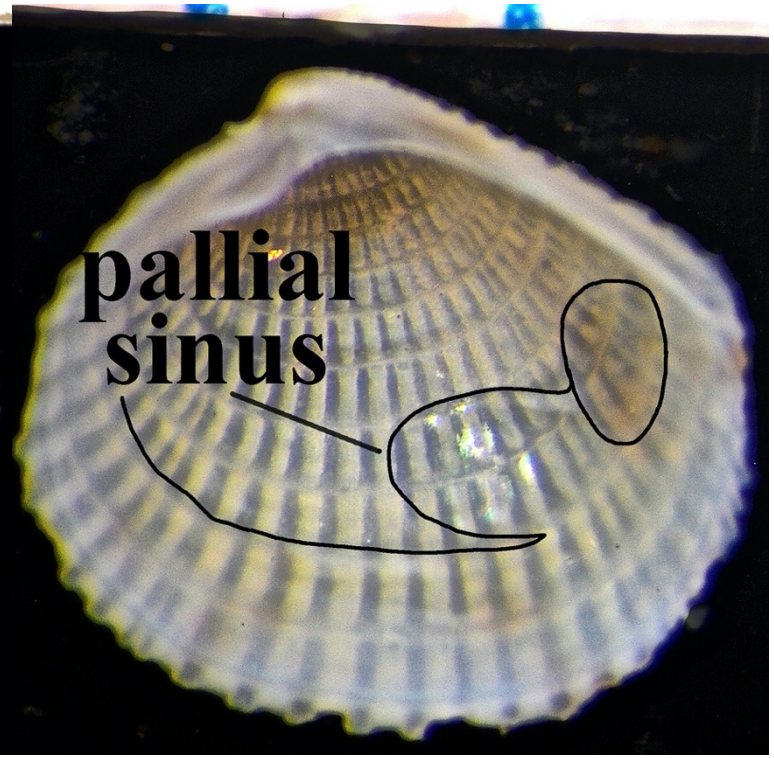
Oxnard 30m 2017

Leukoma laciniata (Carpenter 1864)

10 mm pallial sinus Talbert Marsh 2016



5 mm pallial sinus Oxnard 10m 2017



3 mm pallial sinus B’18 Newport Bay 6m

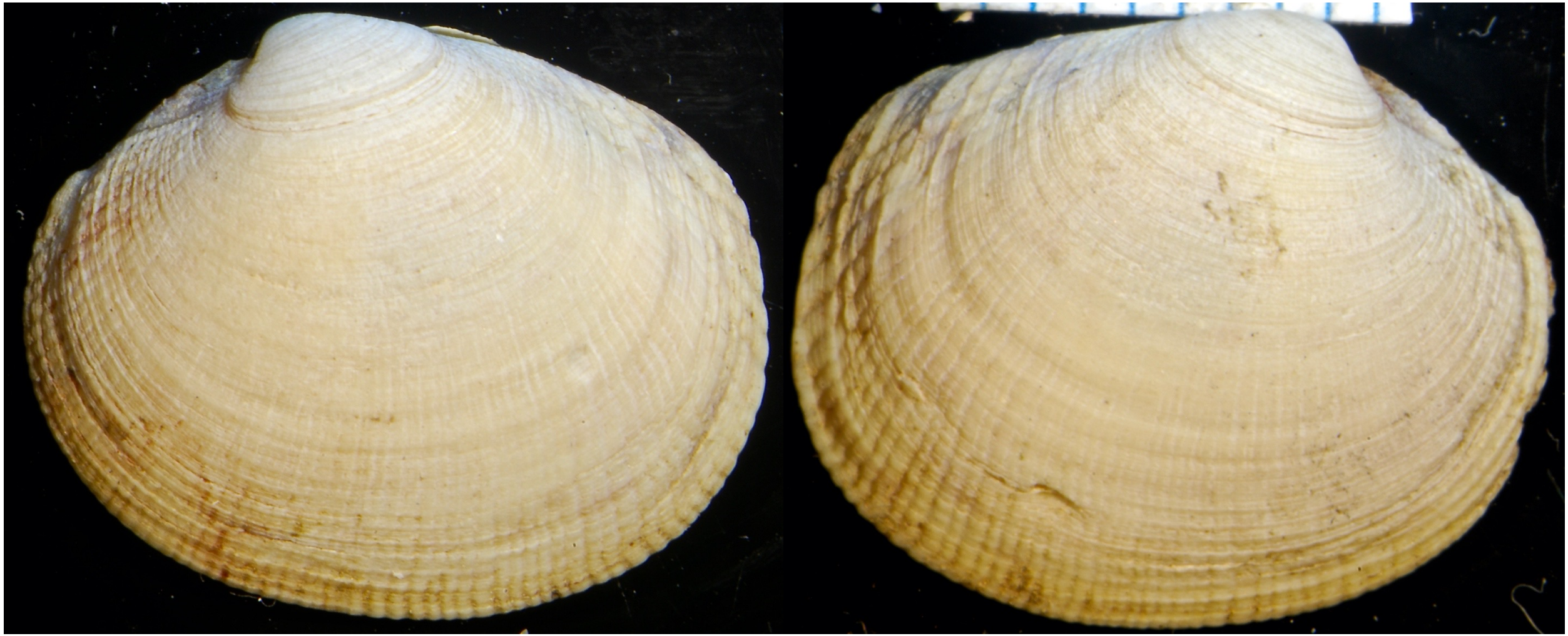
Leukoma staminea (Conrad 1837)

Goleta Slough 5m 2020

Leukoma staminea (Conrad 1837)

Goleta Slough 5m 2019

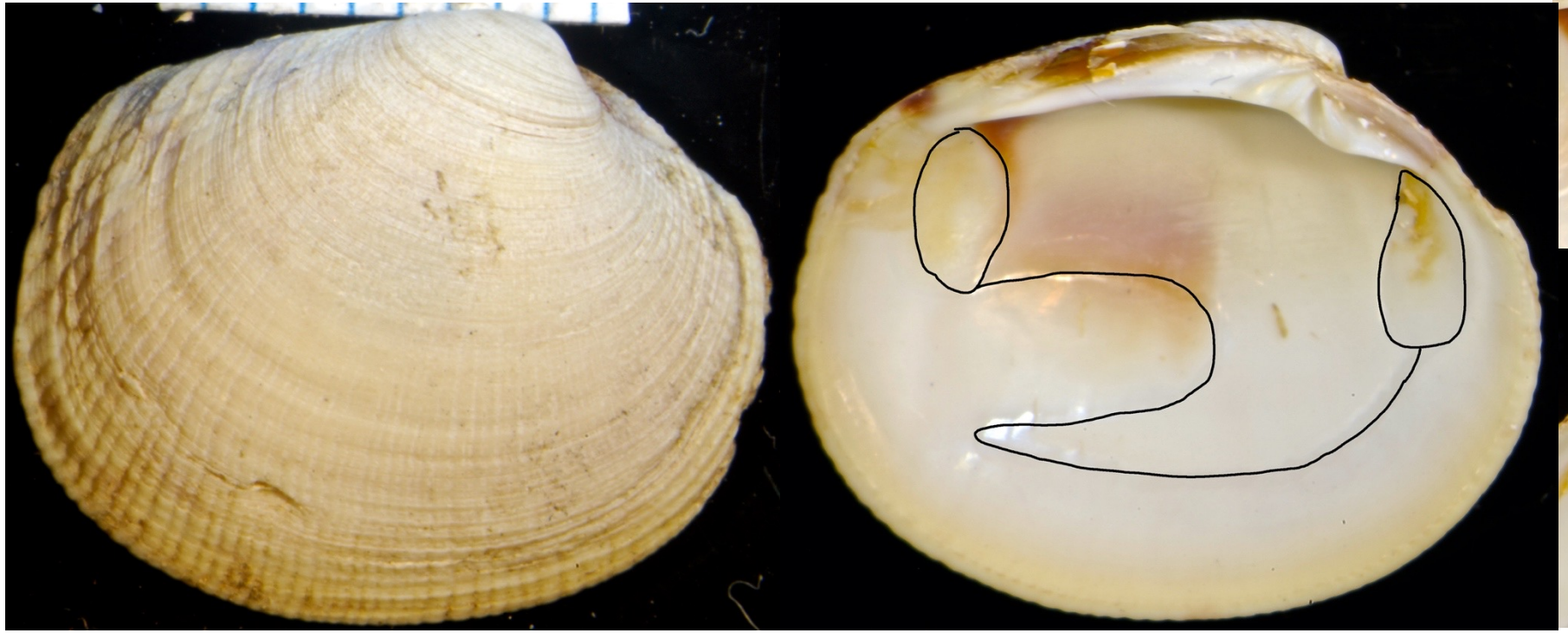
Leukoma staminea (Conrad 1837)



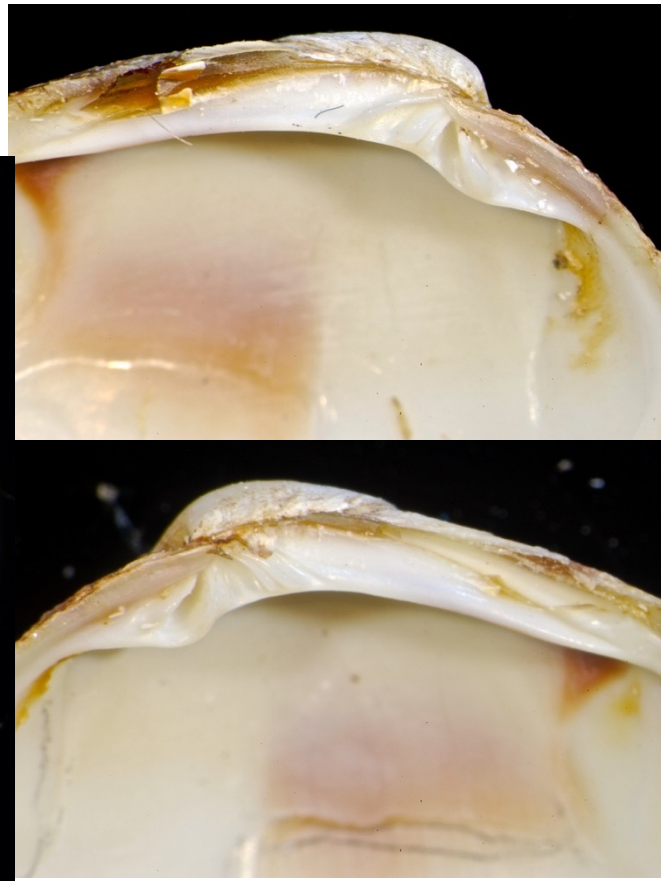
Pelican Point Intertidal 1969

Specimen courtesy of Carol Paquette MBC

Leukoma staminea (Conrad 1837)



Pelican Point Intertidal 1969



left hinge above, right hinge below

Leukoma laciniata/staminea

Colorado Lagoon 2m 2017

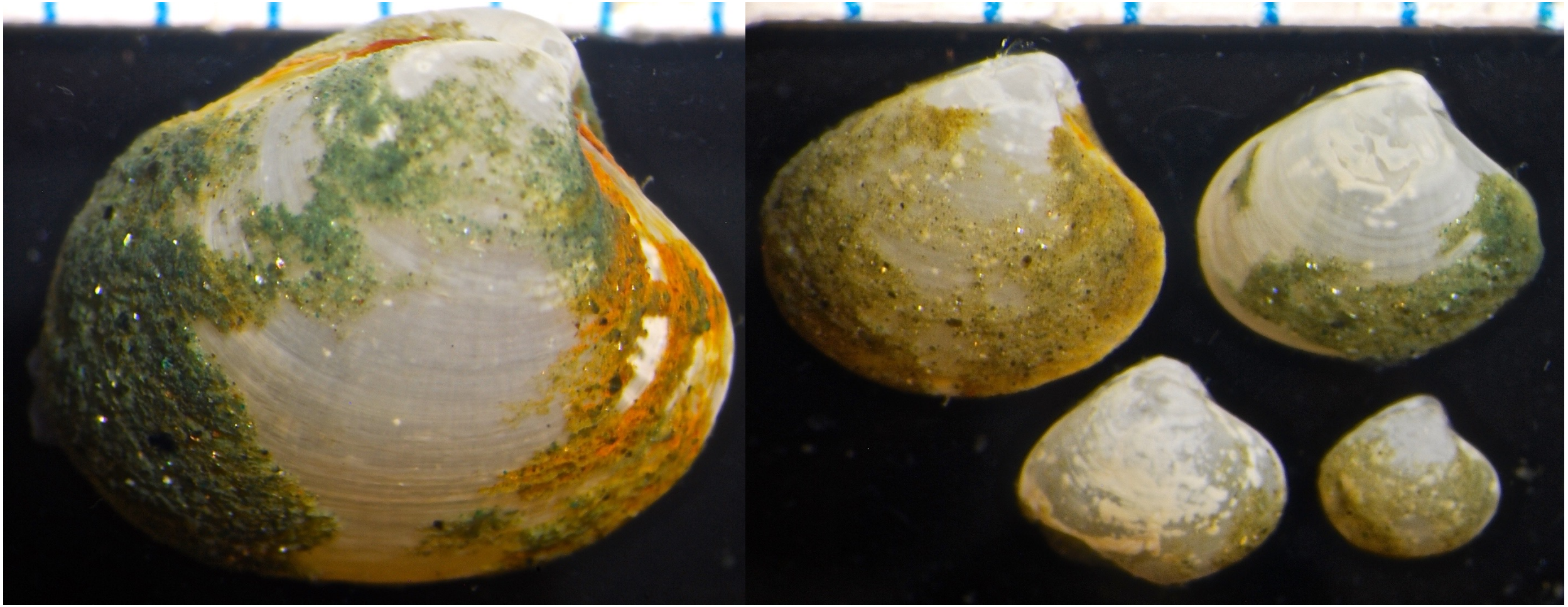
Goleta Slough 1m 2019

Leukoma laciniata/staminea

Orange County Public Works Bolsa Chica BCEPAC 5m 2020

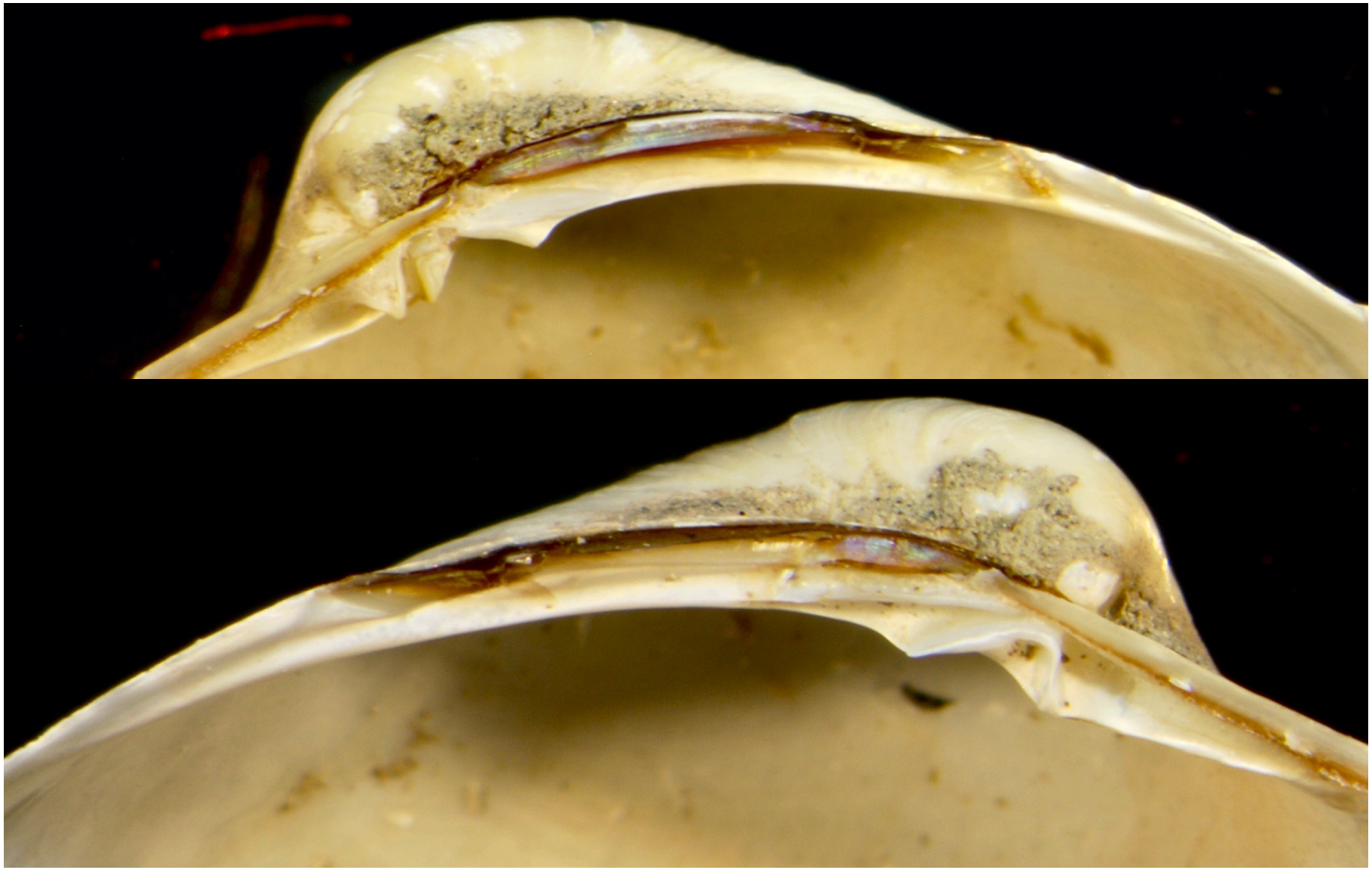
Goleta Slough 2m 2020

Compsomyax subdiaphana (Carpenter 1864)



Long Beach Harbor Anchor PORTS 14m 2018

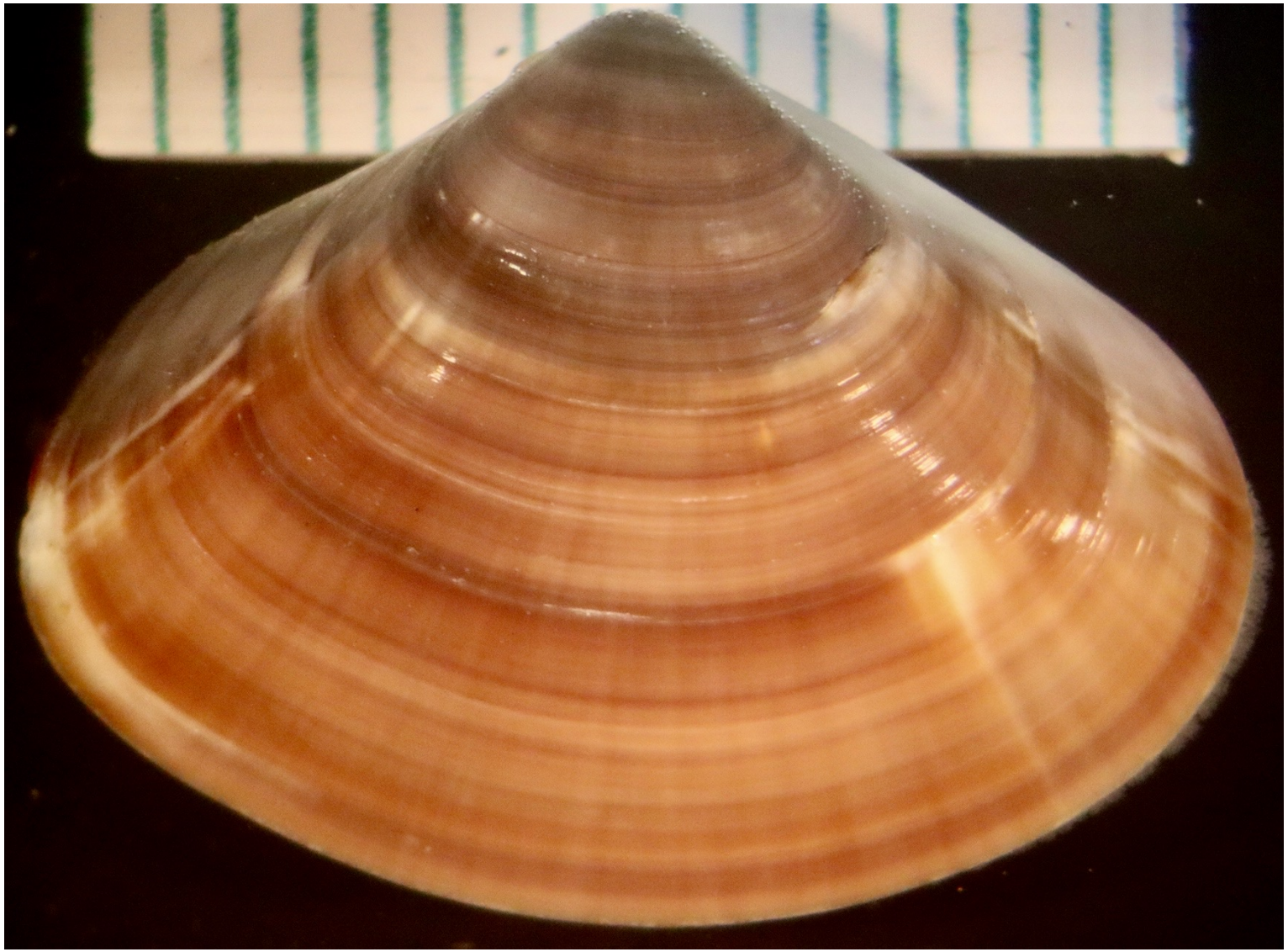
Compsomyax subdiaphana (Carpenter 1864)



ISS Los Angeles/Long Beach Harbors 6111QX13 4/20/2011

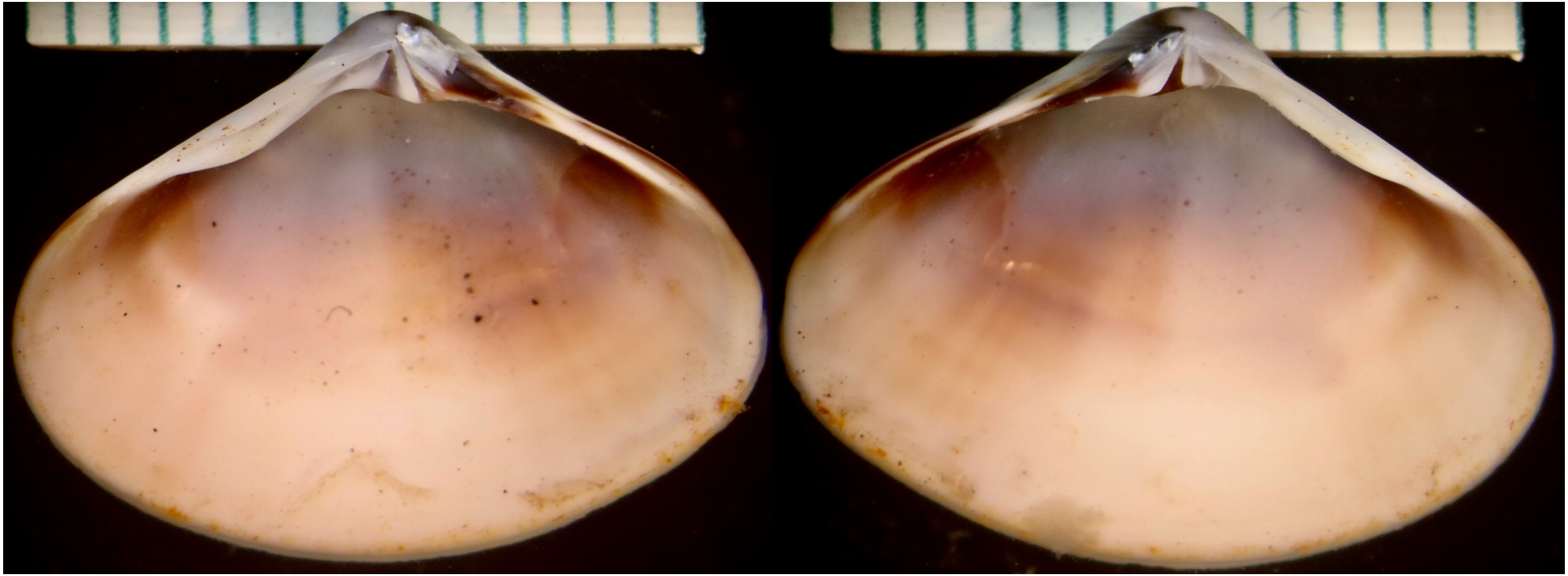
left valve above right valve below

Tivela stultorum (Mawe 1823)



Carpenteria Intertidal May 2022

Tivela stultorum (Mawe 1823)



Carpenteria Intertidal May 2022

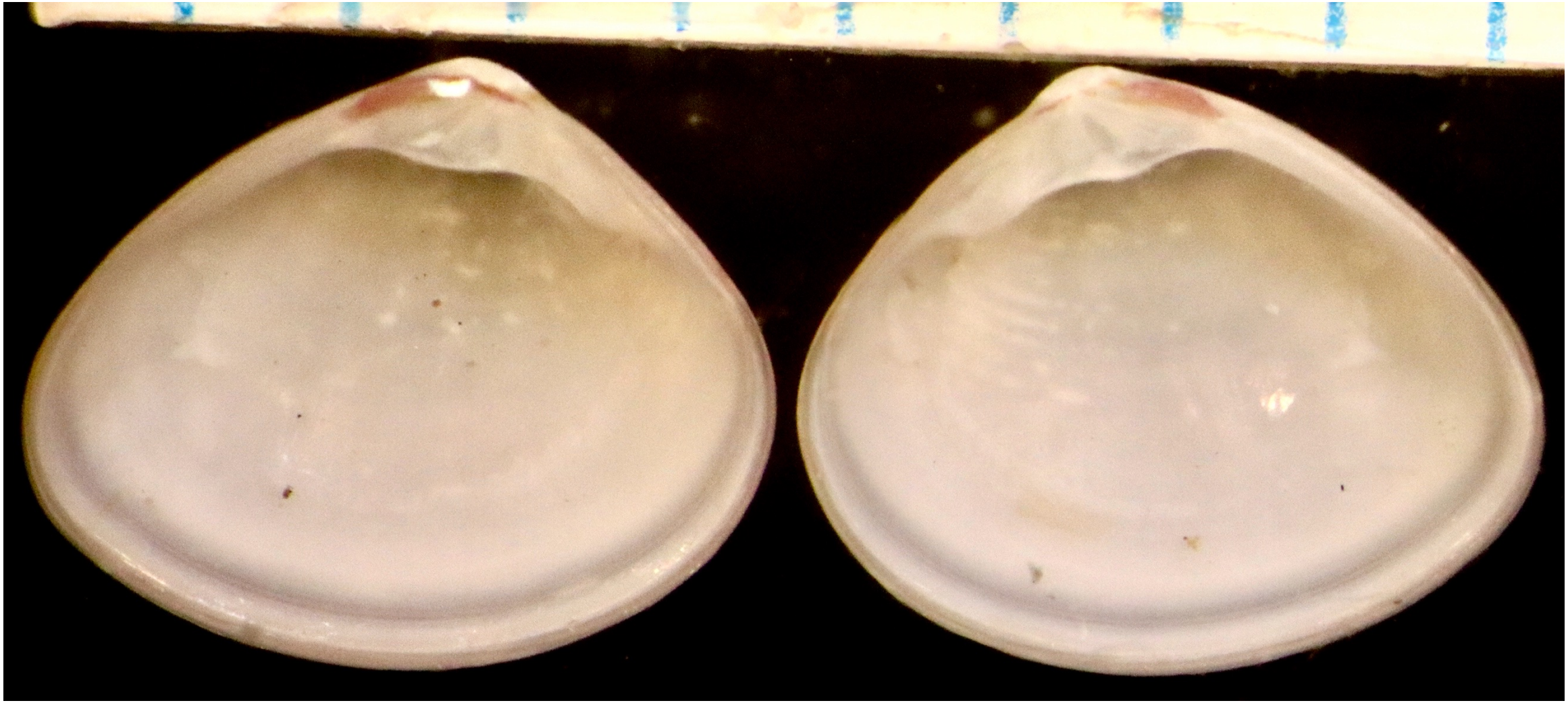
left hinge

right hinge

Nutricola confusa ((S. Gray 1982)

ISS Point Reyes 4062QX13 6/4/07

Nutricola confusa ((S. Gray 1982)



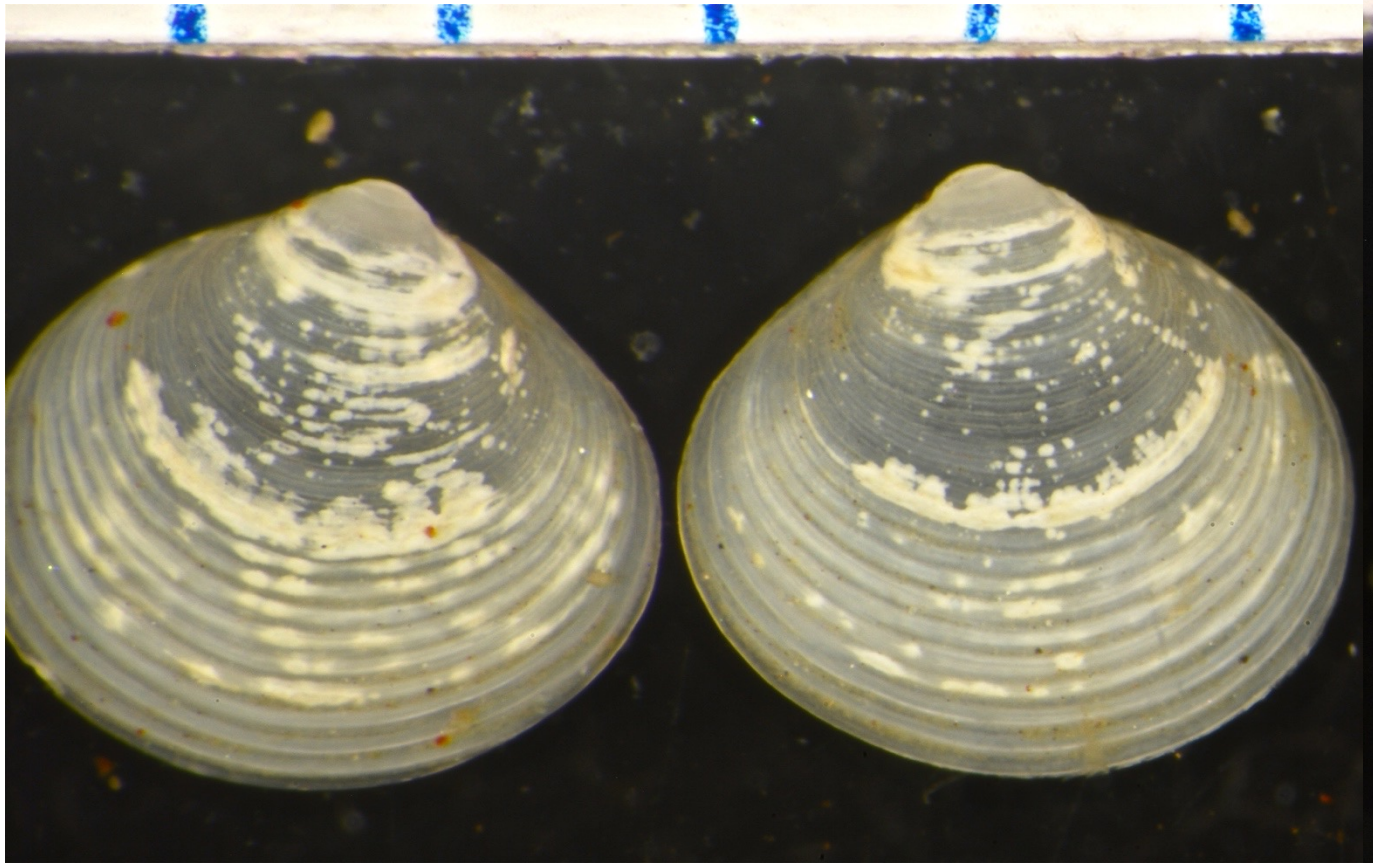
ISS Point Arenas 4019QX13 6/3/07

right hinge left hinge

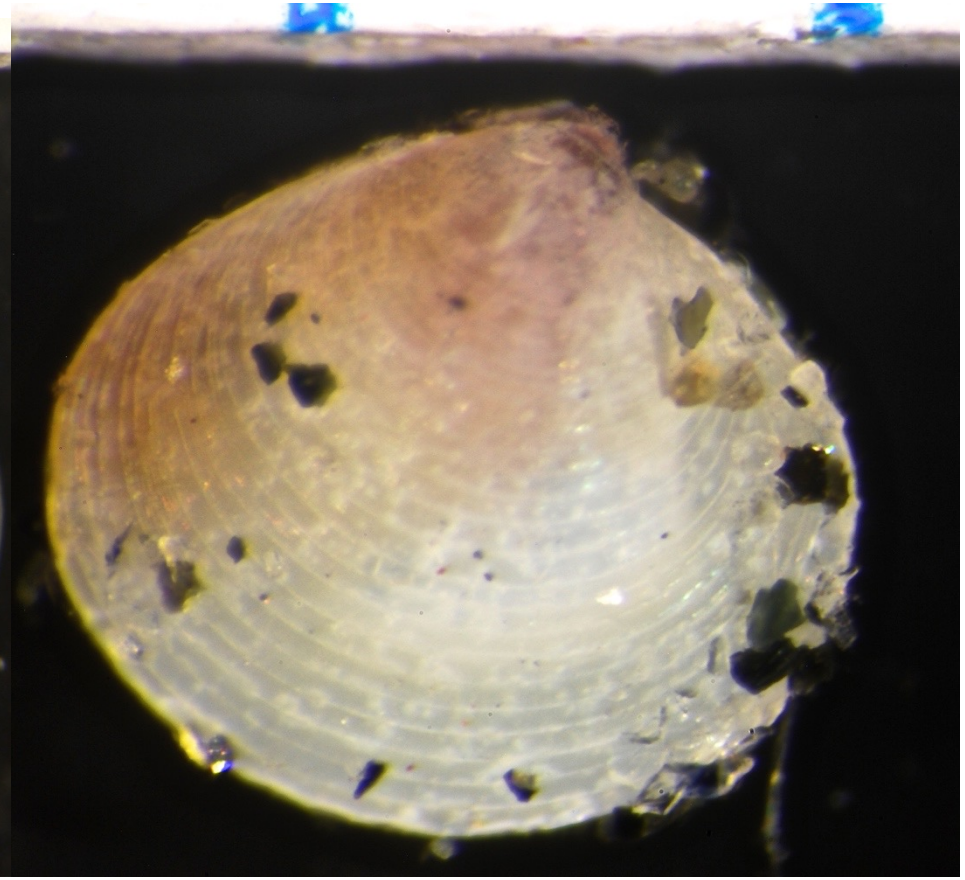
Nutricola confusa ((S. Gray 1982)

ISS Point Reyes 4062QX13 6/4/07

Nutricola cymata (Dall 1913)



B’13 9357 Northern Channel Islands 57m



San Diego Bay 5m 2015

Nutricola cymata (Dall 1913)

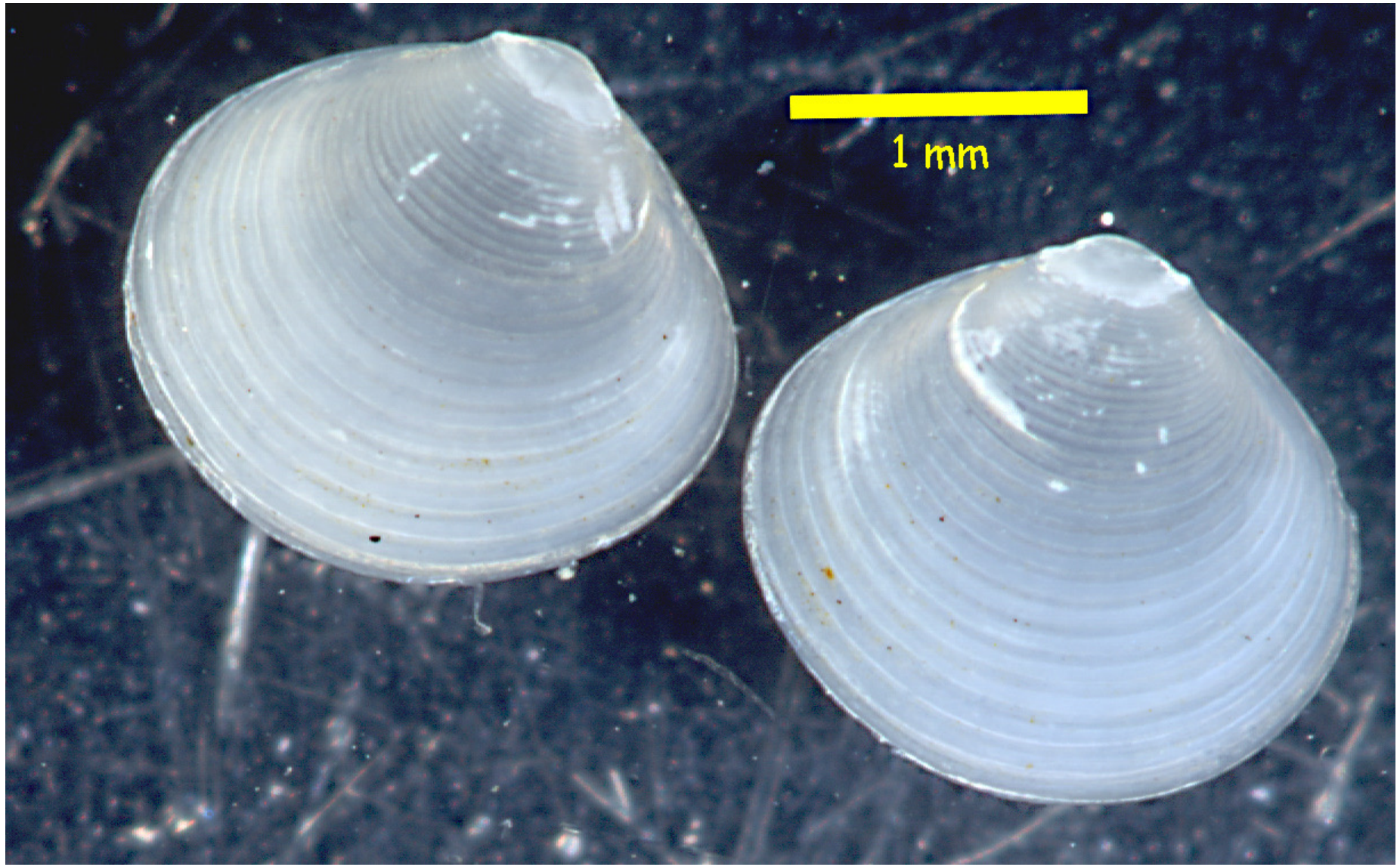
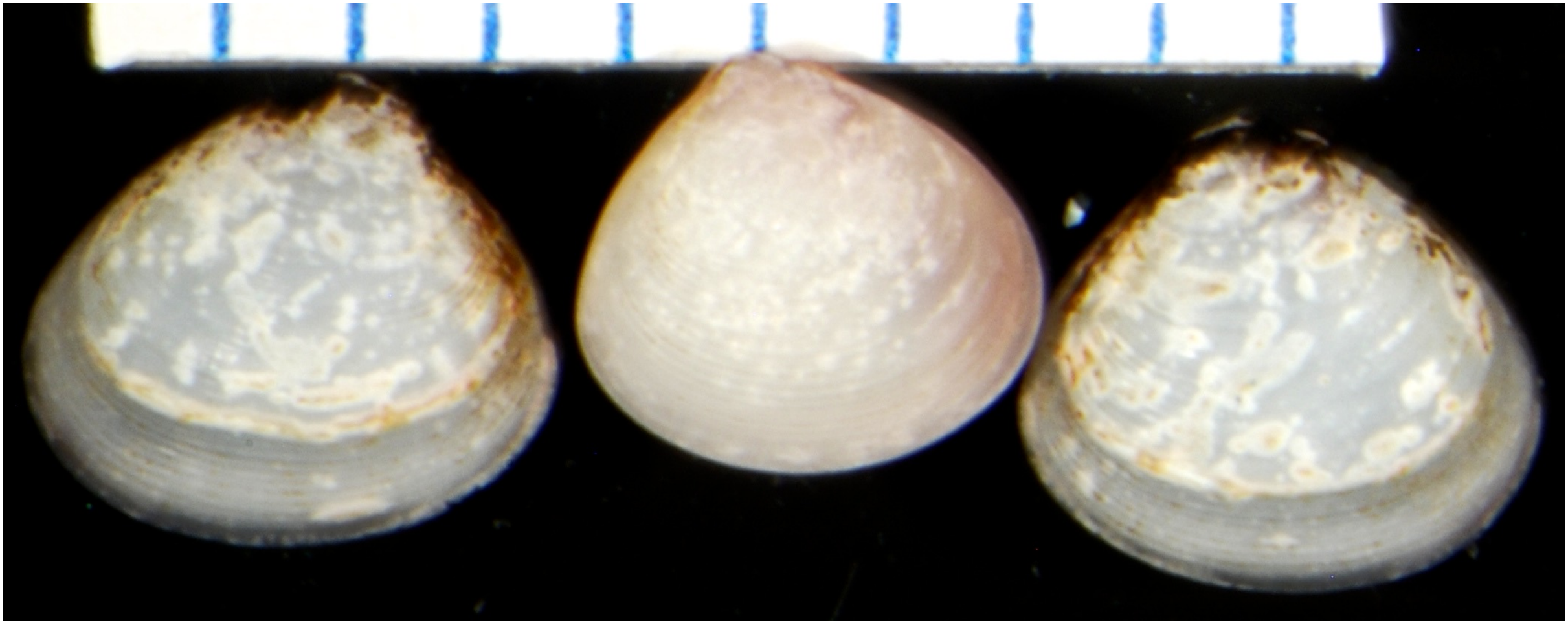


Photo courtesy of Kelvin Barwick

Nutricola lordi (W. Baird 1863)

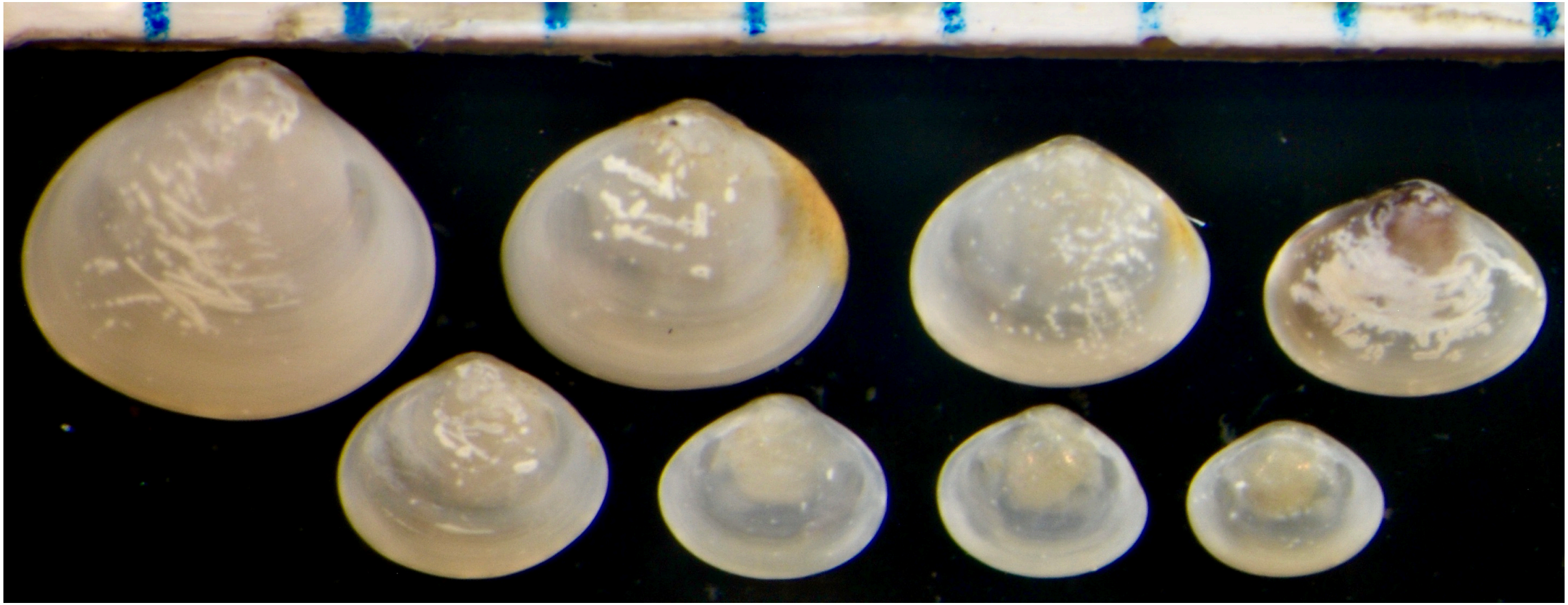


Tomales Bay Hog Island Recon 10m 2011

Nutricola lordi (W. Baird 1863)

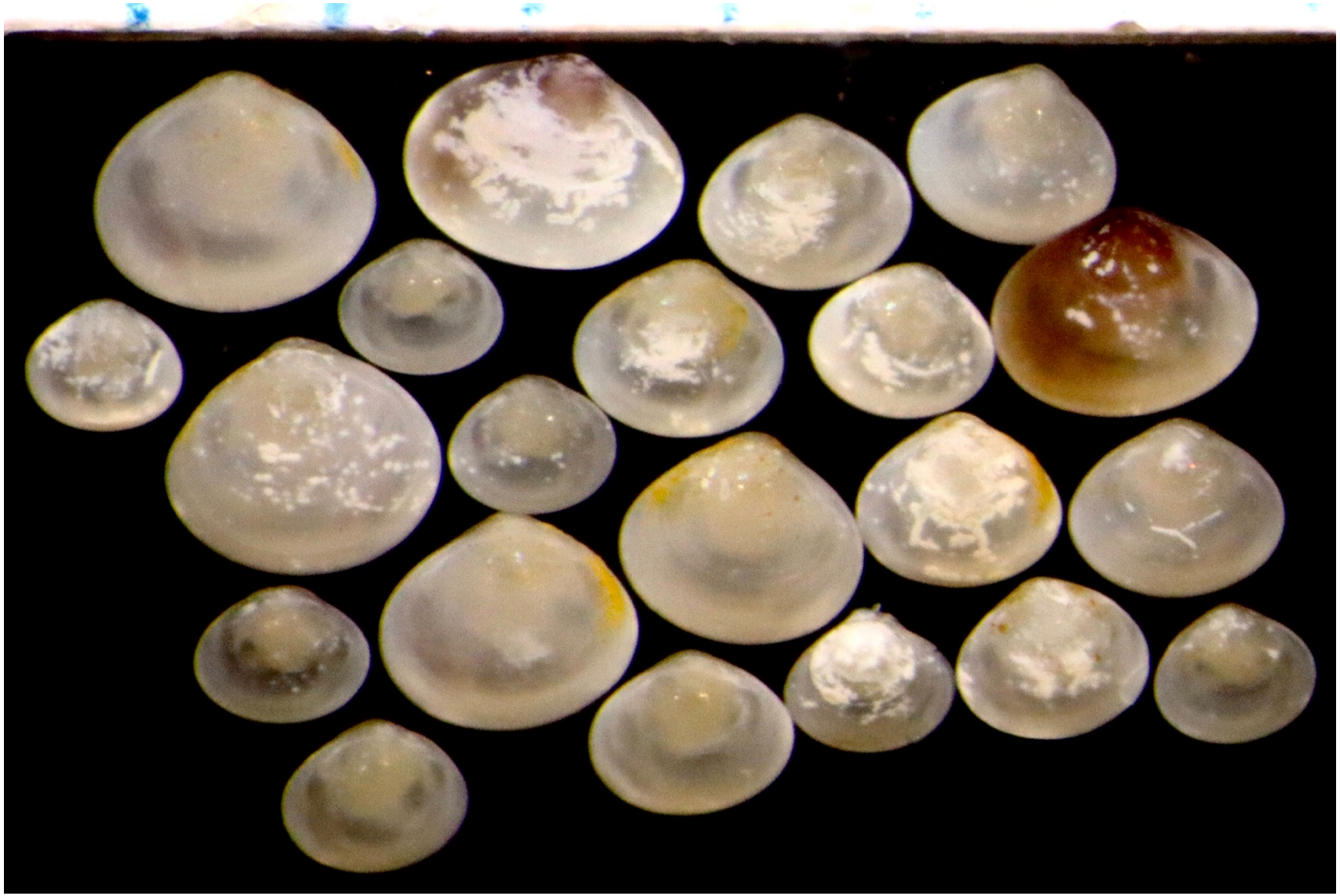
ISS Bodega Bay 5m 3186 QX13 8/11/06

Nutricola lordi (W. Baird 1863)



ISS Bodega Bay 5m 3186 QX13 8/11/06

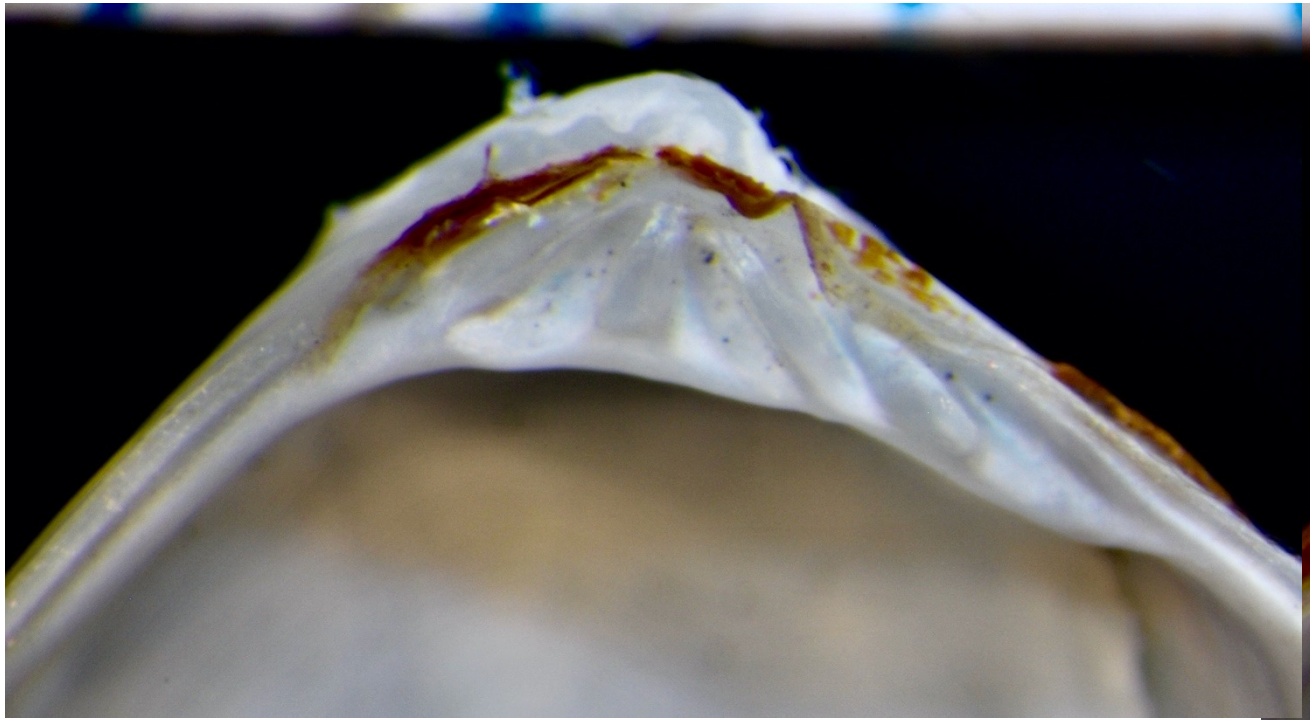
Nutricola lordi (W. Baird 1863)

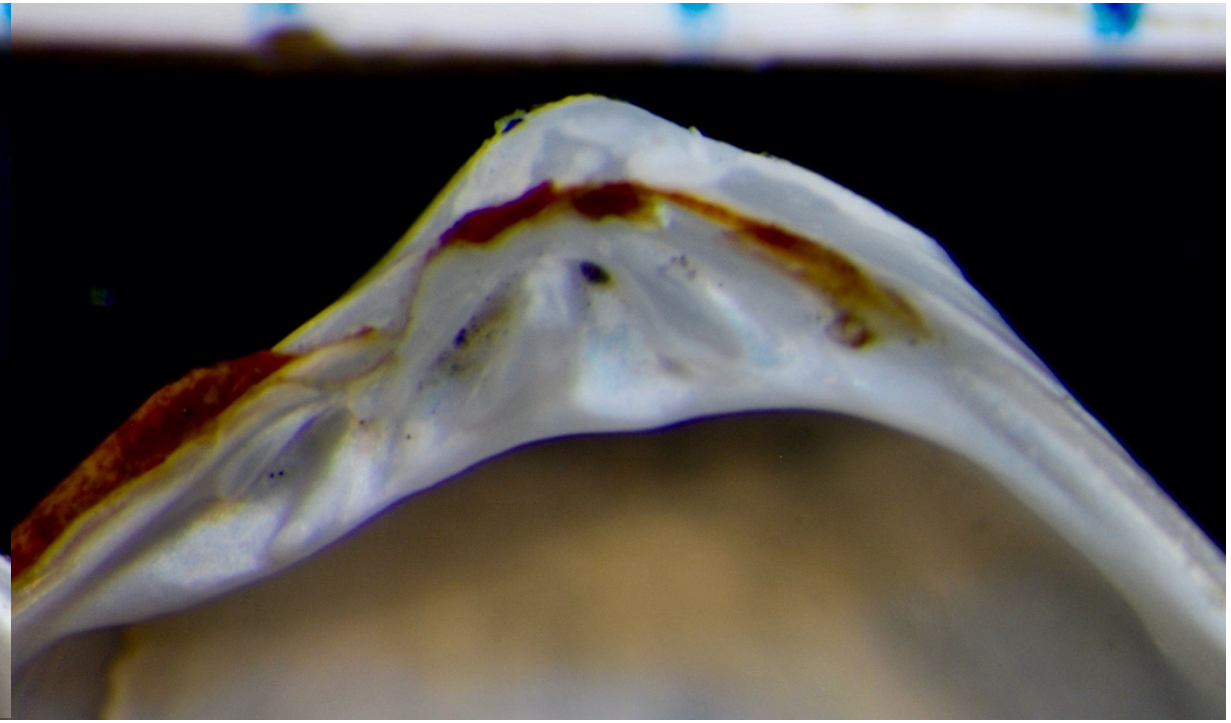


ISS Bodega Bay 3186QX13 5/11/06

Can you find the two Nutricola tantilla……

Nutricola lordi (W. Baird 1863)





ISS Bodega Bay 5m 3186QX13 8/11/06

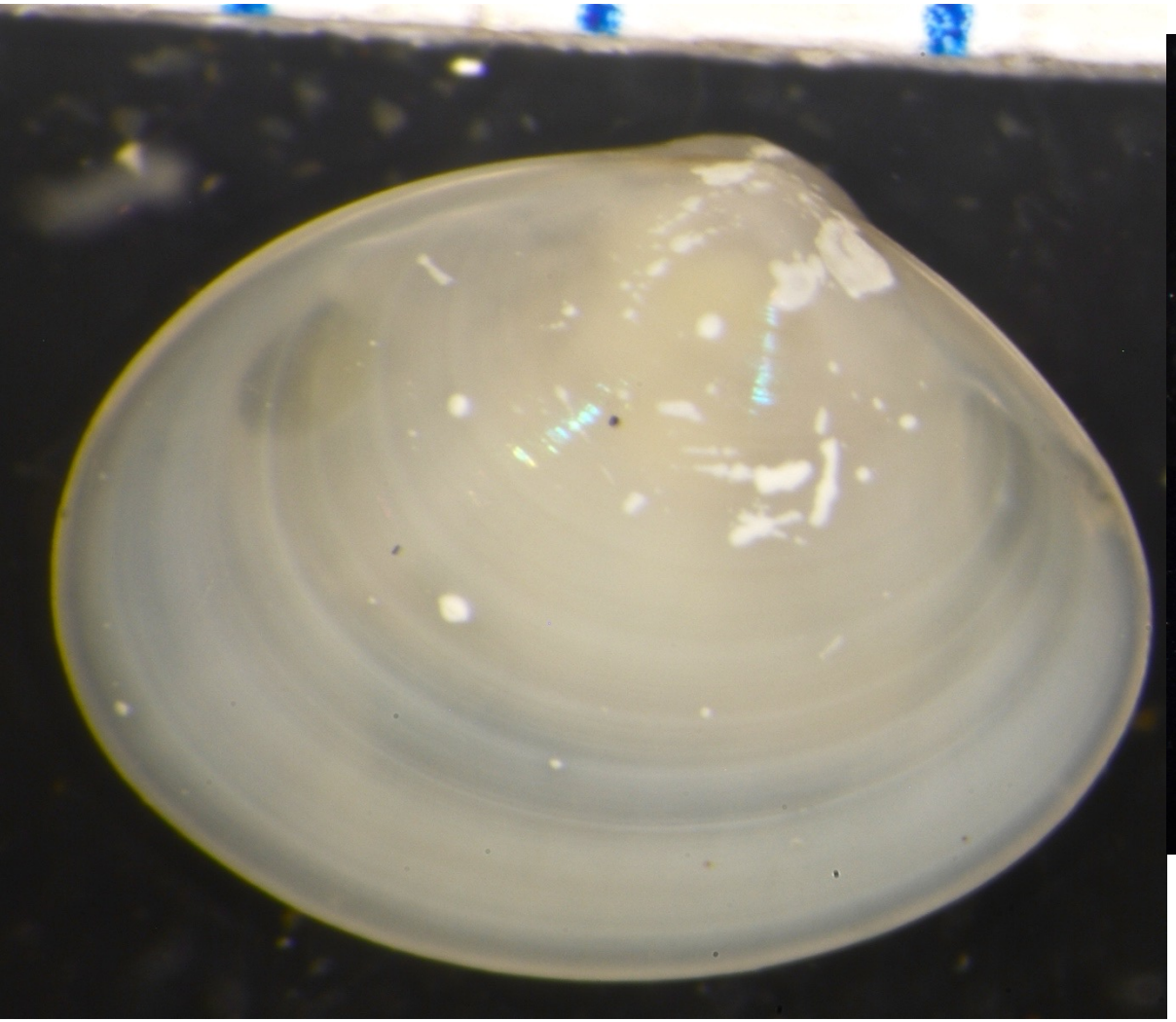
left hinge

right hinge

Nutricola lordi (W. Baird 1863)

Tomales Bay Hog Island Recon 10m 2011

Nutricola ovalis (Dall 1902)



B’13 9428 East Santa Barbara Channel 195m

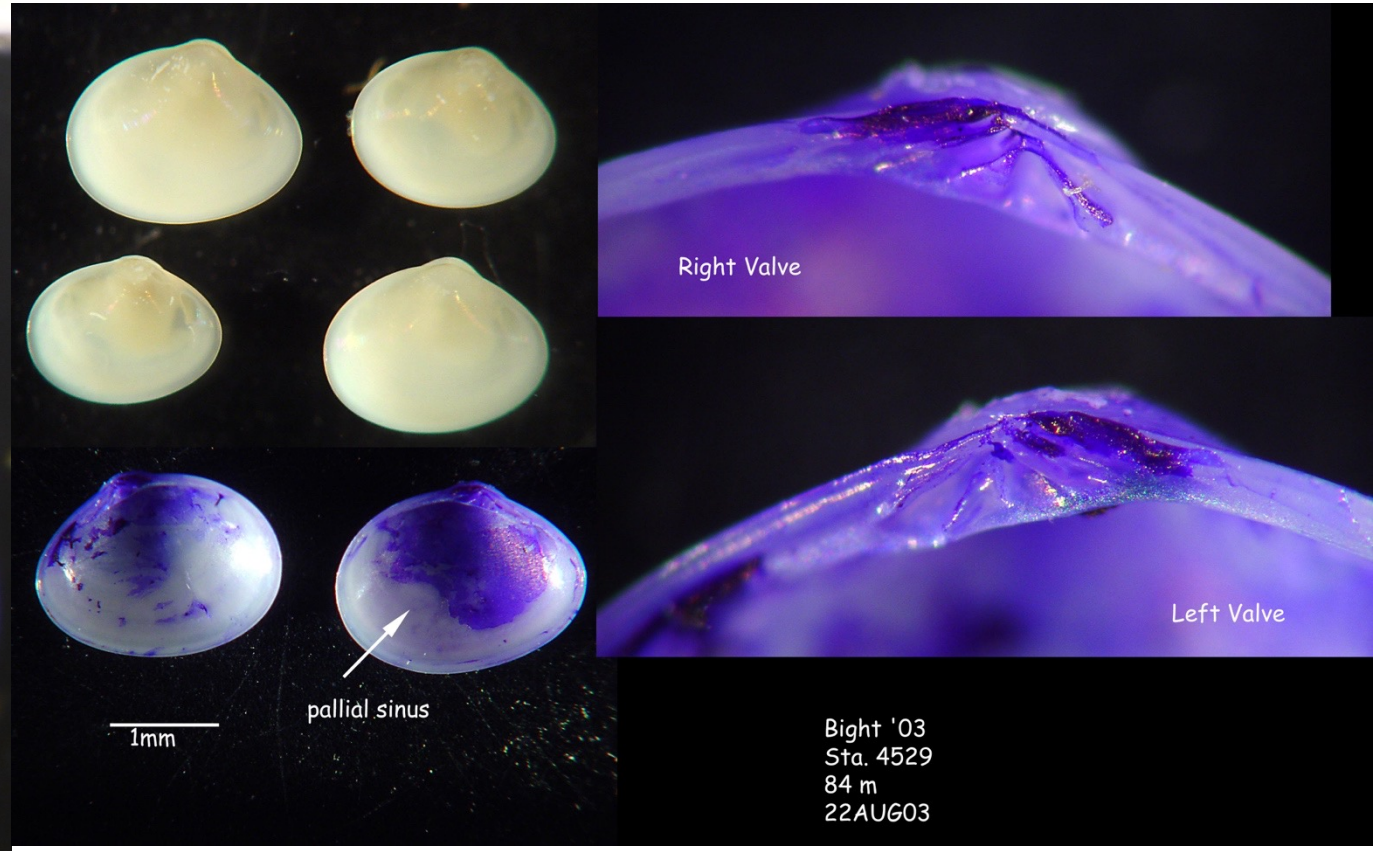


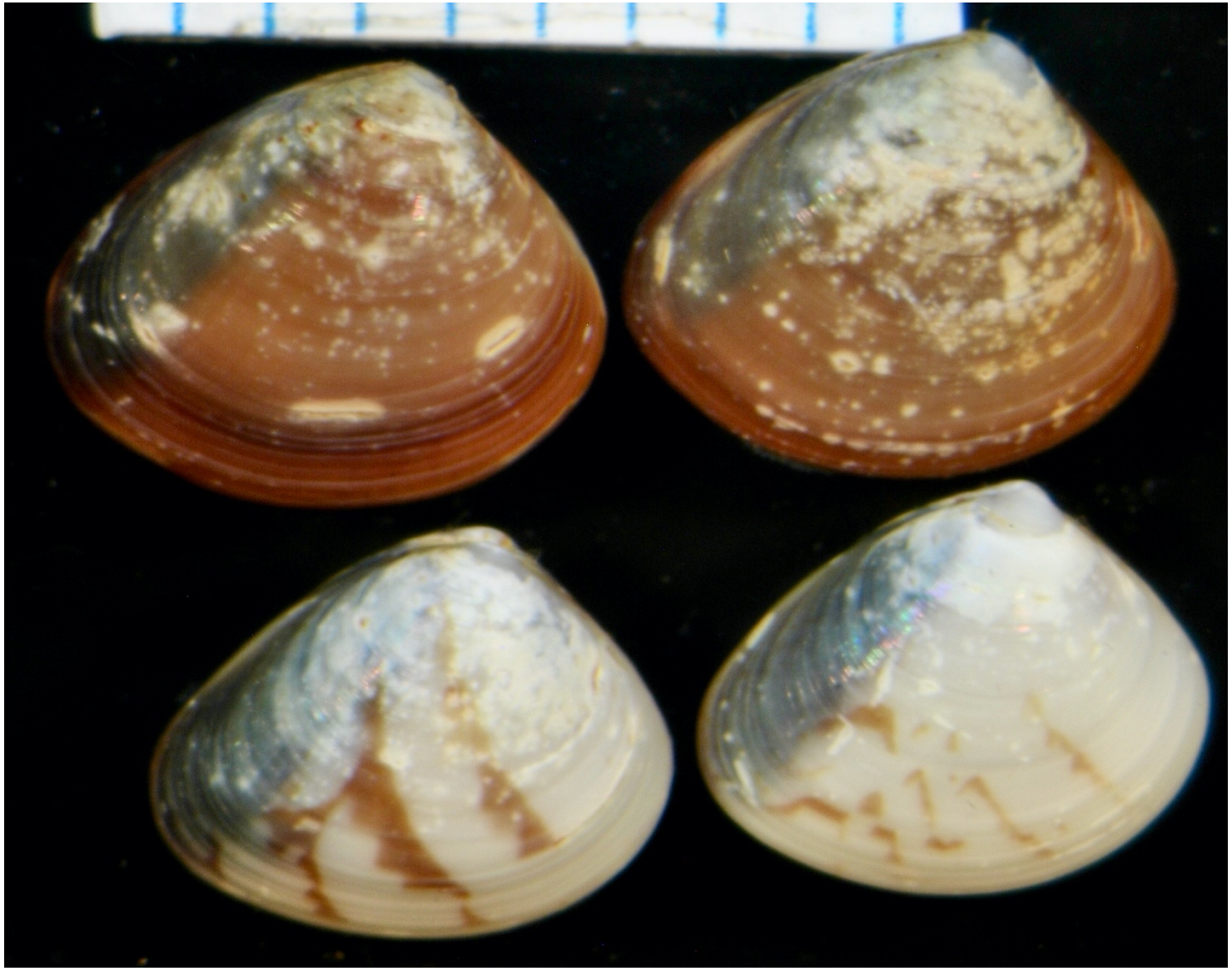
Photo courtesy of Kelvin Barwick

Nutricola tantilla (Gould 1853)

Specimen courtesy of Carol Paquette MBC

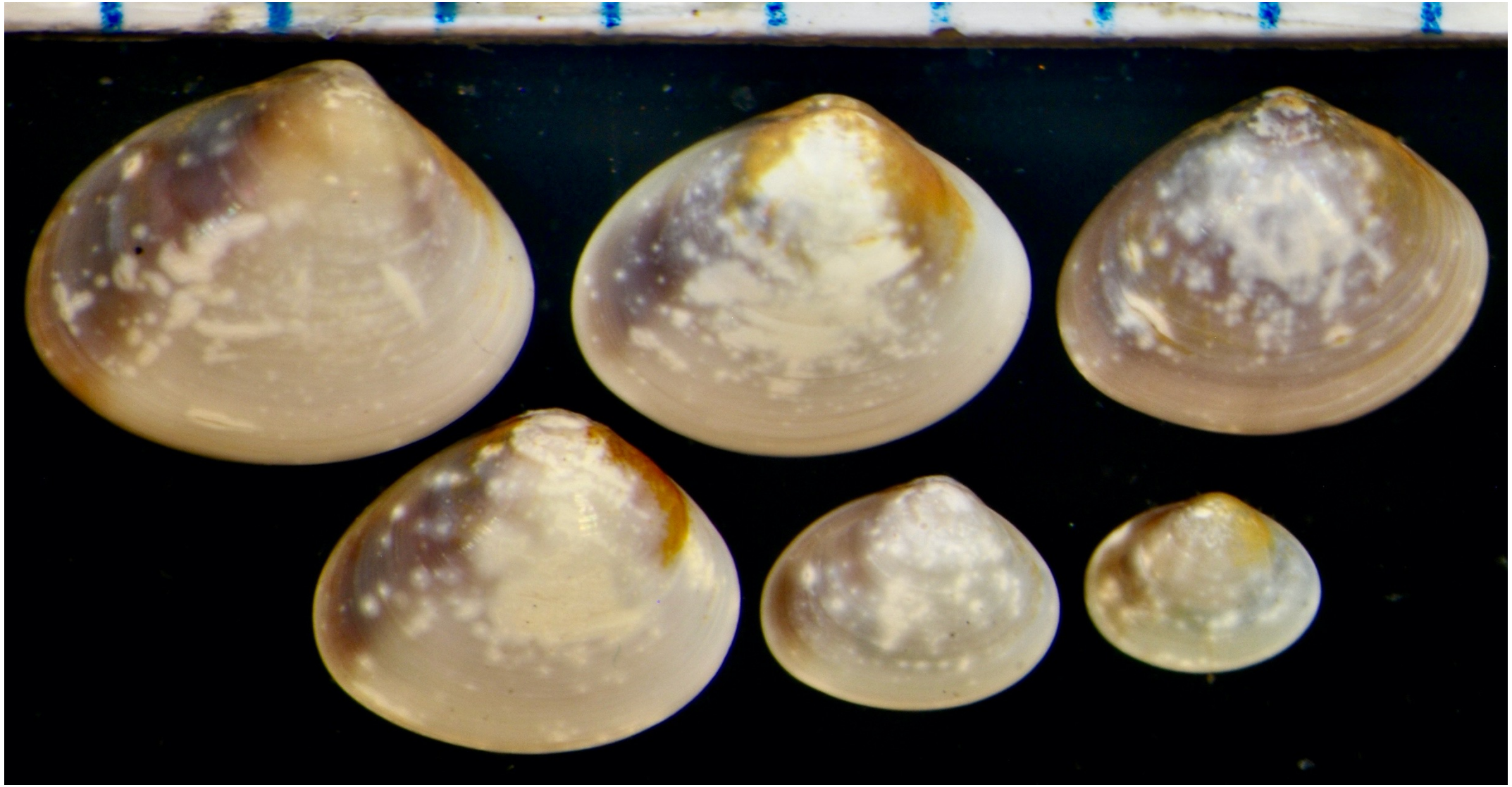
WLNG RS-4 11m 1981

Nutricola tantilla (Gould 1853)



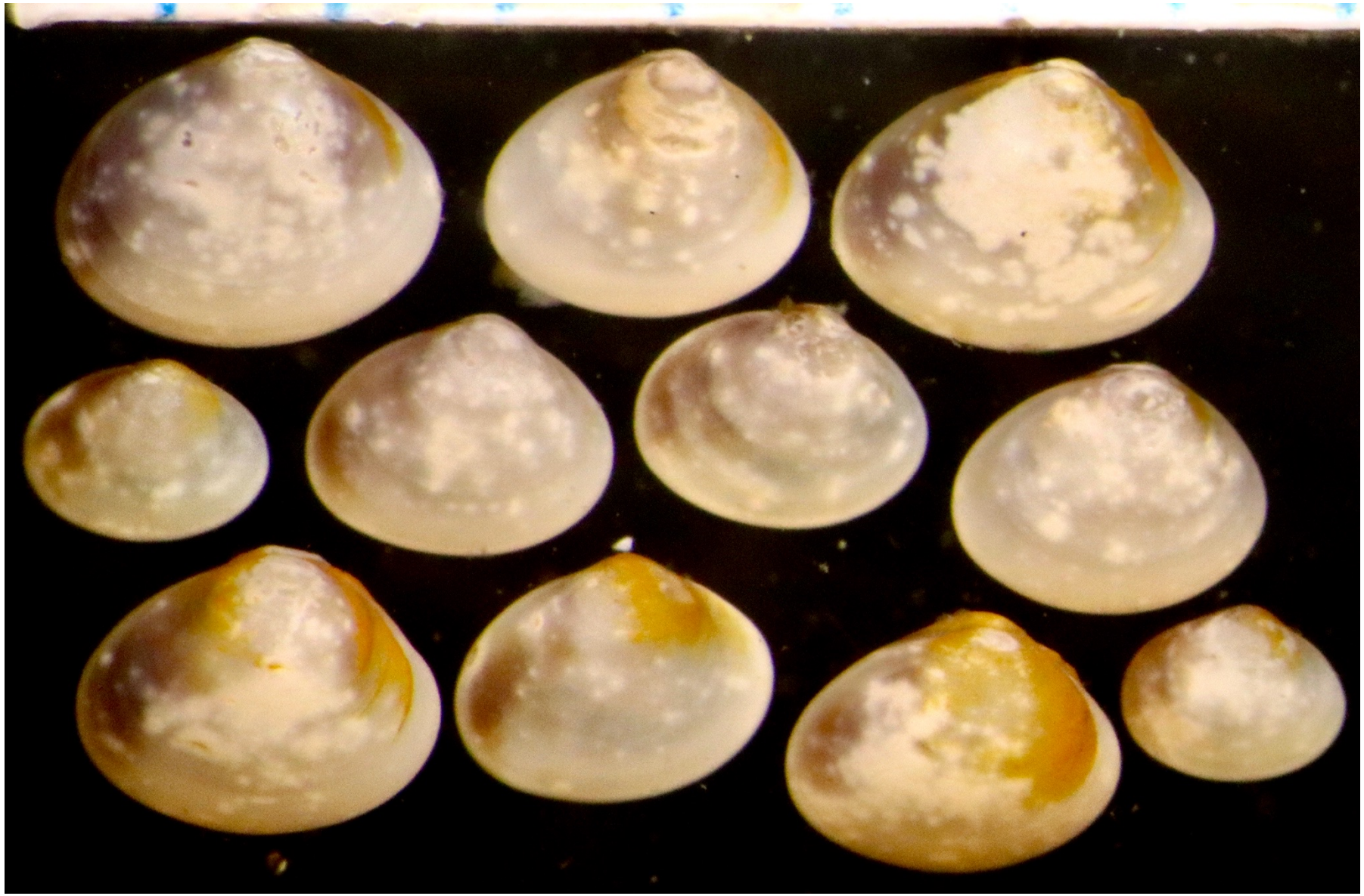
ISS Channel Islands Marina 6048QX13 4/7/2011

Nutricola tantilla (Gould 1853)



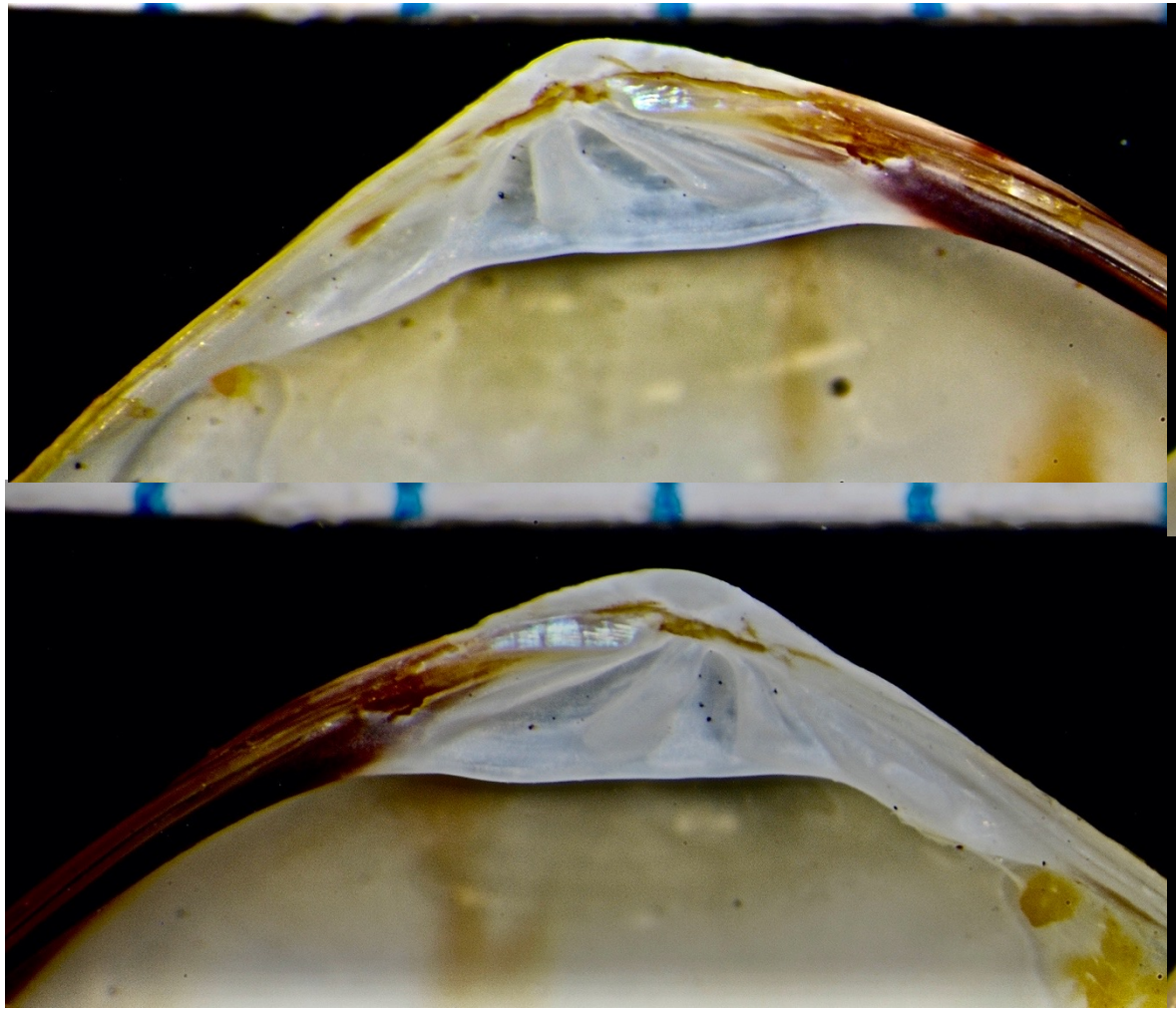
ISS Morro Bay 3109QX13 7/26/06

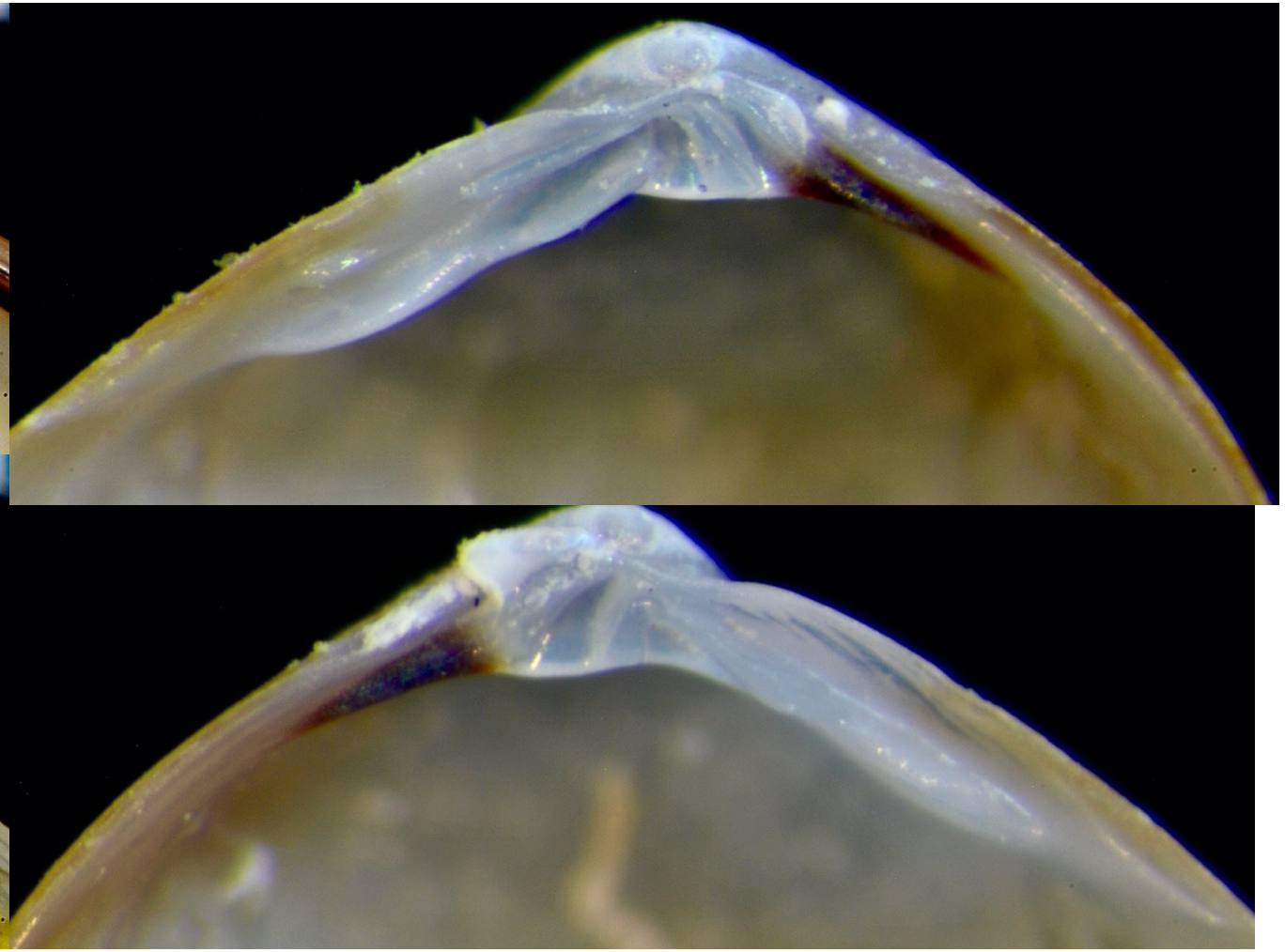
Nutricola tantilla (Gould 1853)



ISS Morro Bay 3109QX13 7/28/06

Nutricola tantilla (Gould 1853)





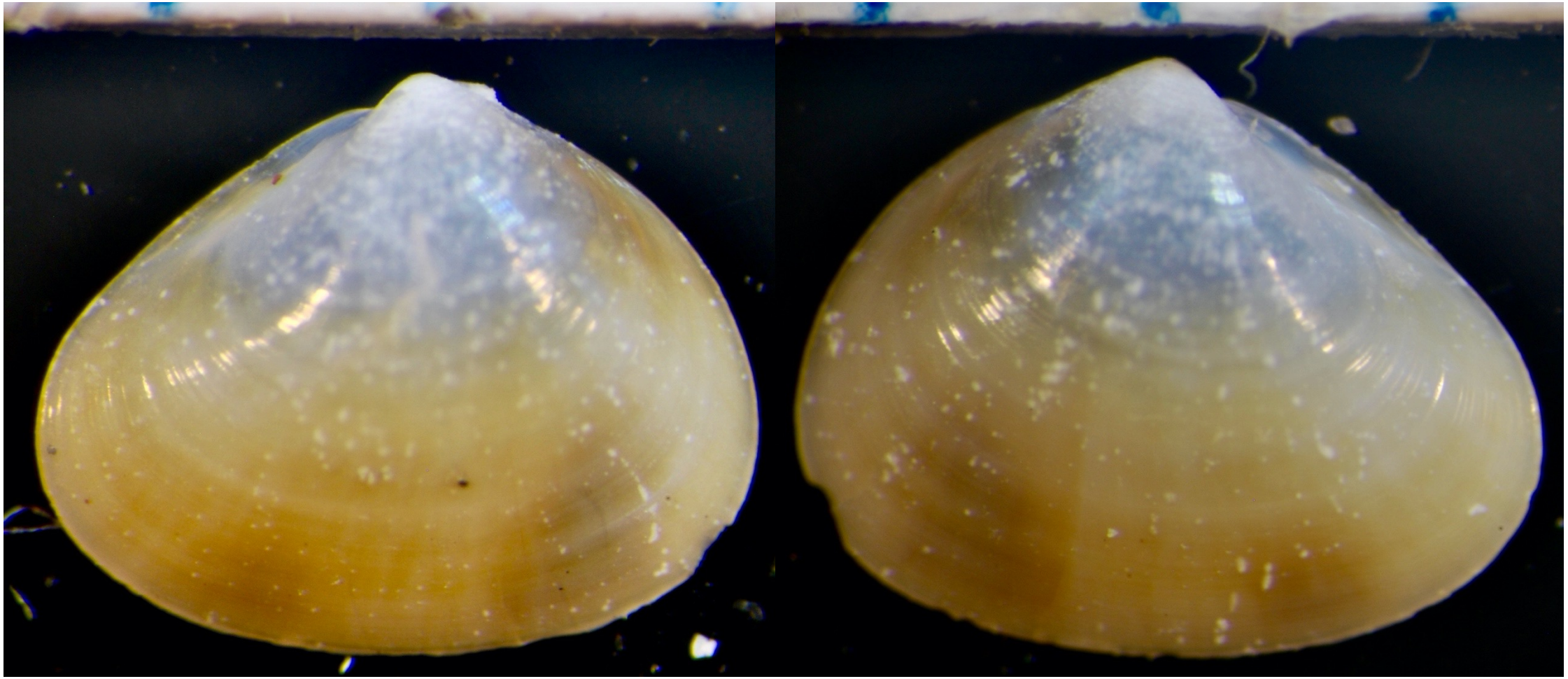
6.5mm WLNG RS-4 11m 1981

Left hinge above right hinge below

3 mm Carpenteria 10m 2020

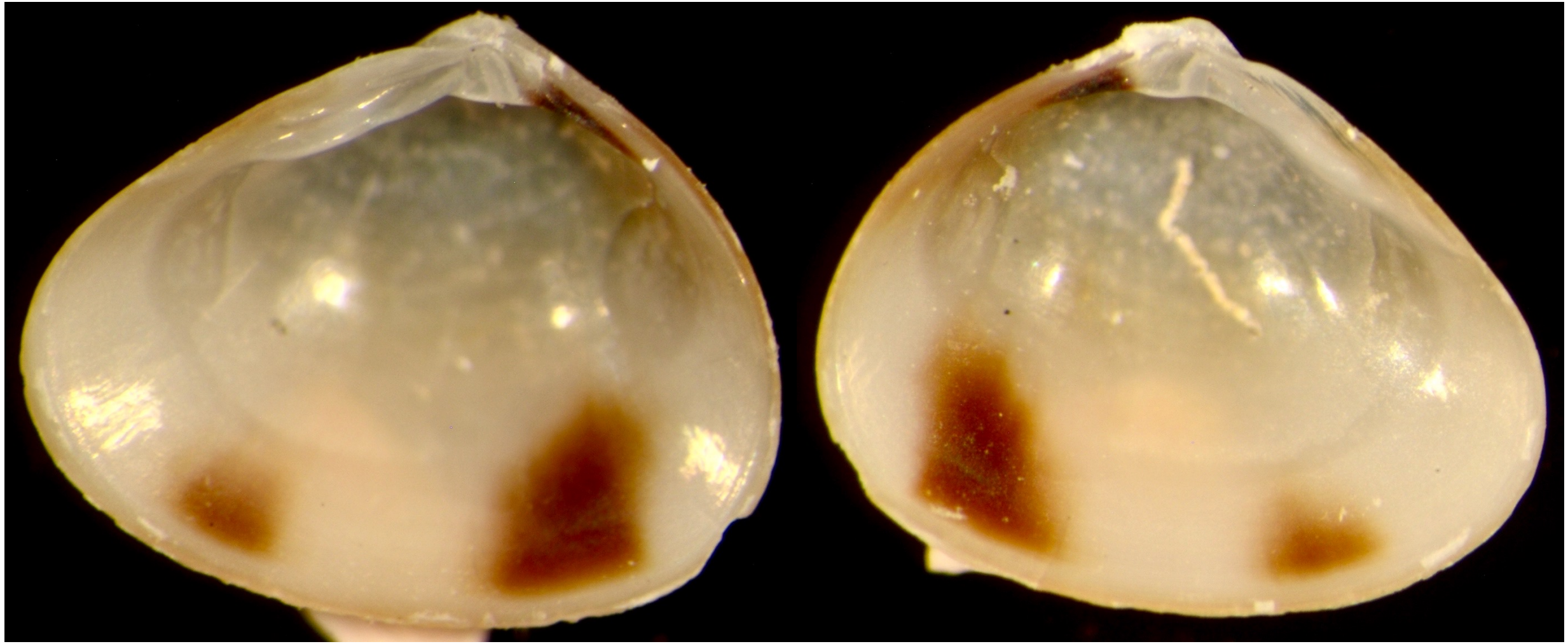
left hinge above right hinge below

Nutricola tantilla (Gould 1853)



Carpenteria 10m 2020

Nutricola tantilla (Gould 1853)

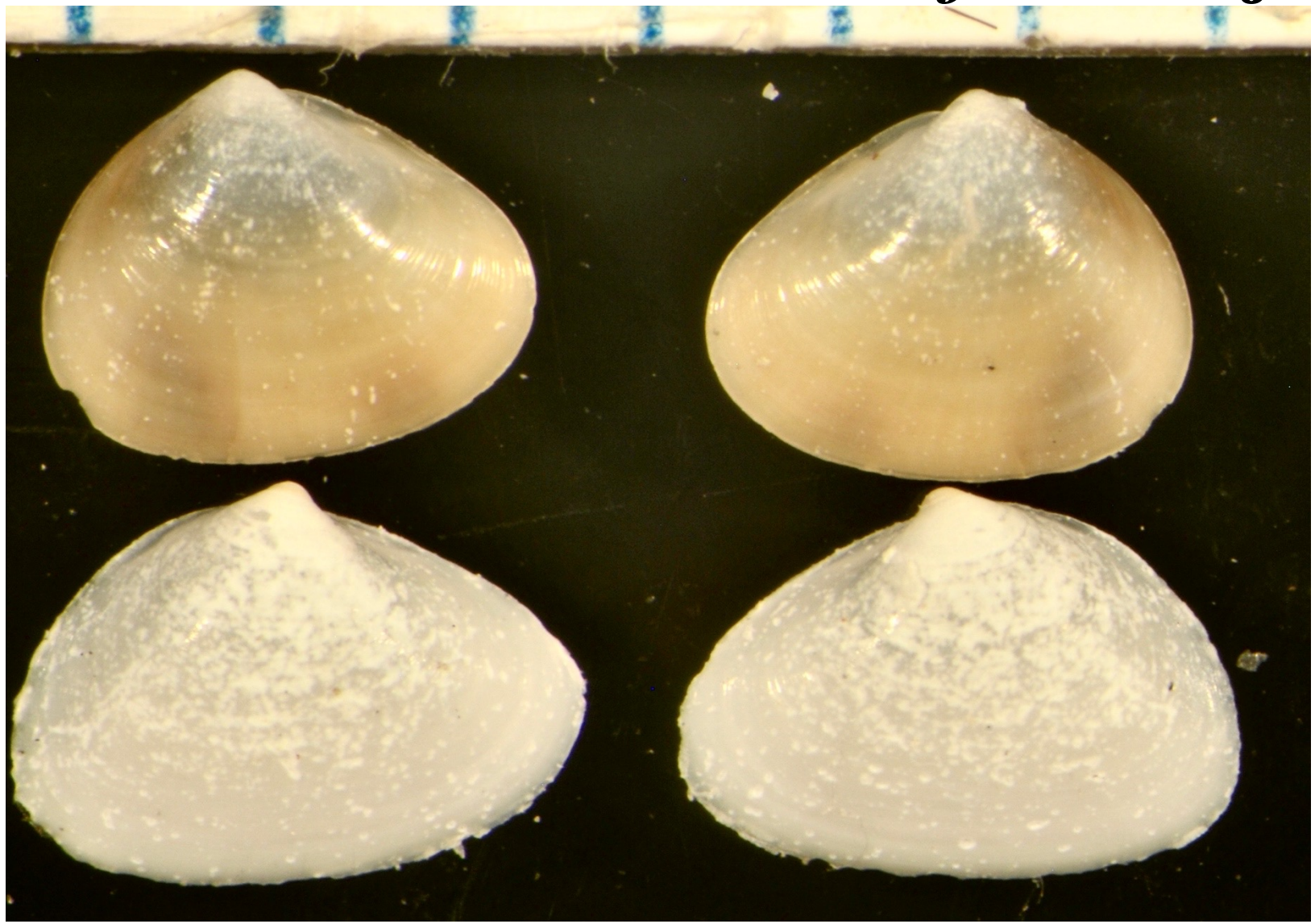


Carpenteria 10m 2020

left valve

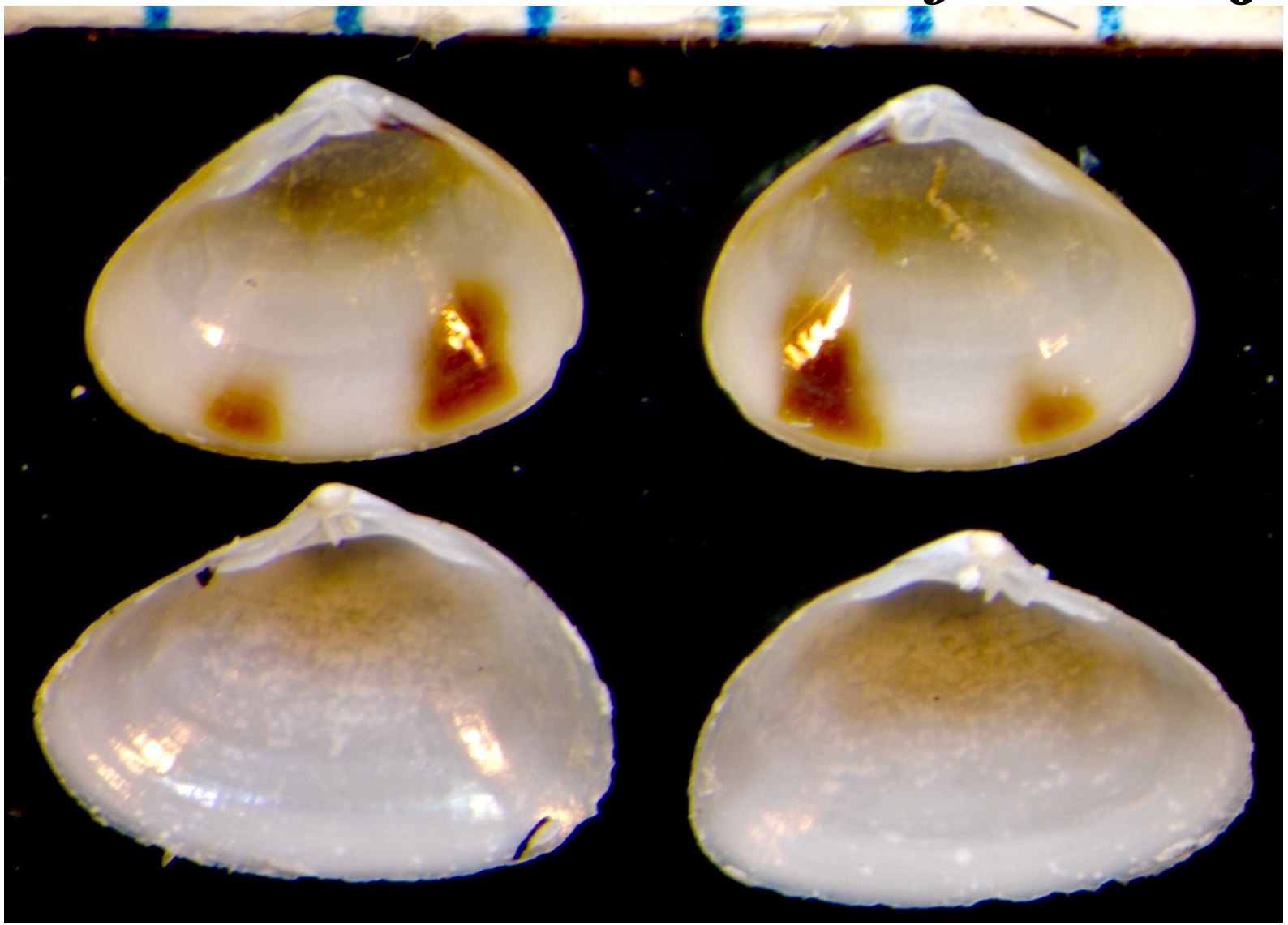
right valve

Nutricola tantilla/Simomactra falcata juvenile



Carpenteria 10m 2020

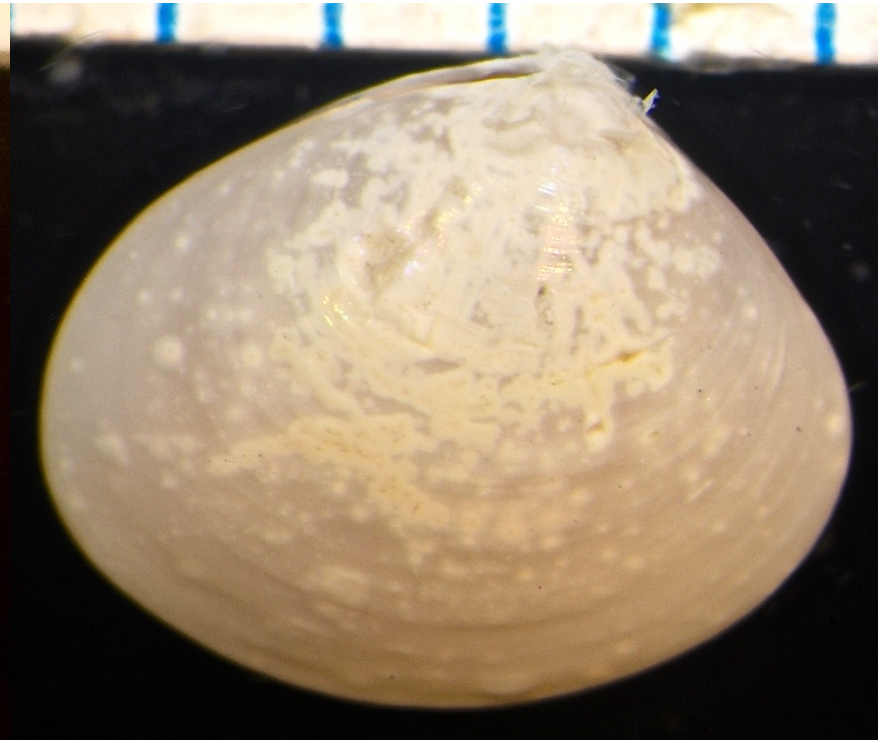
Nutricola tantilla/Simomactra falcata juvenile



Carpenteria 10m 2020

Nutricola confusa/Nutricola tantilla

Pt Arenas ISS 4019QX13 6/3/2007



B’98 2077 Catalina 43m

Nutricola confusa/Nutricola tantilla

Nutricola confusa (S. Gray, 1982)

Plate 79

Nutricola confusa, siphons
(after S. Gray, 1982)

Nutricola tantilla
(A. A. Gould, 1853)

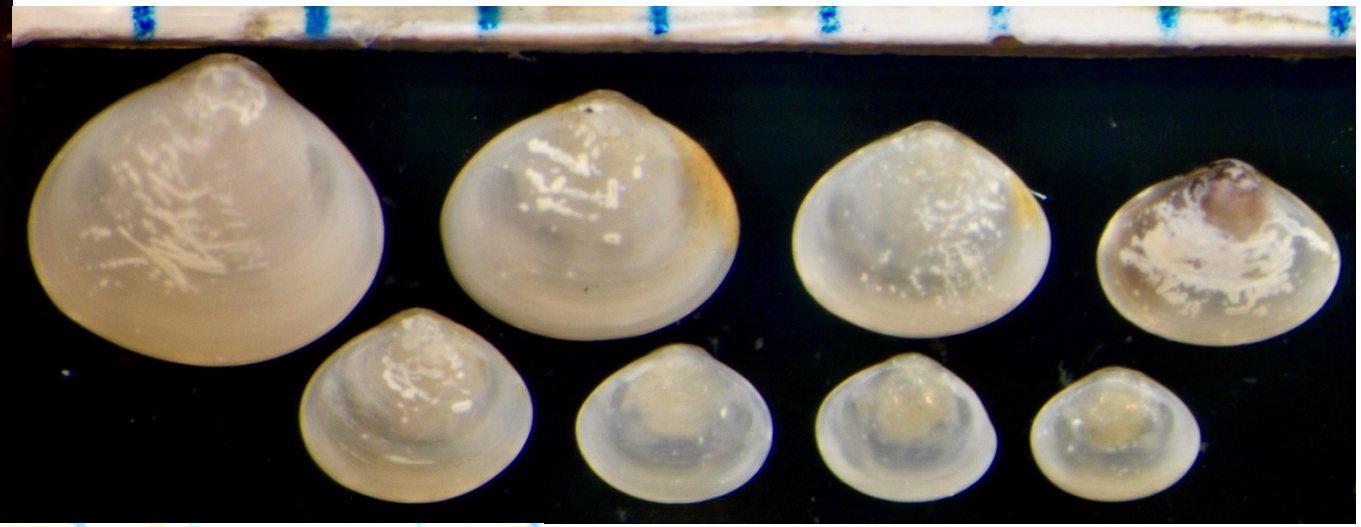
Plate 79

Nutricola tantilla, siphons
(after S. Gray, 1982)

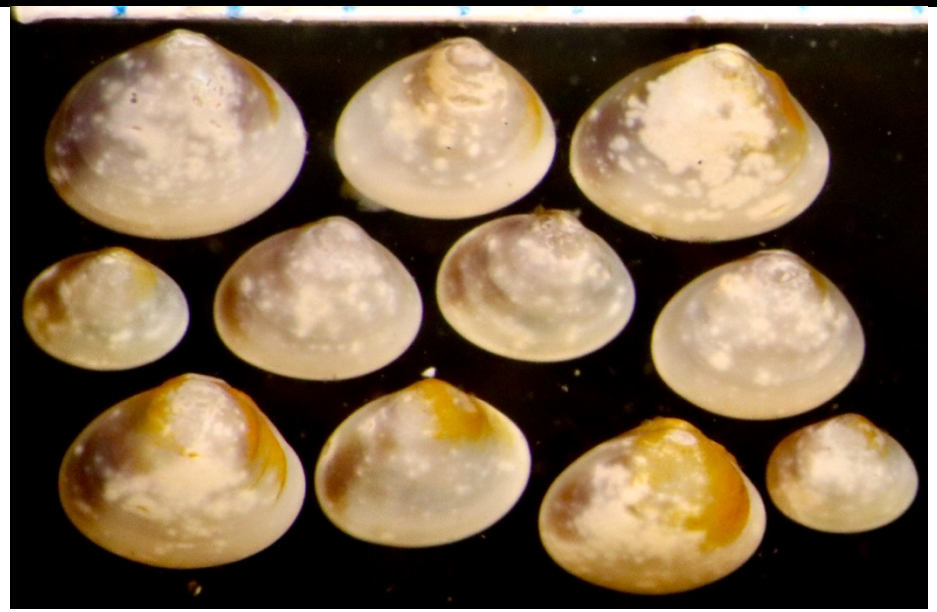
Pictures taken from Coan etal 2000

Nutricola juveniles

Nutricola confusa above

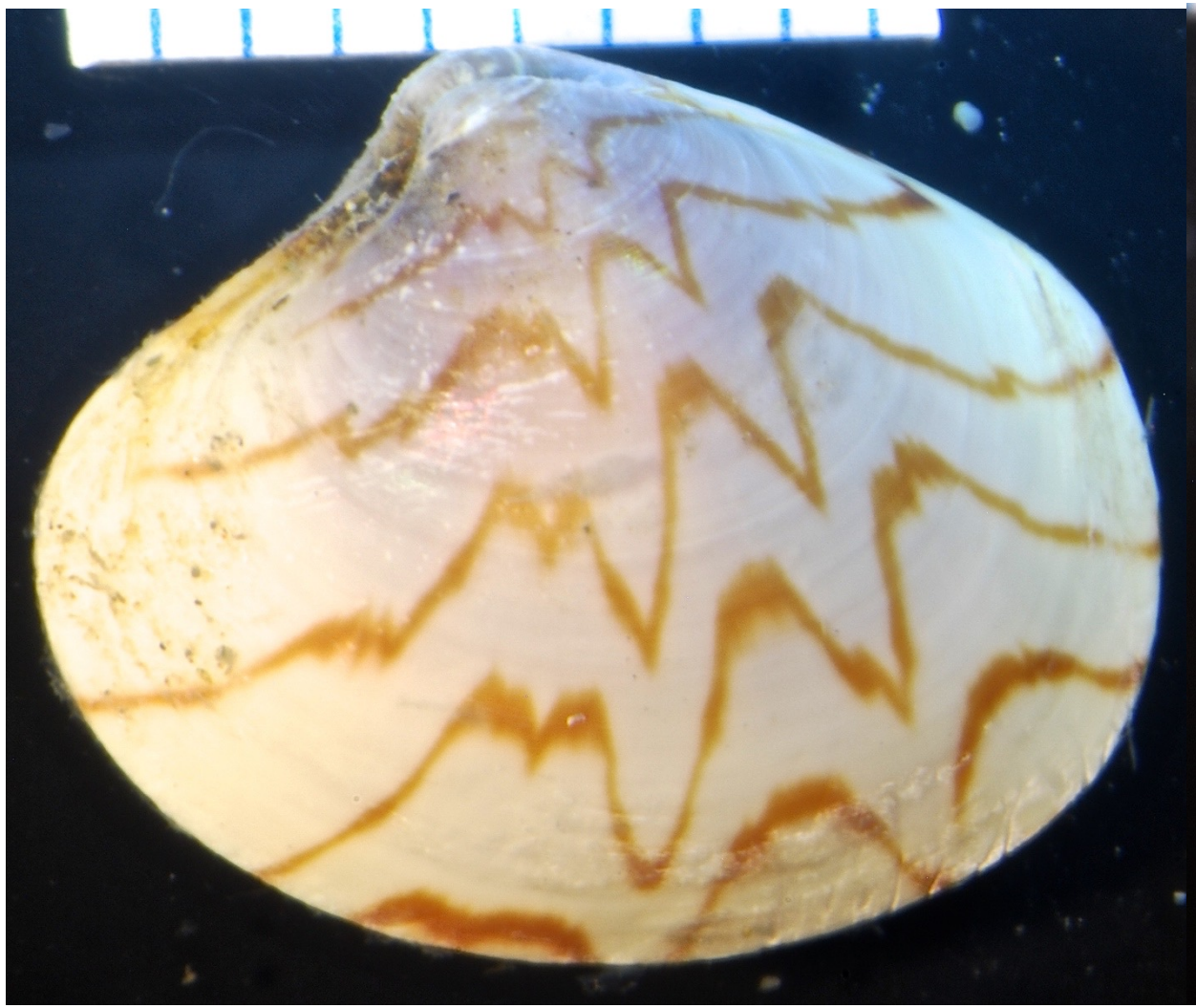


Nutricola lordi above

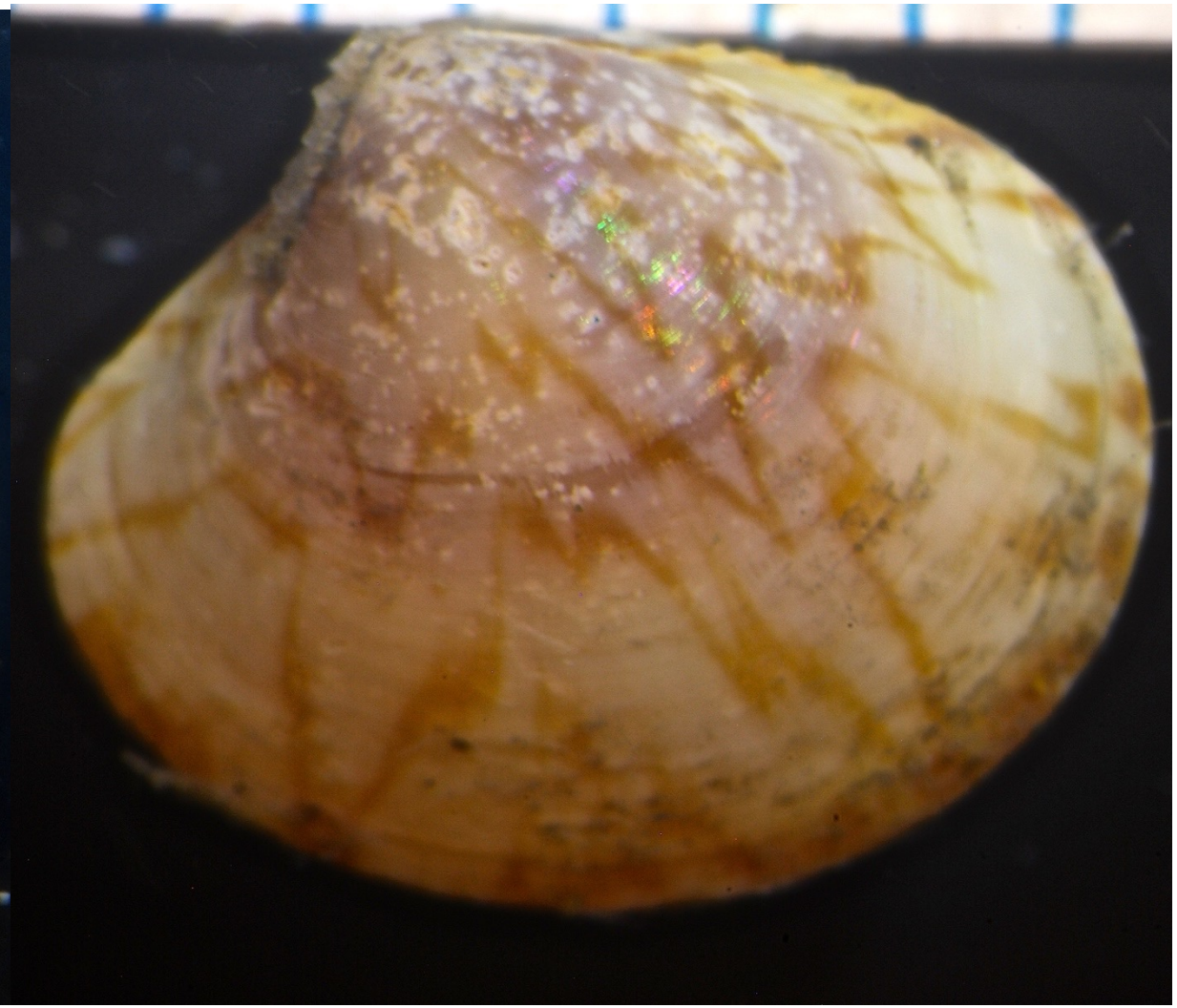


Nutricola tantilla right

Pitar newcombianus (Gabb 1865)



Avalon 30m 2018

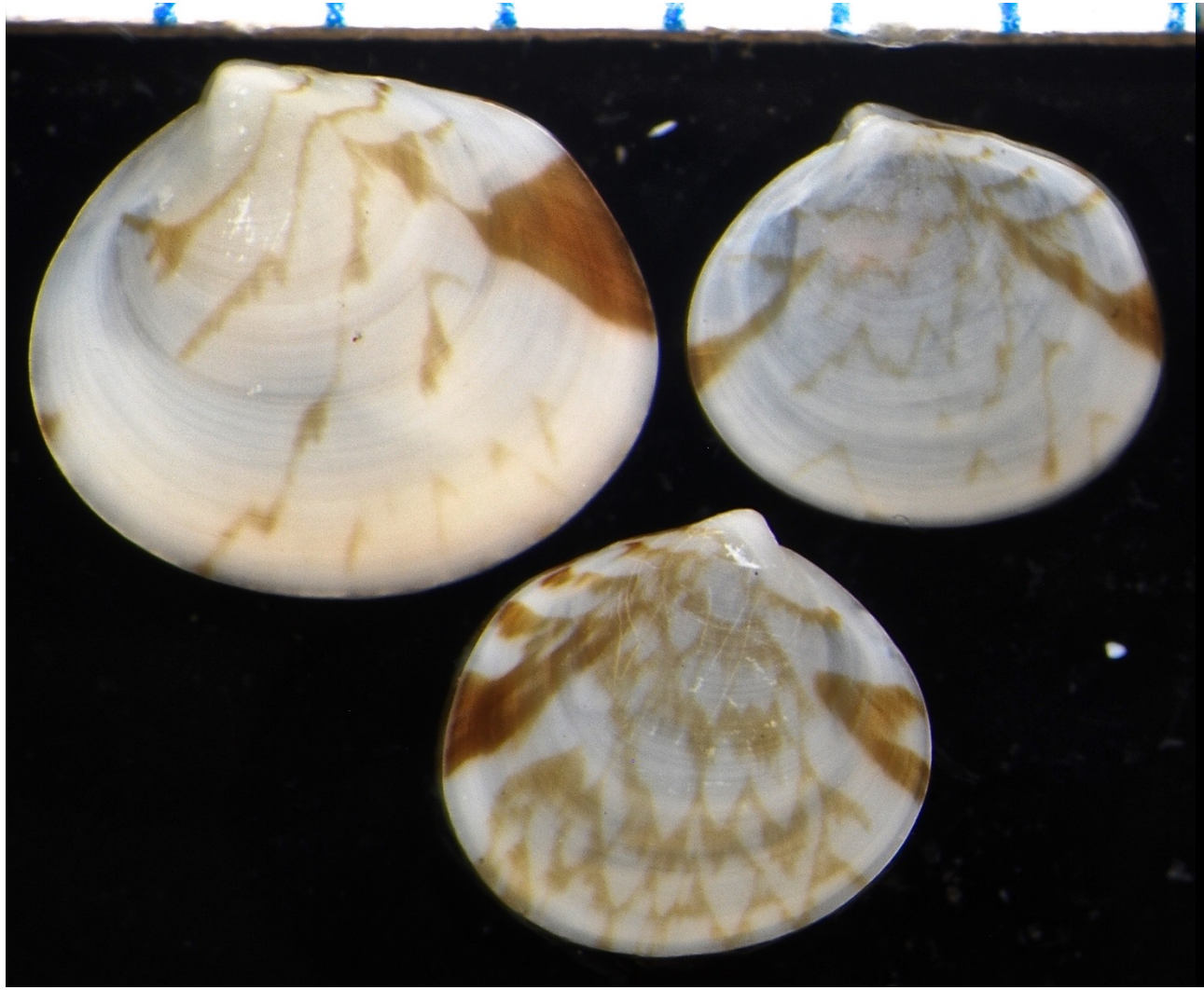


Avalon 30m 2019

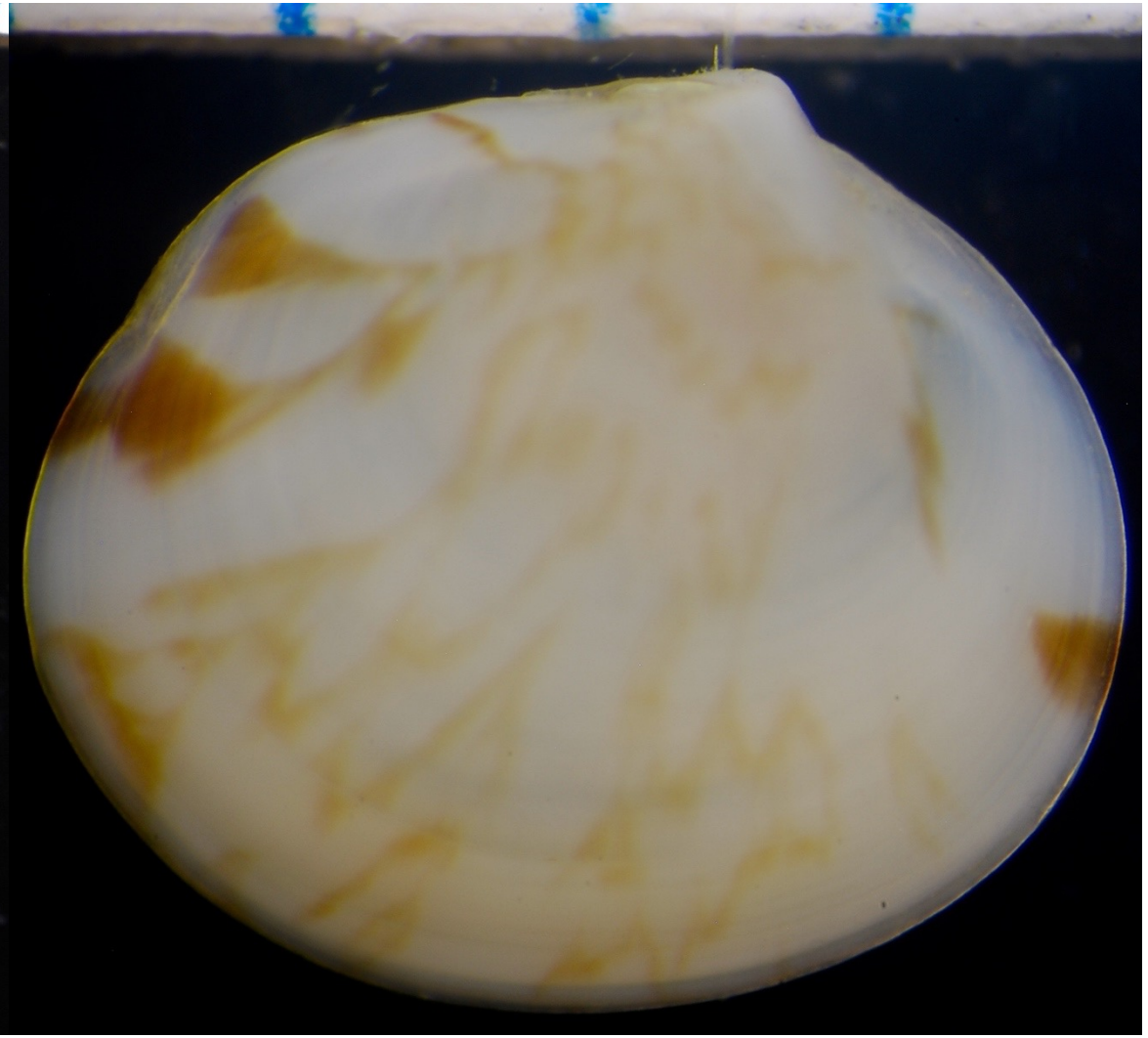
Pitar newcombianus (Gabb 1865)

Avalon 30m 2022

Pitar newcombianus (Gabb 1865)

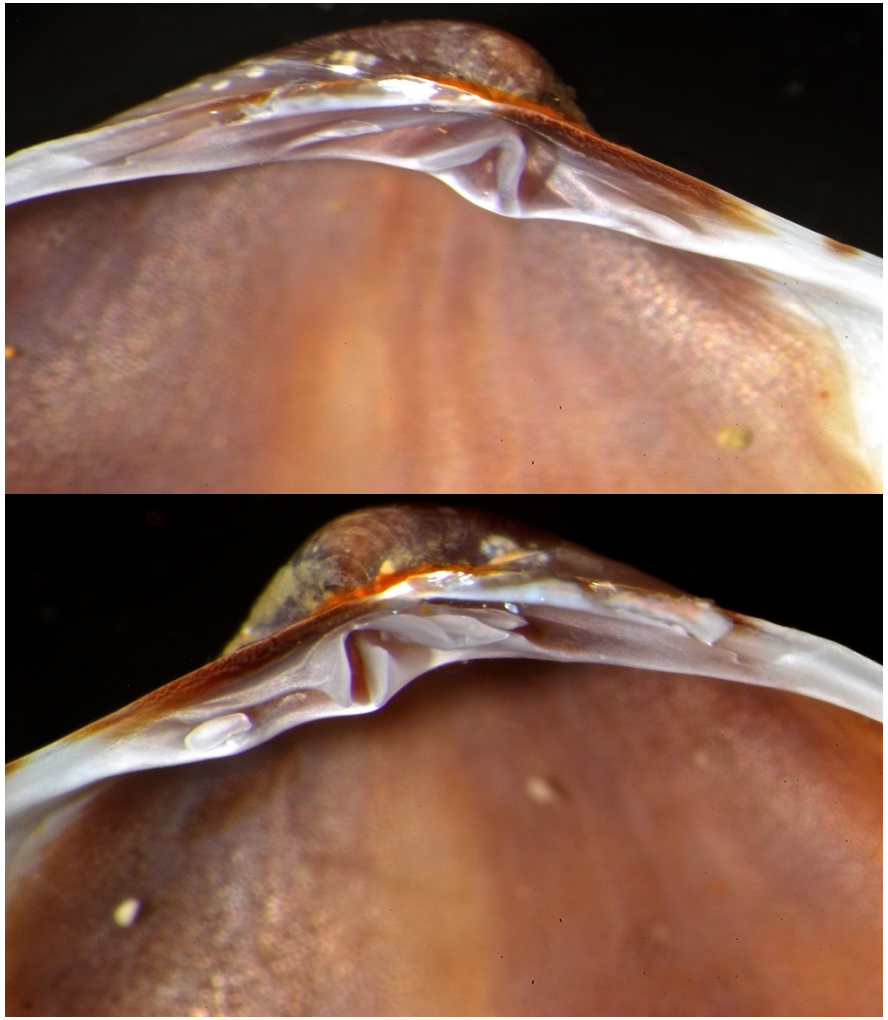


B’18 10062 San Diego Bay 6m

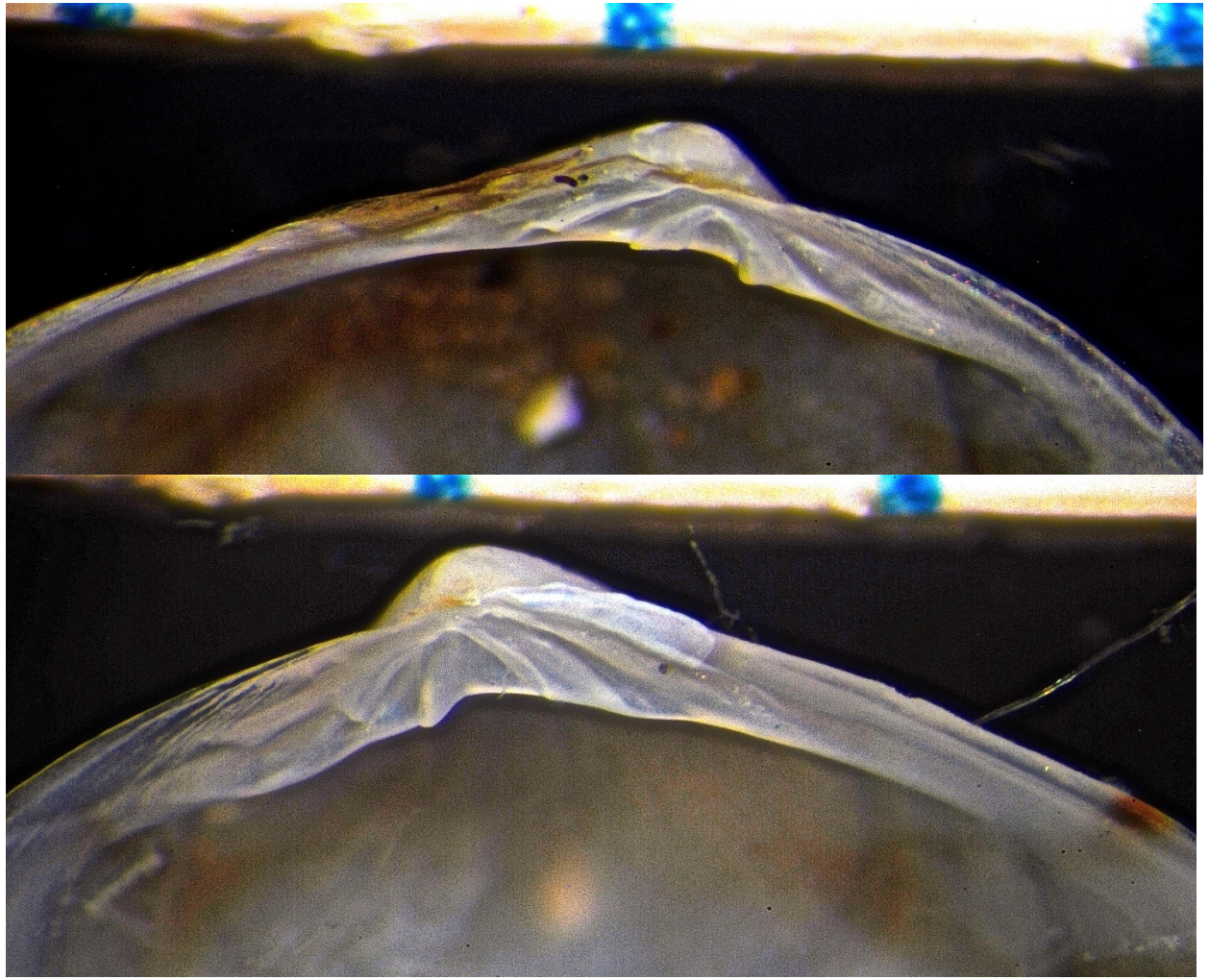


Long Beach Harbor Rip-Rap LBRR3/QS-3A 2018

Pitar newcombianus (Gabb 1865)

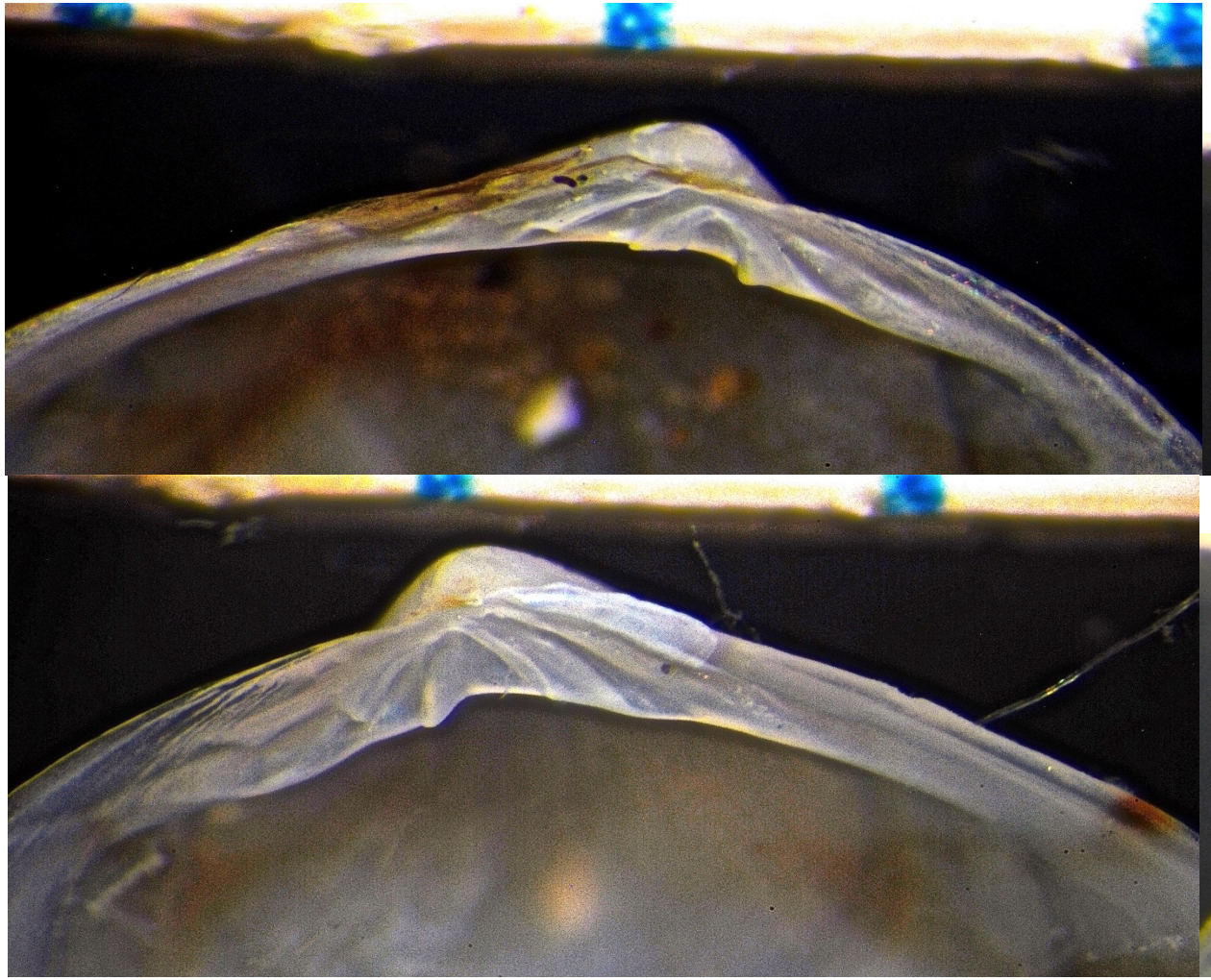


Left hinge (upper) and right hinge (lower) of 14 mm specimen Avalon 30m 2015

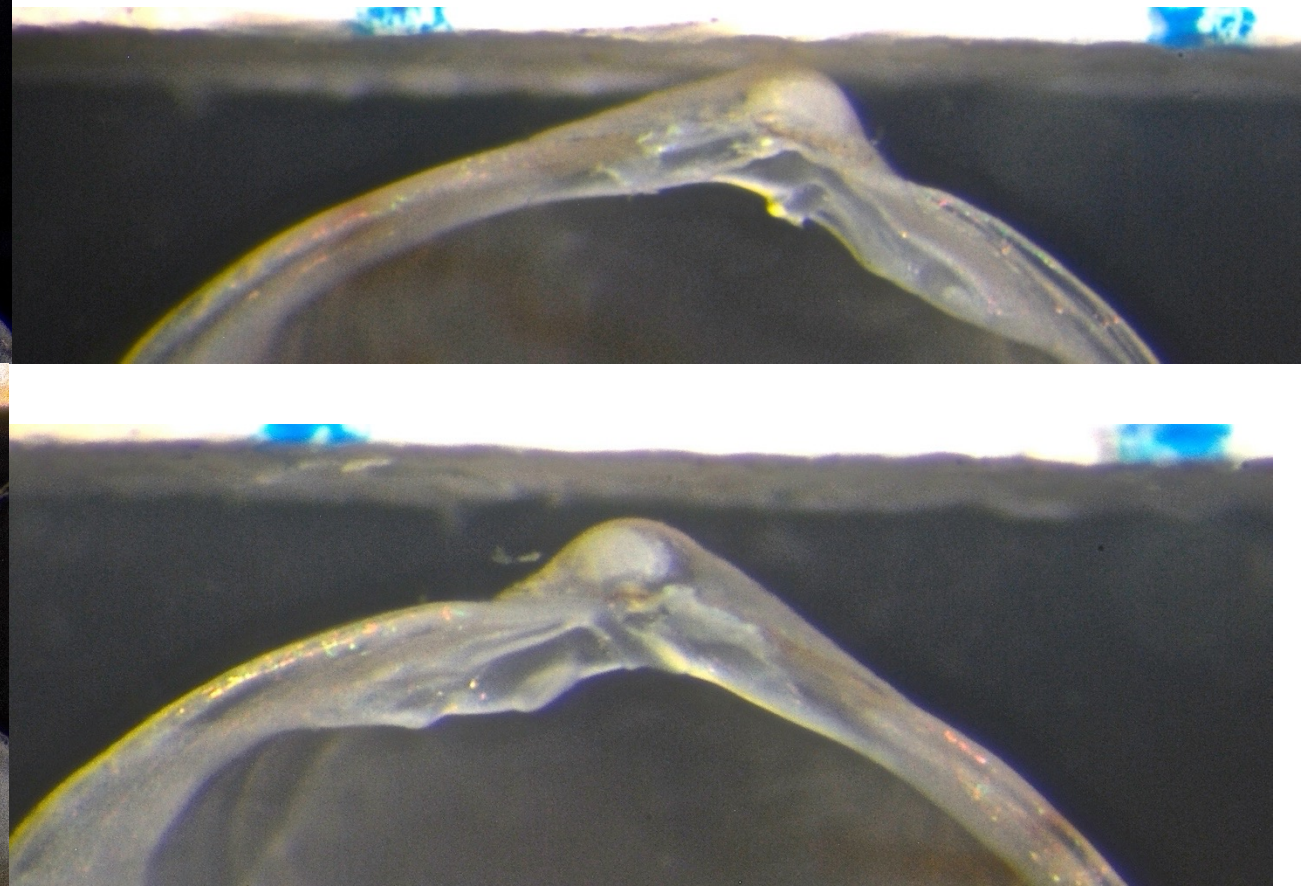


Left hinge (upper) and right hinge (lower) of 2.5 mm specimen B’18 10062 Newport Bay 6m

Pitar newcombianus (Gabb 1865)

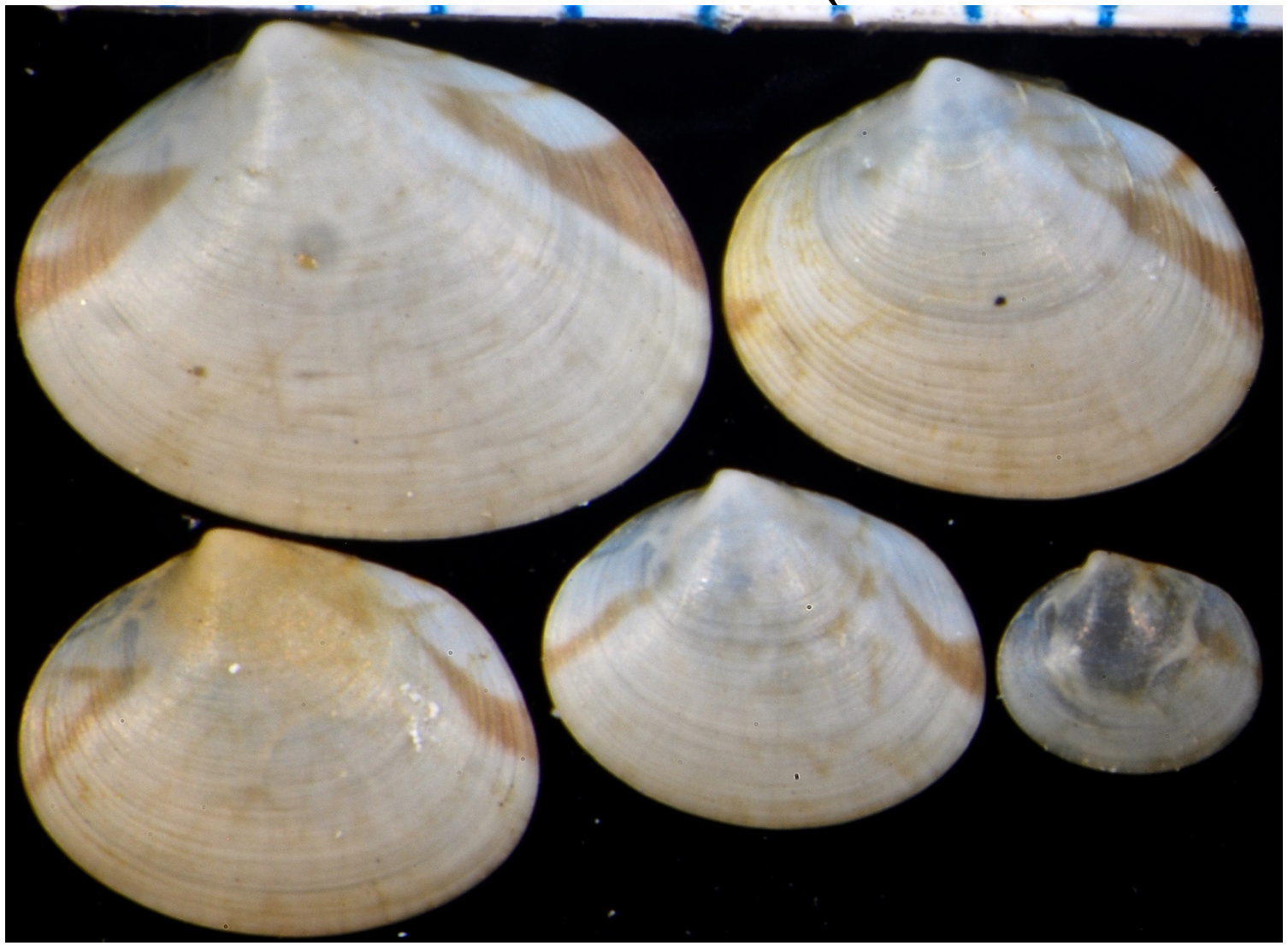


Left hinge (upper) and right hinge (lower) of 2.5mm specimen B’18 Newport Bay 6m



Left hinge (upper) and right hinge (below) of 1.5 mm specimen Oxnard RWS-05 10m 2019

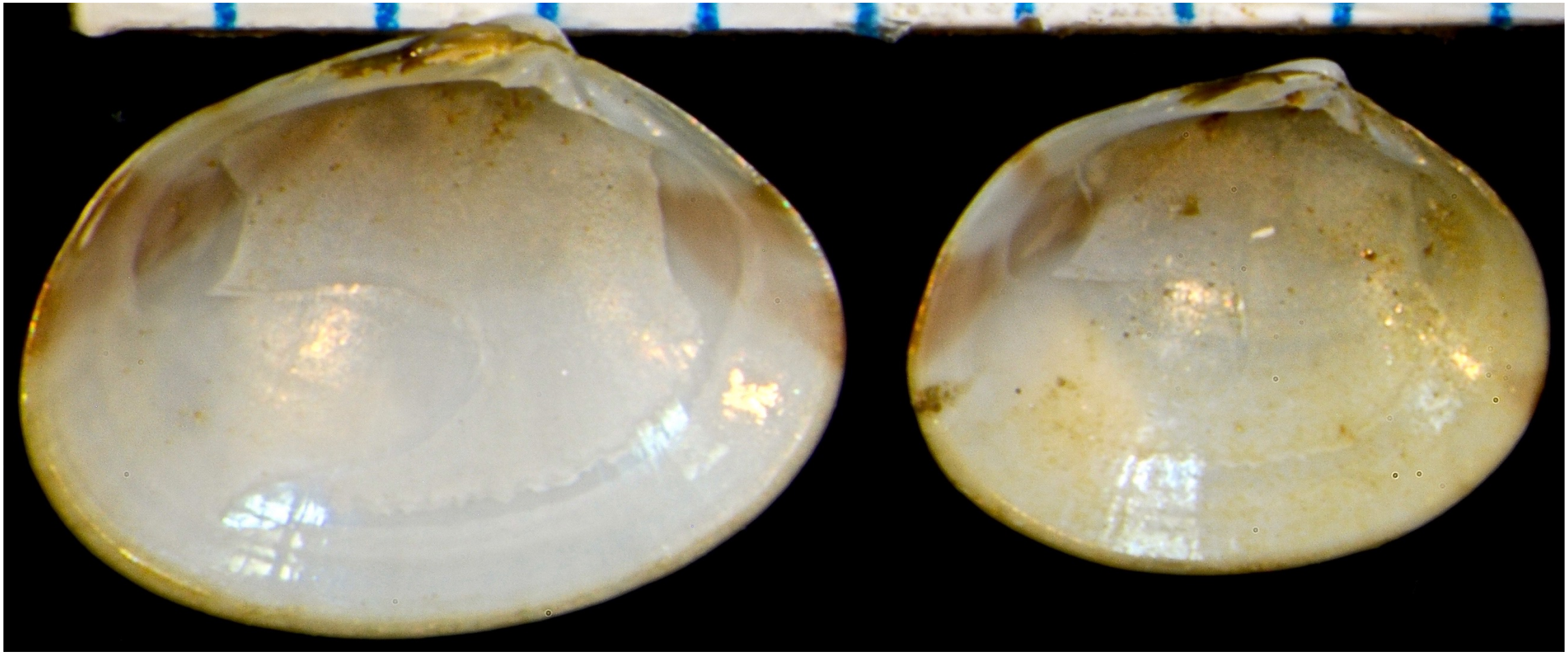
Pitar newcombianus (Gabb 1865)



Mission Bay 5m 1971

Specimens courtesy of Carol Paquette MBC

Pitar newcombianus (Gabb 1865)



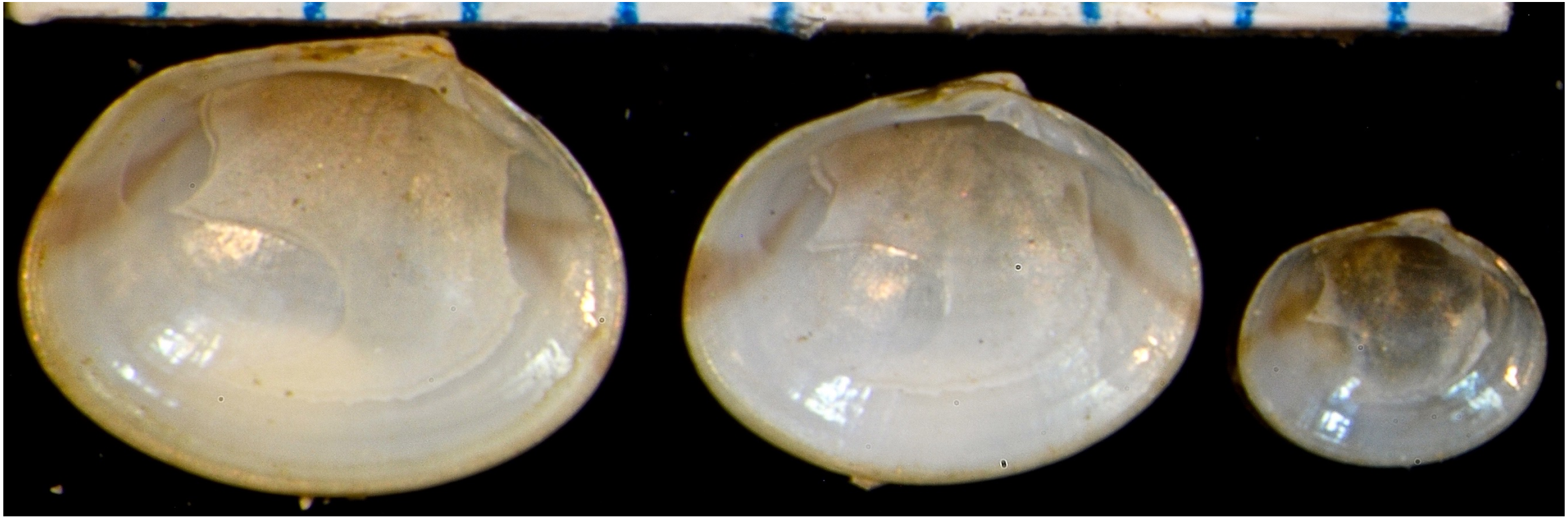
Mission Bay 5m 1971

left valve

left valve

Specimens courtesy of Carol Paquette MBC

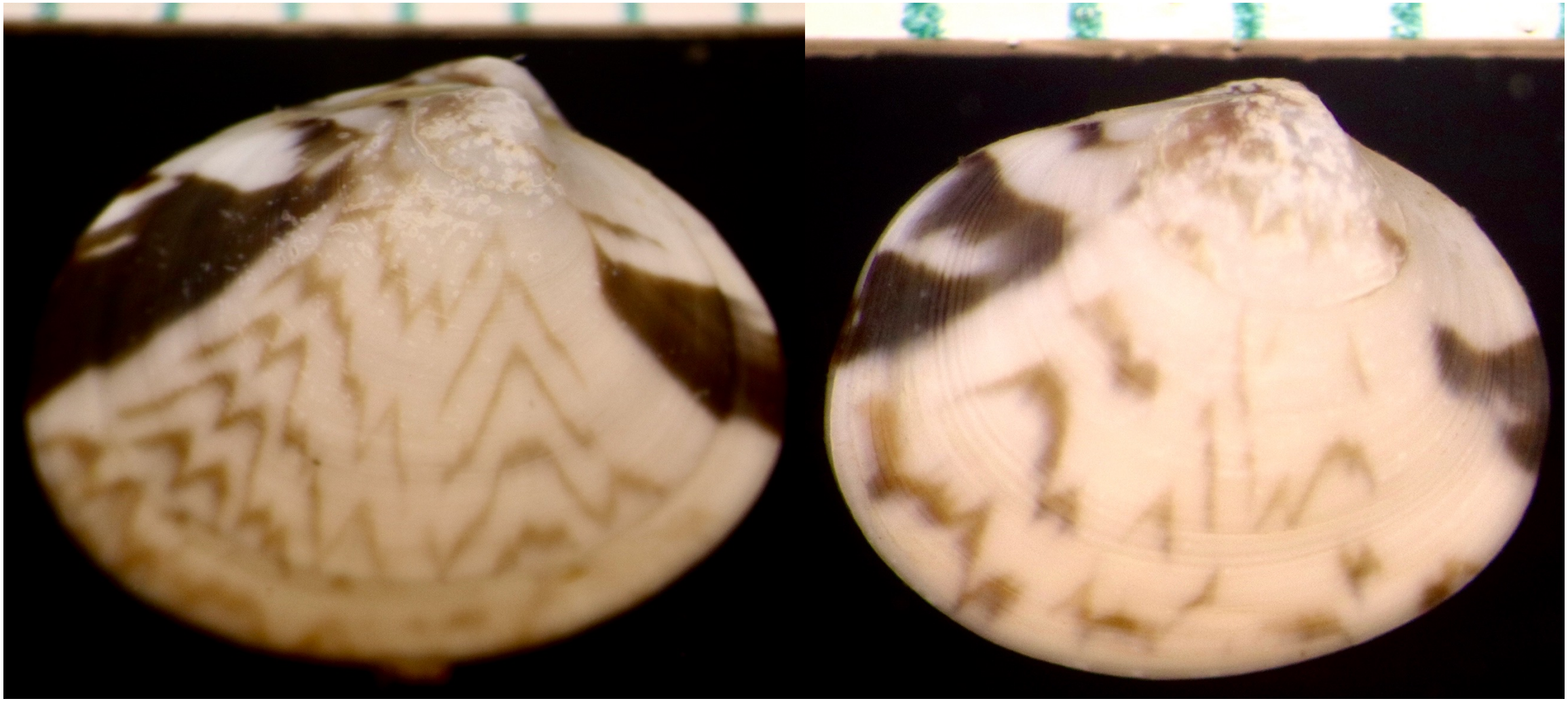
Pitar newcombianus (Gabb 1865)



Mission Bay 5m 1971
left valves

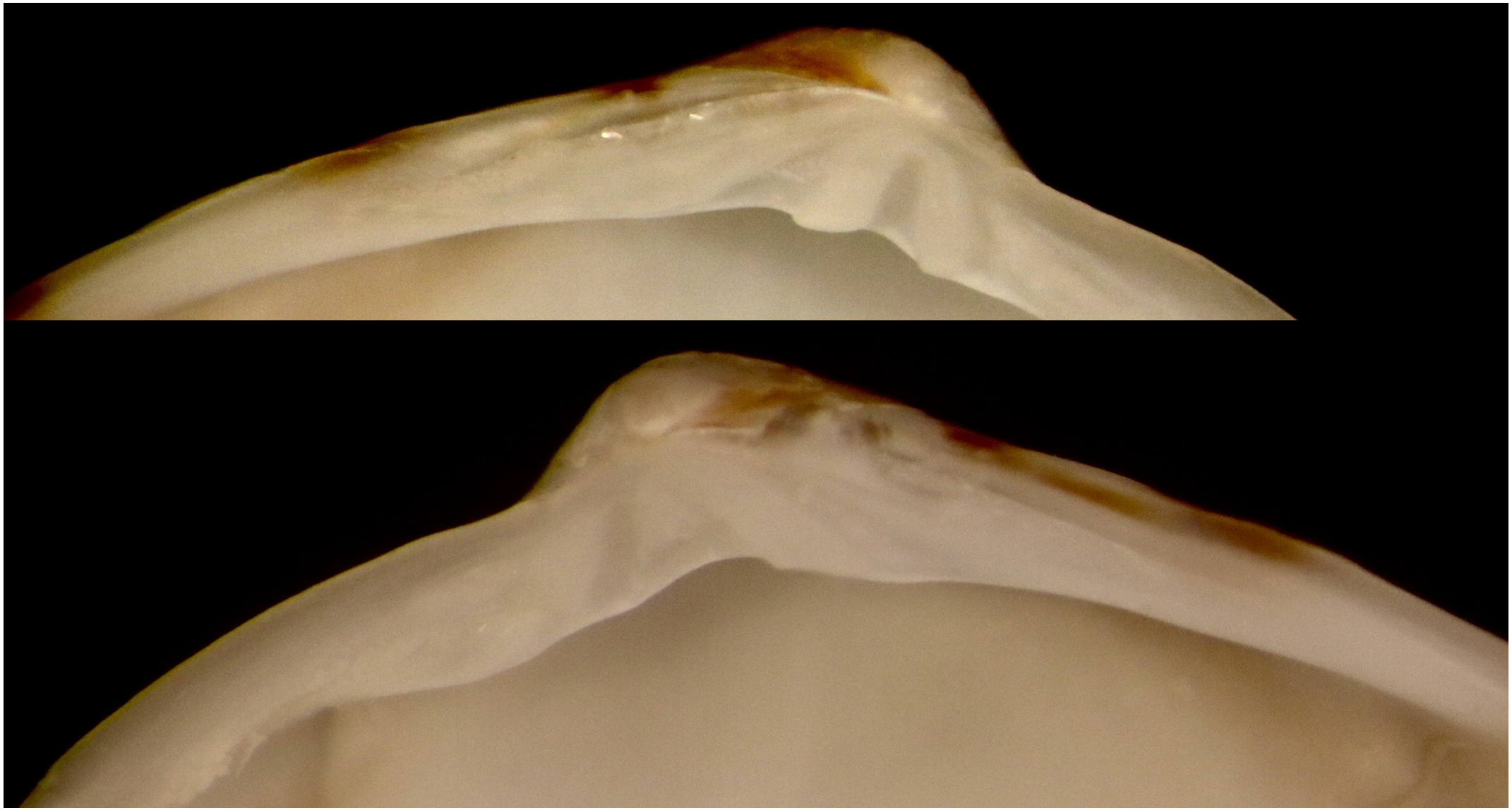
Specimens courtesy of Carol Paquette MBC

Pitar newcombianus (Gabb 1865)



Bodega Bay South Intertidal 5/11/22 (live collected)

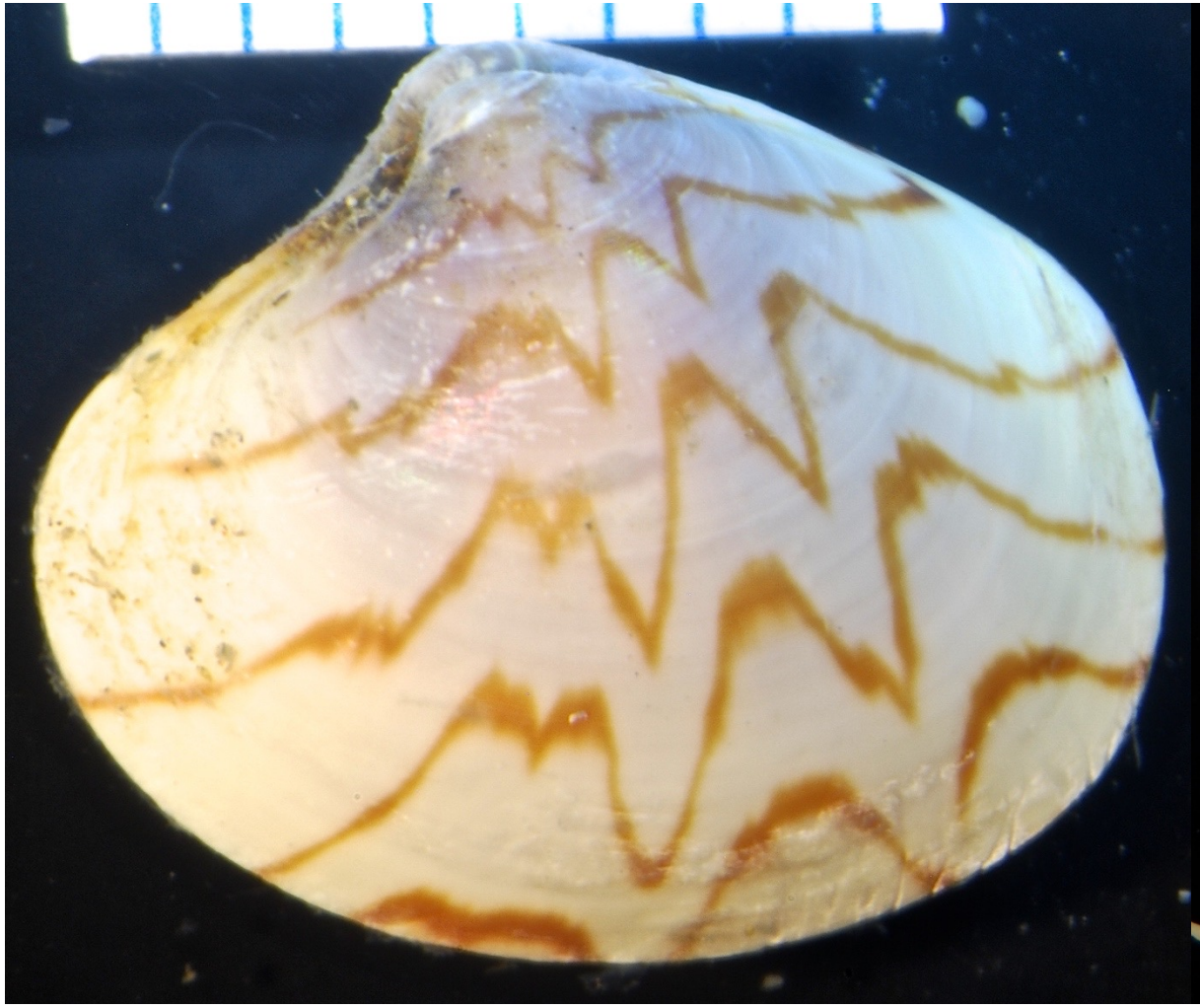
Pitar newcombianus (Gabb 1865)



Bodega Bay South Intertidal 5/11/2022 (live collected)

left valve above right valve below

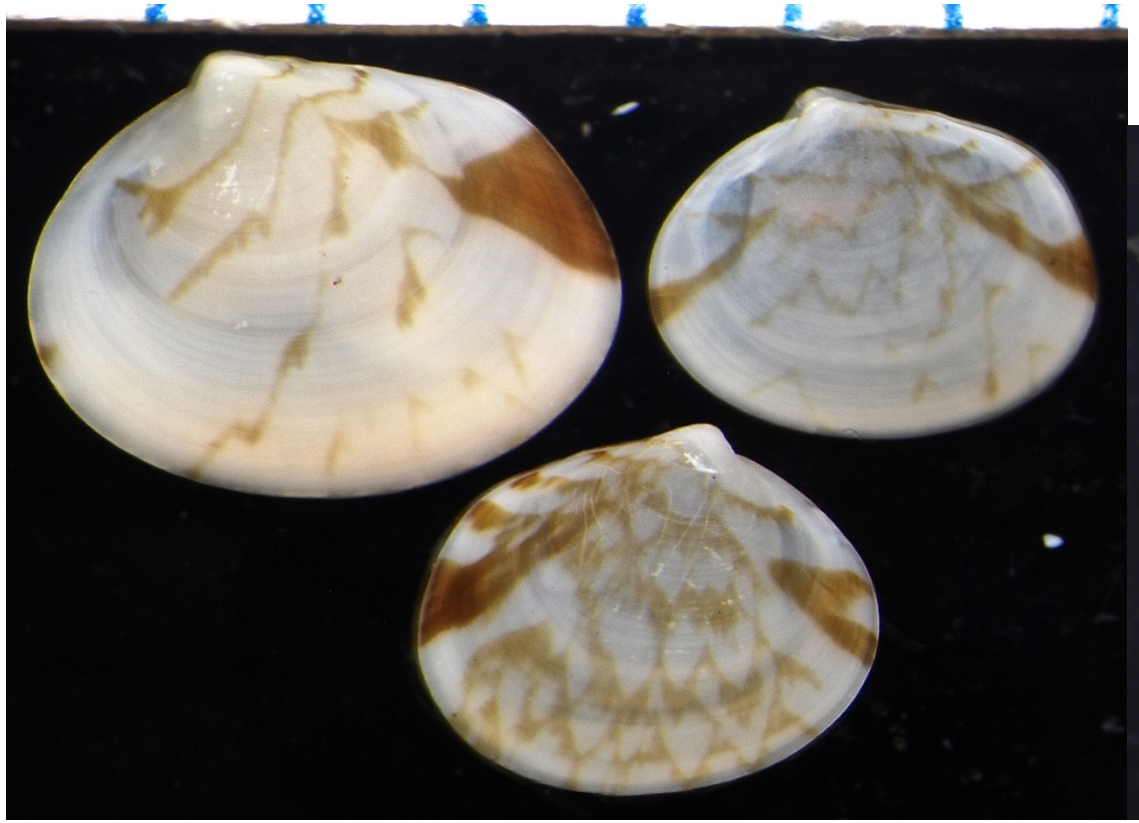
Pitar newcombianus vs *Saxidomus nuttalli*



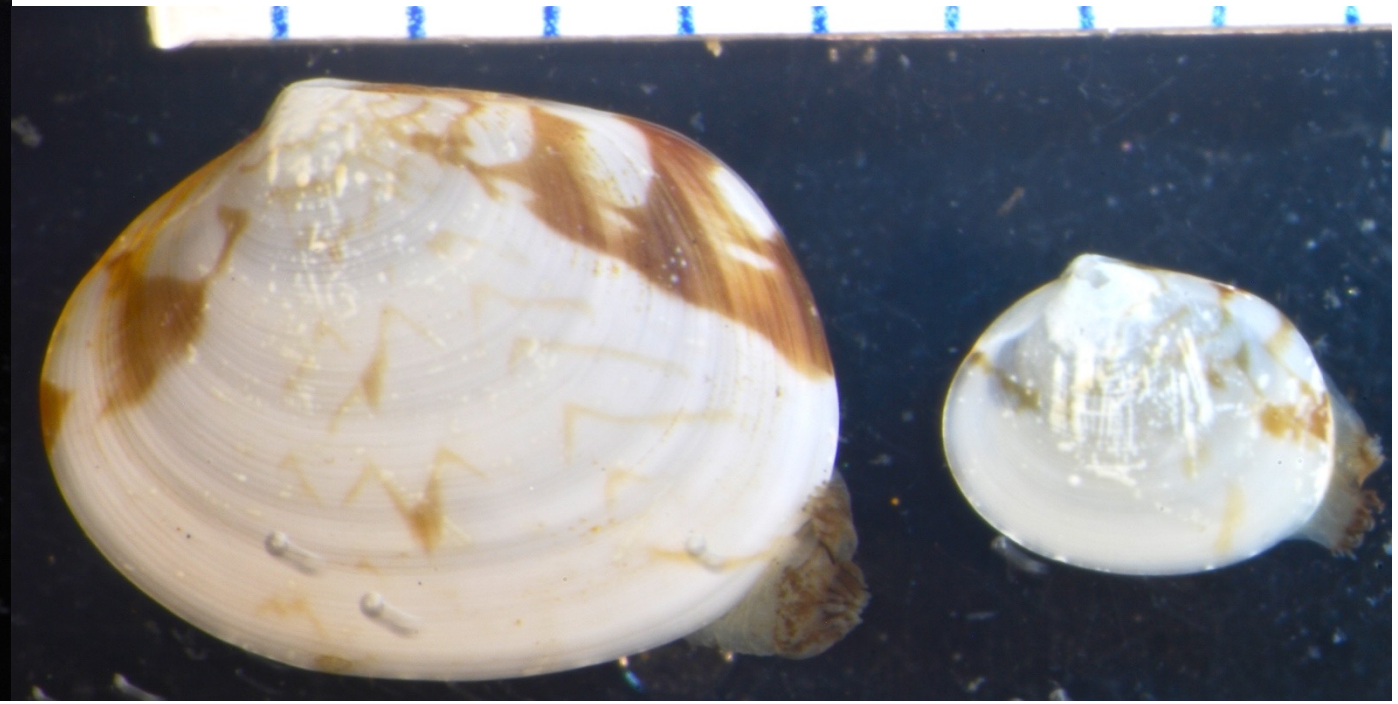
Avalon 30m 2015

B’18 Mission Bay 4m

Pitar newcombianus vs *Saxidomus nuttalli*

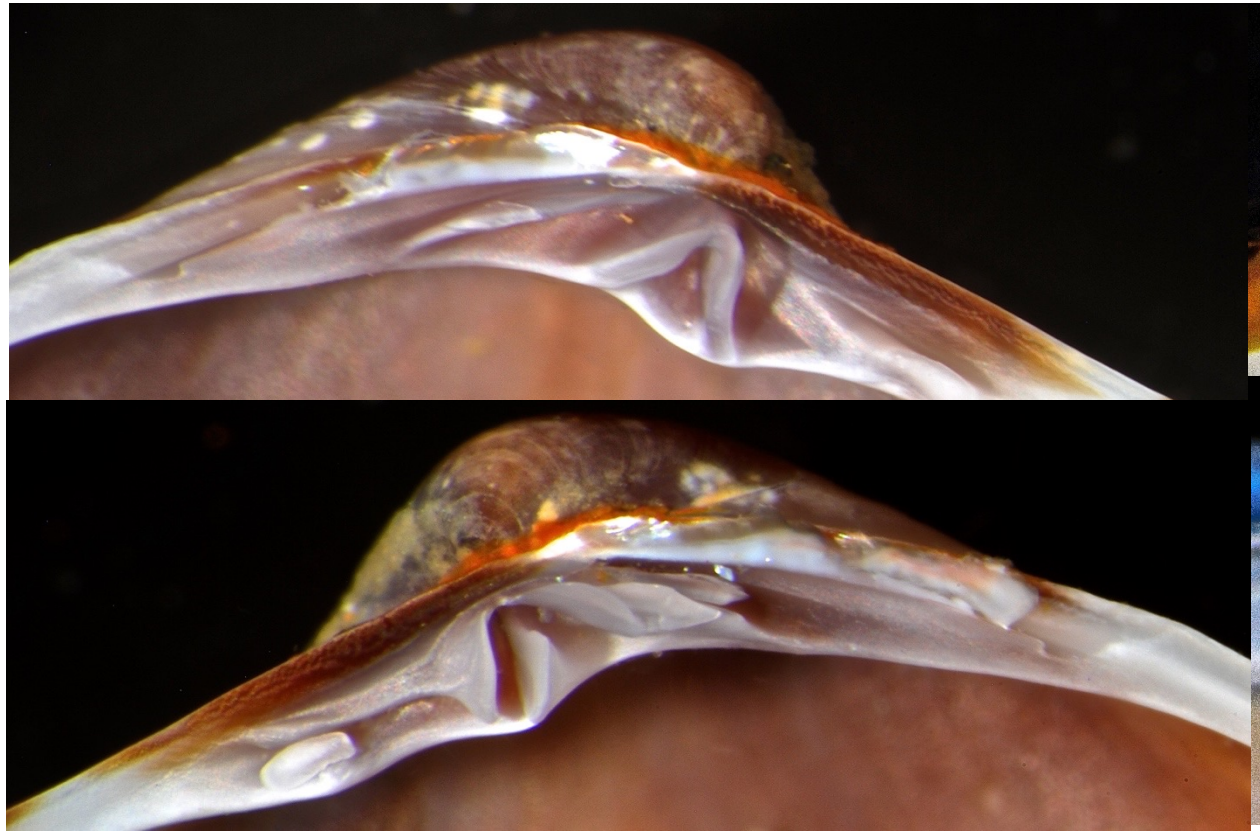


Pitar newcombianus B’18 10062 San Diego Bay 6m

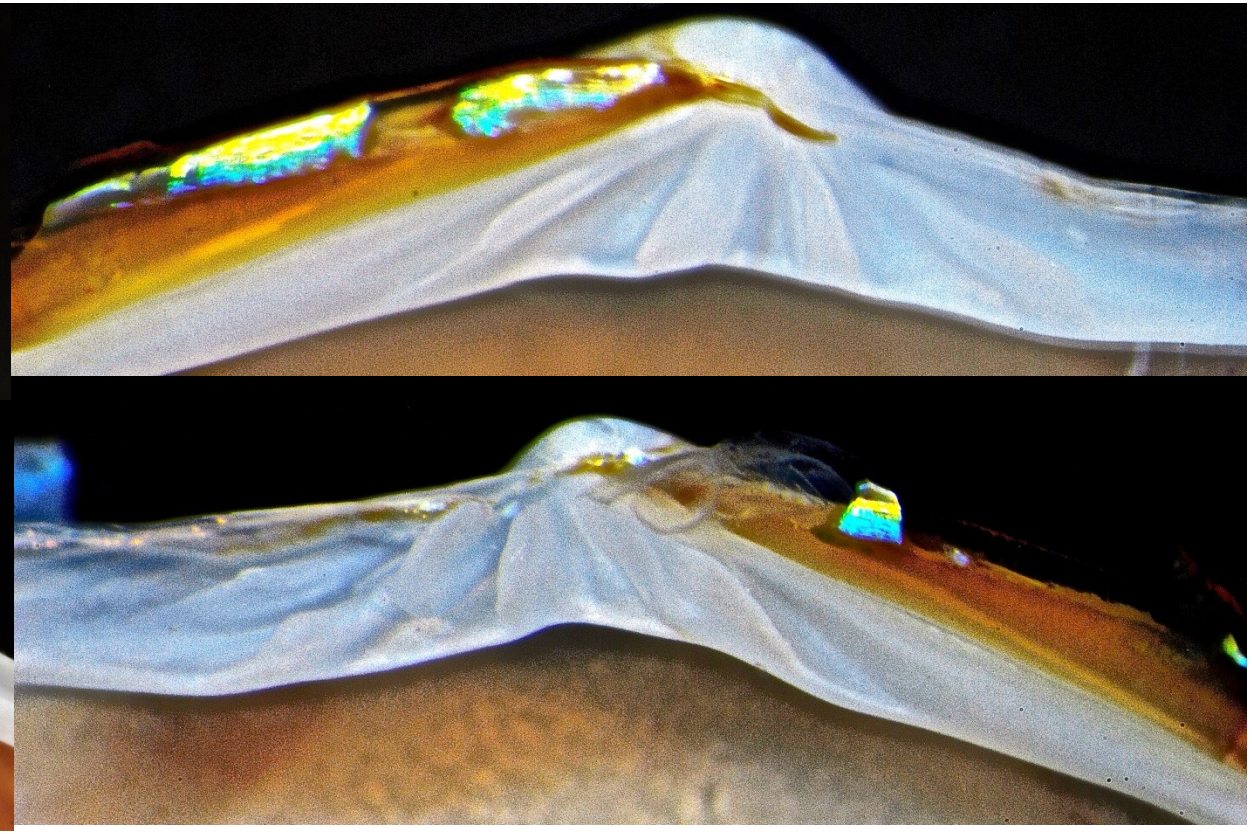


Saxidomus nuttalli B’13 8151 Mission Bay 4m

Pitar newcombianus vs *Saxidomus nuttalli*

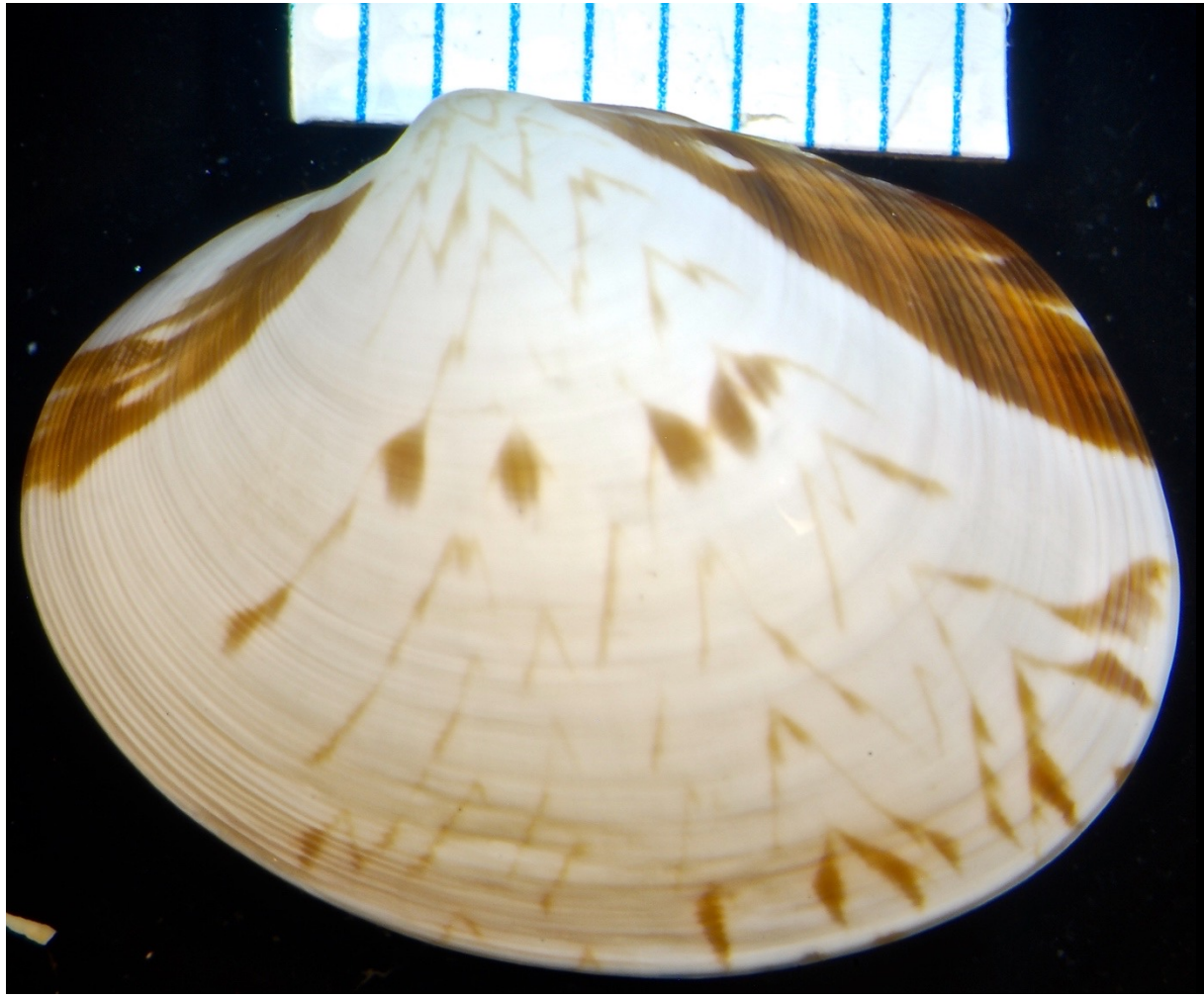


Left hinge (upper) right hinge (lower)



Left hinge (upper) right hinge (lower)

Saxidomus nuttalli Conrad 1837

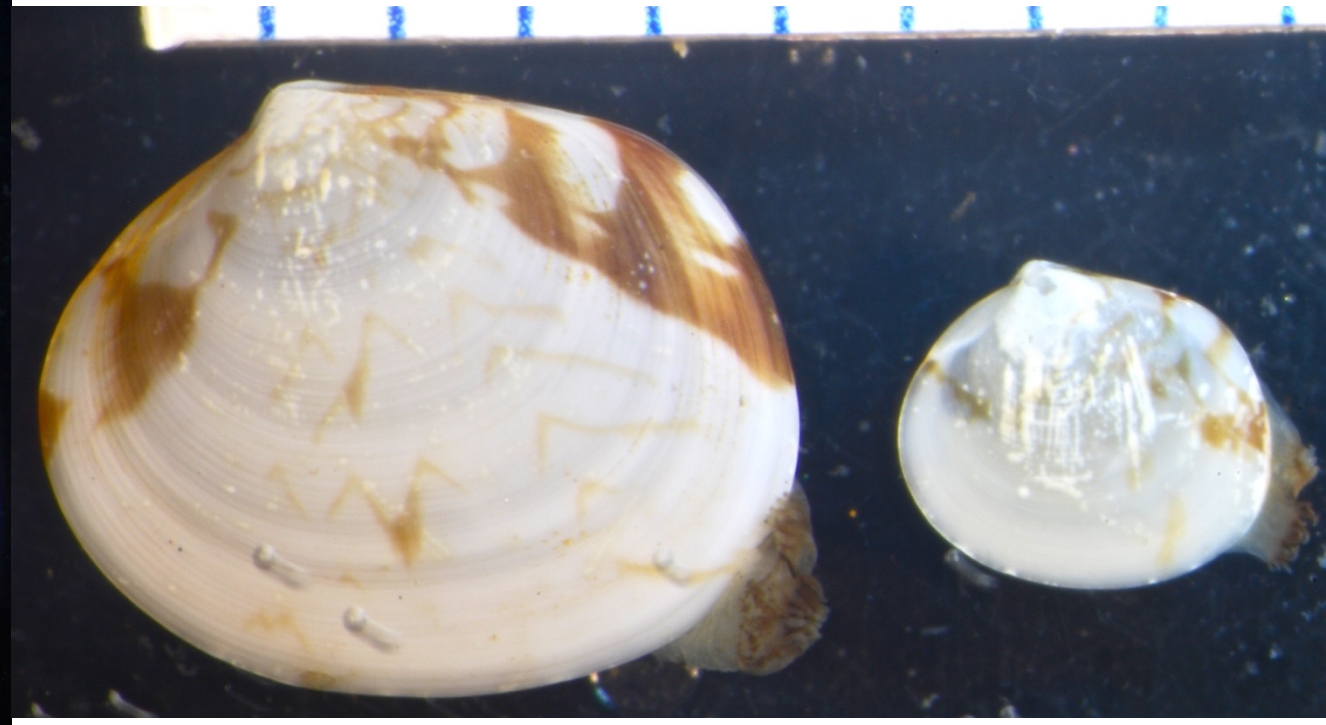


Specimen ‘A’ B’18 10075 Mission Bay 4m

Specimen ‘B’ B’18 10075 Mission Bay 4m

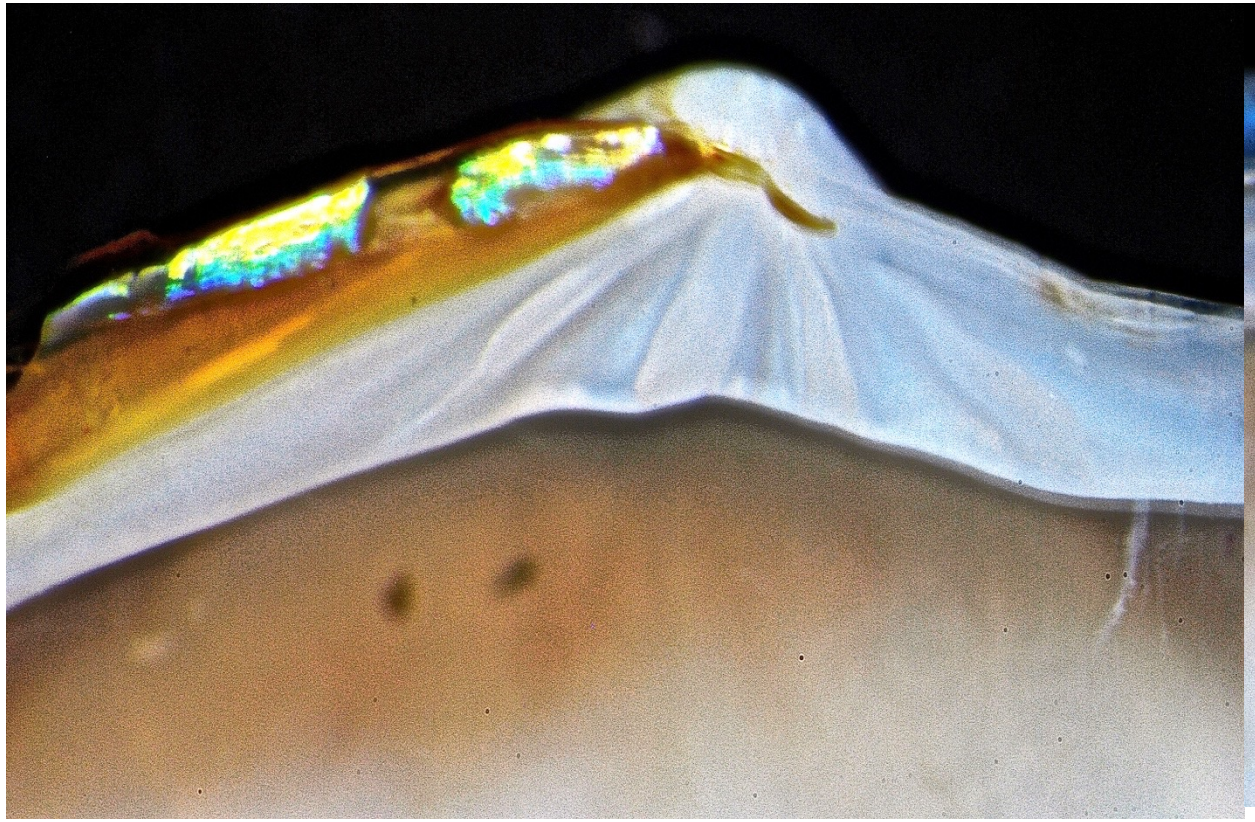
Saxidomus nuttalli Conrad 1837

B’18 10075 Mission Bay 4m

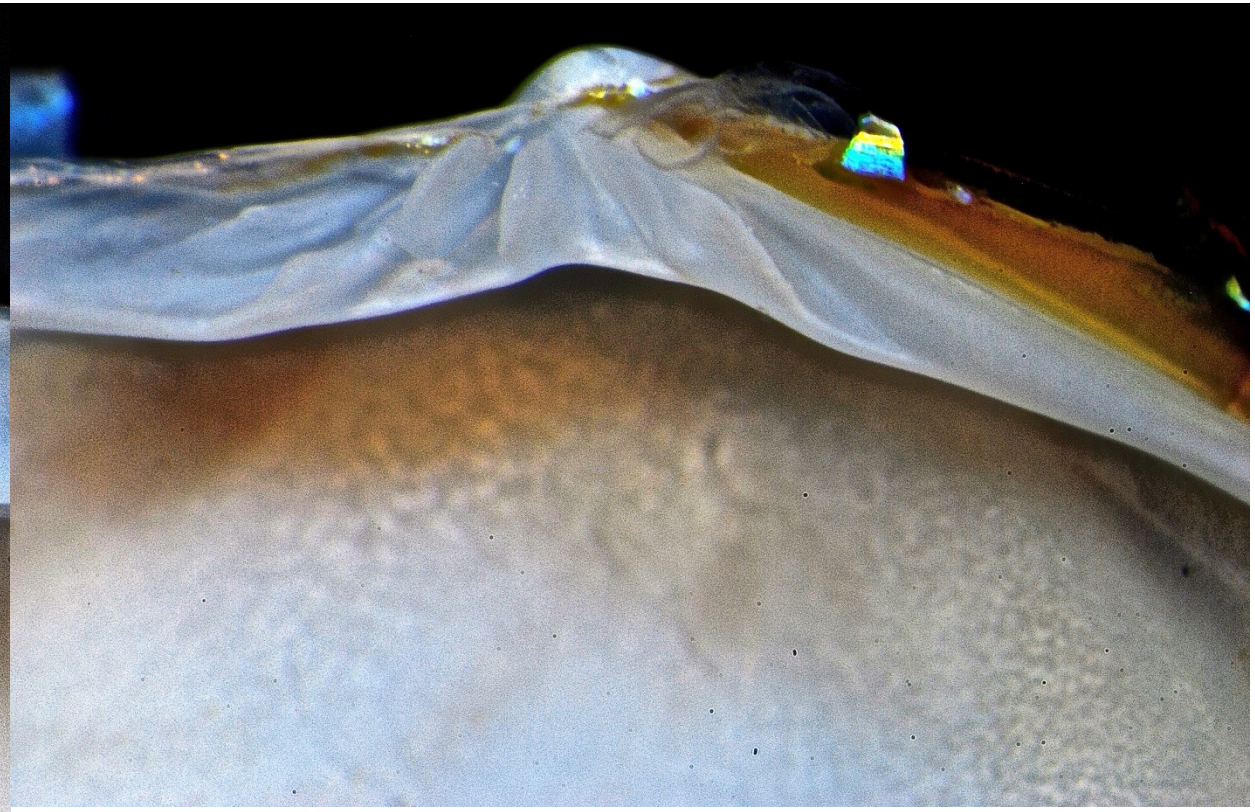


B’13 8151 Mission Bay 4m

Saxidomus nuttalli Conrad 1837



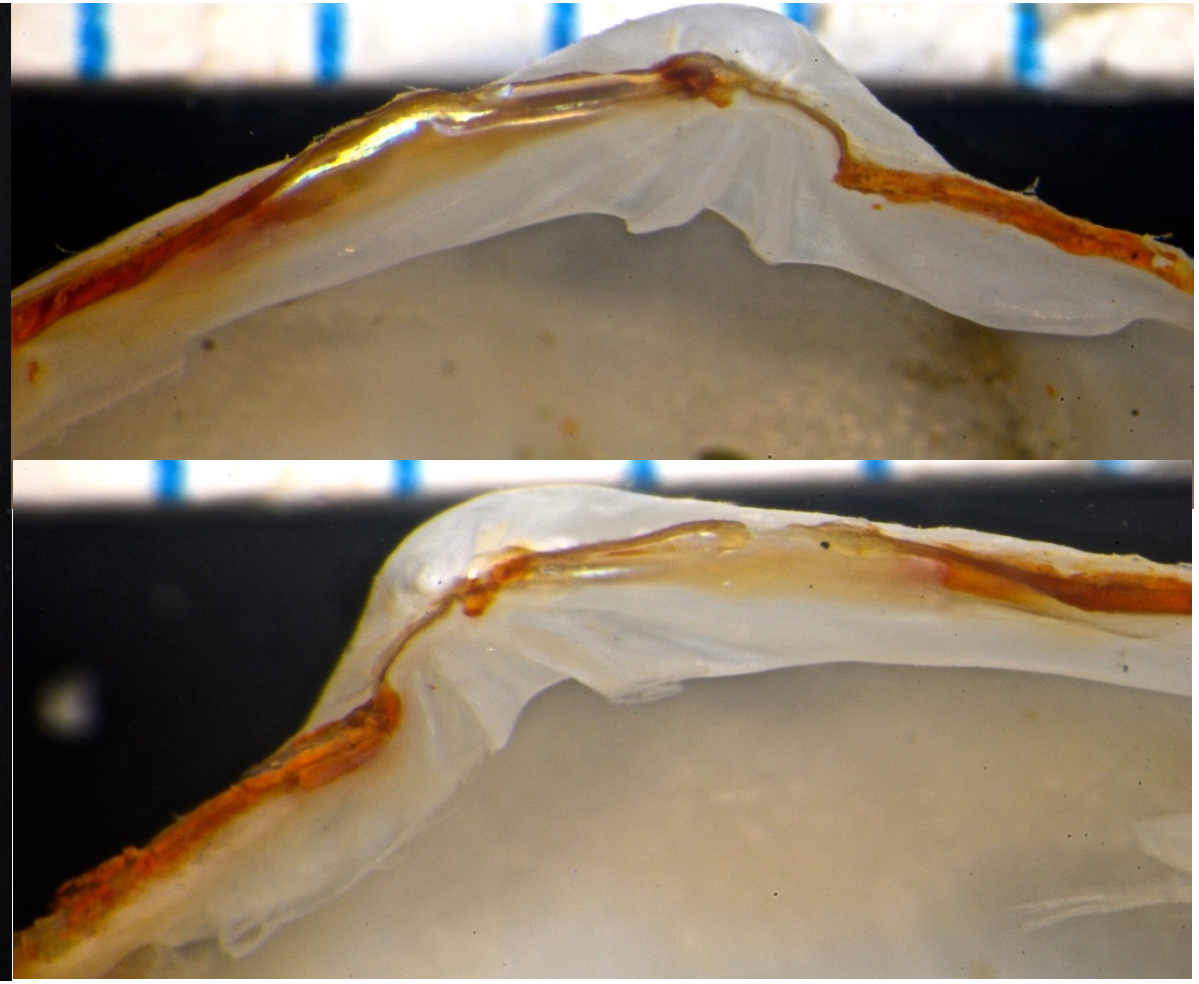
Left hinge specimen ‘B’ B’18 10075 Mission Bay 4m



Right hinge specimen ‘B’ B’18 10075 Mission Bay 4m

Saxidomus nuttalli Conrad 1837

Los Angeles Harbor Arcadis POLA S05A-SS 10m 2016

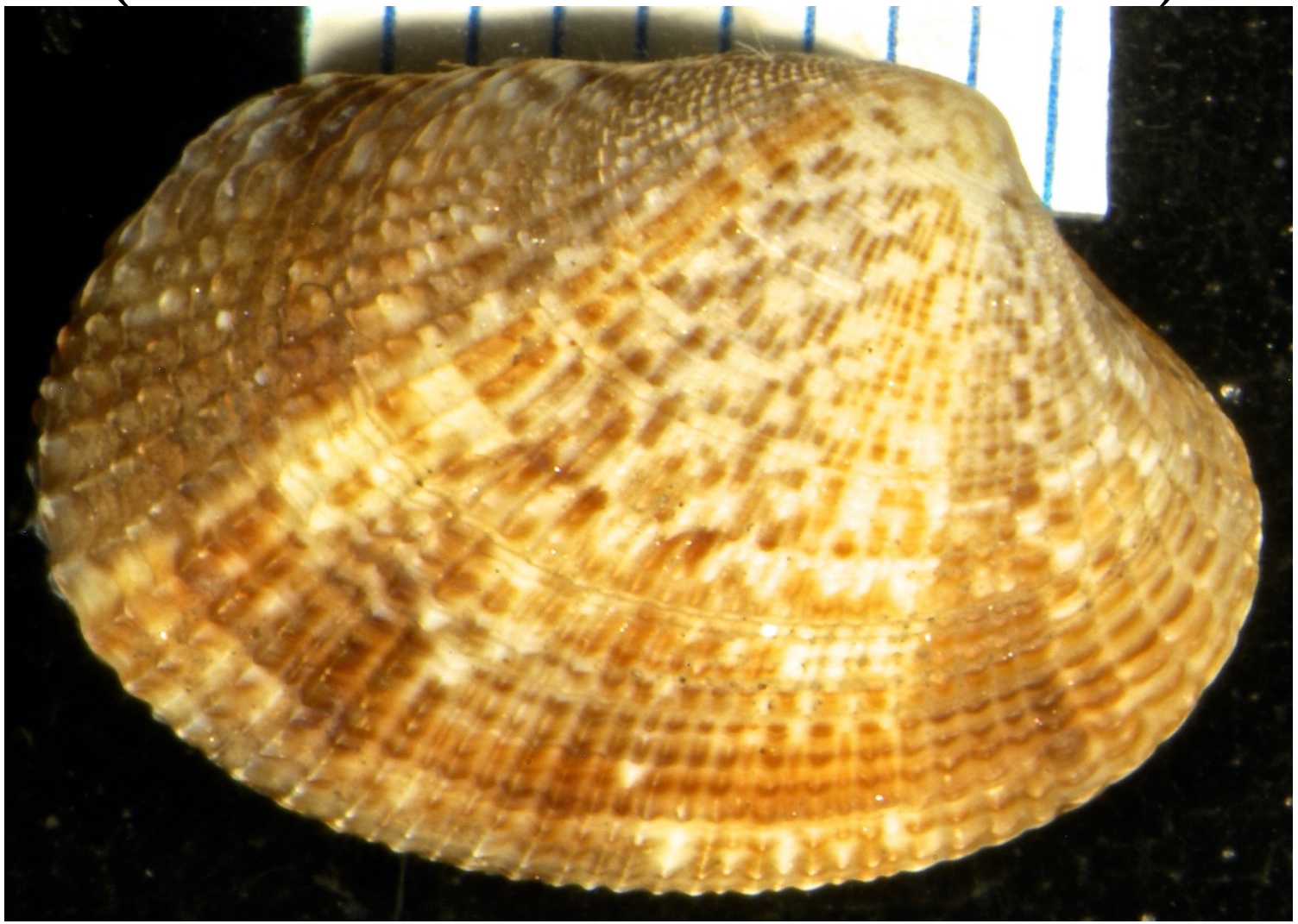


left hinge (above), right hinge below

Venerupis philippinarum
(A. Adams & Reeve 1850)

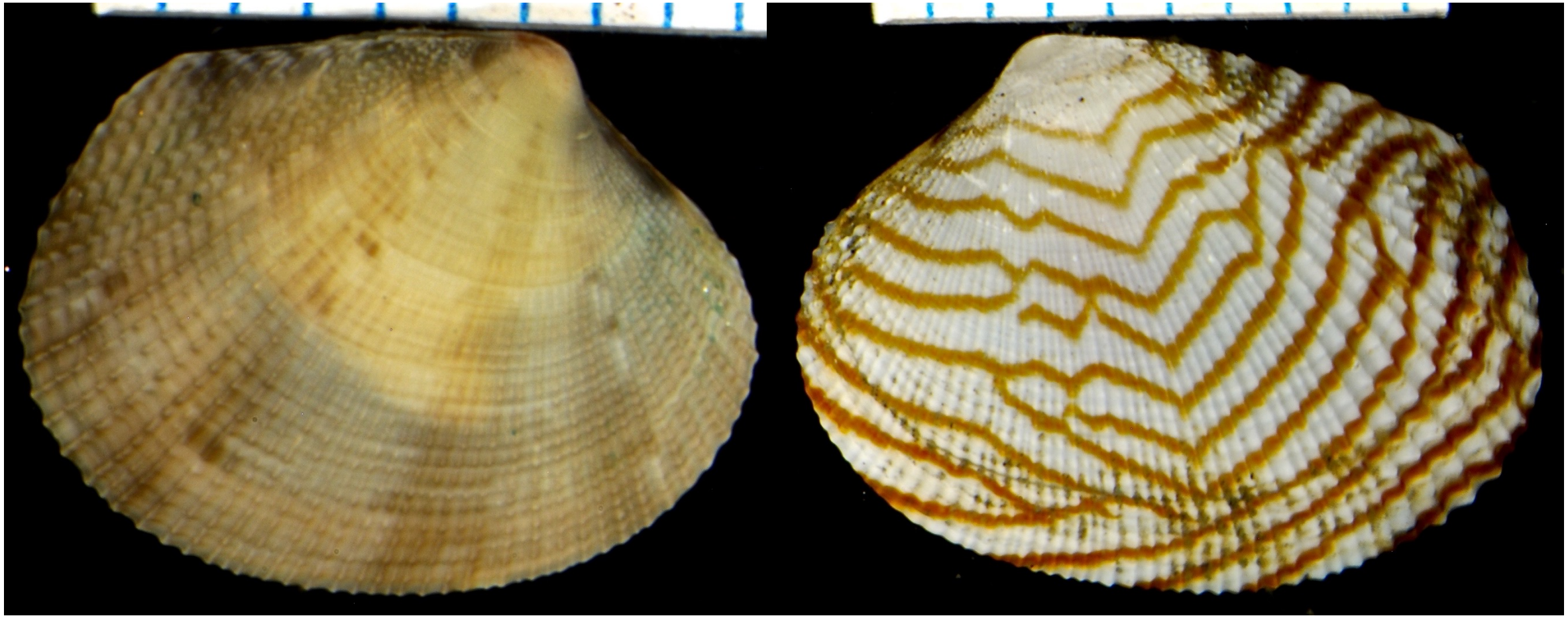
OCPW TBTMAR Talbot Marsh 5m 2020

Venerupis philippinarum
(A. Adams & Reeve 1850)



Camp Pendleton Estuary 5m 2015

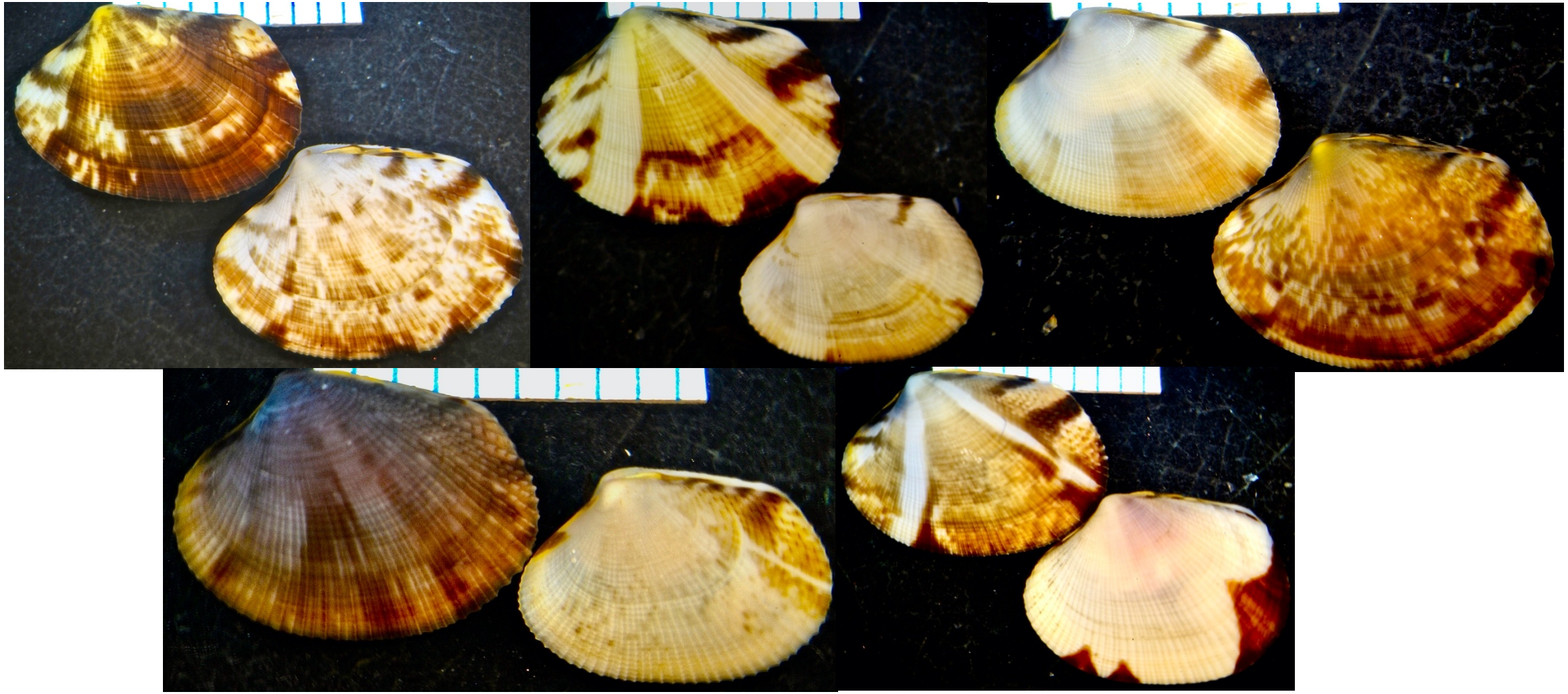
Venerupis philippinarum
(A. Adams & Reeve 1850)



Bolsa Chica 5m 2014

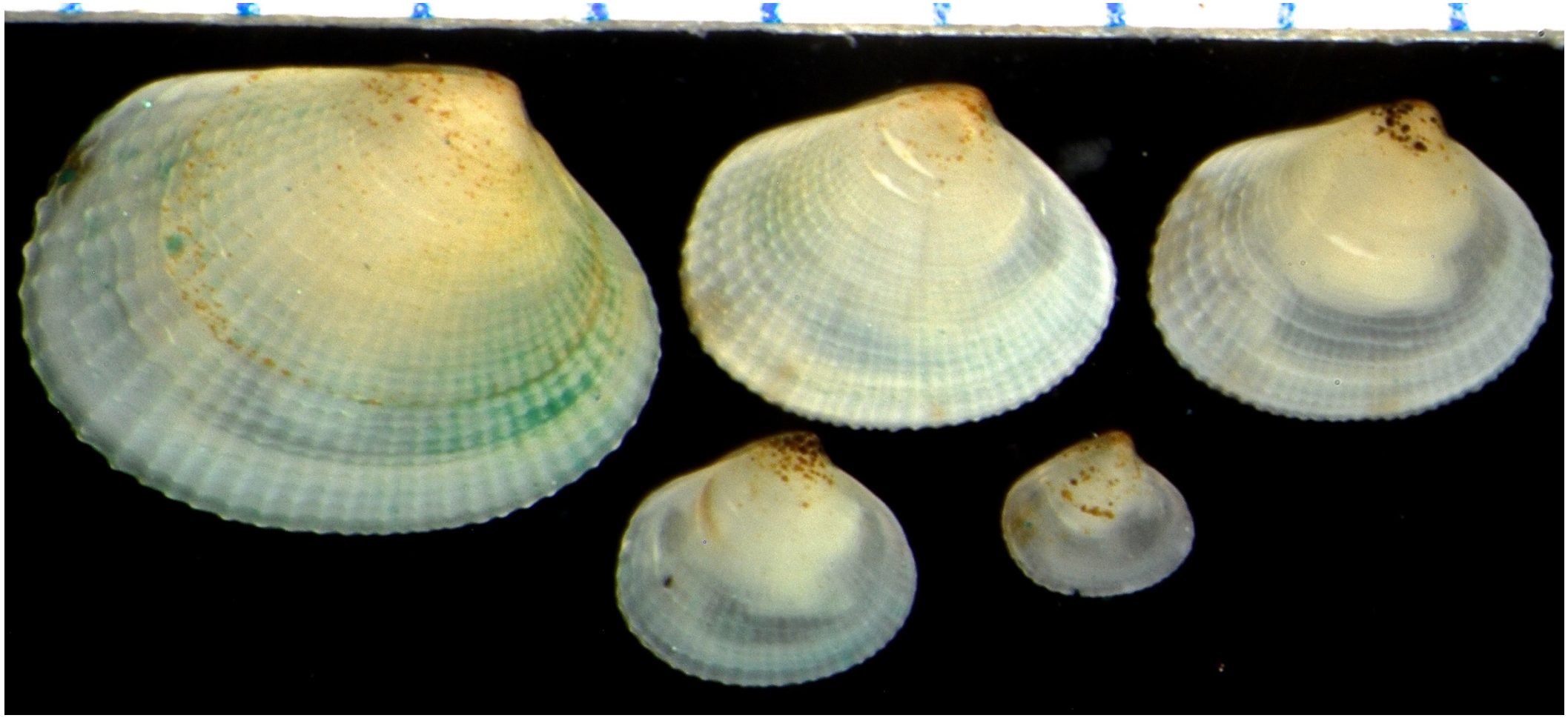
San Francisco Bay 3m 2016

Venerupis philippinarum
(A. Adams & Reeve 1850)



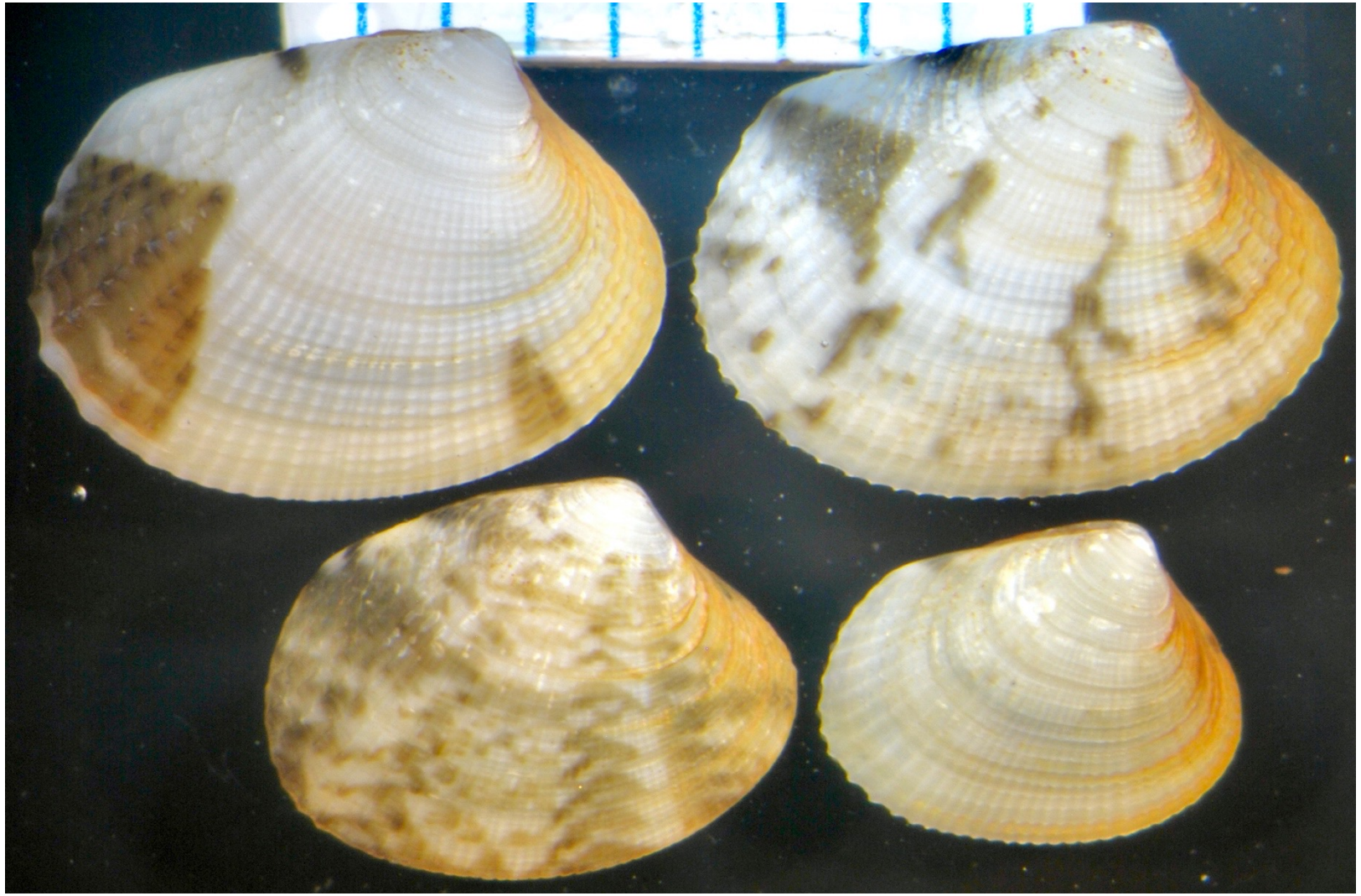
B’18 Bolsa Chica BBOLR 5m

Venerupis philippinarum
(A. Adams & Reeve 1850)



Bolsa Chica 5m 2014

Venerupis philippinarum
(A. Adams & Reeve 1850)

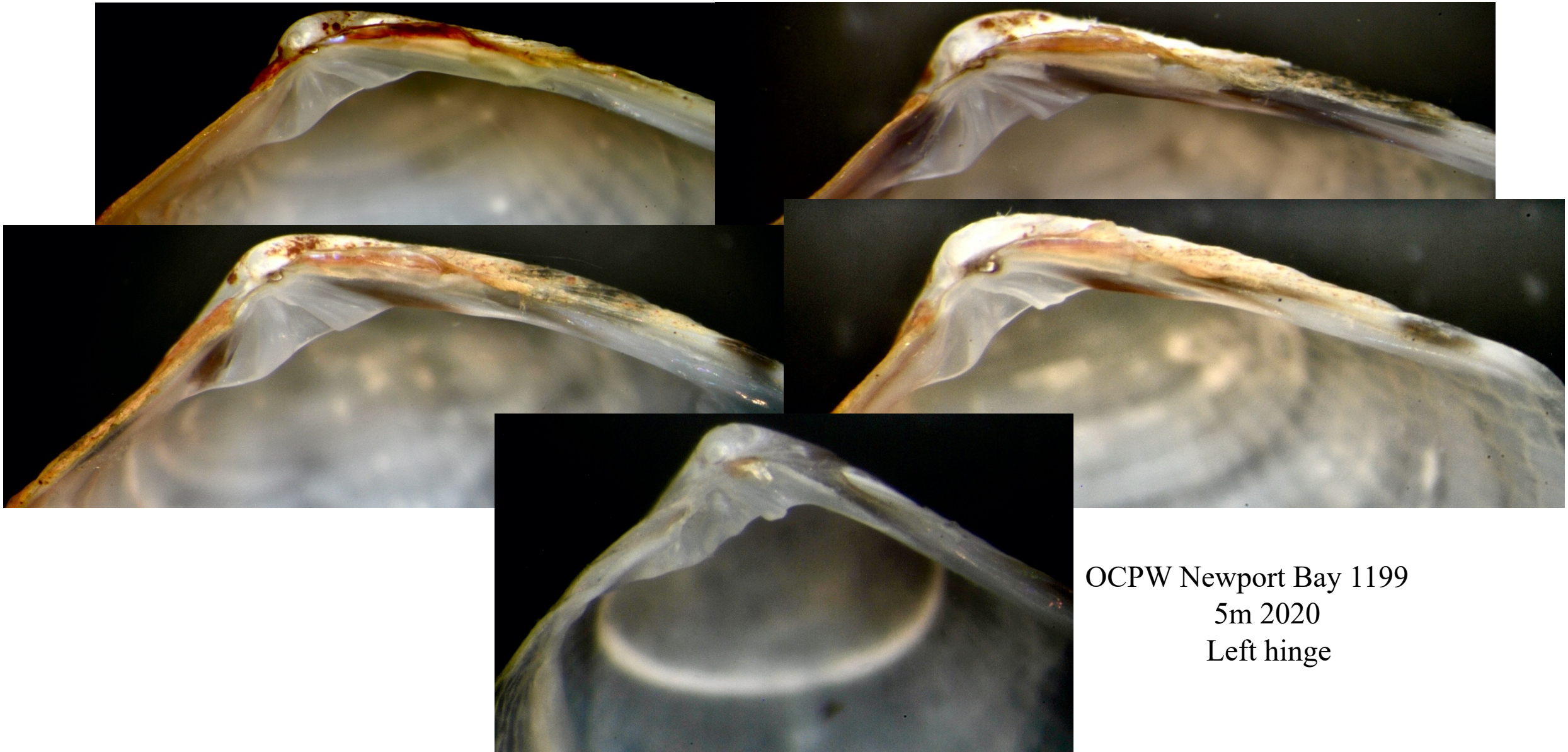


OCPW Newport Bay 1199 5m 2020

Venerupis philippinarum
(A. Adams & Reeve 1850)

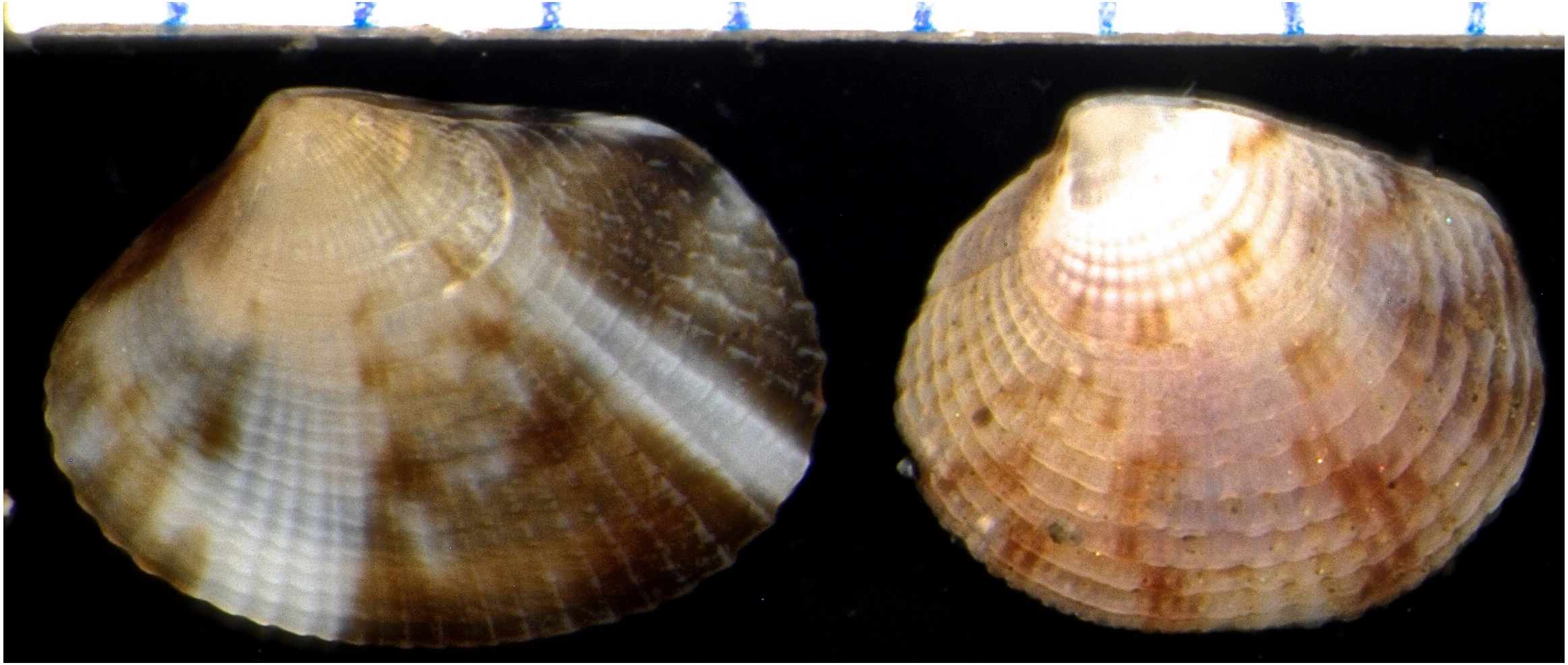
OCPW Newport Bay 1199
5m 2020
Left valve

Venerupis philippinarum
(A. Adams & Reeve 1850)



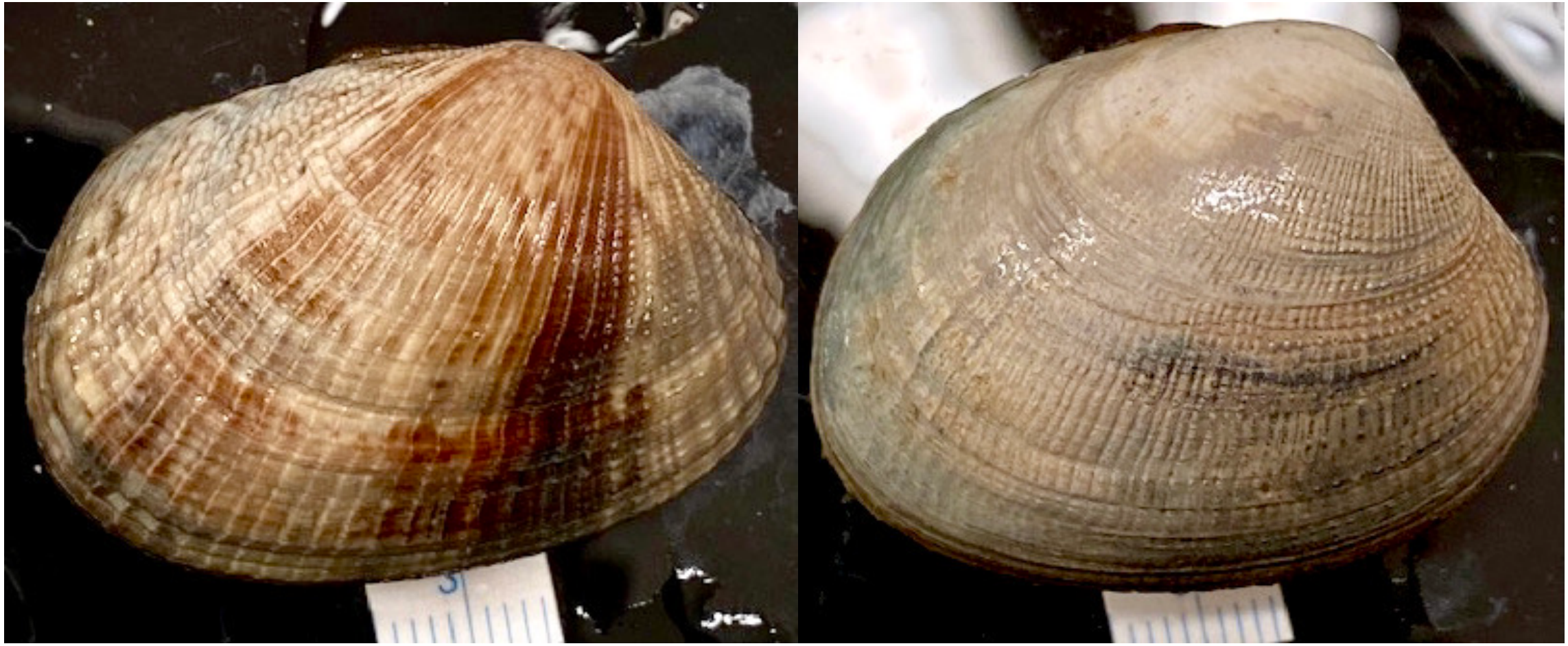
OCPW Newport Bay 1199
5m 2020
Left hinge

Venerupis philippinarum/Leukoma lacianata



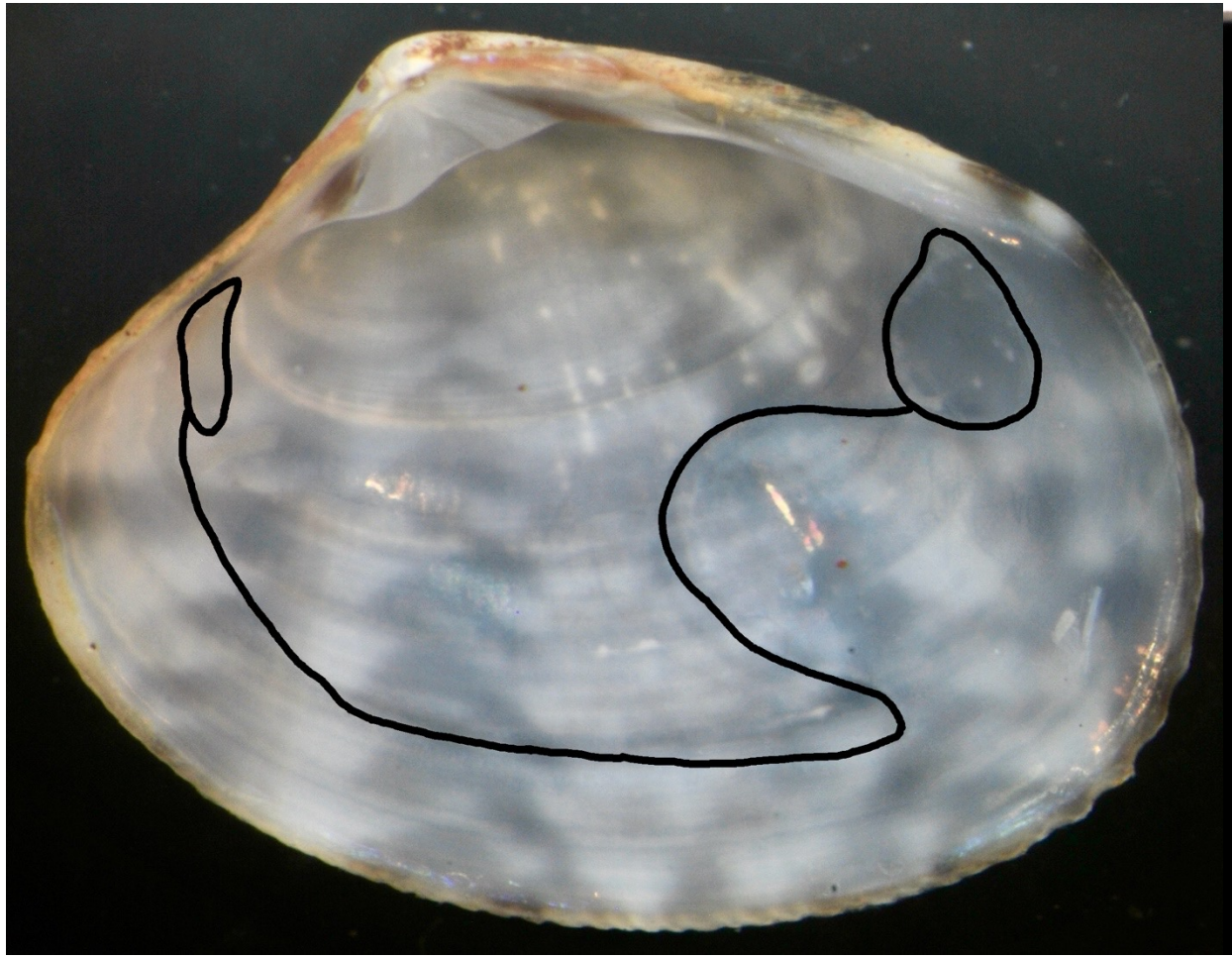
B’18 BBOLR Bolsa Chica 5m

Venerupis philippinarum/Leukoma staminea

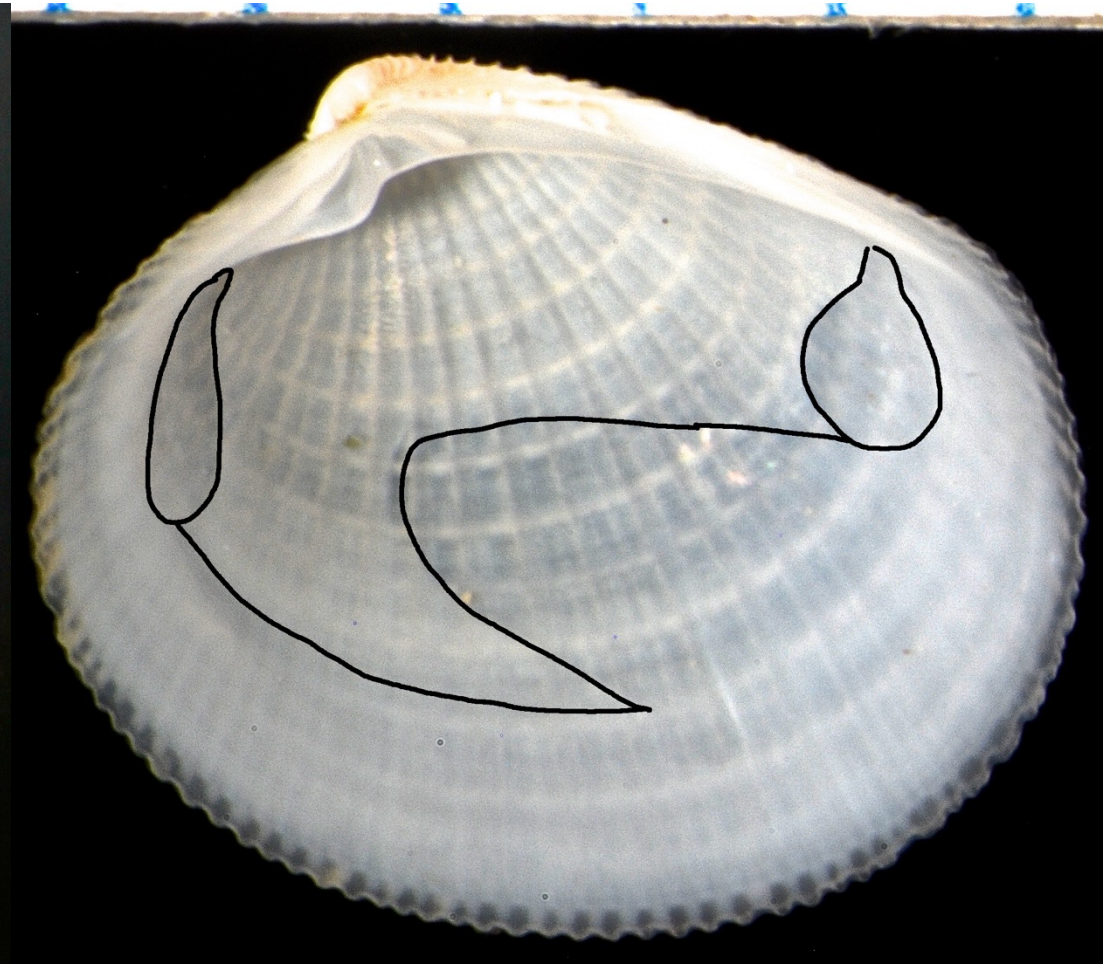


OCPW BBOLR Bolsa Chica 5m 2020

Venerupis philippinarum/Leukoma lacianata

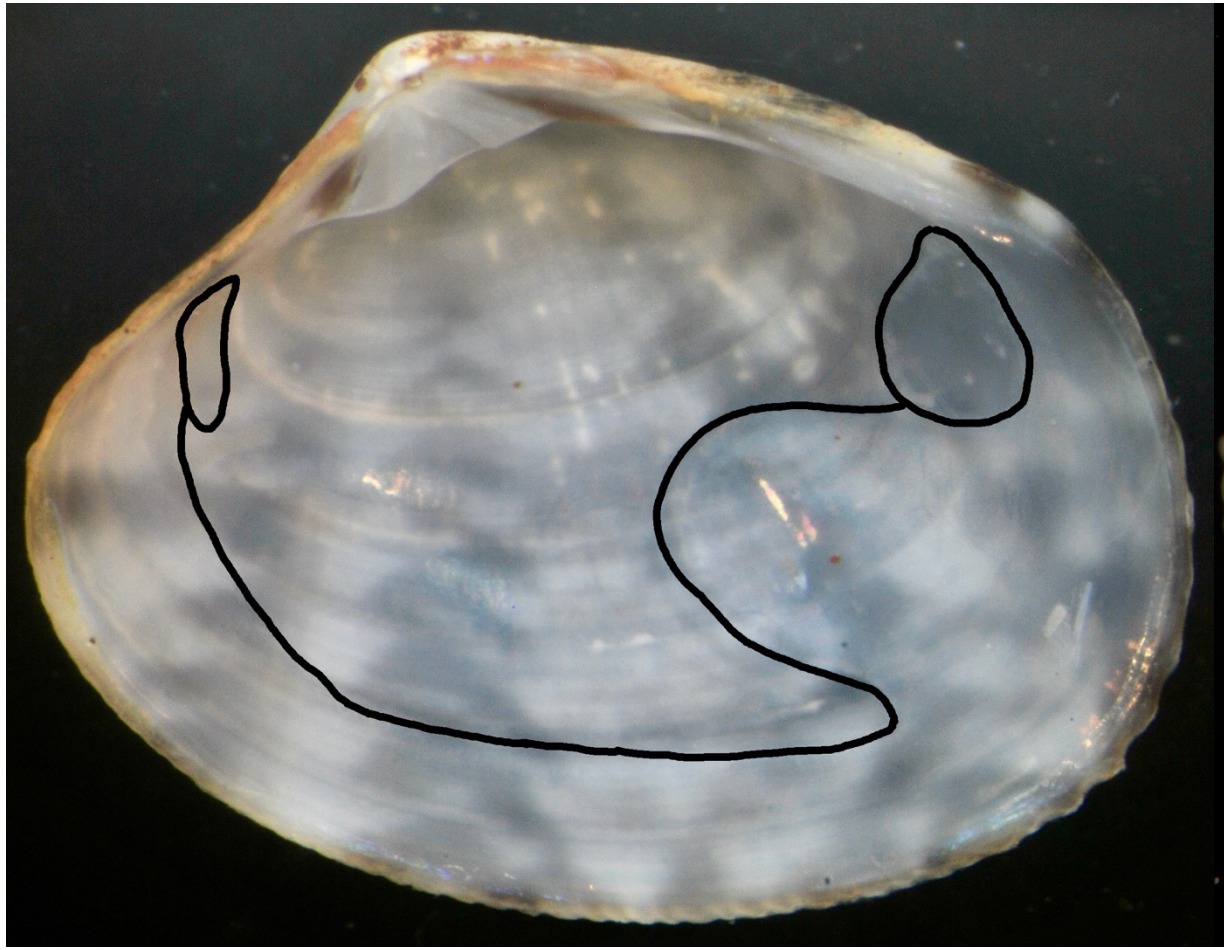


OCPW Newport Bay 5m 2020
right pallial sinus



Oxnard 10m 2015
right pallial sinus

Venerupis philippinarum/Leukoma staminea



OCPW Newport Bay 5m 2020
right pallial sinus

King Harbor 5m 1975
right pallial sinus

specimen courtesy of Carol Paquette MBC

Venerupis philippinarum/Leukoma

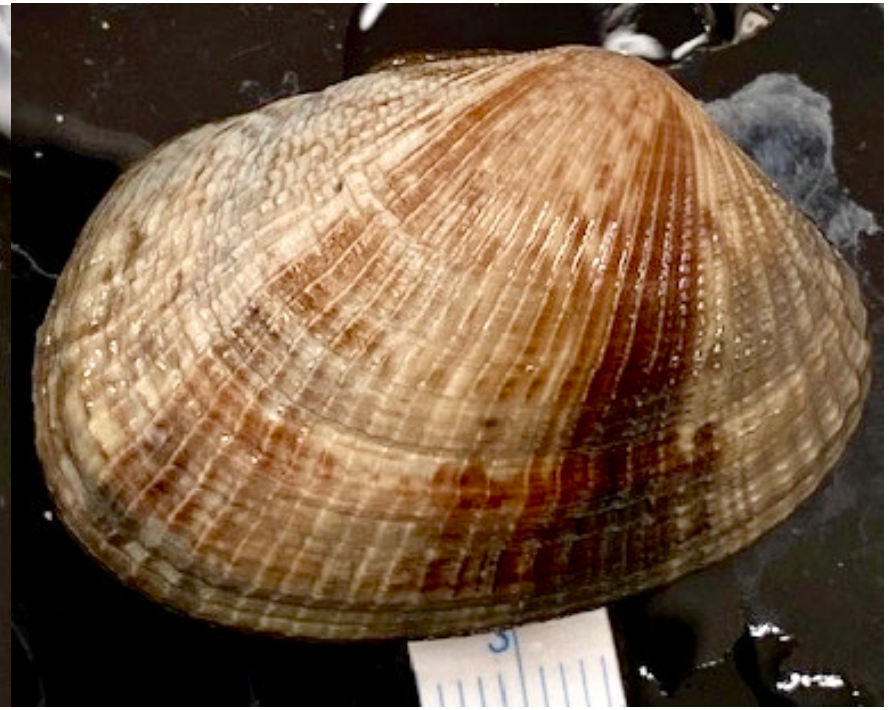
Venerupis philippinarum

Leukoma lacianata

Leukoma staminea

right valves

Chionista/Leukoma/Venerupis



OCPW BBOLR Bolsa Chica 5m 2020

Chionista fluctifraga *Leukoma staminea* *Venerupis philippinarum*

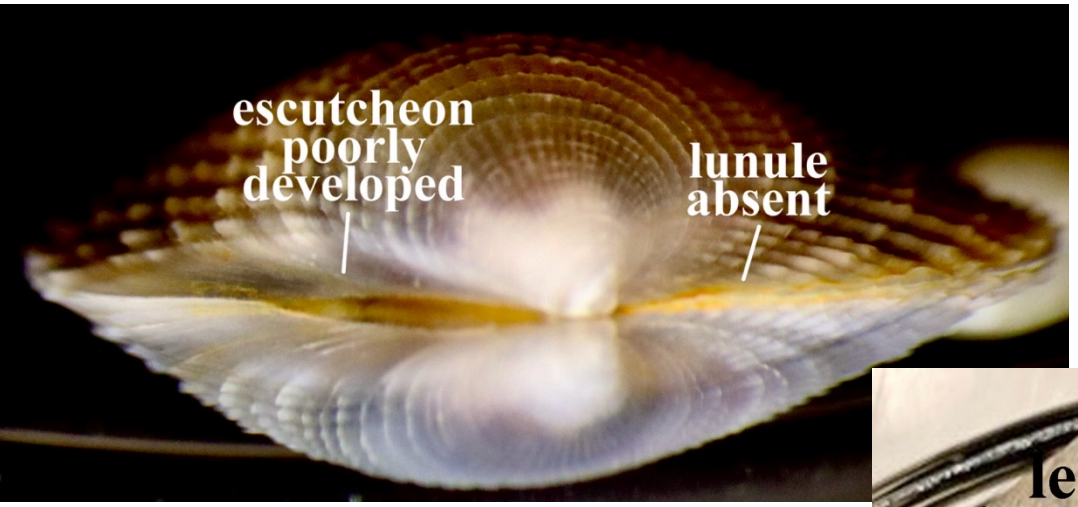
Venerupis/Leukoma/Chione (juvenile)

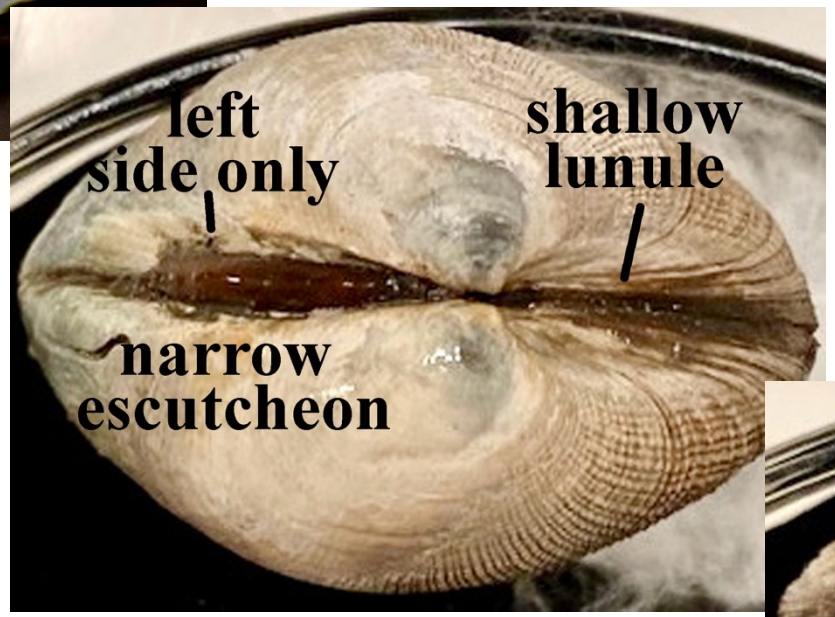
Leukoma sp above (5 mm or less)

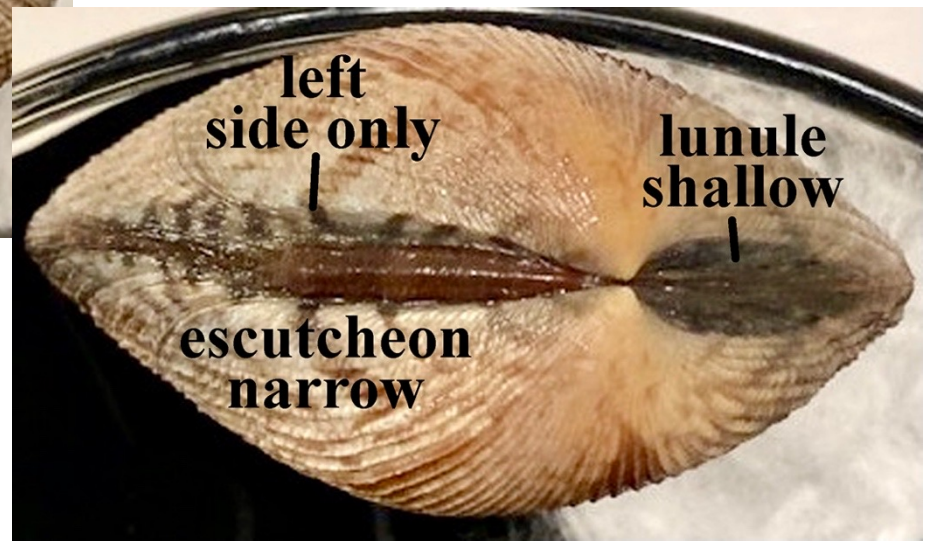
Venerupis philippinarum upper left

Chione californiensis left

Chionista/Leukoma/Venerupis

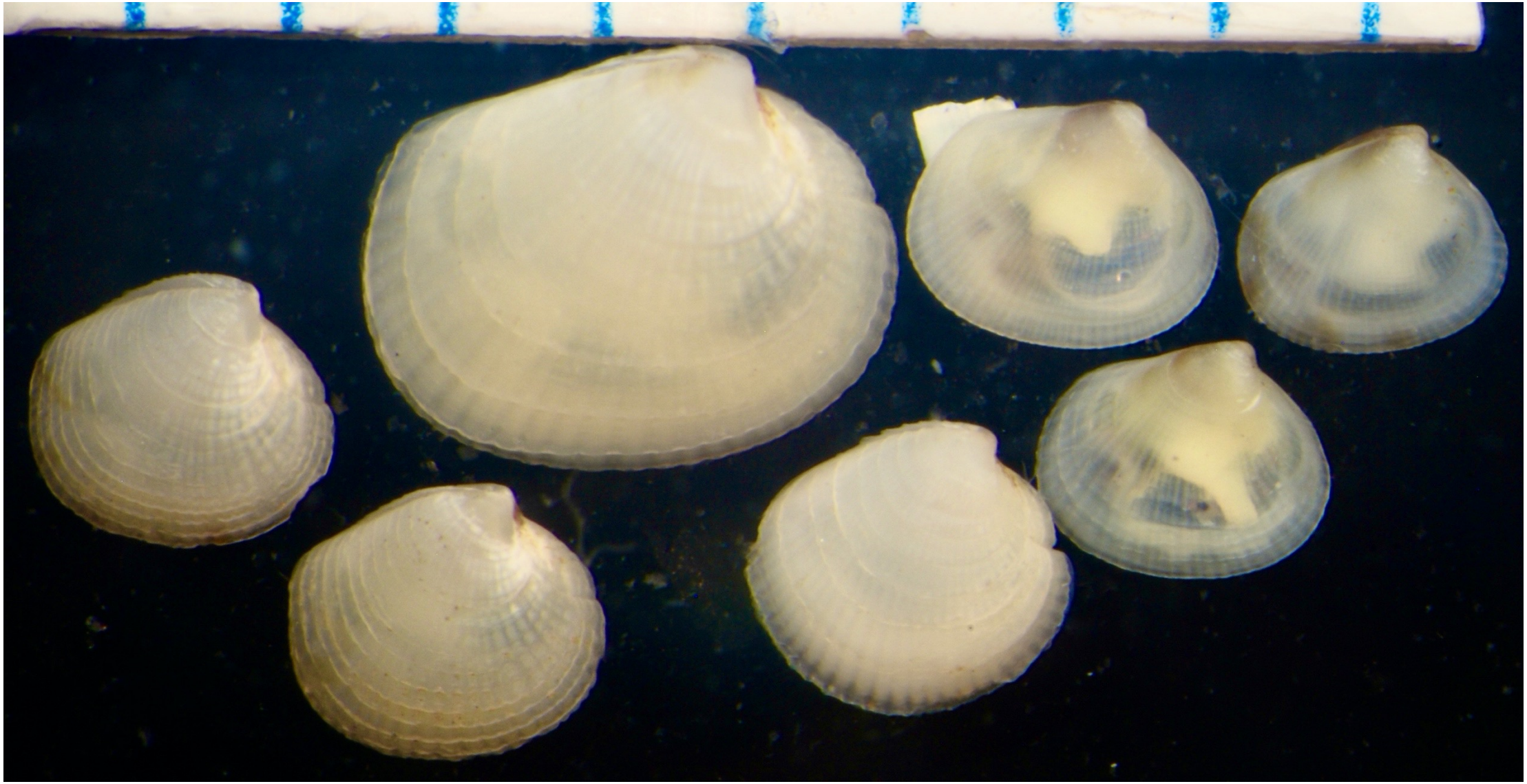






OCPW BBOLR Rolsa Chica 5m 2020

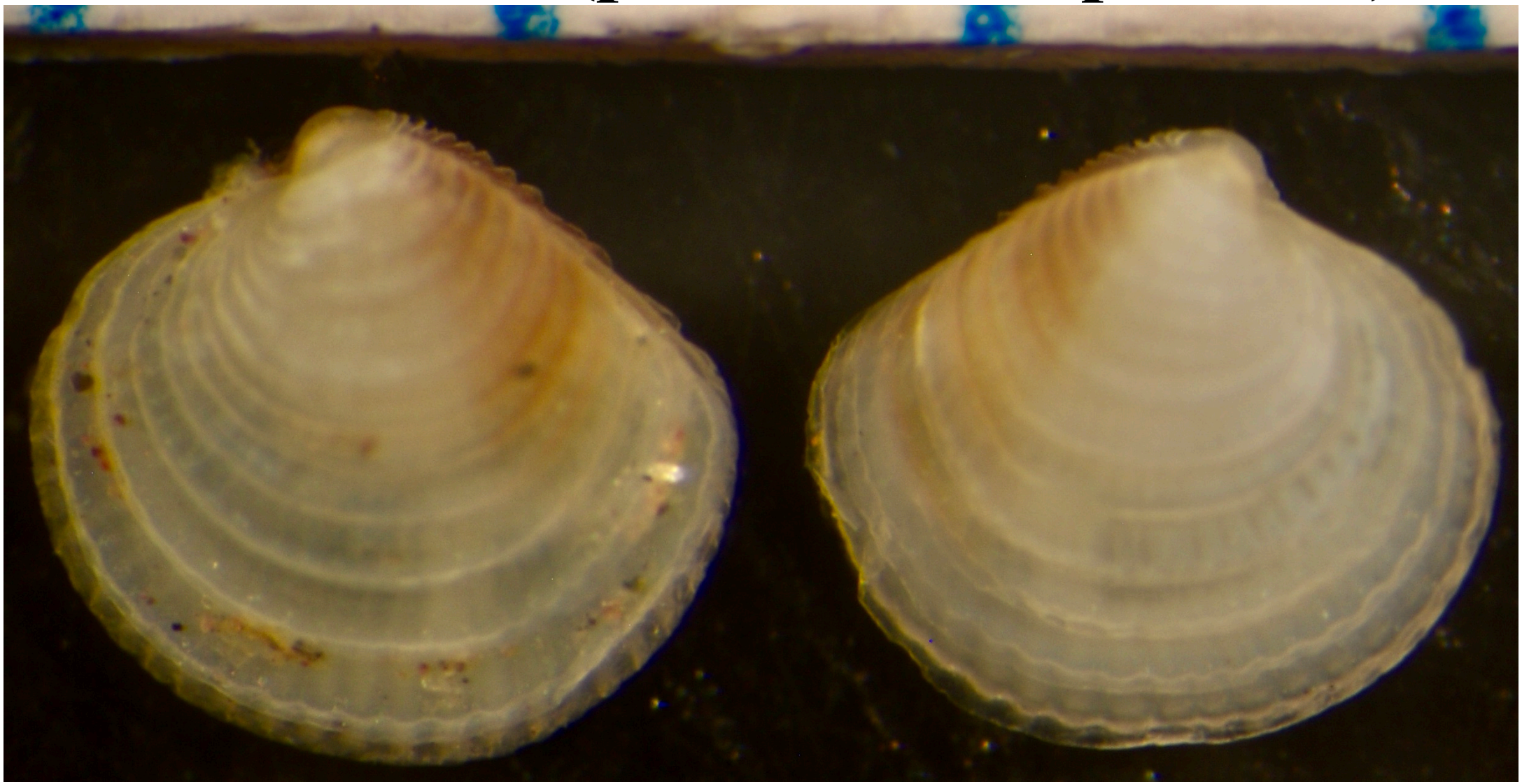
Venerinae (juvenile)



Bolsa Chica BBOLR 5m August 2019

Leukoma sp *Chione californiensis* *Venerupis philippinarum*

Venerinae (per SCAMIT protocol)



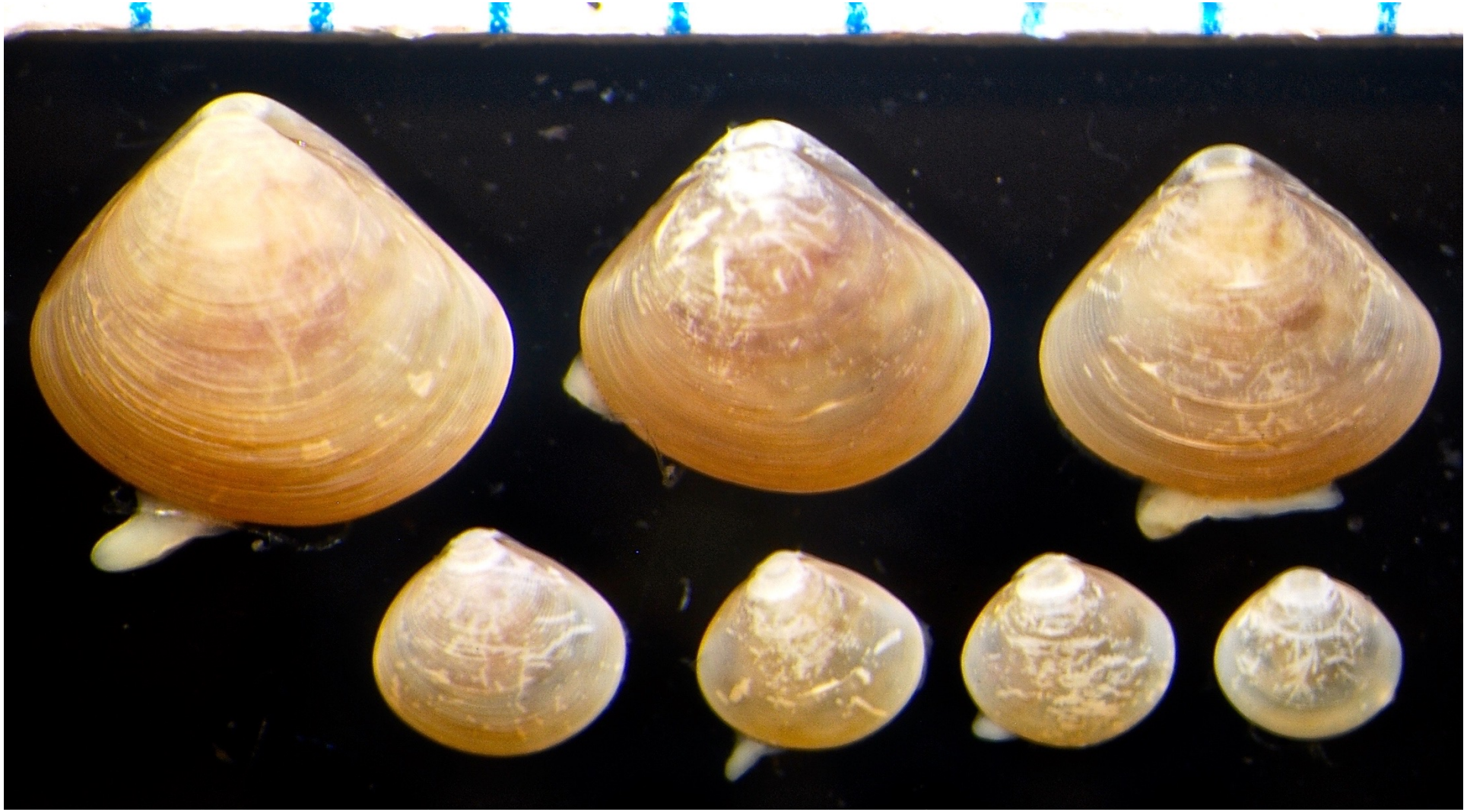
Oxnard R7 10m 2019

Leukoma sp

Family Neoleptonidae

1. **Shell small to minute**
2. **Hinge with two or three cardinal teeth in each valve, may or may not have left anterior lateral tooth**
3. **Ligament mostly internal**

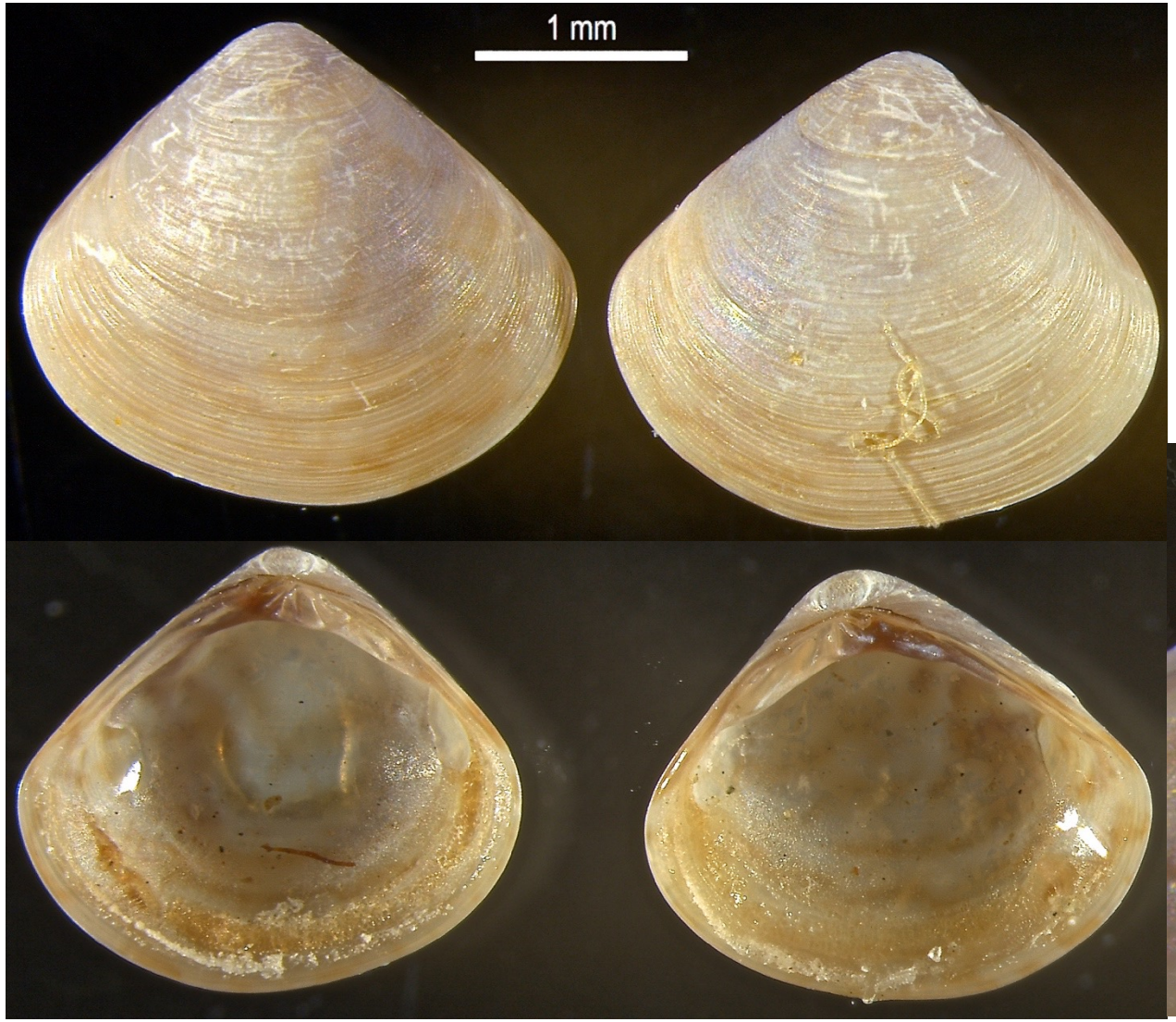
Neolepton salmoneum (Carpenter 1864)

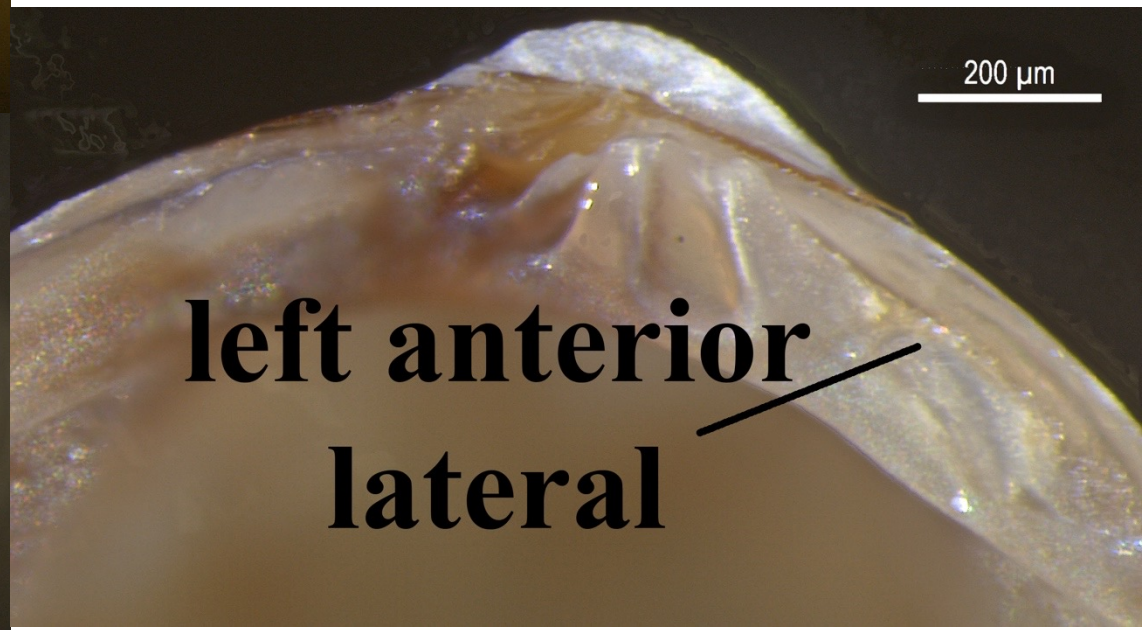


Specimens courtesy of Carol Paquette MBC

Goleta B3 30m 1990

Neolepton salmoneum (Carpenter 1864)



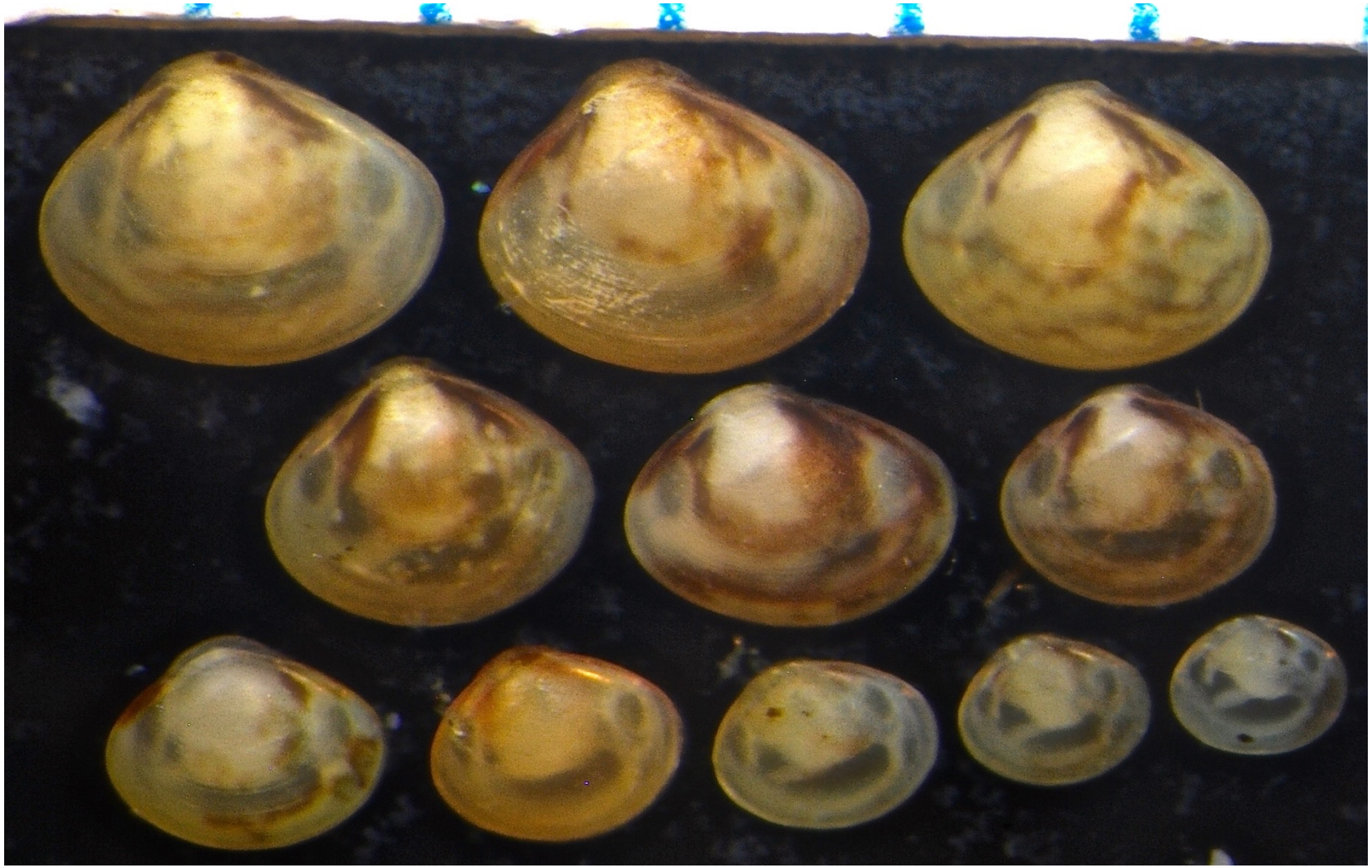


left valve

right valve

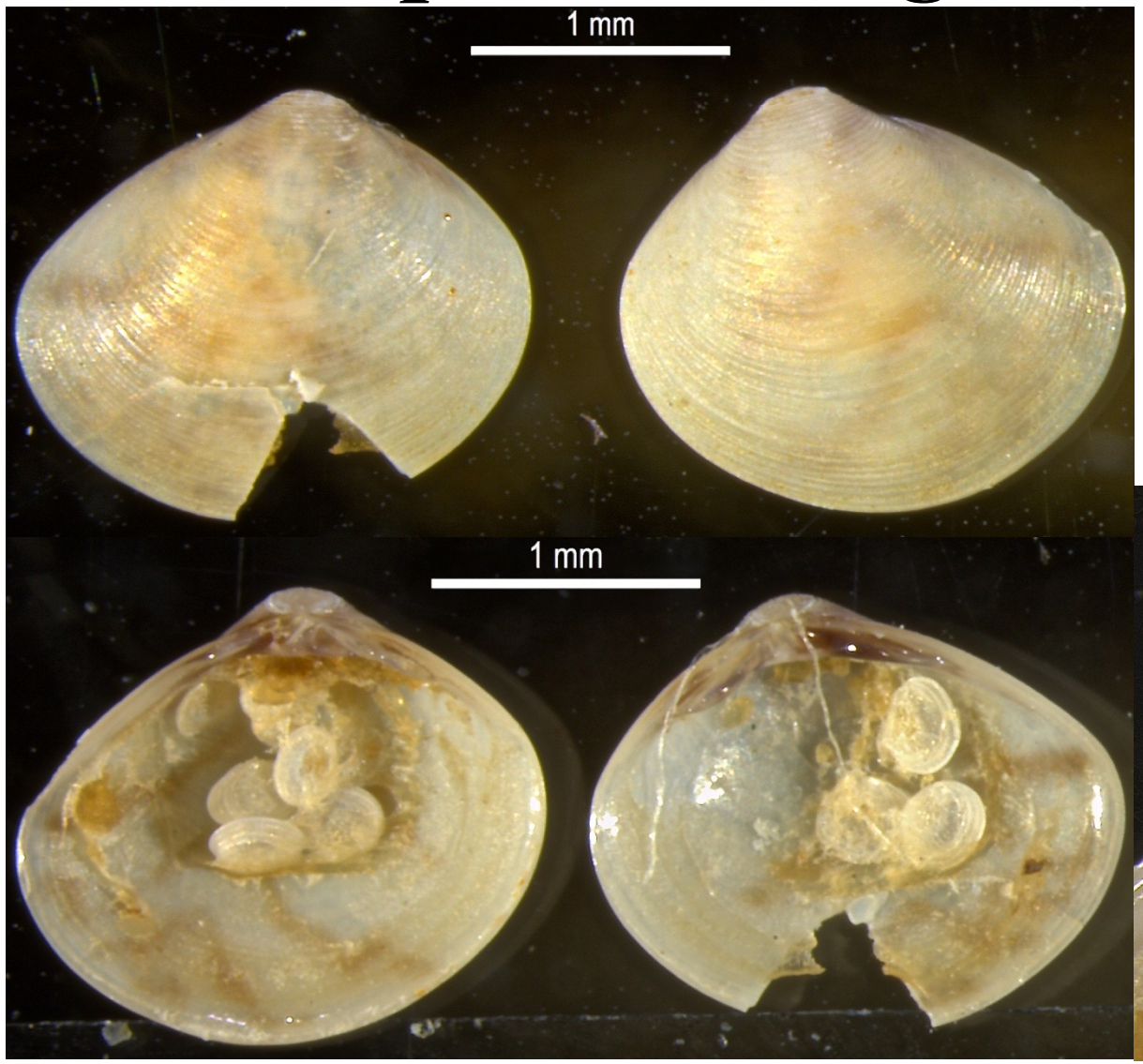
Photos courtesy of Kelvin Barwick

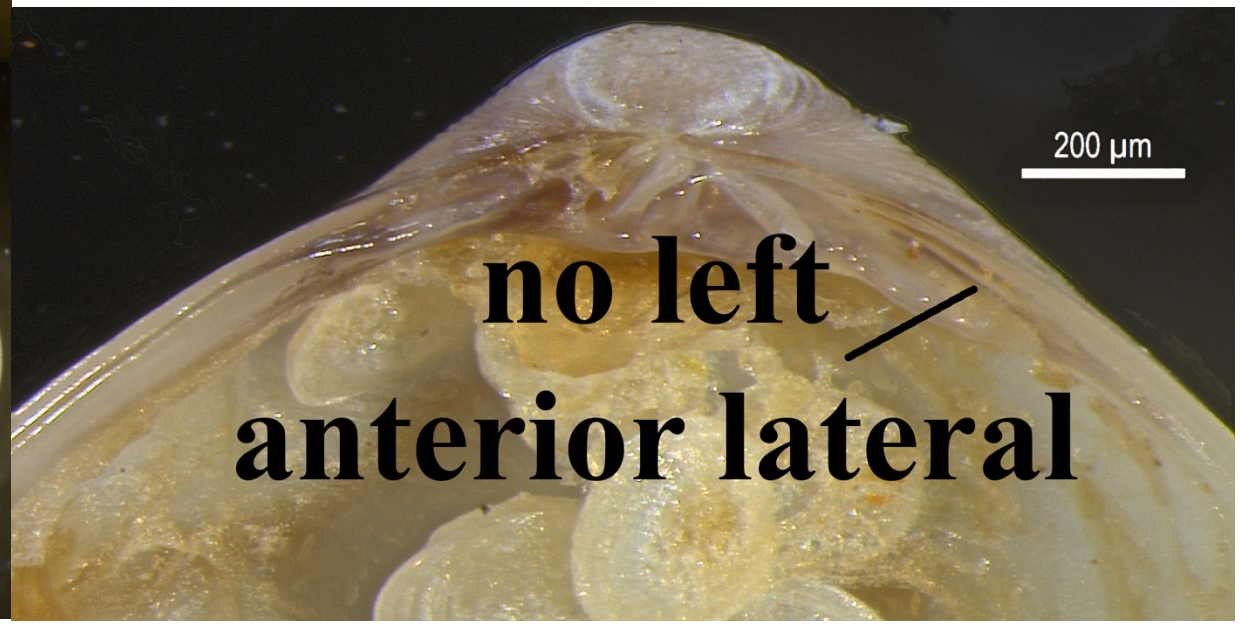
Neolepton subtrigonum (Carpenter 1857)



Los Angeles Breakwater Rip-Rap LARR1/QS-3B 2018

Neolepton subtrigonum (Carpenter 1857)

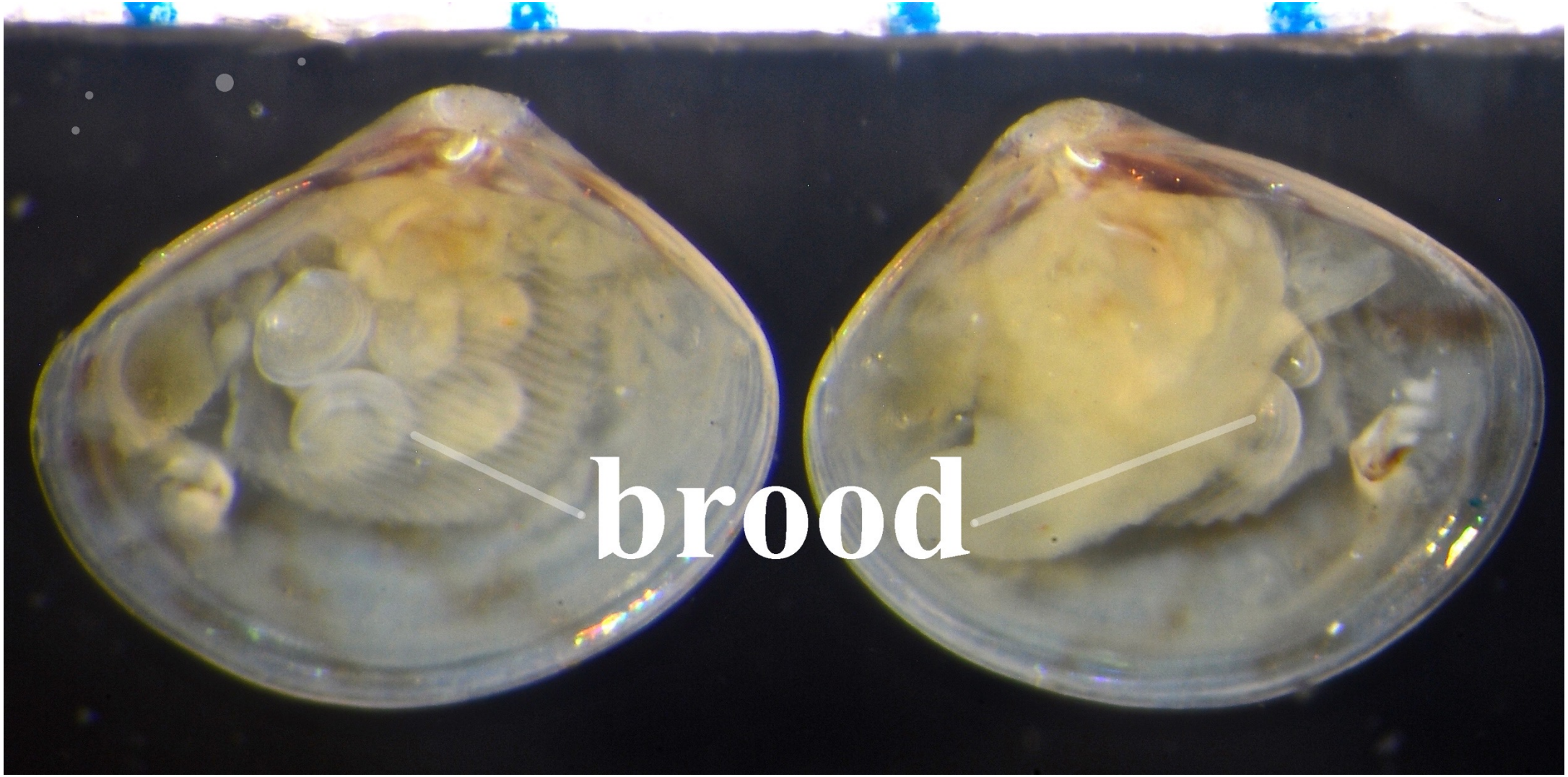




left valve right valve

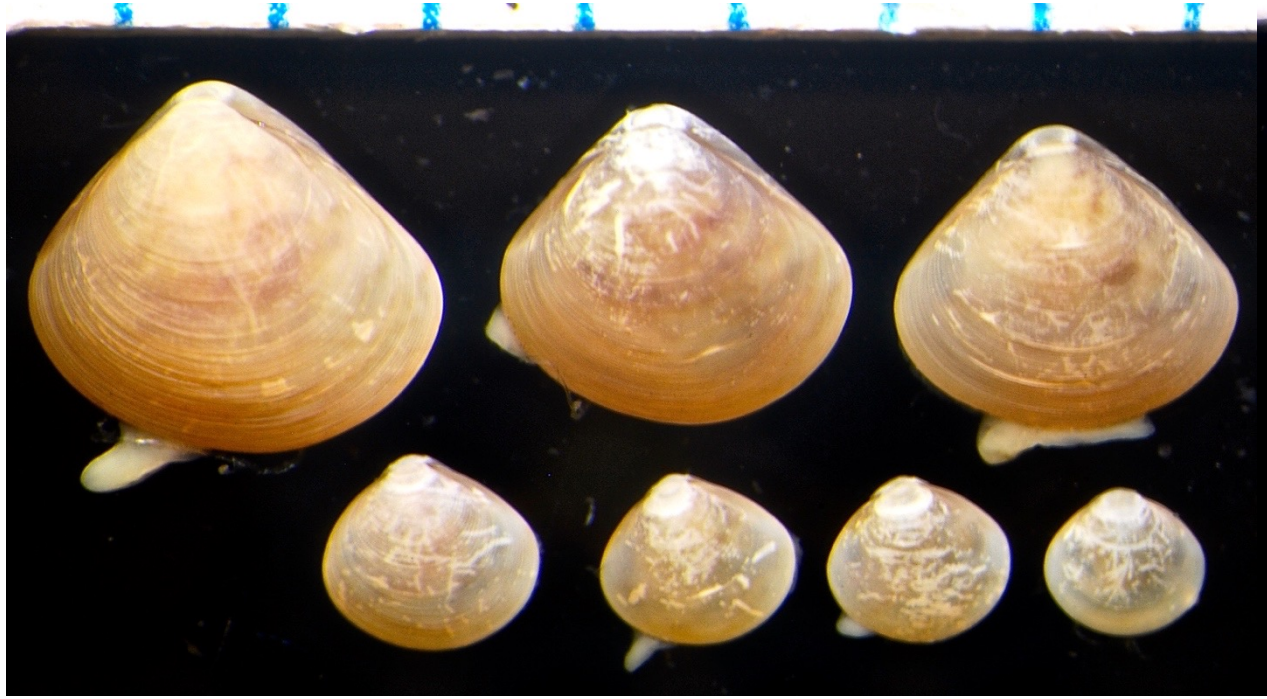
Photos courtesy of Kelvin Barwick

Neolepton subtrigonum (Carpenter 1857)

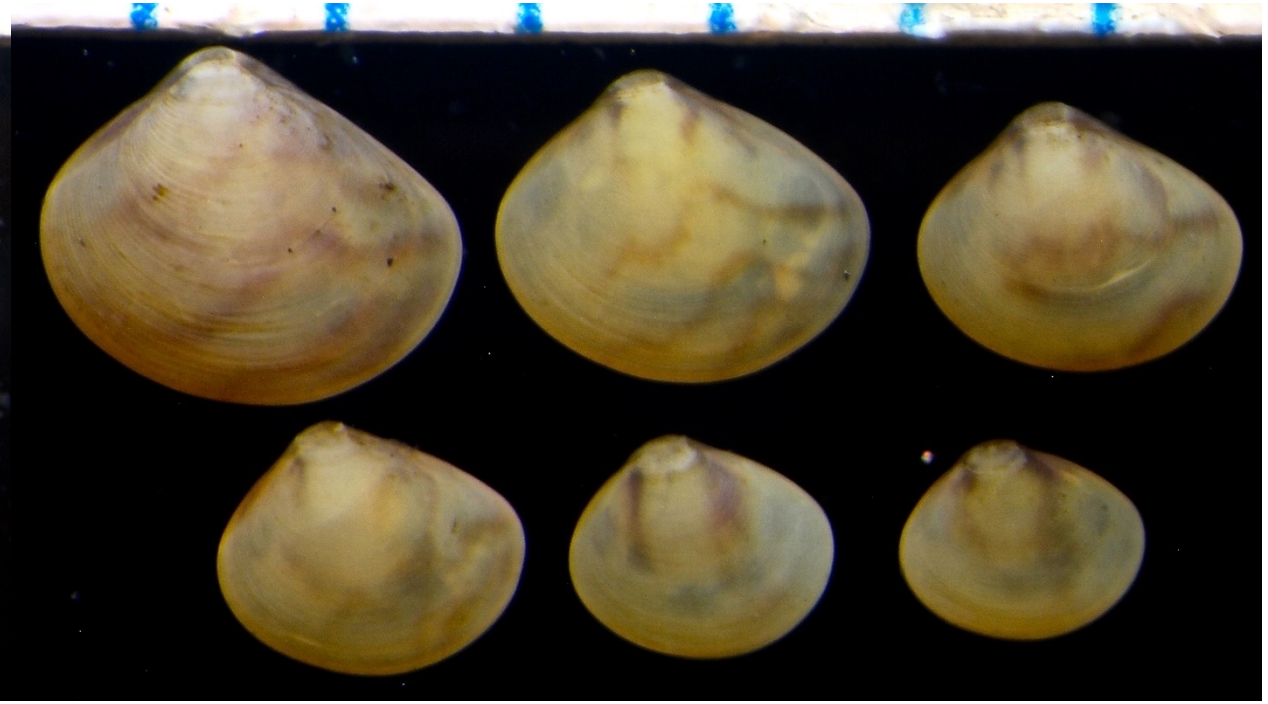


Los Angeles Harbor Rip-rap 2013

Neolepton salmoneum/Neolepton subtrigonum

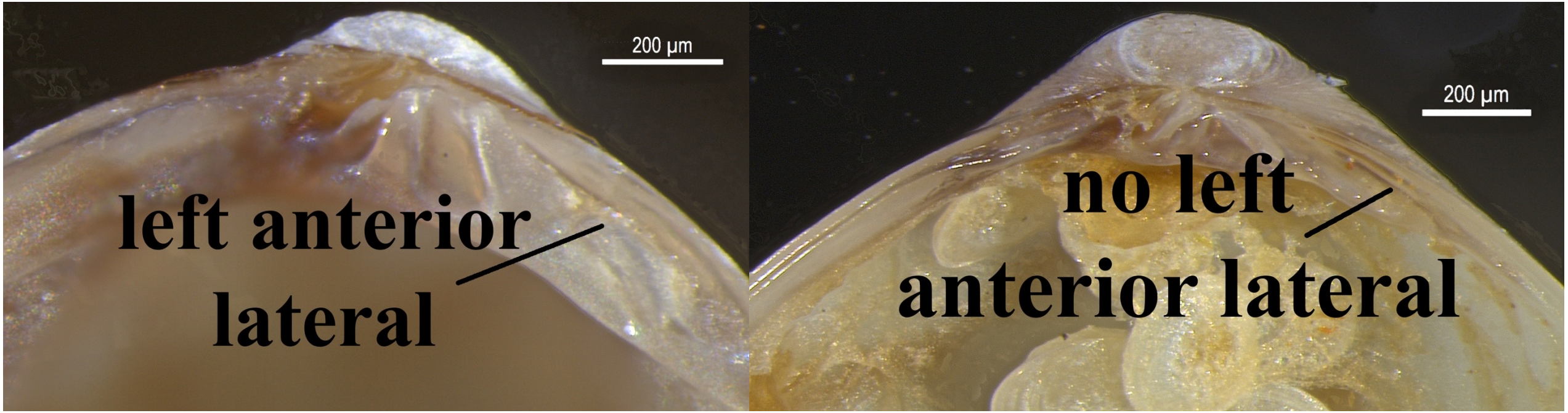


Neolepton salmoneum Goleta B3 30m 1990



Neolepton subtrigonum Los Angeles Harbor Rip-Rap 2013

Neolepton salmoneum/Neolepton subtrigonum

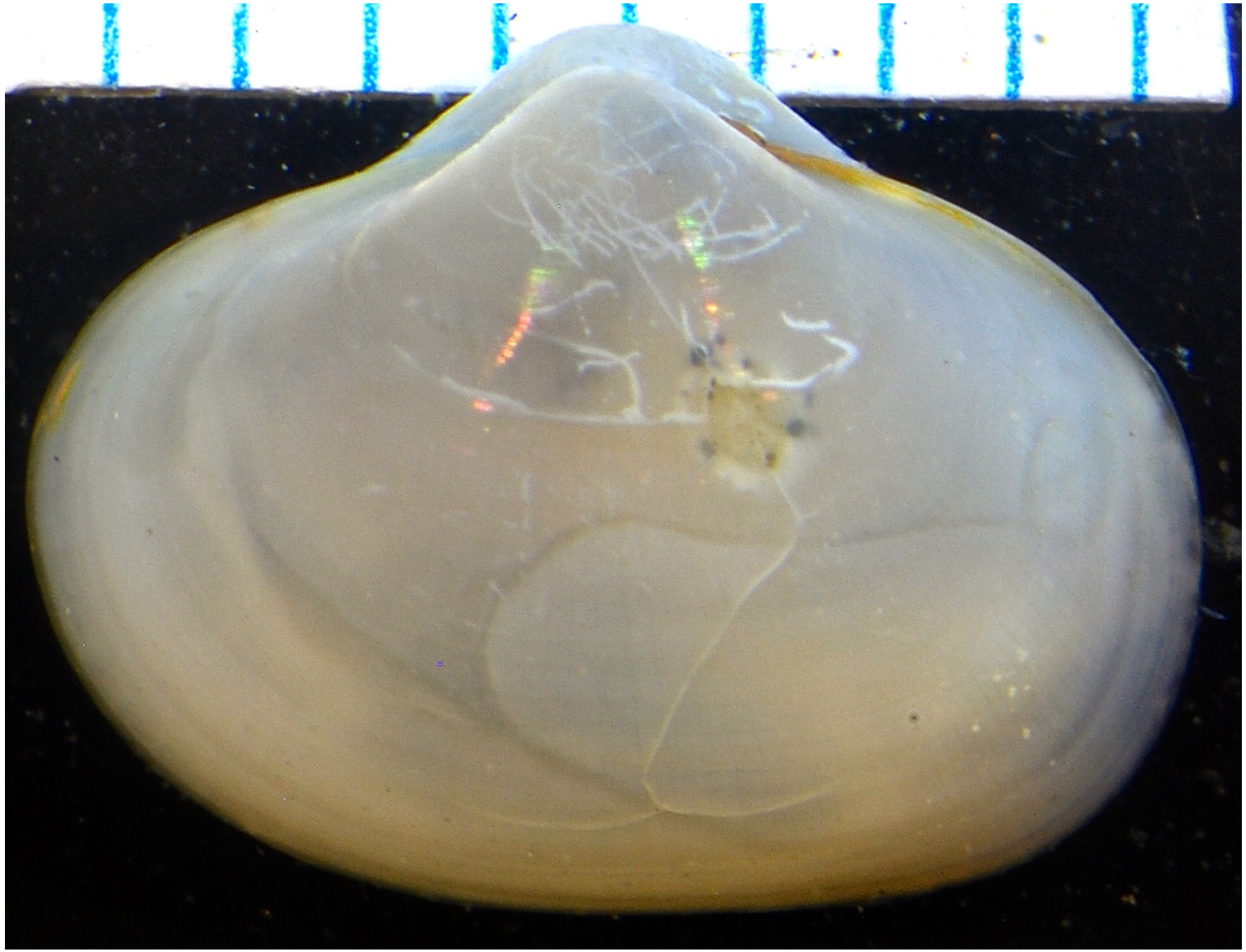


Photos courtesy of Kelvin Barwick

Family Petricolidae

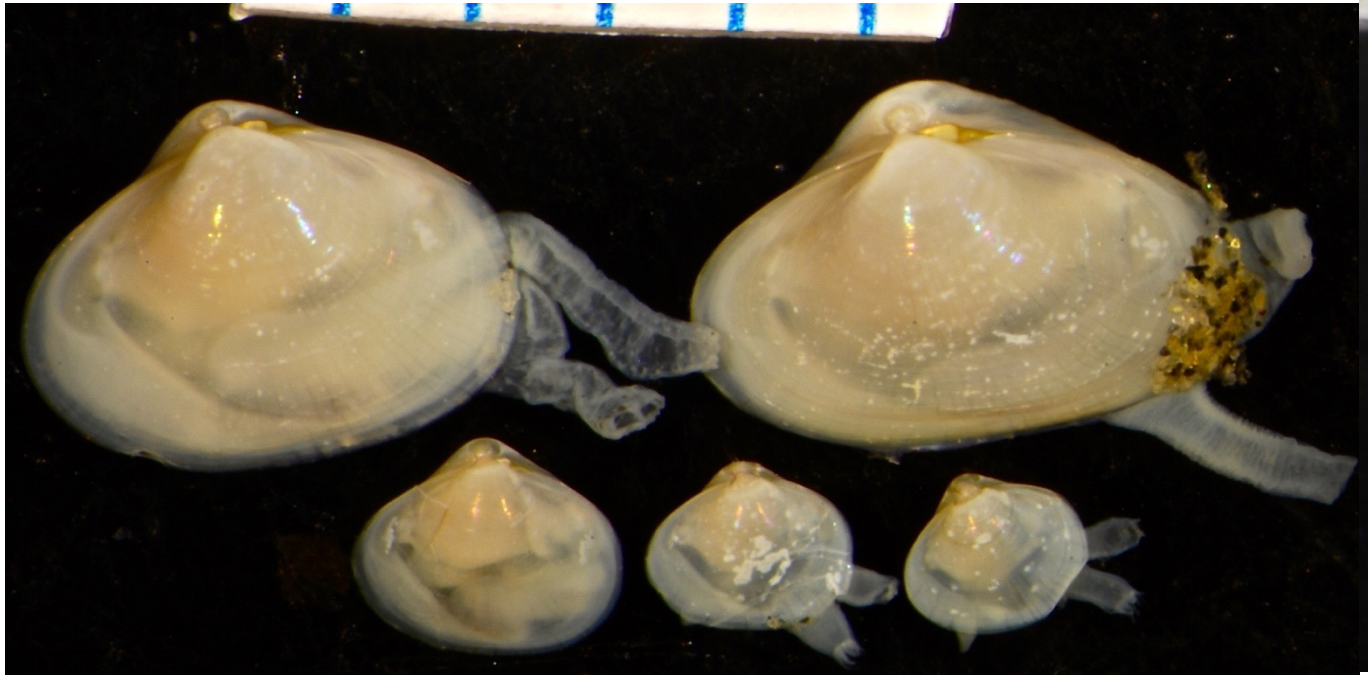
1. **Ovate to elongate, variable in shape, sometimes distorted due to nestling habit**
2. **Ligament external**
3. **Right valve with two sharp bifid cardinal teeth in juvenile, can be obscure or lost in adult; left valve with three cardinal teeth; lateral teeth absent**

Cooperella subdiaphana (Carpenter 1864)

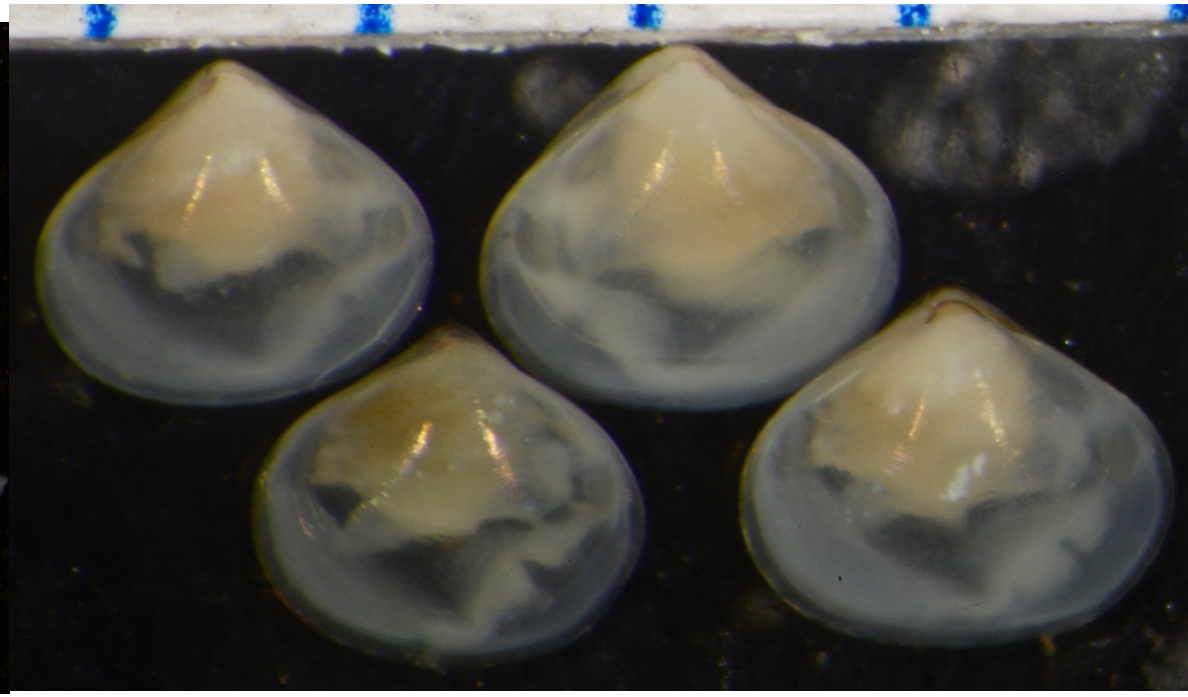


Goleta B3(3) 30m 2019

Cooperella subdiaphana (Carpenter 1864)

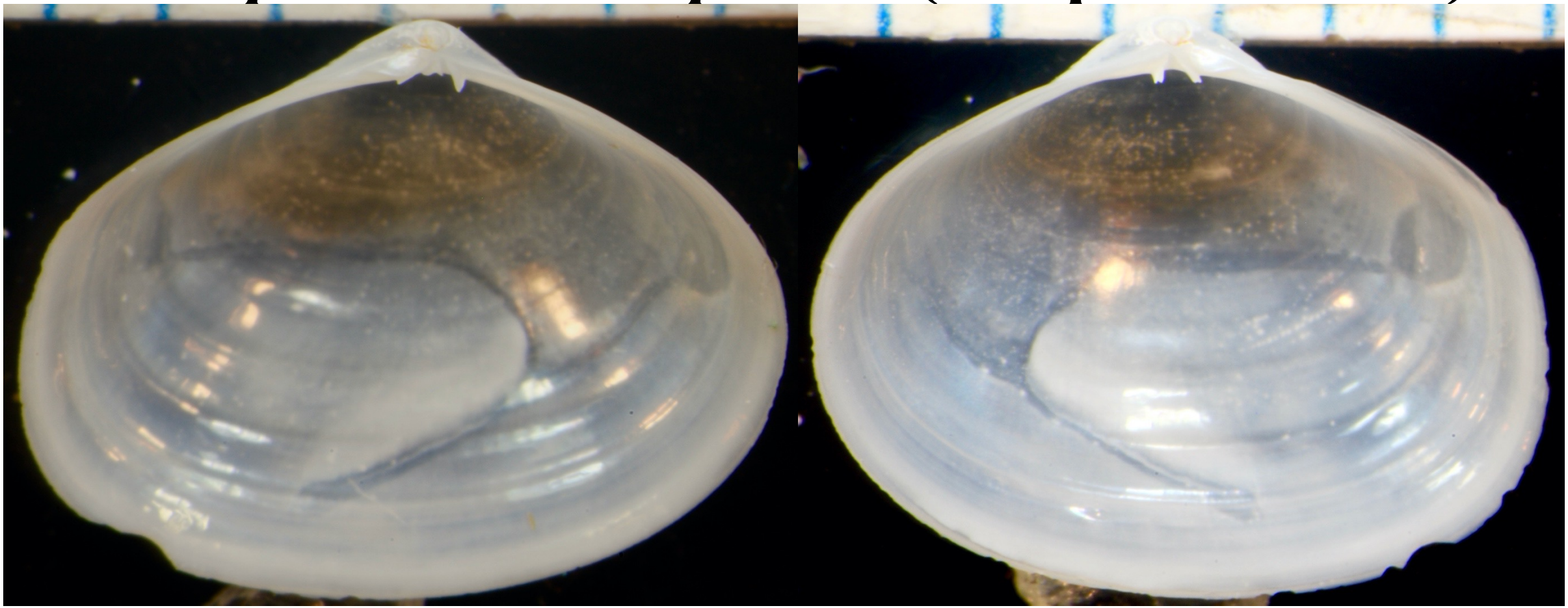


OCSD CON-1 60m 2012



B’13 9245 Los Angeles Harbor 5m

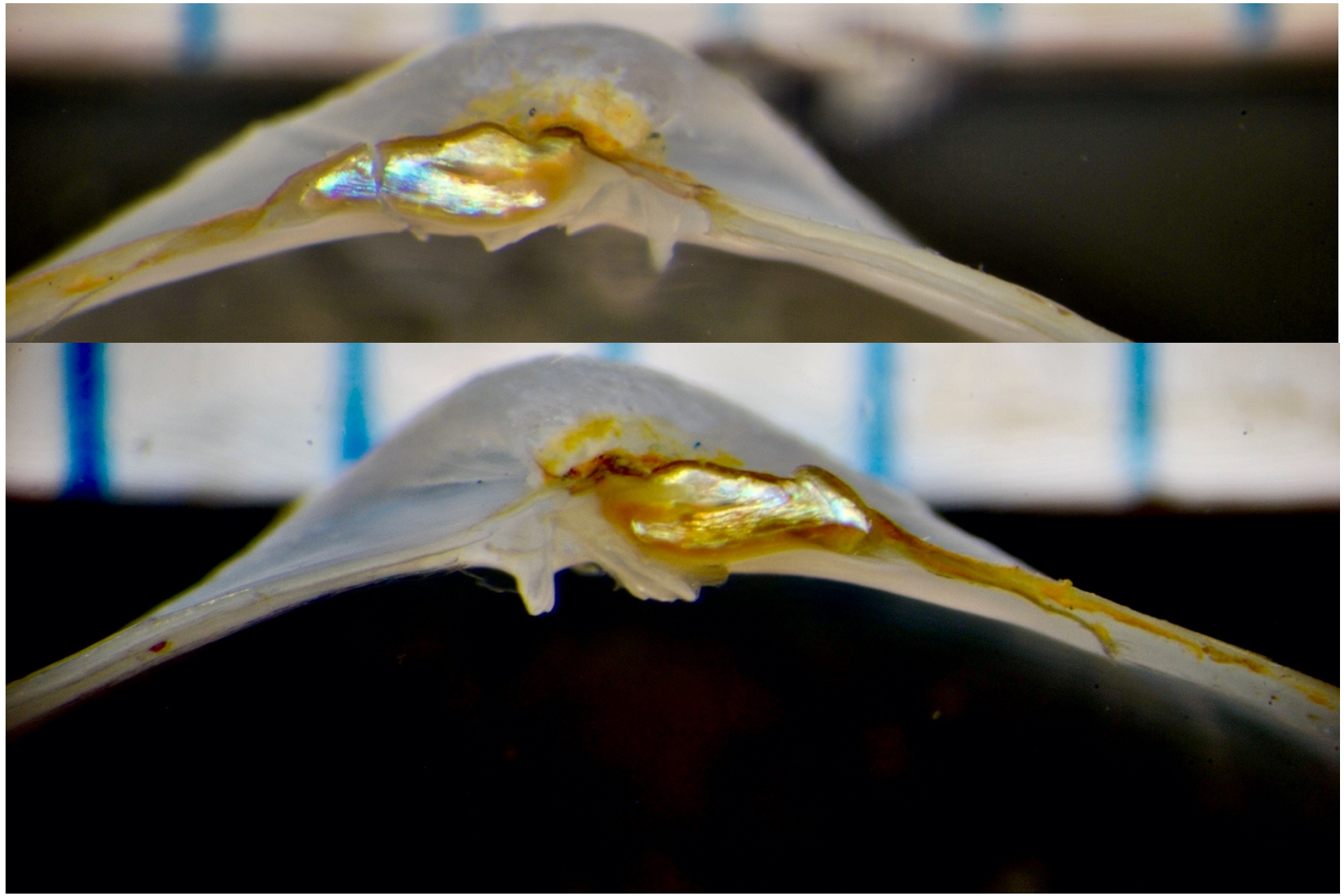
Cooperella subdiaphana (Carpenter 1864)



Mandalay Generating Station BEN-005 7m 2016

left valve right valve

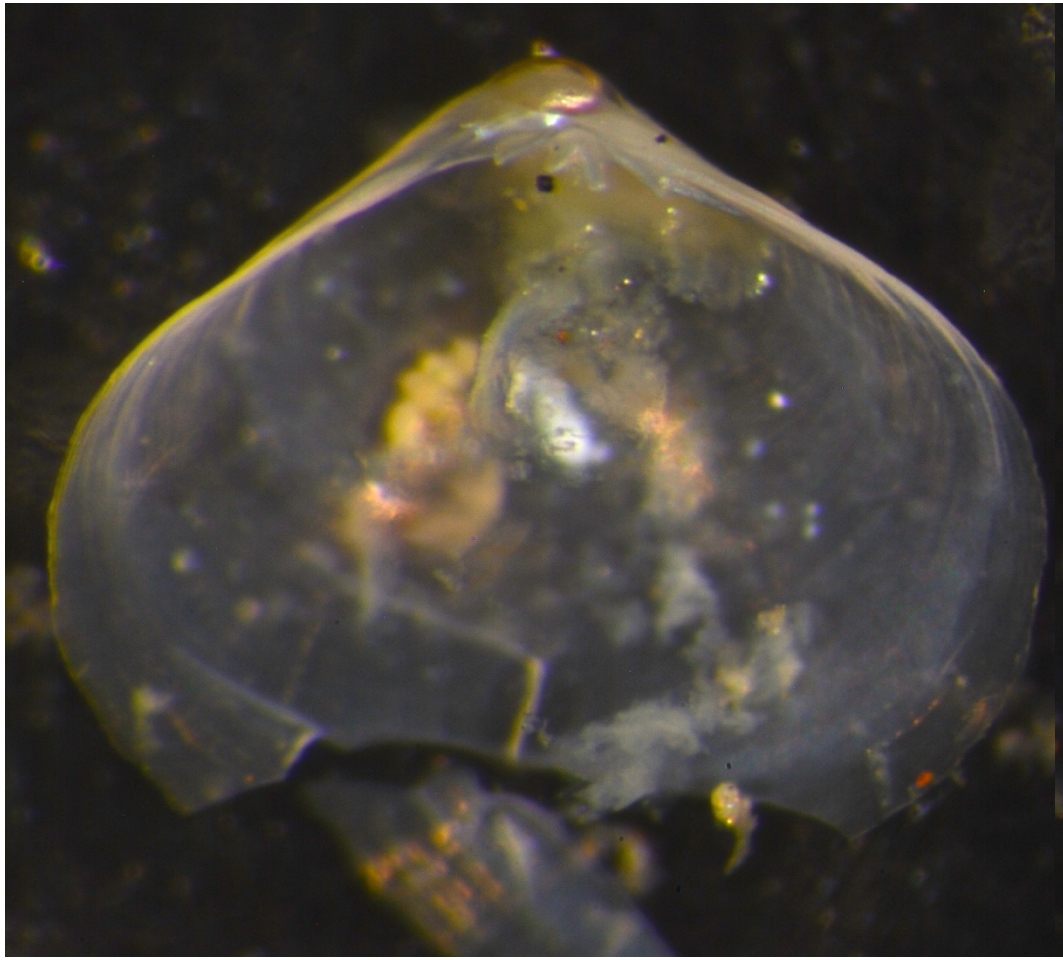
Cooperella subdiaphana (Carpenter 1864)



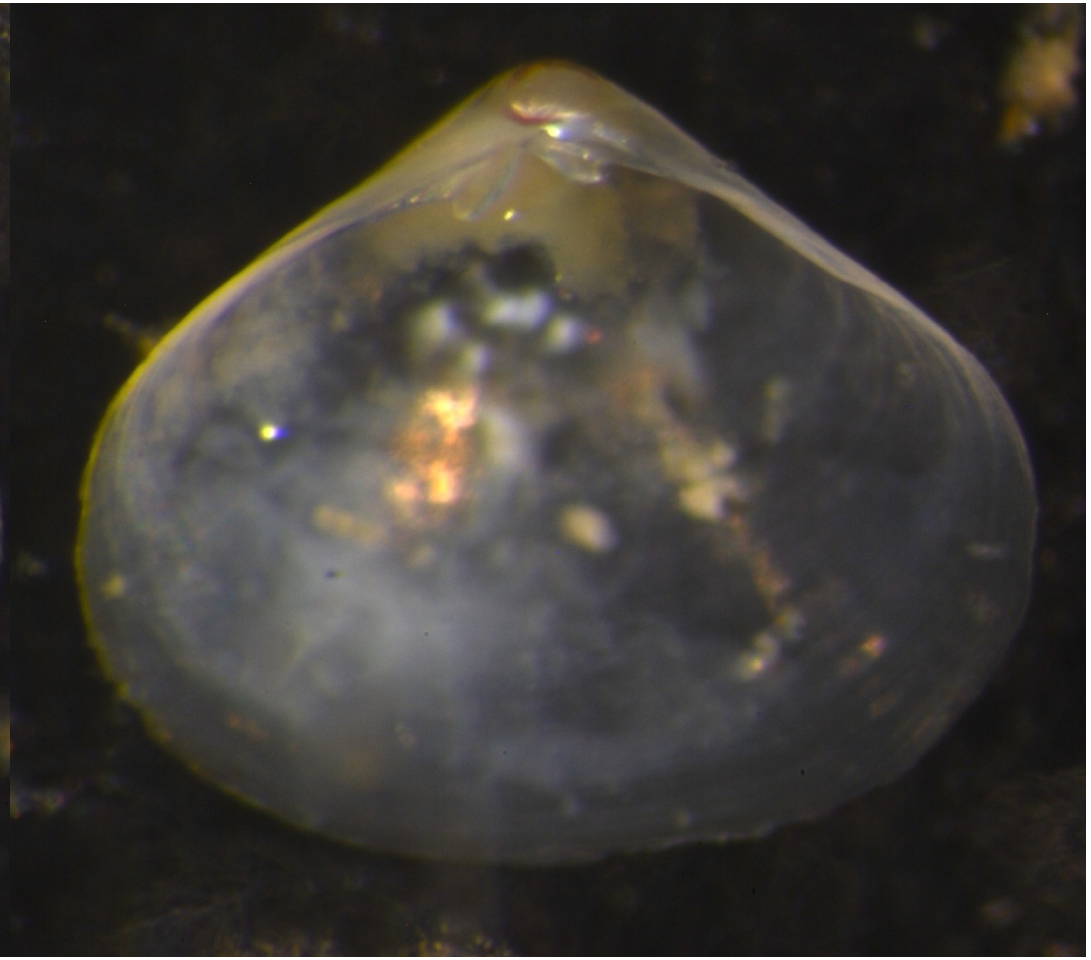
Chevron Generating Station B5 August 2020

left hinge above right hinge below

Cooperella subdiaphana (Carpenter 1864)

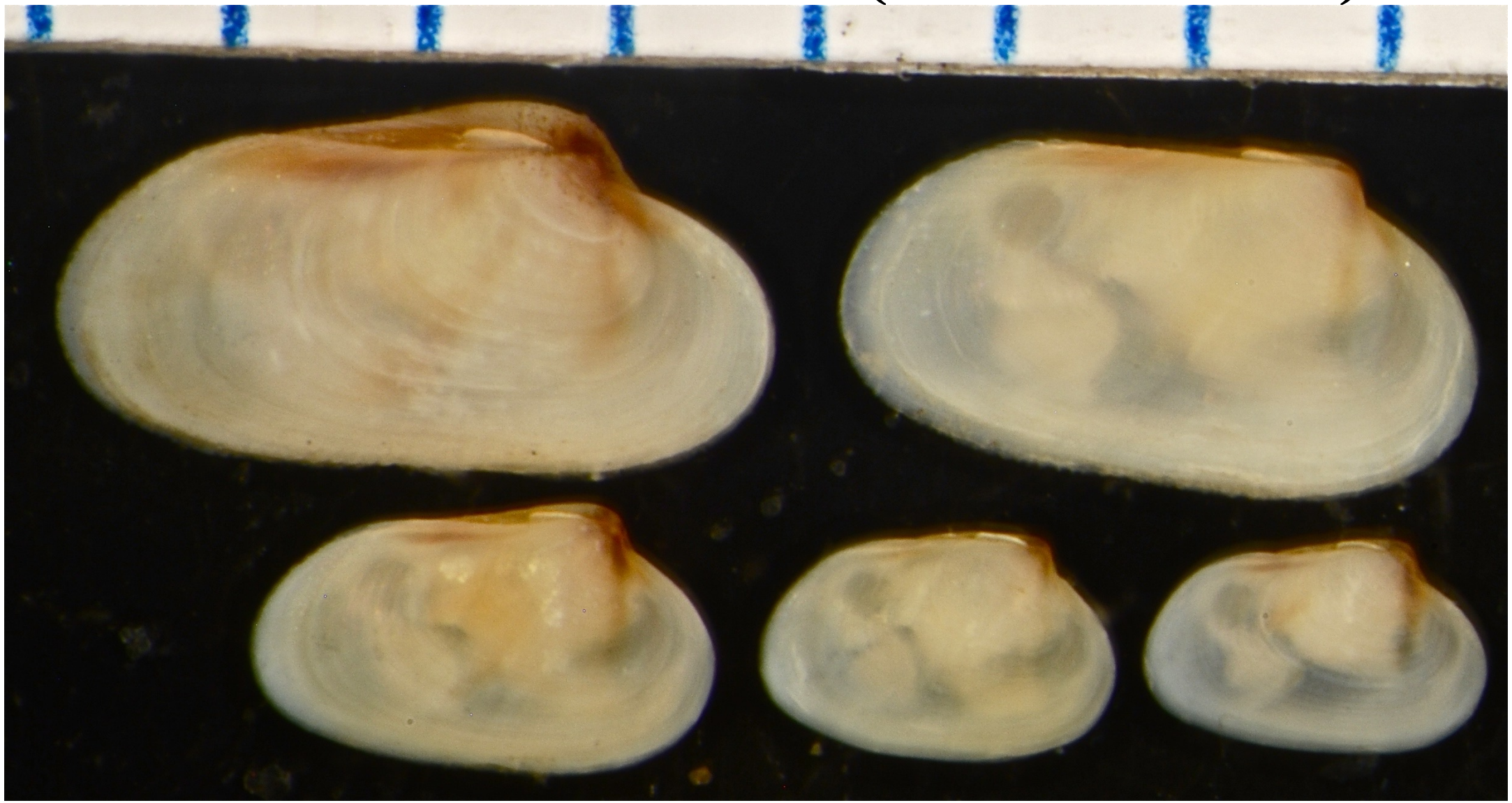


Left hinge 1.5mm B’98 9245 LAH 5m



Right hinge 1.5mm B’98 9245 LAH 5m

Petricola carditoides (Conrad 1837)



Colorado Lagoon 5m 2017

Petricola carditoides (Conrad 1837)

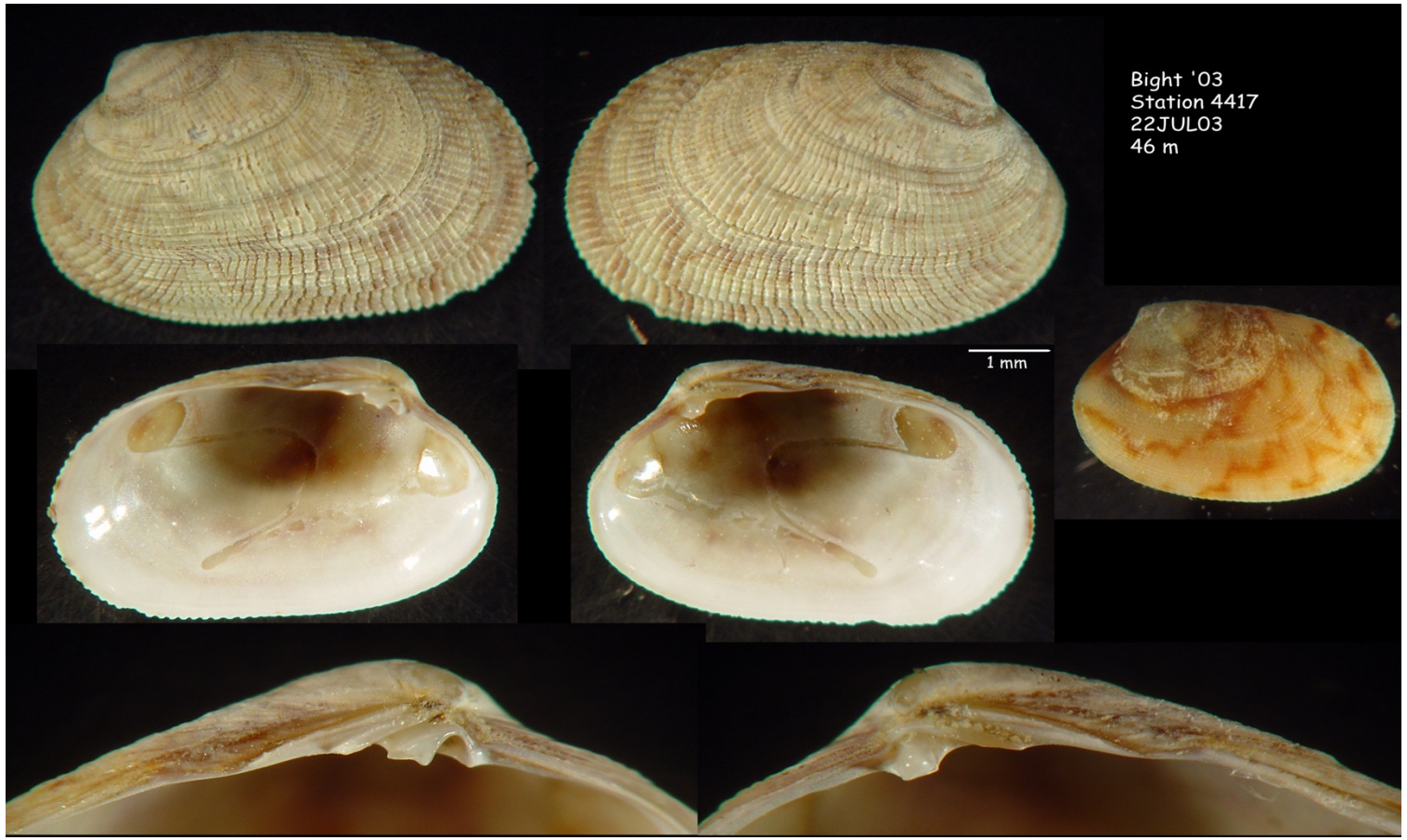
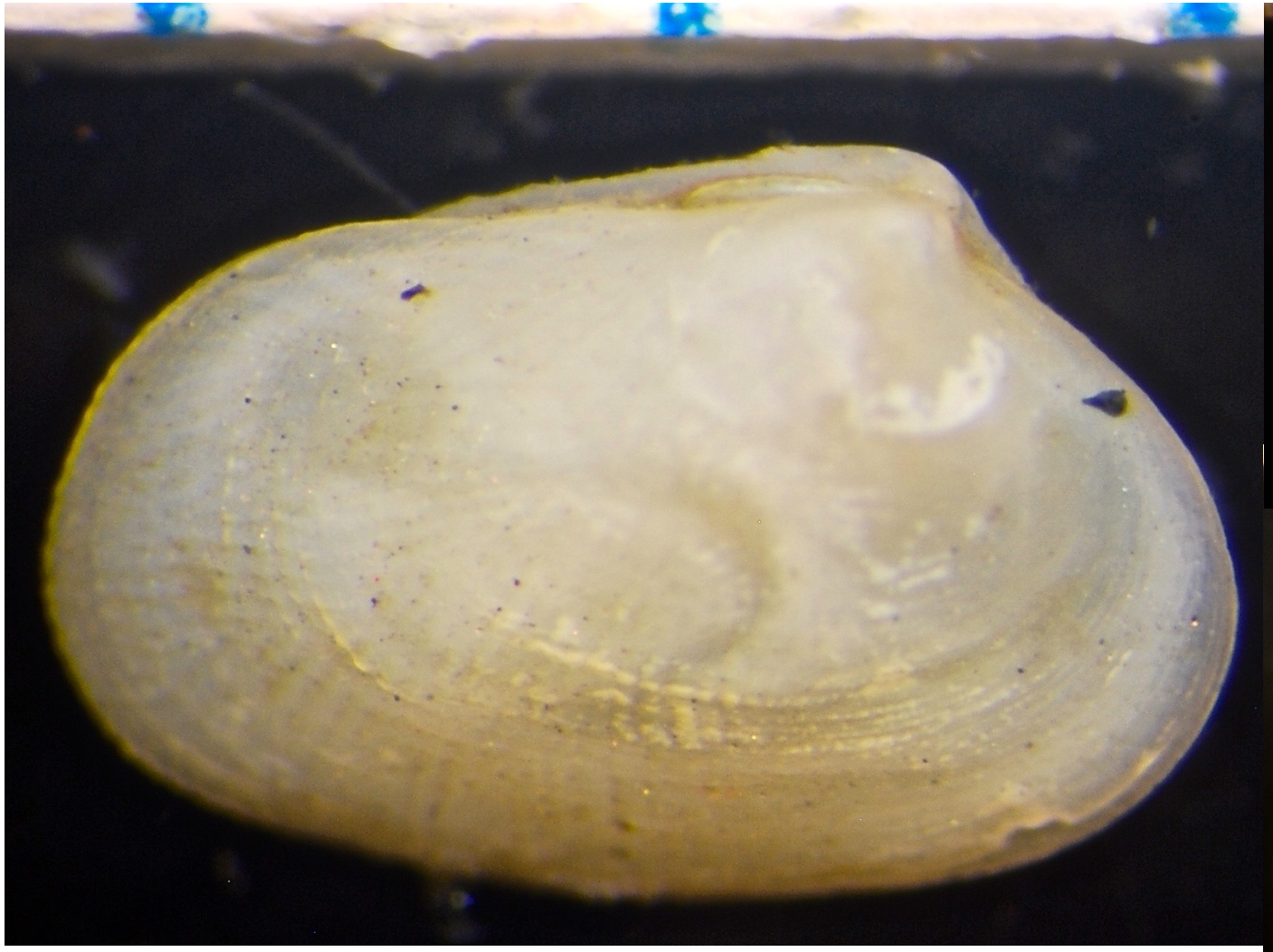
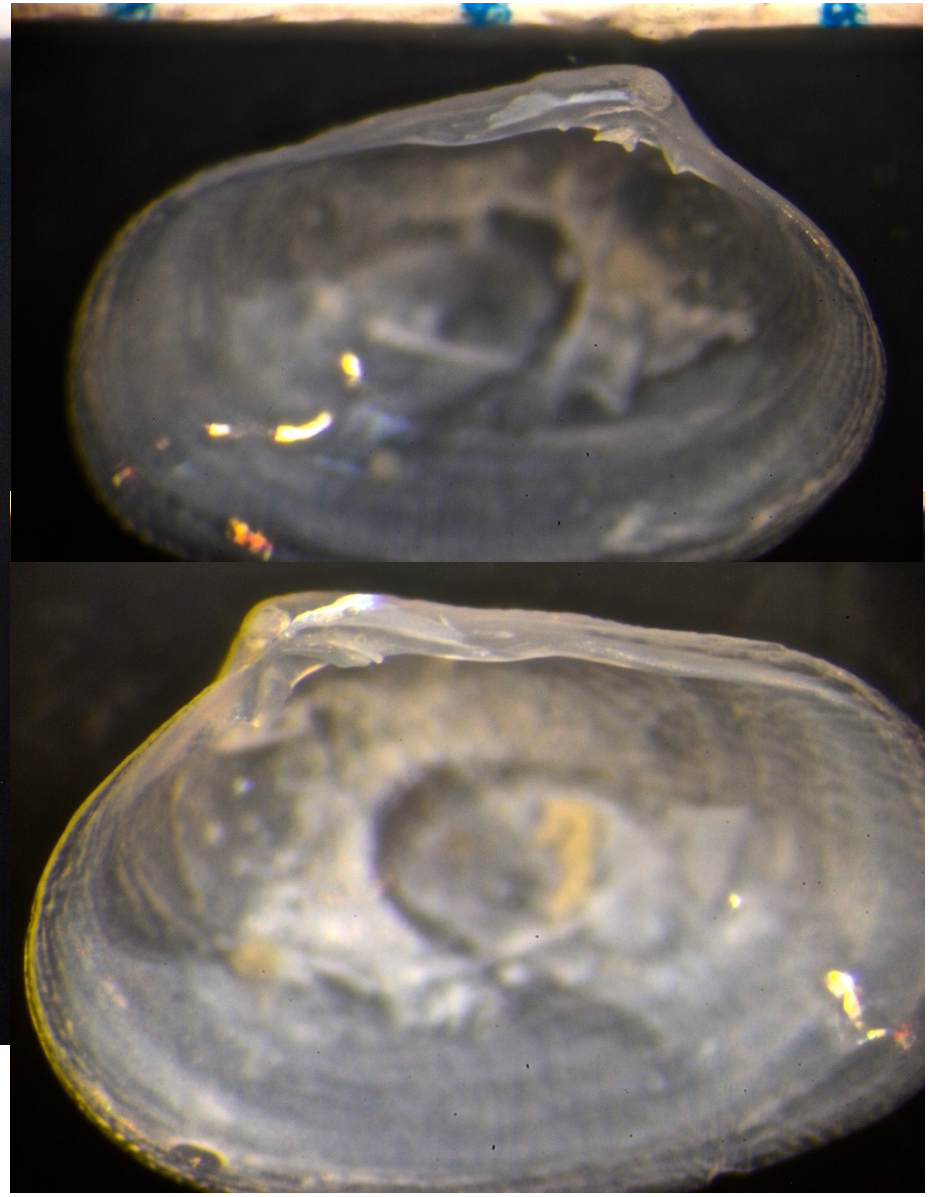


Photo courtesy of Kelvin Barwick

Petricola carditoides (Conrad 1837)

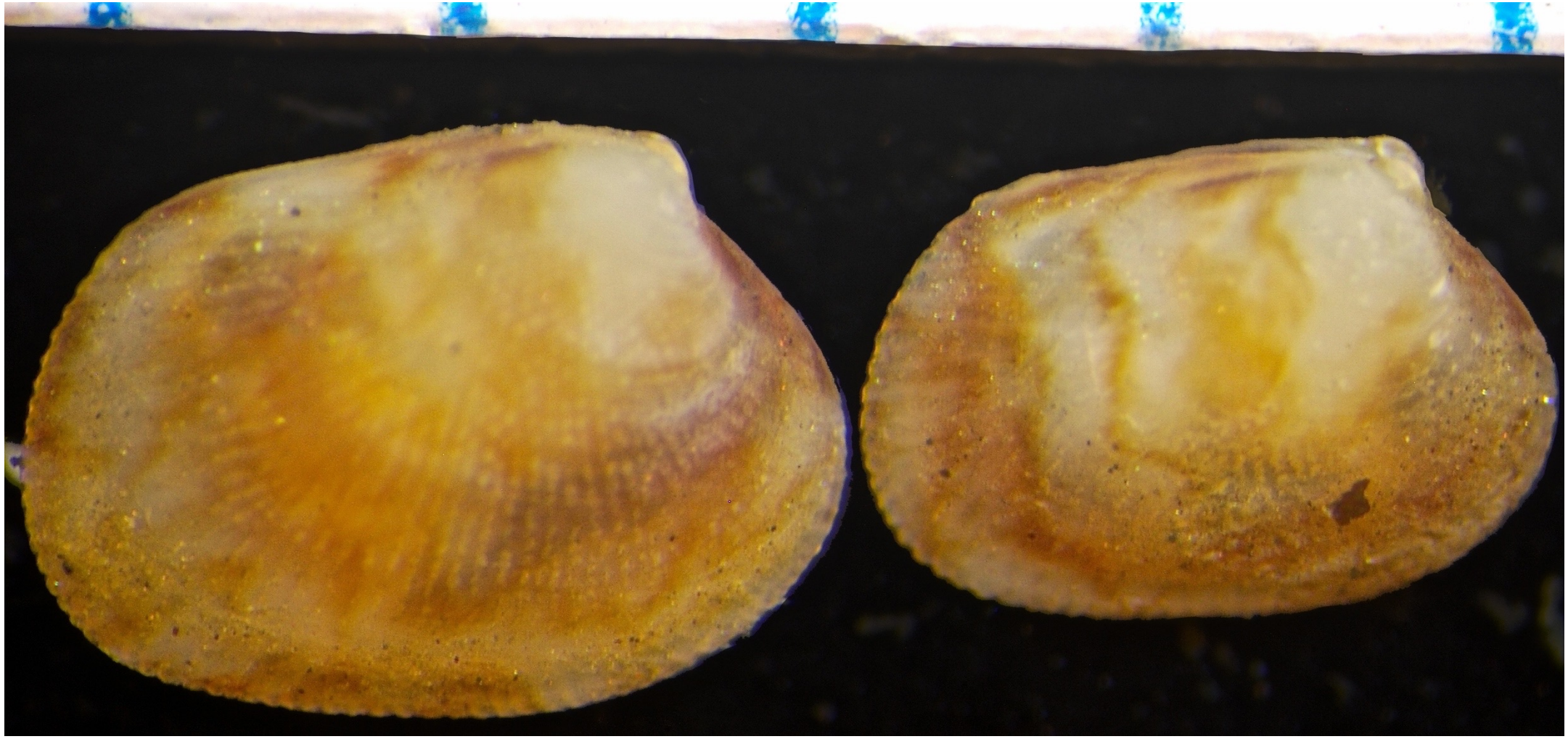




Long Beach Harbor Rip-rap LBRR3/QS-3A 2018

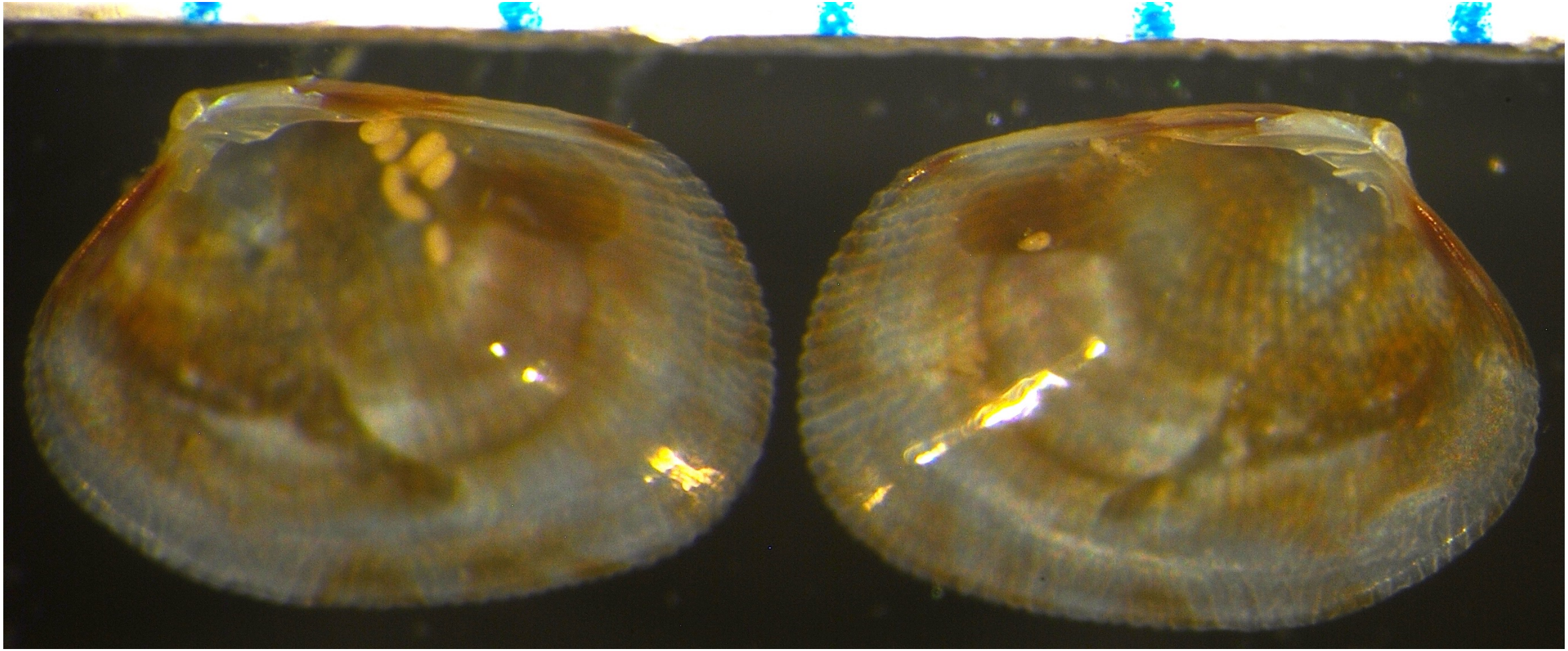
Left hinge (above), right hinge below

Petricola carditoides (Conrad 1837)



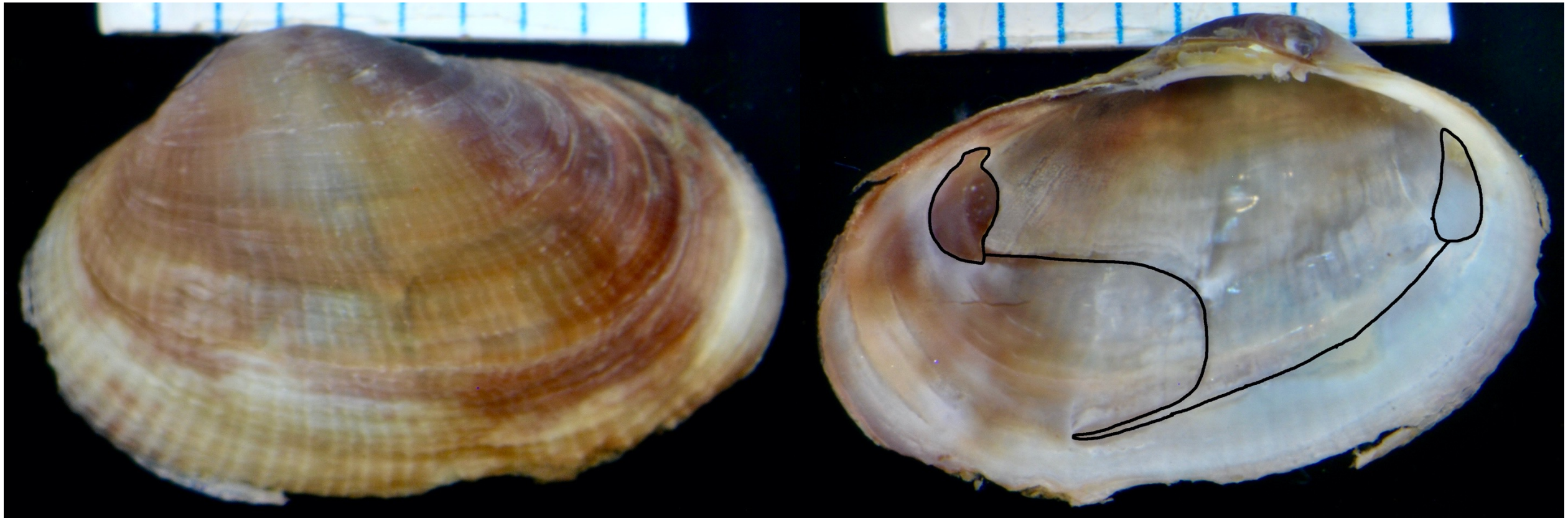
Long Beach Harbor pier piling LBPP3/QS-3B 2018

Petricola carditoides (Conrad 1837)



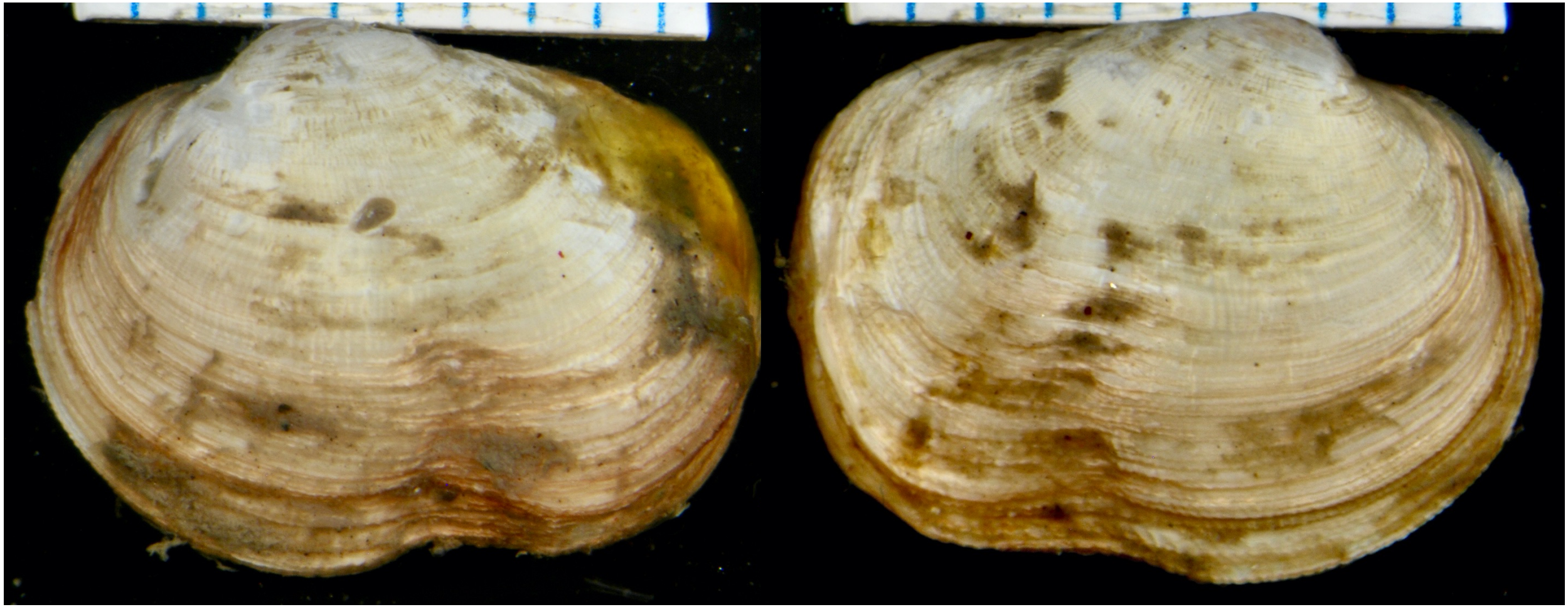
Juvenile hinge Long Beach Harbor pier piling LBPP3/QS-3B 2018

Petricola carditoides (Conrad 1837)



ISS Los Angeles/Long Beach Harbor 3203QX13 8/21/06

Petricola carditoides (Conrad 1837)

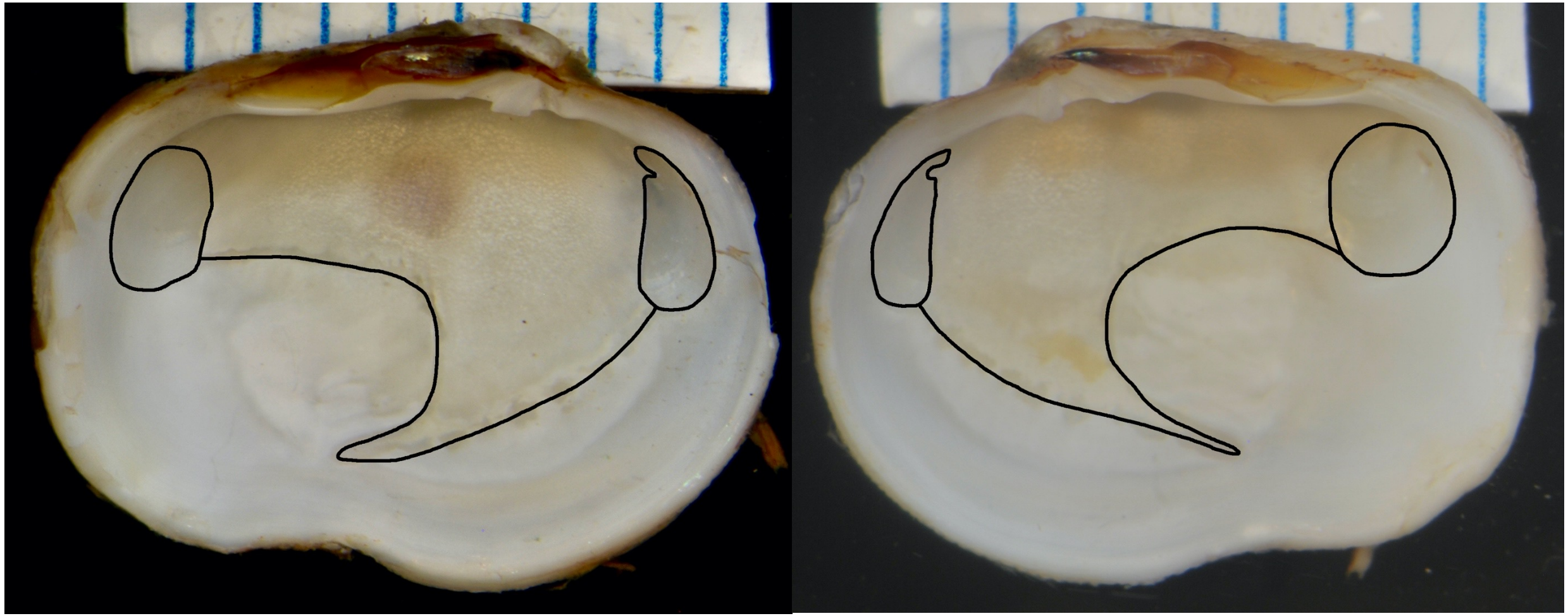


ISS Morro Bay 6008QX13 4/5/2011

left valve

right valve

Petricola carditoides (Conrad 1837)

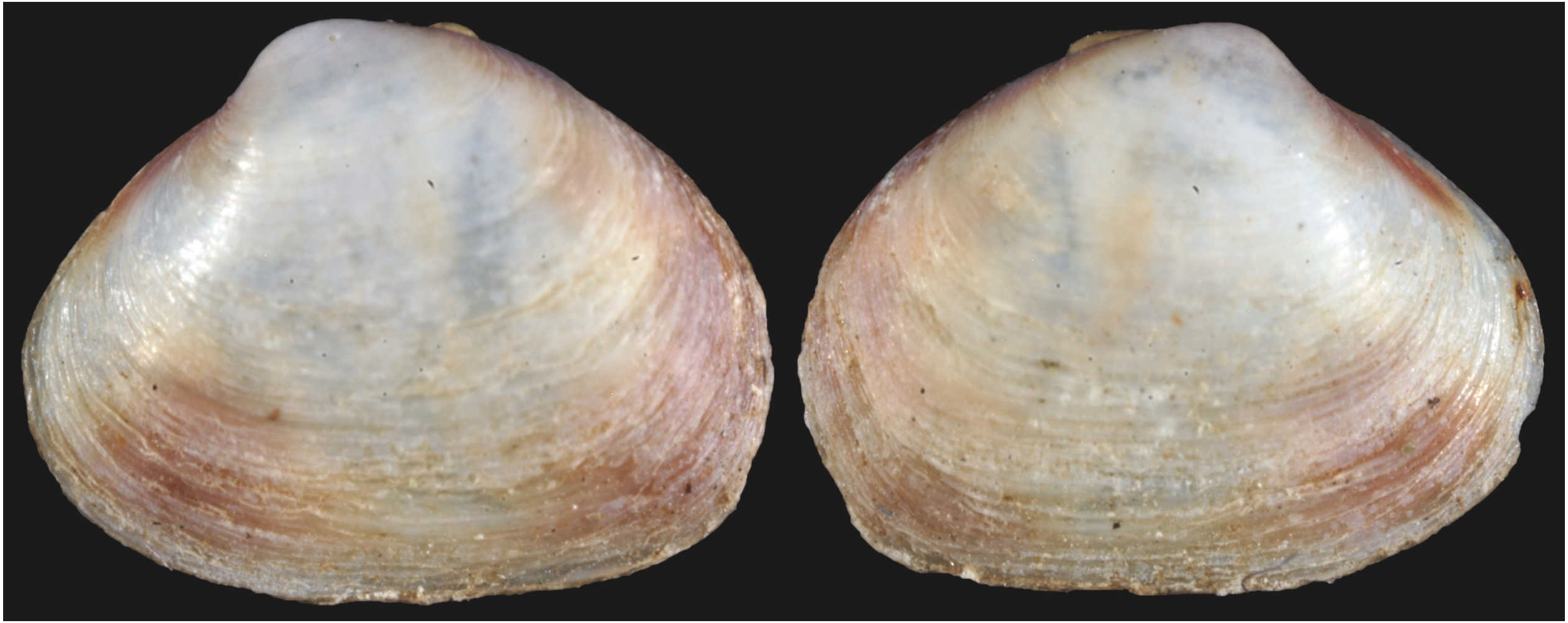


ISS Morro Bay 6008QX13 4/5/2011

left valve

right valve

Petricola hertzana Coan 1997

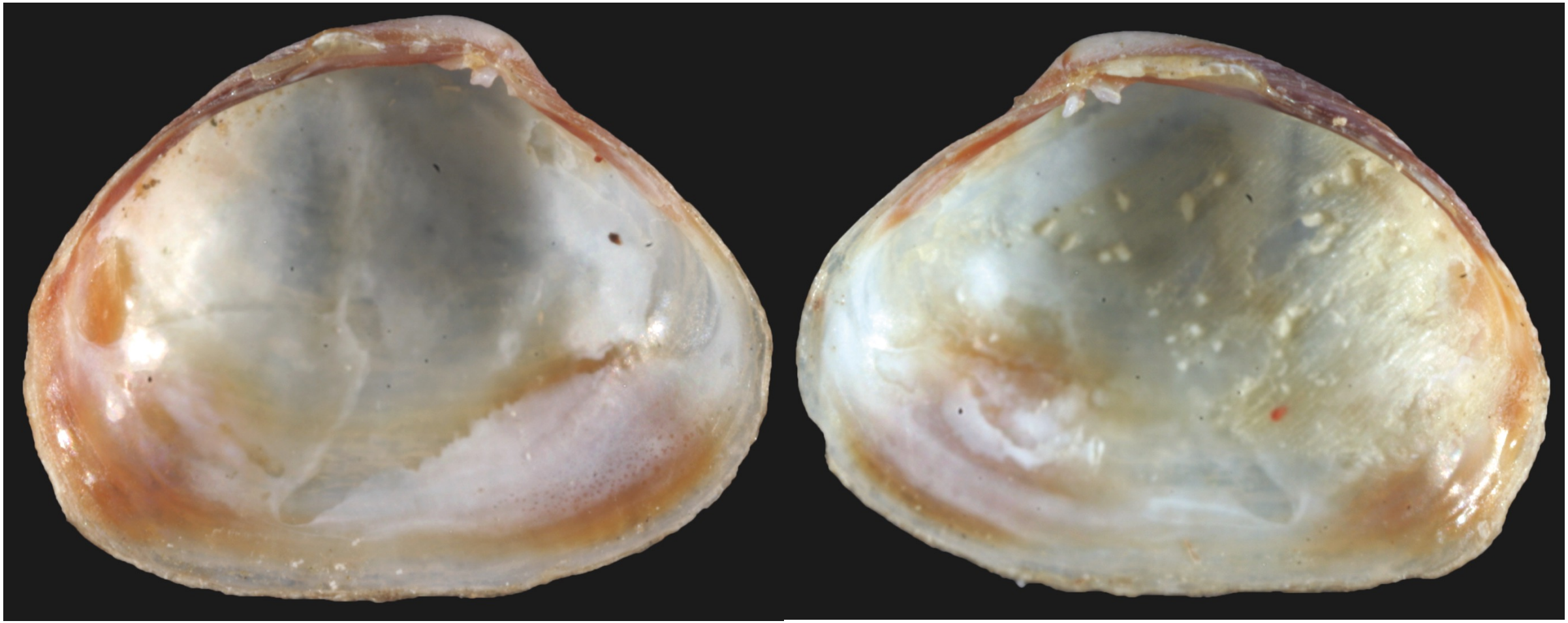


Left valve

Right valve

Photos courtesy of Dr. Paul Scott

Petricola hertzana Coan 1997

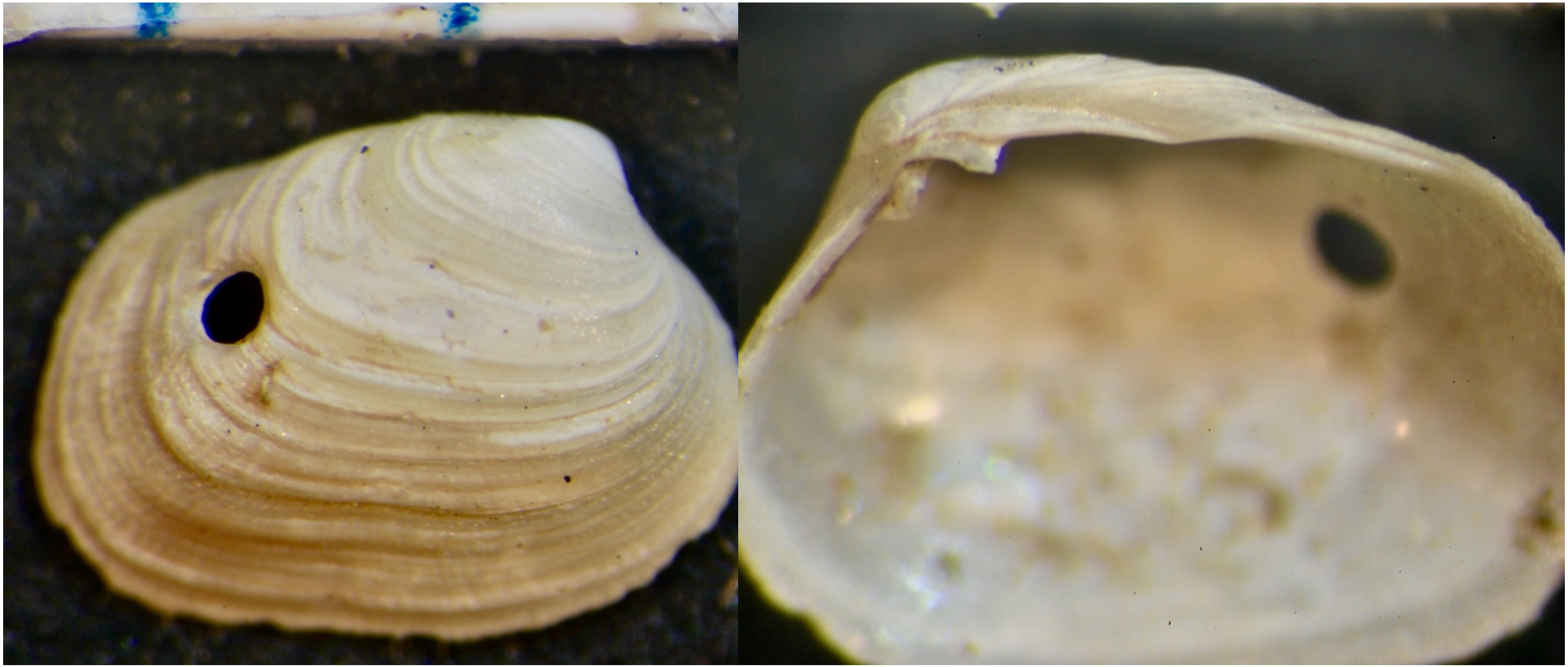


Left valve

Right Valve

Photos courtesy of Dr. Paul Scott

Petricola hertzana Coan 1997



Mission Bay 3m 1971

Specimen courtesy of
Carol Paquette MBC

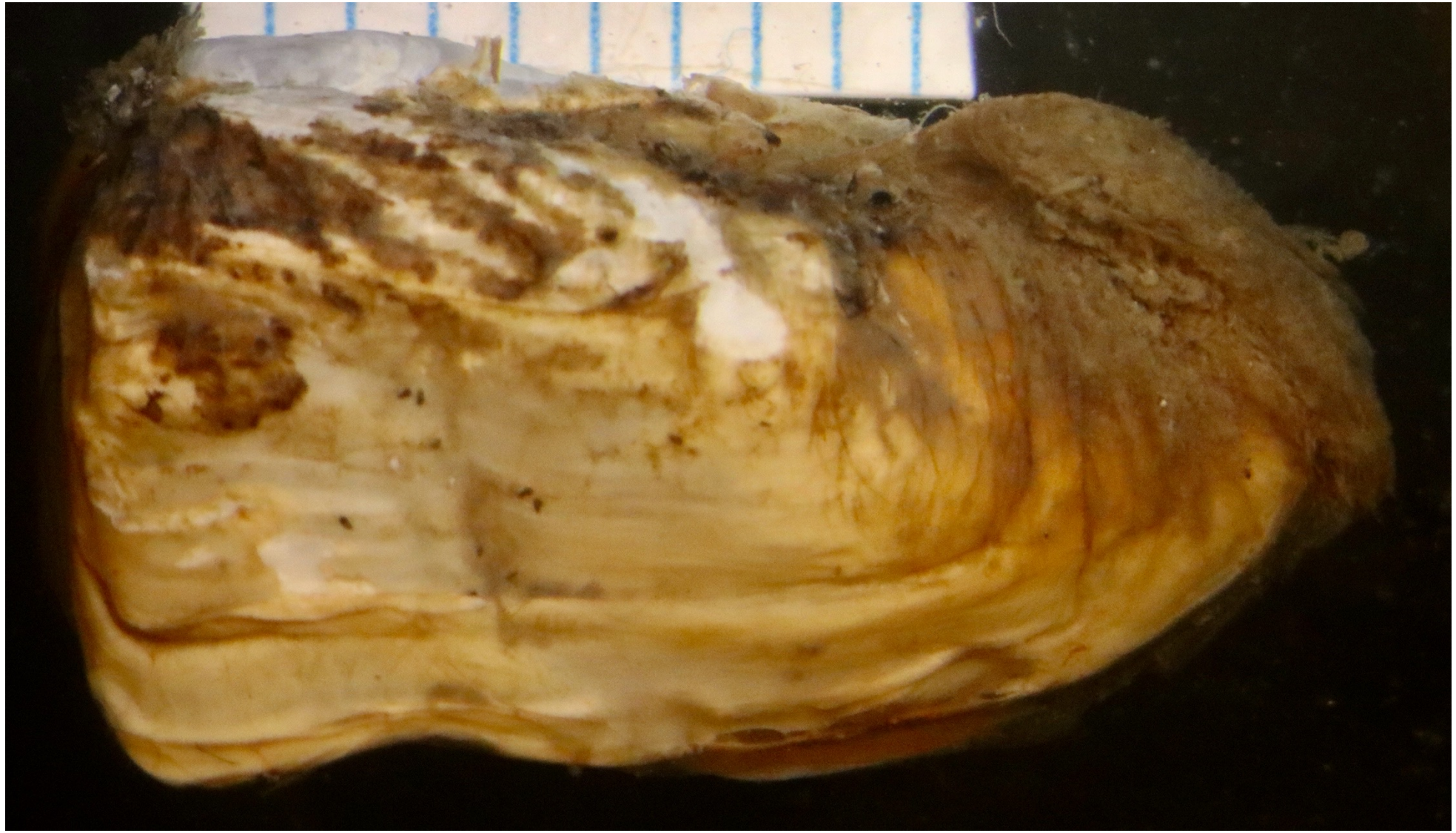
right valve

right hinge

Order Adapedonta
Family Hiatellidae

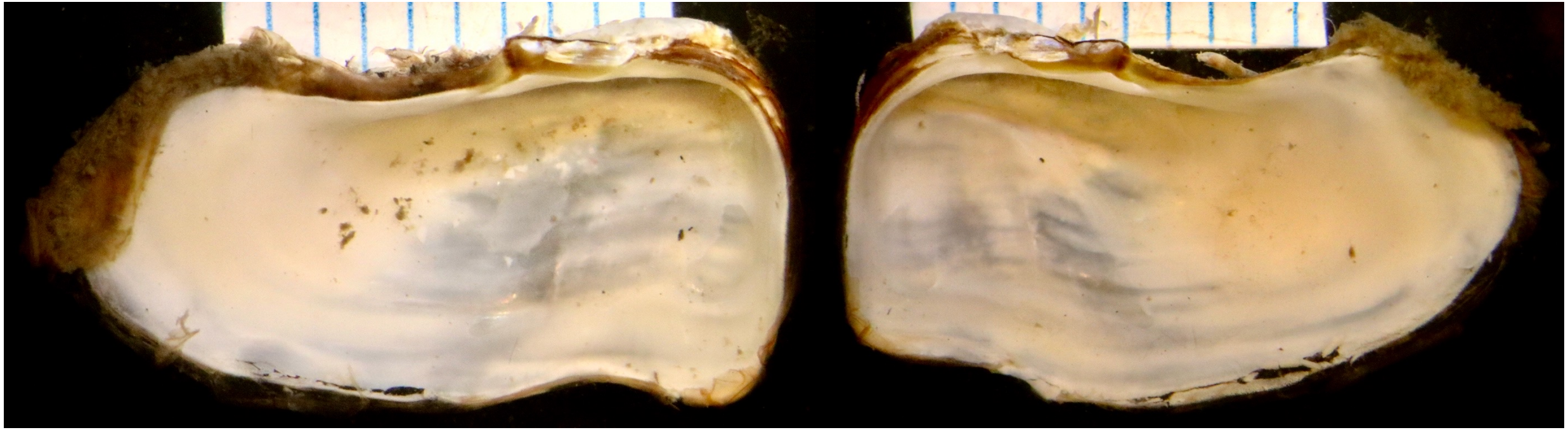
1. Valves ovate to elongate, with extensive gape
2. Sculpture absent or with radial spinose ridges on posterior slope (especially in juvenile)
3. Hinge with one or two denticles, may be lost in adult
4. Ligament external, may be sunken

Hiatella arctica (Linnaeus 1767)



ISS Morro Bay 6010QX13 4/11/2011

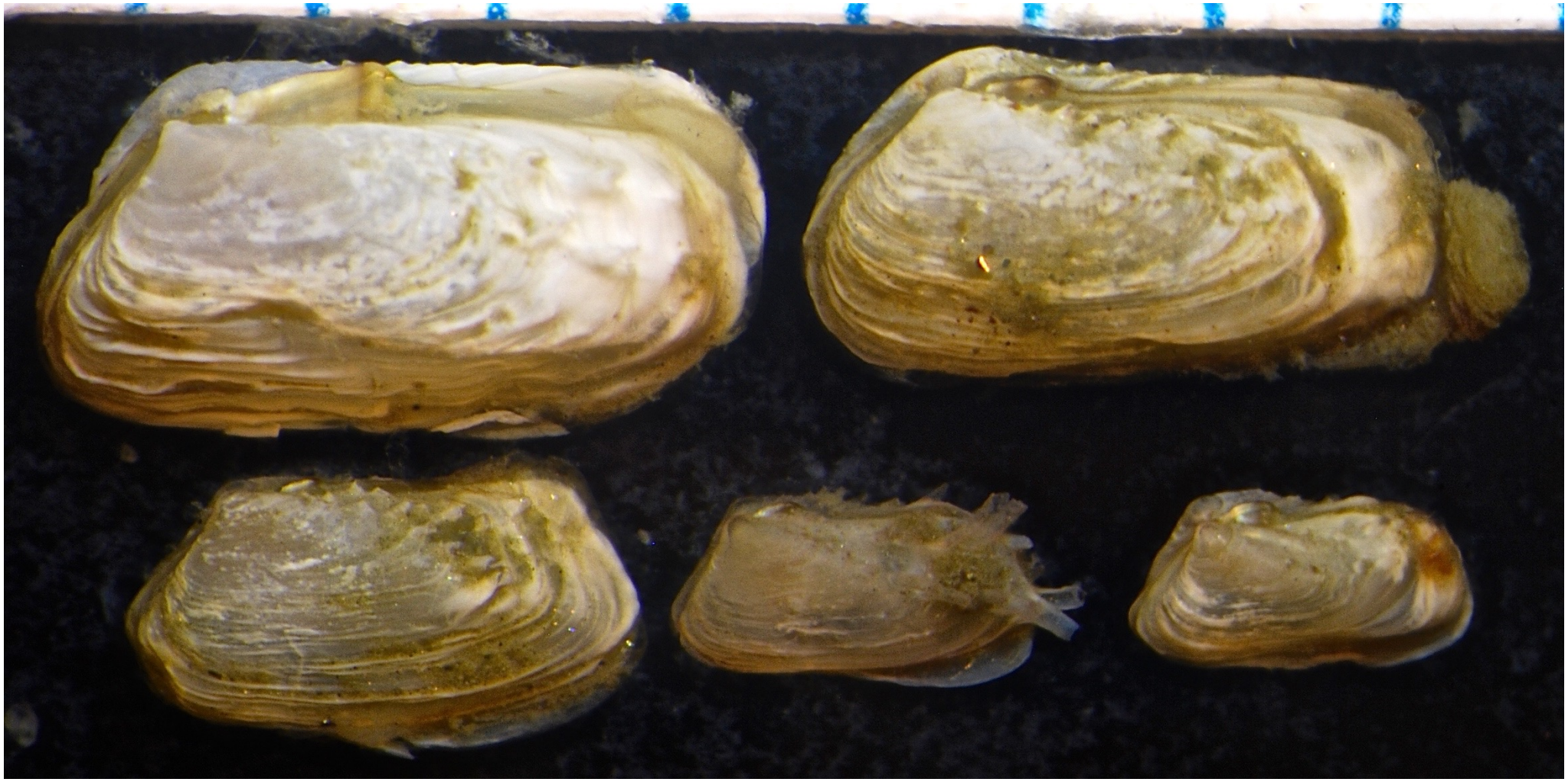
Hiatella arctica (Linnaeus 1767)



ISS Morro Bay 6010QX13 411/2011

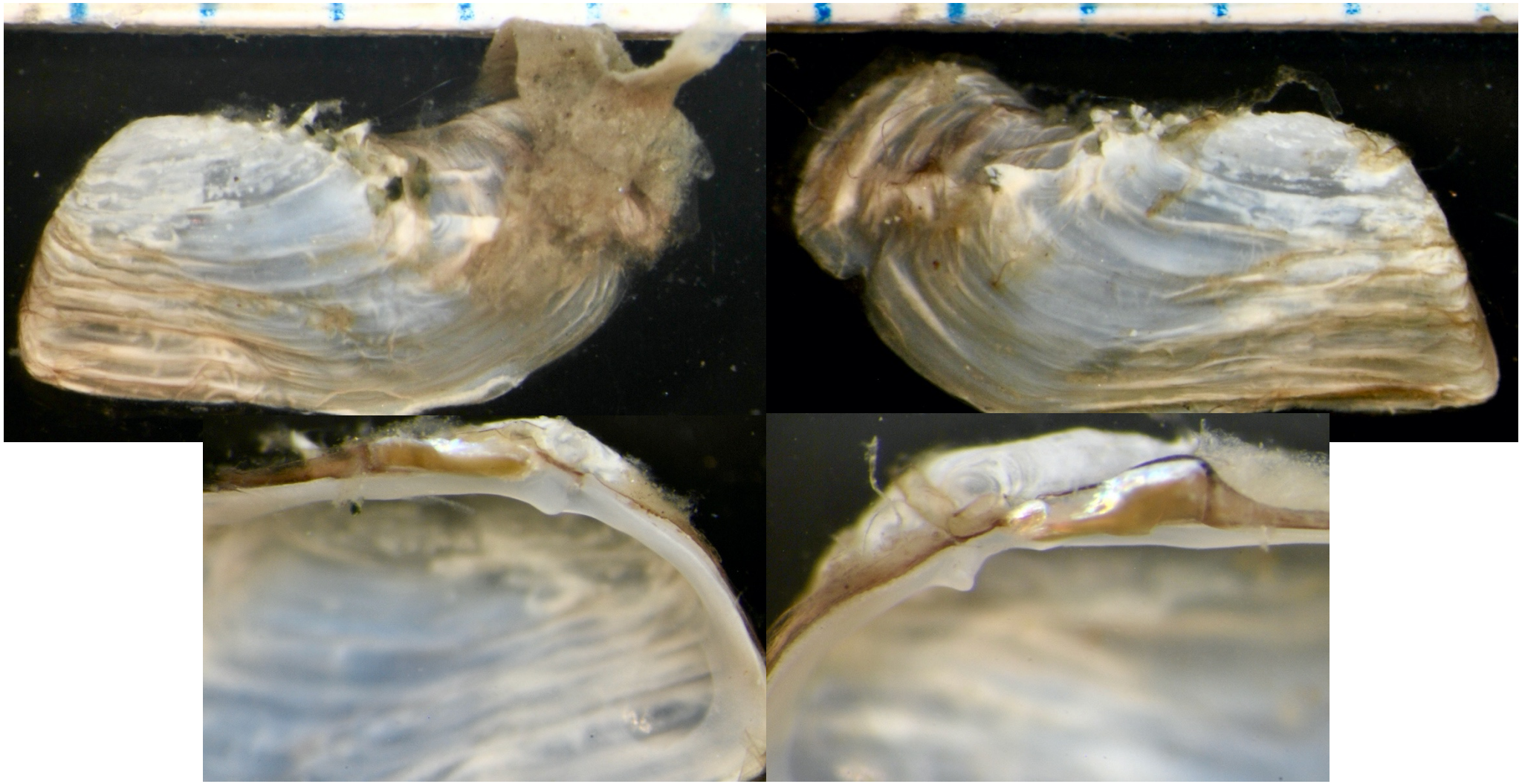
left valve right valve

Hiatella arctica (Linnaeus 1767)



Los Angeles Harbor Rip-rap LARR1/QS-3B 2018

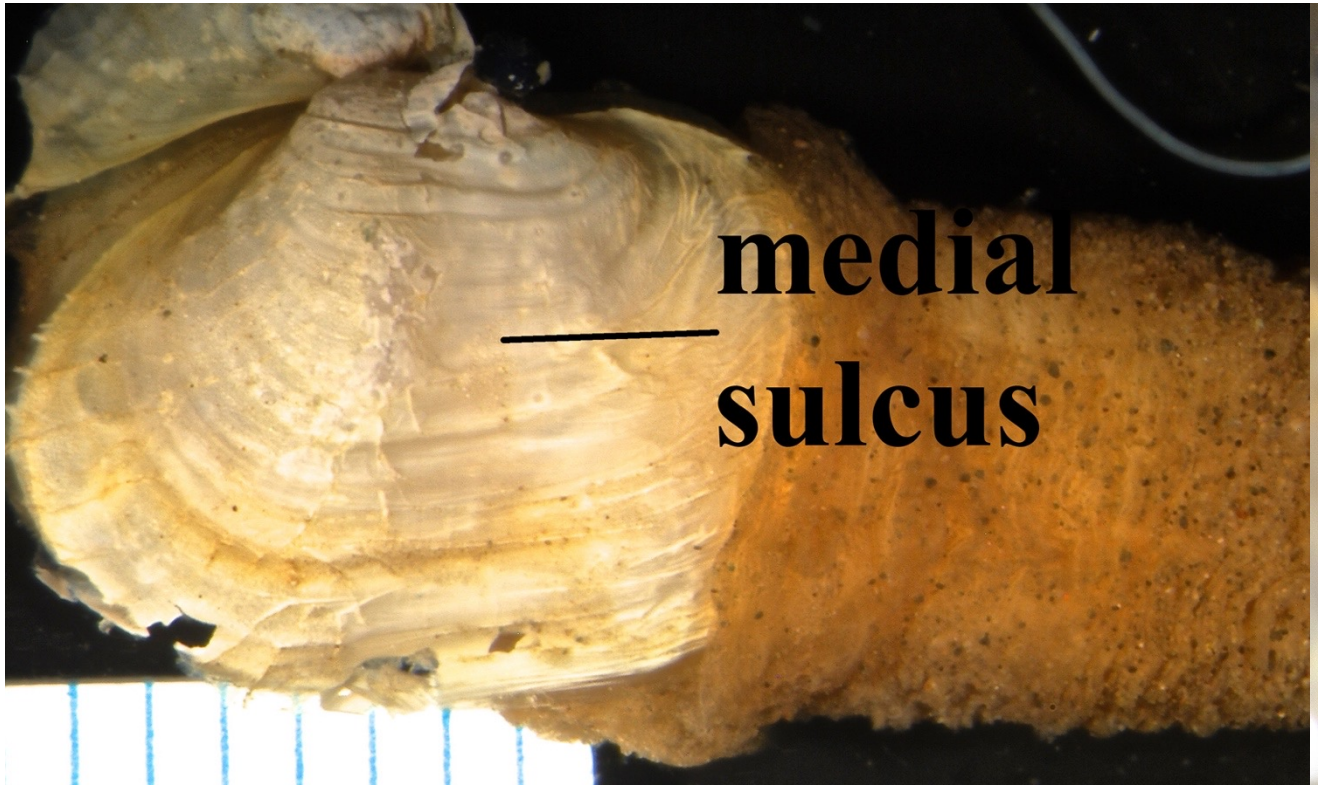
Hiatella arctica (Linnaeus 1767)

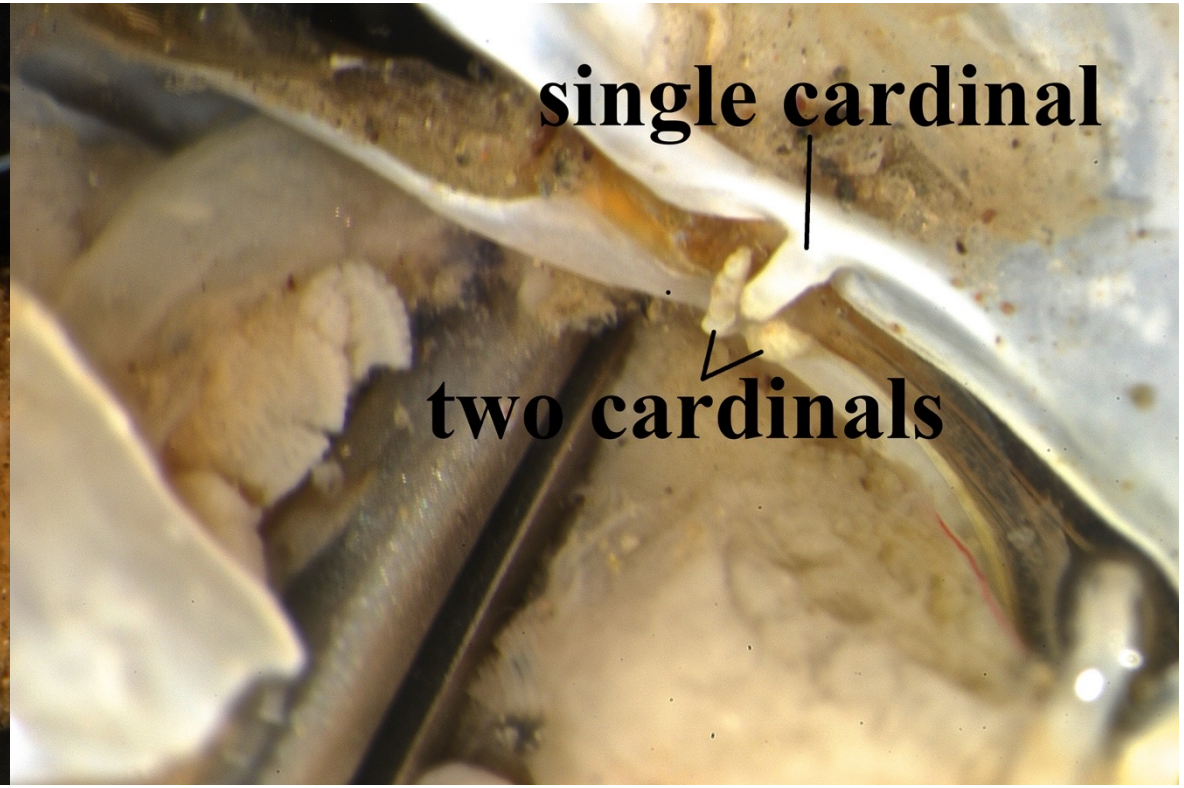


ISS Point Hueneme 3939QX13 7/26/06

left valve right valve

Panomya norvegica (Spengler, 1793)





Goleta B1 30m 2017

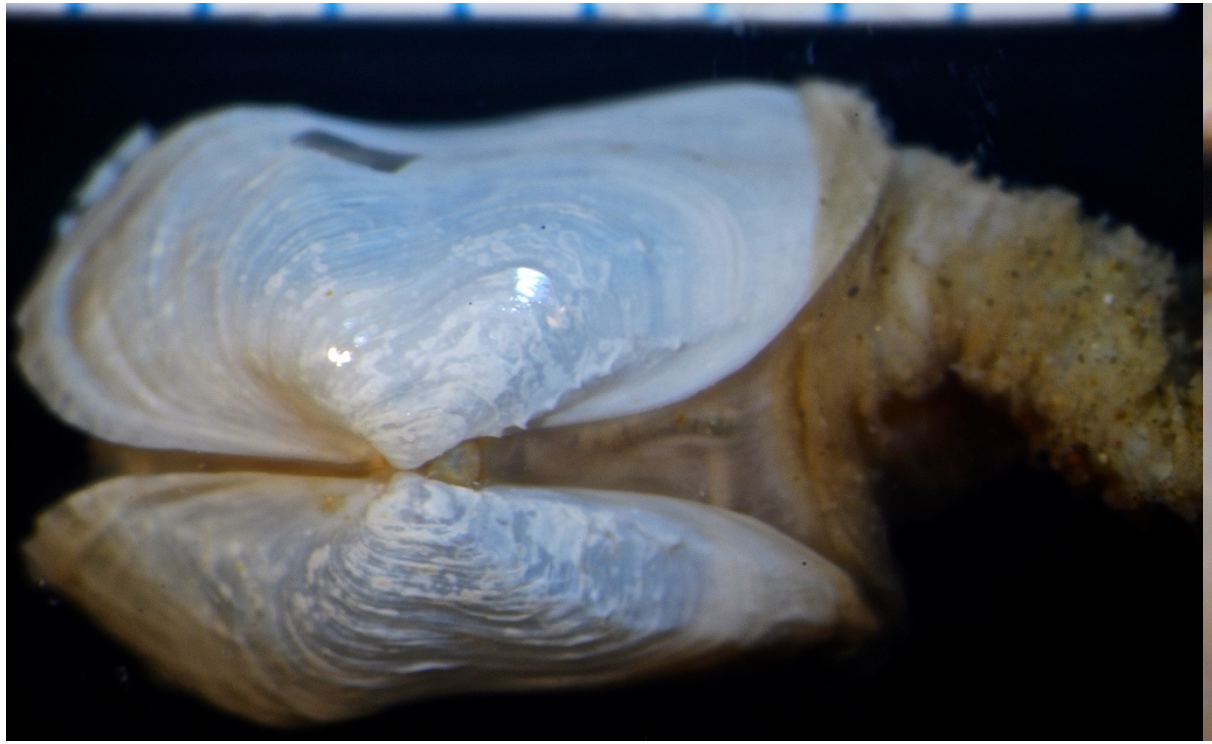
Panomya norvegica (Spengler, 1793)

LACSD 8C 61m 2003

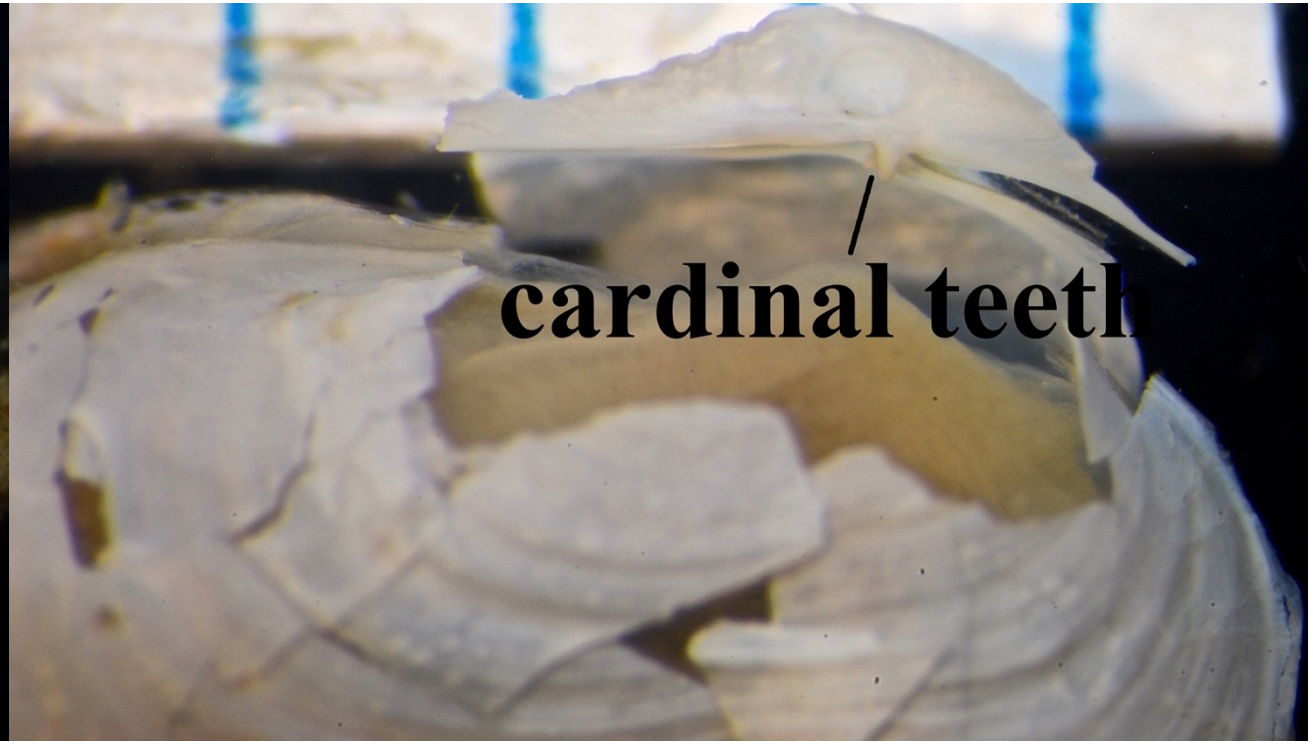
LACSD 5D 30m 2006

Specimens courtesy of Don Cadien LACSD

Panomya norvegica (Spengler, 1793)



LACSD 3D 30m 2013



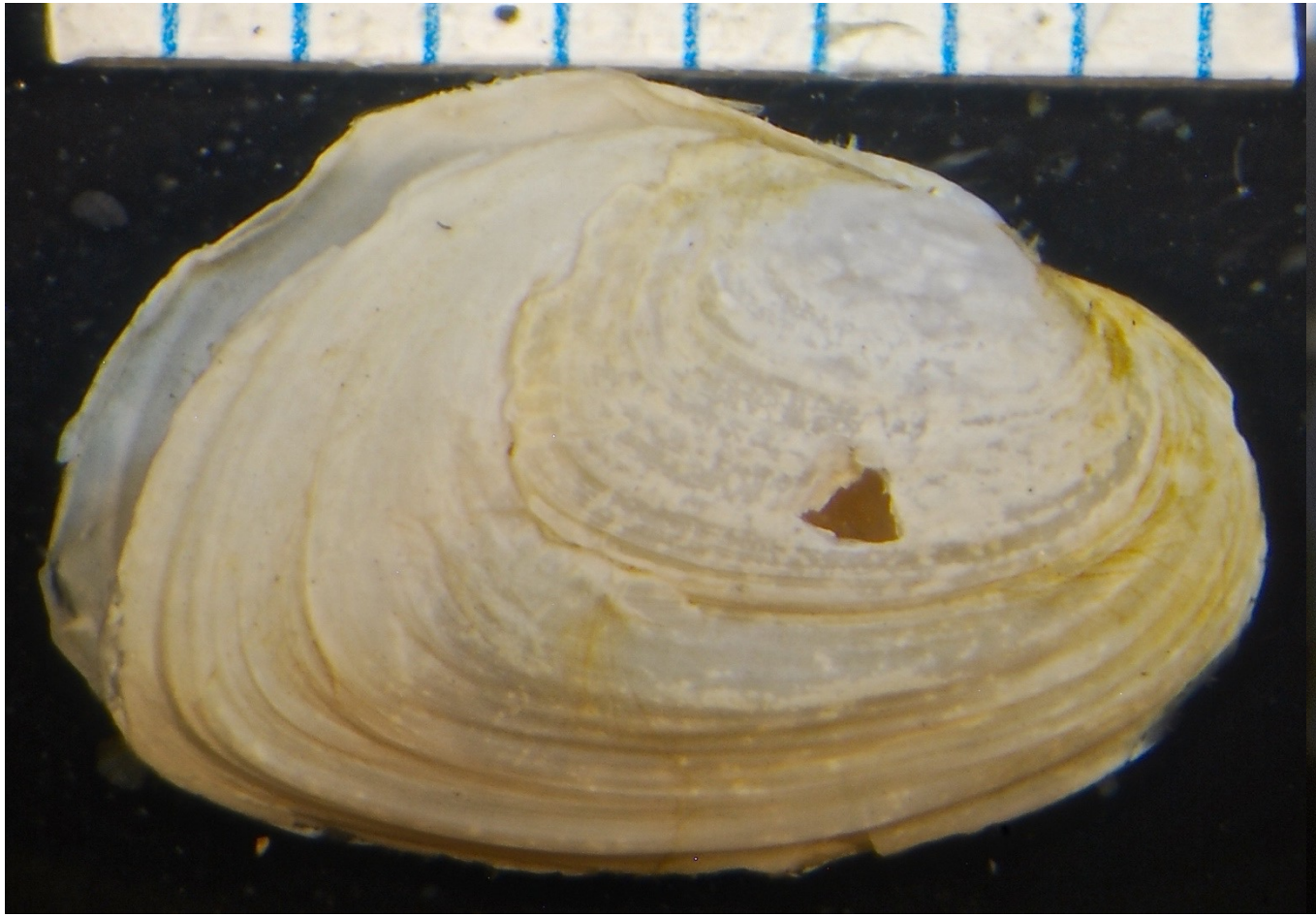
LACSD 8C 61m2003

Specimens courtesy of Don Cadien LACSD

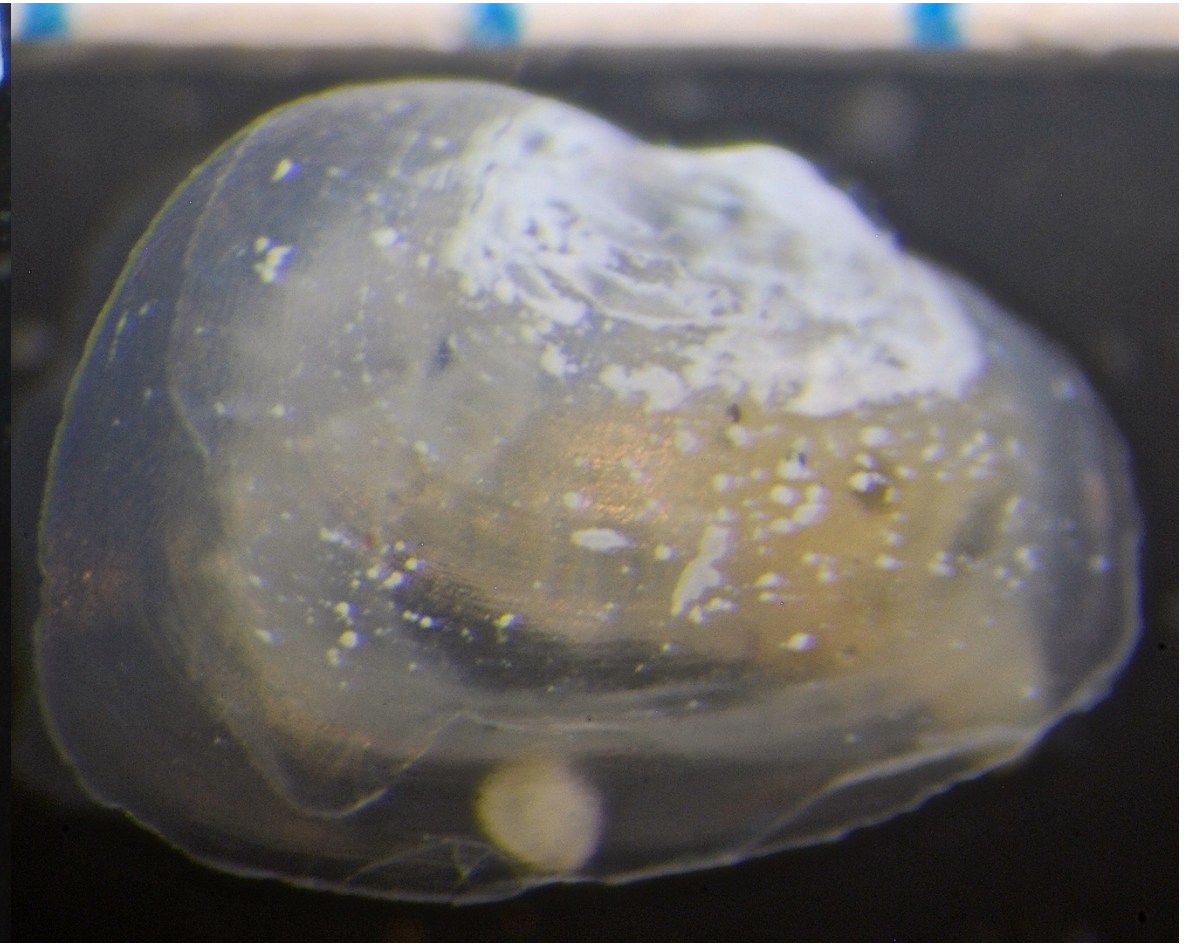
Family Basterotiidae

1. Valves rhomboidal, thin, with posterior gape
2. Ligament mostly external, protruding or deeply sunken
3. Hinge with minute denticle in right valve of juvenile, overgrown in adults

Saxicavella nybakkeni Scott 1994



B’98 2515 Santa Cruz Island 102m

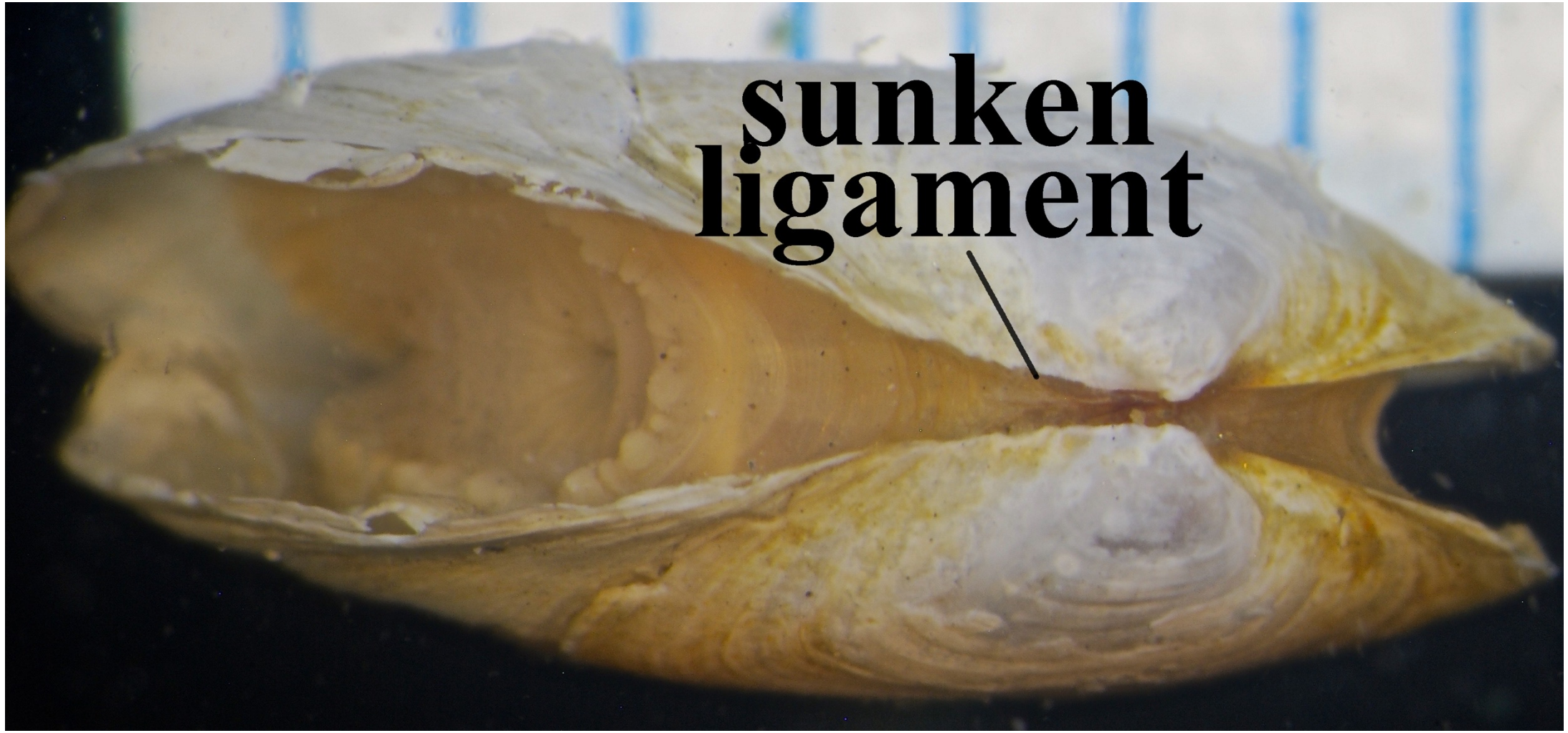


Santa Monica Bay B3 44m 2015

Saxicavella nybakkeni Scott 1994

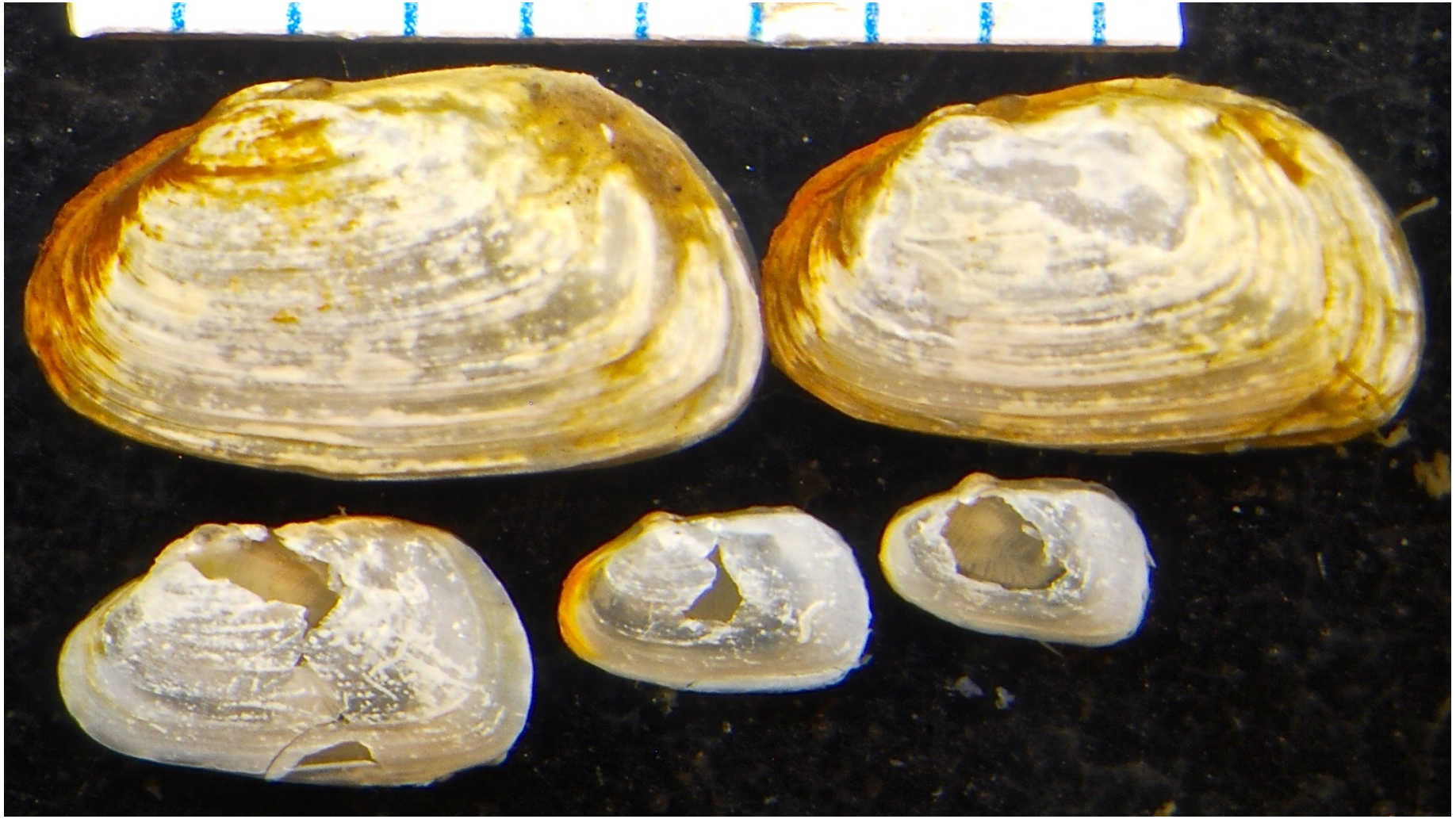
Santa Monica Bay B3 44m 2015

Saxicavella nybakkeni Scott 1994



Santa Monica Bay V4(5) 102m 1989

Saxicavella pacifica Dall 1916

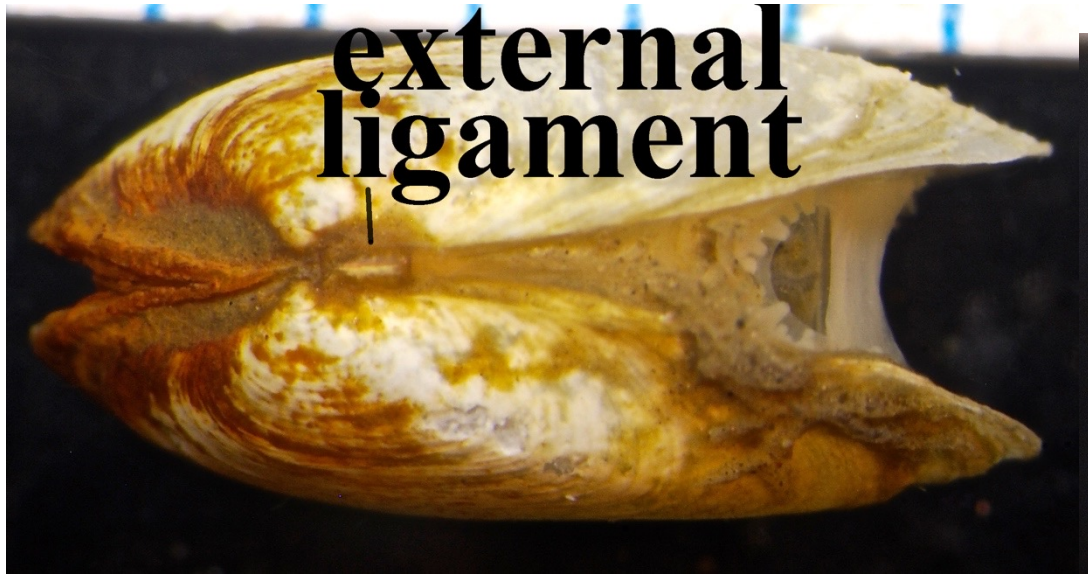


B’18 10033 E Santa Barbara Channel 406m

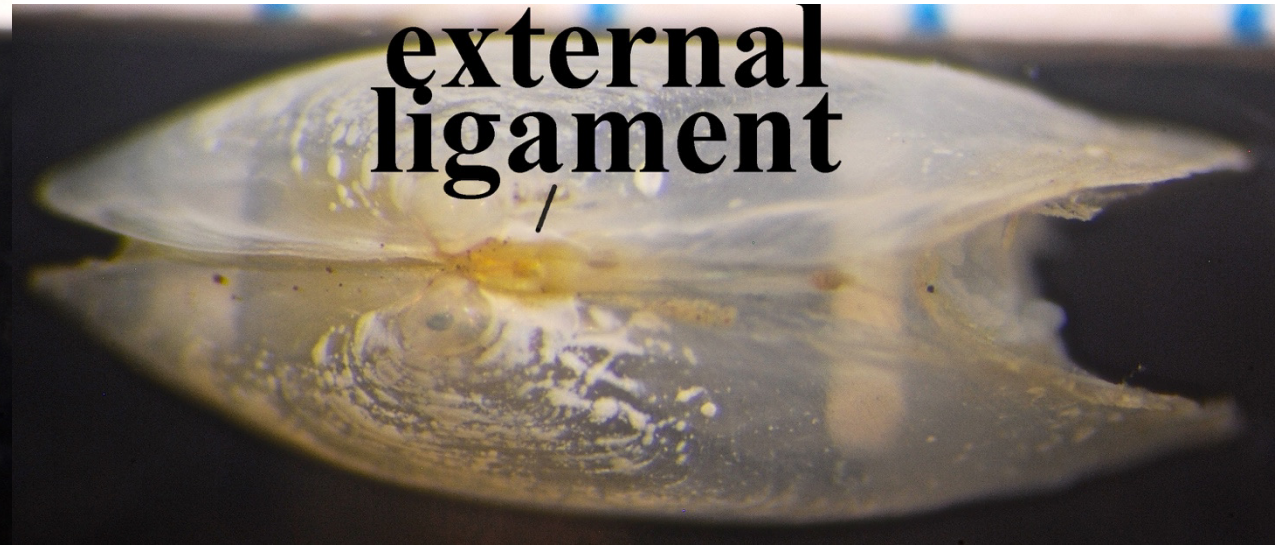
Saxicavella pacifica Dall 1916

Photo courtesy of Kelvin Barwick

Saxicavella pacifica Dall 1916

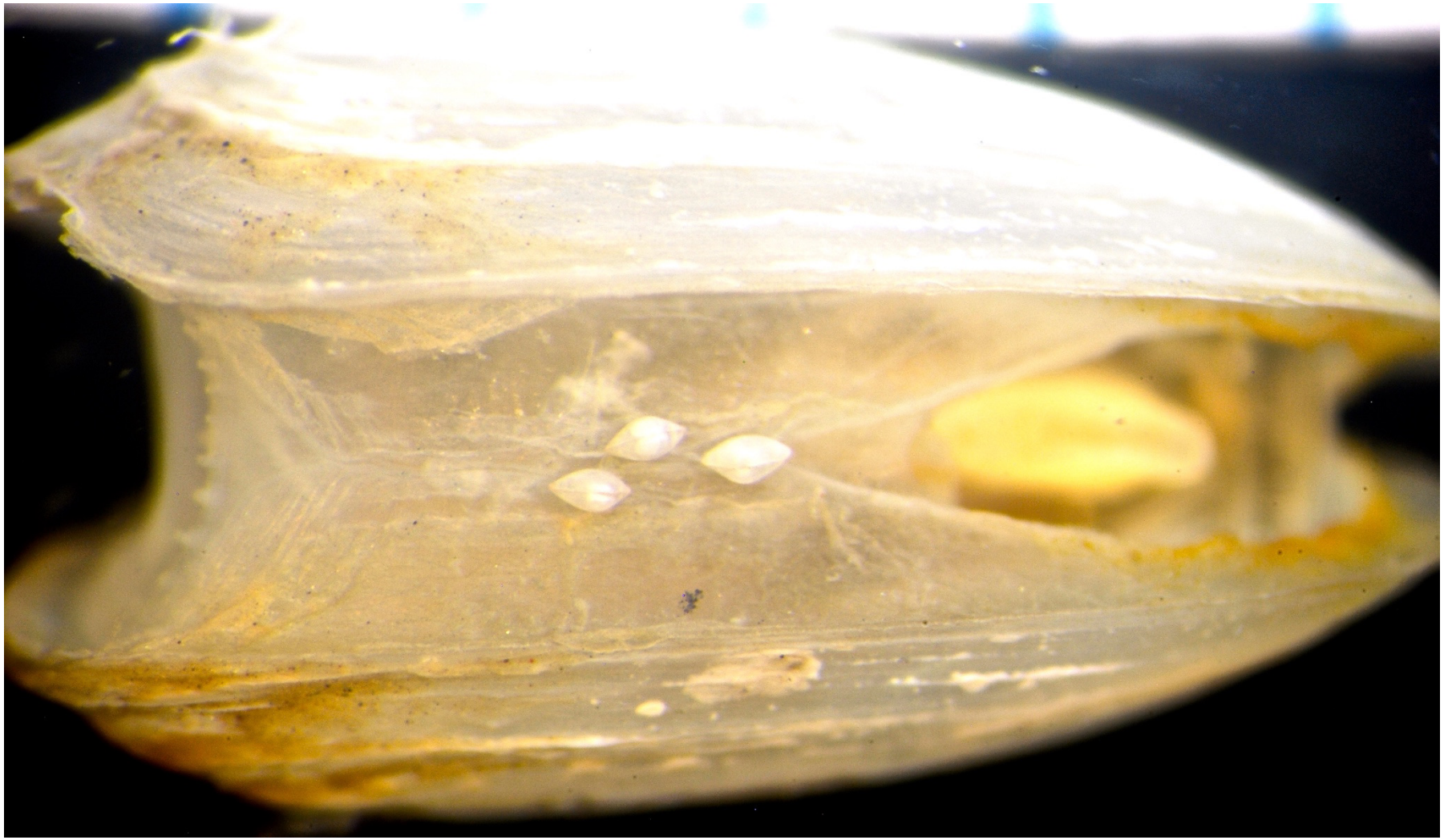


B’18 10033 East Santa Barbara Channel 406m



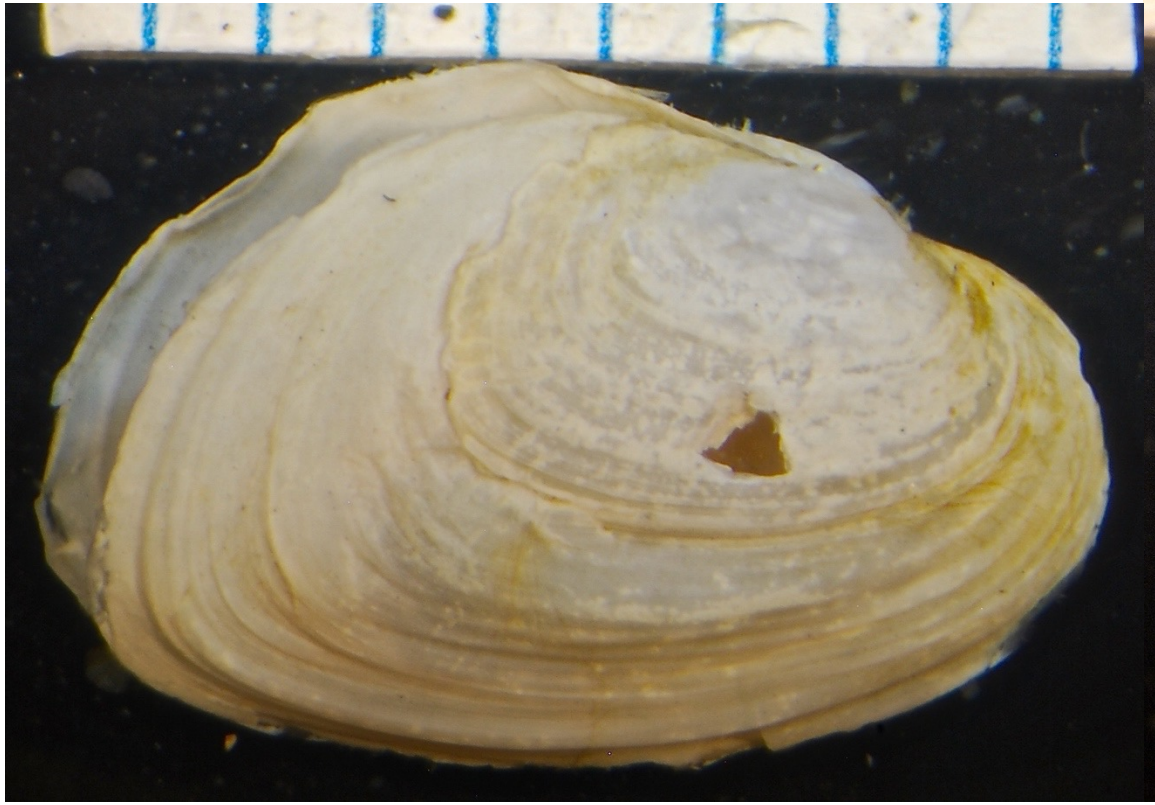
B’18 10246 East Santa Barbara Channel 44m

Saxicavella pacifica Dall 1916

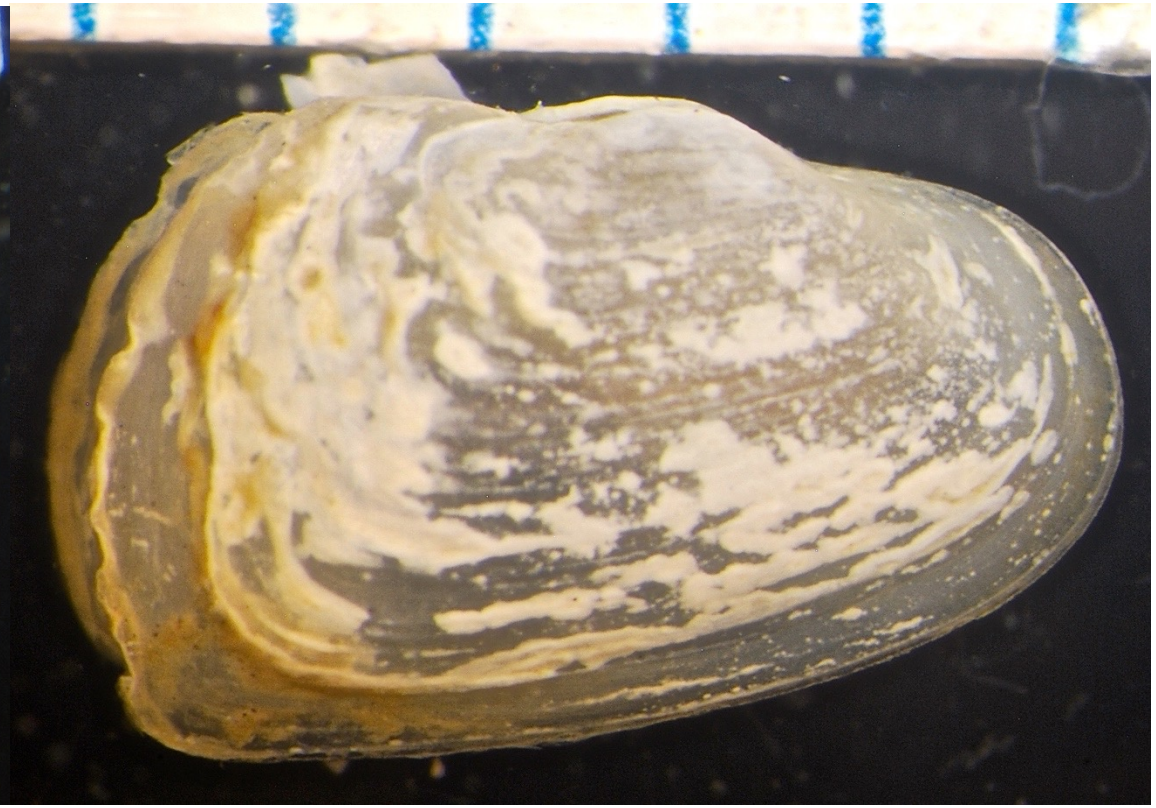


B’98 2515 Santa Cruz Island 102m

Saxicavella nybakkeni/Saxicavella pacifica

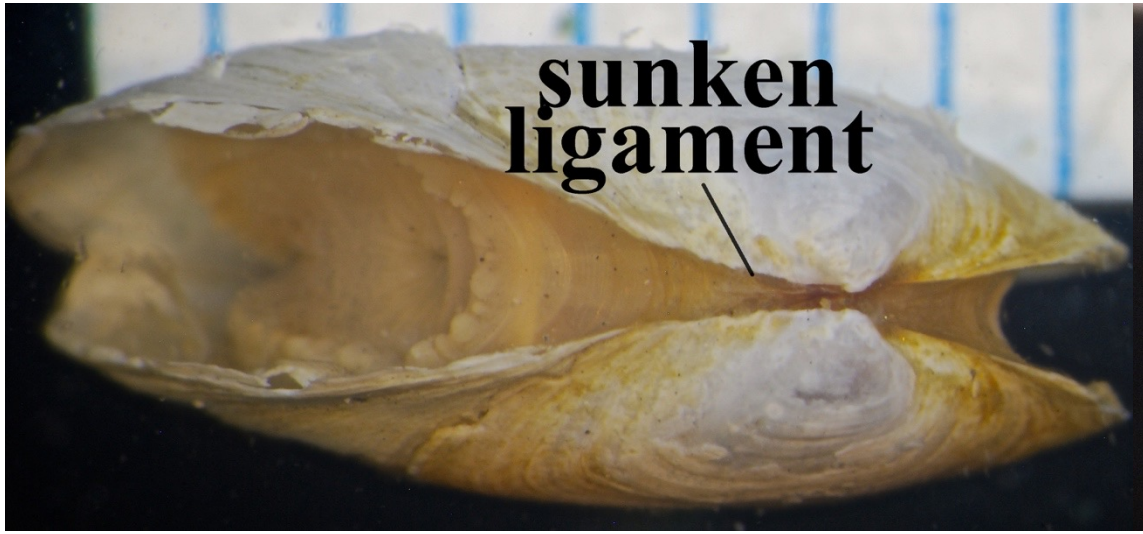


Santa Monica Bay V4(5) 102m 1989



B’98 2515 Santa Cruz Island 102m

Saxicavella nybakkeni/Saxicavella pacifica



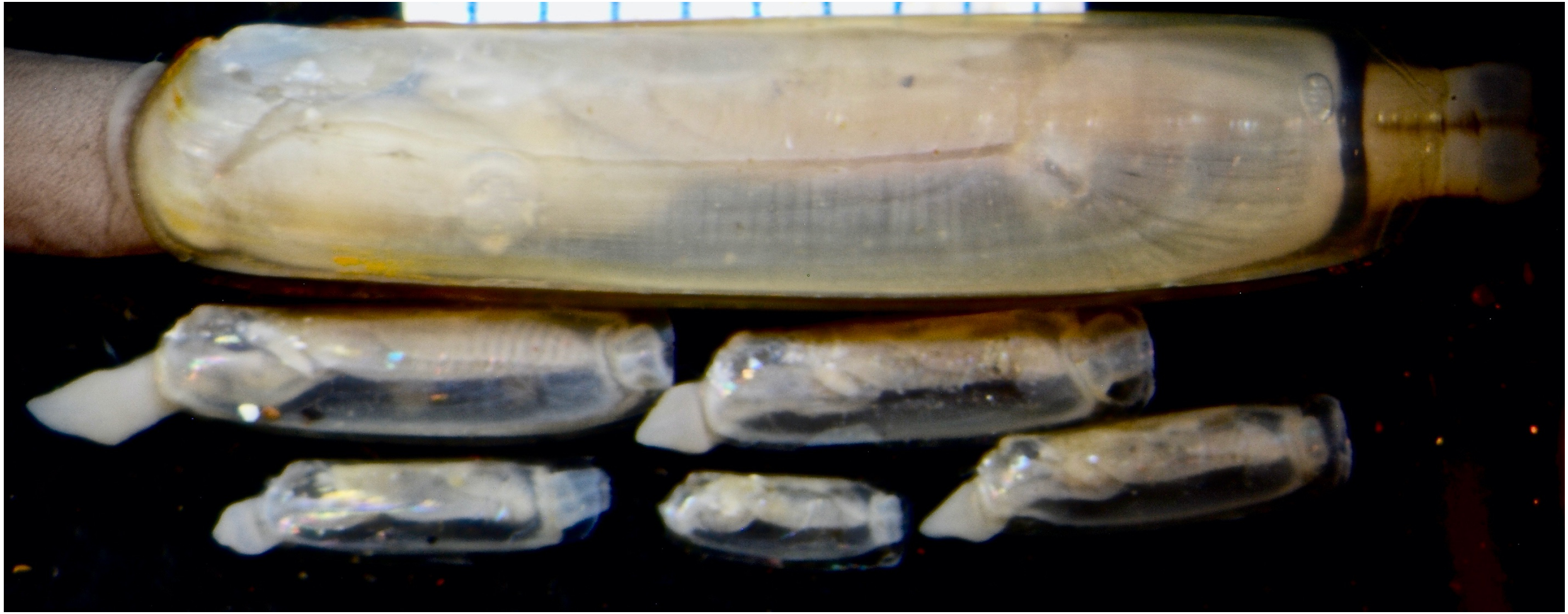
B’18 10033 East Santa Barbara Channel 406m

Santa Monica Bay V4(5) 102m 1989

Family Solenidae

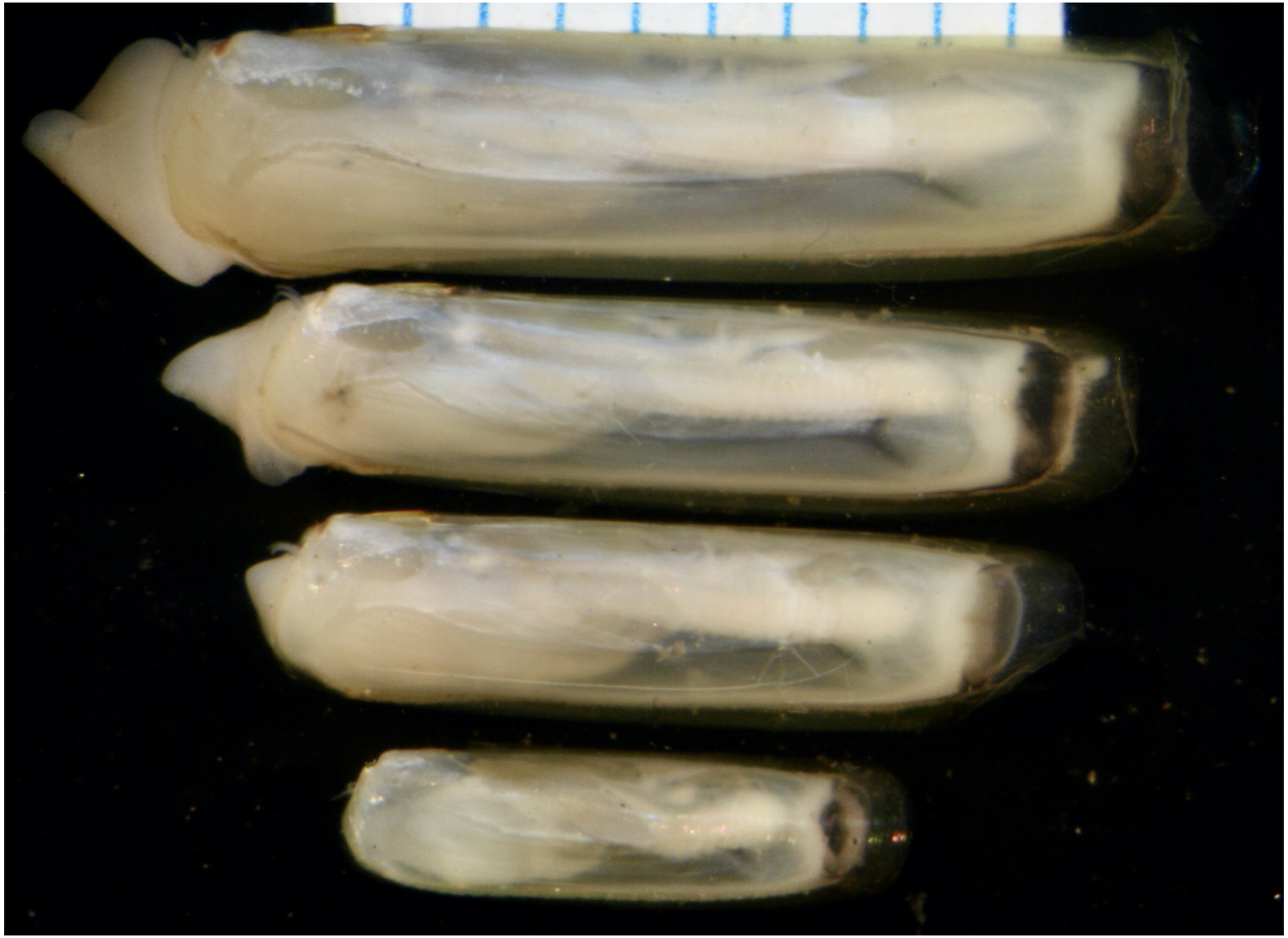
1. Valves elongate, cylindrical, inequilateral, gaping at each end
2. Umbones terminal or subterminal
3. Ligament external
4. Hinge with one cardinal tooth in each valve, lateral teeth absent

Solen rostriformis Dunker 1862



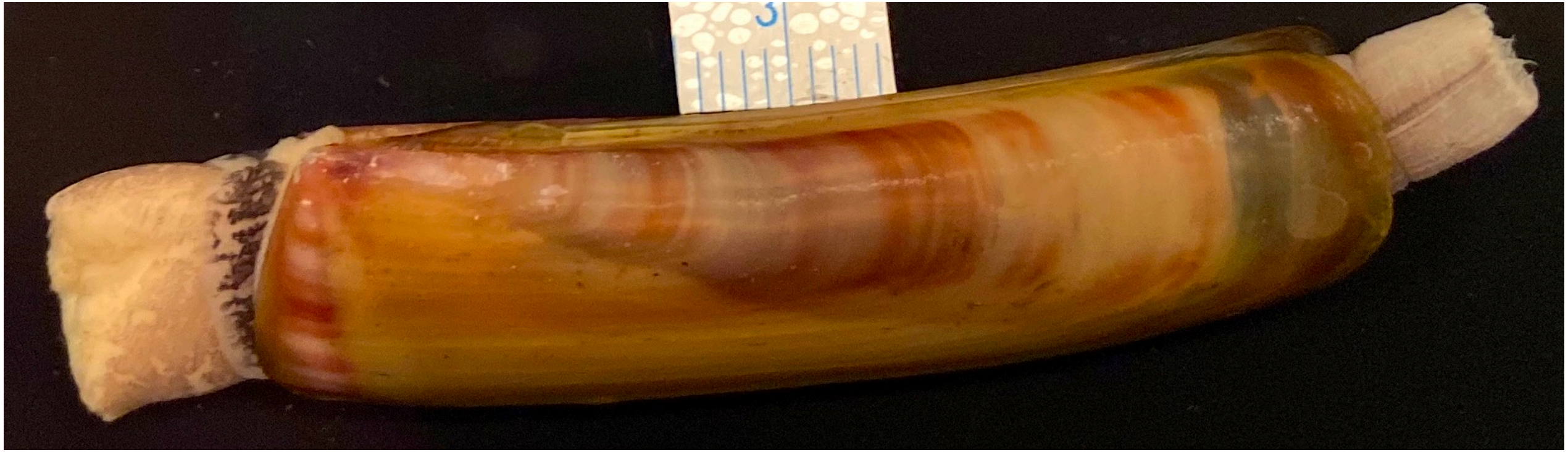
B’18 Station 10114 San Diego Bay 9m

Solen rostriformis Dunker 1862



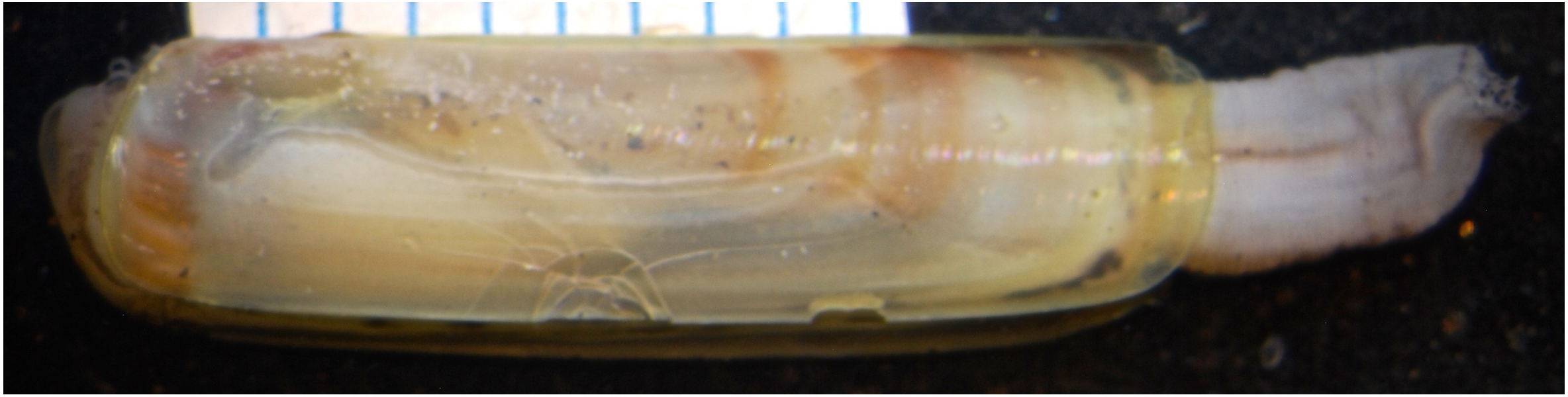
San Diego Bay Merkel SC-MD (rep1) 6m 2020

Solen sicarius Gould 1850



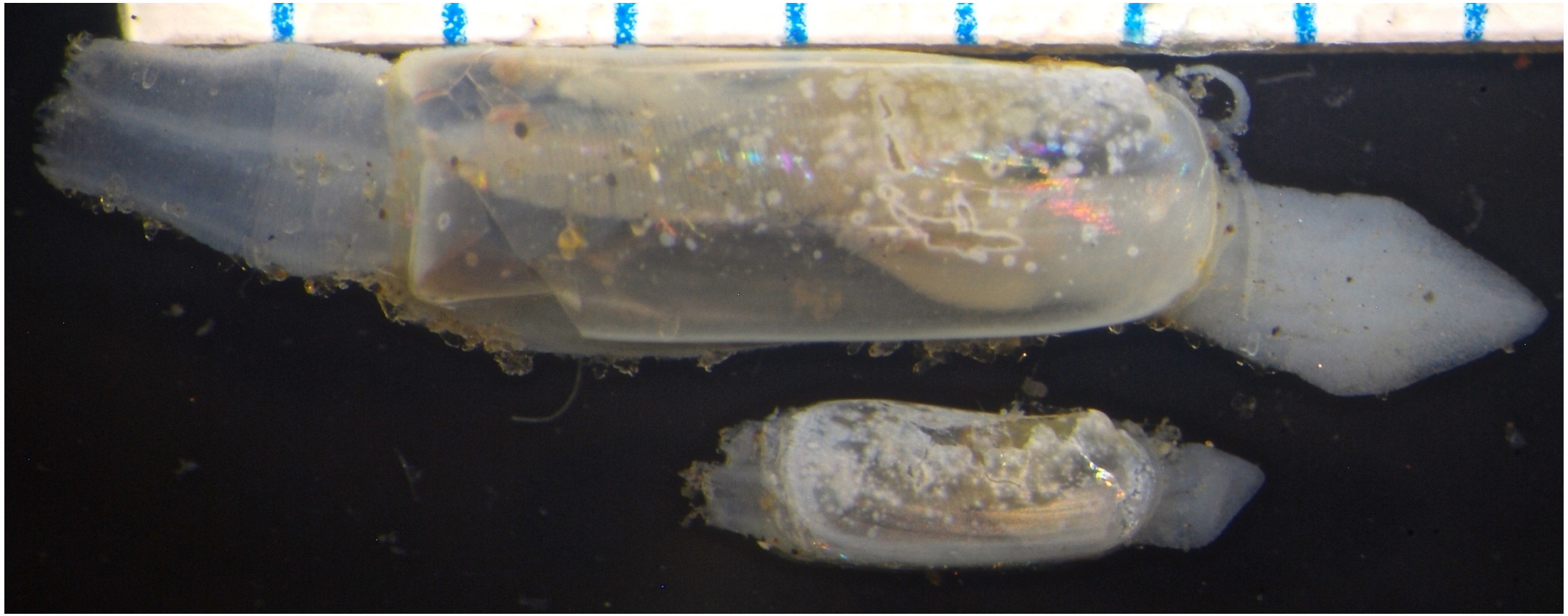
Goleta B1(3) 30m 2019

Solen sicarius Gould 1850



Monticeto 30m 2019

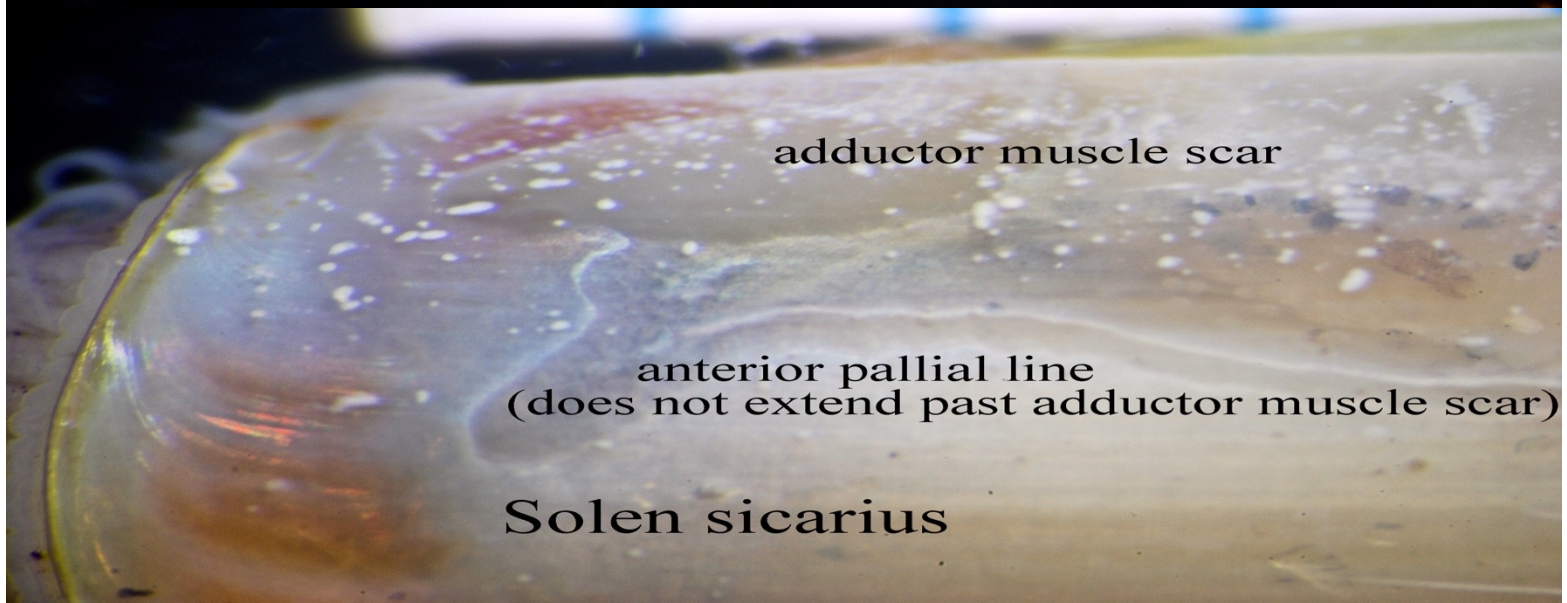
Solen sicarius Gould 1850



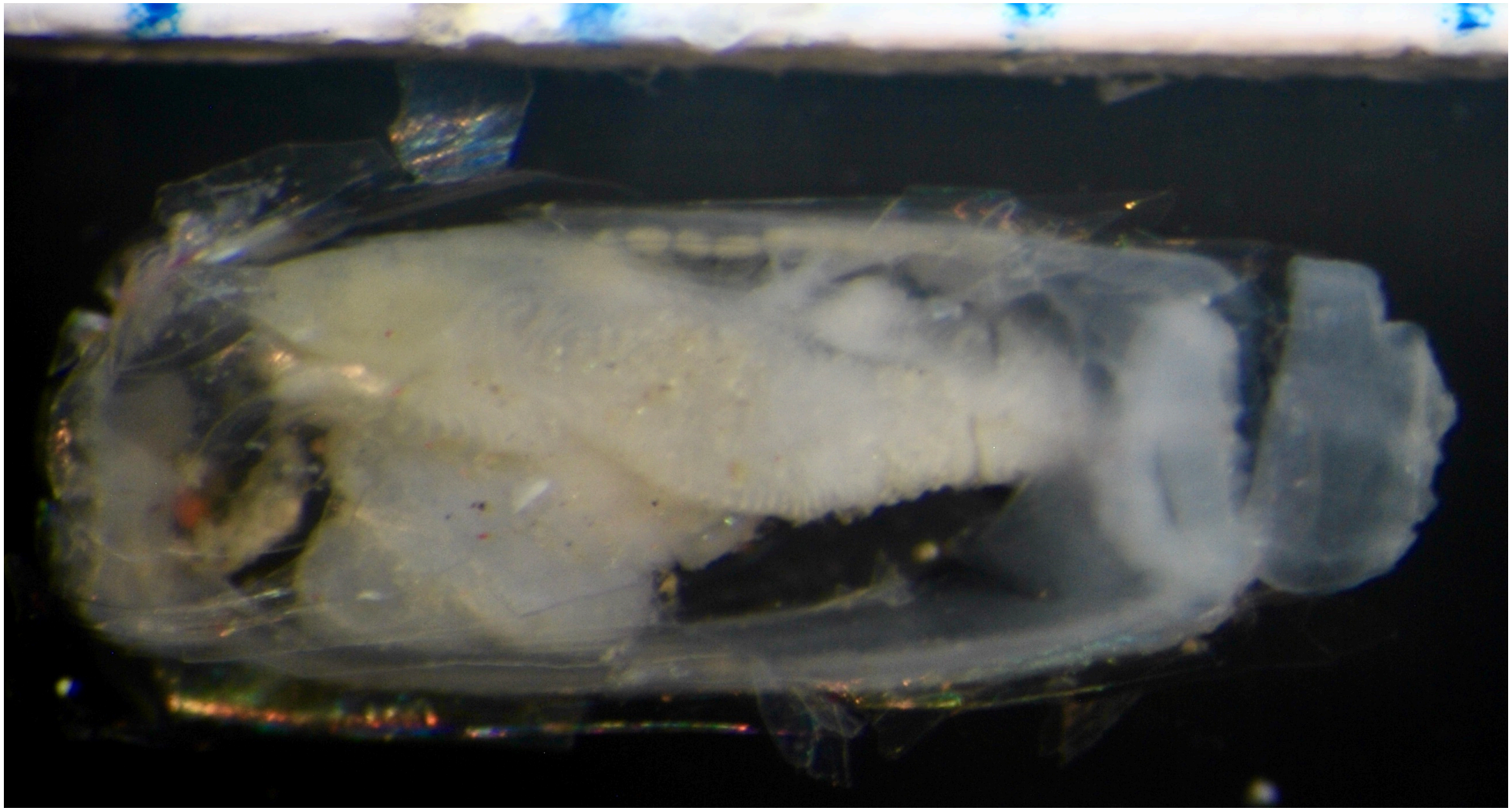
B’18 10209 East Santa Barbara Channel 18m

Solen spp

adductor muscle scar
anterior pallial line
(extends past adductor muscle scar)
Solen rostriformis


adductor muscle scar
anterior pallial line
(does not extend past adductor muscle scar)
Solen sicarius

Solen sp (juvenile)



San Diego Bay Merkel CB-DS (Rep 3) 15m 2020

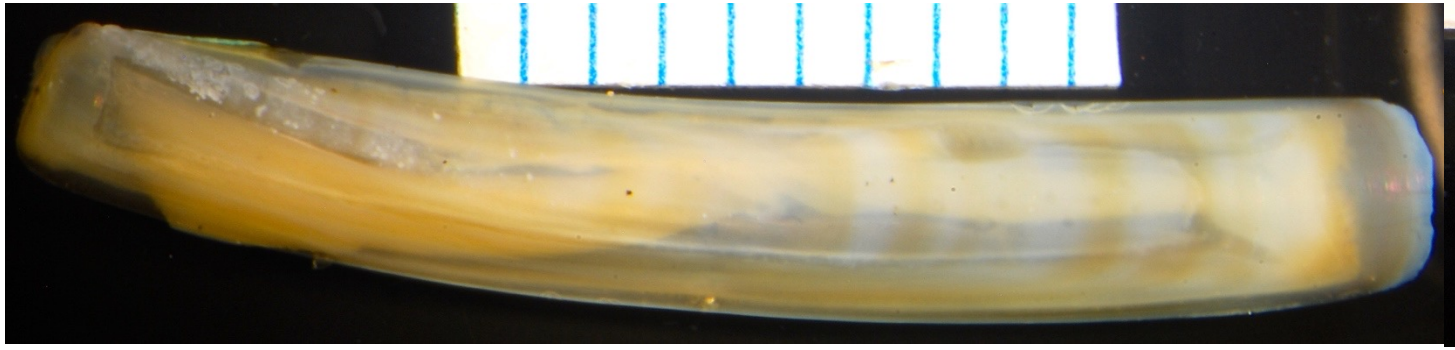
Family Pharidae

1. Valves elongate to rounded, in equilateral
2. Ligament external
3. Internal rib present or absent
4. Right valve with two cardinal teeth, left valve with four cardinal teeth

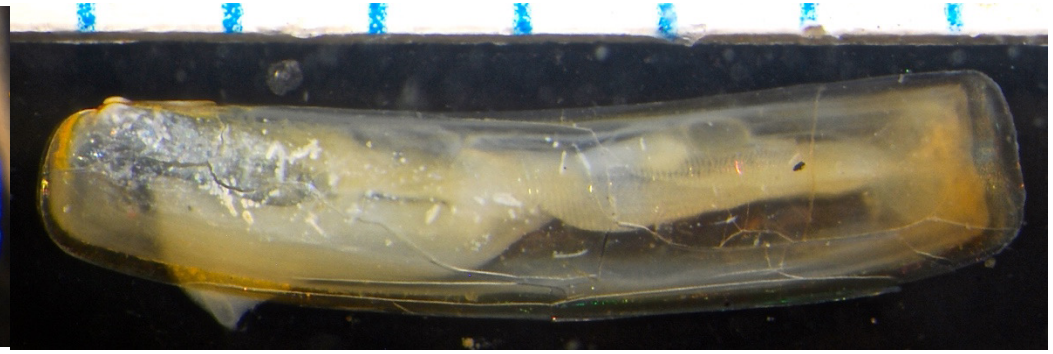
Ensis myrae Berry 1953

Goleta B1(3) 30m 2019

Ensis myrae Berry 1953



Los Angeles Harbor HM8 12m 2014

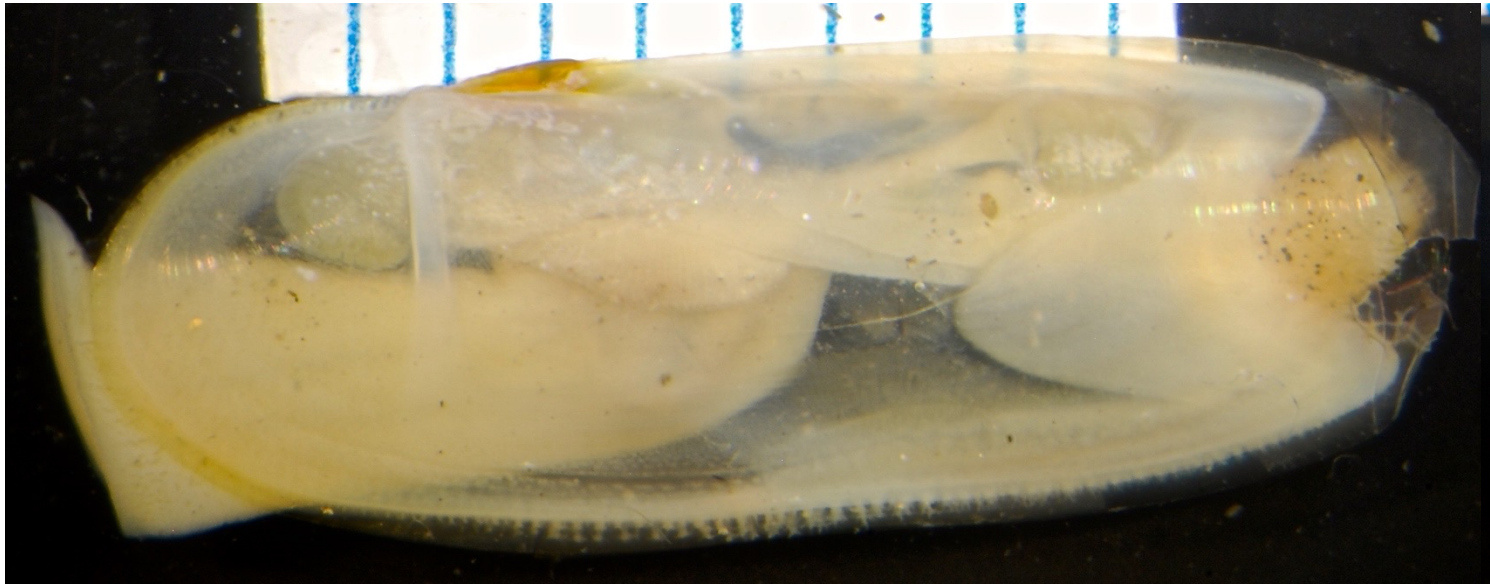


Goleta B6(4) 30m 2019

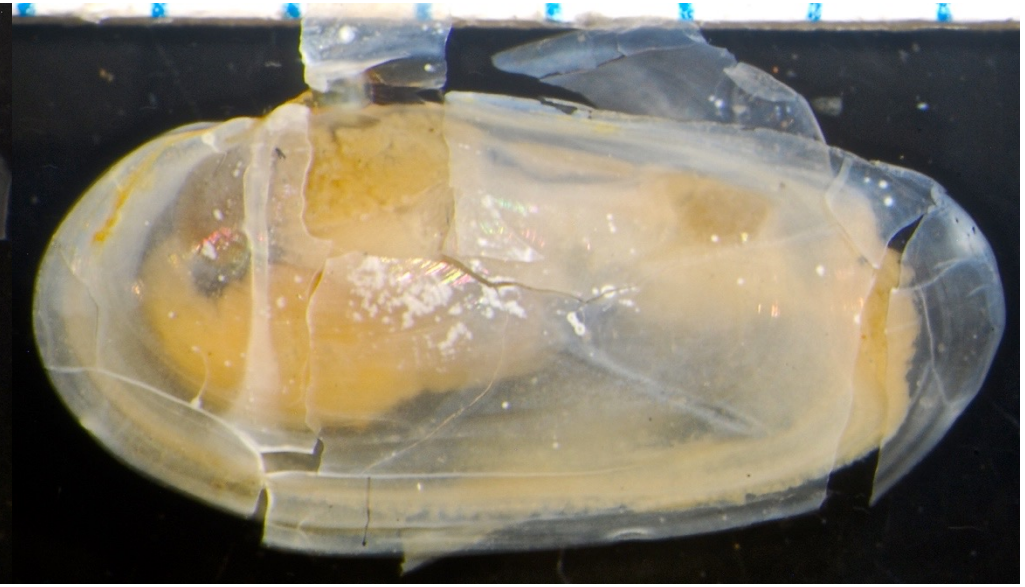
Siliqua lucida (Conrad 1837)

Avila 30m 2016

Siliqua lucida (Conrad 1837)



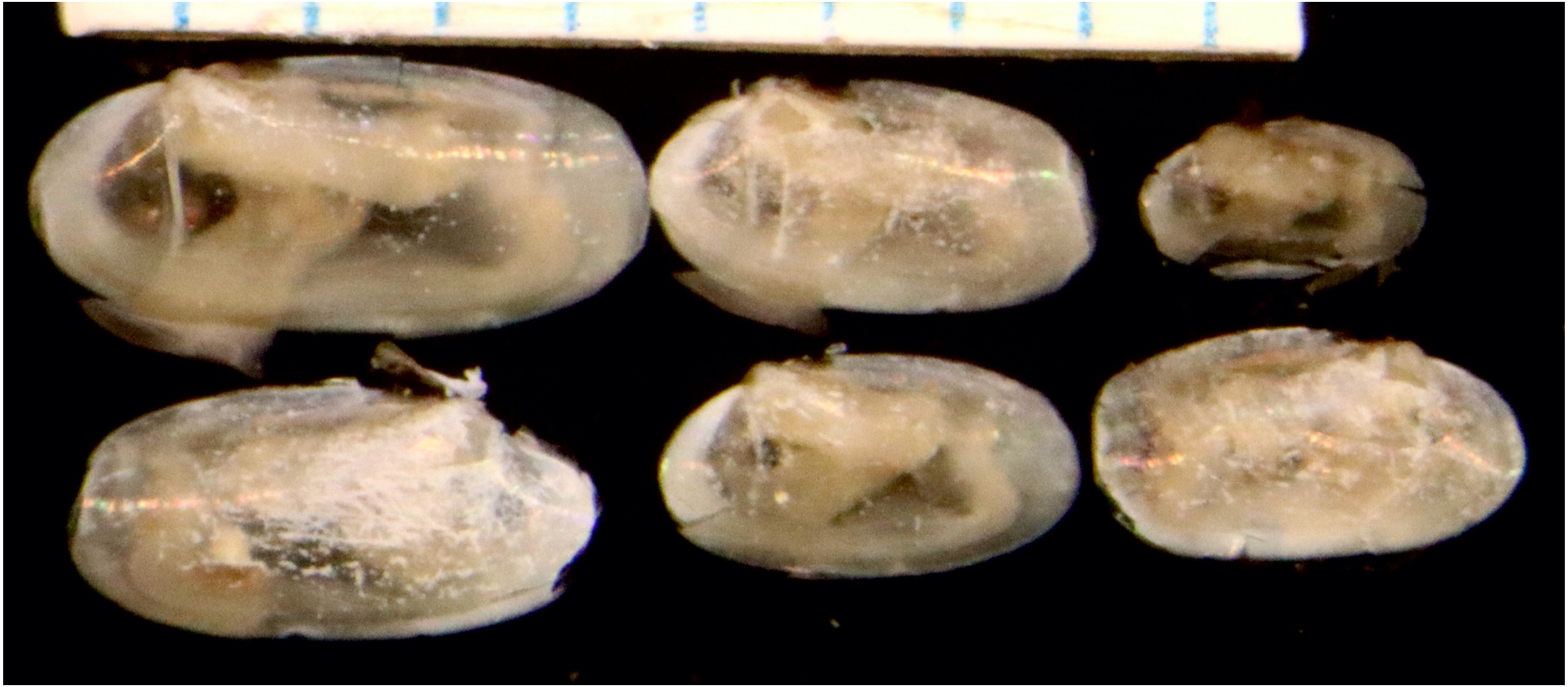
SONGS F-2 10m 1977



EBM 17-2 5m 1974

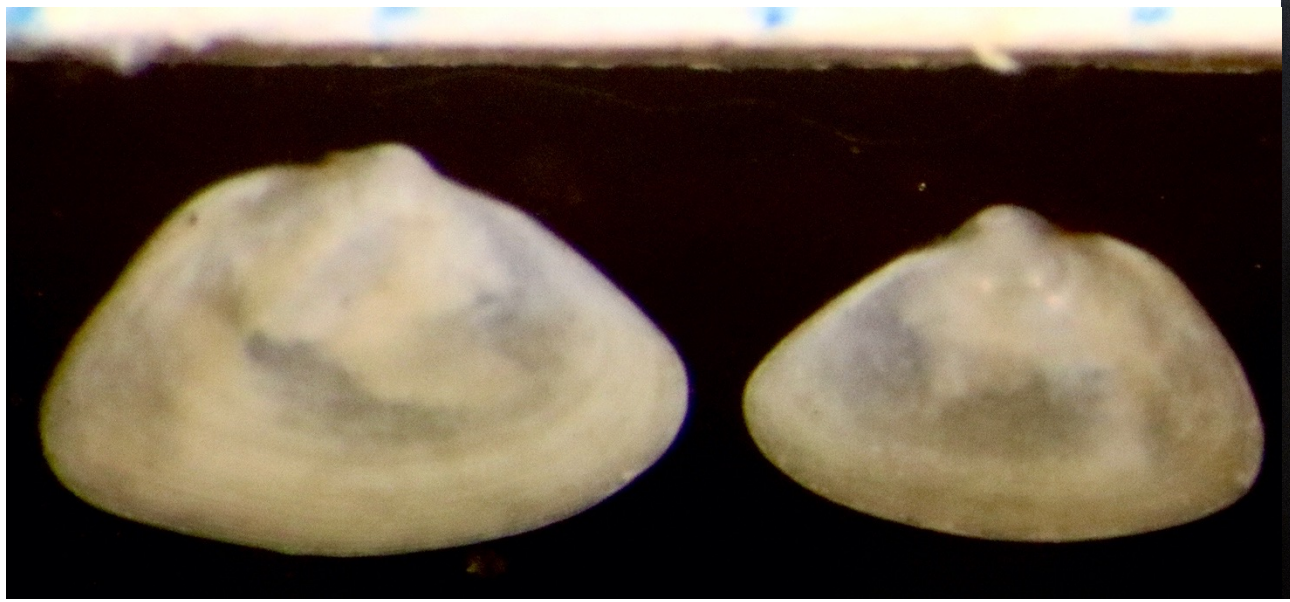
Specimens courtesy of Carol Paquette MBC

Siliqua lucida (Conrad 1837)

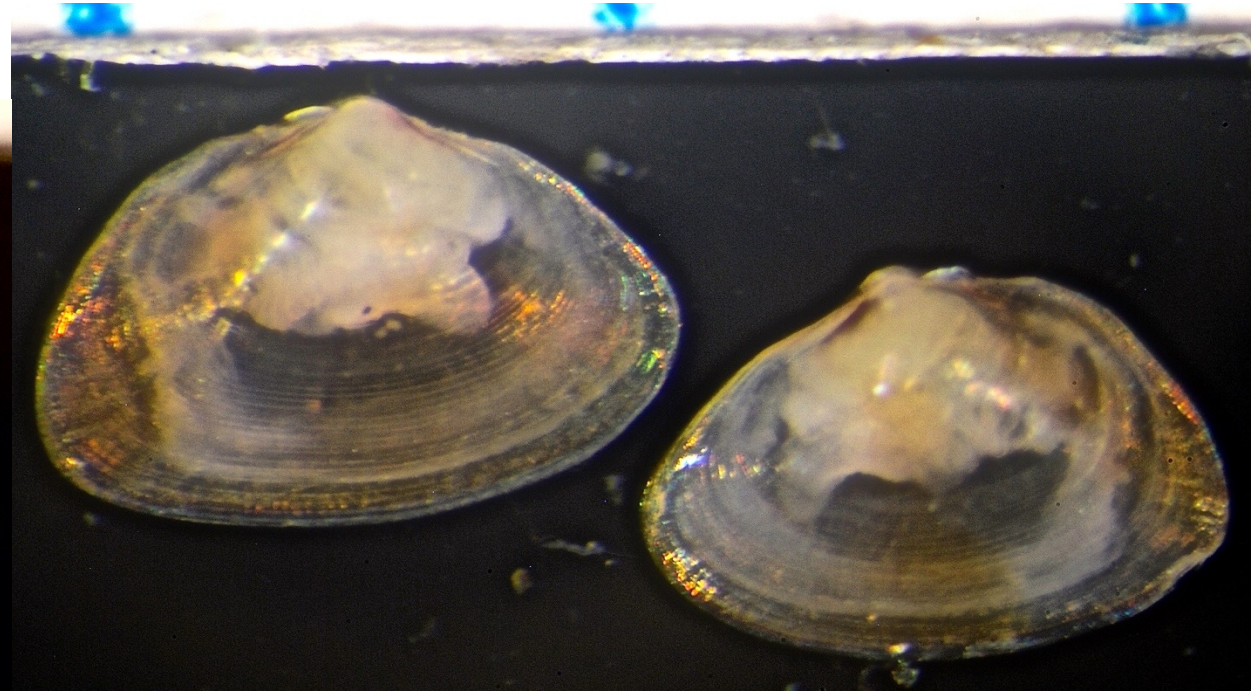


ISS Carpenteria 4335QX13 8/16/07

Siliqua juvenile



ISS Purisima Point 4347QX13 9/6/07



Willapa Bay, WA 5m 2015

Siliqua juvenile

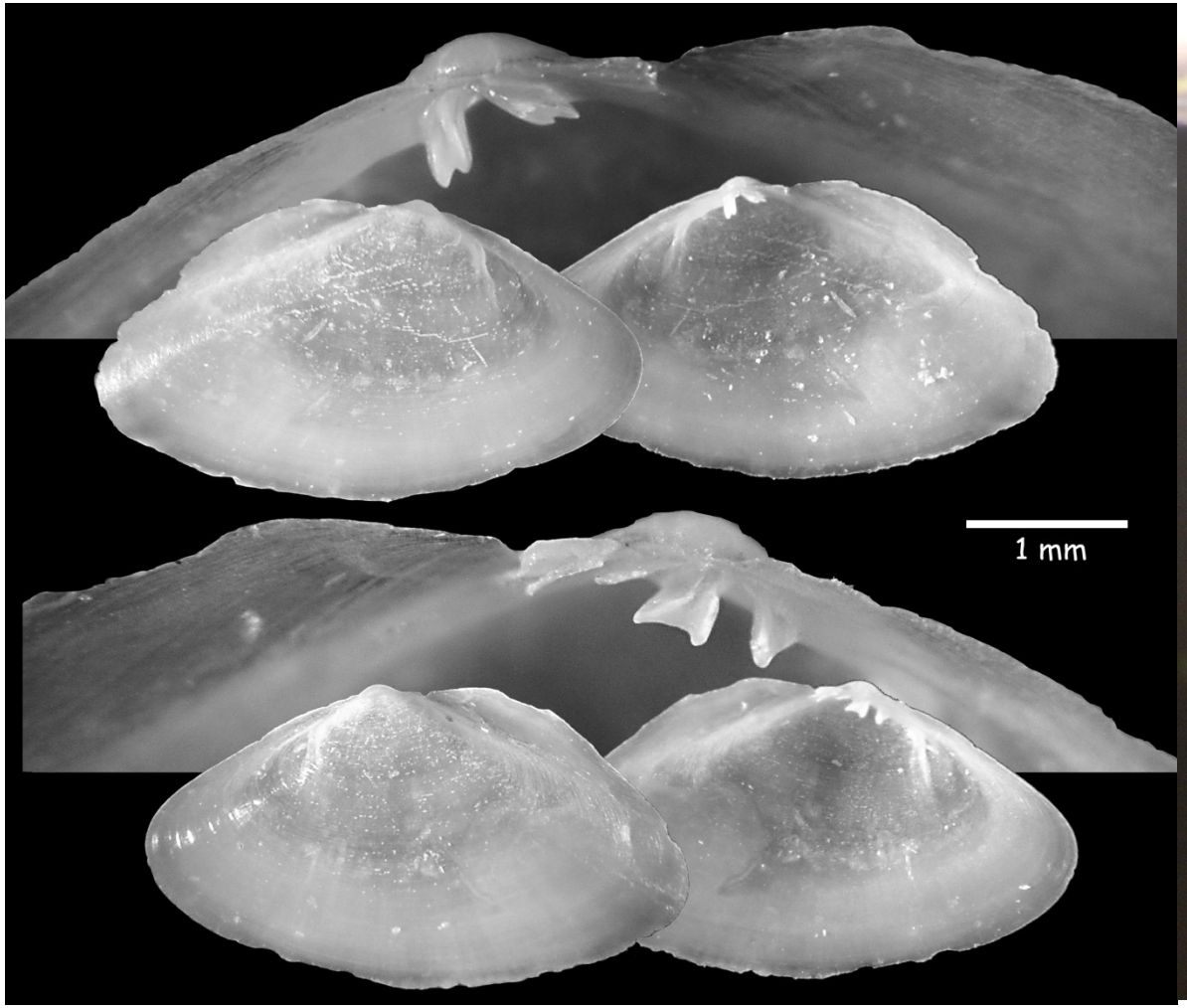
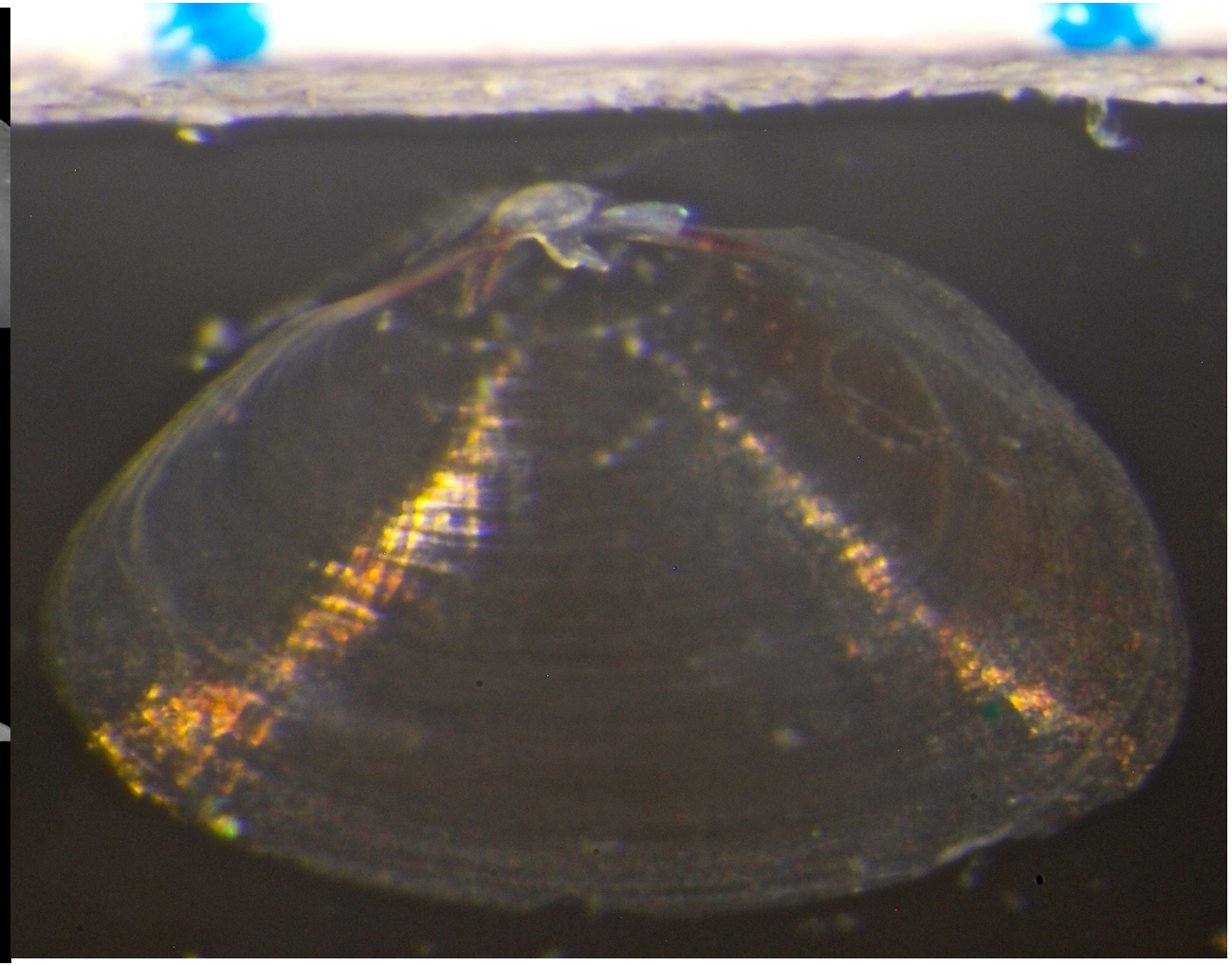


Photo courtesy of Kelvin Barwick



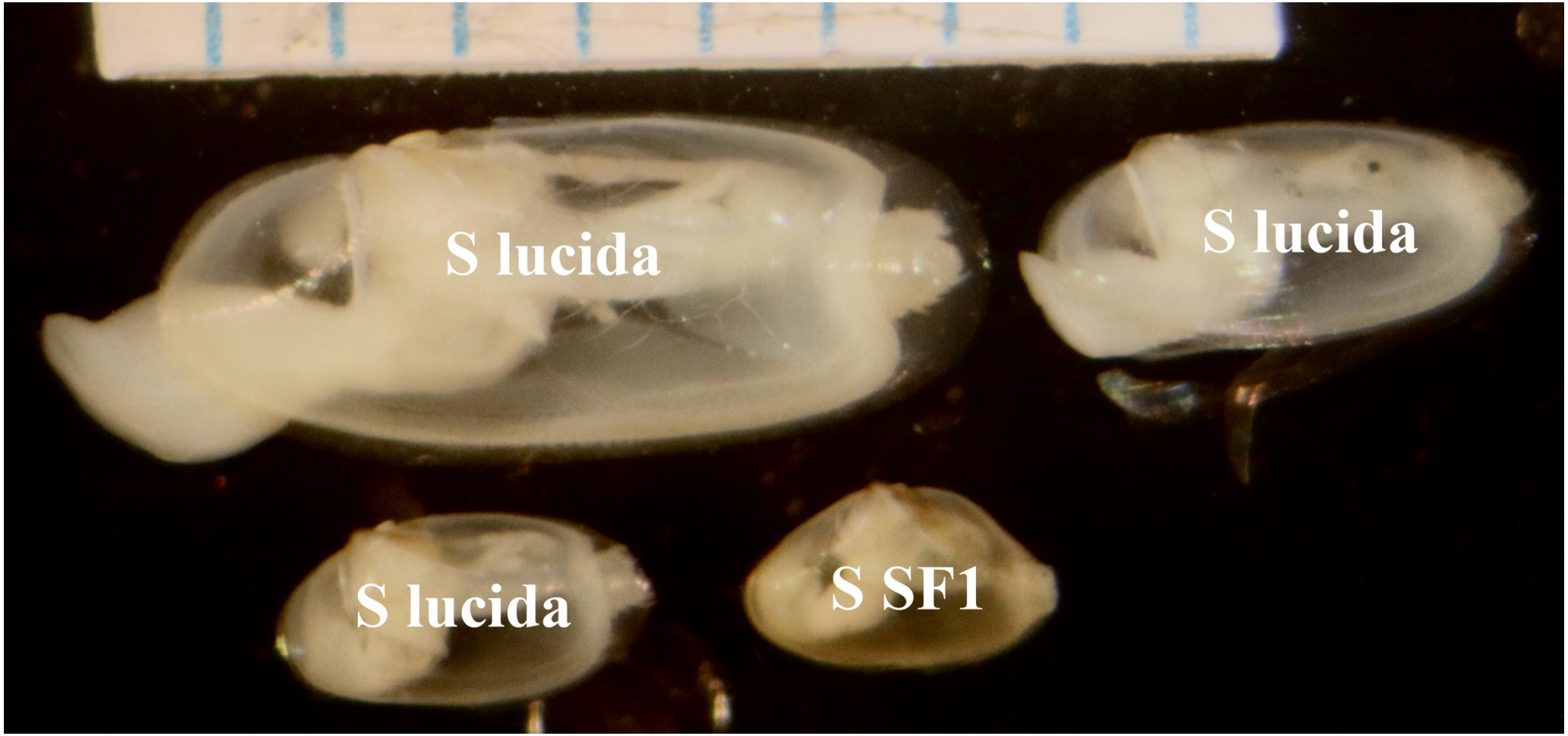
Willapa Bay, Wa 2015

Siliqua juvenile

CCSF SW0045 1.0mm 21m 9/3/2020

Specimen courtesy of Heather Petersen CCSF

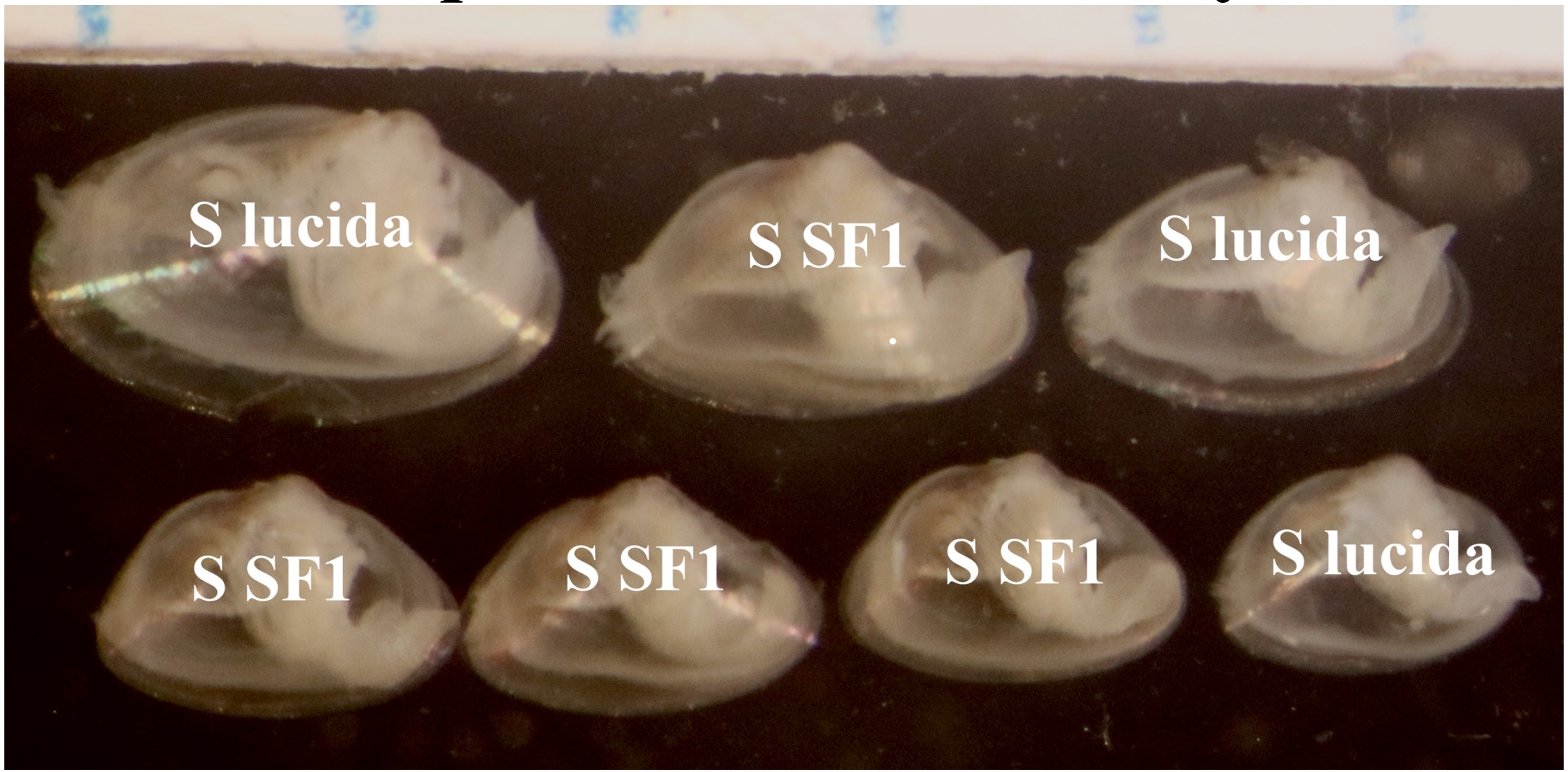
Siliqua San Francisco Bay



CCSF SW0045 1.0mm 21m 9/3/2020

Specimens courtesy of Heather Petersen CCSF

Siliqua San Francisco Bay



CCSF SW0045 0.5mm 21m 9/3/2020

Specimens courtesy of Heather Petersen CCSF