

IDENTIFICATION, PREVENTION, AND TREATMENT OF FOULING

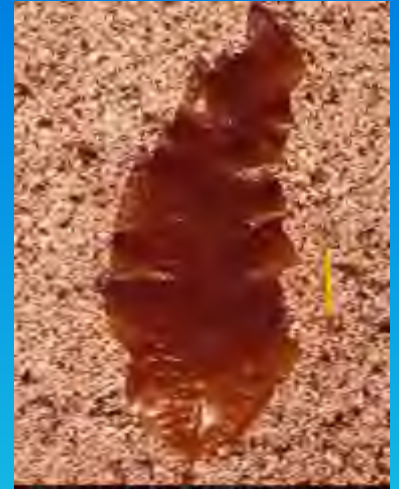
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WHAT IS THE FOULING PROBLEM?

- Seaweed
- Barnacles
- Sponges
- Colonial Tunicates
- Mussels



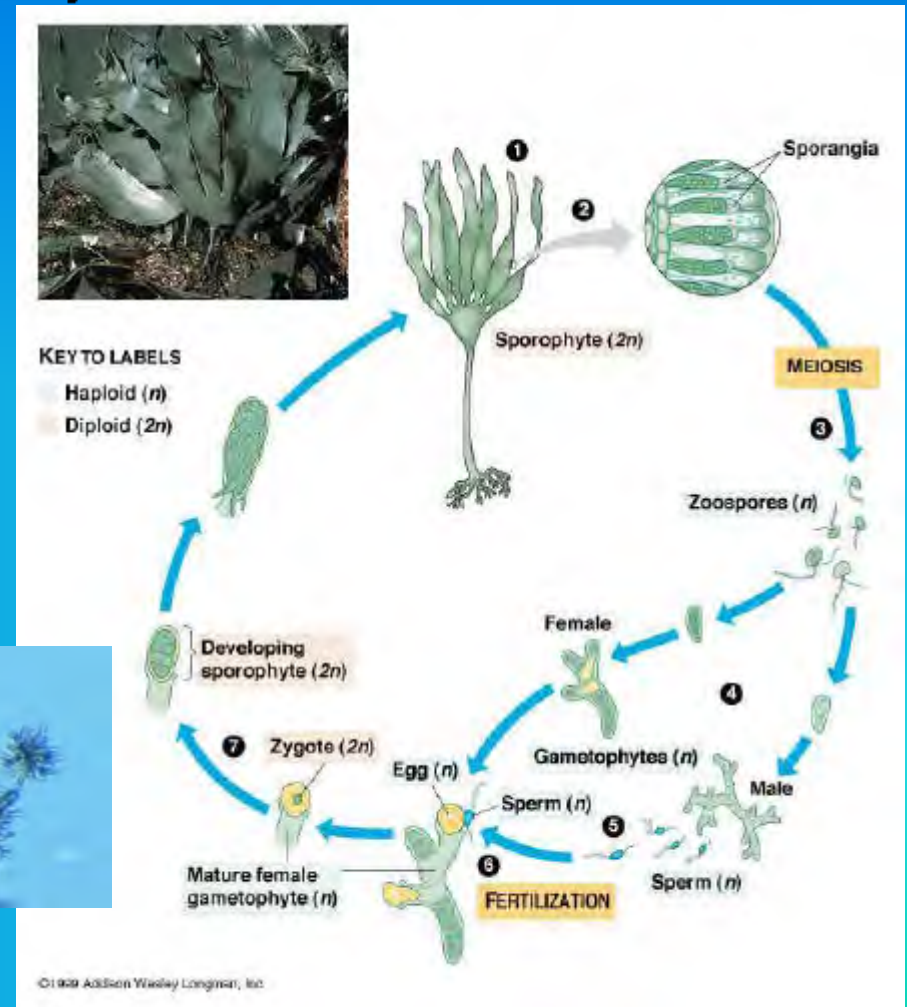
FOULING WITH SEAWEED



BROWN ALGAE (Laminaria)

Life Cycle

- Complex life cycle
 - Microscopic gametophyte
 - Dominant sporophyte
- Reproduction affected by
 - Light intensity
 - Salinity
 - Nutrients

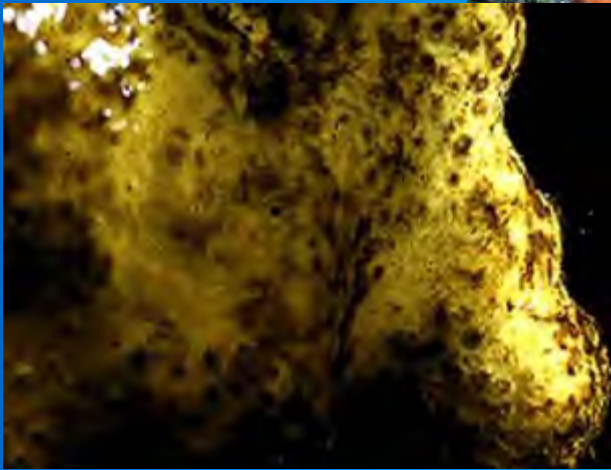


GROWTH OF SEAWEED FRONDS

- A seaweed does not have leaves
 - Structure termed a blade or frond
- Simple cell division from basal meristem
 - Meristem is the active area on the frond where cell reproduction occurs
- The tip of the frond frays



ALASKAN SPONGES



Boring sponge
Cliona thosina



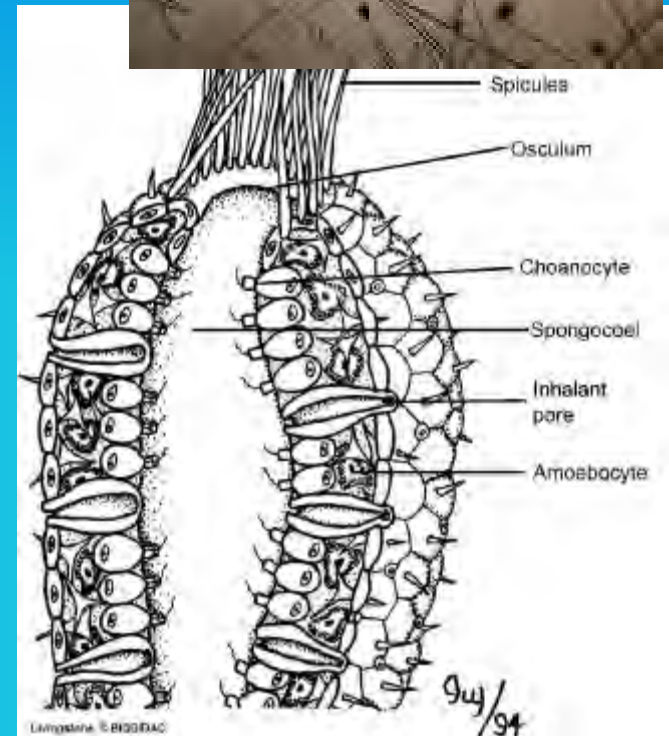
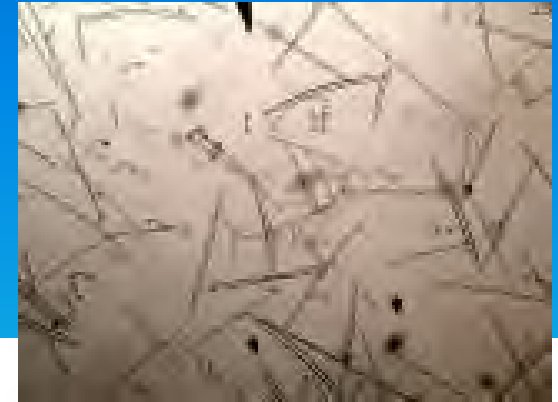
Red volcano sponge
Acarnus erithacus



Bread crumb sponge
Halichondria panicea

SPONGE ANATOMY

- Multicellular, but also have independent cellular function
- Spicules are the best ID feature of sponges
- Reproduce sexually or asexually by fragmentation and budding
- Feed on very small particles
- Not highly competitive with shellfish, but can reduce water flow
- Boring sponges soften shell



TUNICATES

- Multicellular with a notochord (more closely related to us)
- Do not have spicules
- Solitary and colonial
- Reproduce sexually and asexually.
- Can form dense masses
- Feeding via siphons
- Not overly competitive
- Reduce circulation
- Surface tray culture can be a problem

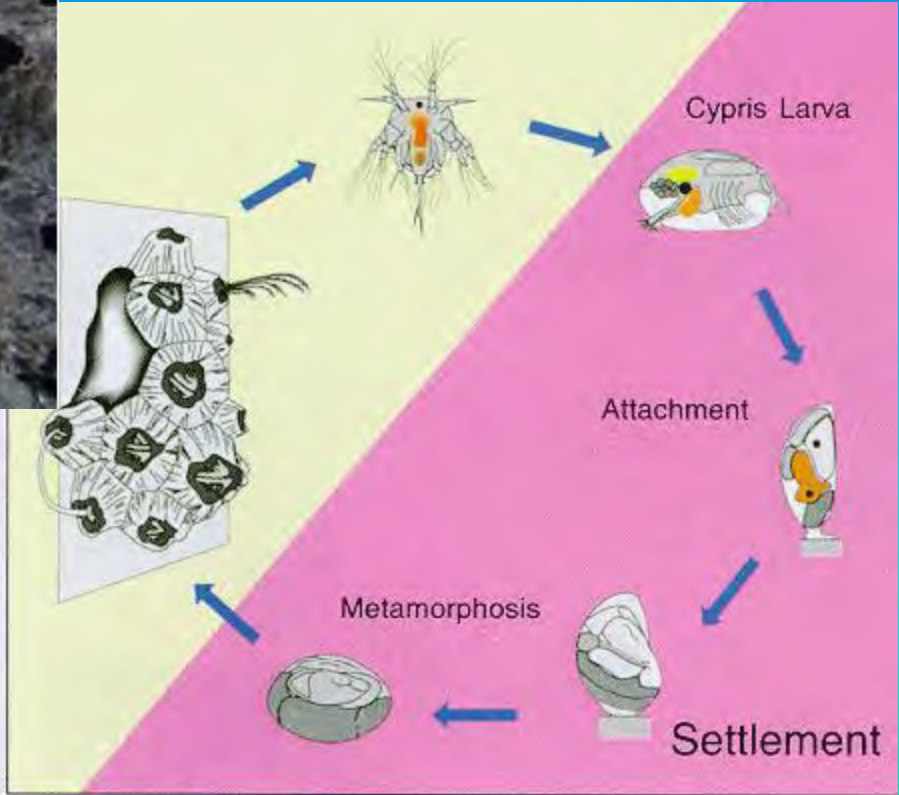


Ascidia parptropa



Aplidium solidum

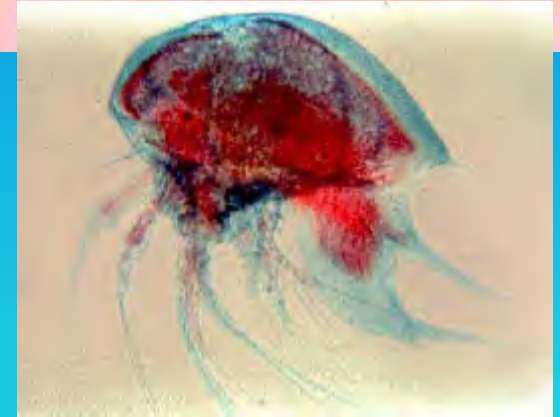
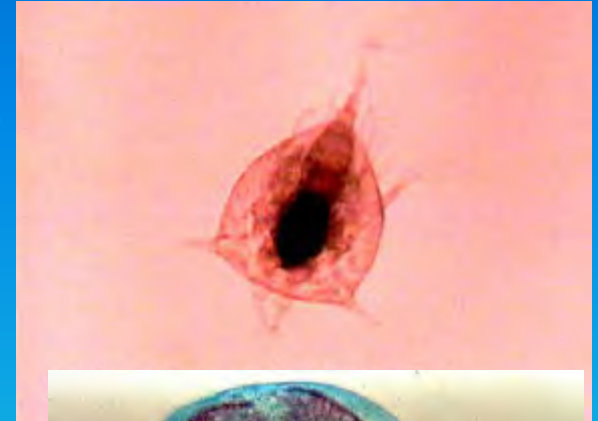
BARNACLES



Life Cycle of Barnacle

BARNACLES LIFE STAGES

Cyprid

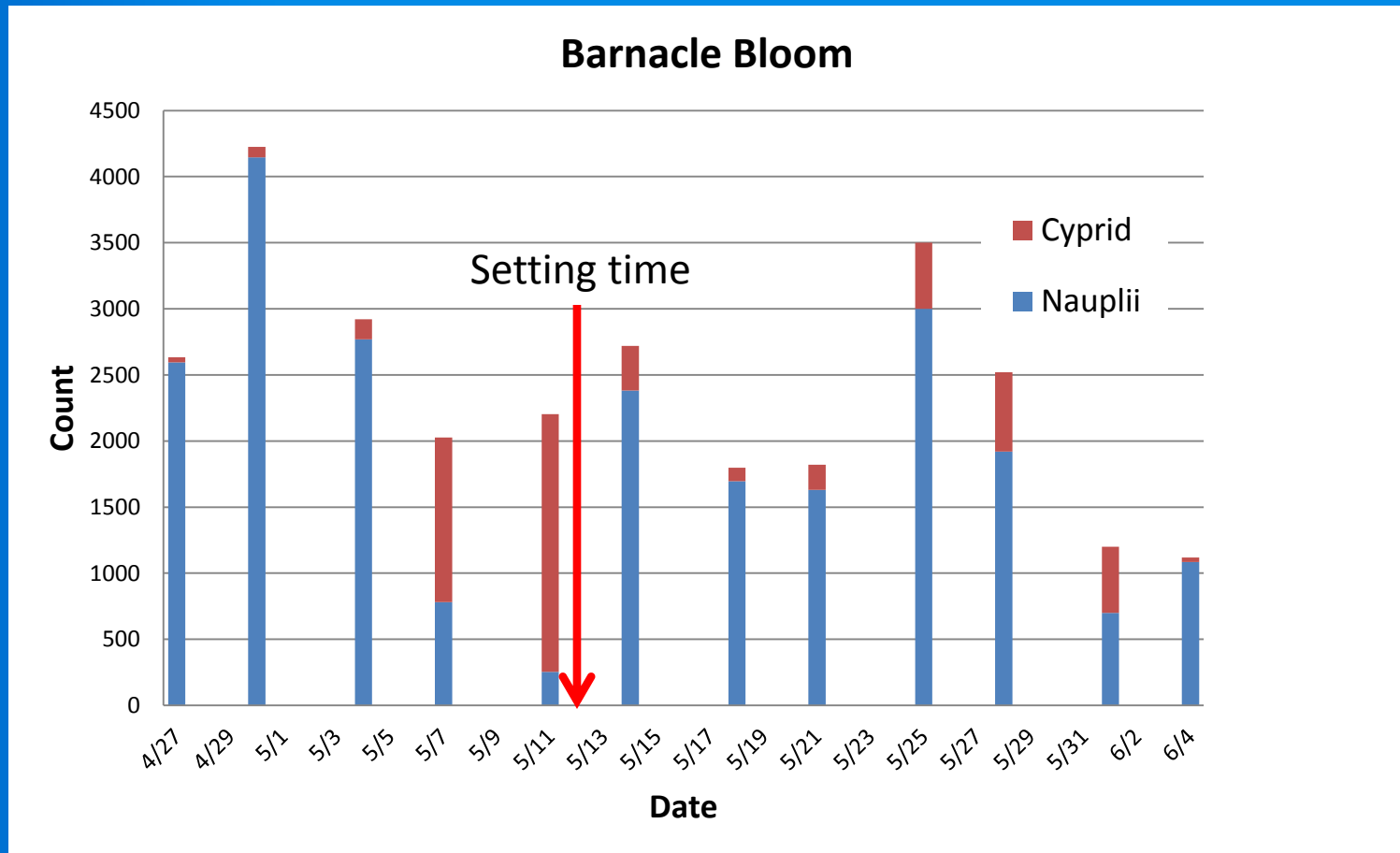


Nauplius

Adult

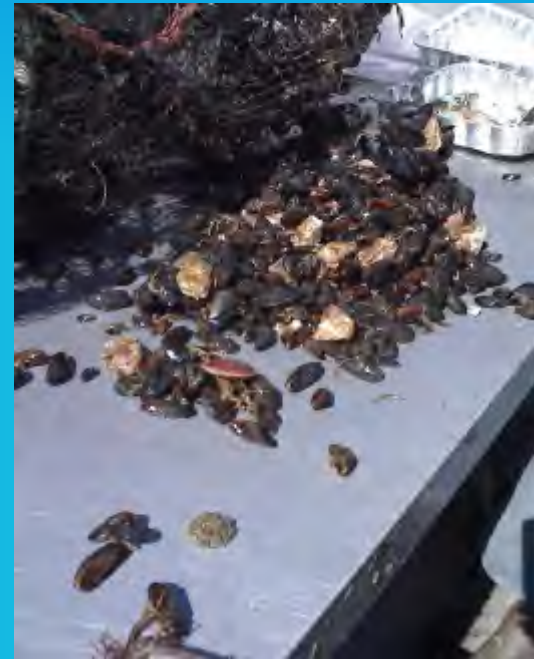


PREDICTING BARNACLE FOULING



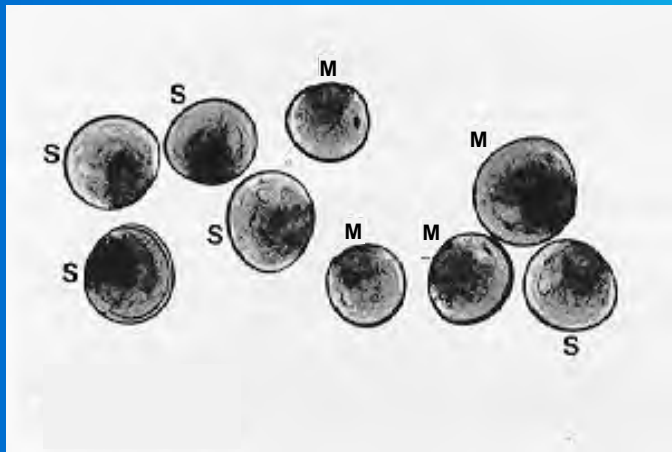
BLUE MUSSEL

- Fast growing
- Dense sets on gear
- Voracious feeder
- Reduce circulation
- Attract otters that damage gear



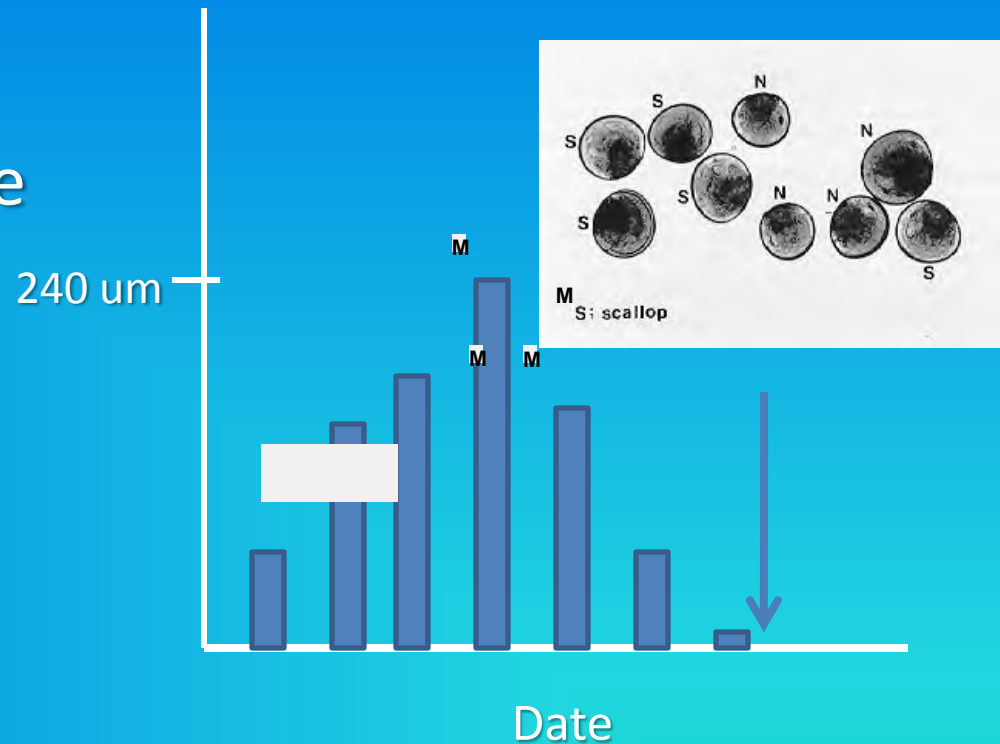
COLLECTING MUSSEL SEED

- Plankton tows twice each week to capture floating scallop larva
 - Identify mussel larva
 - Measure larva
 - Deploy gear when larva are 220 μm in length



BLUE MUSSELS

- Separate mussels from plankton sample
- Place under microscope
- Measure the size
- Determine 240 μm threshold as the setting time
- Clean gear with a few weeks



FOULING CONTROL

- Prevention
 - Larvae monitoring
 - Sinking gear below setting depth of fouler
 - Determine time to clean gear effectively
- Air dry on warm dry day
 - 6-24 hours
 - Sponges, tunicates, very small mussels
- Washing
 - Best if done during an active tidal flow
- Freshwater soak
 - Tunicates
- Time of first cleaning
 - Do not remove seaweed before first barnacle set
- Don't wait too long