Activity #3 - Animals Between the Sand Grains - Meiofauna

Objective:

Students will observe the minute animals that live between sand grains.

Materials:

- plastic tray
- turkey baster or large pipette
- microscope
- petri dish

Procedures:

1) Collect meiofauna samples from the surface of the sand at low tide in low wave action areas. Scrape a layer about 1 cm deep into a plastic tray. Add some seawater from the same location, enough to just barely cover the sand sample and form a pool on top about 1/2-inch deep at the most.
2) Allow the specimen trays to stand at room temperature, undisturbed, for approximately a week, or until there is just a small amount of visible seawater left on the surface of the sand. As the sand sits for a week the environment beneath the sand starts to suffer from oxygen depletion and the meiofauna will crawl up out of the sand to reach the upper, oxygenated water above the sand.
3) Technically, the meiofauna consists of small benthic metazoans that pass through a 0.500 mm sieve and are retained on a 0.045 mm sieve. Thus, the next step is to gently remove the seawater (pour it without also pouring the sand, or use a large pipette such as a turkey baster) from the surface of the sand and strain it through a fine mesh material, such as a piece of an old nylon stocking.
8) Rinse the collected organisms from the mesh and observe the small animals in the petri dish under the microscope.

Discussion:

A· Sketch the organisms, paying attention to appendages
B· How many different animals were found?
C· Why were no plants found in this environment?
D· Can the phylum be identified for each animal? List the phyla.
E· Which phyla were the majority?
F· How do you think the meiofauna animals feed, based on their appendages?

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REFERENCE LIST OF SPECIES AND THEIR PHYLA

Meiofauna of Moss Landing Beach, Moss Landing, CA. From Narine 1976.
source: Monterey Bay National Marine Sanctuary, http://bonita.mbnms.nos.noaa.gov

Phyla or Group

Gastrotrichicha
Xenotrichula, Turbaanella, Pleurodasys, Pseudostomella, Tetranchyroderma

Crustacea/Ostracoda (6 unknown species)

Crustacea/Copepoda/Harpacticoidea
Arenostella kaiseri, Arenopontia dillonbechia, Ameria parvuloides, Apodopsyllus vermiculiformes, unident. Paramesochiridae

Nematoda
Enoploidea, Desmodoridea, Monohyssterioidea, Chromadoroidea, Draconematoidea (Epsilonema)

Turbellaria
Acoela, Rhabdocoela (Typhloplanoida & Kalyptorhynchia), Alleocoela

Nemertina
Ototyphlonemertes, Procephalotrix

Archiannelida
Saccocirrus gabriellae, Protodriloides chaetifer

Polychaeta
Pisione remota, Hesionides arenaria, Microphthalmus, Petitia amphophthalama, Hesioneura, Glycera, Stygocapitella subterranea

Oligochaeta
Tubificidae, Enchytraeidae (Marionina)

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Images from Humboldt County, California. courtesy of Matthew Hooge, University of Maine
http://hooge.developmentalbiology.com/meiofauna/

NEMATODE: ROUNDWORM

POLYCHAETE: *Eusyllis* sp. SEGMENTED WORM

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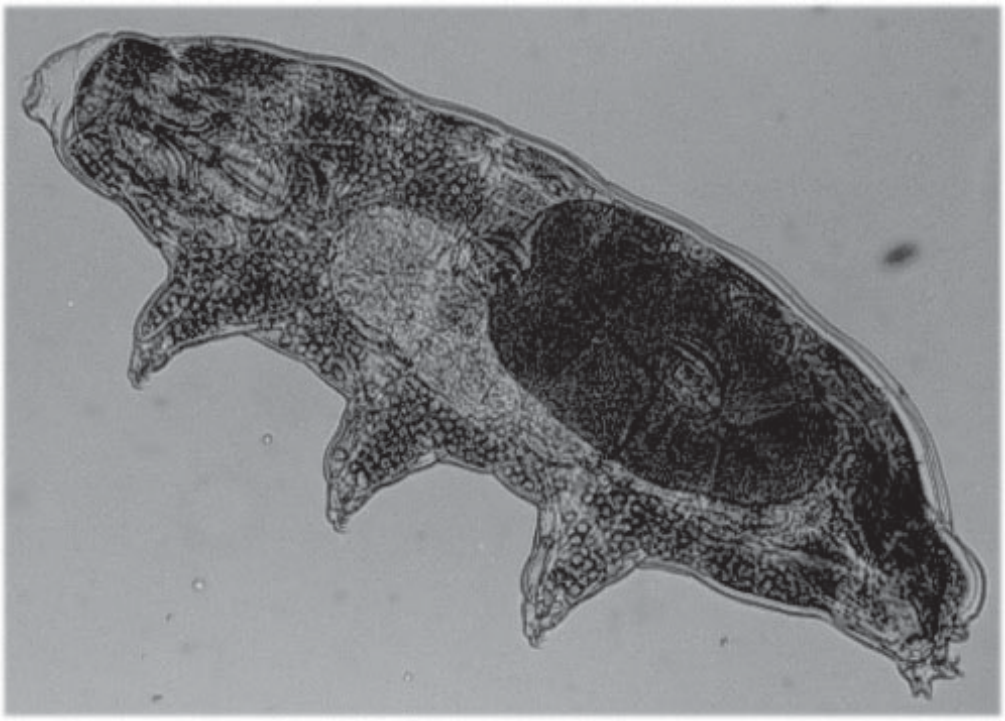
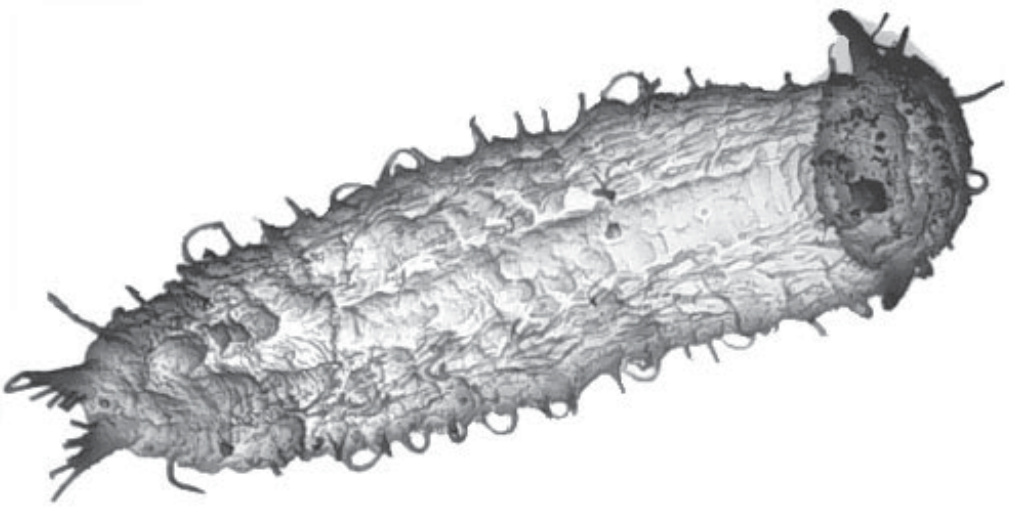


TARDIGRADE: WATER BEAR



GASTROTRICH: *Turbanella mustella*

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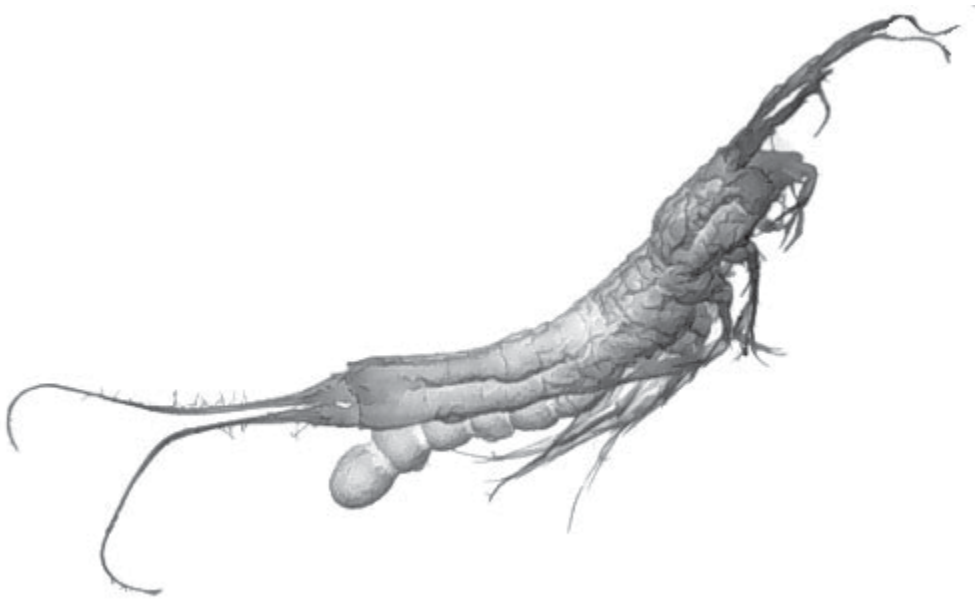
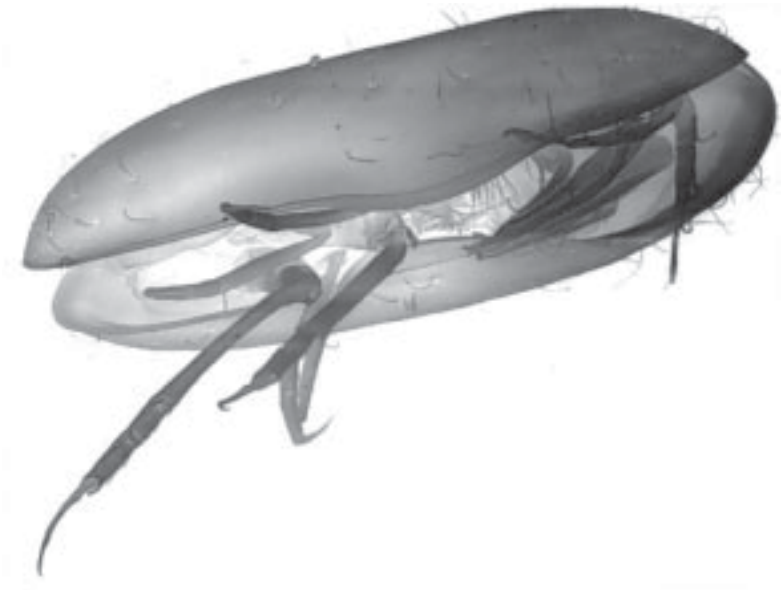


CRUSTACEA: HARPACTICOID COPEPOD



CRUSTACEA: OSTRACOD