Order Spionida

3. Form tubes in sand or mud, often with flattened bodies and bushy cirri
1. Representative genera
   a. Polydora
   b. Primary food source of grey whales.
Order Chaetopterida

4. Bizarre tube dwellers with specialized parapodia and distinct body regions.

1. *Chaetopterus*, *Mesochaetopterus* - tube worms
Order Cerratulida

e. Reduced parapodia, lots of cirri, segments, with tapered terminal segments; often in black sediments

1. *Cirratulus* -
Order Opheliida

- Few segments, grooved ventral surface
- 1. *Ophelia* - white and dead looking
- 2. *Armandia* - sea grub
Order Ophieliida
Armandia

Order Capitellida

g. Capitellida - look like earthworms, often with posterior "gills"
1. Arenicola
Order Terebellida

1. Body divided into thorax and abdomen.
2. Lots of long tentacles and gills; uncini on anterior portion of thorax

1. Thelepus
Thelepus crispus

Order Sabellida

Featherduster worms; crown of brachioles; form tubes in sand or of CaCO₃
Order Sabellida

1. Sabellids - soft tubes
   a. Bispria - orange and blue banded crown; impressive in Gulf of Calif.; often in coral heads
   b. Megalomma - purple crowns
Order Sabellida

2. Serpulids - hard tubes
   a. Spirobranchus
Reproduction

1. Asexual
   a. Occasionally by fragmentation.

2. Sexual
   a. Fertilization
      1. Usually occurs externally.
      2. Either by rupture of adult body walls and mixing of gametes or by association of sexes.
Sexual Reproduction
1. *Typosyllus* - females attract males with pheromones.
   a. Males circle females and release gametes.

Reproduction
2. *Ophryotrocha* - simultaneous hermaphrodites.
   a. Two individuals engage in pseudocopulation.
1. External fertilization, but with mutual release of ova and sperm
2. This is "egg trading"
   a. Occurs in other simultaneous hermaphrodites.

Class Oligochaeta

1. General Characteristics:
   a. Internal, external segmentation
   b. No parapodia, reduced setae.
      1. located on ventrolateral surface.
      2. variable in length
      3. produced in sacs in body wall; can regenerate.
1. Setae are moveable by protractor, retractor muscles.

Class Oligochaeta

3. Body wall
   a. With circular, longitudinal muscle.
      1. Longitudinal muscles are reduced in aquatic forms.
   b. Cuticle external, sometimes with ciliation or gills.
Class Oligochaeta

c. locomotion by progressive peristalsis
4. well developed coelom
5. well-differentiated digestive tract
a. esophagus, crop, gizzard, intestine
b. various enzymes in specialized locations
c. typhlosole for increased surface area
5. Setae are used to grab onto the substrate. Are used in combination with segmental contraction.
Class Oligochaeta

d. associated structures
  1. calciferous glands
     a. secrete CaCO3 crystals
     b. regulate blood pH and Ca levels
  2. Chlorogogen - like a liver
     a. fat storage, glycogen synthesis
     b. urea formation from ammonium

Reproduction:
Anatomy?
Class Oligochaeta

2. Gamete maturation
   a. Testes and ovaries are separate from maturation sacs
   1. These are modifications of septal walls
   2. Gametes collected by funnels after maturation

Class Oligochaeta

3. Note that the amount of material devoted to sperm production is large.
   a. Sex allocation theory suggests that when sperm are cheap; more energy can be devoted to eggs
   b. This doesn't seem to be the case here. – Why?
Seminal Vesicles
1. Often contain sporozoan parasites (*Monocystis*)
2. These feed on sperm – could deplete them.
3. Are not transmitted like STDs;

Mating
a. Note position of genital pores
b. Also note that clitellum is equipped with mucous glands
d. Allignment of individuals

Sperm Transfer
b. Sperm transferred to spermathecae - tiny sperm sac
1. Spermathecae are common in many animals.
2. Mutual insemination - again, like egg trading
3. Mating can take a long time
Lots of Sperm!
Possible explanations?
1. Perhaps more mating opportunities exist for males than appears possible with simultaneous gamete transfer.

Coccoons
  c. After sperm transfer animals form cocoons - mucous from clitellum
  1. Deposited in soil.

Class Oligochaeta
  4. Development is highly modified - no trochophore
Class Oligochaeta

Systematics
1. three orders
   a. Lumbriculida - moderate sized, freshwater forms from USSR

Phylum Annelida

b. Moniligastrida
1. appear to be ancestral; terrestrial
2. can get very large
3. often found in Australia

Phylum Annelida

c. Haplotaxida
1. most familiar oligochaetes for North America
2. include Tubifex and Lumbricus