Synapomorphies of the Aplacophora

(Chaetodermomorpha + Neomeniomorpha)

(Defining node f):

(56) vermiform body;
(57) foot reduced;
(58) Posterior mantle cavity greatly reduced.

(59) Gonads empty into pericardial cavity, exiting to mantle cavity via U-shaped gametoducts
(60) Without nephridia.

Synapomorphies of the Chaetodermomorpha

(7) Calcareous spicules of the body wall form imbricating scales.
(8) Complete loss of foot.
Class Aplacophora

- 1. Weird group, without shell,
- 1. also posterior gills
- 2. gonads, nervous system, like chitons
- 3. pedal groove

Odontophore-Radula Apparatus
Class Aplacophora

4. Characters in common with other molluscs
   a. trochophore larva
   b. radula
   c. often burrowing, occasionally clinging to vegetation
   d. about 250 spp.

Class Polyplacophora

1. Means "many shells"
2. Also known as chitons
Class Polyplacophora

b. Usually attached to rocks, grazing on algae
c. Exploit a high impact habitat -

d. Other interesting notes
1. pallial groove as isopod habitat
2. Competition
3. Asthetes
4. Nerve net (amphineura)
Class Polyplacophora

d. Other interesting notes
1. Pallial groove as isopod habitat
2. Competition
3. Asthetes
4. Nerve net (amphineura)
Synapomorphies of the Class Polyplacophora

(16) Unique shell with 7–8 plates (and with 7–8 shell gland regions), articulamentum layer, and aesthetes.

(17) Multiple gills (perhaps not homologous to the ctenidia of other molluscs).

(18) Expanded and highly cuticularized mantle girdle that “fuses” with shell plates.

Synapomorphies of the Sister-Group to the Polyplacophora

Defining node c:

(19) Preoral tentacles.
(20) Loss of calcareous spines in body wall.

(21) Presence of a single, well defined shell gland region and larval shell (protoconch).

(22) Shell univalve, of a single piece (note: the bivalve shell is taken to be derived from the univalve condition).

Synapomorphies of the Sister-Group to the Polyplacophora

Defining node c:

(23) Shell of the three-layered design (periostracum, prismatic layer, nacreous layer);

(24) Mantle margin of three parallel folds, each specialized for specific functions.

(25) Crystalline style.

(26) Statocysts.
Synapomorphies of the Sister-Group to the Polypladophora

Defining node c:

(23) Shell of the three-layered design (periostracum, prismatic layer, nacreous layer);

(24) Mantle margin of three parallel folds, each specialized for specific functions.

(25) Crystalline style.

(26) Statocysts.
Class Monoplacophora

1. General Characteristics
   a. Once thought extinct since Devonian (450 myr)
   b. Rediscovered in 3600 m Pacific trench in 1952.

c. Unusual because they appear to represent the "pre-torsion" gastropod, or possibly single shelled chiton.
d. Possess single shell, like a bivalve
e. 8 pairs of retractor muscles
f. 5-6 pairs of ctenidia in shallow mantle cavity
g. 6-7 pairs of metanephridia
Class Monoplacophora

h. Paired heart atria
i. small head
1. radula
2. no eyes,
j. dioecious, external fertilization

Class Monoplacophora

2. Other notes
a. Segmentation suggests common ancestor with annelids?
b. Mostly small (1-4 cm), 11 spp. 3 genera.
Synapomorphies of the Class Monoplacophora

(27) 3–6 pairs ctenidia.
(28) 3–7 pairs nephridia.
(29) 8 pairs pedal retractor muscles.
(30) 2 pairs gonads.
(31) 2 pairs heart atria.

Synapomorphies of the Gastropod–Cephalopod Line

Defining node d:
(32) Viscera concentrated dorsally.
(33) Shell coiling.
(34) Well developed, clearly demarcated head.
(35) Mantle cavity restricted to anal region.
Synapomorphies of the Class Gastropoda

(36) Torsion and its associated anatomical conditions.
(37) Further concentration of internal organs as visceral hump.