

LESSER-KNOWN INVERTEBRATES: MESOZOA AND PLACOZOA

THREE MULTICELLULAR PHYLA OF UNCERTAIN AFFINITIES

The Mesozoa and Placozoa are small groups of animals that most of us will never encounter outside of textbook descriptions and illustrations. Even though these phyla are of uncertain evolutionary affinities, some zoologists consider the placozoan body form to be similar to that present in (at least one group of) the first animals.

THE MESOZOAN PHYLA: ORTHONECTIDA AND RHOMBOZOA

The Mesozoa (mez"o-zo'ah) (Gr. *mesos*, middle + *zoin*, animal) include two phyla, Orthonectida and Rhombozoa (figure 1). These two phyla have approximately one hundred species. As larvae and/or adults, mesozoans are parasites of other marine invertebrates (brittle stars, bivalved molluscs, and cephalopod molluscs). They consist of 20 to 30 cells arranged in two layers: an inner layer of reproductive cells and an outer layer of ciliated cells. Mesozoans are dioecious (sexes are separate) with complex life histories involving both sexual and asexual cycles.

PHYLUM PLACOZOA

Members of the phylum Placozoa (plak"o-zo'ah) (Gr. *plak*, flattened + *zoin*, animal) are small (2 to 5 mm) marine organisms. The phylum's one species, *Tricoplax adhaerens*, was first described in the 1800s, largely forgotten, and then rediscovered in the 1960s on algae from the Red Sea. *Tricoplax* consists of two epithelial layers with fiber cells (possibly locomotor in function) between them. The upper epithelium consists of flagellated cells and transparent spheres of fatty material. The lower epithelium consists of flagellated cylinder cells and gland cells of nutritive function (figure 2). When *Tricoplax* feeds, it forms a temporary, ventral digestive cavity by raising its body off the substrate and secreting enzymes into the cavity. The similarity of this animal to a hypothetical ancestor proposed in the syncytial hypothesis of animal origins causes some zoologists to wonder if this group could be closely related to the first animals.



FIGURE 1
The Mesozoans.
(a) *Rhopalura* (0.5 mm),
an orthonectid parasite of
clams.
(b) *Pseudicyema* (1.0 mm),
a rhombozoan parasite of
cuttlefish.
Miller/Harley: *Zoology*, 5th ed.
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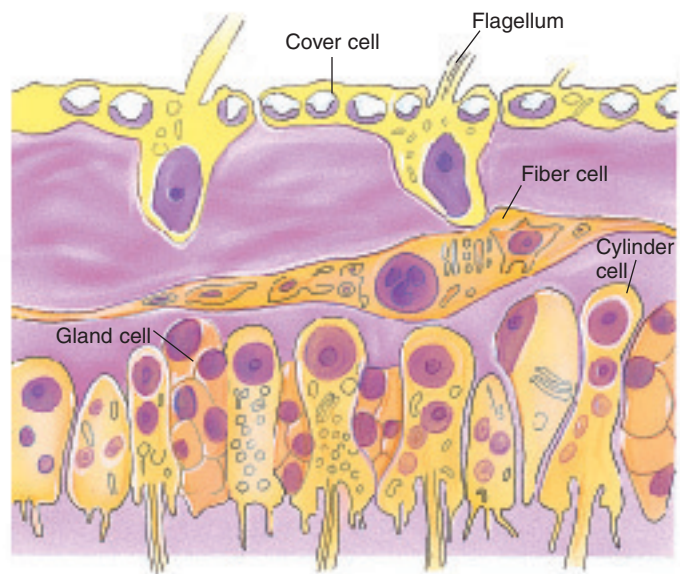


FIGURE 2 Phylum Placozoa. *Tricoplax adhaerens* consists of two epithelial layers with fiber cells sandwiched between. From K.G. Grell, *Zeitung für Morphologie der Tiere*, 73:297–314, 1972. Copyright Springer-Verlag, Heidelberg. Used by permission.