

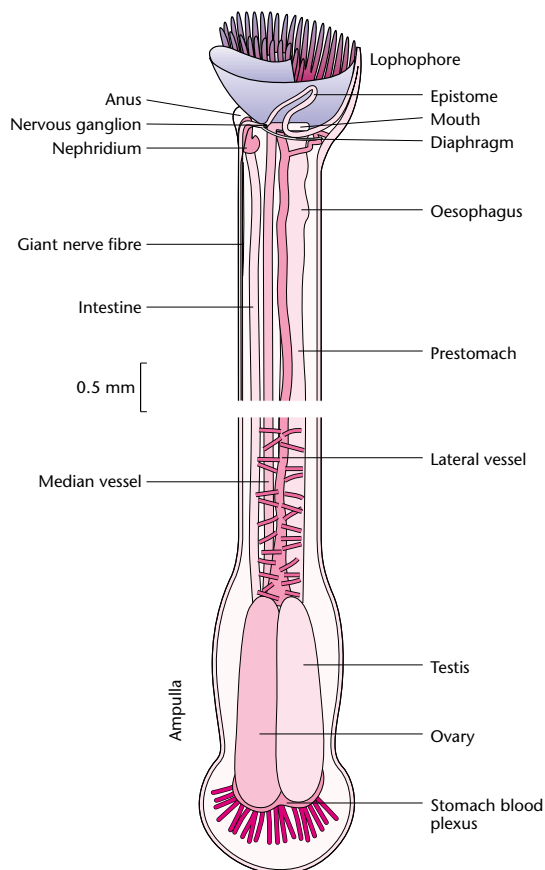
# Phoronida

Christian C Emig, *Centre d'Océanologie de Marseille CNRS, Marseille, France*

The Phoronida, divided into two genera and 10 species, is a small marine group, which belongs to the phylum Lophophorata.

## Basic Design

The Phoronida is an exclusively marine group with a sessile vermiform body enclosed in a tube (Figure 1). The body is composed of three distinct parts (prosoma, mesosome and metasoma), each containing its own coelomic cavity. The prosoma forms the epistome, a fold overhanging the mouth dorsally. The mesosome bears the lophophore, with the mouth lying between its two rows of tentacles. The lophophore is a terminal, bilaterally symmetrical, tentacle crown, each tentacle having complex arrays of cilia for filter-feeding. Lophophore shape is a fairly constant feature within each species, and there is an increasing



**Figure 1** Diagram of an adult *Phoronis* showing the main anatomical features.

## Introductory article

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complexity of the lophophore from an oval to a helicoidal, through a horseshoe and spiral shape. This is related to an increase in the number of tentacles, which is proportional to the general body size.

The metasoma (or trunk) is slender and cylindrical, with a bulb-like posterior end (or ampulla) that anchors the body in the rear end of the tube. It is separated from the rest of the body by the diaphragm, a thick transverse septum located behind the lophophore.

The digestive tract is U-shaped, bringing the anus close to the mouth. The descending branch is divided into a short oesophagus, followed by a long prestomach, then a stomach surrounded by a blood plexus. A muscular pylorus separates the stomach and intestine, the latter being a long, slender ascending tube, which ends in the anus on the anal papilla.

Phoronids have a closed circulatory system, containing red corpuscles with haemoglobin. In the trunk two longitudinal vessels communicate through the stomach blood plexus and the lophophoral vessel. The lophophoral vessel gives rise to a capillary in each tentacle where respiratory gas exchange takes place. The digestive products are taken up from the stomach and intestine into the blood plexus.

Two metanephridia, located on either side of the intestine, open into the trunk coelom by one or two funnels, and discharge to the exterior via a nephridiopore, located on the anal papilla. The morphological characteristics of the nephridia are of prime taxonomic importance in identifying a species.

The nervous system lies within the epithelial tissue. The main nerve centre or ganglion is located in the epistome and gives off a nerve ring at the level of the diaphragm. One or two giant nerves issue from the ganglion and extend along the body wall down to the ampulla.

The trunk wall includes strong longitudinal muscle bundles, arranged in four sections separated by the longitudinal mesenteries.

Phoronids are hermaphroditic or dioecious but can also reproduce asexually. The gonads are applied to the longitudinal lateral blood vessel. Gametes are released through the nephridia, which serve as gonoducts. Fertilization is internal and cross-fertilization takes place in hermaphrodite species. Egg cleavage is total, equal and typically radial. Three types of developmental patterns occur: species with small eggs which are shed directly into

