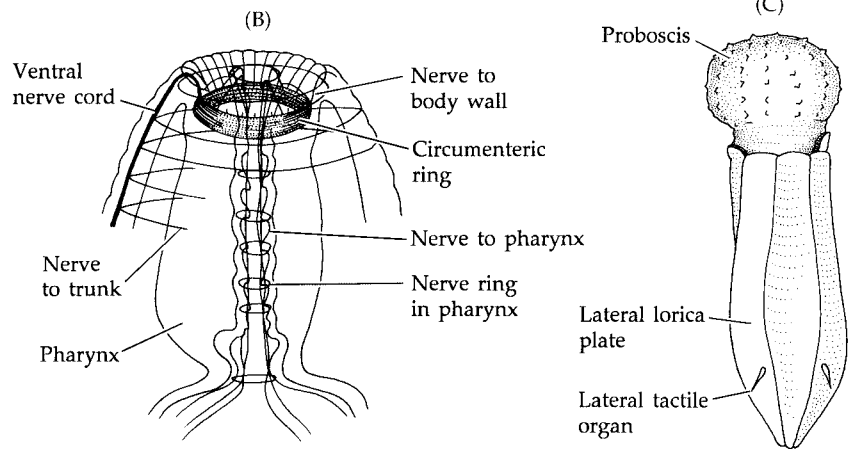


**Figure 12.28** (A) *Priapulid* (longitudinal section). (B) The nervous system in the anterior end of *Halicryptus*. (C) The loricate larva of *Priapulid caudatus*.



pendage (absent from *Halicryptus spinulosus*) either a grape-like cluster of fluid-filled sacs (called vesiculae) or a muscular extension with cuticular hooks. (e.g., *Acanthopriapulid*, *Halicryptus*, *Priapulopsis*, and *Priapulid*)

**FAMILY TUBILUCHIDAE:** (Figure 12.27C). Small (less than 2 mm long); abdomen not annulated; caudal appendage vermiform and muscular. Tubiluchids live in sediments of shallow tropical waters; four species, two genera (*Tubiluchus* and *Meiopriapulid*).

**FAMILY MACCABEIDAE (= CHAETOSTEPHANIDAE):** (Figure 12.27D). Small (less than 3 mm long); meiofaunal; abdomen with rings of tubercles and posterior longitudinal ridges with hooks; no caudal appendage; posterior end of abdomen extensible and mobile, used for burrowing (posterior end first). Maccabeids are found in the Mediterranean Sea and Indian Ocean; monogeneric, with only two described species (*Maccabeus tentaculatus* and *M. cirratus*).

**Body Wall, Support, and Locomotion**

The priapulid body is covered by a thin, flexible cuticle that forms a variety of spines, warts, and tubercles (Figure 12.27). Large hooked spines are often present around the mouth and on the introvert. These spines may be homologous to those of kinorhynchs and loriferans, but this is not yet certain. In all three groups, the spines function as sensory structures and assist in locomotion. Priapulans move through sediments by means of the introvert and peristaltic body muscle action. The cuticle may contain some chitin and is periodically shed as the animal grows. Beneath the cuticle lies

an anciliated epidermis of thin, elongate cells with large fluid-filled intercellular spaces. Beneath the epidermis are well developed layers of circular and longitudinal muscles. There are also complex muscle layers and bands associated with the pharynx, and a set of introvert (proboscis) retractor muscles (Figure 12.28A).

There is a lining to the spacious body cavity, but its origin and exact nature are unknown. Some authors (e.g., Shapeero 1961) hold that this lining is a cellular peritoneum and that the body cavity is a true coelom, although more recent work suggests that the lining is a simple noncellular membrane secreted by surface cells on the retractor muscles, and that the body cavity is a blastocoelom. In any case, this lining covers not only the inner surface of the body wall but the internal organs as well, and forms mesentery-like extensions. Storch et al. (1989) report that, in contrast to other priapulans, *Meiopriapulid fijiensis* does possess a ring of small compartments in the introvert that are lined by a distinct epithelium (i.e., these spaces may be truly coelomic in nature). The fluid of the body cavity contains motile phagocytic amebocytes and free erythrocytes with hemerythrin.

Maintenance of body form and support are provided by the hydrostatic skeleton of the body cavity. The contraction of circular muscles around this cavity also facilitates protrusion of the introvert by increasing the internal pressure. Priapulans that move through the substratum do so largely by peristaltic burrowing, probably using the various hooks and other cuticular extensions to hold one part of the body in place while the rest is pushed or pulled along. *Maccabeus* is thought to use its ring of posterior cuticular spines for anchorage within its burrow (Figure 12.27D).

**Feeding and Digestion**

The majority of priapulans (i.e., members of the family