REEF AND SHORE FAUNA OF HAWAII

Section 2: Platyhelminthes through Phoronida
and
Section 3: Sipuncula through Annelida

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Chapter V

Phylum BRACHIOPODA

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BRACHIOPODS (lamp shells) are enclosed in shells (valves) and may be mistaken at first for clams or other bivalve mollusks. However, the shells of brachiopods are dorsal and ventral in position instead of lateral as in mollusks. Most brachiopods are attached to the substrate by a cordlike stalk, the pedicle, opening through the ventral valve in the Articulata and between them in the Inarticulata. A few species are attached directly to the substrate by the surface of the ventral valve. The lophophore, a specialized structure consisting of 2 thin, coiled plates bearing ciliated tentacles, surrounds the mouth but not the anus (the latter absent in the Articulata). The lophophore mainly functions in feeding, respiration, and protection. Brachiopods are an entirely marine group found in shallow water as well as at great depths. Far more species are recorded from earlier geological periods than occur at the present time.

The brachiopods are divided into 2 classes[1]: the Articulata, in which the valves are hinged by interlocking teeth and sockets, and the Inarticulata, in which the valves are held together by muscles only. In Hawaiian shallow waters only 1 species from each class is known with certainty, although 5 others are recorded from deeper waters (Dall 1895, 1921).

Class INARTICULATA

Lingula reevei Davidson, 1880

The thin, smooth, oblong-ovate shells (dorsal and ventral valves) attain 4 cm in length and the slim whitish pedicle is from 5 cm long when contracted to more than 20 cm when extended. The valves are broadest near the posterior third and have parallel lateral edges (Fig. 2.V.1). Posteriorly, the ventral beak slightly overlaps the dorsal. The valves have a conspicuous blue-greenish or emerald color, with reddish brown and black in varying amounts marginally. The edges are surrounded by light-colored setae of various lengths (Plate 2.V.1a) (Emig 1982).

In Hawaii the animal lives in a vertical burrow in sand at depths from 30 cm

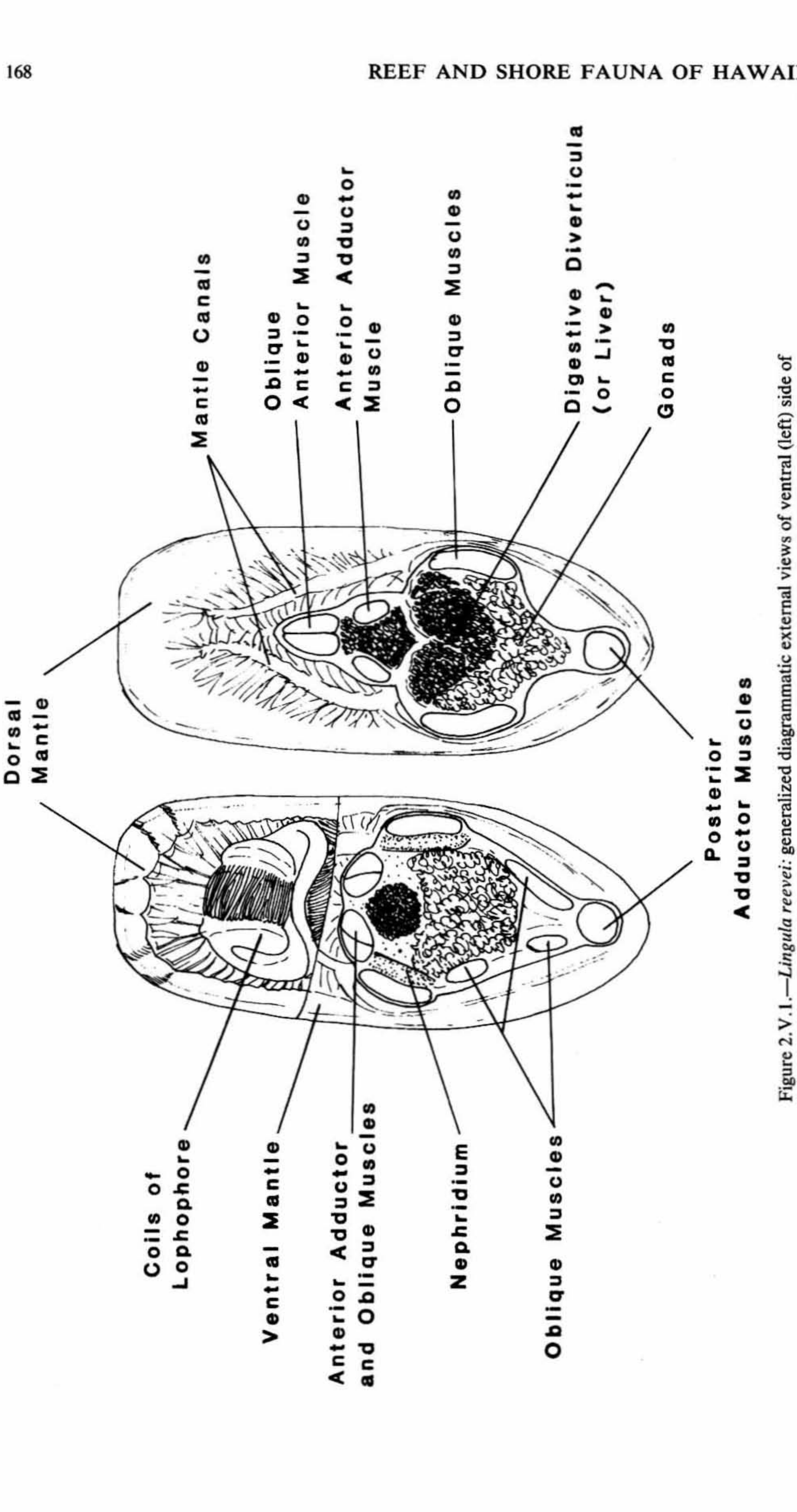

Figure 2.V.1.—*Lingula reevei:* generalized diagrammatic external views of ventral (left) side of body (with anterior part of mantle cut away to show lophophore) and dorsal (right) side of body.

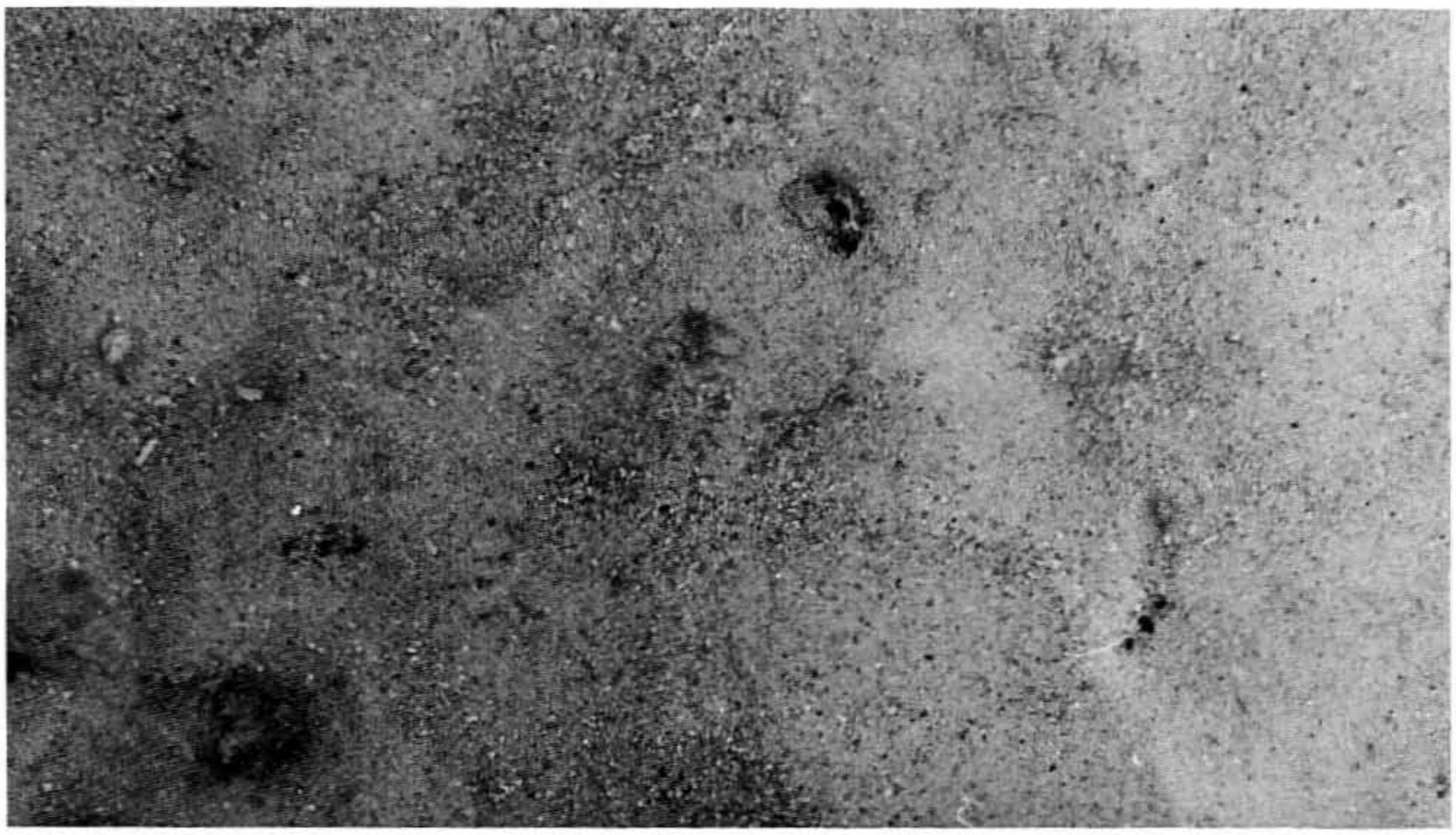

Figure 2.V.2.—*Lingula reevei:* several characteristic 3-hole burrow openings in sand maintained by setae for water currents.

to 5 m. A 3–hole siphonal opening formed by the valve setae is evident at the sand surface (Fig. 2.V.2). This opening is reduced to a slit when the animal retracts. In Hawaiian waters, *L. reevei* is recorded only from Kaneohe Bay, Oahu, where it has been found most abundantly in the southeastern part of the bay in the lower intertidal and subtidal reef flats (Emig 1978, 1981, 1984). Recently Cals and Emig (1979) reported this species from Indonesian waters.

Class ARTICULATA

Frenulina sanguinolenta (Gmelin, 1817)
[syn. *Megerlia sanguinea* Chemnitz: Edmondson 1946]

This brachiopod is subcircular in outline and has inflated valves about 5 mm in diameter with an opening in the ventral valve for the pedicle (Plates 2.V.1b,c). The shell is beautifully colored with irregular, radiating blotches of red. An extensive description was given by Hatai (1940). Specimens have been collected from shallow depths in Kaneohe Bay and Honolulu Harbor and along the leeward coast of Oahu, where they have been found to depths of over 600 m. The valves are occasionally washed ashore along beaches. *Frenulina sanguinolenta* is widely distributed in the tropicaI Indo-West Pacific, including the Philippines as well as Japan.

NOTE

1. Editor's note: Emig (1977) has proposed that Brachiopoda, Ectoprocta, and Phoronida constitute separate classes in his newly established phylum Lophophorata. Adoption of this classification scheme has yet to be agreed upon by Anglo-American biologists working with these groups. The more conventional system that considers these 3 groups as separate phyla is retained in the present publication.

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