

A Redescription of the Inarticulate Brachiopod *Lingula reevii* Davidson¹

CHRISTIAN C. EMIG²

THROUGH THE COURTESY OF Dr. A. H. Banner, Hawaii Institute of Marine Biology, University of Hawaii, I received several specimens of a lingulid species from Kaneohe Bay, Oahu, Hawaii. The Hawaiian Islands are the type locality of *Lingula reevii* and its only known place of occurrence at the present time.

The species was originally described by Reeve (1841:100) as *Lingula ovalis*, but because that name is preoccupied by a fossil species, Davidson (1880) proposed a new name, *Lingula reevii*. Davidson's (1888) description of *L. reevii* is as follows: "Shell oblong oval, broadest about the middle, longer than wide, rather narrow; sides very gently curved outwardly, front rounded; posterior edge obtusely acuminate; valves moderately convex. Surface smooth, blue-green or emerald and verdigris-green, especially along the middle; peduncle thick, much longer than the length of the shell." The description is not sufficient to identify the present species, and, in accordance with the criteria proposed by Chuang (1962) and Emig (1977b), a fuller description of *L. reevii* is given below. According to many authors, size, thickness, calcification, convexity, and coloration of valves cannot be considered specific characteristics. In the following descriptions these features are recorded, but no significance is attached to them.

Specimens occur in abundance in the southeastern end of Kaneohe Bay in a sandy bottom in the lower intertidal and subtidal reef flats; more scattered individuals may be found elsewhere in the bay (A. H. Banner, personal communication).

DESCRIPTION OF *Lingula reevii*

Shell

The shell shape is oblong-ovate (Figure 1a). The shell is thin, but the viscera and the region of muscle attachment to the valves are not visible from the outside. The valves are the broadest near the posterior third; the lateral edges are parallel. The anterior edge is straight, with a slight angular projection in the middle, and its angles are rounded. The frontal edge of the ventral valve extends about 2 mm beyond the dorsal, while posteriorly the ventral beak slightly overlaps the dorsal (Figure 2).

The deltidial regions almost resemble those described by Emig (1977a, b) for *Lingula anatina* Lamarck. However, the triangle of the beak of the dorsal valve is slightly concave, and its inner edge is steep (Figure 2) rather than rounded as in other lingulid species (unpublished observations). The deltidium of the ventral valve shows a deep pedicular groove, continuous with the inner surface of the valve (Figure 2); in other lingulids the groove is more or less strongly rounded. No growth lines are apparent on the pedicular groove.

The external surface of the shell is smooth; the lines of growth and very fine longitudinal lines are faint but distinguishable. A median ridge occurs from the posterior beak to the anterior front, with a depressed area extending on each side that slopes to the lateral edges (Figures 1a, b).

The inner surface of each shell valve is smooth and strongly calcified over the visceral cavity, yet, the valves are very brittle. The median ridge is well marked on the dorsal valve only, as in most other species.

A transverse section shows a slight elliptical outline (Figure 1b). As described by Davidson (1888), *Lingula reevii* has a "beau-

¹ Manuscript received 10 June 1977.

² Station Marine d'Endoume (Laboratoire Associé au C.N.R.S. no. 41), Rue de la Batterie-des-Lions, 13007 Marseille, France.

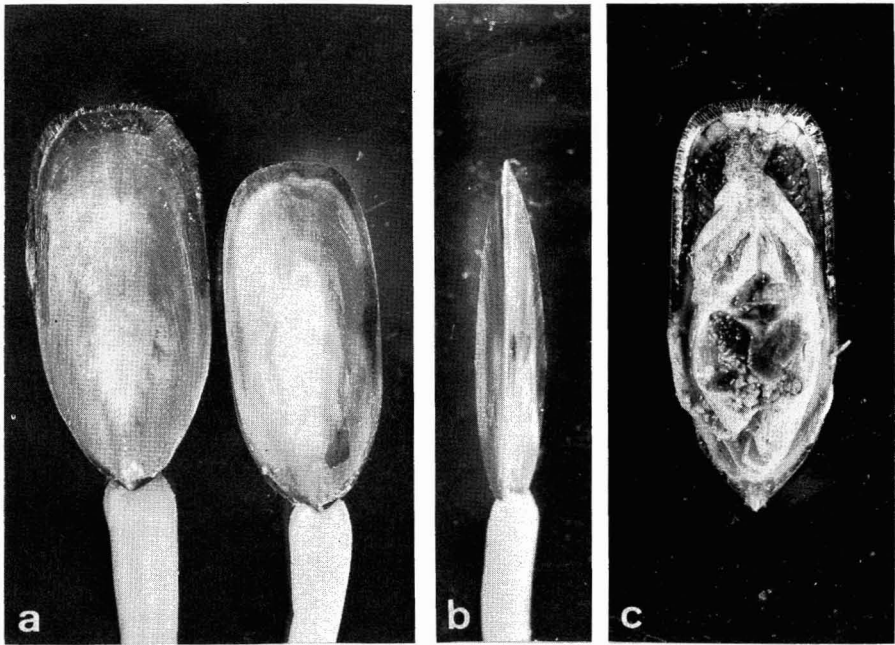


FIGURE 1. Shell of *Lingula reevii*: a, dorsal and ventral view of two specimens; b, transverse section; c, inner view of the dorsal mantle, showing the pallial pigmentation. 1 mm = 1.3 mm.

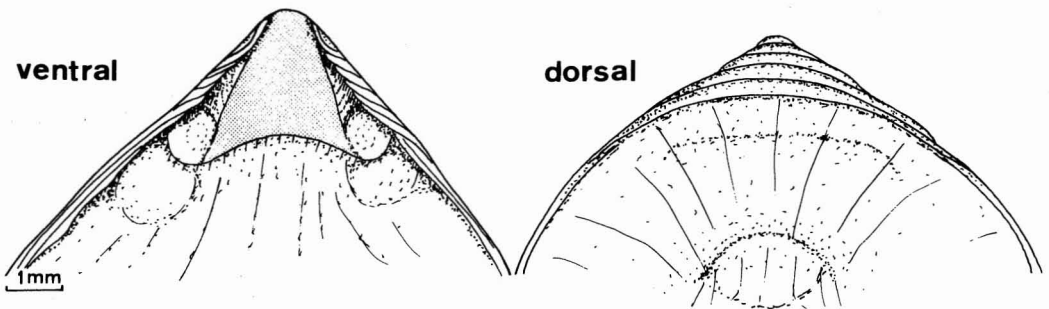


FIGURE 2. Deltidial regions (inner view) of the shell valves of *Lingula reevii*.

tiful and brilliantly coloured shell." It is blue-green, emerald, verdigris-green, red-brown, and black. The pedicle is whitish.

Other Characters

The pedicle, when contracted, is about one and a half to twice as long as the shell. The pallial pigmentation is heavy, red-brown

in color, and interspersed anteriorly with five white blobs (Figure 1c). We were unable to observe the setae arrangement at the free end, because all setae were broken.

The arrangement of the musculature (Figure 3) is distinguishable from that of the other described species.

Measurements of larval shell valves were made for five specimens only (no specimen shows protogulum) and are pooled as the

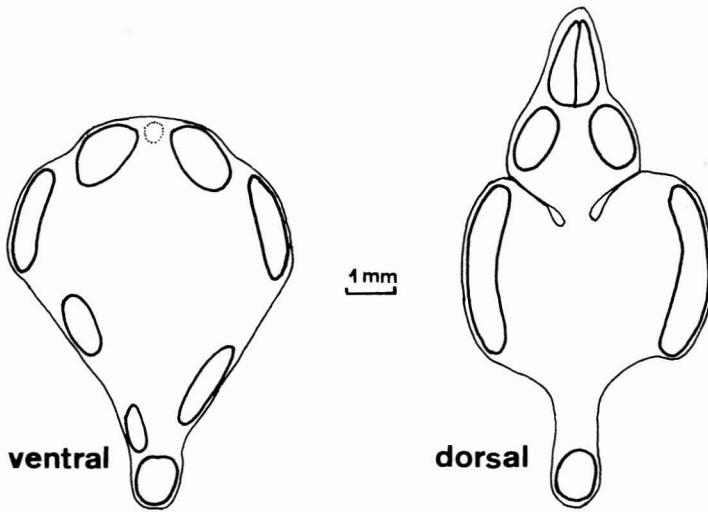


FIGURE 3. Arrangement of the musculature with line of attachment of the body wall of *Lingula reevii*.

TABLE 1
MEASUREMENTS OF THE DORSAL LARVAL SHELL VALVE
OF VARIOUS *Lingula* SPECIES

	WIDTH, <i>w</i> (μ)	LENGTH, <i>l</i> (μ)	<i>w/l</i>
<i>Lingula reevii</i>	713–775 769	651–775 731	1–1.095 1.052
<i>L. anatina</i>	493–1000 577	525–1160 687	0.723–0.988 0.840
<i>L. murphiana</i>	1000–1500 1098	1220–1460 1363	0.788–0.828 0.807
<i>L. parva</i>	945–1065 981	1080–1335 1172	0.761–0.890 0.839

NOTE: *Lingula anatina* data are from Chuang (1962) and Emig (1977a); *L. murphiana* data are from Emig (1977b); *L. parva* data are from Chuang (1961).

width/length ratio in Table 1. The results for *Lingula reevii*, compared with those of other species, are similar to those of *L. anatina*.

CONCLUSIONS

Many species of *Lingula* have been described on the basis of nonspecific characters; consequently, all lingulid species need redescription with the establishment of significant specific features that allow comparison between species. The present work on *L.*

reevii has been undertaken for this purpose. *Lingula reevii* is known only from the Hawaiian Islands. Comparison of two Indo-Pacific species, *L. reevii* and the related species *L. anatina*, with the American genus *Glottidia* could lead to new information on the paleogeographic distribution of Lingulidae.

LITERATURE CITED

- CHUANG, S. H. 1961. Description of *Lingula parva* Smith (Brachiopoda) from the coast of Tropical West Africa. *Atlantide Rep.* 6:161–168.
- . 1962. Statistical study of variations in the shell of *Lingula unguis* (L.). *Vidensk. Meddr. dansk naturh. Foren.* 124:199–215.
- DAVIDSON, T. 1880. Report on the Brachiopoda dredged by the Challenger during the years 1873–1876. *Rep. Sci. Res. Voyage Challenger, Zool.* 1(1):1–67.
- . 1888. A monograph of recent Brachiopoda. Part 3. *Trans. Linn. Soc. London* 4:183–248.
- EMIG, C. C. 1977a. *Lingula anatina* Lamarck, während der Expedition "Meteor" 26 (1972) gefunden (Brachiopoda). *Senckenbergiana biol.* 58:101–103.

_____. 1977b. *Lingula murphiana* Reeve (Brachiopoda) récoltée à Madagascar. Bull. Mus. Hist. Nat. Paris 446 (Zool. 309): 401-410.

REEVE, L. 1841. On *Lingula*. Proc. Zool. Soc. 9:97-101.