



FIGURE 3—Illustrated key of morphologic terms used in describing glycymeridids. 1, *Glycymerita veatchii* (Gabb, 1864), hypotype RBCM EH2009.011.0001, locality 1, left valve, lateral view, $\times 0.8$; 2, *Glycymerita veatchii*, hypotype LACMIP 13606, LACMIP loc. 10938, left valve-posterior; 3, *Glycymerita banosensis* (Anderson, 1958) new combination, UCMP hypotype 557059, UCMP loc. A-3366, right-valve interior, $\times 1.2$.

logic variation is the norm for members of the family. Glycymeridids have been subdivided, nevertheless, into various genera and subgenera on the basis of 1) morphologic characters (e.g., shape, strength of radial sculpture, valve inflatedness, etc.) that show considerable variation, or 2) the presence or absence of radial striae (series of very narrow radial threads that are secondarily superimposed upon the primary radial ribs and allow for attachment of the periostracum). Examples of radial striae are shown in Figures 4.8, 5.2, and 11.5. Radial striae are easily worn off and, hence, are rarely preserved. Willett (1943, p. 108) noted the great amount of individual variation (e.g., color, shape, sculpture, size and prominence of umbones, width of ligament, number of teeth, and morphological change between juveniles and mature forms) of modern species of *Glycymeris*. Powell (1992) mentioned the variability of at least one Pleistocene to Holocene species of *Glycymeris*. It is abundantly evident that a thorough neontological study of this family is much needed because its considerably variable shell characters are not very reliable for taxonomic purposes.

Subfamily GLYCYMERIDINAE Dall, 1908

Genus GLYCYMERIS sensu stricto da Costa, 1778

Type species.—*Arca glycymeris* Linnaeus, 1758, p. 695 [= *Glycymeris circularis* da Costa, 1778], by absolute tautonymy; Pleistocene to Recent. According to Nicol (1945, p. 616), the type specimens of this species were collected from the Island of Guernsey, England. This species is found today from Norway, Baltic Sea, and south to Morocco, the Mediterranean Sea, and the Canary Islands (Poppe and Goto, 1993). The LACM Collection has specimens of this species from Italy

and Yugoslavia. Newell (1969, fig. C12, 1a, 1b) illustrated the type species.

Diagnosis.—Subcircular to circular. Umbones small and obscure to lowly inflated. Shell surface commonly smoothish or with flattened to very slightly raised radial ribs indicated mostly by color change. Interspaces linear to very narrow. Radial striae cover shell. Cardinal area can be asymmetrical. Cardinal area commonly smooth. Hinge plate arched. Taxodont teeth commonly small. Periostracum well developed.

Occurrence.—Cosmopolitan, Early Cretaceous (Aptian) to Recent.

Discussion.—Newell (1969) provided a synonymy of *Glycymeris* and recognized two subgenera: *Glycymeris* s.s. and *Glycymerita*. This present report agrees with Coan et al. (in press) in recognizing no subgenera of *Glycymeris* and agrees with Beu and Maxwell (1990) in recognizing *Glycymerita* as a distinct genus.

This present report also agrees with Newell (1969) in regarding *Manaia* Finlay and Marwick, 1937 as a junior synonym of *Glycymeris*, even though Beu and Maxwell (1990) reported the Mio-Pliocene *Manaia* Finlay and Marwick (1937) to be a subgenus of *Glycymerita*. Based on the description and illustrations by Beu and Maxwell (1990, p. 275, pl. 32, figs. d, e), *Manaia manaiensis* Marwick, 1923, the type species of *Manaia*, is like *Glycymeris* in having a low umbo, weak external sculpture, and no cardinal-area ligamental grooves.

Future investigations might show that *Hanaia* Hayami, 1965 and *Pseudoveletuceta* Tashiro, 1971 are junior synonyms of *Glycymeris*.

Adegoke (1977) believed that his monotypic genus *Ewekoromeris* is a subgenus of *Glycymeris*. *Ewekoromeris*, however, is probably a limposid, based on what appears to be a small but distinct triangular ligamental pit directly beneath the beak of the holotype of *Glycymeris* (*Ewekoromeris*) *ewekoroensis* Adegoke (1977, p. 228, pl. 34, figs. 7, 8). Adegoke failed to mention this critical morphologic feature.

GLYCYMERIS PACIFICA (Anderson, 1902)

Figure 4, Table 1

Pectunculus pacificus Anderson, 1902, p. 74, pl. 7, fig. 159.

Glycymeris pacificus (Anderson). Anderson, 1958, p. 97, pl. 18, fig. 7 [=Anderson's 1902 fig. repeated].

Glycymeris pacificus Anderson. Jones et al., 1978, pl. 2, figs. 23, 24.

Diagnosis.—Shell size small, up to height 35 mm. Subcircular to nearly circular. Valves lowly inflated. Radial ribs flattish, narrow, and commonly obscured by superimposed numerous radial striae. Cardinal area small. Taxodont teeth moderately small and moderately weak.

Description.—Shell size small, up to height 35 mm and length 36.5 mm (same specimen); slightly longer than high, height/length ratio = 0.89–0.98. Subcircular to nearly circular. Equivalved and equilateral; rarely oblique. Sculpture consisting of approximately 48 low, flat ribs (approximately eight per 10 mm of distance measured parallel to length at medial part of adult valve near ventral margin); ribs observable only on weathered specimens, otherwise ribs and interspaces commonly obscured by superimposed radial striae (approximately four on each rib). Ribs narrow (approximately 0.75 mm wide on medial part of adult near ventral margin) with narrow interspaces. Ribs on sides of valves weaker, narrower, and much more closely spaced than ribs on main face of valves. Posterodorsal slope covered with narrow ribs or smooth.