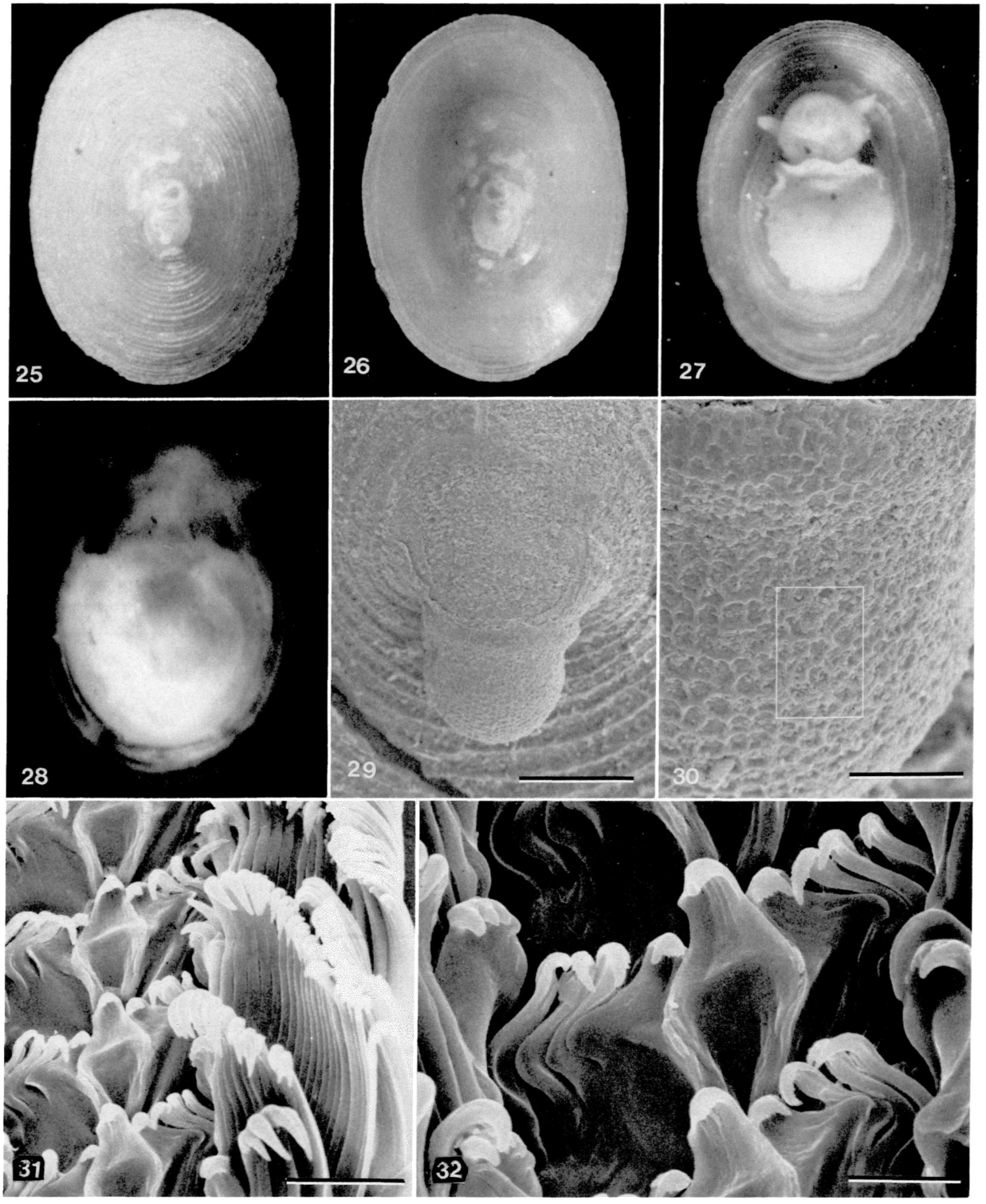

Explanation of Figures 25 to 32

Figures 25–32. *Amphiplica* (***Gordabyssia***) ***gordensis*** McLean, sp. nov. *Alvin* dive 2035, Gorda Ridge, 3305 m. Anterior at top in vertical views. Figures 25, 26. Holotype, LACM 2440. Exterior and interior views. Length 3.9 mm. Figure 27. Ventral view of holotype body attached to shell, showing paired gill leaflets near both sides of foot. Length 3.9 mm. Figure 28. Dorsal view of detached body of holotype. Length 2.1 mm. Figure 29. SEM view of protoconch (with subreticulate sculpture) and teleoconch surface (concentric sculpture). Scale bar = 100 μm. Figure 30. Enlarged view of subreticulate sculpture of protoconch. Scale bar = 25 μm. Figure 31. SEM view of radular ribbon. Scale bar = 25 μm. Figure 32. Enlarged view of central field, showing four cusps on fifth lateral tooth. Scale bar = 12 μm.

ture of fine, sharp concentric ridges, ridges not coalescing. Radial sculpture of exceedingly fine striae, detectable under high magnification, producing fine swellings on crossing concentric ridges. Shell margin sharp, easily chipped; interior transparent, showing exterior pattern of erosion; position of muscle scar faintly visible in shell interior.

Dimensions: Length 3.9 mm, width 2.8 mm, height 1.1 mm (holotype).

External anatomy (Figures 27, 28) as described for genus and subgenus.

Radula (Figures 31, 32): Rachidian tooth elongate, rising above level of all lateral teeth, having simple beaklike overhanging cusp, central part of shaft laterally expanded. First pair of laterals with strong lateral projection, overhanging cusp with long tip and serrations on inner side; second, third, and fourth laterals similarly shaped, cusps with single pointed tip and serrations on both sides. Fifth lateral tooth massive, with four pointed cusps; marginal teeth with long overhanging cusps, the second, third, four and fifth pairs having the longest cusps.

Type locality: Escanaba Trough, Gorda Ridge (41°00.4'N, 127°29.3'W), on sulfide crust, 3305 m.

Type material: 34 specimens from type locality, collected with deep-submersible *Alvin,* dive No. 2035, 5 June 1988. Holotype LACM 2440, 18 paratypes LACM 2441, 15 paratypes USNM 784767.

Additional paratypes were taken at four other *Alvin* dives at the type locality (same coordinates for each dive but different depths and dates): LACM 2441a, 5 specimens, dive 2033, 3356 m, 3 June 1988; LACM 2441b, 4 specimens, dive 2039, 3305 m, 9 June 1988; LACM 2441c, 9 specimens, dive 2040, 3271 m, 10 June 1988; LACM 2441d, 1 specimen, dive 2042, 3271 m, 12 June 1988.

Remarks: This species exhibits considerable variation in shell proportions and in the degree of erosion. A number of specimens were smaller, more elevated and with more compressed sides than the holotype. Most specimens retain the protoconch, even though the surface sculpture on the anterior slope may be eroded.

One other limpet has recently been described from the Escanaba Trough on the Gorda Ridge: *Neoleptopsis gordensis* McLean, 1990. A general report on the hydrothermal-vent fauna of the Escanaba Trough on the Gorda Ridge is given by VAN DOVER *et al.* (1990).

Etymology: The specific name derives from the type locality, the Gorda Ridge.

DISCUSSION

Until now the family Pseudococculinidae has been represented in the Eastern Pacific by a single species, *Yaquinabyssia careyi* McLean, 1988, from the Cascadia Abyssal Plain off Oregon. The four species described here bring the total to five species for the family in the Eastern Pacific. The use of a deep-submersible research submarine has provided new opportunities to locate and sample "islands" of biogenic origin, a sparse habitat in the deep sea (TURNER, 1978). Further opportunities should be taken whenever possible to sample additional wood falls on dives made by deep-submersibles. The sparsity of records indicates that our knowledge of distribution is minimal and that additional species of Pseudococculinidae may remain to be discovered.

New limits to character states in the family Pseudococculinidae are provided here by the new monotypic genus ***Punctabyssia,*** which has a unique protoconch with pits aligned in rows and radular tooth elements that show a derived state of fusion between the first and second lateral tooth elements, which in all other genera are separate elements.

The new subgenus ***Dictyabyssia*** (of *Caymanabyssia*) flags the existence of two species that lack the most prominent sculptural element of typical *Caymanabyssia.*

The new subgenus ***Gordabyssia*** (of *Amphiplica*) provides an exception to the rule that pseudococculinids are always associated with biogenic substrates. One other cocculiniform family, the Pyropeltidae, described by MCLEAN & HASZPRUNAR (1987) occurs in the hydrothermal-vent habitat.

MARSHALL (1986) defined a number of pseudococculinid genera on characters of the radula, protoconch, and external anatomy; HASZPRUNAR (1988a) added anatomical definitions, recognizing a total of 11 genera. Two subfamilies were originally defined by MARSHALL (1986), the Pseudococculininae and Caymanabyssinae, in large part on radular characters. Diagnoses were altered by HASZPRUNAR (1988a:175–176), who questioned the validity of radular characters as a basis for subfamily distinctions and based his own definitions on gill and protoconch characters. However, the utility of a two-fold subdivision is questioned here because the new species *Amphiplica* (***Gordabyssia***) ***gordensis*** has gill characters of Caymanabyssinae and protoconch characters more typical of Pseudococculininae. Accordingly, a subfamily division is not recognized here. Until more is known about how characters combine in this family it may be premature to arrive at a robust classification.

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