

FIGURES 29-32. 29, *Fissurella latimarginata*, length 68 mm; 30, *F. limbata*, length 50 mm; 31, *F. maxima*, length 62 mm; 32, *Collisella araucana*, length 35 mm.

on upper sides of rocks and beneath ledges. Playa Blanca specimens: 75.

Distribution: Iquique to Viña del Mar, Chile (LACM collections) and the Falkland Islands (Orbigny, 1841). The range of this species is no doubt much greater; the Peruvian record of Dall (1909) at Paita needs verification. Type locality: Valparaíso, Chile (Orbigny, 1841).

Remarks: This moderately large species is characterized by strong radial ribs that project at the shell margin, particularly in large specimens. Ribs are light colored, white, and tinged with gray or brown in wedge-shaped spots. Interspaces are colored brownish gray and are faintly tessellated with white. The interior is whitish, and the margin is offset with grayish blue. The central area is usually streaked with irregular brown markings, and is occasionally entirely dark brown. The largest specimen from Playa Blanca measures (in mm): length 37.8, width 34.5, height 11.6. There is considerable variation in height, because many specimens have a strongly depressed apex. In overall appearance, this species resembles the Californian *C. scabra* (Gould, 1846), differing

chiefly in having a more sharply defined, bluish internal margin.

Collisella ceciliana (Orbigny, 1841)

Figure 33

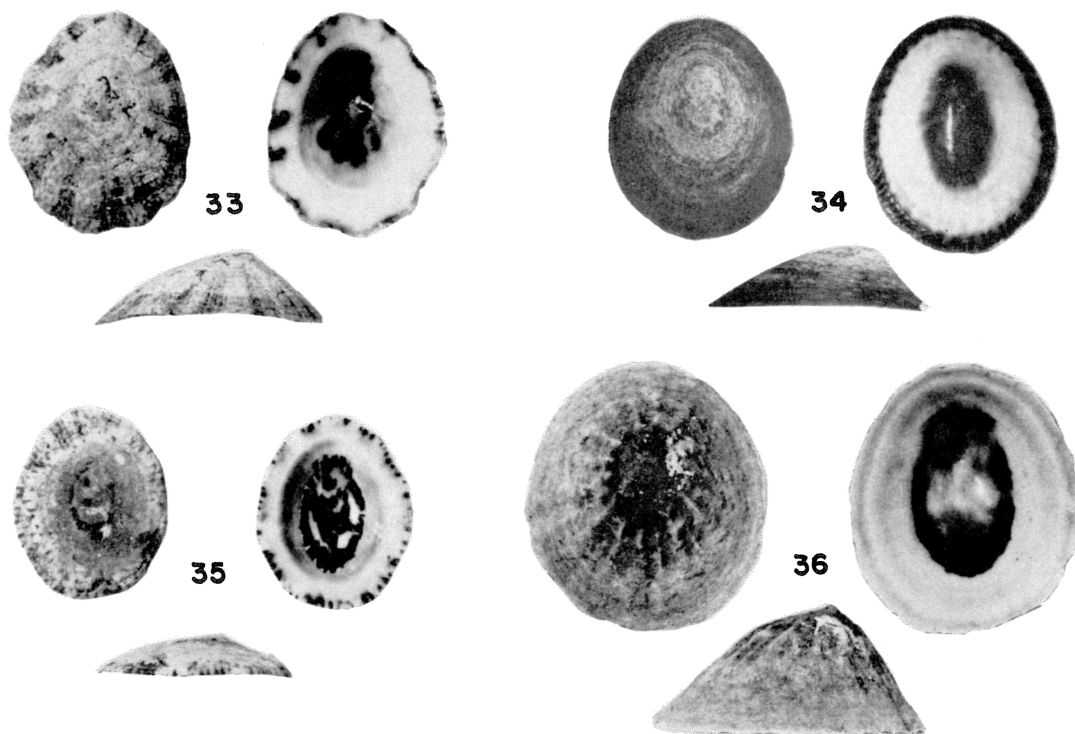
Patella ceciliana Orbigny, 1841, vol. 5:482, vol. 9, pl. 81, figs. 4-6 [as "*P. cecilliana*" in plate caption]; Hupé in Gay, 1854, vol. 8:260; Keen, 1966:2.

Acmaea ceciliana, Pilsbry, 1891, vol. 13:33-34, pl. 34, figs. 14-21 [17-19, copy of Orbigny]; Dall, 1909:237; Thiem, 1917:616, pl. 25, figs. 24-25.

Patelloida ceciliana, Carcelles and Williamson, 1951:258; Dell, 1971:199-200.

Occurrence: Middle and lower intertidal zone, on upper sides of rocks and ledges. Iquique specimens: 782.

Distribution: In addition to Iquique, LACM collections contain material from Coquimbo and Valparaíso, Chile, and Pucusana, Peru. Dall (1909) gave the range as Antofagasta to Valparaíso, and Carcelles and Williamson (1951) included the Straits of Magellan, Tierra del Fuego, southern



FIGURES 33-36. 33, *Collisella ceciliana*, length 18 mm; 34, *C. orbignyi*, length 32 mm; 35, *C. variabilis*, length 29 mm; 36, *C. zebrina*, length 60 mm.

Patagonia, and the Falkland Islands. Dell (1971) reports this species intertidally at several localities in southernmost Chile between 42°S and 55°S. Type locality: Falkland Islands (Orbigny, 1841).

Remarks: The shell is relatively small, thin, moderately elevated, and sculptured with low radial ribs that project slightly at the margin in mature shells. Color, medium to dark brown and gray; ribs lighter in color, rib interspaces with fine, lighter flecking. Interior with variable markings, usually green tinged, with the whitish external ribs visible internally; central area often with a yellowish tinge, internal margin indistinct. This species reaches only about half the size of *C. araucana* and is thinner shelled. Length 18 mm.

Collisella orbignyi (Dall, 1909)

Figure 34

"*Acmaea scutum* Eschscholtz," Orbigny, 1841, vol. 5:479, vol. 9, pl. 64, figs. 8-10 [not Eschscholtz, 1833]; Keen, 1966:3.

"*Acmaea scutum* Orbigny," Pilsbry, 1891, vol. 13:32, pl. 4, figs. 71-81.

Acmaea orbignyi Dall, 1909:179, 237.

Patelloida orbignyi, Carcelles and Williamson, 1951:259.

Occurrence: Middle and lower intertidal zone, on undersides of smooth rocks and beneath overhanging ledges. Iquique specimens: 272.

Distribution: LACM collections contain this species ranging from Paita, Peru, to Talcahuano, Chile. Dall (1909) gave the range as Salaverry, Peru, to the Magellanic region. He also recorded it from the Galápagos Islands, probably in error. Type locality (based on Orbigny's specimens examined by Keen, 1966): Cobija and Arica, Chile.

Remarks: The shell is moderately large, low, thin, and sculptured with fine radial ribbing. Color, dark greenish brown, juveniles often spotted with white. Interior bluish white, with irregular brown markings in the central area, margin dark and sharply offset. Length 35 mm.

Collisella variabilis (Sowerby, 1839)

Figure 35

Lottia variabilis Sowerby, I, 1839:147, pl. 39, fig. 5 [figs. 3, 4 may be *C. zebrina*].

Patella variabilis, Reeve, 1855, vol. 8, *Patella*, pl. 25, figs. 25a-c.

Acmaea variabilis, Pilsbry, 1891, vol. 13:34-35, pl. 34, figs. 1-8 [figs. 1, 2, copy of Reeve]; Dall,

1909:237; Thiem, 1917:617, pl. 25, figs. 9a-c; 614-615, pl. 24, figs. 4a-b [as *Acmaea coffea*].

Occurrence: The LACM collection contains one specimen from Iquique collected by the late Dr. Harvey McMillan in 1966.

Distribution: Dall (1909) gave the range as "whole Peruvian province, and the Galápagos Islands." The Galápagos record is probably in error. An additional LACM lot of 15 specimens was collected at Valparaíso, Chile. Type locality: "Chile" (Sowerby, 1839).

Remarks: The shell is low, outline irregular, sculptured with faint, broad radial ribs superimposed upon minute, closely spaced, narrow, rounded, light colored ribs, the narrow interspaces with dark penciling. Interior with a dark central area characterized by irregular dark streaking, the muscle scar and immediately adjacent area usually deeply stained with yellowish brown, the margin and remaining area bluish white, the margin not deeply offset, but reflecting the fine penciling of the outer surface. As the name suggests, this is a highly variable form, having features suggesting a number of other species. No preserved specimens are available. This species is provisionally assigned to *Collisella*, but may prove to have the branchial cordon of a *Scurria*.

Collisella zebrina (Lesson, 1830)

Figure 36

Patella zebrina Lesson, 1830:417; Hupé in Gay, 1854, vol. 8:258; Reeve, 1855, vol. 8, *Patella*, pl. 25, figs. 65a, b.

Acmaea zebrina, Orbigny, 1841, vol. 5:480-481, vol. 9, pl. 65, figs. 1-3.

Scurria zebrina, Dall, 1871:264; Pilsbry, 1891, vol. 13:62-63, pl. 1, figs. 10, 11; Dall, 1909:235; Thiem, 1917:613-614, pl. 24, figs. 2a, c, ?2b.

Patelloida zebrina, Carcelles and Williamson, 1951: 259; Dell, 1971:200-201.

Occurrence: Upper intertidal and splash zones, most common on smooth, vertical rock walls exposed to strong surf. Patillos specimens: 9, Playa Blanca specimens: 4.

Distribution: LACM collections have 7 lots of this species ranging from the Chincha Islands, Peru (13°37'S, 76°24'W), to Valparaíso, Chile. Dall (1909) gave the range as Mollendo, Peru, to the Magellanic region, and Dell (1971) reports this species from Tierra del Fuego. Type locality: Talcahuano, Chile (Lesson, 1830).

Remarks: Shell large, thick, high, with sculpture of weak to strong, radial ribs that do not project strongly at the margin. Color, greenish brown, ribs

lighter colored, rib interspaces with dark triangular markings. Interior white, the owl-shaped central area usually well defined and darkly stained. Length 60 mm.

Large eroded shells may be difficult to distinguish from *Scurria viridula*, which differs in having a less elevated apex and different color pattern. The branchial cordon of *C. zebrina* consists of a tubular structure with evenly spaced constrictions (based on the only preserved specimen available, from Valparaíso), thereby making assignment to either *Scurria* or *Collisella* somewhat arbitrary.

Scurria Gray, 1847

Scurria parasitica (Orbigny, 1841)

Figures 37 and 38

Patella parasitica Orbigny, 1841, vol. 5:481, vol. 9, pl. 81, figs. 1-3; Reeve, 1855, vol. 8, *Patella*, fig. 136 [looks like juvenile *C. zebrina*]; Keen, 1966:2.

Lottia cymbiola Gould, 1846:151-152; 1852, vol. 12:350-351, pl. 29, figs. 453, 453a-c; Johnson, 1964:65.

Patella coffea Reeve, 1855, vol. 8, *Patella*, pl. 41, figs. 139a,b.

Acmaea coffea, Pilsbry, 1891, vol. 13:35, pl. 4, figs. 88, 91; Dall, 1909:237; Thiem, 1917:614-615, pl. 24, figs. 4a,b [looks like *C. variabilis*].

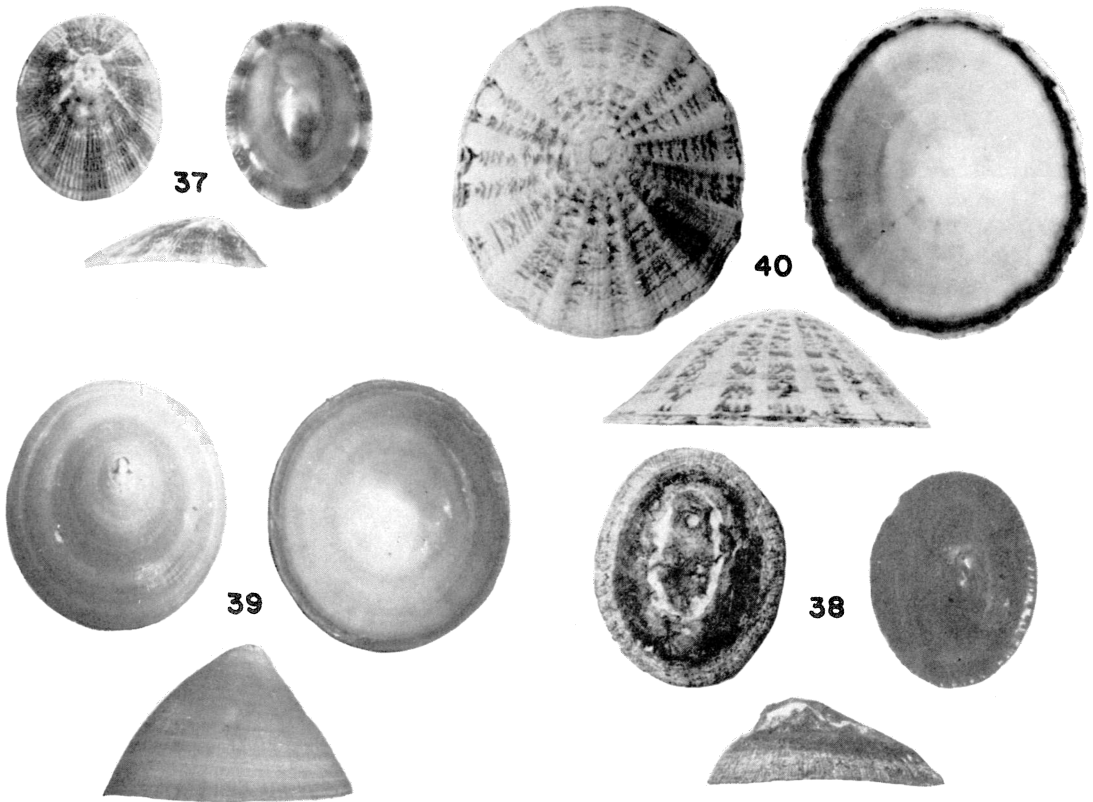
Scurria parasitica, Pilsbry, 1891, vol. 13:63, pl. 4, figs. 74-76; Dall, 1909:179, 237.

Acmaea parasitica Thiem, 1917:616, pl. 25, figs. 12a,b [synonym and homonym].

Occurrence: In shallow excavations made on shells of *Scurria viridula* and *Fissurella* species. Iquique specimens: 50. The dark form named *coffea* occurs in excavations on the shells of the chitons *Acanthopleura echinata* and *Enoplochiton niger*, with as many as five specimens on a single large chiton. Iquique specimens: 20.

Distribution: LACM collections contain this species from localities ranging from the Chincha Islands, Peru, to Talcahuano, Chile. Type locality: Valparaíso, Chile (Orbigny, 1841).

Remarks: The shell is oval in outline, small to moderately large, of moderate height, and with its ends elevated relative to the sides. It is sculpted with fine, even radial ribs. Externally the shell is broadly rayed with brown and white; the internal margin shows corresponding light and dark markings, the central area has irregular brown markings, the muscle scar is bluish, and the area between the scar and the margin is blue with a brown cast. The form *coffea* (Fig. 38) is always eroded on the exterior, but the fine ribbing shows on the growing



FIGURES 37-40. 37, *Scurria parasitica*, length 17 mm; 38, *S. parasitica*, length 19 mm, dark *coffea* form; 39, *S. scurra*, length 25 mm; 40, *S. viridula*, length 65 mm.

edge. Internally, the margin is solid dark brown, the muscle scar is blue, and the rest of the interior is darkly stained. Length 20 mm.

Although previous authors have treated the form *coffea* as a full species, it is here regarded as a dark colored *situs* form of *S. parasitica* (Fig. 37), deriving its dark color from the dark brown valves of the two large chitons upon which it lives. The size, shape, fine sculpture, radula, branchial cordon and habit of attaching only to other shells argues for consideration of the two as the same species. Differences are the eroded surface of the *coffea* form, which may be attributed to the more exposed habit of the chitons, and the lack of the broad white rays in the *coffea* form. The question could easily be resolved experimentally by transferring specimens to differing host shells and watching for a color change.

Scurria scurra (Lesson, 1830)
Figure 39

Patella scurra Lesson, 1830, vol. 2, pt. 1:421-422,
no. 189.

Acmaea scurra, Orbigny, 1841, vol. 5:478, vol. 9,
pl. 64, figs. 11-14.

Scurria scurra, Dall, 1871:263-264; Pilsbry, 1891,
vol. 13:62, pl. 39, figs. 16, 23-27; Dall, 1909: 237;
Thiem, 1917:615, pl. 24, figs. 1a-d; Carcelles,
1950:52, pl. 1, fig. 15; Carcelles and Williamson,
1951:259; Dell, 1971:201.

Occurrence: Lowest intertidal zone and subtidally, in depressions excavated into the stipes and holdfasts of the brown alga *Lessonia nigrescens* Bory. Iquique specimens: 139. This species can be found wherever *L. nigrescens* grows, some plants having as many as 100 specimens of *S. scurra*.

Distribution: Callao, Peru (Dall, 1909) to 46°S in Chile (Dell, 1971). Type locality: Talcahuano, Chile (Lesson, 1830).

Remarks: The yellowish white shell is thick, high, with sculpture of microscopic radial ribbing that faintly crenulates the margin. The juvenile apex is mottled with brown and white. The interior is white and the margin narrow but well defined. Length 28 mm.

Scurria viridula (Lamarck, 1819)

Figure 40

Patella viridula Lamarck, 1819, vol. 6, pt. 1:334.*Acmaea preteri* Orbigny, 1841, vol. 5:481, vol. 9, pl. 78, figs. 15, 16; Keen, 1966:2.*Acmaea viridula*, Pilsbry, 1891, vol. 13:32-33, pl. 1, figs. 1-6; Dall, 1909:178-179, 238, pl. 24, figs. 1, 2; Dell, 1971:199.*Scurria viridula*, Thiem, 1917:614, pl. 24, figs. 3a,b.

Occurrence: Upper intertidal and splash zone, most common on smooth vertical rock walls exposed to strong surf and devoid of all else but green algae and the large chitons *Enoplochiton niger* and *Acanthopleura echinata*. Juveniles occur on the undersides of cobbles and boulders, protected from direct wave action near the adult living sites. One or two *S. parasitica* are found commonly on the shells of *S. viridula*. Iquique specimens: 47.

Distribution: Paita and the Lobos Islands, Peru, to Valparaíso (Dall, 1909) and Punta Choros, Chile (42° S; Dell, 1971). Type locality: unknown.

Remarks: The shell is large, thick, and medium to high; the radial ribs are broad, whitish, and project at the margin only in young shells. Con-

centric bands of grayish green and white are superimposed upon the whitish ribs, with an overall pattern of white and green flecking. Interior of mature specimens white, sometimes with faint brown markings, and often with a dark brown center in juveniles. Length 70 mm.

Family Trochidae

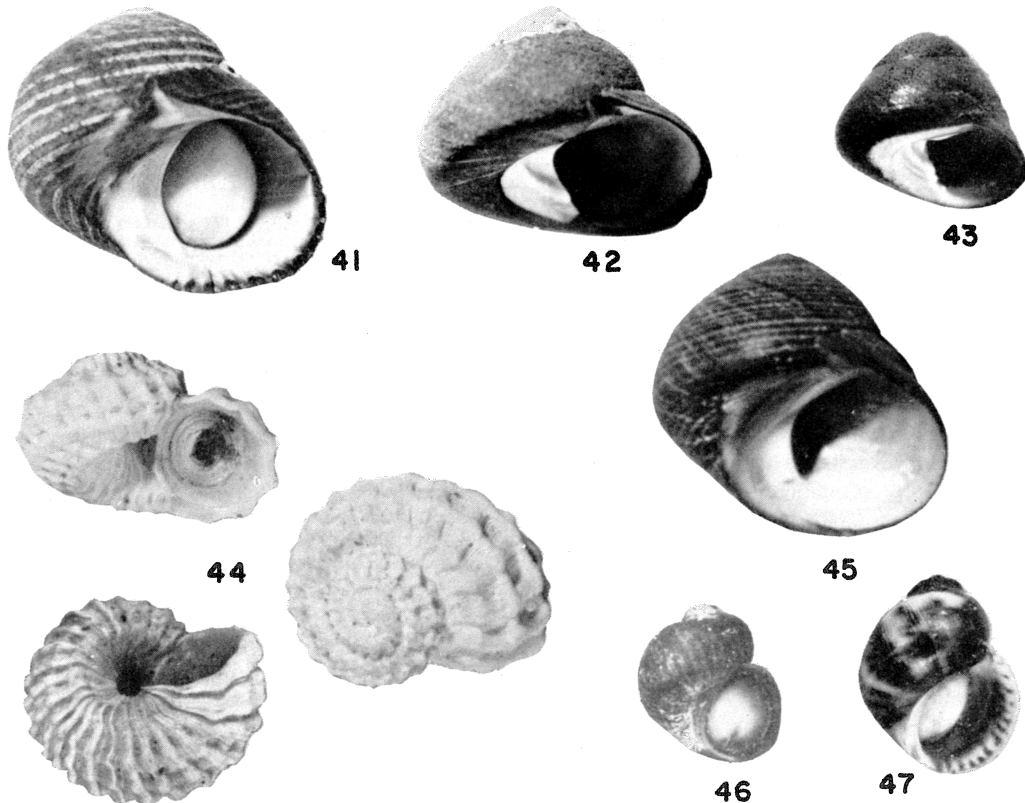
Diloma Philippi, 1845*Diloma nigerrima* (Gmelin, 1791)

Figure 45

Turbo nigerrimus Gmelin, 1791, vol. 1, pt. 6:3597.*Trochus araucanus* Orbigny, 1840, vol. 5:410-411, vol. 9, Moll., pl. 55, figs. 5-8.*Monodonta nigerrima*, Pilsbry, 1889, vol. 11:97, pl. 23, figs. 77, 78, pl. 20, fig. 18; Dall, 1909:240; Carcelles and Williamson, 1951:261.*Diloma nigerrima*, Dell, 1971:195-197, pl. 1, fig. 8, pl. 2, fig. 2.

Occurrence: Throughout lower intertidal zone, often clustered in masses of several hundred individuals. Iquique specimens: 489.

Distribution: Salaverry, Peru, to the Straits of Magellan (Dall, 1909). Type locality: unknown.



FIGURES 41-47. 41, *Prisogaster niger*, diameter 19 mm; 42, *Tegula (Chlorostoma) atra*, diameter 17 mm; 43, *T. (C.) tridentata*, diameter 12 mm; 44, *Liotia cancellata*, diameter 2.3 mm; 45, *Diloma nigerrima*, diameter 19 mm; 46, *Tricolia umbilicata*, height 1.8 mm; 47, *T. macleani* sp. nov., Holotype, height 4 mm.

Remarks: Dell (1971) gives an extensive discussion of this species, noting its close similarity to the New Zealand species *Diloma digna* (Finlay).

Tegula Lesson, 1835

Subgenus *Chlorostoma* Swainson, 1840

Tegula (Chlorostoma) atra (Lesson, 1830)

Figure 42

Trochus ater Lesson, 1830, vol. 2, pt. 1:344, Moll., pl. 16, fig. 2; Orbigny, 1840, vol. 5:409.

Chlorostoma atrum, Pilsbry, 1889, vol. 11:173-174, pl. 28, figs. 40, 41; Dell, 1971:195 [as *atra*].

Tegula atra, Dall, 1909:176, 239, pl. 24, fig. 4; Carcelles and Williamson, 1951:262.

Occurrence: Common in lower intertidal zone, locally abundant; usually with *T. tridentata* (Potiez and Michaud) and *Diloma nigerrima* (Gmelin). Iquique specimens: 890.

Distribution: Pacasmayo, Peru, to the Straits of Magellan and Patagonia (Carcelles and Williamson, 1951). Type locality: Quiriquina Island, Concepción Bay, Chile (Lesson, 1830).

Remarks: Large specimens of *T. atra* are especially abundant at Punta Gruessa, 17 kms south of Iquique, where they occur on rocks among seaweed holdfasts and are encrusted with a pink calcareous alga.

Tegula (Chlorostoma) tridentata

(Potiez and Michaud, 1838)

Figure 43

Monodonta tridentata Potiez and Michaud, 1838, vol. 1:321, pl. 29, figs. 16, 17.

Chlorostoma tridentatum, Pilsbry, 1889, vol. 11:175, pl. 28, figs. 47, 48.

Tegula tridentata, Dall, 1909:176-177, 240; Carcelles and Williamson, 1951:262.

Occurrence: Common in lower intertidal zone, locally abundant, usually with *T. atra* (Lesson) and *Diloma nigerrima* (Gmelin). Iquique specimens: 940.

Distribution: Sechura Bay, Peru, to Chonos Archipelago, Chile (Dall, 1909). Type locality: Peru (Potiez and Michaud, 1838).

Family Liotiidae

Liotia Gray, 1847

Liotia cancellata (Gray, 1828)

Figure 44

Delphinula cancellata Gray, 1828, pt. 1:3, pl. 6, fig. 8.

Delphinula cobijensis Reeve, 1843, vol. 1, *Delphinula*, pl. 5, figs. 23a-b.

Liotia cancellata, Tryon, 1888, vol. 10:109, pl. 36, fig. 2; Dall, 1909:239; Pilsbry, 1934:375-381, pl. 13, figs. 7, 7a-b.

Occurrence: On undersides of rocks in gravel, middle and lower intertidal zone. Iquique specimens: 121.

Distribution: Arica to Coquimbo, Chile (Dall, 1909). Type locality: Arica, Chile (Gray, 1828).

Remarks: *Liotia cancellata* is the type species of *Liotia*, differing from the only other described species, the Californian *L. fenestrata* Carpenter, 1864, by its smaller size, broader umbilicus, and less pronounced spiral and axial cords that do not form deep, square pits.

Family Turbinidae

Prisogaster Mörch, 1850

Prisogaster niger (Wood, 1828)

Figure 41

Turbo niger Wood, 1828, pl. 6, fig. 1; Orbigny, 1840, vol. 5:411-412, vol. 9, Moll., pl. 55, figs. 9-11.

Turbo niger Gray, 1839:143, pl. 36, fig. 1 [synonym and homonym]; Reeve, 1848, vol. 4, *Turbo*, pl. 11, fig. 49; Pilsbry, 1889, vol. 10:219, pl. 42, fig. 42.

Prisogaster niger Wood, Carcelles and Williamson, 1951:268; Dell, 1971:197-198.

Occurrence: On undersides of rocks among gravel, middle and lower intertidal zone, often associated with *Tegula atra* (Lesson) and *T. tridentata* (Potiez and Michaud). Nearly all specimens are from Patillos, 65 kms south of Iquique; rare at Iquique. Patillos specimens: approximately 3000.

Distribution: Pacasmayo, Peru, to the Straits of Magellan (Dall, 1909). Type locality: unknown.

Family Phasianellidae

Tricolia Risso, 1826

Tricolia umbilicata (Orbigny, 1840)

Figure 46

Littorina umbilicata Orbigny, 1840, vol. 5:394, vol. 9, Moll., pl. 76, figs. 1-3.

Phasianella umbilicata, Strong, 1928:200, pl. 10, figs. 16, 17.

non Phasianella umbilicata Orbigny, 1842, vol. 2:77, pl. 19, figs. 32, 34.

Phasianella minima Philippi, 1860:186; Pilsbry, 1888, vol. 10:178, vol. 9, pl. 46, fig. 24; Dall, 1909:238.

Tricolia umbilicata, McLean in Keen, 1971:358, fig. 163.

Occurrence: In lower intertidal zone, especially

along fissures and crevices in rock surfaces. Iquique specimens: 276.

Distribution: Paita, Peru, to Chimba Bay, Chile (Dall, 1909). Type Locality: Cobija and Arica, Chile (Orbigny, 1840).

Remarks: The Iquique specimens are slate gray in color. As noted by McLean, in Keen (1971), the gray color is typical for specimens from the southern end of the range of *T. umbilicata*, while those from the northern end tend to be mottled with red and white.

***Tricolia macleani*, new species**

Figures 47 and 56

Diagnosis: Distinguished from other eastern Pacific Tricolias by its lack of spiral sculpture and its characteristic mottled purplish black and yellowish white coloration.

Description of holotype: Shell small for genus, with one rounded, slightly eroded nuclear whorl; postnuclear whorls three and one-half, moderately rounded, smooth except for wavy incremental growth lines. Body whorl colored by irregular mottling of yellowish white and purplish black, earlier whorls entirely purplish black. Alternating light and dark spots within outer lip have false appearance of apertural teeth. Aperture more than one-half height of shell; inner and outer lips smooth, outer lip thin, inner lip thickened to form narrow callus concealing umbilicus. Dimensions (in mm): height 4.0, diameter 3.1.

Operculum: Calcareous, of about three whorls, outer surface convex with microscopic wrinkles along the outer margin; inner side concave, with a prominent spiral keel, formed on the columellar margin by the raised portion of one opercular whorl.

Radula (Fig. 56): The radula is typical for a *Tricolia*, with the rachidian bordered on each side by four lateral teeth and a large number of marginals. Rachidian basically quadrate and rounded, with smooth borders, and lacking cusps. Each of the lateral teeth bears a prominent cusp having strong denticles. The innermost lateral tooth bears both inner and outer denticles, but the outer laterals bear only outer denticles. There are about 70 similar marginal teeth on each side, which are finely denticulate at their tips.

Type locality: Patillos, Chile, 20° 48" S, 70° 12' W; lower intertidal zone, on walls of tide pools and on undersides of rocks on gravel substrate, July, 1964, 718 specimens.

Type material: Holotype, LACM 1585; 275 paratypes, LACM 1586; 10 paratypes, USNM; 10 paratypes, CAS; 10 paratypes, AMNH; 10 paratypes, SDNHM; 10 paratypes, ANSP.

Referred material: LACM, two worn specimens, Allan Hancock Foundation bottom sample 531, 40 m east of Viejo Island, Independencia Bay, Peru, 13 January, 1935.

Discussion: The coloration of *T. macleani* varies considerably, from nearly all purplish black to nearly all yellowish white. The visible early whorls of most specimens are entirely purplish black, with the characteristic mottled color pattern confined to the body whorl. The apex of most specimens is slightly eroded. Juvenile specimens have a narrow, open umbilicus, and some adults show an umbilical chink when the callus is not fully developed.

Tricolia macleani differs from other eastern Pacific species of *Tricolia* by the combination of its unsculptured whorls and distinctive mottled coloration of purplish black and yellowish white. This species is named in honor of Dr. James H. McLean.

Order Mesogastropoda

Family Littorinidae

Littorina Ferussac, 1822

Subgenus *Austrolittorina* Rosewater, 1970

Littorina (*Austrolittorina*) *araucana* Orbigny, 1840

Figures 48 and 49

Littorina araucana Orbigny, 1840, vol. 5:393, vol. 9, Moll., pl. 53, figs. 8-10; Reeve, 1858, vol. 10, *Littorina*, pl. 16, fig. 88; Dall, 1909:231; Keen, 1971:365.

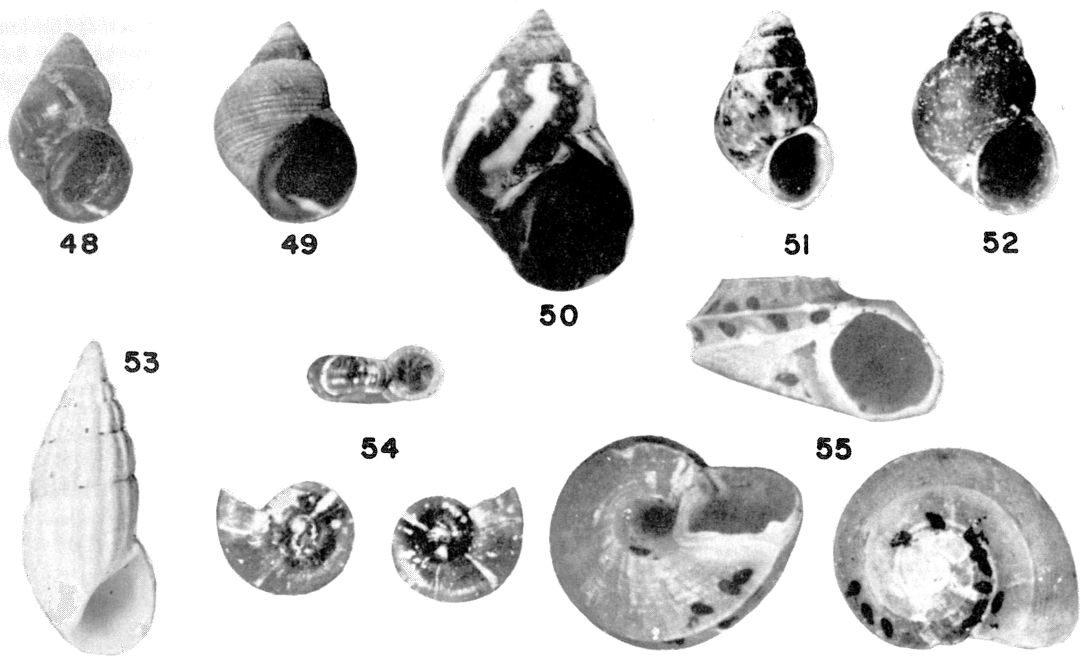
Littorina (*Austrolittorina*) *araucana*, Rosewater, 1970:423; Dell, 1971:205.

Occurrence: Abundant in upper intertidal and splash zones of rocky reefs, but less common than *L. peruviana* (Lamarck). Iquique specimens: 1260.

Distribution: LACM collections show this species occurring from Iquique to Laraquete (south of Concepción), Chile. Dell (1971) reports it at 41° S in Chile. The northern range limit of Nicaragua given by Dall (1909) is probably in error. Type locality: Arica and Valparaíso (Orbigny, 1840).

Remarks: *Littorina araucana* is highly variable in color and form. Many individuals are relatively small, predominantly brown and smooth, with a more angulate outer lip (Fig. 48), while others are generally larger, predominantly gray, and have incised spiral sculpture and a less angulate outer lip (Fig. 49). These characters are gradational, however, and most specimens fall somewhere between the two extremes. Dr. Joseph Rosewater confirmed the identification of this species.

Littorina araucana is usually found with *L. peruviana*, but where the surf is especially strong, *L. araucana* is generally absent.



FIGURES 48-55. 48, *Littorina (Austrolittorina) araucana*, brown form, height 9 mm; 49, *L. (A.) araucana*, gray form, height 9 mm; 50, *L. (A.) peruviana*, height 14.5 mm; 51, *Eatoniella (Eatoniella) latina* sp. nov., Holotype, height 1.54 mm; 52, *Eatonina (Saginofusca) atacamae* sp. nov., Holotype, height 1.71 mm; 53, *Rissoina (Rissoina) inca*, height 5.8 mm; 54, *Omalogyra* cf. *O. atomus*, diameter 0.9 mm; 55, *Cyclostremiscus (Cyclostremiscus) trigonatus*, diameter 2.1 mm.

Littorina (Austrolittorina) peruviana
(Lamarck, 1822)
Figure 50

Phasianella peruviana Lamarck, 1822, vol. 7:53.

Littorina peruviana, Orbigny, 1840, vol. 5:395, vol. 9 Moll., pl. 53, figs. 5-7; Tryon, 1887, vol. 9:249, pl. 44, fig. 78; Dall, 1909:172-173, 231, pl. 23, fig. 7; Keen, 1971:366, fig. 185.

Littorina (Austrolittorina) peruviana, Rosewater, 1970:423.

Turbo zebra Wood, 1828:20, pl. 6, *Turbo*, fig. 33.

Littorina zebra, Reeve, 1857, vol. 20, *Littorina*, pl. 12, figs. 6a-b.

Occurrence: Abundant in upper intertidal and splash zones of rocky reefs. Iquique specimens: 8007.

Distribution: LACM collections contain this species from Paita, Peru, south to Valparaíso, Chile, and Dall (1909) cited the southern range as Valdivia, Chile. Keen (1971) mentions one reported occurrence in the Galápagos Islands. Type locality: Callao, Peru (Lamarck, 1822).

Family Eatoniellidae
Eatoniella Dall, 1876
Subgenus *Eatoniella*, s.s.

Eatoniella (Eatoniella) latina, new species
Figures 51, 57 and 58

Diagnosis: A species distinguished by its gray color and thick shell wall, an operculum with extensive muscle insertion area and no internal ridge, and its radular dentition.

Description of shell: Shell small, thick, smooth; four whorls, slightly convex, suture moderately impressed; protoconch smooth, low, not distinctly marked off from adult whorls. Very weak, shallow spiral groove immediately below suture, otherwise shell surface unornamented. Aperture oval; inner and outer lips smooth, slightly thickened; no umbilicus. Shell dark gray outside, medium blue-gray within, peristome gray-white. Dimensions (in mm): height 1.54, diameter 0.98.

Operculum (Fig. 57): Medium yellowish brown, chitinous, ear-shaped, convex outward; no internal ridge, muscle insertion area extensive; only a narrow outer marginal area; spiral sculpture absent;

faint spiral striae on outer surface; peg long, solid, weakly grooved, darker brown than remainder of operculum.

Radula (Fig. 58): The radula was removed from a paratype. Each row of teeth consists of a rachidian flanked on each side by one lateral and two marginals. Rachidian with a quadrate central cusp and two pointed cusps on each side; base of rachidian not discernible. Lateral tooth elongate, with four small cusps along the mid-anterior margin. Inner marginal tooth elongate and curved, with three to four indistinct anterior cusps and a thickened posterior end. Outer marginal slim and curved, with about four small cusps along the anterior margin; posterior end indistinct.

Type locality: Iquique, Chile, 20° 13'S, 70° 10'W; lower intertidal zone, in gravel and coarse sand between rocks, August, 1964, 126 specimens.

Type material: Holotype, LACM 1587; 100 paratypes, LACM 1588; 5 paratypes, USNM; 5 paratypes, CAS; 5 paratypes, AMNH; 5 paratypes, SDNHM; 5 paratypes, ANSP; 5 paratypes, Australian Museum, Sydney.

Discussion: The paratypes have from four to four and one-half whorls. On some specimens, subobsolete, closely and irregularly spaced spiral lineations are visible on the body whorls. In broken specimens, microscopic wrinkling is clearly seen on the interior shell surfaces; the wrinkling is subparallel to the long axis of the shell; wrinkles extend almost to the apertural margin in some specimens, although not in the holotype. The weak spiral groove immediately below the suture of the holotype is not present in all specimens. Most of the specimens were dead when collected, and had weathered to a light gray color.

The radular preparation does not clearly show all of the relevant morphologic details, and no additional preserved specimens are available. Most importantly, it cannot be seen whether the base of the rachidian has the two strong basal processes present among Eatoniellidae. The posterior margins of the lateral and outer marginal teeth are also hidden from view.

The rather solid, dark gray shell, with a yellowish white operculum bearing weak spiral striae, places this species in the subgenus *Eatoniella*, s.s., as described by Ponder, (1965a). The radular dentition, so far as it is known, supports this judgment.

Eatoniella (Eatoniella) latina is the first representative of the family Eatoniellidae to be reported from the eastern Pacific. Its generic placement has been confirmed by Dr. Winston F. Ponder, who has done extensive work on New Zealand eatoniellids (Ponder, 1965a). The Chilean species is only one-half to two-thirds as high as the three New Zealand

species figured by Ponder. Besides shell size, the absence of an internal opercular ridge also distinguishes *E. (E.) latina* from *E. (E.) kerguelenensis chiltoni* (Suter, 1909), whereas the much blunter opercular peg of *E. (E.) latina* helps separate it from *E. (E.) stewartiana* Ponder, 1965.

The specific name of *E. (E.) latina* recognizes the first occurrence of the genus *Eatoniella* in Latin America.

Family Cingulopsidae

Eatonina Thiele, 1912

Subgenus *Saginofusca* Ponder, 1965

Eatonina (Saginofusca) atacamae, new species

Figures 52, 59 and 60

Diagnosis: This species is characterized by its medium to dark orange-brown color, thin shell wall, and ear-shaped operculum having prominent internal ridge and indistinct muscle insertion area.

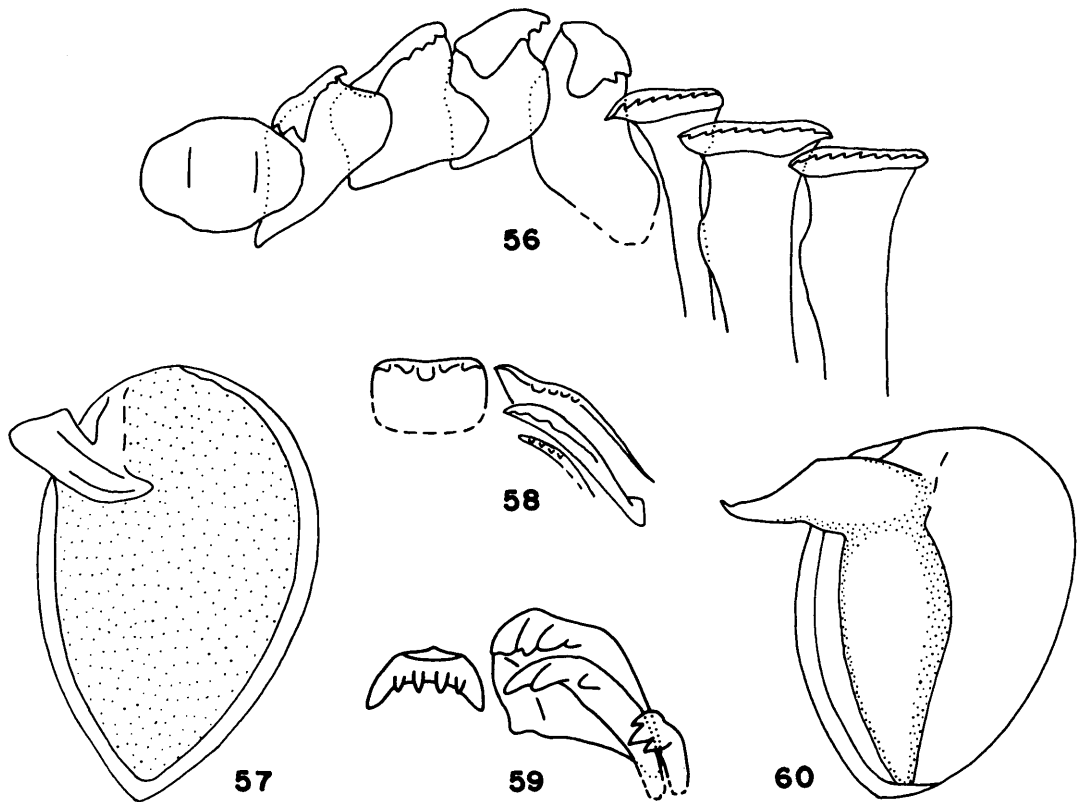
Description of shell: Shell small, thin, smooth, turbinata. Whorls four and one-half, markedly convex, suture impressed; protoconch smooth, not distinctly marked off from adult whorls. Aperture oval; inner lip smooth, slightly thickened; outer lip smooth, thin; umbilicus narrow, deep. Color medium to dark orange-brown. Dimensions (in mm): height 1.71, diameter 1.18.

Operculum (Figure 60): Light yellowish brown, chitinous, ear-shaped, convex outward; internal ridge prominent, broad, coming to a point distally; muscle insertion area indistinct and transparent, incremental growth lines only; peg long, distally pointed, strongly grooved.

Radula (Fig. 59): The rachidian is flanked on each side by one lateral and two marginal teeth. Rachidian has two strong basal processes between which project four basal cusps. Anterior end of rachidian somewhat flattened and produced into a low peak centrally. The lateral tooth is relatively large, roughly quadrate, and produced posterolaterally; it bears four cusps, the most lateral of which is small and indistinct. The inner marginal tooth is elongate and curved, with three large, somewhat rounded cusps. The outer marginal is short, slightly curved and has three cusps that are smaller and more pointed than those on the inner marginal tooth.

Type locality: Iquique, Chile, 20° 13'S, 70° 10'W; middle intertidal zone, on semi-exposed rock surfaces, especially along crevices, August, 1964, 2500 specimens.

Type material: Holotype LACM 1589; 2374 paratypes, LACM 1590; 25 paratypes, USNM; 25 paratypes, CAS; 25 paratypes, AMNH; 25



FIGURES 56-60. 56, *Tricolia macleani* sp. nov., radular dentition; 57, *Eatonella* (*Eatonella*) *latina* sp. nov., inner side of operculum; 58, *E. (E.) latina*, radular dentition; 59, *Eatonina* (*Sagino-fusca*) *atacamae* sp. nov., radular dentition; 60, *E. (S.) atacamae*, inner side of operculum.

paratypes, SDNHM; 25 paratypes, ANSP; 25 paratypes, Australian Museum, Sydney.

Discussion: *Eatonina* (*Sagino-fusca*) *atacamae* is the first species of this genus reported from the eastern Pacific. Its generic placement was suggested by Dr. Winston F. Ponder. The globose form of this species, plus its orange-brown color, and its radula with quadrate lateral teeth and paw-shaped outer marginals, clearly places it in the subgenus *Sagino-fusca* Ponder, 1965. The transparent operculum, with a prominent internal ridge and indistinct muscle-insertion area reinforces this judgment. Two New Zealand species are included in *Sagino-fusca* by Ponder (1965b), both of which are much smaller than *E.(S.) atacamae*. The New Zealand species *E.(S.) atomaria* (Powell, 1933; height 1.2 mm) and *E.(S.) maculosa* Ponder, 1965 (height 0.775 mm), also have blunter opercular pegs and different radular morphology than *E.(S.) atacamae*.

The specific name of *E.(S.) atacamae* refers to the presence of this species on the coastal edge of the Atacama Desert in northern Chile.

Family Rissoinidae

Rissoina Orbigny, 1840

Subgenus *Rissoina*, s.s.

Rissoina (*Rissoina*) *inca* Orbigny, 1840

Figures 53 and 83

Rissoina inca Orbigny, 1840, vol. 5:395, vol. 9, Moll., pl. 53, figs. 11-16; Tryon, 1887, vol. 9:369, pl. 55, fig. 15; Dall, 1909:232; Bartsch, 1915:42, pl. 31, figs. 6, 8; Carcelles and Williamson, 1951:272; Keen, 1966:3, figs. 6a-c; 1971:374, fig. 260.

Occurrence: On undersides of rocks and in gravel and sand of middle and lower intertidal zone, abundant. Iquique specimens: 636.

Distribution: Peru south to Chiloé Island, Chile (Dall, 1909). Type locality: Arica and Cobija, Chile (Orbigny, 1840).

Remarks: *Rissoina inca* is the type species of its genus. Each row of radular teeth (Fig. 83) consists of a rachidian flanked on each side by one lateral and two marginals. The rachidian is broad, with an

indented anterior margin, broadly curved anterior flanks, and sharply pointed lateral terminations. The middle portion of the anterior margin bears nine denticles. The median denticle is largest and the others become progressively smaller away from it. The basal margin is sinuous and nearly parallels the line of the anterior margin, and bears two widely spaced cusps. The lateral tooth is elongate and expanded medially. Its median anterior margin bears a broad cusp that has about three denticles along its posterolateral edge. The marginal teeth are elongate and sharply pointed medially. They bear numerous denticles along their anterior margins.

Family Omalogyridae

Omalogyra Jeffreys, 1860

Omalogyra cf. *O. atomus* (Philippi, 1841)

Figure 54

Truncatella atomus Philippi, 1841:54.

Homalogyra atomus, Johnson, 1934:100.

Omalogyra atomus, Bullock, 1969:70-71.

Occurrence: In black sandy silt among cobbles and boulders of a protected beach, lower intertidal zone. Iquique specimens: 226.

Distribution: *Omalogyra atomus* is best known from the northeastern Atlantic and Mediterranean. It is reported rarely in New England as far south as Rhode Island (Bullock, 1969). Type locality: Sorrento, Italy (Philippi, 1841). I have examined 13 specimens (10 loaned from USNM, no. 184968, ex Jeffreys collection; 3 from Dr. Donald Moore, University of Miami) from Balta Sound, Shetland Islands.

Remarks: The Iquique specimens are minute, discoidal, semitransparent, and of about two and one-half whorls, the first one nuclear. The apex is slightly depressed, with the shell increasing regularly in size. The body whorl is well rounded, and the whorls are separated by a strongly impressed suture and marked only by very fine incremental growth lines. The base is very broadly and openly umbilicate, exposing the nuclear whorls. The aperture is subcircular and interrupted at its inner margin by the preceding whorl. The periostracum is thin and medium brown to yellowish brown in color. The operculum is chitinous, yellowish white, opaque, and with about two whorls with a central nucleus. Dimensions of figured specimen (in mm): greatest diameter 0.90, height 0.30.

No species referable to *Omalogyra* has previously been reported from the eastern Pacific. The Iquique species is not similar to any reported from the south Atlantic, but is extremely close to *O. atomus* of the northern Atlantic and Mediterranean. The Shetland

Island specimens of *O. atomus* differ from the Iquique shells only in having a slightly thinner and more translucent shell wall. Specimens from both regions display "quarter lines" ("Viertel-linie" of Philippi, 1841:54) as their only ornamentation, although the original description clearly says these are not present on *O. atomus*. These lines are white, very shallowly incised, and radially traverse each whorl. The lines may occur on all whorls of a given specimen, but are not continuous from whorl to whorl. Seen in apical or basal view, the lines often, but not always, occur at about 90° increments, although I have not seen four such lines 90° apart on one individual.

Omalogyra atomus burdwoodianus Strebel, 1908, from Burdwood Bank, east of Tierra del Fuego (Strebel, 1908:52-53, pl. 6, figs. 85a-c), has a strongly noded keel on its body whorl that separates it from the Iquique specimens.

Dr. Donald R. Moore provided helpful suggestions for comparison of the Iquique specimens with *Omalogyra* species known from the north and south Atlantic, in addition to loaning me specimens of *O. atomus*. Dr. Joseph Rosewater provided comparative specimens from the U.S. National Museum collections.

Family Vitrinellidae

Cyclostremiscus Pilsbry and Olsson, 1945

Subgenus *Cyclostremiscus*, s.s.

Cyclostremiscus (Cyclostremiscus) trigonatus

(Carpenter, 1857)

Figures 55 and 84

Vitrinella exigua C. B. Adams, 1852:184; Turner, 1956:48, pl. 15, figs. 2, 2a,b.

non Delphinula exigua Philippi, 1849:25.

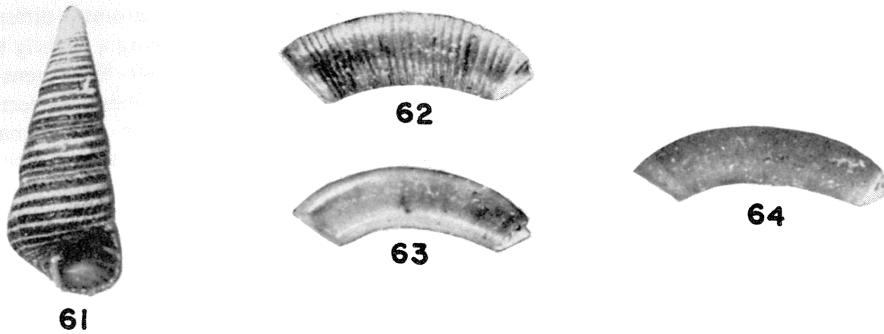
Vitrinella trigonata Carpenter, 1857:244 [as synonym of *V. exigua* C. B. Adams].

Cyclostremiscus trigonatus, Pilsbry and Olsson, 1945:268-269, pl. 27, figs. 2, 2a,b.

Occurrence: In gravel among rocks, lower intertidal zone. LACM specimens from Peru were found in depths to 13 m. Iquique specimens: 60.

Distribution: Mazatlán, Mexico (Carpenter, 1857) to Iquique, Chile (present specimens). LACM collections also contain specimens from Pucusana (12°30'S) and the Chincha Islands (13°38'S), Peru. Type locality: Mazatlán, Mexico (Carpenter, 1857).

Remarks: The Iquique specimens closely match the description and figures of *Cyclostremiscus trigonatus* given by Pilsbry and Olsson (1945). However, the largest specimen of *C. trigonatus* mentioned by Pilsbry and Olsson was 1.25 mm in diameter, whereas the Iquique specimens average over 2.0 mm in diameter and the largest specimen



FIGURES 61-64. 61, *Turritella cingulata*, height 25 mm; 62, *Caecum chilense*, annulate form, length 2 mm; 63, *C. chilense*, smooth form, length 2 mm; 64, *Fartulum moorei* sp. nov., Holotype, length 1.55 mm.

has a greatest diameter of 2.4 mm and a height of 1.5 mm. Spiral striae on the Iquique specimens precludes placement in *C. peruvianus* Pilsbry and Olsson, 1945 (p. 269, pl. 30, fig. 6; Zorritos, Peru).

A radular mount made from one of the Iquique specimens (Fig. 84) shows that the rachidian is bilobed anteriorly and bears a relatively large central cusp flanked on each side by four smaller cusps that decrease in size laterally. The lateral tooth is trigonal and its anterior margin bears four equal cusps on its outer half. The inner marginal tooth is long, scythe-shaped, and bears numerous denticles along its anterior margin. The shape of the outer marginal is not plainly visible, and this tooth and the inner marginal may actually be parts of a single tooth.

Family Turritellidae

Turritella Lamarck, 1799

Turritella cingulata Sowerby, 1825

Figure 61

Turritella cingulata Sowerby, I, 1825:56, appendix p. xiii; Reeve, 1849, vol. 5, *Turritella*, pl. 6, fig. 23; Tryon, 1886, vol. 8:200, pl. 62, fig. 71; Dall, 1909:231; Carcelles and Williamson, 1951:273; Herm, 1969:132-133, pl. 14, figs. 12-15; Keen, 1971:392, fig. 436.

Occurrence: In sand and gravel of semiprotected rocky area 10 kms by road south of Iquique, lower intertidal zone. Number of specimens: 81.

Distribution: Dall (1909) gave the range as from Manta, Ecuador, to Chiloe Island, Chile, but Keen (1971) does not list this species from the Panamic province. LACM collections contain specimens from no farther north than Iquique, although this species probably ranges northward into Peru. Type locality: unknown.

Remarks: This species was found living at only one locality, an unnamed beach 10 kms by road south of Iquique, where there were hundreds of

living specimens per square meter. The shells were lying on the surface or partly buried in the gravel and showed no directional orientation. Dead shells are commonly seen in the Iquique area.

Family Caecidae

Caecum Fleming, 1817

Caecum chilense Stuardo, 1962

Figures 62 and 63

Caecum chilense Stuardo, 1962:5-6, figs. 1, 2.

Occurrence: Common to abundant, locally prolific, on undersides of rocks in lower intertidal zone, often in loose grouping of several hundred. Iquique specimens: approximately 6000.

Distribution: Concepción and Iquique, Chile. Similar specimens are in LACM collections from Pucusana (12°30'S) and the Chincha Islands (13°38'S), Peru. Type locality: Concepción, Chile (Stuardo, 1962).

Remarks: Teleoconchs of *Caecum chilense* range from entirely annulated to entirely smooth, with all gradations present in a local population. On partially ornamented specimens of *C. chilense*, the annulations occur on the posterior portion of the teleoconch.

Fartulum Carpenter, 1857

Fartulum moorei, new species

Figure 64

Diagnosis: Shell small for genus, distinguished by smooth teleoconch, prominent septum, broadly pointed mucro, and diminutive size.

Description of holotype: Teleoconch cylindrical, slightly tapered posteriorly, broadly curved for its whole length, curvature increasing slightly near aperture. Septum slightly depressed, strongly projecting, basically hemispherical but with broadly pointed dorsal mucro, angled nearly 90° to right. Aperture circular, somewhat oblique. Surface sculp-

ture lacking. Teleoconch light buff colored, septum white. Dimensions (in mm): total length 1.55, diameter in middle of teleoconch and at aperture 0.38, diameter at posterior end 0.32.

Operculum: Circular, light to dark brown, multispiral.

Type locality: Iquique, Chile, 20° 13'S, 70° 10'W; lower intertidal zone, on undersides of rocks on gravel substrate, August, 1964, 1186 specimens.

Type material: Holotype, LACM 1591; 1050 paratypes, LACM 1592; 20 paratypes, USNM; 20 paratypes, CAS; 20 paratypes, AMNH; 20 paratypes, SDNHM; 20 paratypes, ANSP.

Discussion: Color of the teleoconch varies from buff to medium brown on the paratypes. The septum is strongly projecting on all the specimens, but the mucro varies from prominent and broadly pointed to nearly lacking.

Fartulum moorei differs from the other known Chilean caecid, *C. chilense* Stuardo, by being smaller, always lacking annular rings on the teleoconch, and having its mucro angled to the right. *Fartulum orcutti* Dall, 1885, of western North America is distinct from *F. moorei* by being thicker for its length, having a more oblique aperture, and a nearly hemispherical septum lacking a pointed mucro, while *F. occidentale* (Bartsch, 1920), also from western North America, is much larger than *F. moorei*, with a slightly constricted aperture and a less projecting posterior septum.

Caecum moorei is named in honor of Dr. Donald R. Moore.

Family Cerithiidae
Bittium Gray, 1847
Bittium sp. indet.

Ten dead specimens of a *Bittium* species were collected from intertidal gravel, and all are very poorly preserved. The most complete specimen is 6.8 mm in height and 2.7 mm in diameter, and composed of five and one-half whorls. The nuclear whorls and earliest postnuclear whorls are eroded away. Sculpture is of three rows of beaded spiral cords; the middle spiral cord is placed slightly closer to the posterior cord than to the anterior one. The nodes are prominent and hemispherical in the early whorls but become quadrate and flattened on the final whorl. The aperture is broken.

Family Cerithiopsidae
Cerithiopsis Forbes and Hanley, 1851
Cerithiopsis sp. indet.

There is at least one species of *Cerithiopsis* present at Iquique, although none is listed from the

Peruvian province. There may be more than one species among the 65 specimens collected at Iquique, but the shells are all too worn to be certain; in most cases, diagnostic apertural and nuclear whorl characters have been lost. The best preserved specimen, somewhat worn, has three apparently smooth nuclear whorls and five postnuclear whorls. Sculpture is of three spiral rows per whorl bearing rounded nodes. The nodes of the posterior row are smaller and less prominent than those of the other rows, and the middle spiral row is set closer to the posterior row than to the anterior row. The apertures of all the specimens are worn or broken. Dimensions (in mm): height 2.5, diameter 0.95.

Family Triphoridae
Triphora Blainville, 1828
Triphora sp. indet.

A single species of *Triphora*, represented by 49 specimens, was found at Iquique in gravel of the intertidal zone. No species of this genus are reported from the Peruvian province but the specimens are too worn and broken to describe as new. An average specimen is 3.5 mm in height and 1.4 mm in diameter, comprised of three and one-half nuclear and six and one-half post-nuclear whorls. The nuclear whorls are too worn to show distinct sculpture, but have suggestions of widely spaced axial riblets. The sculpture of the first five postnuclear whorls is of two spiral axial rows of raised, rounded nodes. On the fifth whorl another row of granules appears between the first two and is positioned slightly nearer to the posterior row. Just behind the mature lip, a fourth row of nodes appears anteriorly, and is much smaller than any of the other three. There are two strong, smooth spiral cords on the base. The color is medium orange-brown.

Family Calyptraeidae
Calyptraea Lamarck, 1799
Subgenus *Trochita* Schumacher, 1817
Calyptraea (Trochita) trochiformis (Born, 1778)
Figure 65

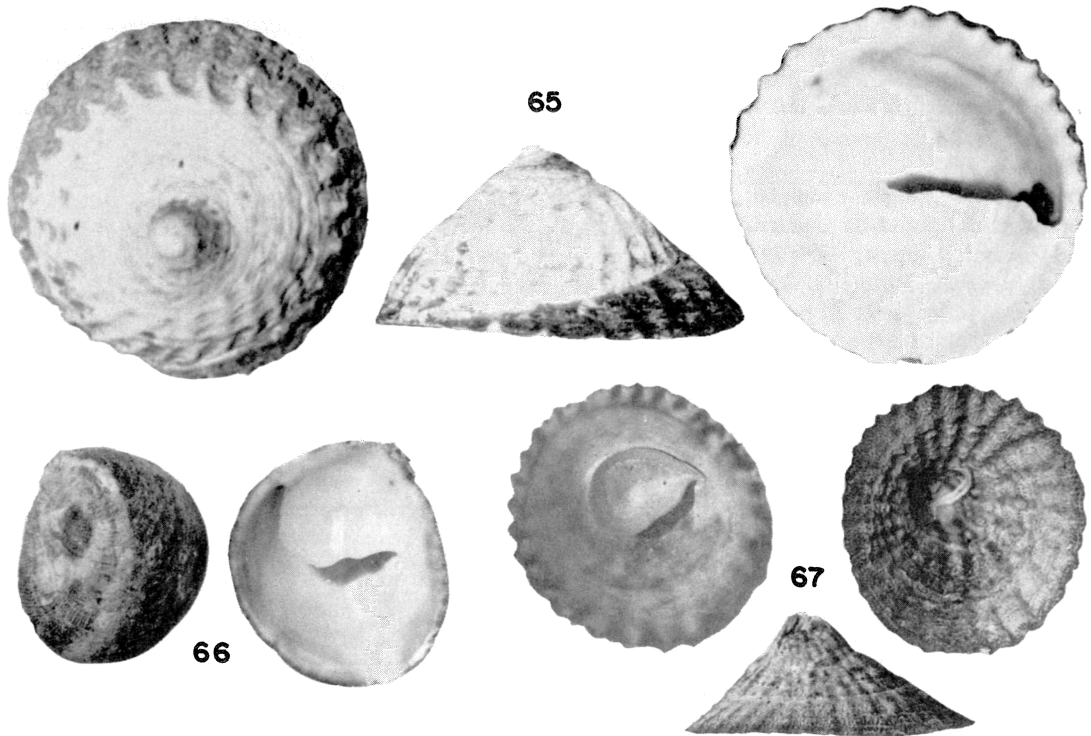
Turbo trochiformis Born, 1778:355.

Patella trochiformis, Gmelin, 1791, vol. 1, pt. 6:3693-3694.

Calyptraea trochiformis, Orbigny, 1841, vol. 5: 461-462, vol. 9, Moll., pl. 59, fig. 3 [as "*C. radians*" in illustration caption]; Carcelles and Williamson, 1951:279.

Trochita trochiformis, Dall, 1909:175, 233, pl. 23, fig. 1.

Calyptraea (Trochita) trochiformis, Keen, 1958: 312; 1971:456, fig. 804.



FIGURES 65-67. 65, *Calyptraea (Trochita) trochiformis*, diameter 48 mm; 66, *Crepipatella dilatata*, length 26 mm; 67, *Crucibulum (Crucibulum) quiriquinae*, diameter 27.5 mm.

Occurrence: Worn shells are not uncommon in beach drift in the Iquique area. I saw no living specimens, but beach shells occur most commonly where the alga *Lessonia nigrescens* Bory is common. *Calyptraea trochiformis* possibly lives on exposed rocky substrate among these plants in intertidal and shallow depths. Iquique specimens: 6.

Distribution: Manta, Ecuador, to Valparaíso, Chile (Keen, 1971). Type locality: unknown.

Remarks: The nomenclatural history of this species is very complex and is discussed by Rehder (1943), Palmer (1963a, 1963b), Robertson (1962), and Keen (1971).

Crepipatella Lesson, 1830

Crepipatella dilatata (Lamarck, 1822)

Figure 66

Crepidula dilatata Lamarck, 1822, vol. 6, pt. 2:25; Orbigny, 1841, vol. 5:465-467, vol. 9, Moll., pl. 58, fig. 6; Reeve, 1859, *Crepidula*, pl. 1, figs. 3a, b; Tryon, 1886, vol. 8:127-128, pl. 37, figs. 31-34, figs. 31-34, pl. 38, fig. 42; Dall, 1909:174, 234. *Crepipatella dilatata*, Dell, 1971:205-206.

Occurrence: Attached to the mussel *Aulacomya ater* (Molina), often piled three deep. Iquique specimens: 251.

Distribution: LACM collections contain specimens from Lorenzo Island, Peru ($12^{\circ}06'45''S$, $77^{\circ}11'45''W$, near Callao) to Punta Arena, Chile ($53^{\circ}S$). Dell (1971) mentions this species from the Falkland Islands. The northern limit of the range given by Dall (1909) of California to the Galápagos Islands and Straits of Magellan is in error. This species is unknown in the Panamic province (Keen, 1971). Type locality: unknown.

Crucibulum Schumacher, 1817

Subgenus *Crucibulum*, s.s.

Crucibulum (Crucibulum) quiriquinae
(Lesson, 1830)

Figure 67

Calyptraea (Calypeopsis) quiriquinae Lesson, 1830: 161.

Calyptraea quiriquinae, Hupé, 1854, vol. 8:228-229.

Crucibulum scutellatum var. *quiriquina*, Tryon, 1886, vol. 8:118, pl. 32, figs. 30, 31.

Crucibulum quiriquinae, Dall, 1909:233.

Occurrence: Specimen found in beach drift. Iquique specimens: 1.

Distribution: Pucusana, Peru (LACM), to Concepción, Chile (Hupé, 1854). Dall (1909) placed the southern range limit at the Straits of Magellan.

Type locality: Isla Quiriquina and Talcahuano, Chile (Lesson, 1830).

Remarks: Dr. S. Stillman Berry identified the present specimen and his personal collection includes other specimens from Iquique.

Family Cymatiidae

Priene H. and A. Adams, 1858

Priene rude (Broderip, 1833)

Figure 68

Triton rudis Broderip, 1833a:6; Reeve, 1844, *Triton*, pl. 14, fig. 53; Tryon, 1881, vol. 3:34, pl. 16, fig. 169.

Argobuccinum rude, Dall, 1909:226.

Priene rude, Smith, 1970:517-518, pl. 43, figs. 1, 5, 6.

Occurrence: Dead shells in beach drift. Iquique specimens: 2.

Distribution: Callao, Peru, to Valparaíso, Chile, at 5-10 fms depth (Smith, 1970). Type locality: Iquique, Chile (Broderip, 1833).

Order Neogastropoda

Family Muricidae

Xanthochorus Fischer, 1884

Xanthochorus buxea (Broderip, 1833)

Figure 69

Murex buxeus Broderip, in Broderip and Sowerby, 1833:194; Reeve, 1845, vol. 3, *Murex*, pl. 33, fig. 170.

Polia buxea, Sowerby, 1834, *Murex*, pl. 61, fig. 28.

Cantharus buxeus, Tryon, 1881, vol. 3:166.

?*Cantharus buxeus*, Vokes, 1971:27.

Tritonalia buxea, Dall, 1909:219.

Ocenebra buxea, Keen, 1958:359, fig. 352; 1971:533, fig. 1031.

Occurrence: Found in beach drift. Iquique specimens: 2.

Distribution: Pacasmayo, Peru (Keen, 1971) to Iquique, Chile (Broderip, 1833). Type locality: Iquique, Chile (Broderip, 1833).

Family Thaididae

Crassilabrum Jousseaume, 1880

Crassilabrum crassilabrum (Sowerby, 1834)

Figure 70

Murex labiosus Gray, 1828:4, pl. 6, fig. 9.

non Murex labiosus Wood, 1828:15, pl. 5, fig. 18.

Purpura crassilabrum, Sowerby, II, 1834, *Murex*, fig. 14.

Murex crassilabris, Potiez and Michaud, 1838, vol. 1:414-415, pl. 33, figs. 10, 11.

Murex crassilabrum, Reeve, 1845, vol. 3, *Murex*, pl. 3, fig. 146.

Crassilabrum crassilabrum, Jousseaume, 1880:335 [not seen]; Vokes, 1971:37.

Tritonalia crassilabrum, Dall, 1909:219.

Occurrence: In crevices and under ledges of rocky reefs, lower intertidal zone. Iquique specimens: 829.

Distribution: Pucusana, Peru (LACM), to 46°S in southern Chile (Dell, 1971). Type locality: Valparaíso (Gray, 1828).

Remarks: Nearly all specimens were collected during a three-day period in July, 1964, when they were observed depositing egg masses on intertidal rocks; most individuals were on top of clusters of orange, elongate eggs when collected. After that time, *C. crassilabrum* was still fairly common in the intertidal zone at Iquique.

Thais Röding, 1798

Subgenus *Stramonita* Schumacher, 1817

Thais (Stramonita) chocolata (Duclos, 1832)

Figure 71

Purpura chocolatum Duclos, 1832, vol. 26:108-109, pl. 2, fig. 7; Kiener, 1835, vol. 4, pt. 1, "Pourpre": 98-99, pl. 26, fig. 70; Orbigny, 1841, vol. 5:436-437, vol. 9, Moll., pl. 61, figs. 1-3.

Thais chocolata, Dall, 1909:169, 221, pl. 22, fig. 22; Carcelles and Williamson, 1951:221; Keen, 1958:372; 1971:550, fig. 1077.

Occurrence: Lower intertidal zone, on rocky substrate, uncommon. Iquique specimens: 5.

Distribution: Although this species is reported occurring from Ecuador (Keen, 1971) to Valparaíso, Chile (Dall, 1909), LACM collections contain specimens from no farther north than Paita, Peru. Type locality: Peru (Duclos, 1832).

Thais (Stramonita) haemastoma (Linnaeus, 1767)

Figure 72

Buccinum haemastoma Linnaeus, 1767, vol. 1, pt. 2:1202.

Purpura biserialis Blainville, 1832, vol. 1:238, pl. 11, fig. 11.

Thais biserialis, Dall, 1909:220.

Thais (Stramonita) biserialis, Keen, 1958:372, fig. 398; 1971:549-550, fig. 1076.

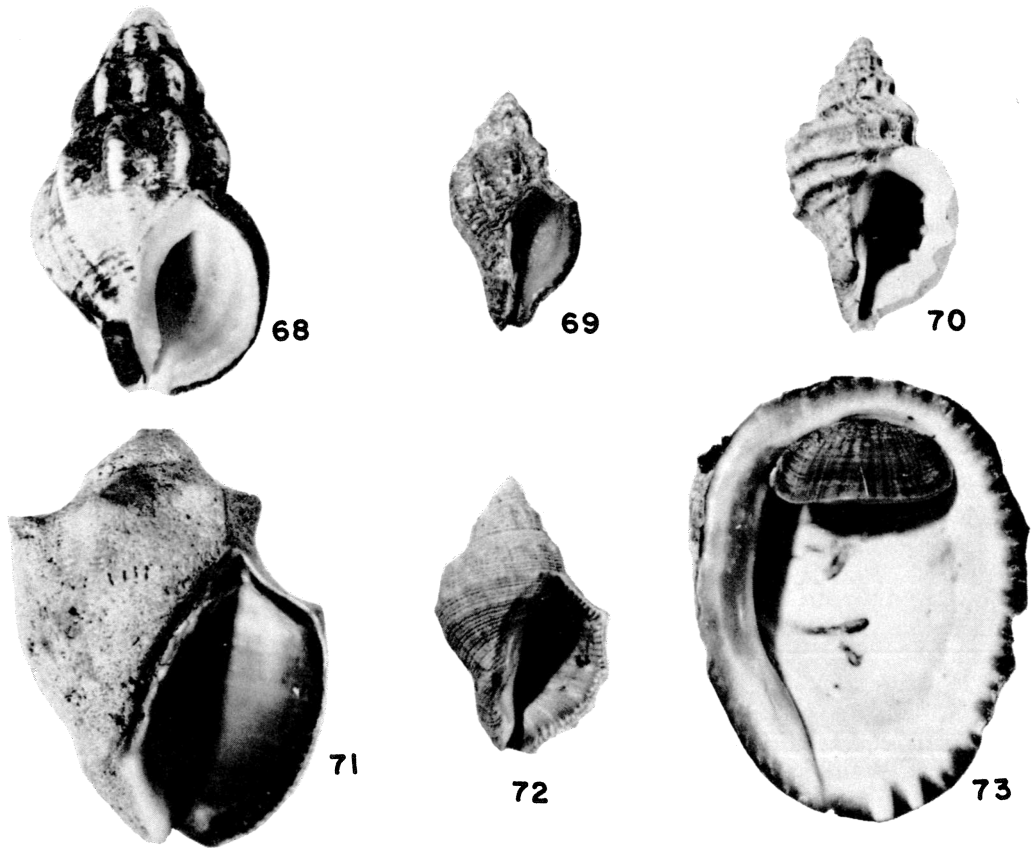
?*Purpura delessertiana* Orbigny, 1841, vol. 5:439, vol. 9, Moll., pl. 77, fig. 7.

?*Thais (Stramonita) delessertiana*, Keen, 1958:372, fig. 400; 1971:550, fig. 1078.

Thais (Stramonita) haemastoma, Clench, 1947:73-76, pl. 36, figs. 1-6 [extensive synonymy].

Occurrence: Beneath rocks and ledges in lower intertidal zone, common. Iquique specimens: 77.

Distribution: Eastern Atlantic — France, western



FIGURES 68-73. 68, *Priene rude*, height 52 mm; 69, *Xanthochorus buxeus*, height 15 mm; 70, *Crassilabrum crassilabrum*, height 25 mm; 71, *Thais (Stramonita) chocolata*, height 56 mm; 72, *T. (S.) haemastoma*, height 37 mm; 73, *Concholepas concholepas*, height 73 mm.

Mediterranean, to West Africa; Western Atlantic — Trinidad to Uruguay; Eastern Pacific — Cedros Island, Baja California, Mexico, to Valparaíso, Chile (Clench, 1947). Type locality: Teneriffe, Canary Islands (designated by Clench, 1947).

Remarks: Eastern Pacific specimens of this species have often been referred to *Thais biserialis*, which some authors consider to differ in having a less strongly noded shoulder on the whorls and having the margin of the aperture colored brownish rather than orange-red. However, LACM specimens from throughout the Panamic province, Chile, and West Africa support the opinion of Clench (1947) that eastern Pacific specimens should be referred to *Thais haemastoma*.

Iquique specimens have relatively high spires with subdued to moderately elevated nodes on the shoulder of the whorls. The exteriors are light to dark gray in color, and the apertures are stained with pale orange-brown. The form and ornamentation of these specimens are identical to that seen on many individuals from the tropical eastern Pacific and West Africa in LACM collections, even though

the tropical specimens tend to be more ornate. The strongly noded West African and Caribbean forms are accorded subspecific ranking by Clench (1947). The orange-brown color of the Iquique specimens is paler than I have seen on specimens from any other locality in the Pacific or Atlantic. On most individuals the orange-brown color is present only along the columellar lip, although most specimens of *T. haemastoma* from other places have the entire aperture darkly tinted. However, the difference is one of degree and the pattern of coloration is the same, because tropical specimens also have their darkest coloration along the apertural margin. Numerous LACM specimens from the tropical eastern Pacific and eastern Atlantic show an identical range of coloration. On the basis of form and color the Iquique specimens are thus referred to *Thais haemastoma*.

It is possible that *T. delessertiana* (Orbigny), which is reported from Ecuador to Paita, Peru (Keen, 1971), is also included within the broad form and color range of *T. haemastoma*, but adequate specimens are not at hand for comparison.

Concholepas Lamarck, 1801*Concholepas concholepas* (Bruguière, 1789)

Figure 73

Buccinum concholepas Bruguière, 1789, vol. 1:252.*Concholepas peruvianus* Lamarck, 1801:69 [not seen]; 1822, vol. 7:252-253; Reeve, 1863, vol. 14, *Concholepas*, pl. 1, figs. 1a-d; Tryon, 1888, vol. 2:199, pl. 192, figs. 314-316.*Purpura concholepas*, Orbigny, 1841, vol. 5:437-438, vol. 9, Moll., pl. 61, figs. 5-7.*Concholepas concholepas*, Dall, 1909:168-169, 222, pl. 22, fig. 1; Carcelles and Williamson, 1951:291; Herm, 1969:136-137, pl. 18, figs. 4a, b; Beu, 1970:44, pl. 4, figs. 10-12; Dell, 1971:210-211.

Occurrence: On rocky substrate, often under low overhanging ledges, lower intertidal zone and subtidal. Iquique specimens: 158.

Distribution: Callao, Peru, south to the Straits of Magellan (Dall, 1909). Type locality: Peru (Bruguière, 1789).

Remarks: This species is commonly collected by commercial divers in 3-5 m depth near shore.

Family Columbelloidea

Aesopus Gould, 1860*Aesopus aliciae*, new species

Figures 74 and 85

Diagnosis: A small shell, characterized by its orange- to purple-brown color, fine spirally incised lines, and microscopic axial lineations.

Description of holotype: Shell of moderate size for genus, fusiform, orange- to purple-brown in color. Nuclear whorls one and one-half, rounded; postnuclear whorls three and one-half, broadly rounded, with greatest diameter of each whorl located slightly anteriorly; suture simple, slightly impressed. Spiral sculpture of weakly incised lines, closely set and separated by much wider interspaces; axial sculpture of microscopic, closely set incised lines separated by interspaces of similar width; axial lines more deeply impressed where they cross the incised spiral lines than where they cross spiral interspaces. Aperture simple; outer lip thickened, reflected posteriorly, posterior angle broad; columella smooth, callus thin and narrow. Dimensions (in mm): height 4.0, diameter 1.7.

Operculum: Chitinous, brown, with an anterior origin.

Radula (Fig. 85): The rachidian is flanked on each side by a single lateral tooth. Rachidian slightly arched anteriorly, laterally elongate, and pointed at its ends. Lateral teeth tricuspid; two of

the cusps are produced together anteriorly, and the third cusp is less sharply pointed and produced posteromedially.

Type locality: Iquique, Chile, 20° 13'S, 70° 10'W; lower intertidal zone, on sides and undersides of rocks on gravel and coarse sand substrate, August, 1964, 85 specimens.

Type material: Holotype, LACM 1593; 5 paratypes, LACM 1594; 5 paratypes, USNM; 5 paratypes, CAS; 5 paratypes, AMNH; 5 paratypes, SDNHM; 5 paratypes, ANSP.

Discussion: *Aesopus aliciae* is not similar to any species of *Aesopus* reported from the eastern Pacific. It is closest to *A. myrmecoon* (Dall, 1916), from California, but the latter species is more slender, white, and has axial sculpture of axially-elongate microscopic pits that do not continue as grooves across the interspaces of the spiral sculpture. *Aesopus aliciae* is named for Señora Alicia Moreno of Viña del Mar, Chile. She and her husband Oscar have made my visits to Chile more enjoyable with their kindness and hospitality.

Mitrella Risso, 1826*Mitrella unifasciata* (Sowerby, 1832)

Figure 75

Columbella unifasciata Sowerby, I, 1832, pt. 2:114;Reeve, 1859, vol. 11, *Columbella*, pl. 19, fig. 107;

Tryon, 1883, vol. 5:116, pl. 47, figs. 40-44.

Columbella unizonalis Gray, 1839:129.*Astyris unifasciata*, Dall, 1909:217.*Mitrella unifasciata*, Carcelles, 1950:60-61, pl. 2, fig. 36; Carcelles and Williamson, 1951:293.

Occurrence: Common on undersides of rocks in gravel, locally abundant. Iquique specimens: 1070.

Distribution: Pucusana, Peru (LACM), to Valparaíso, Chile (Dall, 1909). Type locality: Valparaíso, Chile (Sowerby, 1832).

Cilara Thiele, 1924*Cilara secalina* (Philippi, 1846)

Figure 76

Buccinum secalinum Philippi, 1846:53.*Pyrene* (*Cilara*) *secalina*, Thiele, 1929:302, fig. 331.

Occurrence: Dead specimen in intertidal gravel. Iquique specimens: 1.

Distribution: Pisco, Peru (USNM 655655) and Iquique, Chile. Type locality: Chile (Philippi, 1846).

Remarks: The present specimen was identified by Dr. George E. Radwin, who also allowed me to examine a specimen of *C. secalina* on loan from the United States National Museum.