

MINUTE SHELLS - Part 3

by Bert Draper

From the Pacific Coast of North America--from Alaska to the west coast of Baja California-- at least 600 species of small or minute shells (generally under ten millimeters in greatest dimension) have been described and named. Even more species are known from the Panamic Province--from the Gulf of California to Ecuador and Northern Peru, including the off-shore islands as far West as the Galapagos Islands.

In my discussion of minute shell species, it would be too great a task to try to include all of these species, so I will limit it to those species more commonly encountered and to those rarer species which for some reason are especially interesting. Certain genera include so many species that it will be wiser to discuss generic characteristics and then pick some typical species to discuss as representatives of the genus or of its subgenera. The order in which I will cover these species will follow the same taxonomic order as used by Dr. James McLean in his book MARINE SHELLS OF SOUTHERN CALIFORNIA. (I urge all readers interested in minute species to obtain a copy of this book, if you do not already have one.) It contains descriptive information on nearly one hundred species which are of such size as to fall in the small or minute category, and has included good photographs of each species.

For minute shells of the Panamic Province, Dr. Myra Keen has provided figures and some descriptions of quite a few of these species in her Second Edition of SEA SHELLS OF TROPICAL WEST AMERICA. I will include some of these and some species that she has only mentioned by name, but time and space will not permit thorough coverage of the Panamic minute shells, and I certainly have not gone far enough with these species to do so anyway.

The first family in the Taxonomic order of Gastropods is Haliotidae, the

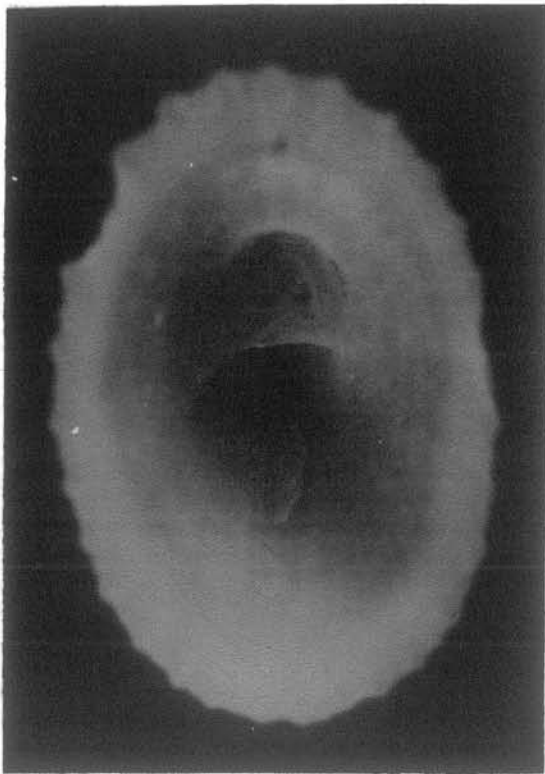
abalones. There are no minute species in this family; however, two closely related families (Scissurellidae and Fissurellidae) do include such species. In both of these families the shells have slit-bands as do the abalones, but there is only a single opening in the slit-band instead of several as in the abalones. On our coast, the family Scissurellidae includes only minute or microscopic species. Genus *Scissurella* of this family has four species, in all of which the opening in the slit-band consists of a slot extending inward from the edge of the outer lip. The largest species is *S. kelseyi* Dall, 1905 which has been found from British Columbia to the Coronado islands off the Northern Baja California coast. It reaches 5.5 mm in diameter. *S. chircova* Dall, 1919 from Chirikoff Island, Alaska; *S. epicharis* McLean, 1970 from the Galapagos Islands; and *S. keenae* McLean, 1970 from the southern part of the Gulf of California, are all deep water species. The latter two are pictured in Myra Keen's book. In all of these, the slit-band extends around the periphery of the shell ending in a narrow slotted opening in the last one-sixth of the final whorl.

The genus *Sinezona*, of the same family, appears to have but one valid species in the Eastern Pacific waters, *S. rimuloides* (Carpenter, 1865). The microscopic shells of these tiny mollusks have been found in finely sifted grunge from eelgrass roots or under kelp, almost anywhere from as far north as San Francisco to as far south as Chile and westward at least to the Galapagos Islands. This species is well figured in both the McLean and Keen books. Adult shells have a very distinctive elongate oval opening or fissure in the slit-band slightly back from the edge of the outer lip. In juvenile shells this opening may start at the outer lip as a slit. Under a microscope these little shells often show slanted axial ribs below the slit-

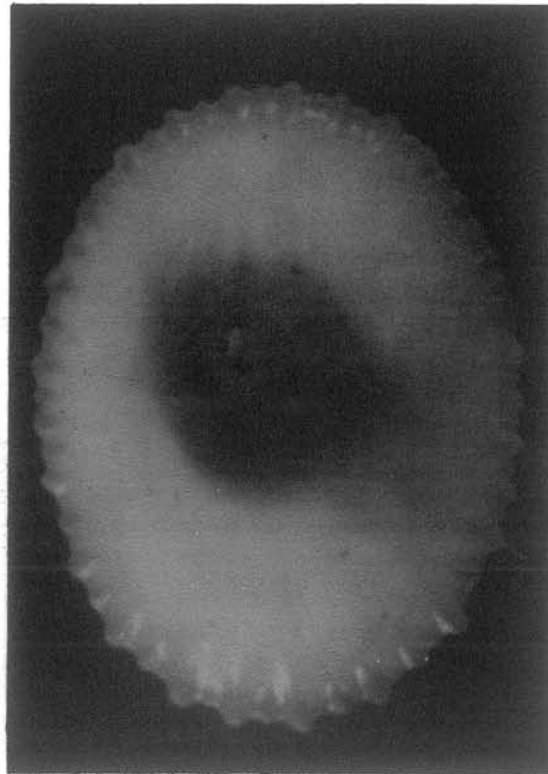
band and spiral lines on the base. The largest of these shells seldom reach 1 mm and to the naked eye they look like small white grains of sand.

The family Fissurellidae also shows its relationship to the abalones by having an opening or fissure in the shell, but in some species the slit-band is almost gone. Several species of this family are small enough to fall into my minute shell category. The first two, both deep water species from our tropical waters, are *Emarginula velascoensis* Shasky, 1961 and *Nesta galapagensis* McLean, 1970. Both are described and figured in Myra Keen's book. Three species of the genus *Puncturella* are quite small and may show up in dredged material or even beach wash along much of our shoreline. *P. galeata* (Gould, 1846) and *P. cooperi* Carpenter, 1864 are two

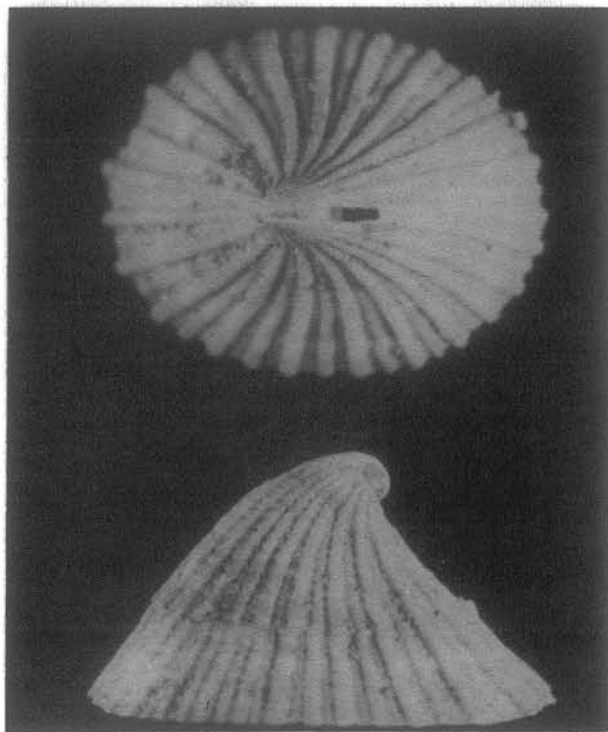
of these that look much alike from the outside, but differ inside the shell, in that *P. cooperi* has a small arching shelf just inside from the fissure while *P. galeata* has this shelf plus a curving supporting sulcus between the shelf and the inner edge of the fissure. Figures 1 and 2 may help to show this difference. The third species, *P. punctocostata* Berry, 1947 (Fig. 3) is generally found only from deeper water. It has minute punctations along the inner edges of its ribs. Otherwise its shape and appearance is much like the other two species. One other minute species of this family is found in the Gulf of California, *Rimula mexicana* Berry, 1969. Keen covers this species well. *Rimula astricta* McLean, 1970 has recently been described from the Gulf of California [= *R. mexicana* according to Keen - Ed.] and



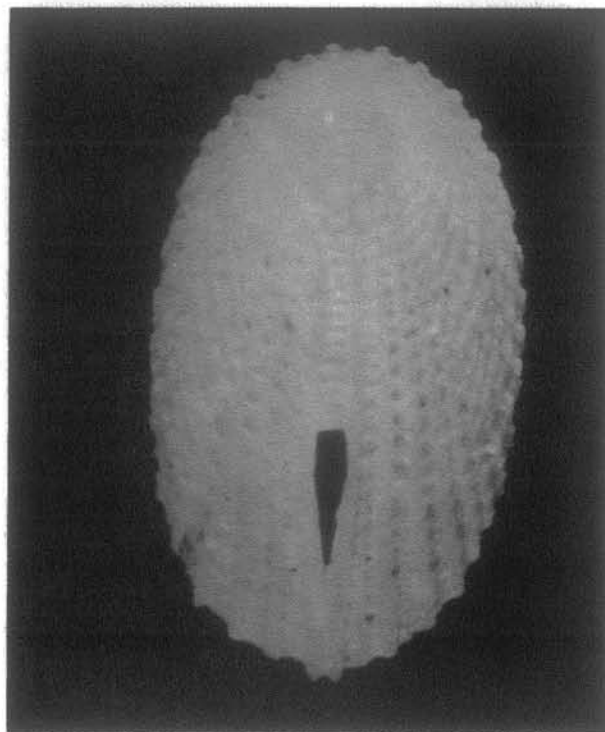
(Fig. 1) *Puncturella cooperi* Carpenter, 1864. Internal view, showing shelf beneath apex, without supporting sulcus. Shell length 5.5 mm.



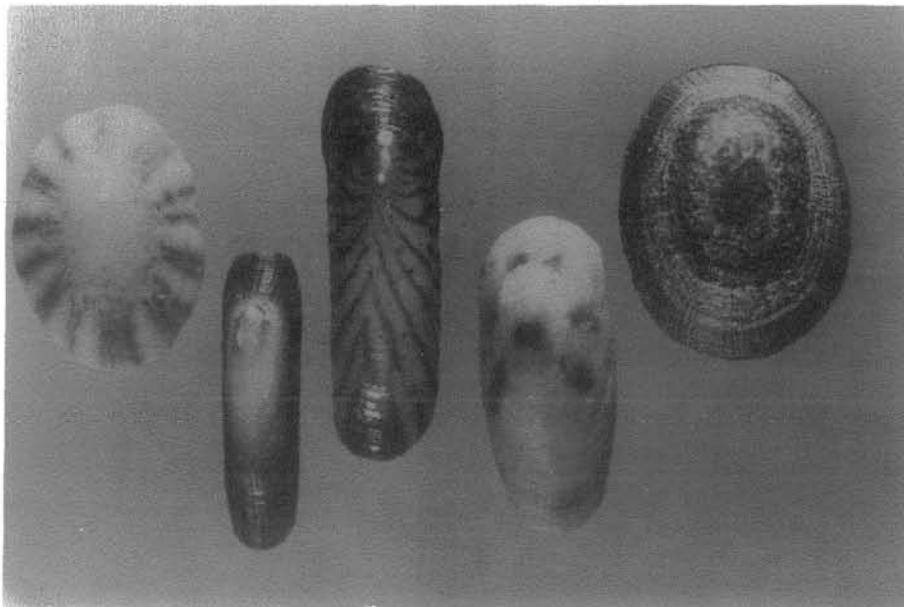
(Fig. 2) *Puncturella galeata* Gould, 1846. Internal view, showing shelf and supporting sulcus. Shell length 8 mm.



(Fig. 3) *Puncturella punctocostata* Berry, 1947. Dredged off Redondo Beach, Cal. by John Q. and Tom Burch, 1935. Shell length 5 mm.



(Fig. 4) *Rimula mexicana* Berry, 1969. Escondido Bay, Baja Cal. H. DuShane, 1970. Shell length 4.7 mm.

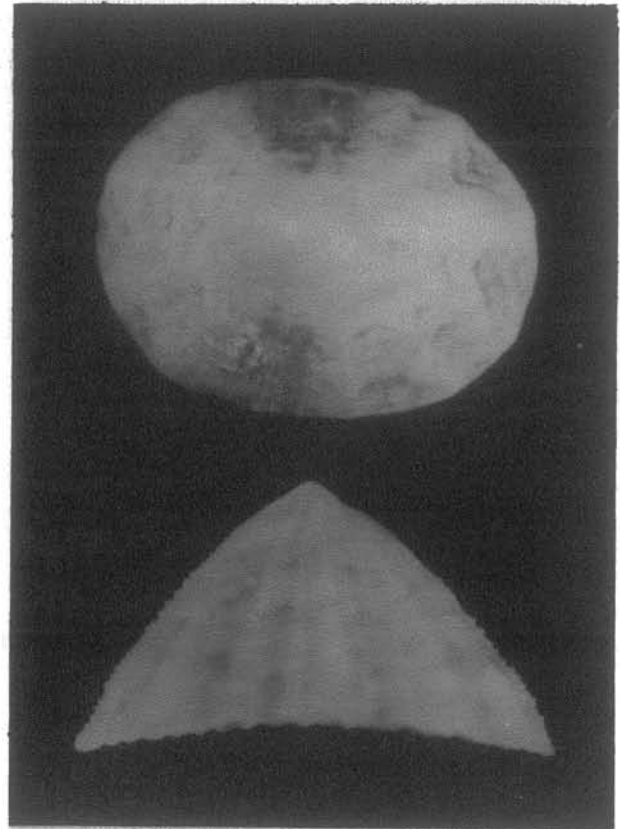


(Fig. 5) Five very small species of California ACMAEIDAE. L. to r. *Acmaea rosacea* Carpenter, 1864; *Notoacmea pal-sacea* (Gould, 1853); *Notoacmea depicta* (Hinds, 1842); *Acmaea triangularis* (Carpenter, 1864); and *Collisella asmi* Middendorff, 1847; All from San Pedro, Calif. area. Collection of B.C. Draper.

Rimula californiana Berry, 1964 from Catalina Island to Outer Baja California. My photograph of *R. mexicana* (Fig. 4) is quite typical of the genus.

The next family with some minute or quite small species is Acmaeidae, which has at least nine such species between Alaska and outer Baja California, and three from the Panamic Province. Two species from Alaskan waters, *Acmaea apicina* Dall, 1879 and *A. rosea* Dall, 1872 have not been seen by the writer. *A. apicina* is described as looking like a small *A. mitra* Rathke, 1833 with blunt rounded apex and a yellow or dull orange spot at the apex. *A. rosea* is of deep rose color on the outside, white with a rosy border on the inside. It is smooth except for a few faint ridges from the apex, which is near the anterior margin. Genus *Acmaea* has two other minute species found along our coast on rocks or on stems of certain sea plants. *A. rosacea* Carpenter, 1864 is shown in Dr. McLean's book in one color form while my photograph (Fig. 5) shows another color pattern. The basic color is pink or orange-brown, with white rays or dots extending out from the apex. Most shells found will be under 5 mm in length, but a large shell may reach 8 mm. *A. triangularis* (Carpenter, 1864) is a white shell with deep brown spots, one at the apex and five or six radiating out from the apex. A side view of the shell shows its triangular shape which gives it its name. Usually these shells are under 6 mm, but one has been found that is nearly 9 mm in length.

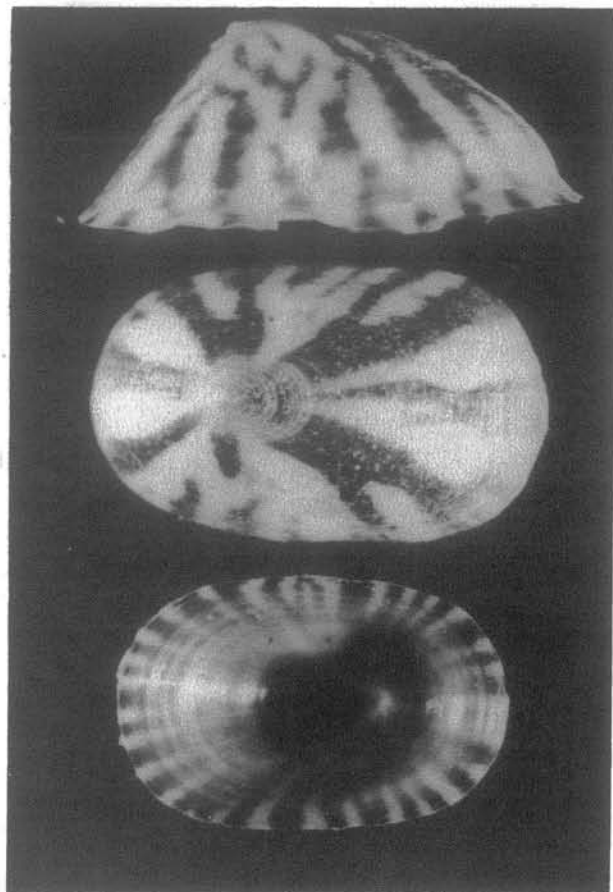
Genus *Patelloidea* has one small species, *semirubida* (Dall, 1914), which may be found throughout the Gulf of California (Fig. 6). At first glance some of these shells look much like *A. rosacea*; on closer study, however, the red or brown markings take on a chevron or triangular shape, and a side view of the shell shows the basal margins curved away from the apex at either end of the shell, and the apex rises much higher. In size this species occasionally reaches 7 mm in length and over half that much in height.



(Fig. 6) *Patelloidea semirubida* (Dall, 1914). Top and side views. Puertecitos, Baja Calif. Length 6 mm

There are several small species of genus *Collisella*: *C. alveus* (Conrad, 1831, an Arctic species which is found as far south as British Columbia, occasionally reaching to 11 mm size, has dark brown rays in various patterns (Fig. 7). This species was also named *Acmaea paralella* Dall, 1914 but *alveus* takes priority and it truly belongs in genus *Collisella*. *C. asmi* (Middendorff, 1847) is a small black species which is usually found only on black tegulas [*Tegula funebris* (A. Adams, 1855)] which they match in color and outer shell surface. Most of these shells are under 10 mm, but a few reach 11 or 12 mm. The interior is bluish and highly polished. *Collisella mitella* (Menke, 1847) and *C. strongiana* (Hertlein, 1958) are two small Gulf species included in Myra Keen's book.

The genus *Notoacmaea* has four small species along our U. S. Pacific



(Fig. 7) *Collisella alveus* (Conrad, 1831). Three specimens from Grant Island, Alaska. ex Willett Collection. Largest 11 mm.

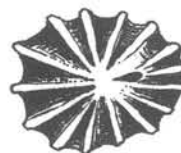
Coast. *N. depicta* (Hinds, 1892) sometimes grows somewhat above 10 mm out most shells will be found smaller. *N. paleacea* (Gould, 1853) is much narrower and relatively higher in shape. Both of these species are found on eel grasses along the Southern California coast, and south along Outer Baja California. *N. paleacea* also ranges north to Canada. *N. gabatella* (Berry, 1960) is a more oval-shaped small species with light brown narrow stripes radiating out from the apex, which is set well to the front of the shell and lower than the midpoint. It has been taken between San Pedro and San Diego. *N. lepisma* (Berry, 1940) is our final small limpet. This species looks much like *N. depicta* but is somewhat broader and relatively lower. The apex is set even farther forward than in *depic-*

ta and the shell slopes quite concavely from the apex to the forward margin. The color is gray with tan stripes radiating from the apex. It was described from a pleistocene fossil, but the writer has recent specimens from the San Pedro area.

Juvenile specimens of many of the larger species of Acmaeidae are commonly found in the type of grunge that yields the best minute shells. These small shells will often fool even experienced collectors, as they may look quite different from the adult shells of the same species, and they quite often have an adult appearance. Comparing these shells with a growth series of the various species of Acmaeids will help clear up the proper identity of these shells.

In Part 4 of this series, the next few families in the taxonomic order will be discussed.

(All photos by Bert Draper)



INJURED ABALONE

One of the unfortunate things about diving for abalone is that the animal may sustain deep punctures in its foot or other soft parts when it is scraped off a rock to be measured to ensure that it has reached a legal harvestable size. Many divers believe that abalone are hemophiliacs and that a wounded one will bleed to death even if immediately placed back on the site from which it was taken.

The blood of abalones, like that of all mollusks, lacks coagulating proteins and, consequently, these animals are susceptible to blood loss following injury. This is prevented to some degree by the clumping together of blood cells; however, there is still a risk that fatalities will result from even a minor injury. (Sea Secrets, Vol 16, No. 5. International Oceanographic Foundation.)