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From the Editor's Desk

Sitting in my office, at the rear of Of Sea and Shore Museum, trying to think of something to write for this issue, I looked out the window. I'm fortunate to have a view of a bit of Hood Canal, an arm of Puget Sound. On this March afternoon I was surprised, and delighted, to see two California Gray Whales cavorting in the shallow water just off the beach near the Pope & Talbot sawmill. They were close enough that I could see the encrusting barnacles on their backs. It made me think of all the wonders that the waters of the world hold and it made me glad that my hobby concerns some of the more fascinating of these denizens. Isn't it nice to have a hobby that, with diligence, you can enjoy and also add to the scientific knowledge of our world? Amateur natural history buffs are the basic contributors to many of the natural sciences through their observations and collecting specimens which scientists can use in their various research projects. Wouldn't it be a much sadder world if this enjoyment of natural history objects were denied to the great majority of us through passage of restrictions and bans on our pursuit of our hobby? As you will note in this and succeeding issues, we highlight recently described species of mollusks - many of which come to light for the first time through the efforts of amateur hobbyists like you and me.

So keep observing, keep enjoying, and join us in continuing to marvel at the wonders of our planet Earth.

Tom Rice, Editor

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"WHEN JOEL GREENE MEETS TOM RICE"®



What's going on here?

You'll just have to wait until our next issue. The event depicted above took place on Phuket Island, Thailand in November of 1994 at the home of Henry Roussy. What do you suppose two people who have been leading shelling tours for more than twenty years each would have to talk about? Maybe we'll tell you a little about that - maybe not.

Also in our next issue we'll continue the checklist of Philippine land shells started in this issue and we'll also have a listing of the gastropods found of the northeast coast of North America. And we're hoping to have the story of a recent collecting trip to East Africa. We'll also include your article - if only you'll send it in!

So, send in your article, news items, comments, advertisement, exchange notice, photographs, puzzles, poems, etc. By the way, Tom is on the left and Joel on the right in the above drawing by Somwang ("Jom") Patamakanthin.

Octopus giganteus: Still Alive and Hiding Where? Part III

Lusca and Scuttles of the Caribbean

**Gary S. Mangiacopra, Michel P. R. Raynal,
Dr. Dwight G. Smith & Dr. David F. Avery**

RUMORS FROM THE ATLANTIC:

NATIVE TRADITIONS, ORAL REPORTS - AND ANOTHER STRANDING?

On June 11, 1983 the first International Society of Cryptozoology (=ISC) conference was hosted and moderated by Dr. Joseph F. Gannaro, Jr., at New York University. During the afternoon session, one of four informal slide presentations was by Dr. Gennaro and was entitled: "Is There a Giant Octopus?". Joining him at the podium was Dr. Forrest G. Wood, giving his recollections of the events (*ISC Newsletter*, 1983a). During their talk, Gennaro showed the audience of 50+ the jar containing the last remaining known fragments of *O. giganteus*.

Five years later, on May 14, 1988, the 7th I.S.C. conference, organized by ISC board member Dr. Eugene ("The Shark Lady") Clark was held at the University of Maryland at College Park (*ISC Newsletter*, 1988a). Author G.S.M. had the opportunity to meet, for the third time, Dr. Wood and take this occasion to ask him of any update on his giant octopus controversy. Foremost among these questions was if he thought that the species was still in existence. Wood replied that he considered this species to be living in the Atlantic and that he had plans to do a follow-up article. Sadly, Wood never had the opportunity as death took him on May 17, 1992 at his San Diego, California home at the age of 73.

Since Wood's passing, others are now continuing in his footsteps, gathering whatever sparse information's available of possible encounters of *O. giganteus*. Though some of the data can be viewed as circumstantial, taken together it may indicate the probable habitat range in the North Atlantic.

Verrill (1897) is credited as being the first zoologist to have speculated upon this species's habitat range. It is

not known as to what sources Verrill consulted to reach his conclusion, but he proposed the broad plateau that was swept by the Gulf Stream, from South Carolina to northern Florida, to be the probable habitat range. Wood, in 1983, suggested that the likeliest habitat would be the steep slopes existing on the Gulf Stream side of Bimini or on the east side of Andros Island in the Tongue of the Ocean (*ISC Newsletter*, 1983b).

Wood's habitat proposal was based upon the oral reports he had personally received when he was in this regions some thirty years previously. In March of 1956, Wood was sent to the West End, Grand Bahamas Island, to survey the location as a possible collecting site. While there he engaged the services of Duke, a fishing guide who was extremely knowledgeable of the fishes of the local waters. Wood recalled one evening's conversation that included references to giant "scuttles" which he understood was part of Bahamian lore. In the course of this conversation with Duke, Wood learned of three such encounters, the last occurring about ten years before (circa 1946). Descriptions of the "scuttles" was that their arms could reach 75 feet and that they were seen in shallow waters only when sick or dying. Their danger towards fishermen was only if they could hold fast to the sea bottom and, at the same time, reach a small boat floating above.

A few evenings later, while in conversation with the island commissioner, a well-educated and conservative native of Andros Island some 40 years old, revealed his own personal encounter with a "scuttle". As a lad of about twelve (making the year about 1925), he was fishing, with his father and another man, for silk snappers in 600 feet of water. As the line was drawn up it felt at first as though the hook was caught on the bottom. Then a large octopus was seen, through the clear water, to be clinging to the line. Detaching itself from the hook and reattaching itself to the bottom of the boat, the octopus then released its hold and returned to

the depths. As to its size, the commissioner did not elaborate, but stated that it was not comparable to the common shallow water octopus. (Wood, 1971)

The local Bahamian lore regarding these giant "scuttles" can be documented at least back to the last third of the 19th century. In 1872, a Mr. J. S. George, of Nassau, in a letter to Mr. B. G. Wilder, told of a huge octopus ten feet long and with each arm measuring five feet. "This is the first specimen I have seen during twenty-seven years residence in the Bahamas, but they are known here traditionally of immense size". (Wilder, 1872)

Another writer, of French nationality, Benedict-Henry Revoil (1863) related how an American sea captain told him that in 1836 his ship was attacked by a kraken near the island Lucayes (= bahamas). The captain told of the event in which the kraken extended its gigantic tentacles and how it carried away two of his men. Though the helmsman retaliated by cutting off one of the arms of the monster, which measured 3.5 meters (11.5 feet) in length and was the size of a human waist in diameter.

A more recent encounter, in which a giant octopus was mutilated by naval men, came to the attention of Wood shortly after the publication of his Natural History article. Wood's hometown newspaper, the San Diego Evening Tribune, reported in its columns of his rediscovery of this tale. A Mr. John C. Martin (BMC, USN Ret.) wrote Wood a letter recounting his own personal encounter with a similar animal:

"It never occurred to me that an animal such as this was related is still in doubt in the scientific world of today. This correspondent saw one of those creatures in the same general area as the one in the news item as mentioned. The way this giant octopus came to my attention was by accident.

"In 1941 I was a coxswain in the first division aboard the USS Chicopee A0-41. My section was on duty in the second dog watch manning the 3-inch gun on the forecabin and kept a good lookout for periscopes and any other part of the enemy. The ship had departed Baton Rouge, Louisiana with a cargo of aviation gasoline and fuel oil for Portland, Maine.

"It was in the last of March or April that the ship was steaming off the coast of Florida in general area of Fort Lauderdale and St. Augustine. Dead ahead of our course appeared something on the surface of the water that could not readily be described. The closer we approached it looked like a huge pile of brown kelp seaweed. As it moved into view there was no doubt as to its identity. The coils of its arms were looped up like huge coils of manila rope. However the coils were over 36 inches in circumference. This last deduction was compared to the girth of my waist at the time.

"There was no mystery as to why we were able to see this monster animal after we had time to reflect on the circumstances preceding its occurrence. There had been preceding our arrival at this segment of our journey two destroyers. They were rearranging the ecology on the floor of torpedo junction like an underwater Fourth of July."

Wood called Martin two days later and received additional information regarding this naval encounter. The animal in question was observed by all of the gun crew and reported to the watch officer, but was probably not recorded in the ship's log. There was enough light for good visibility to see that the creature's arms seemed about equal in length, coiled but moving slowly. Diameter of this animal was estimated at about 30 feet.*

It must be remembered that in this same general area, off Palm Beach, in 1897, a New Haven, Connecticut resident, Judge Tuttle, was attacked while in his boat by an octopus - suffering acute pain where the tentacles had touched him. One might question whether this could have been a garbled account of an encounter with a jellyfish in which Tuttle had an allergic reaction to the touch of the tentacles. Or might it have been a fortunate escape from an encounter with an immature *Octopus giganteus* as this octopus behavior coincided with those of the Bahamian "scuttle". As for the pain inflicted upon Tuttle - this could have been caused by tentacle suckers as there is no indication that the sucker's edges are smooth, as in the common octopus, or serrated.

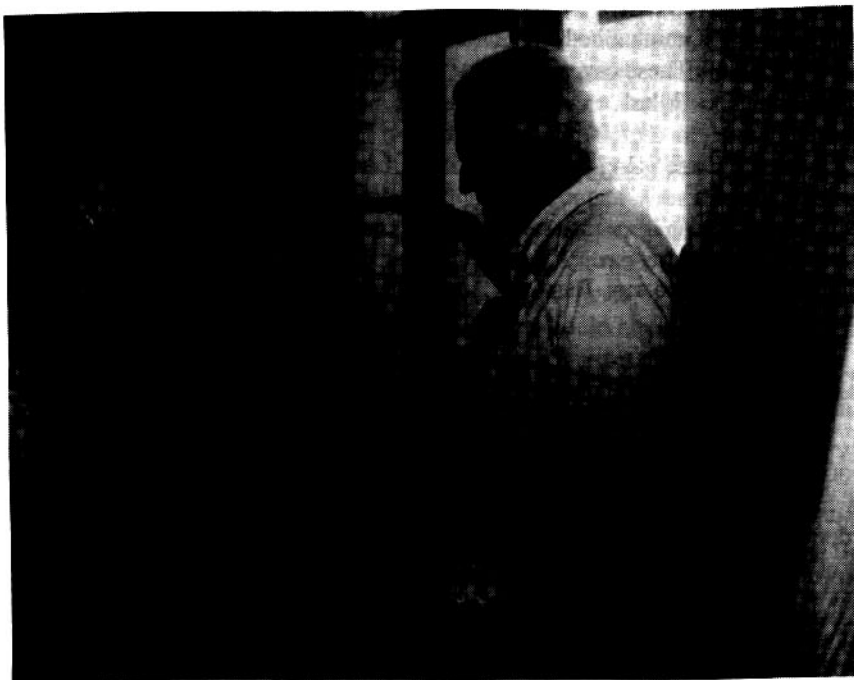
The late Bruce Wright (1967), Director of Wildlife Biology at the Northeastern Wildlife Station, New Brunswick, Canada, wrote of his experience with the "Lusca" of Andros Island. The "Lusca" is described by the natives as "a large and dangerous beast that appeared from its description to be half octopus and half

* Author M.P.R.R. comments on the comparison of Martin's injured animal and the 1896 St. Augustine beach carcass:

- the arms were 36 inches (91 cm) in circumference, that is to say 11.5 inches (29 cm) in diameter. It is the same order of magnitude as in the Saint Augustine specimen: 10 inches (25 cm) in diameter as were the arm that was cut, according to Webb; and about 13.8 inches (35 cm) near the base from my calculations on the photographs.

- the length of the arms, 30 feet (9 m) is shorter than in the Florida monster, but Webb examined the carcass at leisure, and measurements could be accurately made, whereas Martin tried to "uncoil" the arms in his mind.

- what should we understand with the "diameter of the creature"? Certainly not the diameter of the body, because it would suppose a diameter about 6 times greater than in the Florida monster (about 1.5 m). Even the length of the body of the latter (6 m) is 1.5 times shorter than Martin's specimen. It is thus rather believed that this diameter refers to the "umbrella" of the octopus: in the common octopus, the umbrella is at the base of the arms, but in some species it can reach the tip of the arms (as in some cirrate octopods).



Dr. Forrest G. Wood (right) in discussion with Dr. Eugene Clark (frequent National Geographic contributor at the ISC Conference, in 1988, at the University of Maryland.



Dr. Forrest G. Wood (left), rediscoverer of the 1896 St. Augustine, Florida beach carcass talks with Gary S. Mangiacopra, who now carries on Wood's pioneering efforts. (Photograph taken by, and courtesy of, J. Richard Greenwell, Secretary of the International Society of Cryptozoology; July 13, 1983.)

dragon." This hybrid beast is believed to live within the caverns in the limestone rock in the uninhabited interior and western coast of Andros Island. These caverns have an interesting nickname: "the Blue Holes".

THE LAIRS OF THE LUSCA?

"De Luscas, mahn, dat his hole. He drag our boat down theah. All the conch, them crawfish, dey his'n now. We jus' lucky he doan' get us. Th' boat too, that his now. That Lusca, he bad, mahn!" (Palmer, 1987)

Wright himself may have had a near-meeting with a Lusca, circa 1947, in a blue hole. While training British frogmen near Nassau, he had taken the whole unit out to see the most famous hole, the great "Hole in the Ocean". This being a huge vent in the sea floor 40m feet in diameter at a depth of only 30 feet and located about two miles south of Rose Island. Diving to the rim of the blue hole, a few of the divers were descending briefly into it, but were forbidden by Wright to continue when schools of large jacks, which had gone into the hole on the divers' approach, came out in a panic. Since the divers possessed no lights to see in the pitch blackness, nothing else was observed. But all felt a strong swirl as if a jet of water was being forced out of the hole. As Wright descended, a remora came up and tried to attach to his leg - he noted that remoras are rarely found far from some large sea creature.

Wright also related several additional possible Lusca encounters. Dick Birch of Small Hope Bay told him that, several years previously (prior to 1967), a sperm whale was seen breaching, with something tangled about its head. They could not get close enough to distinguish just what it was. This incident occurred in the "Tongue of the Ocean", a basin several hundred fathoms deep what is inserted into the Bahamas Bank and connects with the deep sea off the east coast of Andros Island. Wright postulated that this probably was a combat between a sperm whale and a giant squid. But it could be questioned - could this have been an encounter with a specimen of *Octopus giganteus*?

Further, Wright noted that the local legends claimed that the Lusca could be found inland in deep holes on the island that are miles from the ocean - reaching out with their long tentacles to seize passersby and drag them into the holes to devour.

Wright did not favor the explanation of the Lusca being some giant octopus, but rather are chance encounters with a giant squid. However, one could ask this question: could this native Bahamian folklore actually be based upon past encounters of the tentacles of either the giant squid or, more likely, *O. giganteus* arising from these inland holes? This explanation can rightly be criticized as the wishful thinking of a romantic naturalist

-- but the information surrounding these inland holes may actually give circumstantial support to such a claim.

The "Blue Holes" themselves are one of the Caribbean's mysteries as hundreds of these holes plunge down through the limestone crust of the sea bed. During the last sea-level rising - during the Illinoian glaciation - more than 10,000 years ago, these blue holes were located in shallow waters off the eastern shore of Andros Island and elsewhere, and are thought to be evidence of the sea-level lowering of the past. These were formed by subaerial weathering and solutional processes, resulting in subhorizontal passageways and vertical pits extending more than 100 meters below the present sea level. (Benjamin, Schwarcz and Ford, 1979)

This freshwater connection between the coastal blue holes and the inland brackish waters of the "banana holes" were clearly established in 1972 by the camera team from the British television series Survival. Underwater photographer Don Renhnan and marine biologist Kathy Sellers, while flying over Andros Island in a light plane, had seen large sharks in the holes that were at least 20 miles from the coast. This indicates that the water in these inland holes is salty and comes from the sea through a vast system of underwater caves. Confirmation was obtained by an experiment in which an offshore blue hole was baited with dead barracuda to lure sharks. The same was also done with an inland hole, far back on the island. Several attempts were needed before the sharks appeared in the inland hole, but there was a definite connection. (Willock, 1972)

Barratt (1972) noted that the blue holes of Grand Bahamas, located in the swampland of the north coast some ten miles northeast of Hawksbill Creed, formed an almost perfect circle 200 feet in diameter at a depth of over 200 feet. This hole had claimed both real and imaginary creatures - a five-foot nurse shark and a giant squid.

Further investigation, prior to 1987, showed that these blue holes were very rich in animal life, even supporting an entirely new order of crustaceans, the Remipedia, closely related to creatures seen in 150 million-year-old fossils. (Palmer, 1987)

Whether or not the Lusca is an occasional stray member of the giant squid family or *O. giganteus* (or possibly even both occasionally taking refuge in these holes) is open to debate and speculation. However, these undersea blue holes do contain large amounts of biomass upon which an enormous marine creature could feed. Most of the known octopods, as suggested by Wood, feed upon crustaceans and mollusks while taking fish occasionally. These giant scuttles or lusca probably are active predators, going for a specific prey at any one time.

This theory may actually be supported by several unusual encounters of John P. "Sean" Ingham, owner of Pathfinder Fisheries, located in Bermuda during the mid-1980's. Ingham's profession was to conduct a deep crabbing and fishing operation, at depths of 1,000-2,000 fathoms, using specially designed traps. During 1984 trapping discovered stocks of skinny red shrimp which measure a foot in length and weigh 7 ounces and crabs measuring, from claw to claw, two feet across. The 50-foot vessel, *Trilogy*, fishing about 30 miles off Bermuda's west coast, on August 29, in 500 fathoms, was pulling in an 8x8x4.5 foot trap containing approximately 5,000 pounds of *Geryon* crabs. As the trap broke the surface the line broke and all were lost. Something was attracted to the crabs and had the strength to break the line.

Several days later a second, smaller (6x6x3 foot) trap was lost while being raised from a depth of 500 fathoms. When at a depth of 300 fathoms the winch rope was pulled backwards at a speed of 30 mph. The reversal was stopped and the trap again raised. At a depth of about 250 fathoms a series of "jerks" parted the line. This event, on September 3rd, occurred about a mile from the site of the August 29th incident.

A third incident occurred on September 16, 1984. Hauling up a 3x3x1.5 foot trap, from a depth of 480 fathoms, to the boat which was directly above, the trap could not be lifted off the bottom. Ingham checked his chromoscope (sonar), using a slip bottom mode, and determined that a "pyramid shape, approximately 50 feet high" was on the trap. Whatever this mass, 20 minutes later it began towing the boat at a speed of about one knot to the south. Traveling 1/3-mile toward the inshore shelf, Ingham held the rope and was able to feel distinct thumps, like something walking. The rope went slack and the trap was finally hauled aboard, with only slight damage to one side. (*ISC Newsletter*, 1985)

Some twenty years ago author Mangiacopra reported, in this journal, an encounter with a monstrous jellyfish that had occurred in this same area. (Mangiacopra, 1976) Two skin divers, Richard Winer and Pat Boatwright, were diving, in November of 1969, at depths of 30-40 feet about 14 miles southwest of Bermuda, where the bottom is 1,400 feet deep. Shortly after exhausting the film in his camera, Winer saw a large 50-100 foot, nearly perfectly round, unidentifiable object beneath them at a depth of 100-150 feet. The object's color was of a deep purple, with the outer edge pink and pulsating. No water movement was discernable as this pulsing mass ascended towards them. Retreating towards the surface, the divers noticed that the mass stopped its ascent and started to descend into the depths. All this unfolded in 4 to 5 minutes.

Until Ingham's encounters, there had been no other reports of giant octopuses anywhere besides the Bahamas region, but now the area surrounding Bermuda must be considered. In 1989 the French crew of the diving saucer *Cyana* saw a cirrate octopod that changed shape on contact with the saucer's arm - taking on a bell shape by expanding the web, or "ballooning". (Boletzky, Rio and Roux, 1992) It might be surmised that this behavior response in the smaller members of this order could also occur in a gigantic member.

Should the range of these giant creatures be extended west? A century old report of a boat-dragging incident similar to Ingham's comes from the Texas coast. During January in 1880 it was alleged that a "devil-fish" had done such a thing. The *Galveston News* noted that the American ship *Lancaster* had caught fire and sank in the outer roadstead of this port. The ship wreck attracted fish and so local fishermen came here to try their luck. The smack *Rinaldo*, commanded by Captain Leon St. Marie, reached the wreck and commenced to haul in trout, redfish and whiting. Suddenly there was a great commotion in the surrounding water and the anchor hawser became taut and soon the vessel began to move through the water at a rapid rate. At first the direction was straight out to sea, but after three miles changed to the direction of Point Bolivar and ran to within 1½ miles of the beach where, just as the sun was sinking, whatever was towing the vessel released it and the boat came to a stop. (*New Haven Journal and Courier*, 1880)

A SECOND STRANDING?

In May of 1988 a Bermudian fisherman, Teddy Tucker, came across an eight-foot long "blob" in shallow water in Mangrove Bay. Though by profession an expert wreck diver and fisherman, Tucker was unable to identify the "very large and rubbery" remains. Writing to his friend, Dr. Eugene Clark, who later forwarded the information to J. Richard Greenwell (Secretary of the ISC), Tucker said color photographs had been taken and tissue samples preserved. Unfortunately these samples were lost during shipment to Washington, D.C. A second tissue sample was personally acquired by Dr. Clark during a research trip to Bermuda. (*ISC Newsletter*, 1988b; Greenwell, 1993)

Analysis of the sample was done by Dr. Jeffrey K. Taubenberger, Department of Pathology of the National Cancer Institute, U.S. National Institute of Health, in Bethesda, Maryland. Results indicated that the cellular structure was not evident, but the tough, fibrous material appeared to be collagen. Further examination using an electron microscope by Tim Maugen, Department of Zoology at the University of Maryland, confirmed it was collagen.

Another sample was submitted to marine invertebrate physiologist Sydney K. Pierce who undertook an amino acid analysis. Indications were that the material had come from a poikilotherm (cold-blooded vertebrate) like a fish or reptile. However, it is possible that the formalin preservative may have altered the amino-acid composition, resulting in questionable results. (ISC Newsletter, 1994)

As of this date just what animal was the origin of this blob is uncertain. But the suspicion is that this carcass and that of 1897 came from the same species of animal. Further analyses of the tissue sample may help with this identification.

DISTANT COUSINS?

Though reports of giant octopods seems limited to the region of the Bahamas and the coast of Florida, rumors indicate a possible extension into the Caribbean. Author Francois Poli (1957) tells of Cuban fishermen talking about gigantic octopuses measuring 50 feet across and "capable of dragging down a 20-foot boat". Further legend has it that they never surface "except on certain nights when the moon was full." One fisherman, named Torial, related that "off certain desolate coasts in Mexico, monsters appeared which had never been accurately described, as no one had ever come within a mile of them. They had a huge cylindrical body striped with yellow, and tentacles somewhat like those of an octopus. Whenever one of them was reported offshore the fishermen would refuse to put to sea for days."

A questionable report from the 1920s came from the explorer-writer F. A. Mitchell-Hedges (1937) while he was on the coast of British Honduras (now Belize). A local, named Gabriel, was paddling his canoe from Stann Creek and saw, in the distance - in an area called Water Cay - a huge dark mass in the clear water. The mass changed shape and color continually and loomed close to the small boat. Over the boat's side came an enormous slimy tentacle "large around as his thigh" that Gabriel struck with his paddle. Escaping, he had travelled some 200-300 yards when again several tentacles came in over the side of the boat. This time Gabriel took his harpoon and drove it into the center of the writhing mass. The sea became filthy with a brown liquid and the tentacles slipped back over the side.

It must be noted that this area too has similar blue holes and one can speculate that this is an area for further investigation.

CONCLUSION

Currently there are more rumors of "half-dragon half-octopus" animals than actual reports of sightings. Some

validity can be placed on reports originating from the Bahamas to Cuba and on to the Mexican and Belize coasts. Aside from the Ingham encounters in which something very large and tangible dragged his crabbing vessel, the scattering of reports are circumstantial in nature. They do indicate, however, that some large marine animal was being sighted and that probably it was not a giant squid and may be referred to that other giant cephalopod - the giant octopus.

Further investigation is needed in order to evaluate the habitat and range of *Octopus giganteus* and to see if it is far wider than was originally supposed by Verrill and Wood.

This now leads to the final chapter in this series on what we might be able to surmise about this still unrecognized marine species. "Him of the Hairy Hands. Speculation on this Species." Part IV, next time.

Acknowledgements

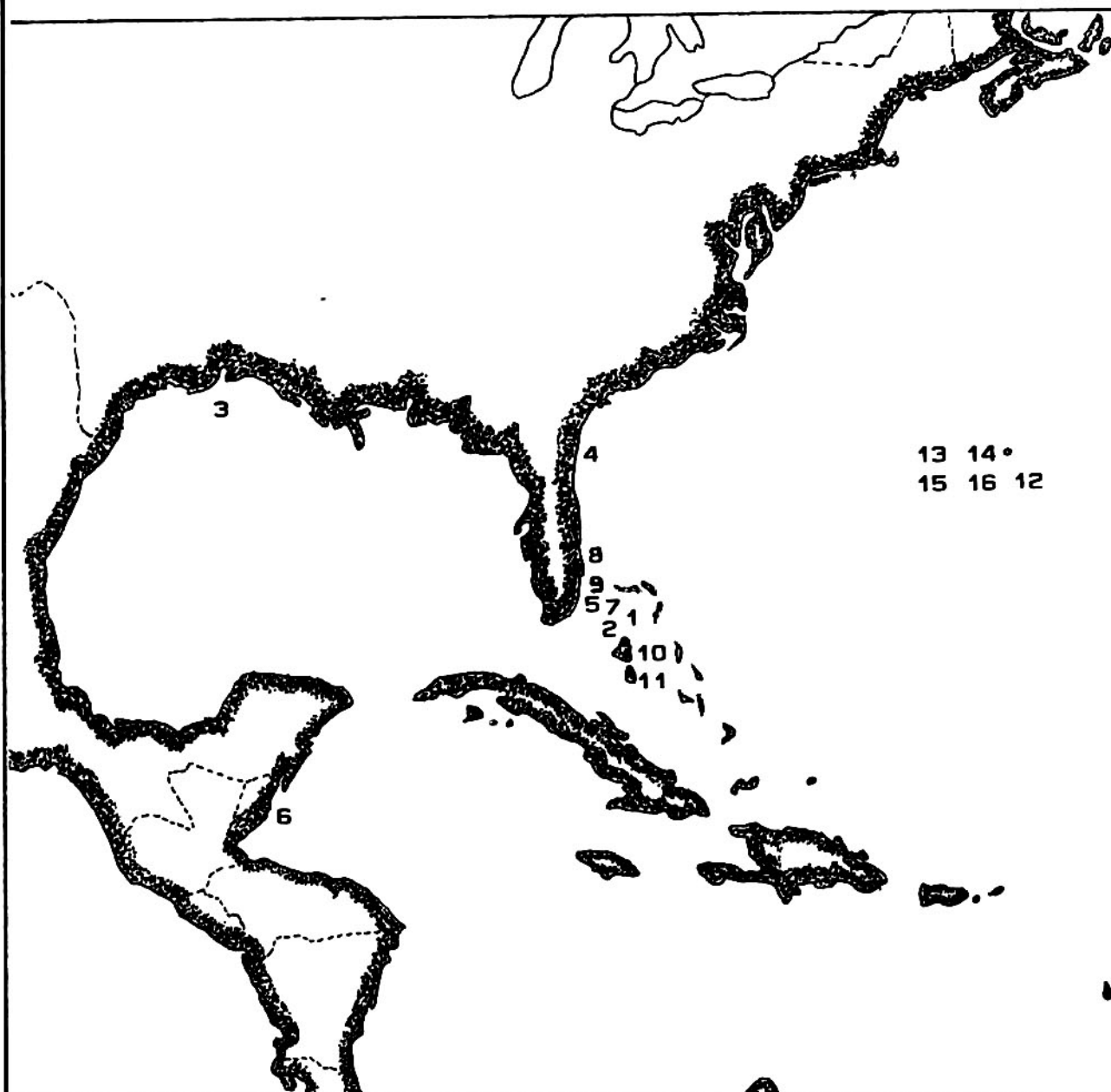
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Possible Sightings of Octopus giganteus Verrill

- | | |
|-------------------------------------|---------------------------|
| [1] American sea captain, 1836 | [9] Duke, circa 1946 |
| [2] George, 1872 | [10] Wright, 1947 |
| [3] <u>Rinaldo</u> , 1880 | [11] Birch, prior to 1967 |
| [4] St. Augustine, 1896 | [12] Winer, 1969 |
| [5] Tuttle, 1897 | [13] Ingham, 1984 |
| [6] Gabriel, 1920 | [14] Ingham, 1984 |
| [7] Island commissioner, circa 1925 | [15] Ingham, 1984 |
| [8] <u>USS Chicopee</u> , 1941 | [16] Tucker, 1988 |

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ATLANTIC SIGHTINGS OF GIGANTIC OCTOPODS:

DATE	LOCATION	OBSERVERS	VIEWED FROM	IDENTIFICATION
1836	Lucayas (=Bahamas)	American sea captain	ship	giant squid?/ O. giganteus?
1872	Nassau, Bahamas	J.S. George	wash ashore	large octopus?/ immature O. giganteus?
1880 Jan.	Galveston, Texas	Capt. Leon St. Marie, several others	<u>Rinaldo</u>	giant squid?/ O. giganteus?
1896 30 Nov.	St. Augustine, Florida	DeWitt Webb, hundreds others	wash ashore	O. giganteus
1897 20 Feb.	Palm Beach, Florida	Theodore Tuttle	boat	jellyfish?/ large octopus/ immature O. giganteus?
1920s	Near Water Cay, British Honduras	Gabriel	boat	giant squid?/ gigantic octopus?
1925 circa	Grand Bahama Island, Bahamas	Island commissioner, 2 others	boat	O. giganteus?
1941	Fort Lauderdale- Saint Augustine, Florida	seamen John C. Martin, other naval personal	<u>U.S.S. Chicopee</u>	O. giganteus?
1946 circa	West end, Grand Bahama Island, Bahamas	Duke		O. giganteus?
1947 circa	Nassau, Bahamas	Bruce Wright	underwater	giant squid?/ O. giganteus?
1967 prior	Tongue of the Ocean, Bahama Bank	Dick Birch	boat	giant squid?/ O. giganteus?
1969 Nov.	14 miles S.W. of Bermuda	Richard Winer, Pat Boatwright	underwater	monstrous jellyfish?/ O. giganteus?
1984 circa 29 Aug.	30 miles off west coast of Bermuda	John P. Ingham	boat	O. giganteus?
1984 3 circa Sept.	30 miles off west coast of Bermuda	John P. Ingham	boat	O. giganteus?
1984 16 Sept.	30 miles off west coast of Bermuda	John P. Ingham	sonar	O. giganteus?
1988 May	Mangrove Bay, Bermuda	Teddy Tucker	wash ashore	unknown/ O. giganteus?

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Intertidal Carnivorous Mollusks of Los Angeles County, California ... A Follow-up

William L. Rader

In the Spring 1994 issue of *Of Sea and Shore* (Vol. 17, No. 2) my article "Intertidal Carnivorous Mollusks of Los Angeles County, California: Marine del Rey to the Ventura County Line" was published. The text was centered around my observations concerning 12 common to uncommon species of carnivorous gastropods that I had encountered in the intertidal zone in a limited area of Los Angeles County over a period that ranged from six to eight years. Any conclusions that I reached were based purely on observations that I made during the late fall, winter and early spring months annually during favorable low tides. In this follow-up article it will be seen how one of my conclusions now seems premature, while a second appears to be becoming a reality. Both instances will undoubtedly lead the reader to conclude once again what deceptively dynamic creatures the gastropod mollusks truly are.

In my 1994 article, under *Nucella emarginata* (Deshayes, 1855), I wrote that an explosion in the population of *Acanthina spirata* (Blainville, 1832) among the *Mytilus* beds upon the quarry rock of the outer northern interior breakwater at the Entrance Channel, Marine del Rey, had apparently relegated *Nucella emarginata* extinct at this locality by the early 1990s. This statement was based upon the fact that no *N. emarginata* were observed at this locality during at least one full season of low tides. This conclusion seems to have been arrived at prematurely.

Remarkably, my observations along the outer northern interior breakwater during this year's January low tides (-1.1 to -1.6 feet) revealed that the population of *A. spirata* seems to have dropped off precipitously while *N. emarginata* has repopulated with a vengeance. While I do not offer an explanation for this reversal of fortunes, it can, however, be seen that *Acanthina* now occurs only in small, disjunct colonial aggregates on the sides and at the bases of the quarry rock where once is numbers flourished. It occupies a position that is now vertically lower than *Nucella*, a position where the *Mytilus* beds appear to be sparser than the dense aggregations of mussels now inhabited by *Nucella*.

The present colony of *Nucella emarginata* at the outer northern interior breakwater is the largest congregation of members of this species that I have encountered in

that area of Los Angeles County under my observation. Visible numbers appear to be in the low hundreds. Most significant is the fact that individuals greater than 25mm or so in shell height appear to comprise a small percentage of the colony. This would tend to verify that this is, indeed, for the most part a young population. That it is a genetically diverse population can be inferred by the number of color varieties in shells that can be differentiated. Finally, as a number of instances of egg-laying were observed among members of this species this winter at this locality, the future existence of this colony seems assured ... at least for the "short term".

In my previous article, I also indicated that at a point along the western extremity of the inner northern interior breakwater, *Acanthina spirata* had been moving eastward into combined populations of *Roperia poulsoni* (Carpenter, 1864) and *Pteropurpura festiva* (Hinds, 1844). This advance now seems well underway, with *Acanthina* numbers burgeoning and the other two species declining. The greater numerical loser at present appears to be *P. festiva*. However, given my recent experience with *Acanthina/Nucella*, it is probably unsafe to draw any firm conclusions concerning what the final outcome of the competition between this trio of carnivores will be at this time.

In 1994 I wrote of having located only two *Maxwellia santarosana* (Dall, 1905) intertidally in extreme western Los Angeles County during eight years of observation. Since I wrote that article, I have encountered two more *M. santarosana*. I chanced upon both after sessions of storms, and both were mature examples (27.5mm and 31.5mm in shell height) of their species. The latest discovery occurred on February 1, 1995, when the 27.5mm individual was found attached to a low rock in the mid-intertidal zone at Leo Carrillo State Beach on a -0.7' low tide. A live *Maxwellia gemma* (Sowerby, 1879), *Ocenebra foveolata* (Hinds, 21844), and *Calliostoma gemmulatum* Carpenter, 1864 were also observed in the vicinity at the same vertical level.

I was fortunate to have made an even rarer discovery later that same month, also following storms. On Saturday, February 25, at Nicholas Canyon County Beach on another -0.7 tide, I came across a hermit crab inhabited *Latiaxis oldroydi* (I. Oldroyd, 1929)

intertidally that measured 18mm in height. I have been apprised that this mollusk generally inhabits rock walls or precipices at a depth of 80 feet or more, and in Southern California it is found more commonly in the waters surrounding the offshore islands, to include Santa Catalina and the Channel islands. Exactly how and over what distance this shell was transported into the intertidal zone remains a mystery to me.

MORE ON MUSICAL MOLLUSCS

I noted with interest the list "Shells Used as Musical Instruments: (*Of Sea & Shore*, 17:4, pg. 191). There is another which could be added. It is an album entitled "Sanctified Shells" by Steve Turré. Most of the album uses four or five shells plus drums, although I believe they use mouthpieces. The album is a release of Antilles Records and the cover features Turré and a large *Syrinx aruanus*.

M. H. BORTNER
Berwyn, Pennsylvania

DEAR EDITOR:

I wanted to tell you how much I have - and still do - enjoy reading *Of Sea and Shore* and appreciate your efforts and dedication that goes into every single issue.

Of course usually one doesn't write as long as everything is fine and only grabs the pen when something isn't - human nature, I suppose. So let me point out a small "oops" that so far apparently has been overlooked - in the first of the two articles by James L. Barnett in the Spring 1994 issue he shows four *Conus quercinus* (pg. 4) with attachments. I have one of these "damaged" (?) *C. quercinus* in my own collection, from the same locality (Batangas Bay), and the attachment does not consist of barnacles, as claimed, but of a small colony of star coral (*Tavia* sp., I guess). The photograph in *Of Sea and Shore* also shows, without doubt, attachments of star coral.

This still doesn't tell us how they got there, of course, but at least now we know what it is, right?

Keep up the good work, and happy shelling!

MONIKA FORNER
Lynn, Massachusetts

DEAR EDITOR:

I wanted to especially thank you for the article in the latest issue on the trend of criminalizing the collecting of natural history specimens. I do intend to follow up on this with the appropriate people.

It will truly be a loss to mankind's accumulated knowledge if restrictions such as these continue to escalate. While my rather modest collection is not likely to have much scientific value currently, it may never have such value in the future with limited ability to augment it. It may not even have value in the future as a study collection for youngsters if donated to a school (as I have considered on occasion) or as a demonstration of a hobby for young children (as I currently do in local schools) should it become criminal to partake of this sort of activity.

It concerns me - and it should all people who share our mutual interest in shell collecting, as well as the collecting of other natural specimens - that we could be branded as criminals for so harmless an activity that often has such noble ideals associated with it, i.e. scientific knowledge about our world, and changes in the environment. Is it too soon to ask: Am I going to be found to be contributing to the delinquency of minors if I go to a school and instruct youngsters in how to collect shells or how to start their own shell collection?

Isn't it a shame that one can even think to pose such a question?

MRS. DONNA M. NAKAGIRI
Brookfield, Wisconsin

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Gregory C. Jensen 1995

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NOTE: I would appreciate hearing of any other corrections and/or additions the reader might offer - it's difficult to keep up with all the new issues being produced and your comments, etc. will be greatly appreciated.

PALAU

10/14/94 issue shows Minnie Mouse visiting undersea clam garden

PENRYN

425 correct name of nudibranch is *Phylloda varicosa*

PHILIPPINES

add

s/s 8/16/94 *Conus marmoreus* & *C. geographus*
s/s " *Conus striatus* & *C. marmoreus*

SENEGAL

a 1995 set of five shell stamps scheduled, included shells are a wentletrap and a moon snail

SIERRA LEONE

add

803 10le 9/22/86 Disney characters in "Mary Quite Contrary" with cockle shells

SOUTH AFRICA

a 1995 shell stamp set will be issued, the four stamps will include *Afrivoluta pringlei* and *Cypraea fultoni*

TOKELAU

add

82 22s 5/5/82 Bow-drilling sea shells
\$5 12/19/94 shell necklace

TURKISH REPUBLIC of NORTHERN CYPRUS

377 2,500 11/15/94 *Charonia tritonis*
378 12,500 " *Tonna galea*
379 12,500 " *Cypraea talpa*

TUVALU

See page 17.

add

40¢ 1994 *Umbonium giganteum*
50¢ " *Turbo petholatus*
60¢ " *Planaxis savignyi*
\$1.50 " *Hydatina physis*

UNITED ARAB EMIRATES

add

259 50f 3/21/88 pearl oyster shell in design

UNITED NATIONS

add

29¢ 1994 *Tridacna gigas* on Endangered Species issue

VANUATU

add

632 60v 5/31/94 *Cypraea argus*
633 70v " *Conus marmoreus*
634 85v " *Lambis chiraga*
635 155v " *Chicoreus brunneus*

VIETNAM

delete last four issues - they are correctly listed above under Vanuatu where they belong

VIRGIN ISLANDS

add

373 20¢ 12/17/79 *Fasciolaria tulipa*
374 the correct conch is *Strombus gallus*

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by Tom Rice

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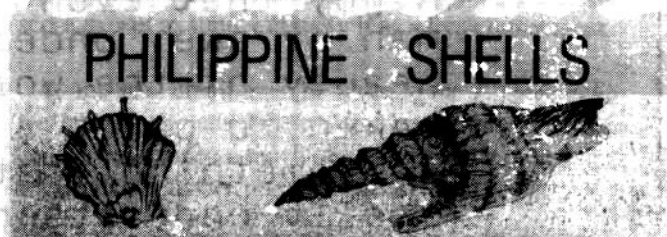
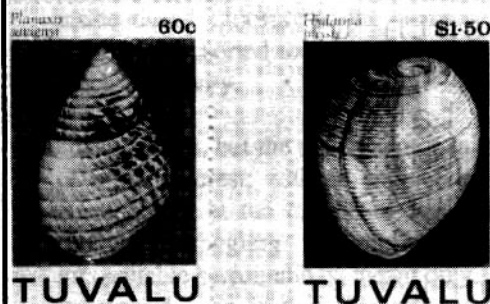
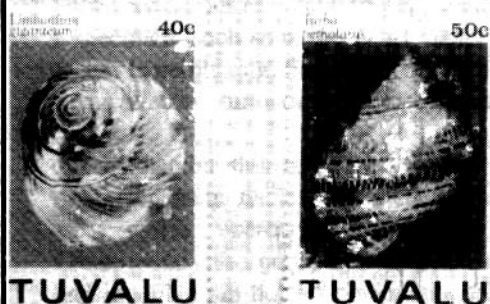
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New
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Stamps
Issues



THE CREATOR'S PAINTS

by Randy Sellmann

An ocean, lots of sand, sea gulls in flight overhead, a painter on a beach, alone in his world... A brush and thoughts of life of new designs and shapes, small and large...a blending of colors. He thinks out his colors, his creation. He takes the small dull ocean creatures and starts to paint, his mark being made, a mark of many colors. Some run together, others stay where the Creator has meant them to be. A blending of a man's soul poured out in his work, a way to say that all is bright even at the very depth of the ocean floor; a new beginning. A joy that even today has taken man by awe, understanding the beauty of the work that it has taken to paint a simple shell is something that we can not really understand, yet we admire what we see and we understand that all was done for the joy of us, a gift from our Creator. The young and old have found peace and tranquility in the small forms from the bottom of the ocean floor, a gift for all to enjoy, a life we can hold on to and share with others just like us...Those gifts are small in some people's eyes, but in others worth more than gold...
THE SEASHELLS OF GOD.....

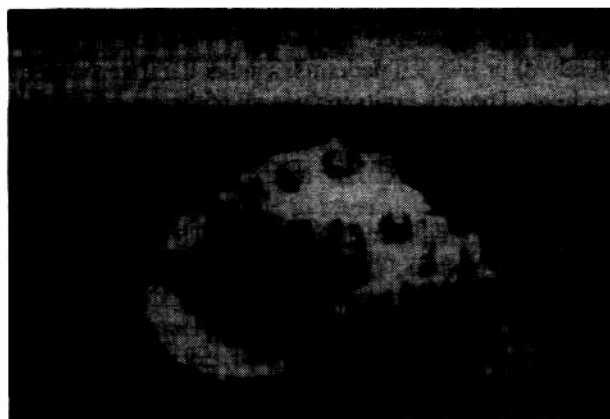
Putting the Right Thing on the Right Place

Brian C. K. Dy

There are instances where attachments or cementing of debris and other foreign objects upon species are observed to be either harmful or beneficial; temporary or permanent; ugly or elegant. This state of affairs is detectable from the tell-tale marks registered on the shells. It depends on the genera or kind of shells, but each individual attachment has its own merits and purposes. But on a rare occasion it happens that all the above conditions are found to have blended into one and a specimen, such as in the *Thais mancinella* above, the matter is perplexing. Especially so when the final object it has attached turns out to be extraordinarily "crafted".

It is its habitat this rock shell is the victim of such organisms as barnacles, worm shells, micro-organisms, etc., which encroach and ravage the mollusk. Consequently the poor shell was dotted with the ugly and indelible pin holes - pockmarks left behind by the predators. Its protoconch was shattered and the animal inside risked exposure to the elements. As a remedial measure it resorted to a harmless clay-like material to block the cavity.

It is bizarre, but the attachment is tailored in the form of a hat or crest; with an engineering precision, it is stuck firmly at the middle of the spire. The staunch mollusk, struggling for survival in the wild and inhospitable surroundings, meant only to mend and seal its wound - an instinct for self-preservation -[and,



however unwittingly ended up with a very refined sculpture, similar to a fanciful man-made trinket.

This presumption as it is described by an "outsider" does not necessarily reflect the actual "inside story". What it etched on the surface of the shell may be circumstantial. It is difficult to fully appreciate the real score except to simply classify it as a freak attachment.

At any rate, credit must be given to the *T. mancinella* for making the attachment - its decoration - possible. Still, it has exuded a touch of handiwork not unlike that of wonderful nature, the ultimate architect.

IN REVIEW

Pacific Coast Crabs and Shrimp
Gregory C. Jensen. 1995. 87 pp.
Sea Challengers, Monterey, CA \$19.95

Pacific Coast Crabs and Shrimp is a new book by Dr. Gregory C. Jensen of the University of Washington's School of Fisheries. It's published by Sea Challengers Press which is well-known for its colorful and informative guide books on marine life. This book is no exception. It covers the crabs and shrimps from Alaska south to the Mexican border, from the intertidal zone down to several hundred feet deep. Jensen is targeting an audience of beachcombers and divers so he doesn't cover the deeper water forms.

In his years at the U. of W., first as a grad student and now as a professor, Dr. Jensen has become the area's eminent expert on local crustaceans (crabs and shrimps). I've called on him many times to identify an obscure shrimp or hermit crab or to explain a weird crustacean behavior I've seen in my tanks at the Aquarium or while diving in the wild. In his book he has put down some of the vast knowledge he has about crustaceans and made it accessible to the public. This book fulfills a valuable need for the lay audience and professional alike.

In the introduction Jensen gives us the definition of a crustacean, a section on growth (important to an animal that lives in a hard articulated shell), reproduction, and an illustrated key to the families. His writing style is always clear and cogent and a pleasure to read. Continued on next page.

SANIBEL SHELLING BAN

On 22 November, 1994, Florida Governor Chiles signed into law a regulation authorizing the city of Sanibel to regulate and prohibit the collecting of any live shells within its city limits.

The banned shells include mollusks (which include marine, land and/or- freshwater snails, slugs and bivalves) or live echinoderms (sand dollars, starfish, sea urchins). The city limits include all of the dry island, the low tide flats, and offshore submerged areas ½ mile beyond the mean high tide mark.

These new regulations, effective January 1, 1995, do not change existing rules for those collecting live shells in other places in Lee County, such as Captiva, Cayo Costa and Pine Island. Those localities are governed by laws passed in 1987 (Sanibel) and 1993 (Lee County) which detail that "No person shall harvest (collect) or possess more than two live shellfish (mollusks or echinoderms) of any single species, per day."

For sympathizing souls who wish to throw back live stranded shells, a section of the new law states that "Temporary possession of a shell for the purpose of determining whether it contains a live shellfish shall not constitute harvest, so long as such shellfish is not harmed in any manner."

A broad interpretation of the new rules could mean that when having your lawn or garden raked of debris, you could accidentally collect hundreds of living *Polygyra*, *Euglandina*, or deleterious plant-eating slugs and technically be in violation of the new regulation.

There are three exceptions to the new shellfish rules for Sanibel and Lee County:

1. "The Department of Environmental Protection (DEP) (Section 370.10 [2], Florida Statutes) may issue permits to harvest or possess more than two live shellfish of any single species within (all of) Lee County for experimental, scientific or exhibitional purposes." The source of these requests must come from or be initiated by legitimate educational or non-profit institutions such as universities, nature trail foundations, museums and schools.
2. Persons are permitted to harvest oysters (*Crassostrea*), hard clams (*Mercenaria*), Sunray Clams (*Macrocallista nimbosa*), Bay Scallops (*Argopecten irradians concentricus*), and Coquinas (*Donax* species). This group of edible exceptions is controlled for public human health purposes by the DEP, and enforced by the Florida Marine Patrol. Separate bag and size limits, and seasonal restrictions on collecting these species exist or may exist separate from the new law.

3. Few people, and possible some few of the Sanibel drafters of these new rules, realize the entire Gulf shore of Sanibel and Captiva are in an unclassified area (no collecting permitted, pending bacterial and sanitary surveys), which means you cannot legally harvest for food any living coquinas or hard shell clams from these barrier island shores. Presumably one may collect live coquinas, if one can prove he is not using them for food, but rather for making shell craft articles or for your shell collection. Sanibel enforcement officers will have to use their judgement in this particular case.

Condensed from an article by R. Tucker Abbott in the Sanibel-Captiva Island Reporter, Nov. 25, 1994 and appearing in The Shell-O-Gram of the Jacksonville Shell Club, Inc.

Continued from previous page.

The book contains brilliant color photographs by the author of over 160 crustaceans, many of them published in color for the first time. The photographs, mostly taken by the author, clearly illustrate certain identification details. In addition to the photographs, each animal also has a written description containing classification characteristics, range, habitat and remarks.

The written descriptions were clear and easy to understand. As Jensen puts it, heretofore many of these animals were identified by ambiguous anatomical details written up in a cryptic journal with poor black-and-white drawings. Here, Jensen has combined all the characteristics needed to identify the animals, frequently using the color of the live animals. In addition to the above, he has added many of his own valuable observations on the range, size, and behavior of the animals.

At the end of the book there is an glossary of terms used in the book, a list of selected references, and a checklist for keeping track of crustacean sightings, similar to that used by bird watchers.

This book will be a valuable addition to the library of the casual backcomber, scuba diver, fisheries biologist, museum curator, or aquarist dealing these crustaceans.

Review by ROLAND C. ANDERSON
(Seattle Aquarium)

1995 Shell Shows, Etc.

The following list is courtesy of Donald Dan, COA Award Chariman. To list your club's event contact him at 2620 Lou Ane Court; W. Friendship, MD 21794. Tel. (410) 442-1242 or 442-1942.

May 7. Pacific Shell Club Show; San Pedro, California. Frank Jewett; 1739 Vallecito Dr.; San Pedro, CA 90732. (310) 514-8012.

May 6-7. Fifth Belgium International Shell Show; Aarschot, Belgium. R. de Roover; Vorsterslaan 7; 2180 Ekeren-Donk, Belgium. (3) 644-3429.

June 8-12. American Malacological Union Annual Meeting; Hilo, Hawaii. Dr. Alison Kay; University of Hawaii; 2538 The Mall; Honolulu, HI 96822. (808) 956-8620.

Jun. 17-18. XIV éme Salon International du Coquillage; Lutry, Switzerland. Dr. Ted W. Baer; CH-1602 La Croix, Switzerland. (21) 393771 or 207371.

Jun. 23-29. Conchologists of America Annual Convention; San Diego, California. Don Pisor; 10383 El Honcho Place; San Diego, CA 92124. (619) 234-0249.

Also we have been made aware of:

May 13-14, 1995. New Zealand National Shell Show. Wellington. Peter Jamieson; 57 Bedford St.; Northland, Wellington, New Zealand 6005.

May 27-29, 1995 (Memorial Day Weekend) Suncoast Conchologists Shellers' Jamboree '95. Largo, Florida. Contact Joan Pierson; 11710 Parkview Lane; Seminole, FL 34642. (813) 397-7610

June 2-6. Western Society of Malacologists; 28th Annual Meeting; Fairbanks, Alaska. Nora R. Foster; University of Alaska Museum; 907 Yukon Drive; Fairbanks, AK 99775. (907) 474-9557. E-Mail: FYAQUA@aurora.alaska.edu.

July 8-9, 1995. Keppel Bay Shell Club Shell Show. Yeppoon, Queensland. Write the Club at P.O. Box 5166; Rockhampton Mail Centre, Queensland 4702.

July 14-16, 1995. Jacksonville Shell Club Show. Sea Turtle Resort, Atlantic Beach, Florida. Contact Judy Blocker (904) 246-4012.

Aug. 17-19, 1995. Jersey Cape Shell Club Show and Sale. The Wetlands; Stone Harbor, New Jersey. Information: P.O. Box 124; Stone Harbor, NJ 08247; call: (609) 368-2391.

C.O.A. to Meet in SAN DIEGO

Want to have a great time this coming June (the 23rd through the 29th)? The Conchologists of America, most likely the most fun-loving (yet still seriously involved) shelling group anywhere, will meet in San Diego, California during those days.

The Pan Pacific Hotel, one of the top hotels in mid-downtown San Diego, is the convention site. Events include a welcoming extravaganza, a dinner cruise on San Diego Bay, a visit to Scripps Aquarium, a fossil collecting trip and a trip to Mexico. And, of course, the famous shell auction (the 1994 ones raised nearly \$20,000!) and the world renowned dealers' bourse.

To get on the mailing list for convention information contact: Don Pisor; 10373 El Honcho Place; San Diego, CA 92124 - tel. (619) 234-0249. Plan to attend - you'll be glad if you do!

A Sheller's Creed

The wildlife and natural resources of this planet have been entrusted to me for protection and preservation. Whether I wish it or not, I must account to the future for my handling of this wealth today. If I collect shells, I will do so conservatively, recognizing that destruction of the marine habitat, by whatever means, is the true enemy of the sea and its creatures.

Suncoast Conchologists

BOOK FOR SALE

***Fossil Shells from Oregon Beach Cliffs*
Ellen J. Moore. 1994. \$9.95***

88 pages, 14 black & white plates, excellent introductory guide.

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MEMORIES STIRRED

Steve Rosenthal's article, "Organizing Your Shell Collection", in the Winter 1995 issue, stirred some memories of family collecting stories. He spoke of "geography on the go," and how difficult it can be to find out exactly where you are. Memory, too, can be fickle.

'Way back in the summer of 1969, my husband and I took our young children camping on Martha's Vineyard for a week. One day we took a little ferry to a small neighboring island and drove out a dirt road toward the dunes. My daughter and I went shelling under a wooden bridge, and discovered a whole lot of Thick-lipped Oyster Drills (*Eupleura caudata*) in the shallow water. Being a good little shell collector, I carefully boiled out the tiny animals over our camp stove and placed the tinier opercula back in their apertures. Then, I tried to find out the name of the place where the shells had been collected. No luck, the road had no sign. The bridge had no railing on which to post a sign, and the person I asked about the name of the little island wasn't even sure of its name. It was only a week later, however, while we were camping in New Hampshire, that the whole world learned about the exact location:

Eupleura caudata (Say)
under Dyke Bridge, Poucha Pond
Chappaquiddick Island,
Martha's Vineyard, Mass.
7/7/79 low tide, pebbly bottom

My father had an opportunity to do some collecting in the South Pacific in the early 60's. I began to receive boxes of shells with no data. Dad had been accustomed to collecting in Mexico. His phenomenal memory made it possible for him to tell where he had found everything, and return if he wanted more of the same. Even when stationed in the Admiralty Islands, he knew what he had picked up at Port Moresby on the way. He knew which islet was the best place for each of his finds during the war.

Let's Collect Philippine Land Shells!

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August 15-30, 1995

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(Advise and consultation on this tour by the foremost Philippine land snail collector, whose been collecting for more than 40 years.)

Now, however, he was traveling faster, and to many new locations, widely scattered. Also, he had lost an arm; and limped, due to polio. So he had a friend make several small label-pads, with Taiwan, Okinawa, Guam, Saipan, etc. already in the corner. This made it easier. He could add more exact information, such as direction or distance from a town. Once or twice, however, he would drop some shells in his pocket and forget. My favorite tag was:

I enjoy your magazine. Keep it coming!

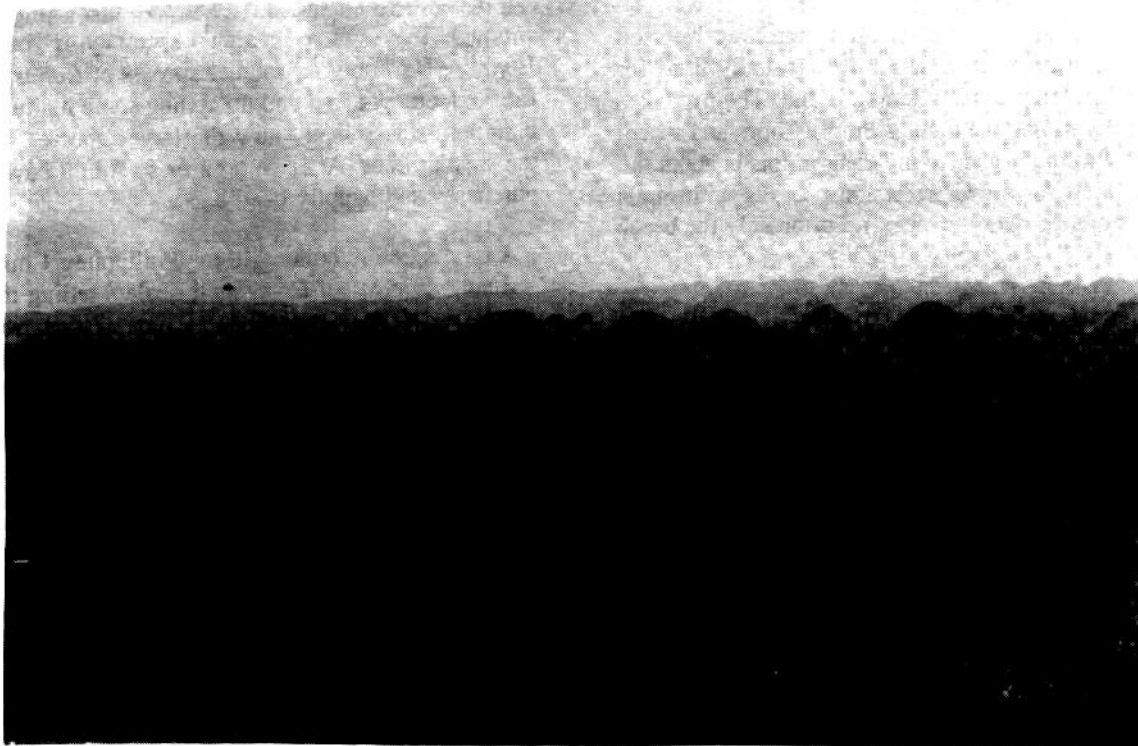
KAY PETERSON
Warwick, Rhode Island

I remember
Picking these up
on a Beach
over



I just don't
remember what
Beach:
not
Okinawa Dad.

To Anillao, Balicasag and Points In Between, continued from the last issue.



The famous chocolate hills of Bohol Island, the Philippines.

One of the main tourist attractions on Bohol are the Chocolate Hills. We visited them, and several old churches on the way, one day. There are more than a thousand of these regularly-shaped hills in the central north part of the island and during the dry season when the brush turns brown they do resemble a multitude of chocolate drops. Returning from the hills we boarded a floating restaurant barge for the slow trip down the river to the coast where we'd be picked up by our van. Lunch was delicious and the trip beautiful and smooth, until the outboard motor pushing the barge quit and the heavens opens with a tropical downpour (fortunately there is a canopy roof on the barge). Our journey slowed tremendously as the young boatmen tried in vain to restart the engine and ended up poling us along the river bank - several times the barge grounded on the bank - and eventually sending one of their numbers in a passing panga to bring back a mechanic who re-attached the sparkplug wire (or something equally simple as it was done in a matter of seconds) and we then completed our journey - you don't suppose I'm a "jinx" when it comes to boats, do you? They do seem either to encounter rough weather, or mechanical problems whenever I'm aboard. Hmmm.

Low tides occurred just after sunrise and so it was up at 5 a.m., put on wet tennis shoes (not yet dried from the previous day's excursion), grab some zip locks and

the collecting kit and head out the door. As I mentioned previously, it was only a short walk under a few palm trees to the beach, then across the steeply sloping sand to the channel, cross it and you on the main reef. Here, at Bohol Beach Club, each morning were dozens of locals diligently searching - fortunately not for shells, but for edible sea urchins. One can wade through shallow water for several hundred feet, keeping an eye out for the *Diadema* sea urchins with their sharp, sometimes poisonous spines, and continually marveling at the constantly changing panorama of sealife. Here are three or four species of sea urchins, one of which has a neon-hued tissue extruding between the spines (doesn't really look like an urchin at all), another is a light pastel pink and yet another is a malevolent black color. Chuck spots, swimming around a coral head, a fantastic little fish that, at first, we mistake for a swimming nudibranch - very slender, colored bright reddish purple with the extremely large and flexible fins outlined in gold.

The inner reef area is sand covered with sea grass and then there is an area of old coral and, near the water's edge live coral heads. Tide pools, here and there, hold schools of tiny fish and, around the edges shells such as *Cypraea tigris*. Atop the sand reef, I find, crawling along amongst the sea grass blades, two beautiful spiny form of *Cymbiola vespertilio* (the Bat Volute) with their

colorful foot extended as they moved across the surface of the sand. (See the photograph in the last issue.)

Having decided that the small panga was just too small - we arrange for a larger one (usually used for dive trips) to ferry us to Balacasag Island. The trip takes about one hour and we then anchor offshore and take a "taxi" boat to the beach (to my chagrin this is about the smallest panga I've ever seen and one sits with one's haunches draped over the sides!). Fortunately the beach is close.

The main occupation of the people of Balacasag is fishing. And many use deepwater tangle nets to bring up shells. The fishermen's wives set up shop under a large tree at one end of the small island and here offer the sea's bounty to anyone who comes along. One might think that in such a remote place the locals might know little about the shells they offer. No! Everyone knows exactly what a *Cypraea guttata* or *C. porteri* looks like and what constitutes a good specimen. The prices on everything are quite reasonable and dickering over the

price is expected. The shells are kept in small plastic containers (like Tupperware) and the seller wants to sell you the entire contents of the box, not just a single shell - though: they will sell a single specimen if you insist. If you're "up" on your smaller species of *Conus*, *Mitra*, *Latiaxis*, etc. you can end up getting some really terrific bargains - the sellers know the larger species, but not the smaller ones. After an hour or so we all have made purchases and happily head back.

A month before coming to the Philippines Chuck had written a number of Cebu shell dealers telling them of our tour and the itinerary. We expected that when we reached Cebu we'd meet up with the dealers. They, however, had other plans. Four of them journeyed to Bohol Beach Club to show us selected shells. Boxes with shells galore were spread out in one of the rooms and spilled over onto the entry area. Rare and common species galore. Even some *Cypraea mappa* that had been painted and were now *C. "aurantium"* and very good imitations at that. The dealers returned to Cebu quite a bit lighter than they had arrived.



Blanche Peters beachcombing at Ligpo Point.



Some of the shells the Cebu dealers offered for sale.

A big consideration when one is traveling is the quality of the food. Well, on this trip it had to be rated five star. Everywhere we went it just got better and better! Fresh fish and fruits, tastefully prepared, sometimes with intriguing flavors, sometimes unexpectedly spicy, but always great.

Too soon it was back on the ferry and across Bohol Strait to Cebu City and on to Mactan Island and the Cebu Beach Club (both B.B.C. and C.B.C. were formerly owned jointly, but are now separate). Located on the shore of Mactan just a short drive from the airport, with other resorts on either side, one would think that any shell on the beach would have been picked up long ago. But on the next low tide after our arrival several species of cone, cowry, murex and miter were collected from the rocks and sand patches right where the dive boats loaded and unloaded their divers.

When I had been here last April, I had met two ladies on this short stretch of beach - they were collecting shells too and gave me several. I was surprised to find them walking along the beach again on this visit. Turns out one of their husbands runs a panga boat and we arrange for transportation to a small offshore island across Bohol Channel. During the two trips we explore two small islands, both with beautiful coral gardens, colorful fish and more shells for us to collect. There is a small fee to land on each island - to cover the caretaker, who watches over small picnic areas (our

boatman and his wife have brought along fish to bar-b-que, plus sodas, fresh fruit, rice, etc. for our lunches). At one island we see circled *Tridacna gigas* (Giant Clams) which are protected against harvest and which, it is hoped, will propagate and repopulate the reef. Everywhere we travel we're amazed at the great variety of color fish darting amongst the coral heads and rocks in the shallow water.

Early each morning someone comes to our quarters with shells to sell. We always make it a point to look over everything (you never know just what might show up), but buy only a few specimens. I add a very large *Pleurotomaria teramachi* to the Museum's collection at one of these early morning sessions. After the mid-morning low tide - either searching the beach or going to one of the small islands - we spend the afternoons visiting various shell dealers and shop in both Cebu and at the famous Punta Engaño area here on Mactan Island. It doesn't take many stops to become overwhelmed with the sheer numbers of shells we see. Sea stars, crabs, wooden shells (sculpted and painted into real works of art), shellcrafts, also fill the shops we visit.

One evening we decide to visit a Chinese restaurant that Chuck and I enjoyed on our previous visit. We all piled into the hotel van and headed into the city. Arriving at the Majestic, we discovered it had been closed to the public in order to handle two wedding parties. We ask the van driver for suggestions and he



Bohol Beach Club makes use of Helmet Shells.

Fran, Blanche & Ellen look over the shell bounty.

takes us to Sea Food City. As you enter this restaurant you are greeted by a hostess and put behind a small grocery cart (like those used in U.S. supermarkets); then led by the hostess along a long counter heaped with fresh fish, clams, mussels, octopus, squid, crabs, shrimp, scallops, etc. Large aquariums hold living examples of these too. You select your meal's entree and accompanying vegetables and fruits from another counter, pay for them at the cash register and give instructions as to how you want your meal prepared. Then sit back with a tall cool drink and soon your made-to-order dinner arrives at your table. Quite an experience.

Traffic in Cebu, like that in Manila, can be frustrating as we find out on a trip to the far side of the city to visit Prudy Ponce's Far Exports. Street repairs and accidents combine to make a half-hour trip into one of two hours. Fortunately we're not in a rush and the visit made it worth enduring even such a long delay.

Near the Cebu Beach Club is one of the chain of Shangrila hotels. Five stars plus. Fran treats our group to dinner here one evening. White linen table cloths, dark, heavily carved woodwork, exceptionally attentive service and food that is sumptuous.

Too soon our time in Cebu has passed and we're amongst the throng boarding planes for the hour flight back to Manila. We stay another night at the Palm Plaza Hotel, making last minute purchases of shells, gifts for relatives, etc. It's a good thing, for several of us, that Philippine Airlines allows two pieces of check-on luggage weighing a total of 144 pounds - at least two of us come awful close to that limit!

So, do you want to come along next time? Or maybe some future tour? Drop your Editor a line and we'll keep you informed of our plans.

Photographs are by the author.

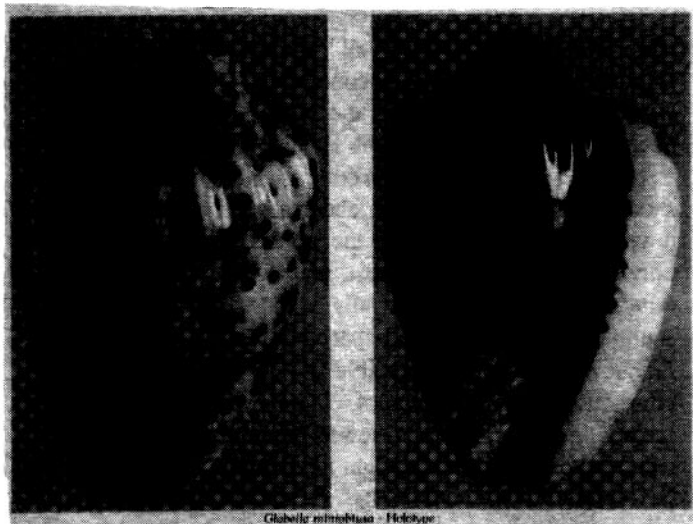
RECENTLY DESCRIBED SHELLED MARINE MOLLUSKS

This section is dedicated to reporting on some of the recently described shelled marine mollusks in order for our readers to become aware of them. It is hoped you will find this of interest - for further information on the species herein, please consult the publications in which they were originally described; these are noted.

NOTE: the following two descriptions seem to be concerned with the same species. Both publications in which the descriptions appear are dated December 1994. The Kilburn description was submitted for publication in May of 1994; there is no indication when the Bozzetti description was submitted for publication. I'll let you know when an official decision on that name which has priority has been made.

Glabella miniobtusa Bozzetti, 1994

Small, measuring between 7.3 and 8.2mm, it has a superficial resemblance to a dwarf form of *G. obtusa*, the main differences, besides the smaller size is lower spire, the wider protoconch, the shorter ribs and the more regular pattern. *G. youngi* (Kilburn, 1977) approaches in shape and pattern, but differs in size (about 10mm), in the more knobbed shoulder, denser spiral stripes and in the different color. *Marginella mosaica* Sowerby, 1846 shows a similar pattern, but differs in size, color and lacks the axial sculpture. Type locality is the island of Inhaca, near Maputo, Mozambique.



Bozzetti, Luigi. A new species of the Genus *Glabella* Swainson, 1840 from the South-Western Indian Ocean. World Shells 11, page 50.

Marginella (Glabella) rosadoi Kilburn, 1994

Dredged from a sand bottom at a depth of 30 meters, this new species is from off Inhaca Island, Mozambique. The author makes the following comparisons.

Marginella (Glabella) rosadoi is similar to only three other Indian ocean species: in size and color pattern it closely resembles *M. (G.) youngi* Kilburn, 1977, from off Chinde, Mozambique, and in shape and sculpture it is similar to *M. (G.) obtusa* Sowerby, 1846, an East African species whose range reaches northern Mozambique; there is last resemblance to *M. (G.) ansonae* (Clover, 1974) from Madagascar.

Below: *Marginella rosadoi* Kilburn, 1994



Fig. 1-2. Holotype of *Marginella (Glabella) rosadoi* n. sp. Dimensions 8.1 x 5.2 mm.

In *Marginella youngi* all whorls are strongly shouldered and subsuturally concave, so that the spire is conspicuously stepped and the body whorl distinctly obconical; on the outer lip the shoulder is so prominent as to be almost auriculate. In contrast, in *M. rosadoi* the shoulder is relatively weak and rounded, and is only developed on the last whorl; the whorls are subsuturally only slightly concave at most, and the shoulder of the outer lip is strongly but evenly rounded. *M. rosadoi* is sculptured by distinct, well-spaced axial ribs whereas in *M. youngi* the only discernible sculpture is a series of close, feeble axial plicules, faintly and irregularly crenulating the shoulder. Viewed dorsally, the siphonal canal in *rosadoi* shows a slight but distinct notch absent in *youngi*. The columella pleats extend further posteriorly in *youngi* and the outer lip in *youngi* is thicker, with more irregular denticles. In both species the protoconch is similar in size and in its domed profile, but in *youngi* it is colorless and very slightly conical, and apparently consists of about 2 whorls, whereas in *rosadoi* it is tinged with light orange, is evenly domed and appears to comprise about 1.7 whorls. *M. rosadoi* is patterned with dark grey-brown on a greyish-yellow ground, the marks consisting of short, spirally arranged dashes, which continue onto the outer lip. In *M. youngi* the markings are dark grey on a greyish-white ground, the spots more or less chevron-shaped and not continuing (or only irregularly so) into the back of the lip.

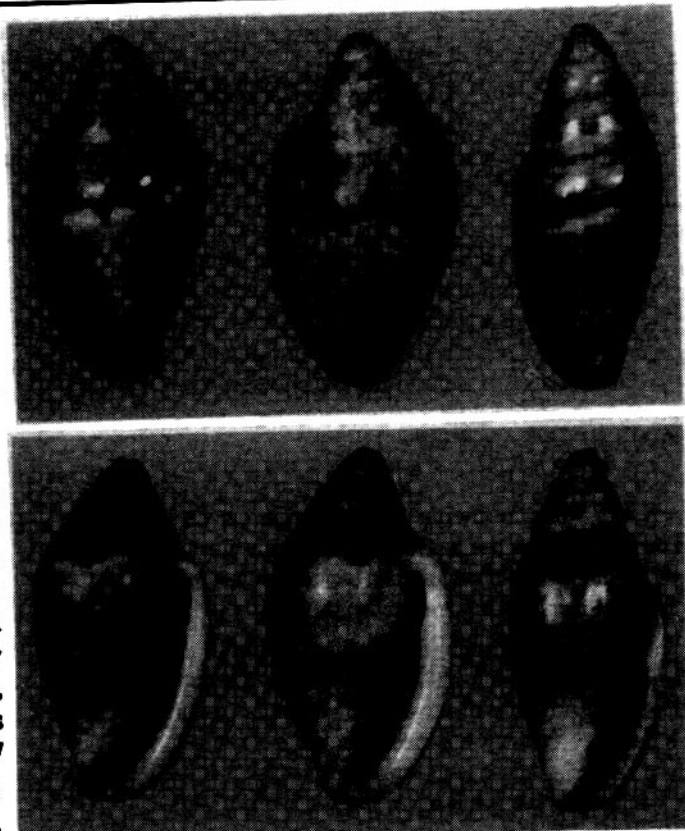
Marginella obtusa is a much larger species than *M. rosadoi* (length 18-22mm), has axial ribs that extend onto the base of the body whorl, and the color pattern is speckled.

The types of *Marginella rosadoi* were living in sand, but those of *M. youngi* were trawled on mud; *M. obtusa* appears to inhabit coral sand.

The only other ribbed *Marginella* (subgenus *Glabella* Swainson, 1840) known from the south-western Indian Ocean is *M. (G.) ansonae* (Clover, 1974), from Madagascar (although erroneously described from Réunion Island); this differs from *M. rosadoi* in shape, in color and in possessing axial ribs that extend the length of the body whorl.

Kilburn, R.N. Description of a New Species of *Marginella* from Mozambique (Gastropoda: Marginellidae). *Journal of Conchology* 35: 179-181 (1994).

Quite a few other new species of Marginellidae have been introduced recently. The following are those of which your Editor is aware.



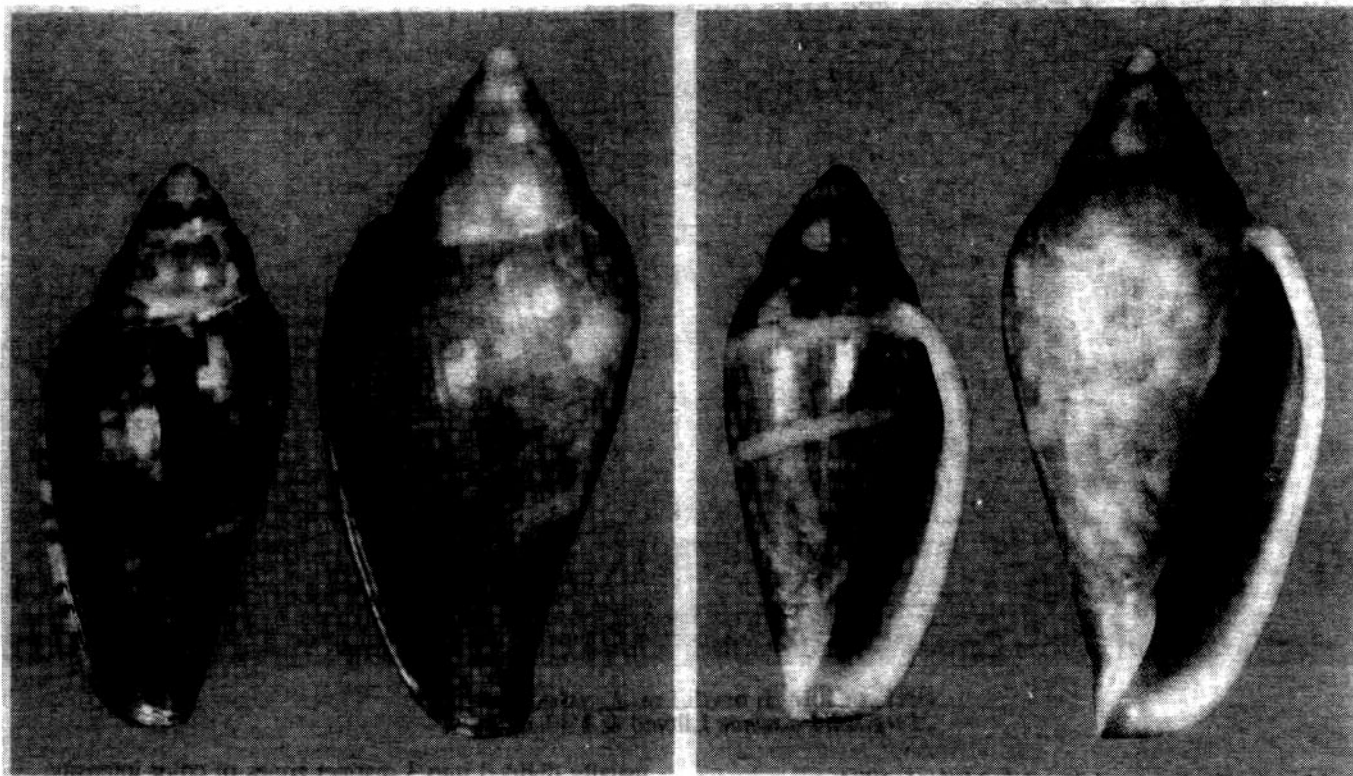
Marginella adamkusi Bozzetti, 1994 - above

10mm in length. Protoconch, peristome and inside of mouth white; spire, subsutural slope of body whorl and basal zone reddish-brown stained in a marbled pattern; middle zone of body whorl yellowish-beige. Darker brown spots and blotches are also present. The species is very distinct. Type locality is off Western Sahara, 120 meters deep, trawled by Lithuanian trawlers.

Bozzetti, Luigi. A new species of the Genus *Marginella* Lamarck, 1799 (Gastropoda, Prosobranchia, Marginellidae) from the eastern Atlantic Ocean. *World Shells* 9, pp. 17-18 (1994).

Marginella asra Liltved & Millard, 1994

This species has been collected by trawling and dredging on sandy substrates along the Natal coast of South Africa. The shell measures 19-28mm in length and has a greatly elevated spire and thin whorls. Ground color is white, fresh shells being overlaid by a blue-gray covering suffused with darker longitudinal flames, fine transverse lines and imbrications or stepped patterns; superficial blue-gray pigment interrupted by small transversely arranged white squares underlined with darker blue rectangular markings.

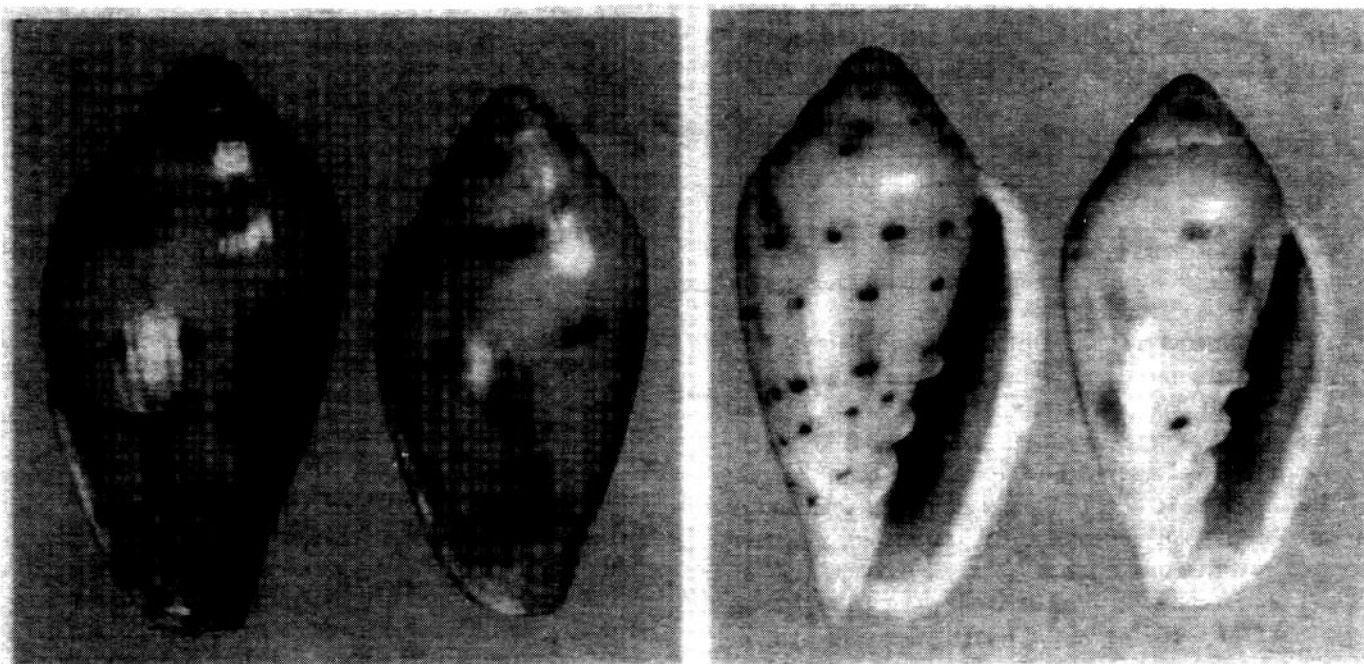


Marginella asra Liltved & Millard, 1994

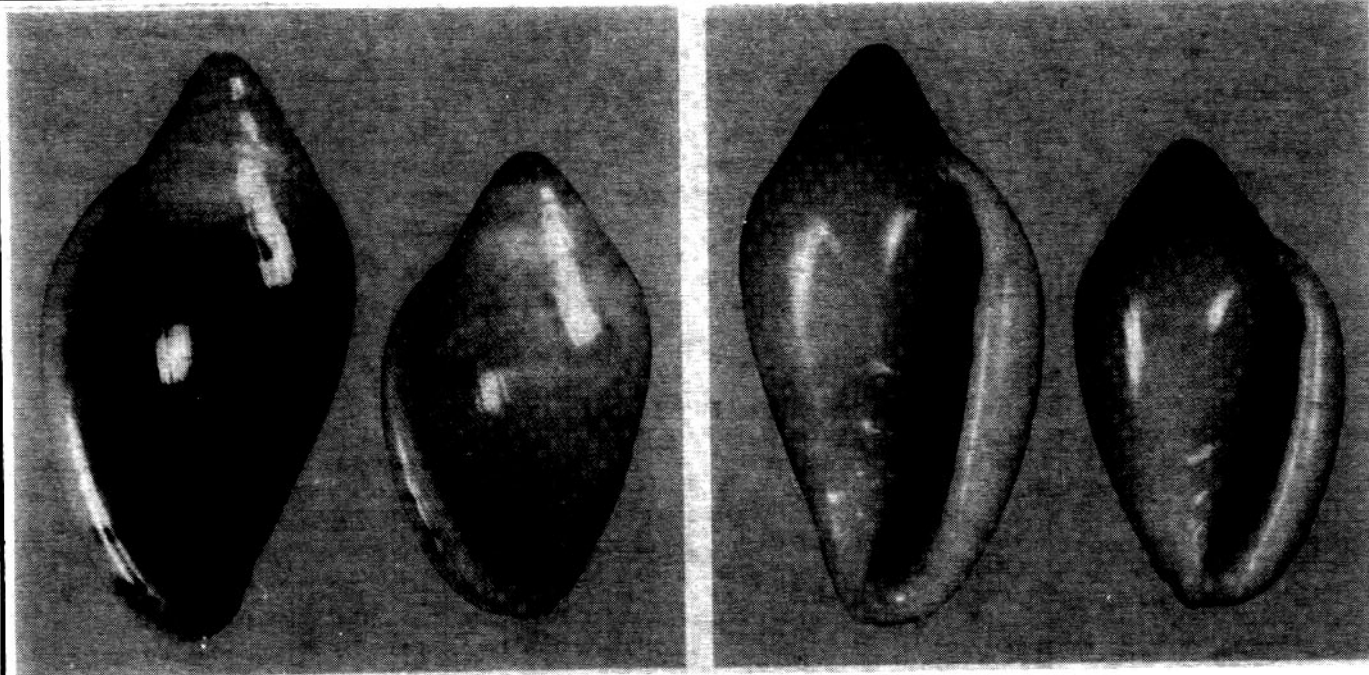
Marginella lemaitrei Liltved & Millard, 1994

Taken from fish stomachs off Cape St. Blaize, eastern Cape Province, South Africa; trawled at a depth of approximately 100 meters. 17-20mm in length with slightly convex whorls; body whorl thin, not

prominently shouldered, although roundly humped at its broadest point. Ground color off-white, usually streaked with light gray undulating longitudinal flames; body whorl usually crossed by 7-8 spiralling rows of blue-gray dashes, one row remaining visible on the spire. Occasional specimens bear more random spotting or fewer spiral rows.



Marginella lemaitrei Liltved & Millard, 1994

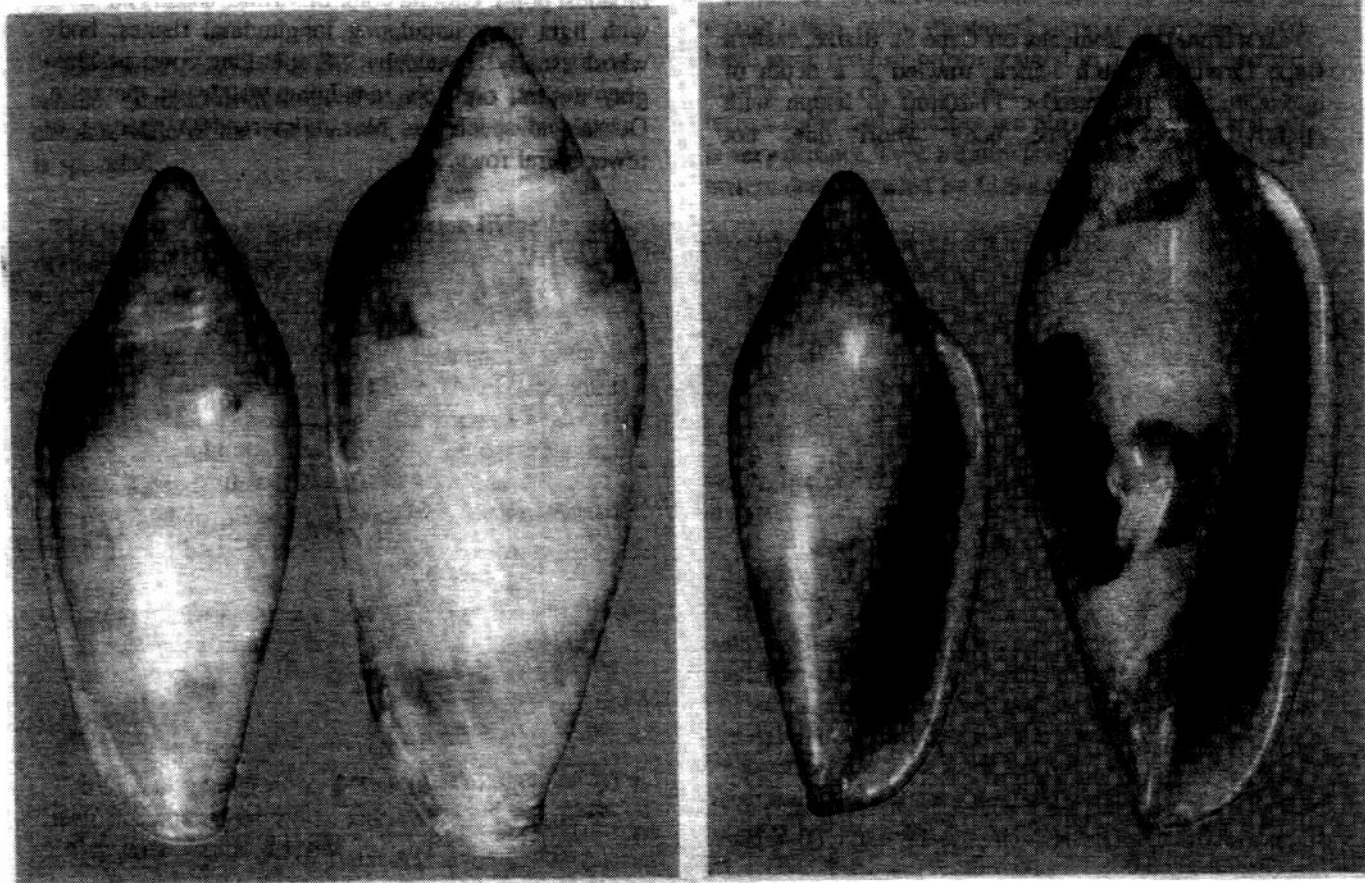


Marginella dawnae Liltved & Millard, 1994

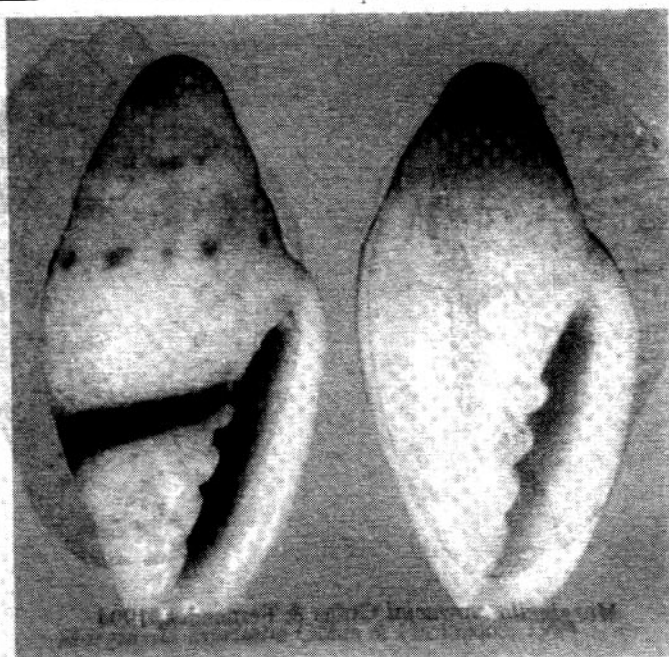
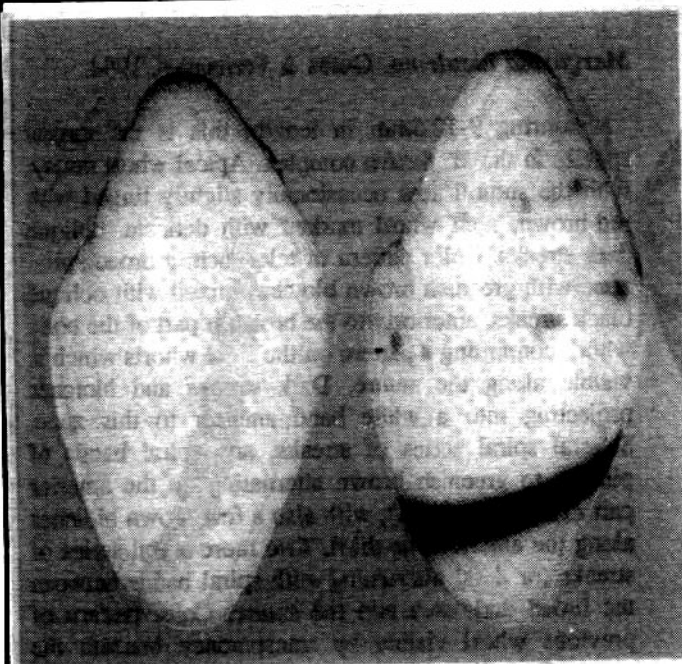
***Marginella dawnae* Liltved & Millard, 1994**

Taken by trawling and dredging at depths of from 175 to 300 meters off the coast of Natal, South Africa and Mozambique, the shell measures 15-20mm. Ground color is pale pink to cream; dorsum of body whorl

usually divided into 3 distinct zones of color intensity, overlaid by fine olivaceous-gray transverse lines and bisected by longitudinal or oblique chevron patterns, especially prevalent on the shoulder. Spire, lateral surface of labrum and ventral surface of the body whorl mostly uniformly colored, devoid of superficial pattern.



Marginella joostei Liltved & Millard, 1994



Marginella xhosa Liltved & Millard, 1994

***Marginella joostei* Liltved & Millard, 1994**

Trawled by commercial fishing boats off Durban and Port Edward, Natal, South Africa at depth between 120 and 300 meters. 28-35mm in length. Body whorl usually evenly divided into three broad brown or blue-gray zones, separated by two narrower creamy white bands. Random flecks of pigment are less prevalent within lighter central zone of blue-gray color than in outermost two, while all three colored zones incorporate fine closely spaced transverse striae. Dark brown rhomboidal markings present on shoulder and spire of type specimens.

Liltved, William R. and Victor G. Millard. Genus *Marginella* Lamarck, 1799. Five new species from Southern Africa. *World Shells* 10, pp. 3-10 (1994).

The following six new Marginellidae are from Angola, West Africa.

***Marginella carquejai* Gofas & Fernandes, 1994**

The authors note that this species has, like *M. huberti*, a larger denticle near the posterior termination of the inner lip. This character, unusual in *Marginella* is interpreted as a synapomorphy uniting the new species with *M. huberti*. *M. carquejai* is distinguished from *M. huberti* by its smaller size (10-12mm versus 17-27mm), darker shell and much thicker outer lip. It lives much shallower (2-10 meters versus 10-100 meters).

***Marginella xhosa* Liltved & Millard, 1994**

Measuring 7-8 mm, the authors remark: the shell of *M. xhosa* most closely resemble those of *M. munda* Smith, 1904, known to occur off eastern Cape Province, Transkei and southern Natal (*M. xhosa* is known only from the area between Kei River Mouth, southern Transkei and Bulungula River Mouth, central Transkei in depths of 74-260 meters). Both species are similar in shape, apart from *M. xhosa* tending to be somewhat broader at the shoulder and slightly larger in size. Although color and pattern varies in *M. munda*, shells usually are marked by dense dark pink or crimson longitudinal flames and do not bear the spotted and solid spiral bands of *M. xhosa*.

***Marginella undulans* Gofas & Fernandes, 1994**

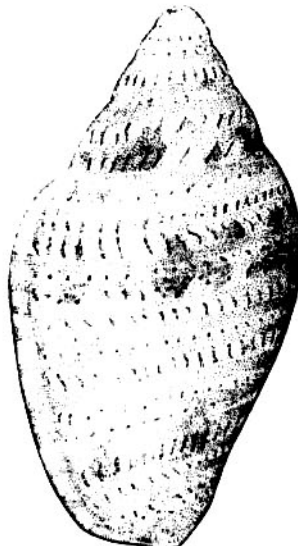
This small, 5mm+, species is found sympatrically with *M. gemmula* and is distinguished from others of the group by the opaque white siphon and the peculiar design of the spiral band on the shell (a scalloped dark design on a white background, bordered posteriorly by a brownish to greenish band). It is most similar to *M. simulata*, but differs in its much stouter profile. The habitat is noted as being in sediment covering large rocky platforms in sheltered bays; always subtidal. The living animals are buried just below the surface of the sediment.

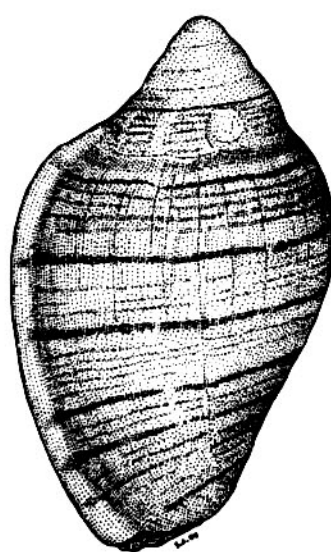
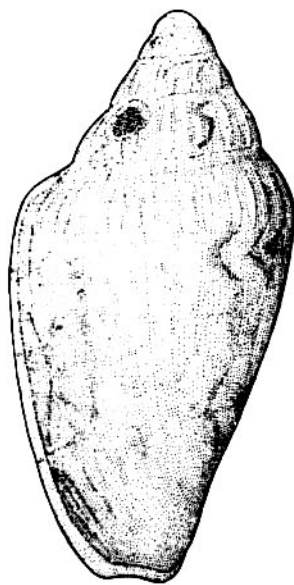
*Marginella carquejai* Gofas & Fernandes, 1994*Marginella luculenta* Gofas & Fernandes, 1994

Measuring 9-12.5mm in length, this is the largest species in the *M. festiva* complex. Apical whorl tawny, with the sutural area occasionally slightly tinged with red-brown; next whorl marked with delicate, oblique dark streaks. Color pattern of teleconch: a broad spiral zone with greenish brown blotches mixed with oblique black streaks, anteriorly to the broadest part of the body whorl, continuing a pattern on the spire whorls which is visible along the suture. Dark streaks and blotches projecting into a white band anterior to this zone. Several spiral series of streaks, and spiral bands of pinkish to greenish brown alternating on the anterior part of the body whorl, with also a few brown blotches along the anterior one-third. Two more spiral series of streaks (or dots) alternating with spiral bands between the broad dark area and the suture. Color pattern of previous whorl visible by transparency beneath the suture. Outer lip with a series of pink or tawny blotches, spaced evenly and mostly terminating the light, continuous spiral bands. Habitat is in shell gravel and in shell sand among rocks.

*Marginella undulans* Gofas & Fernandes, 1994*Marginella simulata* Gofas & Fernandes, 1994

The authors remark that this species is superficially similar to *M. gemmula* but is sympatric with it and consistently different by several chromatic characters of the shell: the early whorls are pink instead of pale buff, and lack a black line along the suture. The pattern of greenish flames on the body whorl does not merge anteriorly with a row of dark streaks, as it does in *M. gemmula*, and there are more rows of dark streaks on the anterior part of the body whorl. It shares with *M. undulans* (see next species) the preference for a soft bottom habitat, but the two species are distinguished by a more slender outline and taller spire in *M. simulata*.

*Marginella luculenta* Gofas & Fernandes, 1994*Marginella simulans* Gofas & Fernandes, 1994



***Marginella fumigata* Gofas & Fernandes, 1994**

The 13-16mm shells have a conical spire and globular apex. The whorls are slightly convex with quite distinct suture, the first two smooth, the next ones with faint axial ribs. Body whorl somewhat shouldered, with faint axial folds continued along the shoulder. Outer lip thickened and strongly reflected outwards; inside with about 12-15 low, irregular denticles, becoming smaller anteriorly; the space between the 2 most anterior denticles with a marked excavation.

***Marginella marimba* Gofas & Fernandes, 1994**

M. marimba recalls *M. musica* Hinds, 1844 and *M. diadochus* Adams & Reeve, 1848, by the pattern of spiral lines. *M. musica* lives in Mauritania and Senegal, has a more conical spire, and the inner lip smooth inside even on quite thickened adult specimens. The South African *M. diadochus* is larger (15-25mm versus 10mm) and more slender, with a wider aperture and a thin, smooth inner lip.

Gofas, S. and F. Fernandes. The Marginellidae of Angola: The Genus *Marginella*. *Journal of Conchology* 35:103-119 (1994).

***Marginella spirilineata* Hayes, 1994**

The new species occurs from Algoa Bay to off Port Alfred, eastern Cape Province, South Africa. Specimens measure between 22 and 26mm in length.

In discussing the new species, the author compares it to *M. floccata* Sowerby, 1889. *M. spirilineata* is squat and has a more angular shoulder than *M. floccata*. In all specimens examined a characteristic white spiral line was present on the angle of the shoulder. This is not a character found in *M. floccata*.

M. spirilineata has a marbled pattern covering the entire shell, but this pattern is finer and more distinct than in *M. floccata*. It also lacks the broad darker or lighter banding sometimes occurring in *M. floccata*.

M. spirilineata has 10-17 dark spiral lines around the body whorl, with an average of 13.6. *M. floccata* has 0-11 dark spiral rows of dashes with an average of 6.8.

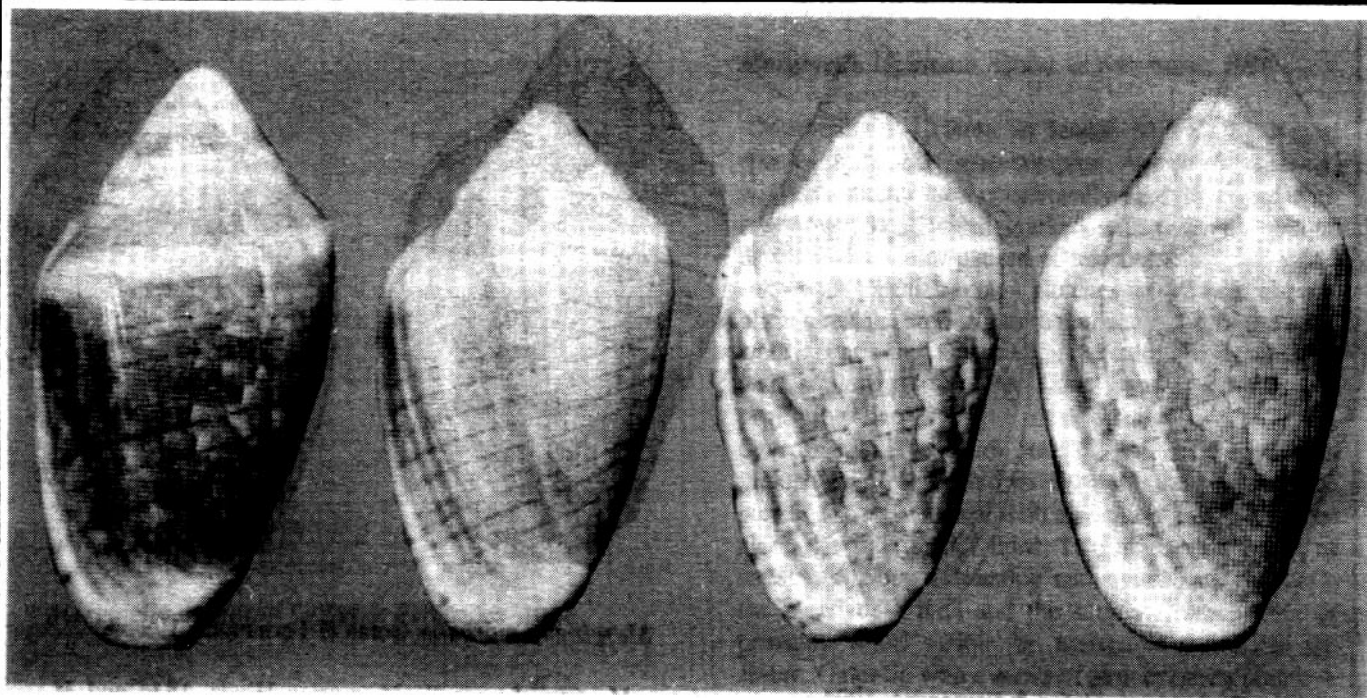
These spiral rows are usually formed by sparse dashes or spots, whereas in *M. spirilineata* they are most often seen as solid lines. These lines end on the margins of both species but in *M. spirilineata* they do not expand into broader bars; in *M. floccata* the dashes on the margins are much thicker than their spiral lines.

Hayes, Brian. A new species of *Marginella* Lamarck, 1799 from the Eastern Cape, South Africa. *World Shells* 10, pp. 44-47 (1994).

Illustration of this species on next page.

***Xastilia kosugei* Bouchet & Houart, 1994**

This new member of the Muricidae was collected from a depth of about 260 meters on the Capel Bank in the Coral Sea. The shell resembles those of the Coralliophilidae, but the radula is characteristic of the muricid subfamily Muricopsinae.

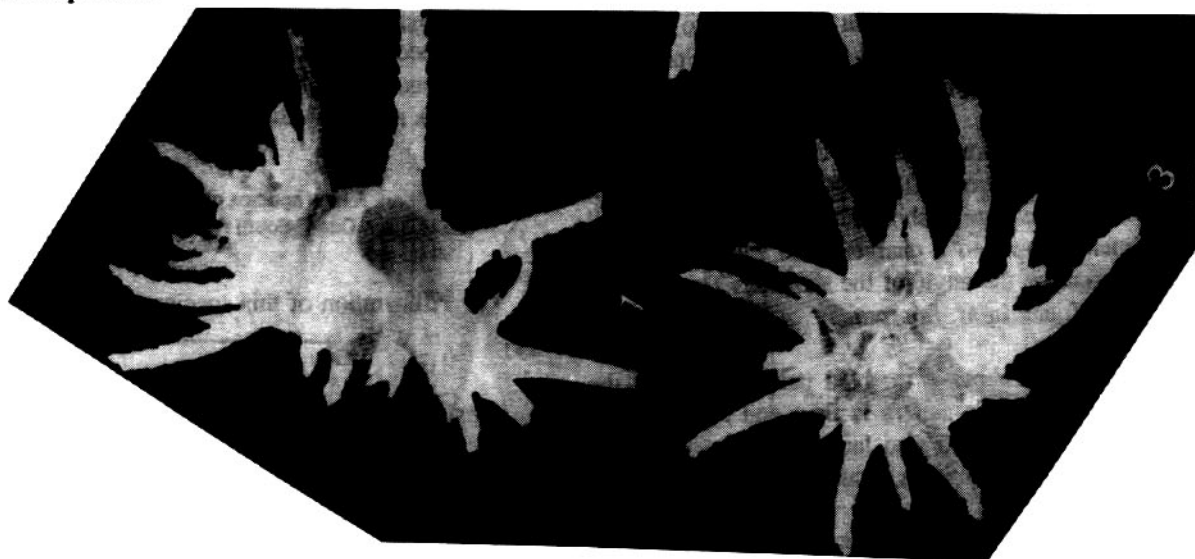


Marginella spirilineata Hayes, 1994

The shell measures 30mm in both height and breadth. The genus *Xastilia* has no conchologically similar genera in the family and was newly erected in this same article. The genus name is an anagram of *Latiaxis* Swainson, 1840. Amongst the coralliophilids, *Xastilia* resembles *Echinolatiaxis* Kosuge, 1979, which also has two rows of long spines, but *Xastilia* has the typical aperture of some species of Muricidae, with a flaring columellar lip, bearing low, abapical nodes, and an erect outer lip with 2 or 3 low nodes within. The operculum of *Xastilia kosugei* also has a typical muricopsine basal (apical) nucleus, compared to the lateral nucleus of coralliophilid opercula.

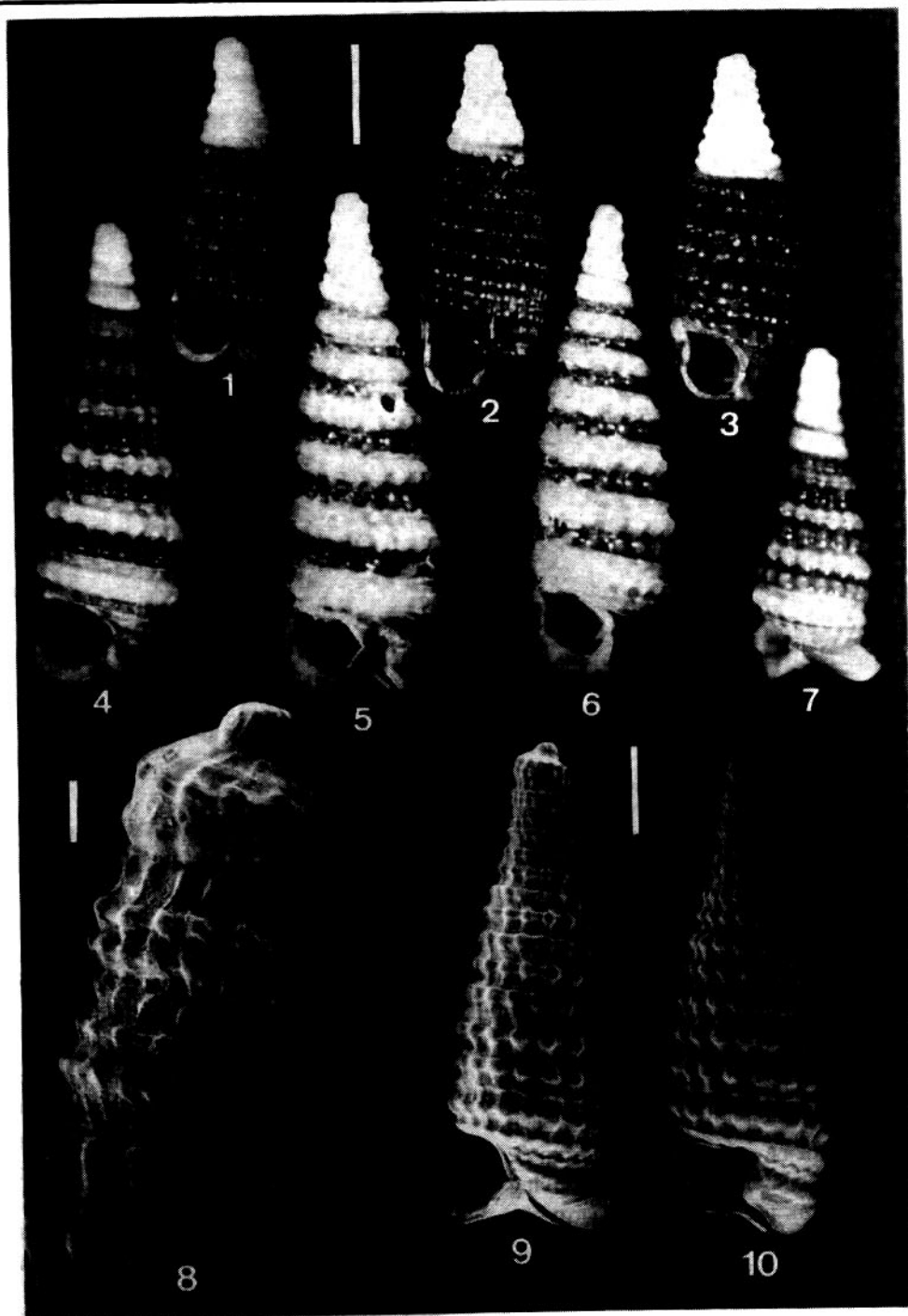
Isotriphora taenialba Rolán & Espinosa, 1994
[Family Triphoridae]

Another small sinistral species - 3-5mm - from Cuba it is included in the genus *Isotriphora* Cotton & Godfrey, 1931 on the basis of the characters of the teleoconch, protoconch, operculum and radula. Color is cream or light brown with the upper cord and suture dark brown. The first whorl is whitish but the suture has a dark brown color; the last whorl is brown, but cream in the external part of the outer lip and at the end of the siphonal canal. In comparison with the similar *I.*



Bouchet, P. and R. Houart. A New Coralliophilid-like Muricid (Gastropoda, Muricidae) from the Coral Sea. Journal of Conchology 35:1 31-135 (1994).

Xastilia kosugei Bouchet & Houart, 1994

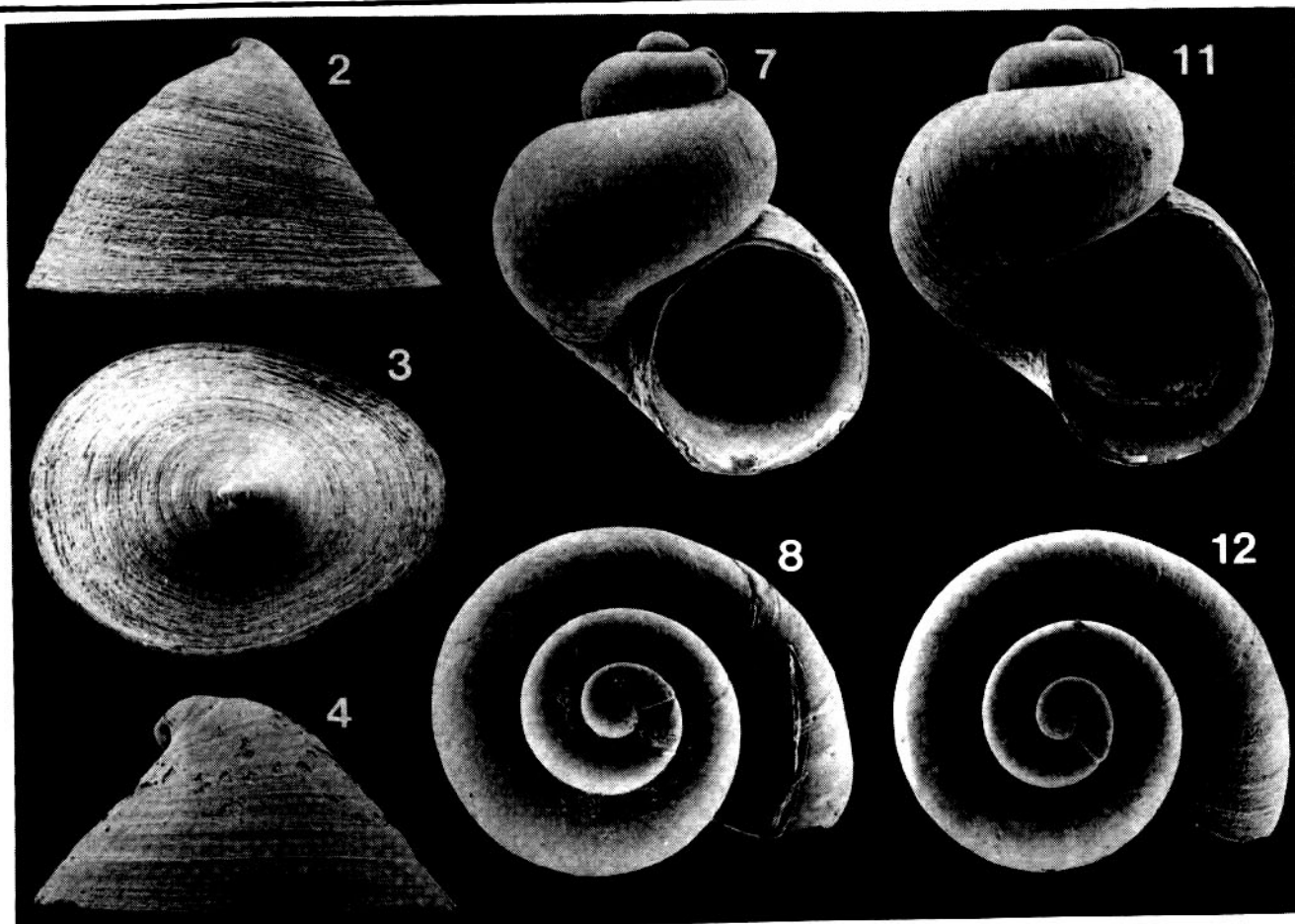


Figs. 1-3, *Isotriphora peetersae*; figs. 4-10, *I. taenialba* Rolán & Espinosa, 1994

peetersae (Moolenbeek & Faber, 1989) some characteristics are consistently different. In *I. peetersae* the first two whorls of the teleoconch are milky-white, the rest being dark brown, whereas in *I. taenialba* the first whorl has a brown suture, the upper cord is white and the lower cream; both change in the second whorl, the upper cord then being dark brown, and the lower cream, while the suture is dark brown. *I. peetersae* also has a shorter siphonal canal which does not protrude beyond the dorsal profile of the shell. *Basteria*, 58: 1-2, pp. 63-68.

Rolán, E. and J. Espinosa. The family Triphoridae (Mollusca, Gastropoda Prosobranchia) in Cuba 3. The genus *Isotriphora*, with description of a new species. *Basteria*, 58: 63-68, 1994.

The mollusca seems able to adapt to almost any habitat, but one of the more bizarre are those whose habitat is deep-sea floor decaying whale bone! *The Nautilus* 108(1):1-8, 1994 contains an article by Bruce A. Marshall which describes four new species obtained from such a habitat in deep water off New Zealand.



Osteopelta praeceps Marshall, 1994

[Family Osteopeltidae] Figs. 2-4, above.

This tiny (5mm) limpet was found alive on whale bone amongst crowded individuals of a species of *Idas* Jeffreys, 1876 [Mytilidae] at a depths between 372 and 912 meters on the Chatham Rise and Challenger Plateau, New Zealand. The new species differs from *O. mirabilis* Marshall, 1987, which has been found living with it, by its smaller size and in having a narrower, taller shell with a longer anterior end.

Bruceiella laevigata Marshall, 1994

[Family ?Skeneidae] Figs. 7 & 8, above.

The type and paratypes of this species came from a whale skull, at a depth of 1,242 meters, northeast of Chatham islands, New Zealand. The shell measures up to 1.7mm high, slightly higher than broad, thin, translucent, glossy, with narrow umbilical chink, periostracum smooth. The protoconch is sculptured with minute anastomosing dendritic threads arranged in fine spiral lines. The teleoconch is composed of up to 2.20 strongly and rather evenly convex whorls. First sixteenth whorl minutely granulate; next sixteenth whorl occupied by strong rounded varix, immediately followed by fine groove; elsewhere smooth. Aperture subcircular, lips thin, parietal contact area narrow.

Compared with the type species of the genus, (*B. globulus* Warén & Bouchet, 1993) *Bruceiella laevigata* is more tightly coiled with a higher spire, but otherwise the two are similar. Amongst the host of superficially similar skeneimorph gastropods known from the New Zealand region, *B. laevigata* is characterized by the combination of distinctive protoconch sculpture, the strong postlarval varix, and the radular morphology.

Bruceiella pruinosa Marshall, 1994

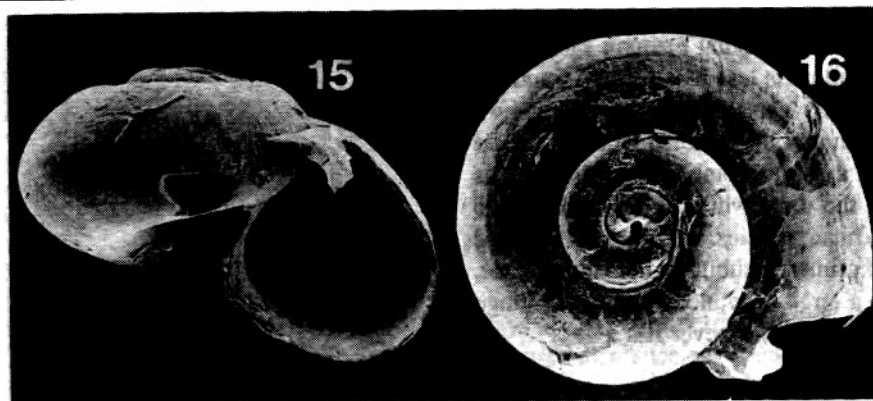
[Family ?Skeneidae] Figs. 11 & 12, above.

Also from whale bone, 908-912 meters on Challenger Plateau, New Zealand, this species differs from both *B. globulus* and *B. laevigata* in having a teleoconch sculpture of minute granules and fine axial wrinkles.

Xylodiscula osteophila Marshall, 1994

[Xylodisculidae]

Xylodiscula osteophila (the species names translates to "bone loving") was collected from a whale skull taken at approximately 900 meters off Mernoo Bank, Chatham Rise, New Zealand, the first record of the group taken from whale bone - other species have been found in association with sunken wood and old sea grass.



Xylodiscula osteophila Marshall, 1994

The holotype measures 1.6mm wide, markedly wider than high, spire weakly elevated, thin, translucent, colorless, umbilicate, periostracum smooth. It differs from other species of the genus in the greater shell height relative to width, the thickened and angled inner lip, and the considerably narrower umbilicus.

Marshall, Bruce A. Deep-sea Gastropods from the New Zealand Region Associated with Recent Whale Bones and Eocene Turtle. *The Nautilus* 108(1):1-8, 1994.

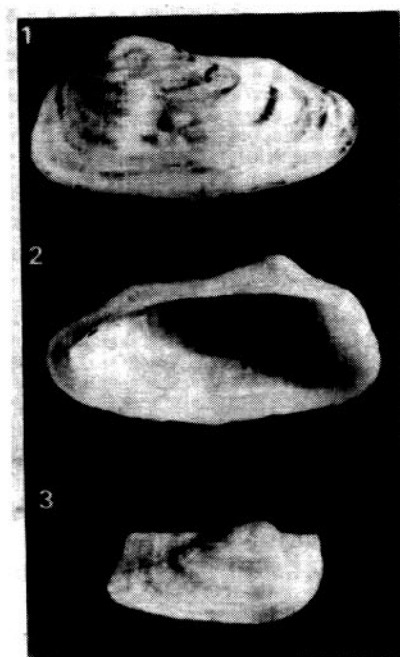
Barbatia perinesa Oliver & Chesney, 1994
[Family Arcidae]

Yes - another Oman species. Uncovered during research leading to an upcoming identification manual, these species by Oliver and Chesney were described in the *Journal of Conchology*, 35:1, pp. 17-31.

The authors state that this new taxa is unusual for a tropical Indo-Pacific species in having the following combination of characters: not greatly inequilateral, presence of radial groove indicating isolated rows of specialized periostracal bristles, a wide dorsal area and a long anterior set of hinge teeth. Most closely related to the South African *B. sculpturata* (which, according to Kilburn, is restricted to the Cape and Transkei regions of South Africa and is absent from subtropical waters), it differs in the ligament, which in *B. perinesa* fills in all the dorsal area except for a small anterior zone below the beaks - in *B. sculpturata* the ligament remains in a posterior position. In *B. sculpturata* the interior color is pink; in *B. perinesa* it is white suffused with violet at least around the posterior ventral margin.

Acar abdita Oliver & Chesney, 1994
[Family Arcidae]

This new species lives attached by a weak byssus to the undersides of large rocks imbedded in sandy gravel in the upper littoral zone o a small area of the coast of Oman, but is surmised to possibly be wide spread in the Indian Ocean. The authors compare the new species to *A. plicata* Dillwyn: in the new species the sculpture is



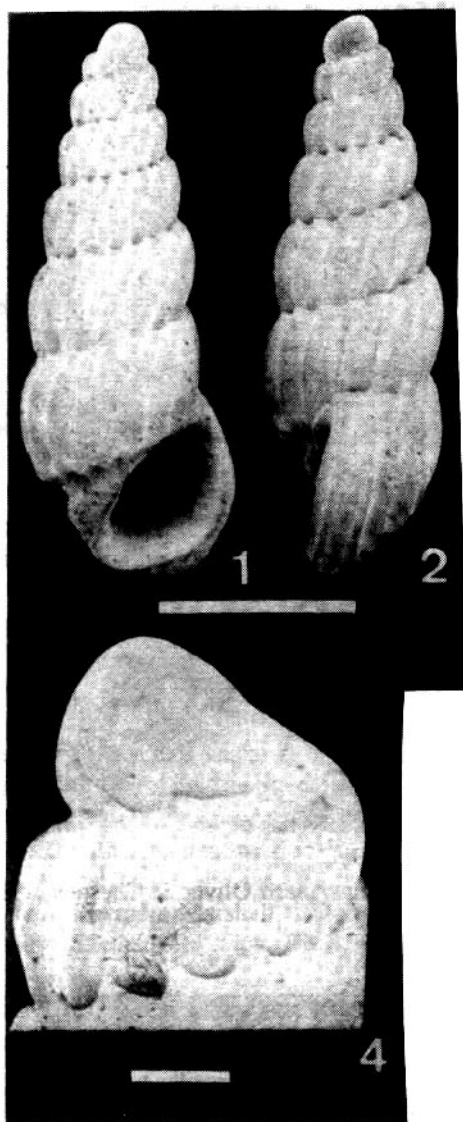
Barbatia perinesa Oliver & Chesney, 1994



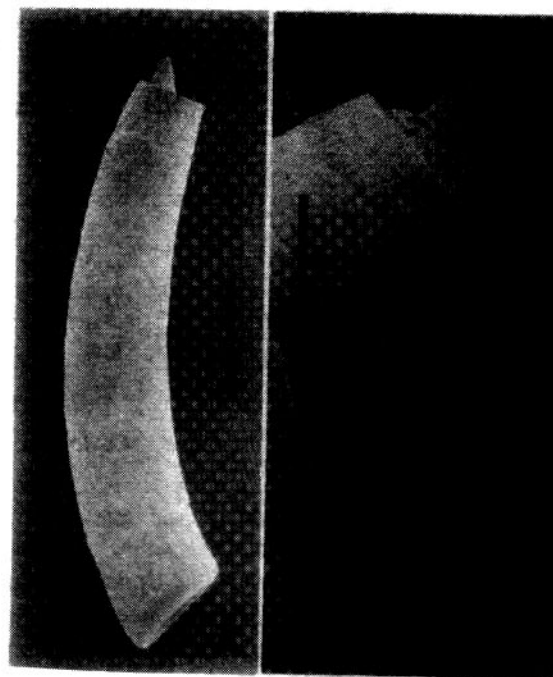
Acar abdita Oliver & Chesney, 1994

finer and dominated by the radial element rather than the concentric; the outline is less inequilateral; and the prodissoconch is weakly capped and approximately 2 times larger. In Oman and the Arabian Gulf *A. plicata* is invariably tinged a salmon pink and in the field is quite distinct from the dirty white of *A. abdita*. Two endemic South African species - both with capped prodissoconchs and primarily sublittoral in habitat. One, *Acar petasion*, has a large edentulous gap in the hinge in all sizes of shell - *A. abdita* never has a gap.

Oliver, P.G. and H.C.G. Chesney. Taxonomy of Arabian Bivalves Part 1. Arcoidea. Journal of Conchology 35:17-31 (1994).



Sleurs, W.J.M. and R.C. Preece. The Rissoininae (Gastropoda: Rissoidae) of the Pitcairn Islands, with the Description to Two New Species. Journal of Conchology 35:67-82 (1994).



Caecum (Elephantulum) massambabensis Absalao, 1994 [Family Caecidae]

Collected off Massambaba Beach, Rio de Janeiro State, Brazil, the species is relatively large (6mm), strong and moderately curved, increasing in diameter towards the aperture. No trace of spiral sculpture but with microscopic longitudinal striae interrupted by growth annulations. The species cannot be easily confused with any other member of the subgenus *Elephantulum* by virtue of its slight curvature and its characteristic ornamentation lacking any kind of strong axial sculpture. Journal of Conchology, 35:2, pp. 137-140.

Absalao, R.S. A New Species of the Genus *Caecum* (Prosobranchia: Mesogastropod) from Southern Brazil. Journal of Conchology 35: 137-140 (1994).

Rissoina (Rissoina) fratercula Sleurs & Preece, 1994 [Family Rissoidae]

Small, up to 3.1mm, elongate-conical, slightly translucent, rather solid. Similar in shell characters to *R. (R.) costata* A. Adams, 1851, but differs by its smaller shell, by its more elongate shell shape and by the less prominent spiral (micro)sculpture. The protoconch of both species is identical in shape, but the fine spiral threads on the last whorl of the protoconch, which can be seen in fresh specimens of *R. (R.) costata*, appear to height relative to width, the thickened and angled inner lip, and the considerably narrower umbilicus.

A Scientific Checklist of Philippine Land Shells

James L. Barnett *

The scientific checklist of Philippine land shells which follows contains details of Philippine terrestrial species which have been confirmed as being presently available to collectors. While all species listed are generally available, many may be very difficult to obtain due to a number of factors. Since land shells do not have the monetary value of their marine counterparts, very few Philippine shell dealers bother with them. Land shells, unlike marine shells, are usually found in out of the way places, such as tropical rain forests and hardwood forests. Travel to, from and within these forests is sometimes very difficult. Roads are either bad, or non-existent, and very few Filipinos collect land shells for a living. However, once in a while, some individual does happen into a shell-rich forest and a few uncommon species appear in Philippine shell shops and on dealer's lists.

Included in the checklist will be the name of the shell, the authority who named the shell, the date when the species was named, and the source location of the shell. When full details are not given it means that the data is not available, or possibly the data available is contradictory and therefore questionable. Every effort has been made to pinpoint the source of the shells to as small an area as possible, but, in a few cases, this has not been possible. Where it has not been possible to confirm the source of shells, these shells will be listed as coming from the "Philippines", "Luzon" much as they were listed in the older literature.

The shells of the checklist will be listed according to the scientific order developed by Wenz and Zilch (*Gastropoda*, 1959-1960). Following a brief discussion of the history of each Genus / Subgenus, a general description of the shells to be found within a particular Genus / Subgenus, the shells will be listed alphabetically. The photographs chosen to accompany the checklist have been selected as those being the most available at present, and those which seem to have given dealers and collectors the greatest identification problems. Since many collectors may be unfamiliar with the geography of the Philippine Islands, a map containing the source of most species is also included.

The Philippine archipelago consists of over 7,000 islands. Some are large, some are small, and some appear only at low tide. But each and every island that

stays above water permanently is generally a source of at least a few species of land shells.

For the study of terrestrials, the Philippine archipelago can conveniently be divided into fourteen land snail regions. These regions can be individual islands, groups of islands, or sections of larger islands. If the region is composed of a group of islands, there is generally a similarity in the land shell fauna of the islands, and forms, or varieties of land snails found on one island can usually be found on other, neighboring islands.

The regions are usually small, so that the climatic conditions are more or less consistent throughout the region. The topography of each region is also fairly consistent; being either hilly, hilly-mountainous, very mountainous, or flatland. The large island of Luzon has been divided into five regions; with some of the regions being very mountainous, others being hilly, and still others being comparatively flat. Since the Philippines consists of so many islands, water barriers generally serve to restrict certain species of land snails to certain regions. On a large island like Luzon, rivers and mountain ranges usually serve to restrict terrestrials to particular regions. Not enough is presently known about the land shell life of the other large Philippine island, Mindanao, to divide that island into regions, so, Mindanao, along with the islands of the Sulu archipelago, has been retained as a single region.

From north to south, the fourteen regions are: the northern Philippine islands, particularly the shell-rich Batanes group; Western northern Luzon; Eastern northern Luzon; Central northern Luzon, the Cordillera Central range; Central Luzon; Southern Luzon; Mindoro and Lubang; Marinduque; the Ramblon group, including Tablas and Sibuyan; the Masbate group, including Burias and Templo; Samar and Leyte; The Visayas group, consisting of Panay de Guimaras, Cebu, Bohol, and Negros/Siquijor; Palawan; and Mindanao and Sulu.

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NOTE: All photographs in this article are by the author.

In order to standardize the names of the various shell workers, who will be referred to in this study, the following tetragraphs have been devised:

Adams & Reeve	ADRE
Bartsch	BART
Beck	BECK
Bowdich	BOCH
Broderip	BROD
Vruguere	BRUG
Chemnitz	CHEM
Clapp	CLAP
Clench & Archer	CLAR
Deshayes	DESH
Donovan	DONO
Dohrn	DORN
Dohrn & Semper	DOSE
Eydoux	EYDO
Ferussac	FERU
Fulton	FULT
Gould	GOLD
Gray	GRAY
Grateloup	GRUP
Grosse	GROS
Gude	GUDE
Hidalgo	HIGO
Hombron & Jacquinot	HOJA
Jay	JAAY
Jonas	JONS
Kobelt	KOLT
Kobelt & Winters	KOWI
Lea	LEEA
Lesson	LESS
Martens	MART
McGinty	MCGI
Möllerndorff	MOLF
Mörch	MOCH
Müller	MULL
Nevill	NELL
Pfeiffer	PEER
Pilsbry	PILS
Quadrans & Möllerndorff	QUMO
Reeve	REVE
Semper	SEMP
Shuttleworth	SHUT
Smith	SMIT
Sowerby	SOBY
Thompson & Auffenberg	THAU
Valenciennes	VALE

Shells of the large and variable *Helicostylinae* Subfamily will be listed first. These will be followed by listings of other major groups of Philippine land shells, including the *Amphidromus* and *Obba* of the Family Camaenidae. These two listings will be followed by

listings of other Philippine species, including the ground-dwelling terrestrials.

Philippine land shells of the subfamily *Helicostylinae* are scientifically classified as follows:

CLASS:	Gastropoda
SUBCLASS:	Pulmonata
ORDER:	Stylommatophora
SUBORDER:	Sibmurethra
FAMILY:	Bradybaenidae
SUBFAMILY:	<i>Helicostylinae</i>

I. Bradybaenidae: *Helicostylinae*

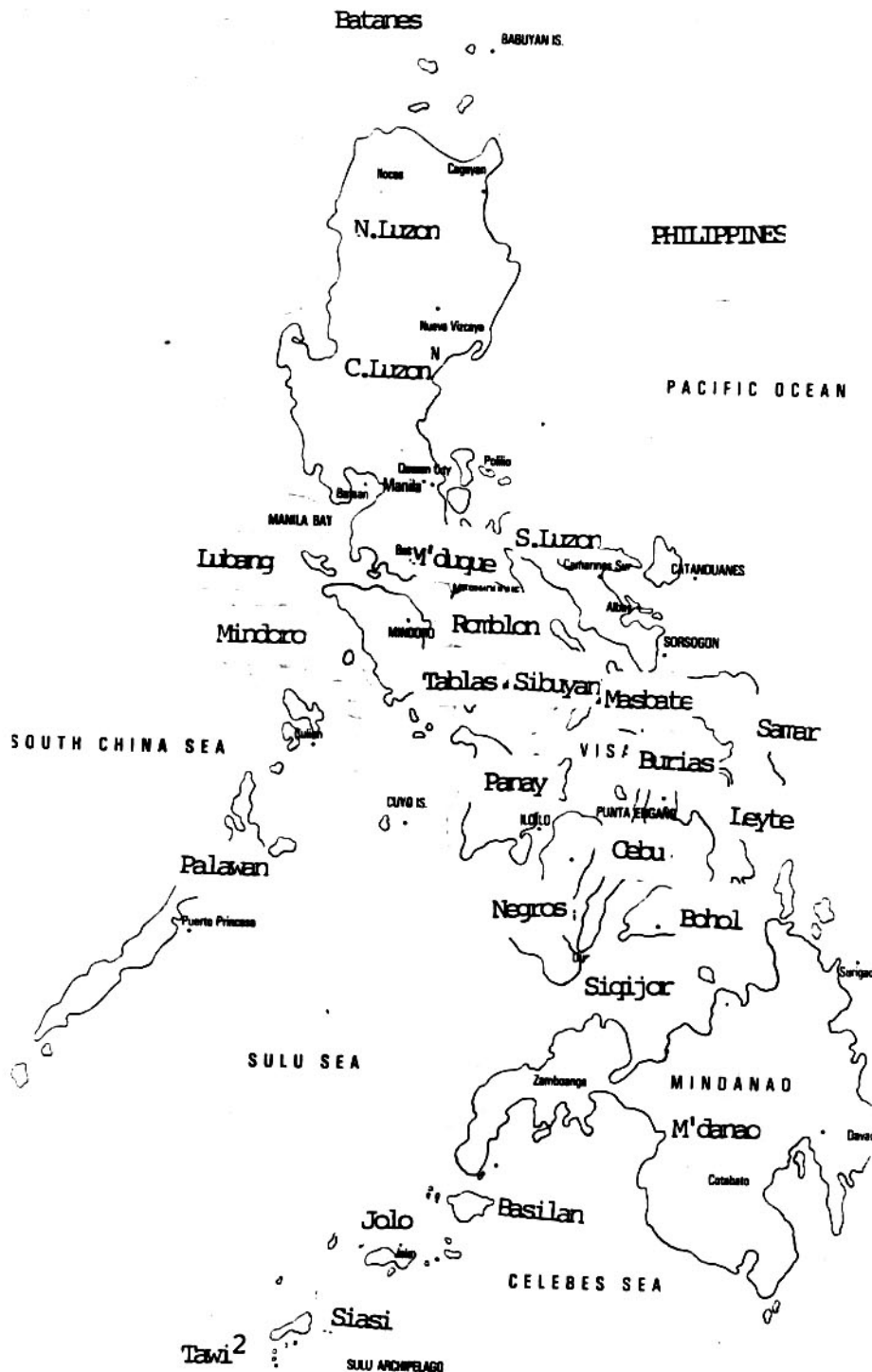
A. Genus: *Calocochlia* Hartmann, 1840.

(*Calocochlea* Hartmann, 1843; *Callicochlias* L. Aggasiz, 1846; *Callochlina* Mörch, 1857)

Shells of the Genus *Calocochlia*, in general, and of the Subgenus *Calocochlia*, in particular, are solid and vary in shape from globose, to depressed-globose, to somewhat flattened. Some shells are unicolored, while others are multicolored. Some are more-or-less covered with variously patterned hydrophanous periostracum (HP), while others can be totally devoid of HP. Banding and an umbilical mark may, or may not, be present. The periphery is usually well-rounded, but it is sometimes carinated, and the texture of the shell can be smooth, or slightly rough. The aperture is generally quite large, and the lip is usually large, solid and flaring. The lip may be white, or it may be just tinted or edged with color, or it may be heavily colored, usually with some shade of red or brown. The columella is usually white, and the interior of the aperture ranges from pure white to a white, tinged with some darker color. Type species: *Calocochlia pulcherrima* Sowerby.

a. Subgenus *Calocochlia*:

1. *albaiensis* SOBY, 1841. Hills, north of Daraga, Albay, S. Luzon.
2. *albaiensis capulica* KOLT, 1910. Capul Island, Samar.
3. *aopta* CLAR, 1933. South of Puerto Galera, Mindoro.
4. *caillaudi* DESH, 1839. Polillo Island, C. Luzon.
5. *caillaudi ferruginea*. Quezon Province, east-central C. Luzon.
6. *chlorochroa* SOBY, 1841. Bohol Island.
7. *chrysochiela* SOBY, 1841. Cagayan Valley, 'northeast Luzon.
8. *cocomelos* SOBY, 1841. Hills, central Tablas Island.
9. *cocomelos princeps* REVE, 1854. Hills, central Tablas Island.
10. *codonensis* HIGO, 1888. Catanduanes Island, C. Luzon.



11. *coronadoi* HIGO, 1868. Catanduanes Island, S. Luzon.
12. *cromyodes* PEER. Cotabato, south-central Mindanao.
13. *damahoyi* PEER. Babuyan Island, North of Luzon.
14. *dautzenbergi* HIGO, 1901. Mountains, west of Casiguran, N.E. Luzon.
15. *identiculata*. Philippines.
16. *depressa* SEMP, 1877. Surigao Province, N.E. Mindanao.

17. *depressa euchroa* MOLF, 1898. Cotabato, south-central Mindanao.
18. *depressa globosa* KOLT, 1910. Mountains, near Davao, Mindanao.
19. *depressa stenochilla* KOLT, 1910. Near Davao, Mindanao.
20. *depressa lignicolor* MOLF, 1888. Surigao, N.E. Mindanao.
21. *difficilis* PEER. Philippines.

22. *dubiosa* PEER, 1845. Hills, Quezon Province, east-central Luzon.
23. *dubiosa submirabilis* PEER. Bataan and Zambales, east-central Luzon.
24. *festiva* DONO, 1825. Ifugao & Isabella, mountains, N. Luzon.
25. *generalis* PEER, 1845. Luzon, Philippines.
26. *gertrudis* KOLT, 1910. Mountains, northeast Mindoro.
27. *gilberti* QUMO, 1896. Mountains near Baler, Aurora, N.E. Luzon.
28. *harfordi* BROD, 1841. Mountains, northwest Negros Island.
29. *hemisphaerion* PEER, 1851. Hills, Sibuyan Island.
30. *hidalgoi* MOLF, 1894. Hills, near San Fernando, Sibuyan Island.
31. *indusiata*. Philippines.
32. *infruscata*. Luzon, Philippines.
33. *lalloensis* PEER, 1855. Near Lal-lo, Cagayan, N.E. Luzon.
34. *leopardis* PEER, 1845. Camarines Sur, Southern Luzon.
35. *leucauchen* MOLF, 1895. Camarines Sur, Southern Luzon.

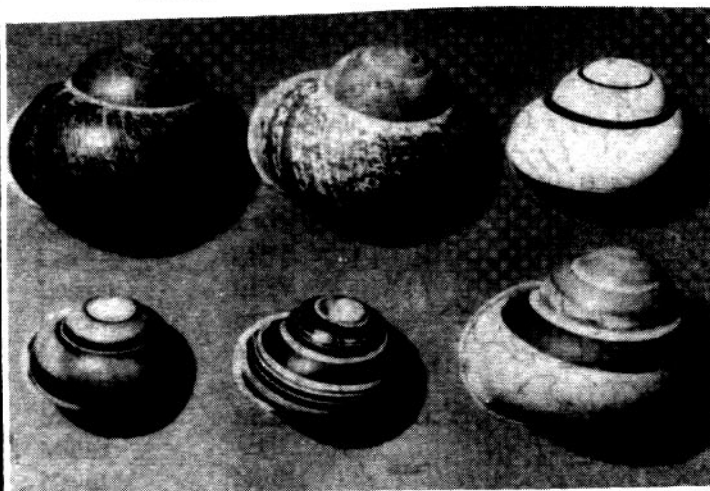


Fig. 1. *Calocochilla*. Top row: (L) *C. pulcherrima*, red-brown color, with HP in streaks, heavy or moderate, average, 42.5mm. (C) *C. pulcherrima chrysacme*, golden color, other details as above. (R) *C. roissyana*, ranges from dark brwn to pure white, heavy HP on only one ssp. Bottom row: (L) *C. speciosa*, light brown, moderate to heavy HP. (C) *C. speciosa batanica*, very dark brown, other details as above. (R) *C. zonifera*, medium brown, HP in wide or narrow bands.

36. *luzonica* PEER, 1842. Cagayan Province.
37. *luzonica areolata* KOLT, 1908. Echague, Isabela Province.
38. *luzonica erythrospira* MOLF, 1850. Malunu, Isabela Province.
39. *luzonica fumosa* KOLT, 1908. Casiguran Aurora, N.E. Luzon.

40. *matruellis* SOBY, 1841. Mindanao Island.
41. *melanochiela* PEER, 1842. Mountains, south of Calapan, Mindoro.
42. *mettalarum* MOLF, 1898. Mambulao, Camarines Sur, S. Luzon.
43. *mindanaensis* PEER, 1842. Camaguin, north-central Mindanao.
44. *norrisii* PEER, 1842. Mt. Isarog, Camarines Sur, S. Luzon.
45. *pan* BROD, 1841. Bohol and Panglao Islands.
46. *polillensis* PEER, 1861. Northern Polillo Island, eastern C. Luzon.
47. *polillensis ajax* PEER, 1861. Polillo Island, Central Luzon.
48. *polillensis andromache* PEER, 1861. Polillo Island.
49. *polillensis fasciata* KOLT, 1910. Polillo Island.
50. *polillensis hectori* PEER, 1861. Polillo Island.
51. *polillensis subdubiosa* KOLT, 1910. Polillo Island.
52. *ponderosa* PEER, 1861. Tuguegarao, Cagayan, N.E. Luzon.
53. *pulcherrima* SOBY, 1841. Cagayan and Isabela, N.E. Luzon.
54. *pulcherrima chrysacme* QUMO, 1893. Abulug, Cagayan Province.
55. *roebelina* MOLF, 1894. Dingalan, Nueva Ecija, north-central Luzon.
56. *roissyana* FERU, 1822. Northeast Mindoro.
57. *roissyana bartschi* CLAR, 1933. Northwest Mindoro.
58. *roissyana cavitala* BART, 1932. Northwest of Paluan, Mindoro.
59. *roissyana cuticularis* KOLT, 1910. Southwest Mindoro.
60. *roissyana laymansa* BART, 1932. Northeast of Mansalay, Mindoro.
61. *roissyana lutea* BART, 1932. Ilin Island, S.W. of Mindoro.
62. *roissyana manlaya* BART, 1932. Southeast of Mansalay, Mindoro.
63. *roissyana monacha* CLAR, 1933. Southeast of Paluan, Mindoro.
64. *roissyana subatra* PILS, 1892. Northwest Mindoro.
65. *saranganica* MOLF, 1893. Sarangani Island, south of E. Mindanao.
66. *semperi* MOLF, 1893. East of Ilagan, Isabella, N.E. Luzon.
67. *semperi camptochila* KOLT, 1909. East of Cauayan, Isabela.
68. *semperi streptostoma* MOLF, 1893. East of Echague, Isabela.
69. *speciosa* JAAY, 1839. North of Basco, Batan Is., Batanes Group.
70. *speciosa batanica* REVE, 1854. North of Basco, Batan, Batanes.
71. *spurabadia* SEMP, 1877. Malunu, Isabela.

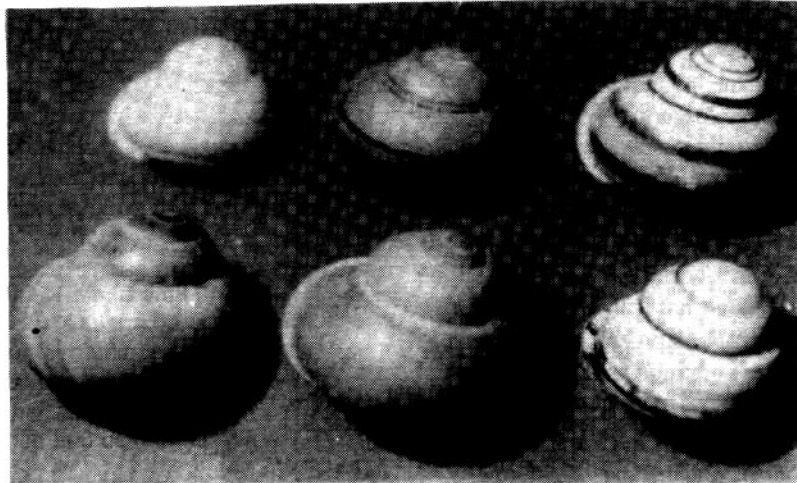


Fig. 2. *Calocochilia*. Top row: (L) *C. albalensis*, white with faint brown bands, only traces of HP. (C) *C. aopta*, medium brown with dark brown banding, no HP. (R) *C. callaudi*, white with three dark brown bands, HP yellowish and solid. Bottom row: (L) *C. callaudi ferruginea* purplish top and light brown bottom, HP yellow in axial streaks. (C) *C. chrysochela*, dark yellow throughout, no HP. (R) *C. trisculpta*, light brown above and dark brown below, usually covered with heavy HP. There is also a green form.

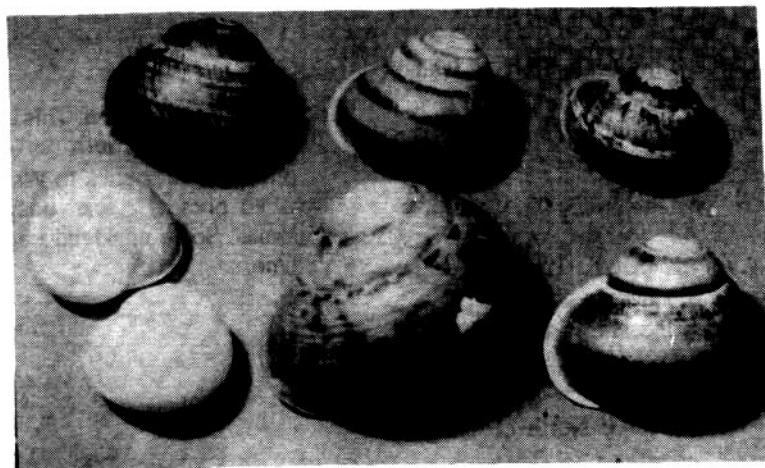


Fig. 3. *Calocochilia*. Top row: (L) *C. valenciennesi*, dark brown with HP places in many wide and narrow bands. *C. valenciennesi chlonodes* is similar, but green in color. (C) *C. dubiosa*, white with three dark brown bands, final whorl almost totally covered with yellow HP. (R) *C. festiva*, pinkish top whorls and dark red below, heavily covered with HP, and a HP band at the periphery. Bottom row: (L) *C. gertrudis*, some pure white (bottom), others with solid yellow (above). (C) *C. harfordi*, golden brown, heavily marked with dark brown HP in streaks, blotches and interrupted bands. (R) *C. hemisphaerion*, dark yellow with many wide and narrow brown bands, moderately covered with light brown HP.

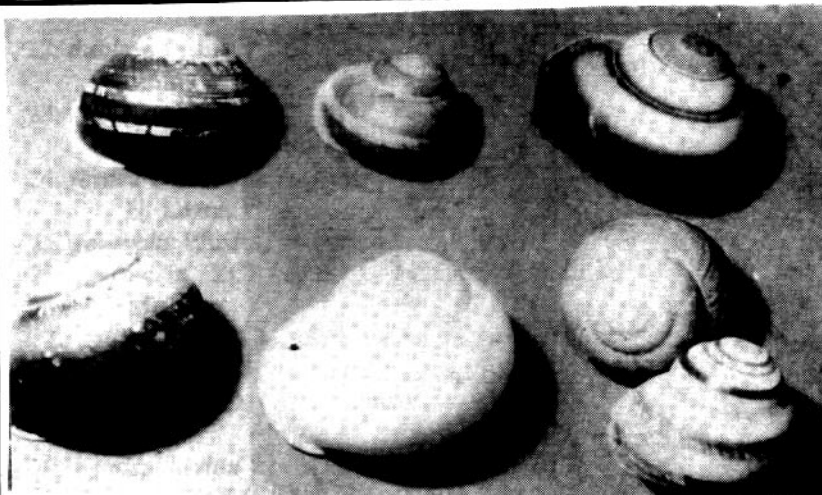


Fig. 4. *Calocochilla*. Top row: (L) *C. zonifera paraleuca*, yellow-brown with HP in radial bands. (C) *C. luzonica areolata*, olive green with a single light brown HP band at the periphery. (R) *C. melanochlela*, purplish on top, yellowish center and shiny dark brown below, no HP. Bottom row: (L) *C. hidalgoi*, golden brown on top and dark brown below, moderately covered with HP. (C) *C. ponderosa*, very lightly yellowish top, and white below, no HP. (R) *C. polillensis* (top), orange-brown, heavily covered with golden HP; *C. polillensis hectori* (bottom), light yellow with brown banding, under a moderate amount of yellow HP.

72. *tephrodes* PEER, 1842. Point Bolinao, Pangasinan, C. Luzon.
73. *trisculpta* MOLF, 1894. Cajidiocan, Sibuyan Island.
74. *valenciennesii* EYDO, 1838. Romblon Island.
75. *valenciennesii chionodes* MOLF, 1896. Cobrador Island, near Romblon island.
76. *xanthobasis* PILS, 1892. On Mt. Isaroq, Camarines Sur, S. Luzon.
77. *xanthobasis holoxantha* KOLT, 1909. Paracale, Camarines Norte, S. Luzon.
78. *zonifera* PEER, 1842. Northeast of Gandara, Samar.
79. *zonifera circe* PEER, 1853. Mainit, northeast Mindanao.
80. *zonifera globosa* MOLF, 1893. North of Wright, Samar.
81. *zonifera modestior* MART, 1867. West of Borongon, Samar.
82. *zonifera paraleuca* PILS, 1892. Surigao Island, Mindanao.
83. *zonifera purpurascens* MART, 1867. South of Lauang, Samar.

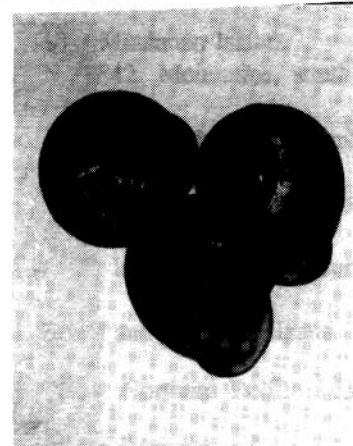


Fig. 5. *C. hidalgoi*. This shell has been misidentified as *C. norrisii* for some time. The misidentification probably dates back to 1948, and Walter Webb's *Foreign Land Shells*. Webb generally included only one top view of a shell, and his descriptions usually did not include color data.

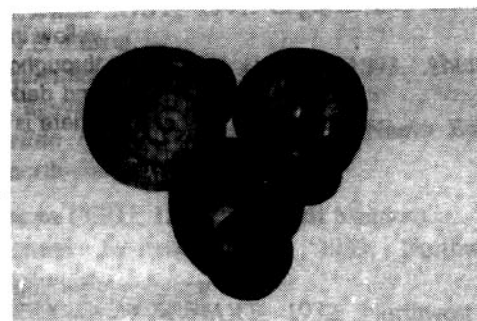


Fig. 6. *C. trisculpta*. This shell has been misidentified as *Helicostyla dimera* for some time. The error also probably goes back to Webb's book. With its black and white photos, it was easy to confuse and misidentify shells. Some misidentifications persist up to the present time.

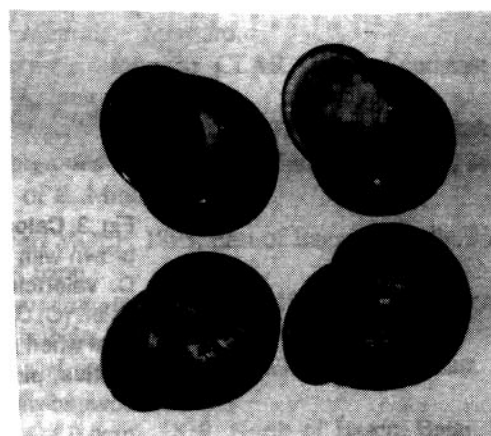


Fig. 7. *C. valenciennesii* (R), and *C. valenciennesii chionodes* (L). The shells are very similar in size, shape, and HP placement. The only difference is in color; the nominate form being a deep red-brown, and the ssp being green.

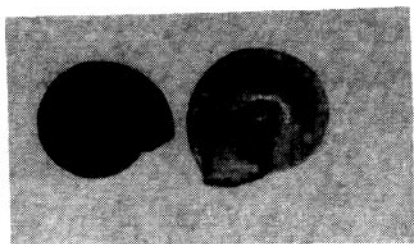


Fig. 10. Left shell: *A. siquijorensis*, a dark brown shell. Right shell: *A. siquijorensis pallens*, a light-colored shell: sometimes near-white, sometimes a light pink or purple. At an average of 34mm, they are between the large and small forms. What all *Anixia* shells have in common is a similarly shaped and colored aperture.

21. *zebuensis* BROD, 1841. Foothills, near Badian, Cebu.
22. *zebuensis epitropis* KOLT, 1910. Hills, near Argao, Cebu.
23. *zebuensis striatissima* PILS, 1891. Hills, near Malabuyoc, Cebu.

c. Subgenus *Trachystyla* Pilsbry, 1892

The shells of subgenus *Trachystyla* are usually large, solid and rough in appearance. They are usually of a dull, dark color and, while some are heavily covered with AP, others are almost totally unmarked. The aperture is large and well-rounded, and the columella and the large, flaring lip are either white or marked with purple. The shells are frequently found on the ground, near tree and bushes, during the rainy season, and the shell frequently has repaired damage marks, as well as large growth rest marks. Type species: *T. cryptica* Broderip.

1. *cryptica* BROD, 1841. Mountains, northeast of Gandara, Samar.
2. *cryptica cineracea* SEMP, 1877. Near Magallanes, Surigao, Mindanao.
3. *cryptica cretata* BROD, 1841. Hills, near Jaro, Leyte.
4. *cryptica depressa* MOLF, 1893. Hills, Camotes Island, near Leyte.
5. *cryptica latitans* BROD, 1841. Hills, southwest Bohol Island.

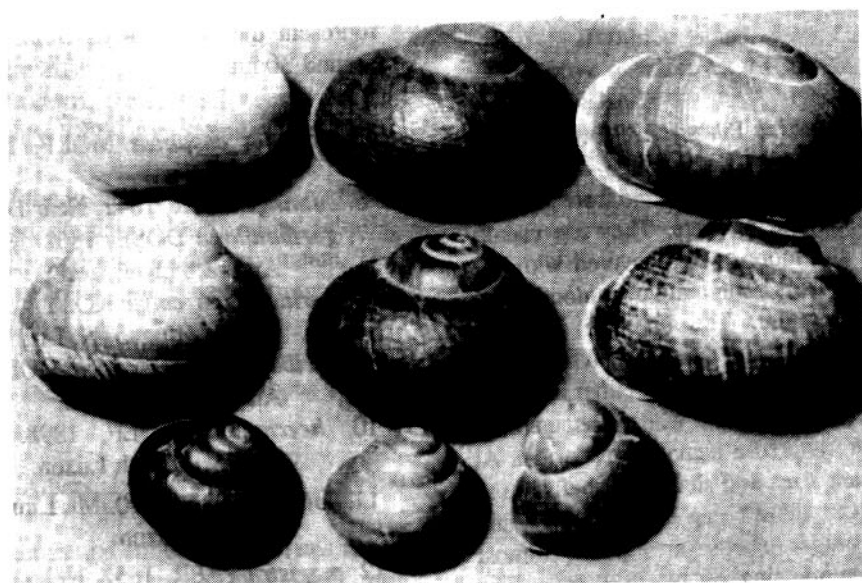


Fig. 11. *Trachystyla*. Top row: (L) *T. cryptica*, shells usually reddish, the shell shown is an uncommon color combination, white on top and orange on bottom. (C) *T. cryptica latitans*, color usually dark red-brown or dark orange, lip heavy purple. (R) *T. cryptica depressa*, usually a pale orange. Middle row: (L) *T. cryptica cretata*, usually a green-brown, heavily decorated with HP. (C) *T. cryptica subglobosa*, shell a very dark brown, and more rounded than the other shells of the

complex. (R) *T. cryptica cineracea*, usually a very dark purple-brown, with an extremely rough final whorl, and a shiny, red lip. Bottom three shells are *T. dattaensis*, shells much smaller than the other shells of the complex. Some shell authorities have placed this species with the *Calocochilla*, but Sempér has placed it with the *Trachystyla*, and it seems to fit best here, due to its rough surface.

6. *cryptica nigricans* MOLF, 1893. Surigao Prov., Mindanao.
7. *cryptica panaensis* SEMP, 1877. Panaon Island, off Leyte Island.
8. *cryptica subglobosa* MOLF, 1893. Surigao Prov., Mindanao.
9. *cryptica tumida* MOLF, 1893. Surigao Prov., Mindanao.
10. *dattaensis* SEMP, 1866. On Mt. Data, N. Benguet, N. Luzon.



Fig. 8. Shells of the *Calocochilla zonifera* complex. Top row: (L) *C. z. zonifera*, usually has a dark band at the periphery. (C) *C. z. purpurascens*, usually heavy HP. (R) *C. z. paraleuca*, heavy HP below a dark top band. Bottom row: (L) *C. z. clirce*, smallest of the complex, and with least HP. (C) *C. z. globosa*, largest of the complex, heavy HP on top, and with a smooth, shiny yellow brown base, lip white. (R) *C. z. modestior*, shell small with very little HP. The shells of the *C. zonifera* complex, due to their similarities, are very hard to separate. It is imperative that the collector/dealer have a very large number of shells, and the exact source of the shells must be known.

b. Subgenus *Anixa* Pilsbry, 1895

(*Axina* Albers, 1850; non-Kirby, 1817)

The shells of the subgenus *Anixa* range from globose-turbinate to depressed and carinate. They are usually dark colored, solid and more-or-less covered with HP. The surface of the shells is comparatively smooth, with very faint spiral sculpture. The aperture is either rounded, or somewhat pointed, depending on the degree of carination at the periphery. The lip is either narrowly or broadly reflexed, and sometimes white, or sometimes either tinged with or covered a heavy shiny brown. At present, three different sizes and shapes of shells are to be found within *Anixa*: these being large, medium and small sizes. The larger shells are found almost exclusively in the mountains of North Luzon. The smaller shells are found exclusively on Cebu Island, and one medium shell is found on Siquijor Island. While the smaller shells, represented by *A. zebuensis*, appear to be the true *Anixa*; the larger shells, represented by *A. garibaldiana*, and the medium shell, *A. siquijorensis*, do not fit the pattern, and the large shells and the medium shell probably rate a subgenus of their own.

1. *carbonaria* PEER, 1842. Mountains, east of Oslob, Cebu Island.
2. *carbonaria papilliformis* MOLF, 1898. Near Boljoon, Cebu.
3. *collodes* SOBY, 1841. Near Boljoon, Cebu.
4. *collodes amicta* REVE, 1851. Near Sambuan, Cebu.



Fig. 9. Top row: Both shells, *Anixa garibaldiana calva*. These shells are representative of the large specimens from the mountains of northern Luzon, and measure about 46mm. Bottom row: three *Anixa pfeifferi*. These represent the small shells from Cebu, which average around 30mm.

5. *collodes castanea* MOLF, 1898. Near Sambuan, Cebu.
6. *cumingi* PEER, 1842. Near Dalaguete, Cebu.
7. *garibaldiana* DOSE, 1862. Mountains, near Baler, Aurora, N.E. Luzon.
8. *garibaldiana calva* KOLT, 1910. Mountains, near Banaue, Ifugao, N. Luzon.
9. *garibaldiana holoserica* MOLF, 1896. Near Baler, Aurora, N.E. Luzon.
10. *heermanni* MOLF, 1898. Mt. Tira, northern Benguet, North Luzon.
11. *kobelti* MOLF, 1890. Mt. Limutan, Morong, Bataan Pen., C. Luzon.
12. *magistra* PEER, 1852. Near Medellin, north Cebu Island.
13. *magistra gloynei* SOBY, 1889. Mactan Island, east of Cebu.
14. *moreleti* PEER, 1848. South of Boljoon, Cebu.
15. *patricia* PEER, 1859. Hills, Quezon Prov., east-central Luzon.
16. *pfeifferi* SEMP, 1877. Foothills, near Ronda, Cebu.
17. *phloides* PEER, 1842. Foothills, near Ronda, Cebu.
18. *schadenbergi* MOLF, 1890. Mountains, near Kiangnan, Ifugao, N. Luzon.
19. *siquijorensis* BROD, 1841. Hills of central Siquijor Island.
20. *siquijorensis pallens* MOLF, 1891. Hills, Siquijor Island.

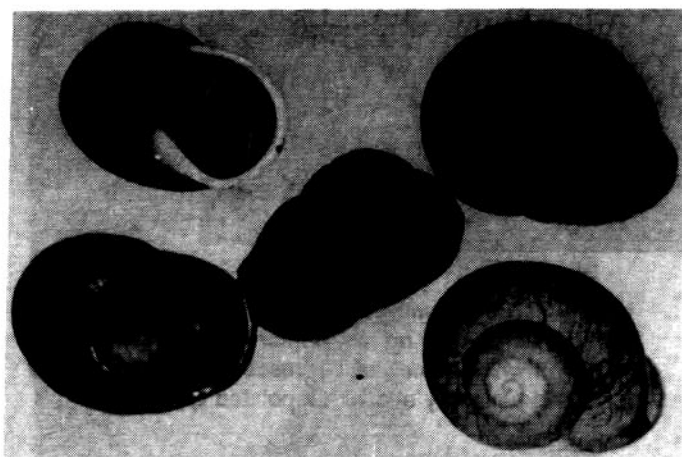


Fig. 12. *Trachystyla*. Top row: (L) *T. cryptica*, shell solid orange, with a white lip. (R) *T. cryptica nigricans*, shell almost black, with scattered HP near the top. Middle row: (C) *T. cryptica panaensis*, shell a very dark brown, and somewhat more elevated than the other shells of the complex. Bottom row: (L) *T. cryptica latitans*, lip a deep red-purple. (R) *T. cryptica crotata*, shell most heavily decorated with HP of the complex.

B. Genus *Steatodryas* Pilsbry, 1932

(*Ptychostylus* Möllendorff, 1888, non-Sanberger, 1870;
Hypopthchus Pilsbry, 1893, non-Steindachner, 1880)

The lone species of the genus, *S. cepoides*, is globose-turbinate, and formed of many closely-coiled whorls. The lip is thin, and the aperture is narrowly lunate. The columella is twisted spirally, and it has a strong tooth-like fold near the base.

1. *cepoides* LEEA, 1840. Hills, central Lubang Island, Mindoro.

C. Genus *Chloraea* Albers, 1850

The shells of the genus and subgenus *Chloraea* range from depressed-globose to lens-shaped, and are generally thin, but solid. The shells vary in size from small to medium, and with the exception of some banding, are usually light colored and unicolored. The entire shell is covered with very fine, closely-placed spiral lines. The periphery can be well-rounded, or sharply carinated. The aperture is generally quite large, and the lip is thin, but strong. Type species: *Chloraea sirena* Beck.

a. Subgenus *Chloraea*

1. *almae* MOLF, 1890. Hills, southwest Cebu.
2. *amoena* PEER, 1845. Hills, east of Badian, Cebu.
3. *benguetensis* SEMP, 1880. Near Baguio, Benguet, N. Luzon.

4. *bifasciata* LEEA, 1841. Mountains, central Bataan Peninsula, C. Luzon.
5. *bifasciata dealbata* MOLF, 1898. Hills, Central Marinduque.
6. *bifasciata diffusa* KOLT, 1906. Mountains, Zambales Province, C. Luzon.
7. *bifasciata huegeli* PEER, 1848. Hills, Nueva Ecija, C. Luzon.
8. *bifasciata multifasciata* MOLF, 1898. Pampanga Province, C. Luzon.
9. *bifasciata pseudoamoena* KOLT, 1906. Bauang, LaUnion Province, N.W. Luzon.
10. *bifasciata sabunicolor* KOLT, 1906. Sibul, Bulacan Province, C. Luzon.
11. *bifasciata pusilla* KOLT, 1906. Aliaga, Nueva Ecija, C. Luzon.
12. *bifasciata saturnalis* MOLF, 1898. Lubang Island, Mindoro.
13. *bifasciata virescens* KOLT, 1906. Candon, Ilocos Sur, N.W. Luzon.
14. *caerulea* MOLF, 1888. Mountains, Bataan Peninsula, C. Luzon.
15. *cristatella* QUMO. Hills, near Tuguegarao, Cagayan Province, N.E. Luzon.
16. *dryope* BROD, 1841. Odiongan, Tablas Island.
17. *dryope leucospira* MOLF, 1898. Hills, central Romblon Island.
18. *dryope taeniata* MOLF, 1898. Hills, central Tablas Island.
19. *dryope sibuyanica* MOLF, 1898. Hills, central Sibuyan Island.
20. *fibula* Reeve, 1842. Foothills, south-central Cebu.

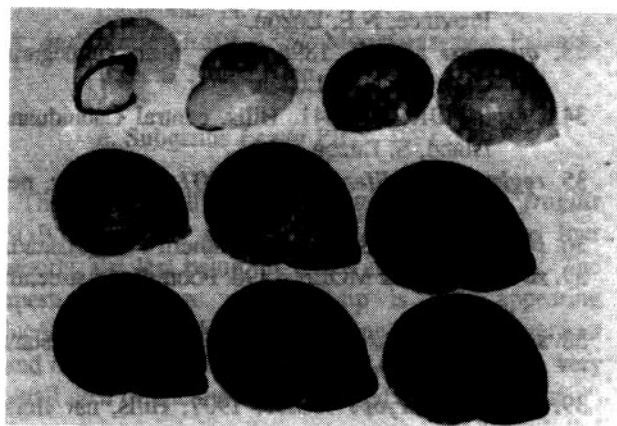


Fig. 13. *Chloraea*. Top row: (two left shells), *C. dryope sibuyanica*, white with black nucleus and black lip. (two right shells), *C. dryope*, small, light green. Middle row: (L) *C. dryope leucospira*, medium, dark green, no banding. (two right shells) *C. dryope taeniata*, large, medium green, brown banded. Bottom row: (L) *C. dryope leucospira*. (two right shells), *C. dryope taeniata*.



Fig. 14. *Corasia*. Left to right: *C. microspira*, pure white with a well-rounded body whorl; *C. sphaerion crassilabris*, numerous color forms ranging from near-white to gay-blue; *C. sphaerion nana*, yellow, usually

heavily decorated with HP; *C. sphaerion merldionalis*, light brown or white on top, darker brown on bottom; *C. virgo*, off-white, somewhat depressed, and with a sharply carinated periphery and with a pointed lip.

21. *geotrochus* MOLF, 1888. Mountains, Bataan Peninsula, C. Luzon.
22. *hanleyi* PEER, 1845. Tagudin, Ilocos Sur, N.W. Luzon.
23. *henningiana* MOLF, 1893. Hills, near Tuguegarao, Cagayan, N.E. Luzon.
24. *gmeliana* PEER, 1845. Luzon.
25. *loheri* MOLF, 1894. Bataan Pen., C. Luzon.
26. *malleata* QUMO, 1893. Palauig Island, north of Engano, Cagayan, N.E. Luzon.
27. *malleata tumida* KOLT, 1907. Palanan, Isabela Province, N.E. Luzon.
28. *papyracea* BROD, 1841. Mountains, northeast Mindoro.
29. *papyracea dilatata* MOLF, 1888. Mountains, east-central Cebu.
30. *paradoxa* PEER, 1845. Hills, north-central Mindoro.
31. *psittacina* DESH, 1861. Palanan, Isabela, N.E. Luzon.
32. *psittacina laurae* GUDE, 1896. Buguey, Cagayan Province, N.E. Luzon.
33. *quadrasi* MOLF, 1896. Hills, near Tuguegarao, Cagayan, N.E. Luzon.
34. *reginae* BROD, 1841. Hills, central Catanduanes Island, S. Luzon.
35. *reginae maculifera* KOLT, 1907. Mountains, near Baler, Aurora, N. Luzon.
36. *sirena* PEER, 1842. Hills, southern Panay Island.
37. *sirena cebuana* MOLF, 1890. Foothills, east-central Cebu.
38. *sirena guimarasensis* PILS, 1891. Guimaras Island, south of Panay Island.
39. *sirena subdryope* KOLT, 1907. Hills, near Iloilo, Panay Island.
40. *thersites* BROD, 1841. Mountains, northeast Mindoro.
41. *thersites aberran* KOLT, 1907. Mountains, east-central Mindoro.
42. *unifasciata* MOLF, 1898. Mountains, Abra Province, North Luzon.

b. Subgenus *Corasia* Albers, 1850

The shells of *Corasia* are somewhat similar in appearance to the shells of the subgenus *Chloraea*, but they are always larger in size. They are generally globose, but a few species are depressed, and somewhat carinated. The shells are usually thin, but solid, and the aperture is generally wide. The thin lip is either rounded, or slightly pointed, depending on the amount of carination on the final whorl, at the periphery. Type species: *Corasia virgo*.

1. *aegrota* REVE, 1851. Mountains, northeast Mindoro.
2. *casta* PEER, 1845. Luzon, Philippines.
3. *eydouxii* HIGO, 1887. Hills, central Masbate Island.
4. *filaris* PEER, 1845. Mt. Mangilao, Cebu.
5. *globosula* MOLF, 1894. Palanan, Nueva Ecija Province, N. Central Luzon.
6. *intorta* SOBY, 1841. Hills, south-central Bohol Id.
7. *irosinensis* HIGO, 1887. Near Naga City, Camarines Sur, S. Luzon.
8. *limansauensis* SEMP, 1877. Limasawa Is., and southeast Leyte.
9. *magtanensis* SEMP, 1890. On Mactan Island, near Cebu City, Cebu.
10. *magtanensis globosa* MOLF, 1890. Camotes Is., just N.E. of Mactan Island.
11. *magtanensis nana* MOLF, 1890. Hills, near Bantayan, north Cebu.
12. *puella* BROD, 1841. Camaguin Is., north of Mindanao.
13. *puella apheles* KOLT, 1908. Balut Is., south of Mindanao.
14. *samarensis* SEMP, 1877. Hills, near Calbayog, Samar.
15. *sphaerion* SOBY, 1841. Hills, near Bato, Leyte.
16. *sphaerion crassilabris* MOLF, 1893. Bato, Leyte.
17. *sphaerion meridionalis* MOLF, 1893. Hills, near Maasin, Leyte.
18. *sphaerion nana* SEMP, 1877. Mountains, near Malitbog, Leyte.
19. *virgo* BROD, 1841. Mountains, south-central Cebu Island.

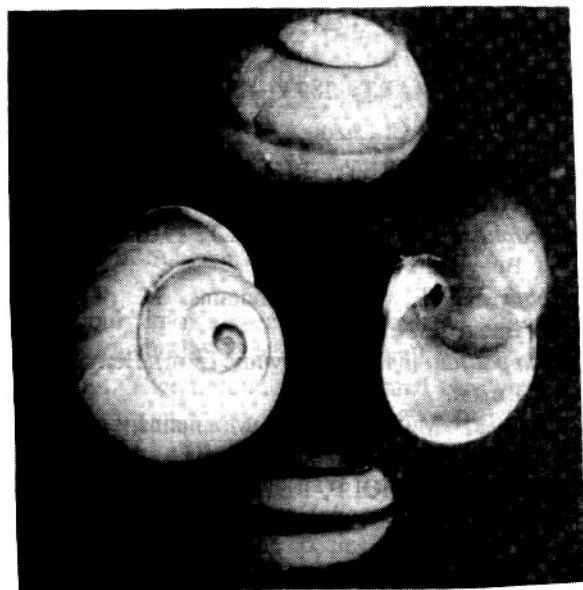


Fig. 15. *Corasia*. *C. Intorta*, shells are usually some shade of yellow, sometimes a very light golden color, and other times a yellow-brown. A brown peripheral band is usually present, sometimes subdued, and other times very vivid. Most *C. Intorta* average around 46mm, but there is apparently a dwarf race, which averages around 30mm. The true *C. Intorta* is known only from Bohol island. *C. Intorta* is another shell which has posed identification problems over the years. It frequently has been confused with *Calocochila coccomelos*, but that shell is of a totally different subgenus, and is from Sibuyan Island. It appears again that the misidentification problems with *C. Intorta* dates back to Webb's 1948 book. In black and white, a banded form of *Calocochila coccomelos* looks very similar to a *Corasia Intorta*.

c. Subgenus *Pfeifferia* Gray, 1853

The single species of the subgenus *Pfeifferia*, *P. micans* PEER, 1845, is globose, thin, and of an off-white color. It has few whorls, and a large, well-rounded aperture. The thin lip is fragile, and the columella is only slightly thickened. *P. micans* is found in a very restricted area near Pamplona, Cagayan Province, N.E. Luzon.

d. Subgenus *Chromatosphaera* Pilsbry, 1892

The shells of the subgenus *Chromatosphaera* are turbate-globose and solid. The surface is devoid of spiral sculpture, and the smooth, shiny shells are richly colored, and adorned with narrow and wide bands of HP, in white, light and dark brown, and gold. The aperture is large and ovate, the columella is oblique and sometimes tinged with purple, and the blunt, solid lip is reflexed and usually just edged with a purplish-brown. The few shells of the subgenus are restricted to a very small area of Northeast Luzon, and are very difficult to come by. Type species: *C. aurata*.

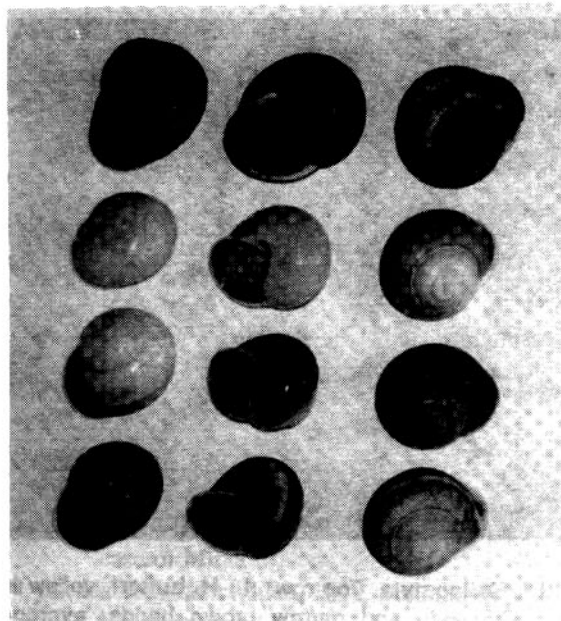


Fig. 16. *Corasia*. Top row: three shells, all *C. sphaerion*, largest, darkest and most heavily decorated with HP of these three. Second and third row: six shells, all *C. sphaerion crassilabris*, colors rang from a shiny white to a shiny dark brown, little HP. Fourth row: three shells, all *C. sphaerion nana*, usually a yellowish shell, with a moderate cover of HP at the top and at the periphery.

1. *aurata* SOBY, 1841. Near Pamplona, Cagayan Province.
2. *erubescens* SEMP, 1877. Near Claveria, north Cagayan Province.
3. *lividocincta* SEMP, 1877. Mountains, near Baler and Casiguran, N. Luzon.
4. *pudibunda* SEMP, 1877. Mountains, near Palanan, Isabela, N.E. Luzon.

e. Subgenus *Leytia* PILS, 1891

The single shell of the subgenus *Leytia*, *L. fragilis* SOBY, 1841, is globose and very thin. It has four whorls, the last being angulated at the periphery. The aperture is large and the lip is thin, appearing incomplete. The short, thin columella is nearly vertical and deeply inserted. *L. fragilis* is found only in a very small area of southwest Samar, and northeast Leyte.

D. Genus *Helicostyla* Férussac, 1821

The shells of this genus and the subgenus *Helicostyla* range from small to large, and are somewhat similar to the shells of the Genus *Calocochila*. *Helicostyla* shells usually have a more elevated contour and they usually lack spiral striae. The shells of the Genus *Helicostyla* are among the most colorful of all Philippine terrestrials. Colors include greens, yellows, browns, whites, and

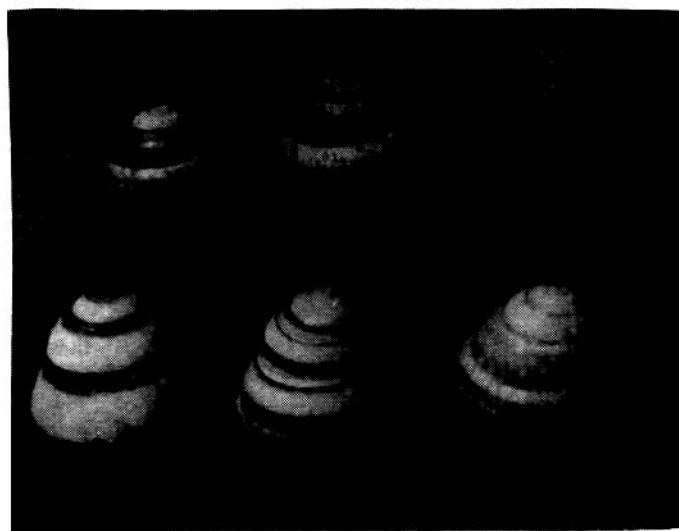


Fig. 17. *Helicostyla*. Top row: (L) *H. butleri*, yellow in color, with wide and narrow brown bands, average 27.5mm. (C) *H. butleri gravis*, red-brown in color, with many light HP bands, at an average of 32.5mm, much larger than the nominate form. (R) *H. crossei*, ground color a shiny dark brown, almost completely covered with a heavy coating of light brown HP. Bottom row: (L) *H. dimera*, a two-tone shell, brown on the bottom and white on the top, with two thin brown bands. (C) *H. fulgens*, shell elongated and white, with many light and dark brown bands. (R) *H. libata*, shell similar in form to *H. butleri*, light green in color with light and dark brown HP bands.

near-blacks. The term "*Helicostyla*" has, over the years, been used erroneously to designate all of the shells of the greater subfamily Helicostylinae, rather than just the true *Helicostyla* shells listed below. Type species: *Helicostyla mirabilis*.

a. Subgenus *Helicostyla*

1. *boettgeriana* MOLF, 1888. Hills, Bataan Peninsula, C. Luzon.
2. *bruguieriana* PEER, 1845. Hills, central Tablas Id.
3. *butleri* PEER, 1842. Mountains, near Mankayan, Benguet, N. Luzon.
4. *butleri gravis* KOLT, 1910. Mountains, N.E. of La Trinidad, Benguet.
5. *crossei* HIGO, 1887. Hills, central Tablas Island.
6. *curta* SOBY, 1841. Hills, western Ilocos Sur, N.W. Luzon.
7. *curta nigrescens* KOLT, 1910. Hills, near Bauang, La Union, N. Luzon.
8. *decora* ADRE, 1850. Hills, central Romblon Island.
9. *dimera* JONS, 1846. Hills, central Tablas Island.
10. *elerae* MOLF, 1896. Mountains, southwest of Casiguran, Aurora, N.E. Luzon.
11. *fenestrata* SOBY, 1841. Mountains, Bataan Province, C. Luzon.

12. *fulgens* SOBY, 1841. Mt. Calapan, northeast Mindoro.
13. *fuliginata* MART, 1873. Hills, western Tarlac Province, C. Luzon.
14. *leucophaea* SOBY, 1841. Mountains, Bataan Peninsula, C. Luzon.
15. *leucophaea subfenestrata* KOLT, 1910. Mt. Data, Benguet, N. Luzon.
16. *libata* REVE, 1851. Mountains, N. of Atok, Benguet, N. Luzon.
17. *libata pallida*. (a nearly all-white form), Benguet, N. Luzon.
18. *martensi* MOLF, 1898. Mountains, N.E. of Mankayan, Benguet, N. Luzon.
19. *melanorhaphis* MOLF, 1898. Northern Luzon.
20. *mirabilis* FERU, 1820. Hills, southeast of Boac, Marinduque.
21. *mirabilis donsallana* BART. Hills, northeast of Bulan, Sorsogon, S. Luzon.
22. *mirabilis trichroa* PILS, 1892. Hills, northeast of Ligao, Albay, S. Luzon.
23. *mirabilis tricolor* MOLF, 1898. Hills, northeast of Iriga, Camarines Sur, S. Luzon.
24. *montana* SEMP, 1877. Mountains, northwest of Atok, Benguet, N. Luzon.
25. *montana corticolor* KOLT, 1911. Mountains, near Mankayan, Benguet.



Fig. 18. subgenus *Helicostyla*. Top row: (L) *H. leucophaea subfenestrata*, shell very elongated, solid, dark brown body color, heavily covered with streaky HP, and interrupted HP bands at the suture. (C) *H. martensi*, purplish apex and dark brown body color, little HP, a very rare shell. (R) *H. mirabilis tricolor*, shell elongated and wide, white with light and dark brown bands. Bottom row: (L) *H. montana*, shell somewhat similar in shape to *H. leucophaea subfenestrata*, but always smaller, brown, some with sparse HP. (C) *H. montfortiana*, shell a golden color, lighter on top and darker on bottom. (R) *H. seckendorffiana*, shell somewhat similar to *H. crossei*, but always smaller and not as heavily decorated with HP.

26. *montfortiana* PEER, 1846. Hills, central Tablas Island.
27. *seckendorffiana* PEER, 1847. Hills, central Tablas Island.
28. *versicolor* MOLF, 1894. Mountains, northeast of Sabani, Nueva Ecija, N. Luzon.

b. Subgenus *Orustia* Mörch, 1852

The only known species of the subgenus *Orustia*, *O. monticula* SOBY, 1841, is very small, turbanate-globose and thin. The columella is short and near-vertical and the thin lip is narrowly reflexed. The few shells seen have been light green, heavily covered with a light brown HP. *Orustia* shells have frequently been confused with shells of the Genus *Helicostyla*, but, as far as can be determined, only one species of this subgenus exists.

c. Subgenus *Pachysphaera* Pilsbry, 1892

The shells of the subgenus *Pachysphaera* are small, solid, and restricted to the Ilocos region of northwestern Luzon. The base color is usually yellow or light brown, with a few whites. Some shells are unicolored, while others are brown banded. Type species: *P. sphaericca*.

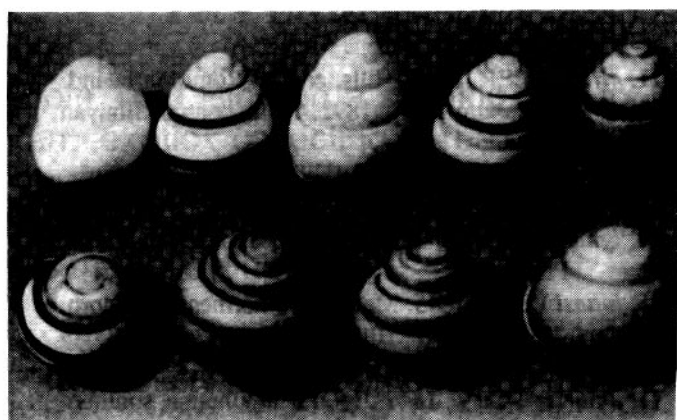


Fig. 19. subgenus *Pachysphaera*. Top row: (first, third & fifth shells) *P. annulata*, usually unicolored; (second & forth shells) *P. iloconensis*. Bottom row (L) *P. balteata*, short and rotund, and banded; (second & third shells) *P. sphaerica tigrina*; (fourth shell) *P. sphaerica simplex*.

1. *annulata* SOBY, 1841. Foothills, Ilocos Norte, northwest Luzon.
2. *balteata* SOBY, 1841. Foothills, Ilocos Sur, northwestern Luzon.
3. *iloconensis* SOBY, 1841. Foothills, Ilocos Norte and Sur.
4. *sphaerica simplex* KOLT, 1910. Foothills, Ilocos Sur.
5. *sphaerica tigrina* KOLT, 1910. Foothills, east of Candon, Ilocos Sur, northwestern Luzon.

d. subgenus *Cochlodryas* Martens, 1860

The shells of the subgenus *Cochlodryas* are somewhat more elevated than the other shells of the Genus *Helicostyla*. They are vividly colored, usually of greens and browns, and to a lesser extent, whites. They are easily recognized by the presence of a fairly wide band of HP at the summit. Banding and umbilical marking may, or may not, be present. The columella, aperture peristome are usually a shiny white, sometimes edged with dark brown. Type species: *C. viridostriata*.

1. *florida* SOBY, 1841. Mountains, northeast Mindoro.
2. *florida aureola* BART, 1932. Mountains, northern Mindoro.
3. *florida fuscolabiata* KOLT, 1912. Mountains, eastern Mindoro.
4. *florida helicoides* PEER, 1849. Mountains, northeast Mindoro.
5. *florida signa* BART, 1932. Mountains, west of Roxas, southeast Mindoro.

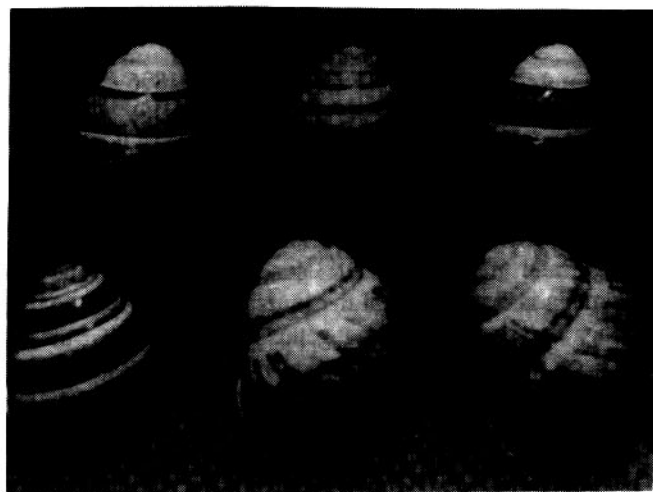


Fig. 20. subgenus *Cochlodryas*. Top row: (L) *C. florida fuscolabiata*, shell brownish, with a brown-tinged lip. (C) *C. florida*, shell usually a light green, with 3-5 bands. (R) *C. florida helicoides*, shell usually a dark green, unbanded. Bottom row: (L) *C. tenera*, shell dark brown and multi-banded. (C) *C. viridostriata polychroa*, shell usually brownish, with 3-4 bands. (R) *C. viridostriata*, shell usually greenish, unbanded.

6. *orbitula* SOBY, 1841. Mountains, eastern Mindoro.
7. *tenera* SOBY, 1841. Mountains, southeast Mindoro.
8. *viridostriata* LEEA, 1840. Hills, Burias and Templo Islands.
9. *viridostriata polychroa* SOBY, 1841. Hills, Burias Island.

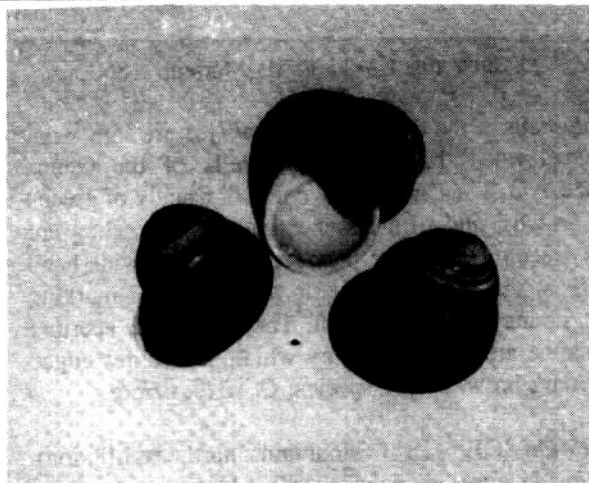


Fig. 21. *Cochlodryas orbitula*. Another of the Philippine terrestrials that is frequently misidentified. It is often confused with the brown variety of *Cal. rolssyana* (*C. rolssyana* form *subatra*), and less frequently with *C. tenera*. However, it is always taller than *C. rolssyana*, and the banding is obscured and less vivid than that of *C. tenera*.

e. Subgenus *Opalliostylia* Pilsbry, 1896
(*Eudoxus* Albers, 1850, non-Agassiz, 1846)

The shells of the subgenus *Opalliostylia* are ovate, or ovate-conic, thin, smooth, shiny, and usually very light in color. The predominate colors are white, yellow, orange, and green. The shells generally lack HP. The columella is flattened, and the lip is thin, but generally strong. The shells of this subgenus are quite similar to those of the subgenus *Phengus*, but while these are more oval, those are more trochiform. Type species: *O. effusa*.

1. *aegle* BROD, 1841. Mountains, near Bislig, Mindanao.
2. *albina* GRUP, 1840. Mountains, north-central Mindoro.
3. *barandae*. Baranda Island, off Mindanao.
4. *buschi* PEER, 1845. Foothills, along the east coast of Mindoro.
5. *bustoi* HIGO, 1887. Hills, central Catanduanes Island, S. Luzon.
6. *caesar* PEER. Luzon, Philippines.
7. *canonizadol* BART, 1932. Hills, east-central Mindoro.
8. *cossmanniana* GROS, 1886. Hills, south of Boac, Marinduque.
9. *cumingi* PEER, 1842. Hills, central Camaguin Island, Mindanao.
10. *cumingi otostoma* KOLT, 1912. Mountains, near Mainit, Mindanao.

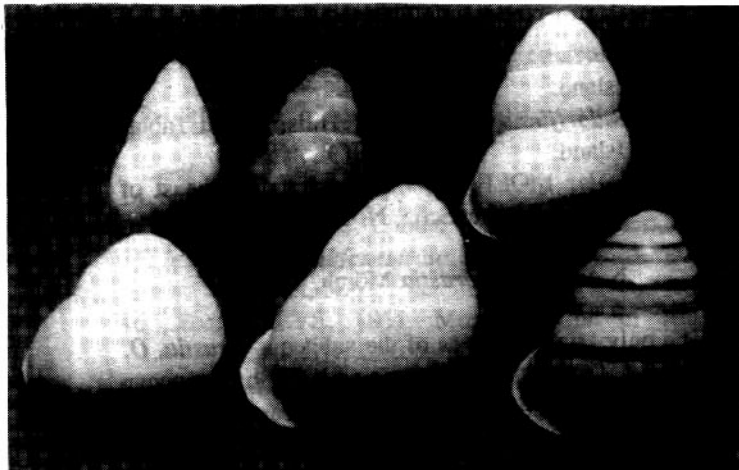


Fig. 22. subgenus *Opalliostylia*. Top row: (L) *O. albina*, entire shell an off-white, sometimes very light yellow, with a slight carination at the periphery. (C) *O. barandae*, shell a shiny light brown throughout, with a fine white line between the whorls. (R) *O. buschi*, shell usually an off-white, very infrequently a light green. Bottom row: (L) *O. canonizadol*, entire shell an off-white, rarely light yellow. (C) *O. effusa*, entire shell an off-white, rarely with light yellow streaks. (R) *O. effusa fasciata*, similar in shape to nominate form, but usually smaller, shell a light yellow, richly decorated with brown bands.

11. *effusa* PEER, 1842. Hills, central Romblon Island.
12. *effusa fasciata* PILS, 1892. Hills, central Sibuyan Island.
13. *halichlora* SEMP, 1910. Hills, south of Claveria, Cagayan, N. Luzon.
14. *ignobilis* SOBY, 1841. Hills, central Cuyo Island, Palawan.
15. *jonasi* PEER, 1845. Mountains, northeast Mindoro.
16. *leai* PEER, 1846. Hills, north of Basco, Batan Island, Batanes Group.
17. *modesta* SOBY, 1841. Bondoc mountains, southern Luzon.
18. *oviformis*. Mindanao, Philippines.
19. *paradoxa* SEMP, 1877. Mindanao Island.
20. *phaeostyla* PEER, 1856. Luzon, Philippines.
21. *quadrasi* HIGO, 1886. Hills, south of Santa Cruz, Marinduque.
22. *simplex* JONS, 1843. Mountains, southeast Mindanao.
23. *smargadina* REVE, 1842. Mountains, south of Bislig, Mindanao.
24. *smargadina lutea* SEMP, 1877. Mountains, west of Mainit, Mindanao.
25. *smargadina nigrescens* SEMP. Mountains, Surigao region, Mindanao.
26. *smargadina zonifera* SEMP, 1877. Mountains, Placer, Mindanao.
27. *stramina*. Mindanao.

To be continued.



Judy Barrick won the duPont Trophy for her exhibit "Muricidae of the World" at the recent Oregon Shell Club's show in Portland. Congratulations Judy!

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Fossil Shells from Oregon Beach Cliffs
 Ellen J. Moore. 1994. \$9.95
 Chintimini Press; Corvallis, Oregon

Many of us in the northwest are familiar with the author's 1971 book "Fossil mollusks of coastal Oregon". This new 88 page, 9x6" paperback is a welcome successor. Dealing with the Cenozoic Era fossils of the Astoria Formation, the Yaquina Formation and the Nye Mudstone, it helps anyone who has picked up a few fossils along the public beaches of the Oregon coast.

Divided into six parts the author, who had a long career as a paleontologist with the U.S. Geological Survey (retiring with the title of scientist emeritus), begins with an introduction that covers geologic time, fossils defined, collecting fossils, identifying fossils, terminology and fossilization - each covered in a concise paragraph or two.

In Review

Other sections cover beach cliffs, Indian shell middens and erosion with emphasis on specific locations along the coast. Small sections cover the Astoria Formation and Rocks Without Fossils.

The largest portion of the book covers, naturally, the fossils themselves: 19 gastropods, a scaphopod, 15 bivalves and a cephalopod are described and illustrated on 14 black and white plates.

Finally there is a section on suggested excursions for fossils. In all a very useful guide to those of us who know the Recent mollusks, but are not all that familiar with the fossils we encounter along the beach and recommended as an addition to your library.

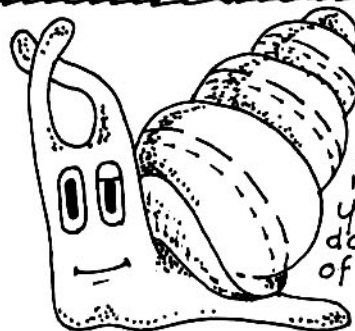
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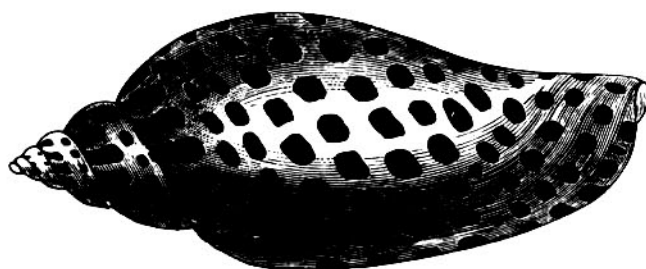
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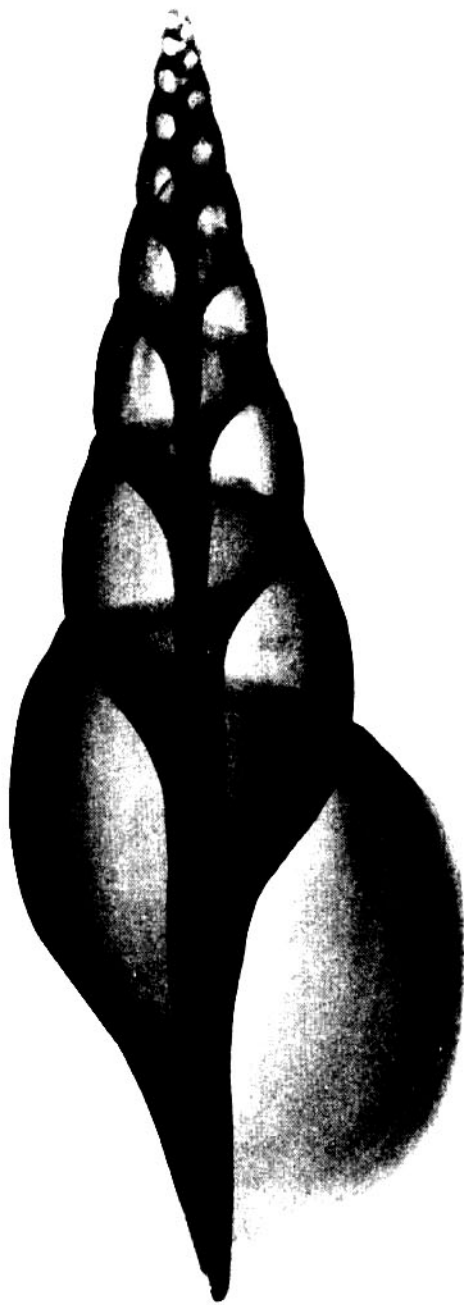


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