



*THE
CONE
COLLECTOR*

#16 - January 2011



THE
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*Note from
the Editor*

Here we are at the beginning of a new year. The World is still full of problems, so let us hope that 2011 will bring us the solution to at least some of them!

We are of course lucky to have our Cone collections to keep us happily busy. The study of Cones is apparently an endless subject and that of course is for the better, as it allows for a continuing interest in a fascinating field of research and a delightful hobby.

We bring you a new issue of TCC, as usual full of interesting articles that cover many aspects that hopefully will interest our readers, be they advanced collectors, professional researchers or enthusiastic beginners. Our aim is to always provide something for everyone.

Some of our readers have asked about the abstracts of the talks given at our Meeting in Stuttgart last October. I regret to say that it has not yet been possible to bring them all together, so that their publication must still wait for a suitable opportunity, but please be assured that we will get there eventually.

So, without further ado, I will leave you with our authors – to whom renewed thanks are in order – and with the wonderful graphics once again done by André Poremski.

A.M.

On the Cover:

Conus coccineus

(Gmelin, 1791) Image courtesy
of Thierry Vulliet

Who's Who in Cones: Eric Monnier

In spite of the fact that I was born in Montreal, Canada on July 1953, I am French and my family is from Toulouse, South of France. I now live in Paris and all the cone lovers are welcome to my home!

Since I was very young I have been strongly interested in Nature: animals, plants and minerals. I also love Archeology and Art (Indian, Egyptian, Sumerian and Precolombian civilizations) but the main passion of my life has always been to collect and study shells.

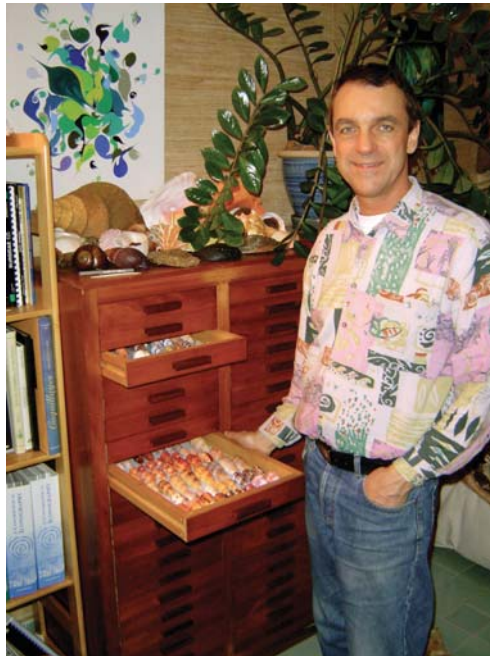
When I was a young boy I started buying shells in shops in Toulouse, Biarritz, Marseille or Playa de Aro (Spain) and I started a general collection with a particular interest in Volutes, Chitons and Cones.

In 1977 I obtained the diploma of Engineer in Biological Chemistry (INSA Toulouse) and after two years teaching in the University of Cumaná (Venezuela) I came back to Toulouse where in 1982 I obtained a PhD degree in Physical Organic Chemistry. I then taught for one year in the University of Fes (Morocco) and since 1984 I have been Associate Professor in CNAM (Paris) and in 1992 I obtained the grade of "Docteur d'État ès Sciences Physiques", working in esterolysis of allophanates as carboxybiotin models in surfactant reversed micelles. I also worked on the decontamination of war's toxicals and on electrochemical DNA chips.

At a certain point during the last 12 years I turned from a generalist collector with a special taste for *Volutidae* into a true Cone lover. The Cones are for me the most exciting molluscs because of the diversity of their colors, patterns and radulae and the complexity of

their phylogeny...and as an organic chemist I am flabbergasted by the venomous beauty of the conotoxins: more than 200,000 peptides as potential drugs!

Recently I have started describing some new species of cones in association with Luigi Bozzetti (*Conus alainallaryi* from Colombia) and Loïc Limpalaër (*Conus dorotheae* from Senegal) and with the latter (and in collaboration with Felix Lorenz) we are currently studying several other complexes and new species of the family *Conidae*.



Together with some friends (Loïc Limpalaër, Alain Robin and Christophe Roux) we are currently working on a Taxonomic Iconography of the Living Conidae. In this book (which we expect to make available in 2012 or 2013) we'll try to be as exhaustive as possible with about 5000 pictures and probably more than 1000 proposed taxa.

In fact, only DNA analysis (of which only about 25% is available for the moment) would determine if these taxa represent species, subspecies or mere forms. The proposed genera and subgenera will be based on the available works on DNA at the time of publication

– especially those of Christopher P. Meyer, Philippe Bouchet, Thomas F. Duda, Silke Kauferstein, Alan J.Kohn, Nicolas Puillandre & Baldomero Olivera (not yet published) – and also on John K.Tucker and Manuel J.Tenorio's recent work.

The book will also include many pictures of the colour and pattern variations of each taxa, highlighted whenever useful with details of the spire or of the protoconch, maps of geographical distribution, and other in-

A rare gem!!

dication as to diet, development type, medium size and bathymetry, DNA and toxins' analysis (where known).

I also recently started research with Philippe Bouchet and Nicolas Puillandre about the MNHN collections of the deep water conid species from North West Madagascar and the Mozambique Channel, also in collaboration with Reto Stocklin and Philippe Favreau from Atheris (Geneva). The fields of research that are open are really amazing.

I warmly thank António Monteiro for being the real catalyst of the recent activity about cones and for the beautiful meeting in Stuttgart last October. I hope that the next Shell Show in Paris (5 and 6 of March 2011) will be an opportunity for further discussion around our passion.

Our friend Mike Hart has recently sent in this beautiful photo of a 44 mm *Conus adamsonii* Broderip, 1826.

According to Mike, this is "the best coloured specimen from the Cook Islands that I have seen. Looks like a Marquesan shell". Quite easy to believe, certainly, as it is indeed a thing of beauty!

Thanks to Mike for sharing it.



Angasi & Advertex

Jon Singleton

Conus metcalfei Angus, 1877 was the name given to a small cone size 20 mm × 10.5 mm which was trawled from an unstated depth off the Sow and Pigs Reef, port Jackson, Sydney Harbour. The name was invalid, so it was re-named *Conus angasi* Tryon, 1884. I do not know of any further specimens being found until the upsurge of the prawn fishing industry, when many new grounds were established off the eastern Australian coast in the late 1960s. Over the next few years, *C. angasi* was found at several locations between Yamba N. S. W., to off Cape Moreton southern Queensland, but remained an uncommon species, from depths between 50 m to 160 m.

From my own specimens and sightings in many other Queensland collections, the southern limit for *C. angasi* is Yamba, which is 570 km north of the type locality, which seems a bit surprising. Another odd fact is that the holotype at 20 mm in length is the smallest I have sighted, and the only sub-adult specimen, and my own smallest is 31 mm × 18 mm.

The increased trawling activities brought up many new species, and many proved to be endemic, and were quickly named and described. One was *Conus advertex* Garrard, 1961, the holotype size 30 mm × 19 mm, with a type locality of off Cape Moreton, from a depth of 160 m. This species was to prove a more common species to *C. angasi*, which it resembled in many ways, but differed by having a flattish spire and straighter sides, and both had identical parallel spiral grooves on the spiral whorls.

The known range of *C. advertex* from Noosa Heads Qld., and south to Evans Head N. S. W. which is 140 km south of the QLD/NSW border. Excluding specimens from 160 m off Cape Moreton, the depth habitat is usually within the 40 m to 60 m range. I have spoken with a couple of Queensland trawler skippers who knew their local shells, and they both stated that *C. angasi* and *C. advertex* never surfaced together in the same drag, indicating they possessed differing depth habitats.

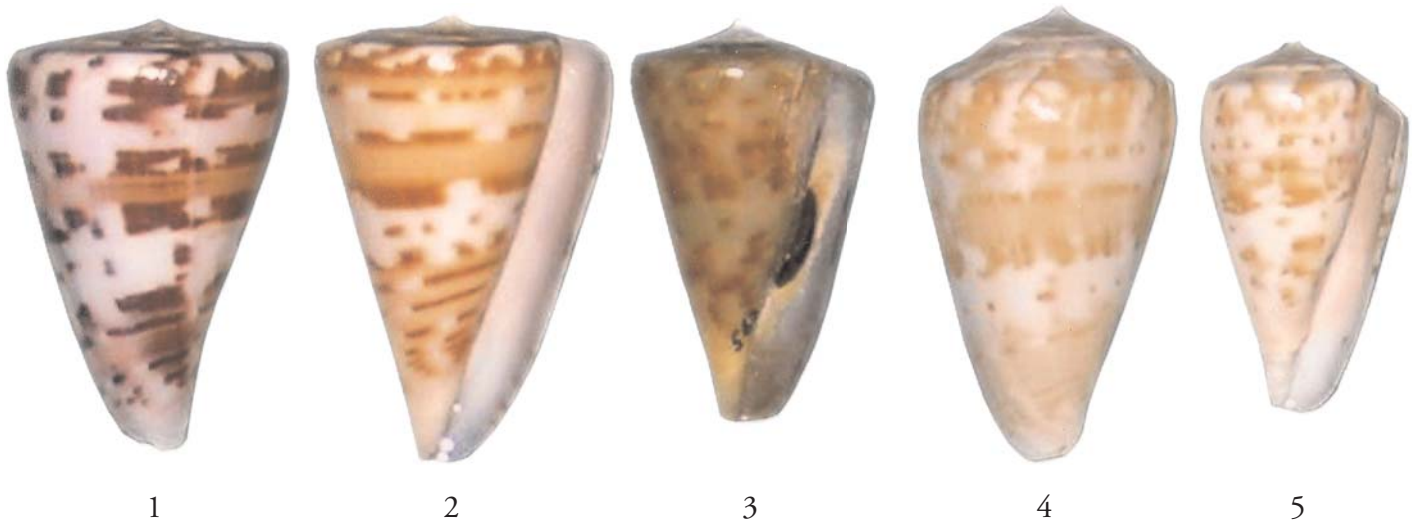
The Cape Moreton region produced a mass of shells, and all were tossed into tea chests whatever the size or condition. Local dealers purchased by bulk not knowing the contents. I assisted a Sydney dealer and sorted through several chests. It was impossible to be certain whether a specimen had been live taken, and I only ever found one specimen of *C. advertex* with the periostracum intact. I have never seen the *C. angasi* periostracum. The sea-bed off Cape Moreton seems to preserve the colour and patterns on shells for a long time, as very few well eroded shells were seen from this source. At a guess I would think some 75% of all material off Cape Moreton was dead collected.

Like most collectors, I kept the two species as separate for many years. Likely the first publication which considered *C. advertex* to be just a form of *C. angasi* was the Coomans et al “Alphabetical Revision” of the living *Conus* in 1979, and also the Walls *Cone Shells* book suggested it may be a subspecies the same year.

Today, some 30 years later, most publications and collectors now regard *C. advertex* to be just a form of *C. angasi*. The full scientific proof will likely be based on DNA results, providing specimens with the animal preserved are available. With modern trawling techniques far less by-product such as shells surfacing, neither species seems to have been found for many years.

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Alphabetical Revision of Recent Conidae. *Basteria* 43; 81-105, Part 2.
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Figures

- 1 - *C. advertex*, 37 x 24.9 mm
- 2 - *C. advertex*, 39.2 x 24 mm
- 3 - *C. advertex*, 35.3 x 21.7 mm, with periostracum
- 4 - *C. angasi*, 48.5 x 28.5 mm
- 5 - *C. angasi*, 40 x 22.6 mm

Notes on *Conus aplustre* Reeve, 1843

Thierry Vulliet & Sébastien Dutertre

We report here on diverse observations made on *Floraconus aplustre* (Reeve, 1843) collected from Hastings Point, Australia. This endemic cone was found on exposed rocky areas under rocks or partly buried in sandy pockets.

Several of the collected specimens were kept in aquaria for behavioral observations. The first remark concerns the color of the animal itself. In the *Manual of the Living Conidae* (RKK) reference book, *C. aplustre* is described as having its “foot, rostrum and siphon white, speckled with black”. However, all of our specimens were pink all over their body. The second observation relate to the diet of the *C. aplustre*.

This cone, as expected from its taxonomy, size and radula morphology, prey on worms. Indeed, an *eunicidae* worm was consumed whole, without prior stinging, by one of the *C. aplustre* while in captivity. The shell of *Floraconus aplustre* was first described by Reeves in 1843, and the original drawings are reproduced here for a comparison with the Lectotype and our cleaned shells. The size of our specimens ranges from 17.4 to 27.7 mm.

This cone is not easy to find, although it lives in shallow water, under rocks, because in its location there is a lot of waves... This also means that it is hard to find nice specimens without scars.

Figures

1 - *Conus aplustre* habitat at Hastings Point, New South Wales (collecting site)

2 - (left) Original drawing from Reeve, L. A., 1843. *Conch. Icon.*, 1. *Conus*, (right) Lectotype (BMNH) 26 x 16 mm Photo Credit: Alan J. Kohn

3 - Cleaned shell of *C. aplustre* from Hasting Point

4 - Two radulas of *C. aplustre* as seen under a

microscope from two different angles. The first (left) micrograph shows clearly the opening at the tip of the tooth, where the venom is ejected.

5 - A view of the animal where you can see an unusual colour (red to pink mouth and proboscis, white bulb, black venom duct and yellow radular bag).

6 - *C. aplustre*, 25.8 mm

7 - *C. aplustre*, 27.7 mm

8 - *C. aplustre*, 24.6 mm

9 - *C. aplustre*, 17.4 mm

10 - *C. aplustre*, 25.9 mm

11 - *C. aplustre*, 24.5 mm

12 - *C. aplustre*, 27.1 mm

13 - *C. aplustre*, 27.7 mm

14 - *C. aplustre*, 24.7 mm

15 - *C. aplustre*, 24.5 mm

16 to 23 - *C. aplustre* in its natural habitat

Conus aplustre continued...



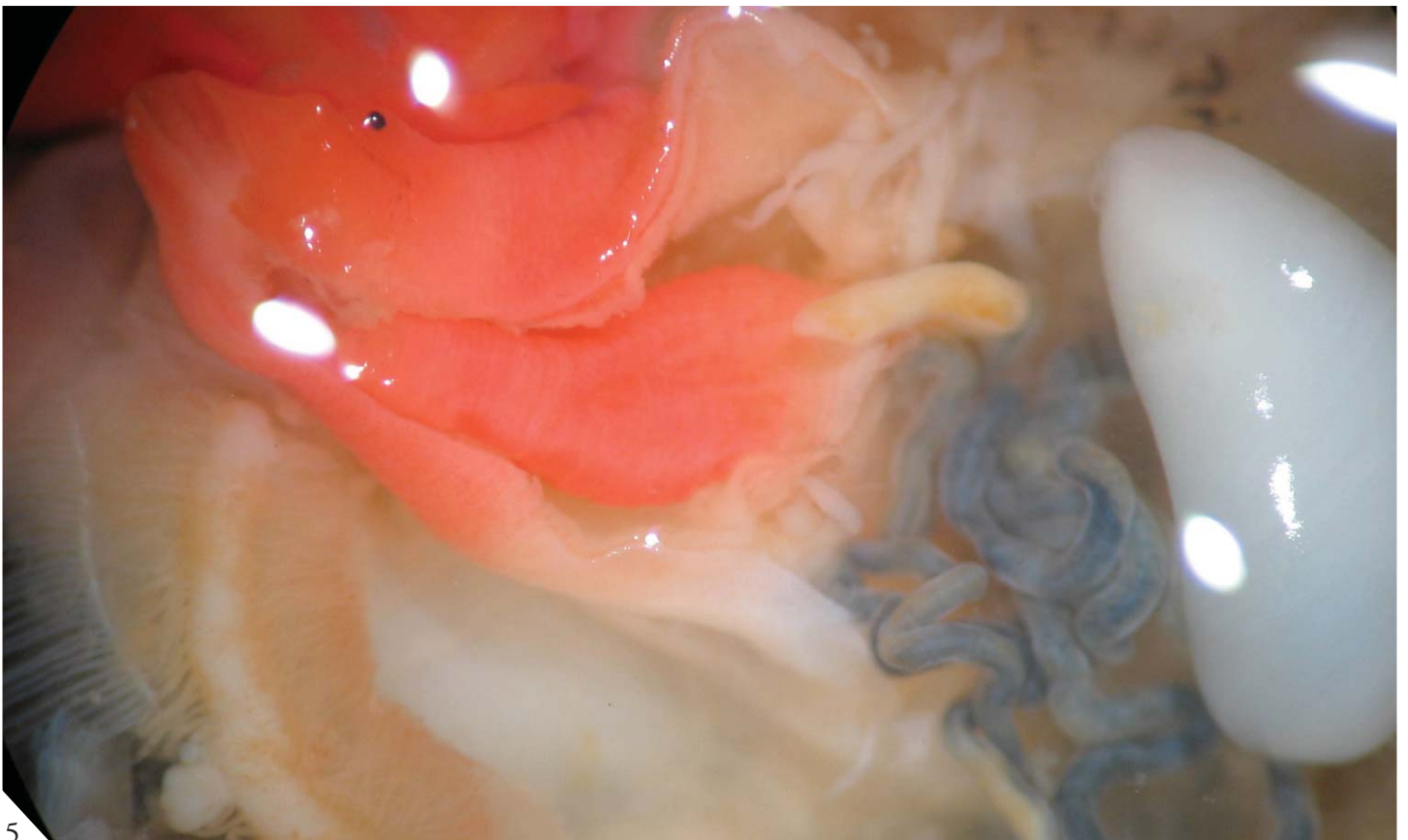
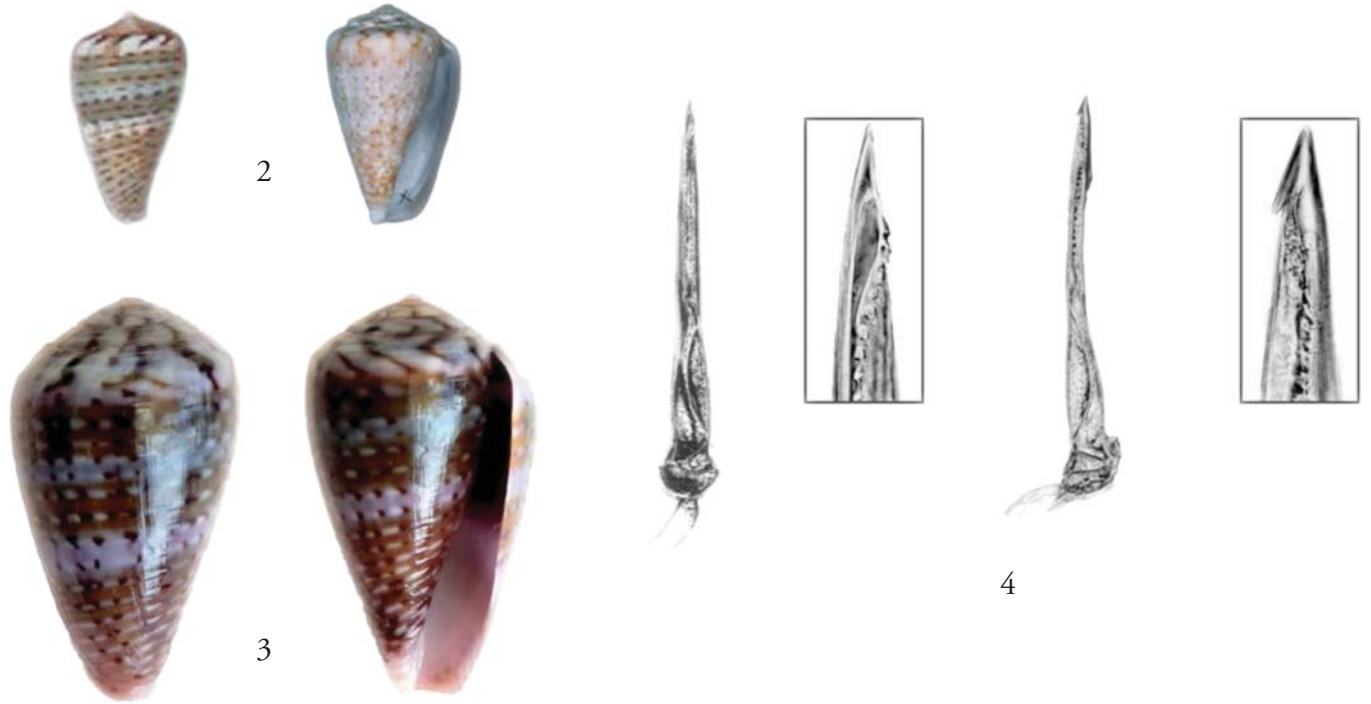
1a



1b



1c



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Conus aplustre continued...





8a



8b



9a



9b

Conus aplustre continued...



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Are those Mexican Slippers?

Joaquin Inchaustegui

At a recent Shell Auction of the Houston Conchology Society sponsored by the Houston Museum of Natural Science, I saw 2 *Conus recurvus* Broderip, 1833 in one zip-lock bag on a Silent Auction table and since the last bid was very low, I bid on them and periodically returned to raise my bid if someone had out-bid me. I heard this lady sheller complain to her companion “I am having trouble with #12 (my number). Every time I bid on those cones, he comes right behind me and raises the bid!”

When the bidding was finished I had gotten these 2 cones at a very nice price. Little did I know that I had done better than I realized since rather than 2 shells there were 3. I will explain below.

Later, at home, I was examining these shells and I noticed a strange “hump” on one of them and a peculiar “flaring” of the outer lip near the shoulder, opposite the “hump”. This cone had the periostracum intact, which I wanted to preserve, so I gently pushed on the “hump” with my thumb but it would not move or come off. I put the shell in cool water to soak a minute or so at which time, when I pushed again, the “hump” came off.

It turned out to be a little 21 mm crepidula that had attached itself (probably while very young) to the live cone and did not come off after the shell was collected and cleaned but finally did so when I soaked it in water. So I had 3 shells in the zip-lock bag, not two as I had originally thought. Then, when examining the peculiar flared lip which at first I thought was due to a “freak” growth I began to surmise that the “flaring” was caused by the Slipper Shell crowding the cone’s aperture so, as the cone grew it’s last whorl, it flared the lip out so as to accommodate the crepidula.

I have tentatively identified the “hump” as *Crepidula excavata* (Broderip, 1834) of which A. Myra Keen says in her book *Sea Shells of Tropical West America*: “Lower California throughout the Gulf and south to Panama,

on other shells, especially Polinices.” However, this little shell probably never read the book because here it was on a living *Conus*.

Figures

1 - The 53 mm *Conus recurvus* Broderip, 1833 Manzanillo, Mexico collected by Theresa Stelzig on Jan.1, 1975 with the “hump”, flared lip and periostracum next to a *C. recurvus* from Guaymas, Mexico collected by Ruth Anne Sparlin in 1988 for comparison.

2 - A dorsal view of the cones with the 21 mm *Crepidula excavata* (Broderip, 1834) between them. Notice that the color of the Slipper Shell mimics the color of the *Conus* on the left which I believe is not by accident.

3 - The apertural view of the crepidula.

Photos by the Author.

Mexican Slippers continued...



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Hunting for *Conus legatus*

David Touitou

In my last article I have brought to your attention a species that I particularly like: *Conus episcopatus*. I thank Mike Filmer for having supplied further details about this species.

This time I wish to tell you about another one of my favourite species: *Conus legatus*. For me, this is one of the most beautiful cones. Broadly speaking, like many of you I very much like the “textile group”, to which it is linked. I have come across this wonderful species for the first time in Polynesia, during a day time dive in the Tahiti peninsula, thanks to my friend Michel Balleton. The specimen in question was found at a depth about 17 metres in the lagoon in the centre of a passage. It was resting on a medium-sized sand-less coral slab.

Since then I have collected many specimens while diving between 15 and 20 metres deep on the outside of the coral reef, always on small slabs of dead coral, never with sand. In Polynesia, specimens are usually small, measuring less than 30 mm. I have also found *C. legatus* inside the lagoon, just beyond the reef. It was there, in fact, that I found my largest specimen, under a relatively huge slab about 1.5 metres deep at low tide; it is 37 mm long – a monster as Polynesian specimens come! But I should noticed that in my opinion that is not at all its biotope, and it is really a cone belonging to the external slope.

This captivating species intrigued me. A little research revealed that it is a relatively uncommon to rare species throughout its range, which is rather wide: the entire Indo-Pacific! In the Pacific, sizes remain small and the largest specimens I could find mentioned in the Internet did not go beyond 45 mm in length; they came from the Philippines. I was also able to find the species in “fresh dead” condition while diving in New Caledonia, at about 20 metres depth on the outer slope. And it was also on the outer slope that my friend Serge Rolland found his own New Caledonian specimens. On the other hand, I had noticed that in the Indian Ocean large sizes – even approaching 60 mm!! – could

be found, notably in Reunion Island.

In the Seychelles, I have found this species from 15 to 20 metres, except once in apnea, under a slab of dead coral about 8 metres deep. Usually specimens of this species do not bury themselves in sand. It appears to be uncommon in that location and until then I had only spotted smallish specimens, under 40 mm. But one could say that its trip has its surprises...

Last April (2010), I was able to dive alone in a spot where in previous occasions I had been fortunate to find a number of interesting species: the famous *Conus legatus*, *Conus canonicus*, *Conus episcopatus* and *Conus pennaceus*. The zone is 15 to at most 17 metres deep, near a granitic rock formation, and begins after the boulders in the 8 metres zone. On the bottom the flat rock presents numerous sand pockets covered with dead coral slabs of all sizes; in fact, the only places where sand can resist the backwash is inside those pockets. This means that the cones can be nowhere else but under the slabs, which makes hunting in the area really easy for a diver. It is nevertheless a huge job, because there are many hundred plaques to inspect, some of them too heavy to move, some attached to the bottom. One must choose which ones to lift, as time is of the essence during a dive!

The first dive began with trivial findings and it was only after 45 minutes that I found my first monster! Those of you who actually dive surely understand my meaning. I had the impression of seeing a large *Conus canonicus* – remember that the mask acts like a magnifying glass! –, but the pattern was very compact and I realized that it was a humungous *Conus legatus*! I guarantee that such a find was a great shock!

Soon it is time to go up, as I had promised those who hang about on the boat that I would not be under water for more than 60 minutes... I went to the border, feverishly lifting slabs. Nothing! I got to a very large granite block, from which I decided to proceed with

Hunting for legatus continued...

my upward climb and to work my security stages. I began to go up but then I spotted a beautiful slab... Temptation was too strong, so I got down 3 metres again and lifted that particular slab, 14 metres deep: nothing to be seen at first glance. I sweep away the sand and there... what a surprise! A second *Conus legatus* of enormous size was there! I was ecstatic. Once on the boat, I got to my pocket and took out the socks containing the cones, to see at last its pinkish colour. I thought I would take the opportunity to return to the water a little *Conus canonicus* that I had hesitated to bring up simply because it had a rather different pattern: another surprise awaited me: it was yet another *legatus*! I found myself with two 57 mm specimens and a 45 mm one, no less!

After such a catch, it would be impossible not to return to the same spot. The second dive went along rather in an inverse order, as I found two huge *Conus legatus* within the first 20 minutes and none other. In the same dive I also found *Conus aulicus*, *Conus tenuistriatus* and *Chicoreus saulii*.

Figures

- 1 & 2 - Habitat of *C. legatus*
- 3 - *C. legatus*
- 4- *C. aulicus*
- 5 - *C. episcopatus*
- 6 - A nice assortment of dived shells!
- 7 - *C. striatus*
- 8-23 - *C. legatus* (cleaned specimens)



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Hunting for legatus continued...



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Discovery of the *Conus lightbourni* Petuch, 1986 holotype

Elizabeth K. Shea and William J. Fenzan

[This article is reproduced from *American Conchologist* (Vol. 37, No. 4, 2009) with permission. We heartily thank the authors and the Editor for allowing us to have it in TCC]

On Friday 14 March 2008, Bill Fenzan arrived at the Delaware Museum of Natural History (DMNH) with a specimen whose arrival had been eagerly anticipated for many years – the holotype of *Conus lightbourni*. This specimen was collected in 1973, described by Ed Petuch in 1986, and documented as missing from the DMNH collection in 1991 (Bieler & Bradford, 1991). Over the years, there has been much speculation about the whereabouts of the shell. Many concluded that the shell had been sold to a private collector and was hidden away.

Background

In the early 1970s John R. H. Lightbourn and Arthur T. Guest developed a productive way to collect gastropods' shells by trapping the hermit crabs that inhabited them. Baited lobster traps were dropped into the deep waters off Bermuda and left for several days. When the traps were retrieved, the hermit crabs had delivered new and interesting slope-inhabiting molluscs to Lightbourn and Guest's eager hands (Figure 1, Lightbourn 1991, Jensen & Pearce 2009).

The Lightbourn/Guest specimens were well known in the molluscan community and many new species were described based on their findings (see Lightbourn 1991, Jensen & Pearce 2009). In the mid. 1970s, Jack Lightbourn sent many specimens to his friends and colleagues R. Tucker Abbott and Russ Jensen at DMNH for their consideration and study (Jack Lightbourn pers. comm.. 28 April 2008). Ed Petuch was a graduate student at the University of Miami at the time and regularly visited the DMNH collection.

In 1977, Tucker Abbott abruptly left DMNH, leaving Russ Jensen in charge of the collection. According

to Ed Petuch, Russ encouraged his interest in cone snails, and suggested he study the Lightbourn/Guest specimens. He hand carried the specimens to school, wrote his manuscript, and hand carried the specimens back to DMNH the following year (Ed Petuch pers. comm. 1 April 2008). After substantial delays, the original description of *C. lightbourni* was published in the *Proceedings of the Biological Society of Washington* in 1986.

The Problem

In 1988, R. M. Filmer visited DMNH and learned that the holotype of *C. lightbourni* could not be located. Bieler and Bradford (1991) subsequently documented two problems with the *C. lightbourni* type specimens. First, the holotype was not present in the DMNH collection and second, the range of measurements given for the paratypes in the original description was inconsistent with the specimens in the collection (Bieler & Bradford, 1991).

During manuscript preparation, Bieler and Bradford re-examined Jack Lightbourn's personal collection of *Conus lightbourni* in an attempt to resolve these issues. Four specimens were examined, three of which were identified by size as being part of the specimen series listed in the original description as remaining in Jack's collection. The fourth specimen (50.5 mm) was much larger than the published size range in the description (22.4 – 44 mm) and was likely added to Jack's collection after the original description was published. None of the specimens matched the pattern of the published holotype material.

Bieler & Bradford (1991) concluded that the holotype had never been received by DMNH, and that the DMNH paratypes series contained two of the three originally described and identified paratypes. Over the years, DMNH curators have tried to piece together the location of the missing holotype without success. Letters were written to ed Petuch, Conch-L was

queried, researchers and shells collectors were asked to speculate, but nothing was ever resolved.

The Retrieval

In mid-2007, Jack Lightbourn contacted Don Pisor, a shell dealer in San Diego, about selling his prized shell collection. Don agreed to buy the collection, which included a single specimen of *C. lightbourni*. Other specimens of *C. lightbourni* were retained to maintain an exhibit of local shells for visitors to Jack's house.

Upon his return to San Diego, Don found a second specimen of *C. lightbourni* in a container of "Bermuda miscellany". After discussing the serendipitous find with Jack, Don decided to keep one specimen for himself, and sell the other. He contacted Bill Fenzan, a known *Conus* collector, who happily agreed to purchase the specimen. In short order, Bill received the *C. lightbourni* and an invoice.

Knowing that the holotype of *C. lightbourni* was missing, Bill checked his specimen against the original description. Although the measurements were not exact, the patterns and imperfections of the specimen in hand (Fig. 2 A-B) matched the original description perfectly (Fig. 2 C-D). An independent review of the photographs by Dr. Harry Lee confirmed this identification.

With the missing holotype of *C. lightbourni* in hand, Bill called Liz Shea at DMNH and recounted the whole story. On 14 March 2008, the holotype arrived at DMNH, carefully protected in Bill's jacket pocket. The story of its discovery was the highlight of Mid-Atlantic Malacologists Meeting the following day (Fig. 3).

So What Happened?

In April 2008, Liz emailed Ed Petuch to let him know the shell had been found, but not where or how. In a

series of email exchanges, Ed recalled that he had hand carried the shell to DMNH. He went on to suggest that the shell may have travelled out of the Museum for further study, a common practice in the 1970s and 1980s.

Unfortunately, there is no paperwork that can be tied to this specimen to support or refute this account. There are no donation papers, thank you letters, or loan documents. Only a few meagre resources establish collections activities in the late 1970s and early 1980s. We can document that during a flurry of activity in December 1979, two catalog numbers were skipped in the original, hardbound, DMNH ledger (Fig. 4). In January and February 1980, these numbers were mistakenly filled in with new data, suggesting the specimens had not been received by February 1980. At an undated time, DMNH volunteer Al Chadwick scratched out the incorrect data and added the reminder that DMNH 134938 was assigned to the *C. lightbourni* holotype but it had never been received.

There are multiple entries in the guest book documenting visits by Jack Lightbourn and Ed Petuch in 1978-79, but none that specifically reference *C. lightbourni*. Multiple trips between DMNH and Bermuda can be documented based on letters and receipts in the DMNH archives, and the well-worn path between the two locations was confirmed by Jack Lightbourn (pers. comm., 28 April 2008). There are no firm records of Ed Petuch visiting the museum from 1980-1988. Regrettably, we cannot document the actual history of the *C. lightbourni* holotype. How the specimen got mixed in with the collection of "Bermuda miscellany" remains a mystery.

Where Is It Now?

The *C. lightbourni* holotype (DMNH 134938) is now happily housed in the type collection at DMNH and ready for further study. A brief announcement of the return was published by *The Cone Collector* (Fenzan

2008), and in the *American Malacological Bulletin* (Shea & Fenzan 2008). A photograph of the specimen has been provided to Dr. Alan Kohn for his *Conus Biodiversity Website* (<http://biology.burke.washington.edu/conus/index.php>).

Please come to visit, measure, photograph, and otherwise study this beautiful shell. Just don't ask to borrow it!

Acknowledgements

We thank Mr. Jack Lightbourn, Dr. Ed Petuch and Dr. Jerry Harasewych, for their willingness to discuss their memories of these events. Thanks to previous DMNH curators Drs. Rüdiger Bieler, Paula Mikkelsen and Tim Pearce for their past attempts to locate the specimens and the notes they kept. Thanks to Mr. R. M. Filmer for recounting notes of his visit to DMNH in 1988. We appreciate Mr. Don Pisor's understanding of the importance of the holotype to DMNH, and his efforts to facilitate its return. We thank Dr. Harry Lee for his independent review confirming initial suspicions of the identity of the holotype. Thanks to all who commented on this paper during its preparation, especially Dr. Alan Kohn, Dr. Paula Mikkelsen, and Mr. John Tucker.

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Figures

1 - The type locality of the *Conus lightbourni* type specimens, 2.5 km south of Castle Island, Bermuda

2 - The holotype of *Conus lightbourni* was found, identified, and returned by the combined serendipity, effort, and good-will of Jack Lightbourn, Don Pisor, Harry Lee, and Bill Fenzan (co-author). Dorsal (A) and ventral (B) view of the returned specimen, and dorsal (C) and ventral (D) view of the published holotype, taken by M. G. Harasewych. Photograph© 2007. Biological Society of Washington, *Proceedings of the Biological Society of Washington*, reprinted by permission of Allen Publishing Services. Plate reprinted with permission of the *American Malacological Bulletin*, Ken Brown, Editor.

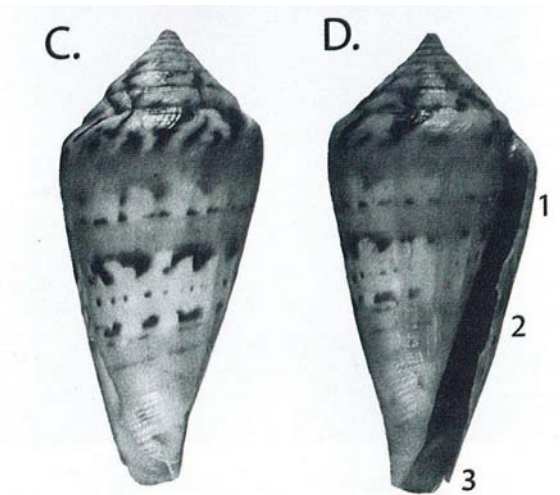
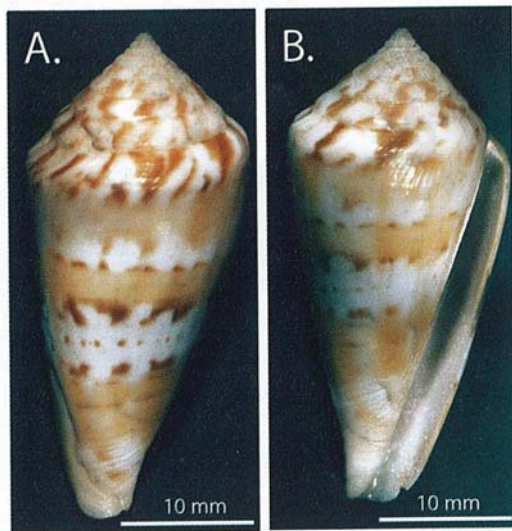
3 - Group photo from the 2008 Mid-Atlantic Malacologists Meeting at the Delaware Museum of Natural History. Bill Fenzan is grinning in the back row, blue shirt, sixth from the right.

4 - Photograph of the original DMNH ledger with mistakes & corrections. The remarks section at the far right reads: "specimen never returned to DMNH."

Discovery of lightbourni hototype continued...



1



2



3

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Conus longurionis in Australia

Jon Singleton

Conus longurionis Kiener, 1845 is a long ranging species from off East Africa, across the northern Indian Ocean to the Western Pacific. Sadly the holotype's "whereabouts" are unknown, but the old Kiener type illustration is excellent, and the species easily identifiable. No type locality was stated.

C. longurionis is one of the rarer species within Australian waters, and as yet only recorded from West Australia. The initial find was off Coral Bay, about 200 km north of Carnarvon. Several specimens were trawled from a depth of 40 metres, but all were dead and slightly faded cones. Two of these are illustrated in figs. 1 & 2, and both are 29 mm in length.

There is only one other recorded specimen, but a live taken cone from a depth of 400 metres off Port Hedland by a museum research vessel, see fig. 3. This specimen was displayed behind glass at the museum, so

I was never able to obtain a photograph. Eventually the collections were re-located to a building in the Perth City suburbs, and I have been unable to find this cone which was likely packed away with miscellaneous items from the display cases, and possibly still unpacked.

A *Conus kantanganus* da Motta, 1982 was named for a cone trawled off Kantang, Thailand, and now regarded as a synonym of *C. longurionis*, and it is a good match for the Port Hedland specimen.

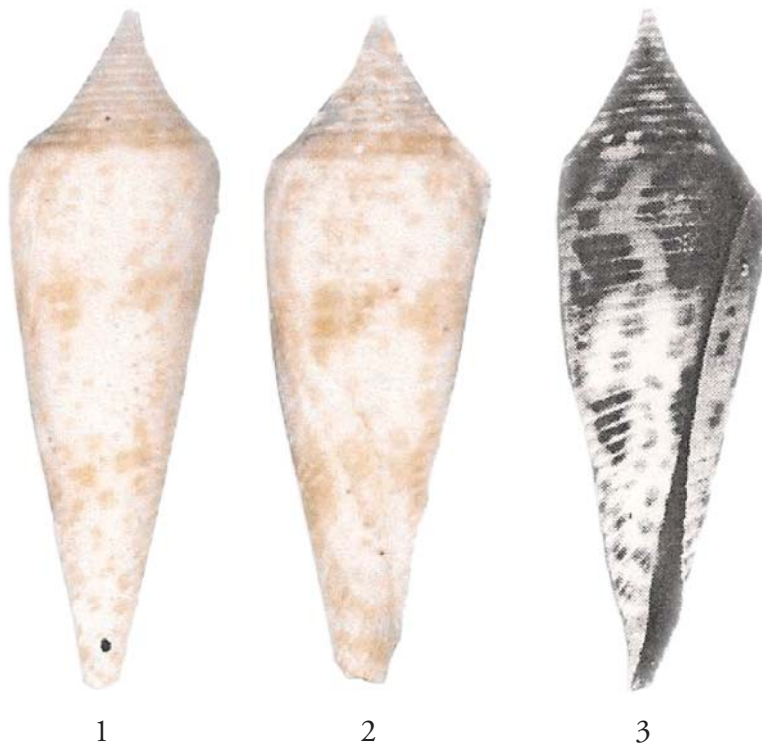
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Australian Shell News No. 43.



Cones with preserved Periostracum

Giancarlo Paganelli

My interest in cones is not only in good-looking specimens but also in shells with unusual shape or colour patterns. Since I like to imagine cone snails in their natural environment, what is better than a *Conus* still covered with its periostracum or with calcium carbonate or algae incrustations?

As far as possible I try to collect at least one specimen with periostracum intact for each species. Of course somebody could say that cones with periostracum are sometimes ugly and their real colours are hidden, but several specimens display a really nice coloured film that makes the shell charming.

Usually the periostracum sticks to the shell but if it is thick maybe it may break into small pieces, mostly in gerontic specimens. Obviously every species has its distinctive one. Thin to thick, translucent to opaque, variously coloured of yellow to brown, green, orange to reddish, smooth to rough, with or without regularly placed tufts.

Unfortunately the layer, with time, tends to dry up and flake off and, particularly in gerontic specimens, to divide into small scales and peel off the shell. In the beginning I made the mistake of oiling the periostracum

with liquid paraffin for better conservation.

I realized that it is an inadvisable method as the oil that permeates the layer sometimes gives it an unpleasant dark look. Depending on my experience it is possible to obtain better results using silicone oil.

The thickness of the periostracum varies from a few (~10/50 μm) to about 500 μm up. Most probably the look and the consistency change also by different environmental conditions. It is reported that this layer leans to be thicker and at times hairy in species that live in deep cold water.

As well-known, the periostracum (an outer quinone-tanned protein layer) is the external of three layers that constitute the shell. Its primary function is to aid in secretion of the shell. The secondary function is to protect the calcified shell against dissolution by acidic waters and the inhibition of epizoan and boring organisms. Moreover, the periostracum, when covered with sediments and algae, may act as camouflage to predators.

But, what may be the actual role of the colour pattern in the shell covered by a thick periostracum is still an unsolved dilemma!



pennaceus



scitulus



shikamai



simanoki



tribblei



kimioi



capitaneus



miles



capitaneus



generalis



ammiralis



araneosus



maldivus



achatinus



balteatus



aristophanes



gilvus



coronatus



betulinus



coronatus



arenatus



tessulatus



pulicarius



distans



virgo



lividus



namocanus



leopardus



thalassiarchus



furvus



litoglyphus



litteratus



pennaceus



behelokensis



pennaceus

tsara



textile



catus

suturatus

catus



vexillum

sumatrensis

augur



augur





kinoshitai



australis

vimineus

pretiosus



aureus

orbigny

teramachii

aurisiacus



gubernator



striatus



flavidus



terebra



dorreensis





circumcisis



violaceus



nussatella



geographus



lotoisii



geographus



simplex



scitulus



agulhasi



mozambicus



ventricosus



guanche



ermineus

zebroides

ermineus



guinaicus



tabidus



guinaicus



mercator



unifasciatus



cacao



pulcher



genuanus



pulcher



cuneolus



delanoyae



pseudocuneolus



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curralensis



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irregularis



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fantasmalis



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venulatus



isabelarum



pseudonivifer



damottai



galeao



josephinae



cancellatus



worki



spurius



puncticulatus



jaspideus



henckesi



vittatus



californicus



mus



fergusoni



brunneus



ximenes



princeps



perplexus

Conus recurvus Broderip, 1833 One More Time

Joaquin Inchaustegui

In a recent article that appeared in the *Triton*, the *Epi-tonium*, and *American Conchologist* discussed some shells I obtained from the Houston Conchology Society that had been donated to the Club by the Houston Museum of Natural Science.

In the article that appeared in the *American Conchologies* Vol. 38, No.3, September, 2010 Mr. Tom Eichhorst added a foot note that read "*Conus recurvus* Broderip, 1833, is apparently no longer valid as the type does not match shells of that name, the correct name is probably *Conus (Kohniconus) emarginatus* Reeve, 1844."

This made me ponder so I checked my literature to see what I could find out. In Abbott's *American Seashells* he shows *Conus recurvus* Broderip, 1833 as valid with synonyms *scriptus* Dall, 1910 and *magdanelensis* Bartsch and Rehder, 1939. These synonyms only showed that this cone was probably very variable.

So I next checked Keen's *Sea Shells of Tropical West America* Second Edition which showed *C. recurvus* Broderip, 1833 to be valid with synonyms: *incurvus* Sowerby 1833, *emarginatus* Reeve, 1844, *scariphus* Dall, 1910 and then it showed that *Conus regularis* Sowerby, 1833 to be also valid with several synonyms; *syriacus* Sowerby, 1833, *angulatus* A. Adams, 1854, *magdalenensis* Bartsch & Rehder, 1939 *monilifer* Broderip, 1833 and *gradatus thaanumi* Schwengel, 1955, *gradatus* Wood, 1828, *recurvus helenae* Schwengel, 1955.

This did not leave me with any positive thoughts about any of the above so I then contacted one of my shell collecting friends that has an extensive collection and a vast library of literature to ask his opinion of this foot note and he was kind enough to email me two scanned paragraphs of *A Chronological Taxonomy of Conus, 1758-1849* which was published in 1992 by Dr. Alan J. Kohn and reads as follows:

(Pg. 246) "Although Nybakken (1970) reported the radulas of *C. recurvus* and *C. regularis* to differ strik-

ingly, it is not clear from his illustrations of shells (Nybakken, 1970: figs. 35-39 that his concept of *C. recurvus* is consistent with the specimen (Fig. 36). Hanna (1963:30) suggested that "*C. regularis* is not very distinct and intergrades with *gradatus*, *scalaris*, and *recurvus*."

Pending further study of this difficult complex, I tentatively conclude that *C. recurvus* Broderip 24 May, 1833 is a junior synonym of *C. regularis* Sowerby, 17 May, 1833."

And later on Kohn continues:

(Pg. 274) "The result of this is that *C. arcuatus* Gray, 1839 is a junior primary homonym but not a synonym of *C. arcuatus* Broderip and Sowerby, 1829. Because the former species is valid, it takes the next available name applied to the taxon. Reeve (1844: pl.43, sp. 232) renamed *C. arcuatus* Gray as *C. emarginatus*. I thus conclude that *C. arcuatus* Gray is a junior primary homonym but not a synonym of *C. arcuatus* Broderip and Sowerby, 1829, is *C. emarginatus* Reeve, 1844."

In view of all of the above, I will change my *C. recurvus* labels to "*Conus regularis* Sowerby, 1833" but don't take my word for this since all of this is in flux and may change any day. Do your own research and go accordingly.

Photos by the author.

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Keen, A. Myra. *Sea Shells of Tropical West America*, 1971

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Pearls in the Nevada Desert?

Joaquin Inchaustegui

On October 10, 2009 my wife and daughter accompanied me on a rest and relaxation trip to Las Vegas, Nevada for the stage shows, the inexpensive buffets and perhaps a little gambling in the casinos on The Strip. While in the Flamingo Hotel lobby to pick up some show tickets for later that evening, we passed by a little shop called “The Pearl Factory” where they exhibited some beautiful pearl necklaces, ear rings and other jewelry for sale. In a small wooden dish I noticed some shells in water and I asked what that was. The sales girl said they were Hawaiian pearl oysters with lovely pearls hidden inside the mantle folds and that if I bought one we could open it and see what size and color pearl I would find.

I selected one and the girl tapped the bowl with a wooden spoon 3 times and all the other girls joined in and sang “A L O H A”. Then she opened the oyster and told me to look for the pearl by pushing down with my finger until I felt the pearl and out came a lustrous, shiny, white pearl of about 8 mm. diameter. She continued with her sales pitch and enticed me to buy another to see if I could find a larger pearl or even a pink one which she assured me was entirely possible and showed me some in a glass display case as a sample of what could be found. Since I am easily sold when it comes to molluscs, I selected another and out came a 7 mm. white pearl.

These pearl oysters are not at all related to the true oysters (*Ostreidae*) because these belong to the family *Pteriidae* which produce a thick shell when mature, such as the Golden Lip (*Pinctada maxima* Jameson, 1901) and the Black Lip (*Pinctada margaritifera* Linne, 1758). These have a great commercial value for the mother-of-pearl (nacre) manufacture. Apart from the nacre trade, under certain circumstances they produce valuable natural pearls which are lustrous just as the nacre on the inside of the valves. In many instances this pearl is only a by-product of the oyster shell fisheries which in 1980 had a price of \$1200 per ton down to about \$200 per ton depending on the thickness, color and qual-

ity of the shell. Other pearl oysters are *Pinctada albina sugillata* (Reeve, 1857) *P. perviridis* (Reeve, 1858) and *Pedum pedum* Brug. 1791, family *Pectinidae*. However, the most famous of the pearl oysters used in the culture of pearls is *Pinctada martensii* Dunker, 1872 from the West Pacific. *P. martensii* Dunker, 1872 is a small shell of only about 2 inches in diameter but it is not valued for its shell nacre but for human food and the culturing of pearls. The pearl culture business is now over a billion dollars per year industry.

This brings to mind that while snorkeling in the Caribbean with Dr. R. Tucker Abbott in March of 1971, as I reported in *Hawaiian Shell News*, Tucker said to me “Jo-Jo, you know a single female oyster can produce 500,000 offsprings in one spawning season! Imagine what she could do if she was married!!”

The Japanese originated the cultured pearl industry by inserting a small bead (or “seed”) made from the freshwater mussels called naiads from North America. These mussel shells were exported to Japan by the tons because they provided the base for easily culturing beautiful pearls that were produced more uniformly, in a shorter period of time (in some cases today as little as 2 months) and with better overall value than those produced by Nature.

Pearls occur naturally when certain molluscs are infected with parasitic organisms or other irritants, usually when they burrow through the shell into the tissue inside. However, this does not happen with grains of sand or other inorganic grit. The mollusc’s immune system triggers the secretion of a mucus-like substance called nacre, which coats the irritant to protect the mollusc from damage. Over time, the layers of nacre build up, resulting in the formation of a pearl within the shell. Pearls tend to retain the shape of the original irritant, and so most natural pearls are not round. Naturally occurring pearls are rare, and many thousands of molluscs can be killed in the search for one round pearl. This is why natural pearls command the highest

prices, as the yield is unpredictable. Some natural pearl necklaces are so rare today that a perfectly matched necklace can sell at auction for \$100,000 or more. As natural pearls are so desirable and rare, pearl farmers have worked out ways to stimulate the pearl formation process, greatly increasing the yield of pearls.

There are several types of cultured pearls such as:

FRESHWATER PEARLS which are cultured in fresh water lakes, ponds and rivers. They are nucleated by inserting a small piece of mantle tissue from a donor naiaid into a young mollusc's valve. This process can be repeated up to 25 times per valve after the pearl has been harvested. Then the pearls are dyed (if needed), drilled and strung for sale. These freshwater pearls are generally low quality, irregularly shaped and with a lesser luster than the saltwater variety. They fetch a lower price and so are in demand for costume jewelry.

SALTWATER PEARLS are grown in marine molluscs, and are usually rounder and of a higher quality than the freshwater pearls. This is because marine molluscs are nucleated with a seed nucleus as well as the donor mantle tissue which forms the bead sac, and since the seed is round the resulting pearl is round. There are several types of saltwater pearls available which causes some confusion with the various names for these pearls.

AKOYA PEARLS are grown in the Akoya oyster, which is the smallest of the saltwater pearl oysters. As a result, Akoya pearls are some of the smallest saltwater pearls available, and are rarely seen at more than 8 mm. Akoya pearls are bead-nucleated cultured pearls produced in *Pinctada fucata martensii* Dunker, 1872 and *P. fucata* Gould, 1850. Akoya pearls were traditionally farmed in China and Japan, although these days most Japanese Akoya pearls are actually from China. These have a rich deep luster and are generally round or near round, and either white or cream with overtones of rose pink. They are extremely desirable for matching with

existing jewelry due to their consistency of shape, color and quality, and can command fairly high prices.

TAHITIAN PEARLS are formed in the black lipped oyster (*Pinctada margaritifera* Linne, 1758) in and around the French Polynesian Islands. The black lipped oyster is one of the largest pearl producing molluscs, and so the size of the resulting Tahitian pearls is larger than Akoya pearls. Tahitian pearls are much darker than other saltwater pearls and naturally occur in a range of colors, often called "black", although a true black pearl is quite rare. Most have hues of other colors, usually green. My wife, Rose has a beautiful "black" pearl ring she bought in French Polynesia on the Island of Huahine in 1990.

SOUTH SEA PEARLS are cultured in the waters between Australia and China, using *Pinctada maxima* Jameson, 1901. South Sea Pearls can be between 9 and 20mm, some of the largest cultured pearls in the world. South Sea Pearls have a much thicker layer of nacre than others, up to 6mm thick and have a satiny luster. They come in a variety of pale hues and are very desirable.

CORTEZ PEARLS are farmed in the sea around California and they are also referred to as New World Black Pearls. Cortez pearls are produced in the Panamic Black-Lipped Oyster *Pinctada mazatlanica* (Hanley, 1856) and the Rainbow-lipped Oyster *Pteria sterna* (Gould, 1851), which produce highly iridescent pearls. Most are baroque, with round pearls forming less than 3% of normal yield.

MABE PEARLS are the semi-round pearls often used in jewellery. They are used in making earrings and rings. They are formed by using hemi-spherical nucleus during nucleation and implanting it against the shell. When harvested they are referred to as blister pearls and are worked into Mabe Pearls by cutting away the shell and filling the back with resin. This is then mounted on a mother-of-pearl back. In my shell collection I had

a *Pinctada margaritifera* Linne, 1758 from Tahiti with a large attached blister pearl on one of the valves. The pearl was almost entirely black and if properly worked it could have become a beautiful Mabe Pearl.

GASTROPOD PEARLS are rare natural pearls produced by gastropods. *Strombus gigas* Linne, 1758 produces a large, pink pearl which although hardly ever round, is very rare and desirable to collectors. One of the members of the Louisiana Malacological Society had a large pink pearl of this gastropod and although not round (it was more elongated than wide) she had it mounted into a beautiful ring.

I found a rare natural pearl in a *Conus striatus* Linne, 1758 from Kenya. It was tear-shaped and the same color as the Cone. I obtained this shell in a trade with a Kenyan collector and I received it with the animal mummified inside it because Kenya is very dry but Louisiana is very damp and this would have eventually caused the well known aroma of dead mollusc. While cleaning it, before adding it to my collection, out fell this little pearl. I reported this in *Hawaiian Shell News* with pictures but unfortunately Hurricane Katrina took the shell, the pearl, the HSN article, the picture and negatives.

I WOULD LIKE TO ASK ALL READERS THAT IF THEY HAVE A COPY OF THE HAWAIIAN SHELL NEWS ARTICLE, IF THEY COULD SEND ME A COPY, I WOULD BE VERY GRATEFUL.

So if you doubt that there are pearls in the Nevada desert, there really are, and I have some in my collection to prove it.

Photos by the Author.

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Help Wanted

A friend of mine – an archaeologist – is looking for information concerning the use of shells, particularly Cones, by primitive societies as amulets or particularly as musical instruments such as whistles! Can anybody supply examples of such findings and also information about techniques and tools for such handicraft?

Within a broader scope, can anybody suggest articles/books that concern shells and their destiny or function in Paleolithic societies?

By the way, once my friend's research is done, we will surely hear more about it in TCC!

A.M.

Loose Notes

1.

We have received a message from Alessandro Zanzi concerning the article entitled "Exceptionally large *Conus ventricosus*" (TCC # 4, p. 29).

Alessandro indicates that the specimen indicated with the letter B, found in Messina, corresponds to the variety *Conus grossii* (Maravigna, 1853).

Although this is but a form, hence a synonym of *Conus ventricosus* Gmelin, 1791, it is always useful to know exactly what is meant by each name.

2.

In a recent issue of *Malacologia* (IV/2010, November, no. 69) the well-known bulletin published by Mostra Mondiale – Cupra Marittima, John K. Tucker and Luigi Bozzetti published an article entitled "*Asprella cavailloni* (Fenaux, 1942), a valid species of cone shell from Madagascar (*Conidae*, *Punctuliinae*)".

The authors separate *A. cavailloni* from its closest species, *A. lynceus* and *A. inscripta* (with which *A. cavailloni* had been usually synonymized). The main difference between the latter and the other two resides in the smaller number of spirals on the sutural ramps of the teleoconch; on the other hand, *A. cavailloni* appears to occur only in Madagascar, whereas *C. lynceus* is found from the West Pacific to Thailand, which means that the relationship between the two will need further study, as the authors indicate.

Lovely specimens of *C. episcopatus*

As a follow-up to previous articles on *Conus episcopatus* da Motta, 1982, Paul Kersten has sent photos of some beautiful specimens in his collection.

We urge our readers to send photos of other specimens that are particularly noteworthy.



Conus adami – Still a Puzzle

Jon Singleton

My first sighting of the cone was at a local Shell Club meeting in 1974. The owner had obtained two large all-white cones around 100 mm in length from a contact in Darwin. For myself I had never seen a cone like these, being large with concave sides and a fattish spire, and very light-weight for their size.

A few months later I obtained the description of a *Conus visagenus* Kilburn, 1974, which possessed a similar shape, but a much smaller and colourful cone from another continent.

I was able to take a week's leave and headed for Darwin, and checking the local trawlers in port, I was fortunate in obtaining my initial specimens of this cone. The trawler skipper showed me his working area on his marine chart, which was the western side of the Arafura Sea. A few weeks later I received a number of other specimens from the same source.

I sent a batch of these cones, including one complete with periostracum, to Mike Filmer, who had expressed naming this species *Conus arafuraensis*. Sadly during his research the description of *C. adami* was published, a poorly illustrated paper, the name meaningless to Australians, and the loss of another type to an overseas museum. Mike continued his research, and published a lengthy paper. He illustrated several specimens of *C. adami*, *trigonus* and another cone which today is still known as the "intermediate" form. His final conclusion was that *C. adami* was a subspecies of *C. trigonus* Reeve, 1848.

When I look at *C. adami* alongside a *C. trigonus*, I see two very different cones that differ in shape, sculpture and periostracum, and consider them to be full separate species. The main problem to me is the so called intermediate form, which to the best of any one's knowledge came from Southern Indonesian waters.

A while following their appearance, I made another trip to Darwin, and obtained a few from a local trawler

in port. Unfortunately the skipper was not forthcoming as to exactly where these cones were found, and changed the subject when I repeatedly asked the question. I strongly suspect that on occasions the trawlers may be working closer to Indonesia than Australia. All specimens I obtained were without periostracum.

I have never decided just where these intermediates fit in, even after a lengthy study of their sculpture, which is all we have to go on, unless a cone with the periostracum intact is found, and also some precise location data. Both *C. adami* and the intermediate form have not been collected now for many years, and the only occasional specimens available are from old collections being broken up for sale.

References

1988. Wils.
Gloria Maris 27 (5-6). Description of *C. adami*.
1992. Filmer R. M.
C. adami, species or subspecies? *Pub. Ocas. Soc. Port. Malac.* No. 16.

Figures

- 1 - *C. adami*, N.W. Arafura Sea, 71.3 x 48.9 mm
- 2 - *C. adami*, N.W. Arafura Sea, 76.1 x 50.1 mm with periostracum
- 3 - *C. trigonus* intermediate, Indonesia, 72.9 x 45.4 mm
- 4 - *C. trigonus* intermediate, Indonesia, 67.9 x 44.4 mm

Some chat on *Conus trigonus*

Jon Singleton



I soon became familiar with *Conus trinonus* Reeve, 1848 when I arrived in the North-West of Australia to work in the mining industry in 1972. Being based near Port Hedland, my first stroll along the local foreshore produced two live specimens, one of which remains in my collection today.

During the following years I collected many more from various locations which were exchanged, including many fine fresh dead specimens from the famous Eighty Mile Beach. My largest ever was an 82 mm in length cone from off Broome in 15 metres depth.

Within Western Australian waters, *C. trigonus* is a shallow water species, inhabiting the intertidal zone and adjacent shallows. As one goes north the habitat seems to be in slightly deeper waters, and my most northern limit is Cassini Island, which is at the extreme northern end of the Buccaneer Archipelago, and from a depth of 25 metres.

The standard colour and pattern consists of thin horizontal bands of light and a darker brown, a thin white band at shoulder level, and two broad white bands mid body and at the anterior. There is one very distinctive variety which I call the “stripey” form, and only occurs at one small region near Dampier, but sadly is likely extinct as none were sighted on my last two previous visits. The one other oddity is an all white specimen which I collected near port Hedland, and I know of two other similar specimens.

Around the “Top End” Northern Territory waters, the habitat of *C. trigonus* is much deeper water, and it is rarely collected alive by scuba divers. It is generally believed these have been up-lifted into scuba depth by storm activity. There are extensive beaches east of Darwin where good fresh dead specimens can be found. Mostly the cones from this region are usually paler than their West Australian cousins, being whitish with light brown blotches.

C. trigonus continued...

In the early 1990s I was able to visit the Australian Museum Sydney, and view their cone collections. I was surprised to find specimens of *C. trigonus* with locations from Queensland, as I had never considered it would extend so far east. Some were from off the Torres Straits Islands, and a couple from the mid western side of the Cape York Penins Cula.

I had always thought of *C. trigonus* as an Australian endemic species, but I received one which was trawled from 50 metres just south of Timor, Indonesia. The trawler skipper knew his shells and had always supplied me with very accurate location data in the past. The colour and pattern on this one is typically W.A..

Finally the whereabouts of the juvenile and small sub-

adult specimens remains a mystery. Possibly they spend their early lives remaining buried under sand, but one would expect to find them on the tidal drift lines, but no signs. My smallest is a long dead one at 29.9 x 19.1 mm.

Figures

- 1 - *C. trigonus*, Broome, W.A., 80 x 52.5 mm
- 2 - *C. trigonus*, Candon, W.A., 69.1 x 43.3 mm
- 3 - *C. trigonus*, Dampier, W.A., 61.6 x 38.1 mm
- 4 - *C. trigonus*, Port Hedland, W.A., 44.7 x 28.1 mm
- 5 - *C. trigonus*, Groote Eylandt, N.T., 51.1 x 34.3 mm
- 6 - *C. trigonus*, Gunn Point, N.T., 52 x 34.2 mm
- 7 - *C. trigonus*, Badu Is., QLD., 45.5 x 28 mm
- 8 - *C. trigonus*, off S. Timor, Indonesia, 61.9 x 39.3



Live Cones From New Caledonia



Our friend Thierry Vulliet has sent us a very interesting set of photos of live Cones from New Caledonia. It is a pleasure to share them with our readers.

Here is the first part, others will follow. I would also like to draw attention to the wonderful Vulliet logo-type, above! Well done!











Live Cones continued...







Comments

on: TCC #15

From Robert Eason:

Antônio, just finished reading TCC #15 and found it to be a very interesting read, as is normal, even for one that is a collector and not a scientist. I too have looked at Hardy's site and found that by adopting the format that he used it is easier to keep my collection cataloged being as I not only have it on computer, but also keep a paper hard copy on file cards. I can understand the reluctance of many collectors with sizable collections to convert as it is very time consuming to do so. It would be nice if there was a way to easily and quickly locate the information (shell morphology) on each species and the sub-species. However as was noted in one of the articles, some of those papers are, shall we say, faux. I do fully agree with you that the purpose of TCC is to present the available information and allow the reader to form their own opinion, after all I as a mere collector do not have the time necessary to sort thru the ICZN's literature and do find TCC a valuable tool to assist me in this task. You and André keep up the great work as it will help those that are novices to continue educating ourselves.

As an afterthought I also would like to thank those that are contributors as that is what helps to keep this magazine forum interesting. We may not all agree on all things but it does seem that we can agree on one thing, that is that good healthy discussion will help to find the answers that we are all seeking, or in some cases keep them as clear as mud!

The Editor replies:

Thanks for your comments and especially for your support, Robert! We surely could not do it without the likes of you!

From John Tucker:

I send you a comment on the note by David Berschauer on mono-generic families. I thought that the

comment was OK as it went but there was a remark that I thought confusing and I did not want our work dismissed by such an offhand comment. I included the classification summary to aid readers who have not seen the book. [See below. Ed.]

Also this was a really good issue. I particularly liked the La Rochelle plates. The article by Rick McCarthy on *queckettii* was also very good.

Being the lumpner I am I would list the taxon as a synonym of *Rhombiconus imperialis*. However, the fact that the radular teeth of *R. imperialis* and *R. queckettii* are nearly identical has nothing to do with the decision that they are conspecific. Rather it shows that they are congeneric, i.e., both are *Rhombiconus* Tucker & Tenorio, 2009. Snails from many of the genera of cone shells have very similar radulae. They should because we relied on radular morphology to define the genera. If they had turned out to be really different, it would have been a big shock to me.

What be *Conidae*?

I read with interest David Berschauer's comments on the fall of the mono-generic family. Having done my very best along with Manuel Tenorio's heroic efforts, I hope we have pushed the cone shells over the precipice. Time will tell. Regardless, I do want to pick up on one comment that may have given readers the wrong impression about our work. David says "Worse yet, do Turrids really belong in the *Conidae*?" Manuel and I certainly cannot be held responsible for that. In fact, because we narrowed the definition of *Conidae*, we actually kicked turrids out of the *Conidae*. I am not sure which taxa David was referring to as turrids but I suspect it was *Benthofascis* or maybe even *Pseudoconorbis*. Both of these taxa have hypodermic radular teeth not connected to the radular ribbon and resorb the inner shell whorls something also true of all cone shells. In our classification neither are in *Conidae*. Granted we exclude from the *Conidae* many species that most

consider *Conidae*. We did because our classification is mostly based on details of the radular tooth and we developed it cladistically. My purpose is not to go into details on our classification; all that is in the book. However, I did want to duck the accusation that we put turrids in the *Conidae*. We can be accused of taking cone shells out of the *Conidae*. I include a summary of the Tucker & Tenorio classification for those who have not seen it. This summary is slightly modified from the original. *Protoconus* da Motta, 1991, is a junior homonym of another taxon and we missed the description of *Lindaconus*, which is senior to *Spuriconus*. I might also mention that the citation is Tucker, J. K. & Tenorio, M. J. 2009, *Systematic Classification of the Recent and Fossil Conoidean Gastropods*, ConchBooks, Hackenheim, Germany, 295 pp.

Classification Summary

Superorder CAENOGASTROPODA Cox, 1960

Order SORBEOCONCHA Ponder & Lindberg, 1997

Suborder HYPGASTROPODA Ponder & Lindberg, 1997

Infraorder NEOGASTROPODA Thiele, 1929

Superfamily CONOIDEA Fleming, 1822

Family CONIDAE Fleming, 1822

Subfamily CONINAE Fleming, 1822

Genus *Conus* Linnaeus, 1758

Genus *Calibanus* da Motta, 1991

Genus *Chelyconus* Mörch, 1852

Genus *Cylinder* Montfort, 1810

Genus *Darioconus* Iredale, 1930

Genus *Endemoconus* Iredale, 1931

Genus *Eugeniconus* da Motta, 1991

Genus *Gastridium* Modeer, 1793

Genus *Leptoconus* Swainson, 1840

Genus *Nataliconus* Tucker & Tenorio, 2009

Genus *Phasmoconus* Mörch, 1852

Genus *Pionoconus* Mörch, 1852

Genus *Protostrioconus* Tucker & Tenorio, 2009

Genus *Pseudolilliconus* Tucker & Tenorio, 2009

Genus *Textilia* Swainson, 1840

Subfamily PUNCTICULIINAE Tucker & Tenorio, 2009

Genus *Puncticulis* Swainson, 1840

Genus *Africonus* Petuch, 1975

Genus *Asprella* Schaufuss, 1869

Genus *Austroconus* Tucker & Tenorio, 2009

Genus *Calamiconus* Tucker & Tenorio, 2009

Genus *Conasprelloides* Tucker & Tenorio, 2009

Genus *Dauciconus* Cotton, 1945

Genus *Dendroconus* Swainson, 1840

Genus *Ductoconus* da Motta, 1991

Genus *Dyraspis* Iredale, 1949

Genus *Eremiconus* Tucker & Tenorio, 2009

Genus *Floraconus* Iredale, 1930

Genus *Fulgiconus* da Motta, 1991

Genus *Genuanoconus* Tucker & Tenorio, 2009

Genus *Gladioconus* Tucker & Tenorio, 2009

Genus *Gradiconus* da Motta, 1991

Genus *Harmoniconus* da Motta, 1991

Genus *Hermes* Montfort, 1810

Genus *Kalloconus* da Motta, 1991

Genus *Ketyconus* da Motta, 1991

Genus *Kioconus* da Motta, 1991

Genus *Kurodaconus* Shikama & Habe, 1968

Genus *Lamniconus* da Motta, 1991

Genus *Lautoconus* Monterosato, 1923

Genus *Leporiconus* Iredale, 1930

Genus *Lithoconus* Mörch, 1852

Genus *Lividoconus* Wils, 1970

Genus *Miliariconus* Tucker & Tenorio, 2009

Genus *Monteiroconus* da Motta, 1991

Genus *Plagioconus*† Tucker & Tenorio, 2009

Genus *Plicaustraconus* Moolenbeek, 2008

Genus *Seminoleconus* Petuch, 2003 (= *Protoconus* da

Motta, 1991 in book)
Genus *Pseudonoduloconus* Tucker & Tenorio, 2009
Genus *Purpuriconus* da Motta, 1991
Genus *Pyrucanus* Olsson, 1967
Genus *Rhizoconus* Mörch, 1852
Genus *Rhombiconus* Tucker & Tenorio, 2009
Genus *Rolaniconus* Tucker & Tenorio, 2009
Genus *Sciteconus* da Motta, 1991
Genus *Lindaconus* Petuch, 2002
(= *Spuriconus* Petuch, 2003 in book)
Genus *Stellaconus* Tucker & Tenorio, 2009
Genus *Stephanoconus* Mörch, 1852
Genus *Strategoconus* da Motta, 1991
Genus *Trovaconus* Tucker & Tenorio, 2009
Genus *Turriconus* Shikama & Habe, 1968
Genus *Varioconus* da Motta, 1991
Genus *Virgiconus* Cotton, 1945
Genus *Virroconus* Iredale, 1930
Genus *Vituliconus* da Motta, 1991

Family CONORBIIDAE Powell, 1942

Genus *Conorbis*† Swainson, 1840
Genus *Artemidiconus* da Motta, 1991
Genus *Benthofascis* Iredale, 1936

Family CONILITHIDAE Tucker & Tenorio, 2009

Subfamily CONILITHINAE Tucker & Tenorio, 2009

Genus *Conilithes*† Swainson, 1840
Genus *Bathyconus* Tucker & Tenorio, 2009
Genus *Conasprella* Thiele, 1929
Genus *Dalliconus* Tucker & Tenorio, 2009
Genus *Eoconus*† Tucker & Tenorio, 2009
Genus *Fusiconus* da Motta, 1991
Genus *Globiconus* Tucker & Tenorio, 2009
Genus *Jaspidiconus* Petuch, 2003
Genus *Kohniconus* Tucker & Tenorio, 2009
Genus *Lilliconus* Raybaudi Massilia, 1994
Genus *Parviconus* Cotton & Godfrey, 1932

Genus *Perplexiconus* Tucker & Tenorio, 2009
Genus *Profundiconus* Kuroda, 1956
Genus *Pseudoconorbis* Tucker & Tenorio, 2009
Genus *Quasiconus* Tucker & Tenorio, 2009
Genus *Viminiconus* Tucker & Tenorio, 2009
Genus *Ximeniconus* Emerson & Old, 1962
Genus *Yeddoconus* Tucker & Tenorio, 2009

Subfamily CALIFORNICONINAE Tucker & Tenorio, 2009

Genus *Californiconus* Tucker & Tenorio, 2009

Family HEMICONIDAE Tucker & Tenorio, 2009

Genus *Hemiconus*† Cossmann, 1889

Family TARANTECONIDAE Tucker & Tenorio, 2009.

Genus *Taranteconus* Azuma, 1972
Genus *Kenyonia* Brazier, 1896

Fossil genera appear marked with †

Superfamily CONOIDEA Fleming, 1822 (cont.)

Family CRYPTOCONIDAE Cossmann, 1896

Genus *Cryptoconus*† von Koenen, 1867 Eocene-Oligocene, Miocene
Genus *Genota* H. & A. Adams, 1853
Genus *Genotina* Vera-Peláez, 2004

Family BORSONIIDAE Bellardi, 1875

Representative *bathytomid* genera:
Genus *Bathytoma* Harris & Burrows, 1891
Genus *Micantapex* Iredale, 1936
Genus *Parabathytoma* Shuto, 1961

Family RAPHITOMIDAE Bellardi, 1875

- Subfamily RAPHTOMINAE Bellardi, 1875
- Subfamily MANGELIINAE P. Fischer, 1883
- Family CLATHURELLIDAE H. & A. Adams, 1858
- Subfamily CLATHURELLINAE H. & A. Adams, 1858
- Subfamily MITROMORPHINAE Casey, 1904
- Superfamily TURROIDEA Swainson, 1840*
- Family CLAVATULIDAE J. E. Gray, 1853
- Family DRILLIIDAE Olsson, 1964
- Family PSEUDOMELATOMIDAE J. P. E. Morrison, 1965
- Family STRICTISPIRIDAE McLean, 1971
- Family TEREBRIDAE H. & A. Adams, 1854
- Family TURRIDAE H. & A. Adams, 1858
- Subfamily TURRINAE H. & A. Adams, 1858
- Subfamily COCHLESPIRINAE Powell, 1942
- Subfamily CRASSISPIRINAE McLean, 1971
- Subfamily ZEMACIINAE Sysoev in Medinskaya & Sysoev, 2003
- Subfamily ZONULISPIRINAE McLean, 1971

The *Conus auratinus* Con[e]undrum

Richard L. Goldberg

It is often difficult to separate closely related species without a much wider understanding of variations within a species and a closer look at comparative material.

A small investigation raises many questions.

A picture of a *Conus auratinus* da Motta, 1982 that I posted on Facebook (Figure 1, E) prompted Paul Kersten to ask if this 112 mm specimen from the Ontong Java Atoll, Solomon Islands was the largest reported specimen of the species. Bill Fenzan replied that a 141.9 mm specimen from the Philippines, owned by Victor Dan, is listed in the 2009 Registry of World Record Size Shells (WRS) (6th edition). Quite often atypical forms of *Conus aulicus* Linné, 1758 from the Philippines (and other locations) are improperly identified as *C. auratinus* (Figure 2, D, K, N), so I mused at whether this WRS shell might also be misidentified. Bill noted a second large 140 mm specimen of *C. auratinus* from the Philippines is pictured on the cover of Carfel Philippine Shell News (Vol. 1, No. 4, July-August 1979) with the caption, *Conus auratus* Hwass in Bruguière, 1792, a specimen also attributed to Victor Dan (Figure 3, G in this article). The newsletter contains no further detail about this shell.

With a growing number of unanswered questions about *Conus auratinus*, I was encouraged to start up a small-scale literature and collections search to confirm definitive locality records for *C. auratinus*.

Differentiating *auratinus* from *aulicus*.

Conus auratinus da Motta, 1982 is a rare and elusive species that is quite often misidentified due to its extreme similarity to *Conus aulicus*. *C. aulicus* is the closest living relative to *Conus auratinus*. Differentiating the two species often creates a conundrum.

In the book *Cone Shells – A Synopsis of the Living Conidae* (1979) the author Jerry G. Walls includes and

illustrates *Conus auratus* (pp, 166-167, ill. pg.128), a name now considered a synonym of *Conus aulicus*. In fact, the two specimens he pictures for this species are clearly *Conus auratinus*. (Figure 3, F in this article)

Walls was quite on track with his observation that *C. auratinus* (his *C. auratus*) and *C. aulicus* are distinct. At the time his Cone book was published the species was only known from the Tuamotu Archipelago. I very much agree with the comment that the species has, in his words, "...a certain almost indefinable 'feel' that makes them distinct from *C. aulicus*." It is a very perceptive observation, especially when both *C. auratinus* and *C. aulicus* are compared side-by-side (Figure 4). Silhouetted images of *Conus auratinus* and *aulicus* add further clarity to the differences (...that certain indefinable feel...) (Figure 5).

C. auratinus has a narrower, less ventricose outline with straighter sides, a spire and shoulder angle that is more tapering than *C. aulicus*, and a more elevated spire. The color of the aperture is bluish-white. One personal observation relates to the anterior end of both species. After studying many specimens of *Conus aulicus* and specimens and pictures of *Conus auratinus*, I noted that the siphonal fasciole in undamaged and untrimmed shells of *C. aulicus* in most cases extends beyond the basal curve of the lip. This almost never seems to be the case for *C. auratinus* (Figure 7). A larger study sample of both species should help support or disprove this observation, though the scale has tipped towards the siphonal fasciole being another reliable identifying characteristic separating the two species.

Confirmed localities for *Conus auratinus*.

In da Motta's original description (Publicações Ocasionalis da Sociedade Portuguesa de Malacologia #1, 1982, p. 3.) the type locality and distribution information for of *Conus auratinus* is given as follows:

"Type locality: Taken in shallow water, Fakarava Is-

land, Tuamotu Archipelago. Distribution:

The type described is peculiar to the Tuamotu Archipelago. A form with smaller tenting pattern has been found in Kwajalein; also, a chestnut-colored one from Samar, Philippines. Occurrence in other Pacific island (sic) has been reported; but not known in the Indian Ocean."

So where does *C. auratinus* truly inhabit? Along with da Motta's type material, a number of additional Tuamotu examples of *C. auratinus* illustrated in books and this article prove its existence in the type locality (Figure 1, A, B, C, D, H, N). The Solomon Islands specimen (Figure 1, E) formerly in my inventory (sent to me as *Conus auratus*), plus two other specimens recorded from Ontong Java obtained through the same source, the late Johnson and Ann Kengalu of Honiara, confirm the species in the Solomons.

In correspondence that I received from Ann Kengalu dated March 19, 1987 she wrote:

"I have sent a rare shell in a separate parcel today. It is a *Co[nus] auratus* from the Ontong Java Atoll found by a local person and brought into Honiara. It is the second one we have had from that area. According to Walls it is a very large specimen. The man found it when he was diving for beche-de-mer so it must have been found during the day on white coral sand. ..."

I subsequently learned that the second specimen mentioned in her letter is a 107mm shell in the collection of Andre Delsaerd of Belgium and illustrated in his comprehensive series of articles entitled "The *Conidae* of the Solomon Islands." (*Gloria Maris* 29(4-5) Part 2, December 1990, pl. 1, fig.9). (Figure 3, B in this article).

I received the Ontong Java specimen from the Kengalu's with the name *Conus auratus* based on an identification made using the Walls Cone book, which was published prior to da Motta's description of *C. auro-*

tinus. The name *Conus auratus* Hwass, in Bruguière, 1792 is now considered a junior synonym of *C. aulicus*. Figure 2, A illustrates the type specimen of *Conus auratus*, a shell from the Indian Ocean. The name *C. auratus* was frequently misapplied to specimens of *C. auratinus* throughout the 1980's when da Motta's description was not well known and the defacto standard for *Conus* identification was the Walls Cone book.

Delsaerd's Solomons account of *C. auratinus* also mentions a third specimen from Ontong Java, a 125mm specimen that Johnson Kengalu kept in his collection. The whereabouts of the Kengalu collection at this time is not known. Nonetheless, two additional *C. auratinus* from the Solomons were recently found in the collection of Al and Eva Fox collected off Shortland Island.

Extreme variations of *Conus aulicus* (Figure 2, E) found in the central and southern Solomons south of Ontong Java sometimes mimic, but are not *C. auratinus* (Figure 2, D).

Delsaerd lists a number of other locality records for *C. auratinus* in the article based on records in other publications.

"...The Tuamotu Arch. is the most cited locality. But the species is also found in Vanuatu (in *Rossiniana*, 1984, N. 23: 14), in Futuna (in *Rossiniana*, 1986, N. 32: 11), in New Ireland (Hinton, 1972: pl. 38, fig.1). Moreover, Springsteen & Leobrera (1986: pl. 70, fig. 4; p. 248) illustrate the species and mention Philippine records in Eastern Samar and Sulu."

I have checked each of these references. In my opinion not all illustrate *C. auratinus*. In the following paragraphs I explain why I hold this opinion.

C. auratinus is correctly identified in Springsteen & Leobrera (*Shells of the Philippines*, 1986, p. 248, pl.70, fig. 4) (Figure 3, A in this article). The shell is a golden color form of 103.3 mm. It appears on the same plate

with *C. aulicus* and illustrates a clear comparison of the characteristics that separate the two species.

I initially disagreed that the shell from New Ireland illustrated in Hinton on plate 38 #1 (Figure 3, C in this article) is a specimen of *Conus auratinus*. It is reminiscent of *Conus aulicus* (+ *aurantia*), an orange *C. aulicus* form with a white aperture. Yet if I use the diagnosis of the siphonal fasciole as a consistent character to differentiate *C. auratinus* from *C. aulicus*, I have to believe the Hinton shell captioned as *Conus auratus*, is in fact, *Conus auratinus*.

It is a split decision with regard to the specimens illustrated in the magazine *Rossiniana*. Though the picture is black and white, the Vanuatu specimen is clearly *C. aulicus* (Figure 3, D). The *Futuna* specimen is problematic (Figure 3, E). Without additional photos of the aperture side this shell may or may not be *Conus auratinus*. It is yet another example of the conundrum encountered when attempting to confirm identifications of *C. auratinus* found outside of the type locality.

The Manual of the Living Conidae – Vol. 1 (Röckel, et al. 1995, p. 289) records the range of *Conus auratinus* as: Tuamotu Archipelago, Society and Marshall Is., Vanuatu, Solomon Islands and the Philippines. What about other records of *C. auratinus* from the Philippines beyond the shell pictured in Springsteen & Leobrera, and the 140 mm shell illustrated on the cover of *Carfel Philippine Shell News*? Could this latter shell be the same one listed in the WRS Registry at 141.9 mm with a more accurate measurement?

Victor Dan helped clear up this question. He confirmed that they are two different shells. He was kind enough to send a photograph of the shell listed as the record size specimen of *C. auratinus* (Figure 6, inset), which he refers to as *C. auratus*. Unfortunately, I believe this specimen is *C. aulicus* (+ *aurantia*) based on the diagnostic characteristics of each species discussed above.

Victor also mentioned that the dark brown 140 mm specimen illustrated on the Carfel cover (as *C. auratus*) was misplaced after it was photographed for the newsletter more than 30 years ago! This 140 mm specimen is undoubtedly *Conus auratinus* (Figure 3, G).

Victor's extensive collection of *Conus aulicus* from the Philippines represents 107 variations. (Figure 6) The variation exhibited in this series adds immensely to the knowledge of the *C. aulicus* species complex.

Conus auratinus inhabits Kwajalein Atoll and has been confirmed most recently by Scott & Jeanette Johnson. Among the specimens they collected are a number of dead, fragmented shells (Figure 1, J) that are clearly *C. auratinus*. A Kwajalein specimen from the collection of Bob da Motta (Figure 1, O) is problematic. The look of the shell is not necessarily that of a typical *C. auratinus*. Scott Johnson stated (pers.comm.) that some specimens, particularly from Eniwetok Atoll are also not typical of *Conus aulicus* (Figure 1, I). Da Motta's specimen may fall into this nebulous category of an *aulicus-auratinus* form. Figure 1, P and Fig. 2, F are also indicative of the variation in the wider area surrounding Kwajalein.

American Samoa is a confirmed locality for *Conus auratinus* based on a report and photo published by Emilio Garcia (*American Conchologist*, Vol. 22(1) March 1994, pg. 16). The specimen measures 105.7mm and was live collected (Figure 1, M in this article).

In an earlier article by Emilio dealing with the shells of Takapoto Atoll, Tuamotu Archipelago, French Polynesia (*Am. Conch.* Vol. 19(1) March 1991, pg. 18) he reports and illustrates two shells labeled as *Conus auratus*. Though difficult to determine just by the photograph, the shells seem to be *Conus aulicus* forms. If correct, this proves the coexistence of *Conus aulicus* in the type locality of *Conus auratinus* (B.Fenzan, pers. comm.).

A specimen from the Cook Islands, just west of Tu-

motus (Figure 2, L) in the collection of the Academy of Natural Sciences Philadelphia (ANSP) is undoubtedly a form of *Conus aulicus*.

During this study I found no confirmed records of *C. auratinus* from the Cook Islands. *Conus auratinus* and *C. aulicus* also seem to coexist in Guam. A 94.3 mm specimen in the collection of Bill Fenzan collected in Lele Harbor, Guam (Figure 1, L) seems to agree with the characteristics of *Conus auratinus*, whereas a similar size specimen collected by Bob Abela on Luminao Reef, Guam has all of the characteristics of *Conus aulicus*.

Further clarification is needed to add Indonesia as a possible new location for *Conus auratinus* based on two specimens from the collection of Dieter Roeckel housed in the Stuttgart Museum. The smaller of the two shells with data indicated as 'Moluccas' (Figure 2, G) is seemingly *C. auricomus*. The second shell (Figure 1, K) is clearly a specimen of *Conus auratinus*. The data of "Moluccas" for this latter specimen though is speculative.

Finally, as indicated in da Motta's original description of *Conus auratinus*, it has not been found in the Indian Ocean where *Conus aulicus* is present (Figure 2, B, C, M).

Summary

In conclusion, *Conus auratinus* is a rare species with a spotty range through [throughout ?] the Western and South Pacific. The largest recorded and confirmed specimen of *C. auratinus* is a 140 mm specimen illustrated on the cover of *Carfel Philippines Shell News*, but currently missing.

Specimens from Tuamotu, Solomons and Marshall Islands, Guam, American Samoa, Papua New Guinea and the Philippines can be confirmed by visual inspection of shells and a comparison to original descriptions

and other literature that explain the differences between these similar species. The Moluccas is a possible additional locality record.

Additional records of *C. auratinus* are needed to gain a better understanding of its true distribution. I would be pleased to receive photographs of well-documented *Conus auratinus* shells from any of the recorded localities and, of course, unrecorded locales. You can email me at worldwide@rcn.com. With your help we will hopefully add to the published knowledge of *Conus auratinus* in a future issue of TCC.

Acknowledgements

This article would not have the clarity and substance if not for Bill Fenzan who along with Paul Kersten originally encouraged me to pursue this investigation. Bill photographed material for this article from the da Motta, Roeckel and Korn collections housed in the Stuttgart Museum (SMNS) and provided substantive comments and guidance that helped shape this article. My gratitude is also extended to the Stuttgart Museum. My sincere thanks goes to Dr. Alan Kohn who allowed me use of his type pictures of *Conus auratinus* and *C. auratus* from "The Conus Biodiversity Website" <http://biology.burke.washington.edu/conus/>. I would also like to thank Dr. Gary Rosenberg and Paul Callomon for access to the vast Philadelphia Academy of Natural Sciences (ANSP) collection to photograph specimens for research related to this article. Paul Kersten also provided pictures from his collection. Many thanks to Victor Dan who sent numerous photos of his collection of Philippines *C. aulicus* and information that helped to unravel a number of questions about the *C. aulicus* complex and how it relates to *C. auratinus*.

Additional thanks go to Scott & Jeanette Johnson, Underwater Kwajalein <http://www.underwaterkwaj.com/> for permission to use their photographs and for providing information about *Conus auratinus* found in Kwajalein Atoll. I am truly grateful to Emilio Garcia

of Lafayette Louisiana, who provided numerous photographs of *Conus auratinus* acquired during his many field expeditions to the South Pacific. And I truly appreciate the loan of photographs by Bob Abela of Guam and Robert Lum of Hawaii that helped to fill in important geographical data.

Figures

PLATE 1

Confirmed specimens of *Conus auratinus*.

Abbreviations Figure 1: MHNG = Natural History Museum Geneva; SMNS = Stuttgart Museum of Natural Science; ANSP = Academy of Natural Science Philadelphia; RLG = Richard L. Goldberg, Worldwide Specimen Shells; BF = Bill Fenzan; EG = Emilio Garcia; AK= Alan J. Kohn ; RKK = Manual of the Living Conidae Vol.1, Roeckel, Korn & Kohn; other photos, collections and publications credited as marked.

A. *Conus auratinus* Da Motta, 1982 – Holotype, MHNG Catalogue # 982.118. Size: 82 x 29.5 mm
Type Locality: Fakarava Is., Tuamotus Archipelago.
Photo: AK, The Conus Biodiversity Website <http://biology.burke.washington.edu/conus/>

B. *Conus auratinus* – Paratype #1, Fakarava, French Polynesia, Size: 84.8 x 30.8mm, SMNS Catalogue #0348. Specimen also illustrated in RKK, Plate 61, fig. 7, Photo: BF.

C. *Conus auratinus* – Tahiti, French Polynesia, Size: 75 x 25.2mm, SMNS Catalogue # Z10070035, ex. Korn collection, Photo: BF.

D. *Conus auratinus* - Anaa Island, Tuamotu, found in 1977 after a tropical storm; Size: 65.1mm. Photo & Collection: Paul Kersten.

E. *Conus auratinus* – Ontong Java Atoll, Solomon



PLATE 1

aurantinus Con[e]undrum continued...

Islands, Size: 112mm, one of a handful of confirmed records for the Solomons, Photo: RLG.

F. *Conus auratinus* – Shortland Island, Solomon Islands, Size: 85mm, leg. Al & Eva Fox, Photo & Collection: BF.

G. *Conus auratinus* – Shortland Island, Solomon Islands, Size: 77.5mm, leg. Al & Eva Fox, Photo & Collection: BF.

H. *Conus auratinus* – Fakarava, French Polynesia, Size: 52 x 18mm, part of Paratype lot # 2, SMNS catalog #13? Photo: BF.

I. *Conus auratinus* – Eniwetok Atoll, Marshall Islands, Size: 66.2mm, ex. Crawford Cate, Photo & Collection: BF.

J. *Conus auratinus* – Kwajalein Atoll, Marshall Islands, Size: 101.2 x 32.2mm, a fragment that clearly shows the occurrence of *C. auratinus* in Kwajalein. Photo & Collection: Scott & Jeanette Johnson.

K. *Conus auratinus* – Moluccas ?, Size: 88.5 x 29mm, SMNS catalog # Z10064131, ex. Collection of D. Roedel. If this data can be confirmed then this is a definitive record for *C. auratinus* in Indonesia. Photo: BF.

L. *Conus auratinus* – Lele Harbor, Guam, Marianas Is., Size: 94.3mm, Photo & Collection: BF.

M. *Conus auratinus* – Tutuila Island, American Samoa, 105.7mm x 37.6mm, Photo & Collection: EG.

N. *Conus auratinus* – Rangiroa, Tuamotu Archipelago, 69.8mm x 27.4mm, Photo & Collection: EG.

O. *Conus auratinus* – Kwajalein, 77.0mm x 28.4mm, da Motta Collection (SMNS), a specimen that does not totally adhere to the diagnosis of *C. auratinus*.

Photo: BF.

P. *Conus auratinus* – North central Mili Atoll, Marshall Islands, 83mm x 26.1mm, see Figure 2, G for a problematic specimen from this same locality. Photo & Collection: E.G.

PLATE 2

Conus aulicus and other shells related to *C. auratinus*.

A. *Conus auratus* Hwass, in Bruguière, 1792 – Lectotype of *Conus aulicus* – Indian Ocean, Size: 106mm x 49mm, Museum of Natural History, Geneva (MHNG). Photo: AK, The Conus Biodiversity Website <http://biology.burke.washington.edu/conus/>

B. *Conus aulicus* Linné, 1758 [+ *aurantia* Dautzenberg, 1937] – Sri Lanka, Size: 114.8 mm, ANSP 402066, catalogued as *Conus auratus* Hwass, in Bruguière, 1792, ex. Meyer Naide Collection. *Conus auratinus* is not represented in the Indian Ocean. Photo: RLG.

C. *Conus aulicus* Linné, 1758 – Salomon Islands, Chagos Archipelago, Indian Ocean, Size: 111.5mm, ex. Al & Eva Fox, Photo & Collection: BF.

D. *Conus aulicus* Linné, 1758 – Guadalcanal, Solomon Islands, Size: 114.1 x 45.0mm, a form that is sometimes mistaken for *C. auratinus*, Photo: RLG.

E. *Conus aulicus* Linné, 1758 – Malaita Island, Solomon Islands, Size: 95.2 x 39.1mm, *C. aulicus* exhibits the same variability in the Solomons as found in the Philippines. Photo: RLG.

F. *Conus auratinus* da Motta, 1982 – Mili Atoll, Marshall Islands, Size: 82.6mm, One of the problematic specimens with a siphonal fasciole similar to *C. aulicus* with a body whorl and spire of *C. auratinus*. See Fig. 1, P. Photo & Collection: E.G.



PLATE 2

G. *Conus auratinus* da Motta, 1982 – Moluccas, Size: 54 x 19.3mm, SMNS cat. # Z10064132, ex. Collection of Roeckel, Photo: BF. Due to its small size and general appearance this specimen may be more closely related to *C. auricomus*. Photo: BF.

H. *Conus auratus* Hwass, in Bruguière, 1792 – Amboina, Moluccas Ids., Size: 59.4mm, ANSP #34032, the shell was originally cataloged at the museum as *C. aureus*. It was later re-identified as *C. auricomus* in 1974 by A.J. Kohn with a further re-identification from E. Petuch in 1981 as *C. auratus*. Like the Roeckel specimen from the Moluccas (Fig. 2, G) I am inclined to believe that this shell represents *C. auricomus*. Photo: RLG.

I. *Conus auratus* Hwass, in Bruguière, 1792 – Philippines, Size: 53.3mm, ANSP #332883, Identified as *C. auratus* by William Old in 1973. A year later it was re-identified as *C. auricomus* by A.J. Kohn. Most recently the name *C. auratus* was reapplied to the specimen by Rosenberg and Ruggeri in 1988. The shell size and look is similar to Fig. 2, G and H, yet it is not clear if this shell is *C. auratinus* or *C. auricomus*. Photo: RLG.

J. *Conus auratinus* da Motta, 1982 – Zamboanga, Philippines, Size: 62.5mm x 23.9mm, SMNS #Z10050768, ex. da Motta collection. Even though this shell has features of both *C. aulicus* and *aurantius*, I am inclined to believe it is *C. aulicus*. Photo: BF.

K. *Conus aulicus* Linné, 1758 – Luminao Reef, Guam, Size: 93.2mm, Both *C. aulicus* and *aurantinus* are found in Guam (also see Fig. 1, L). Photo & Collection: Bob Abela.

L. *Conus aulicus* Linné, 1758 – Passage at Atiu Island, northern Cook Islands, 1962, Size: 105.1mm, ANSP # 279321, cataloged as *Conus auratus*. Though found just west of Tuamotu, the type locality for *Conus auratinus*, this specimen is undoubtedly a form of *Conus*

aulicus. There are currently no confirmed records of *C. auratinus* from the Cook Islands.

M. *Conus aulicus* Linné, 1758 – Zanzibar, Size: 133.2 x 49.5mm. Though this specimen might be mistaken for *Conus auratinus*, da Motta states that there are no records from the Indian Ocean. This shell's more ventricose sides and more acute spire angle help separate it from *C. auratinus*. Photo: RLG.

N. *Conus aulicus* Linné, 1758 – Philippines, Size: 149.3mm, a specimen that at first look can easily be confused with *C. auratinus*. Photo & Collection: David Lum.

PLATE 3

Published images of specimens, or thought to be specimens of *Conus auratinus*.

A. *Conus auratinus* – published in: Shells of the Philippines, Springsteen & Leobrera, 1986, Plate 70, fig. 4, fig. size: 103.3mm. Correctly identified and one of a limited number of specimens known from the Philippines.

B. *Conus auratinus* – published in: The *Conidae* of the Solomon Islands – part 1, A. Delsaerd in *Gloria Maris* 27(4), 1988, fig. size: 107mm, leg. Johnson Ken-galu, Ontong Java, Collection: Delsaerd.

C. *Conus auratus* – published in: Shells of New Guinea and the Indo-Pacific, Hinton, 1975, Pl. 38, fig. 1, fig. New Ireland, Papua New Guinea, size: 107.95mm. A specimen that adheres to the diagnosis of *C. auratinus*, yet can easily be confused with *C. aulicus*, form *aurantia*.

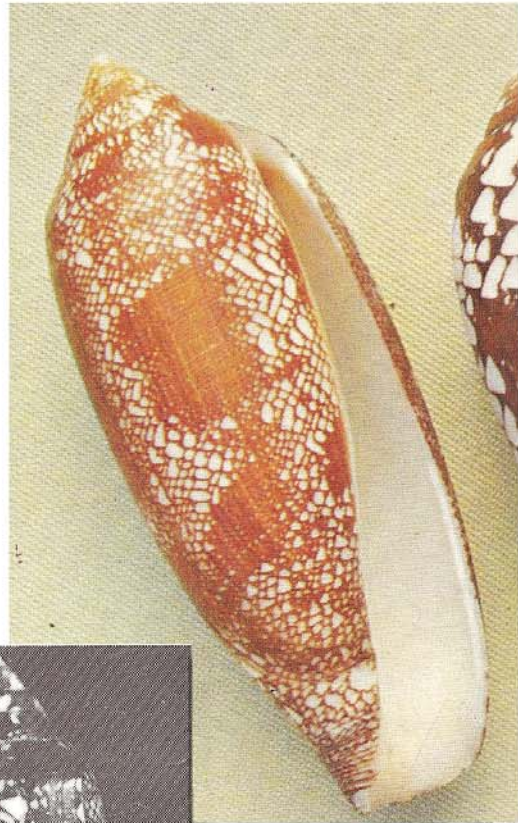
D. *Conus auratus* – published in *Rossiniana*, No. 23, 1984, fig. size: 104mm, from Vanuatu, Photo & Collection: Turret. Thought to be *C. auratinus*, but clearly is a specimen of *Conus aulicus*.



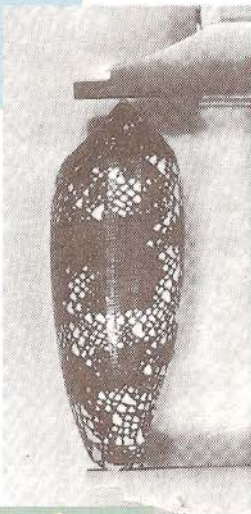
A



B



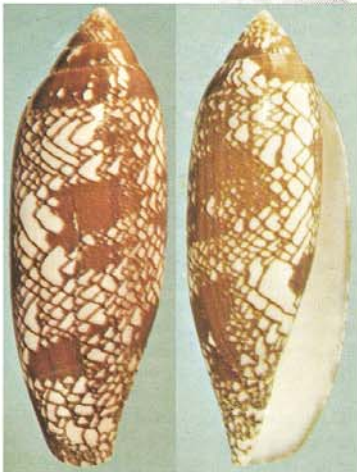
C



D



E



F



G

PLATE 3

E. *Conus auratinus* – published in *Rossiniana*, No. 32, pg. 11, fig. size: 92.5mm, from Ile de Futuna. Photo: Prigent, Collection: Burrus. Without additional photos of the aperture side, it is uncertain that this shell is *C. auratinus*.

F. *Conus auratus* – published in *Cone Shells – A Synopsis of the Living Conidae*, G. Walls, 1979, text pp, 166-167, ill. pg.128. This is a specimen of *Conus auratinus*.

G. *Conus auratus* – published in *Carfel Philippines Shell New*, Vol. 1, No. 4, 1979, cover. Fig. size: 140mm, from E. Samar. This is a specimen of *Conus auratinus* and is also the largest recorded specimen. Ex. Victor Dan.

PLATE 4

Side-by-side comparison of *Conus auratinus* and *Conus aulicus*.

A. *Conus auratinus* - Tahiti, French Polynesia, Size: 81.7mm, Photo & Collection: BF.

B: *Conus aulicus* [+ *aurantia* "Lamarck" Dautzenberg, 1937] - Philippines, Size: 99.8mm, Photo: RLG.

C: *Conus aulicus* Linné, 1758 - Philippines, Size: 119mm, Photo: RLG.

PLATE 5

Silhouette images of *Conus auratinus* (left), *Conus aulicus* (+ *aurantia*) (center) and *Conus aulicus* (right). The tapered spire profile is one of the major keys to separating *C. auratinus* from *C. aulicus*. The extension of the siphonal fasciole in *Conus aulicus* may also provide a key to separate the two species. Illustration: RLG. (The silhouettes are from actual specimens that are similar in size)

PLATE 6

A large series of *Conus aulicus* from the Philippines - illustrates the extreme variability of color, pattern and shape of *C. aulicus* – Inset: the specimen designated as the largest recorded specimen (WRS) of *Conus auratinus* in "Registry of World Record Size Shells", Sixth Edition – 2009. Based on the diagnostic characteristics for *C. auratinus* and *aulicus* in this article, this specimen seems to represent *Conus aulicus* (+ *aurantia*). Photo & Collection: Victor Dan.

PLATE 7

Anterior end of *Conus auratinus* (A) and *Conus aulicus* (B). The siphonal fasciole extends beyond the curve of the basal lip in undamaged and untrimmed specimens of *Conus aulicus*. The opposite is true of *Conus auratinus*. A larger study is needed to help support or disprove the consistency of this diagnosis.



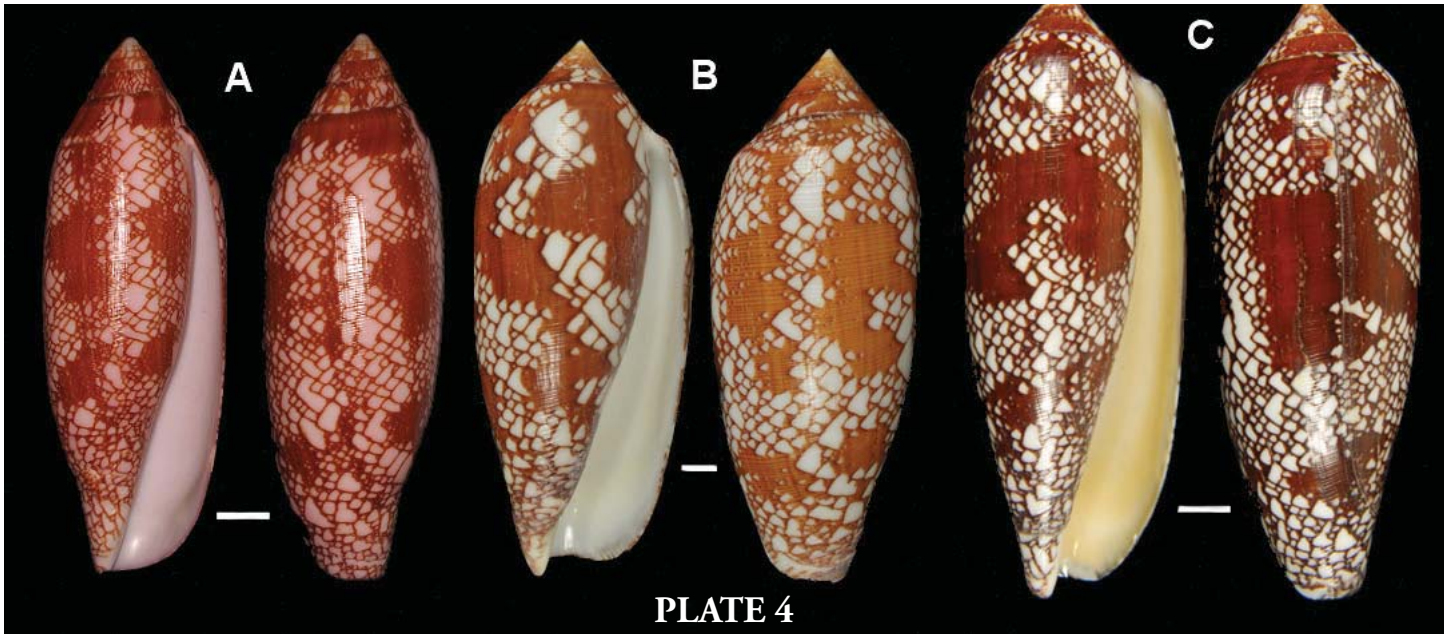


PLATE 4

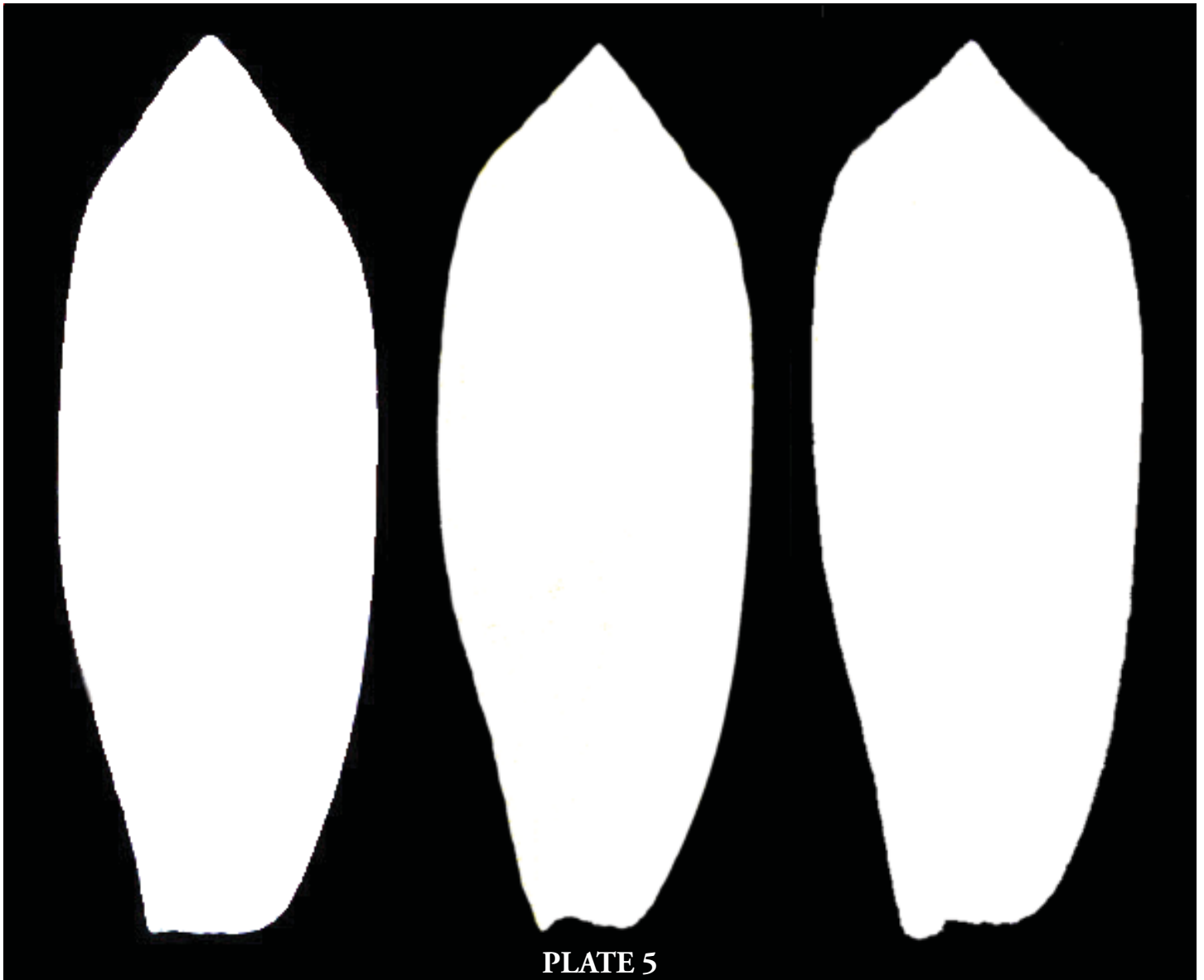


PLATE 5

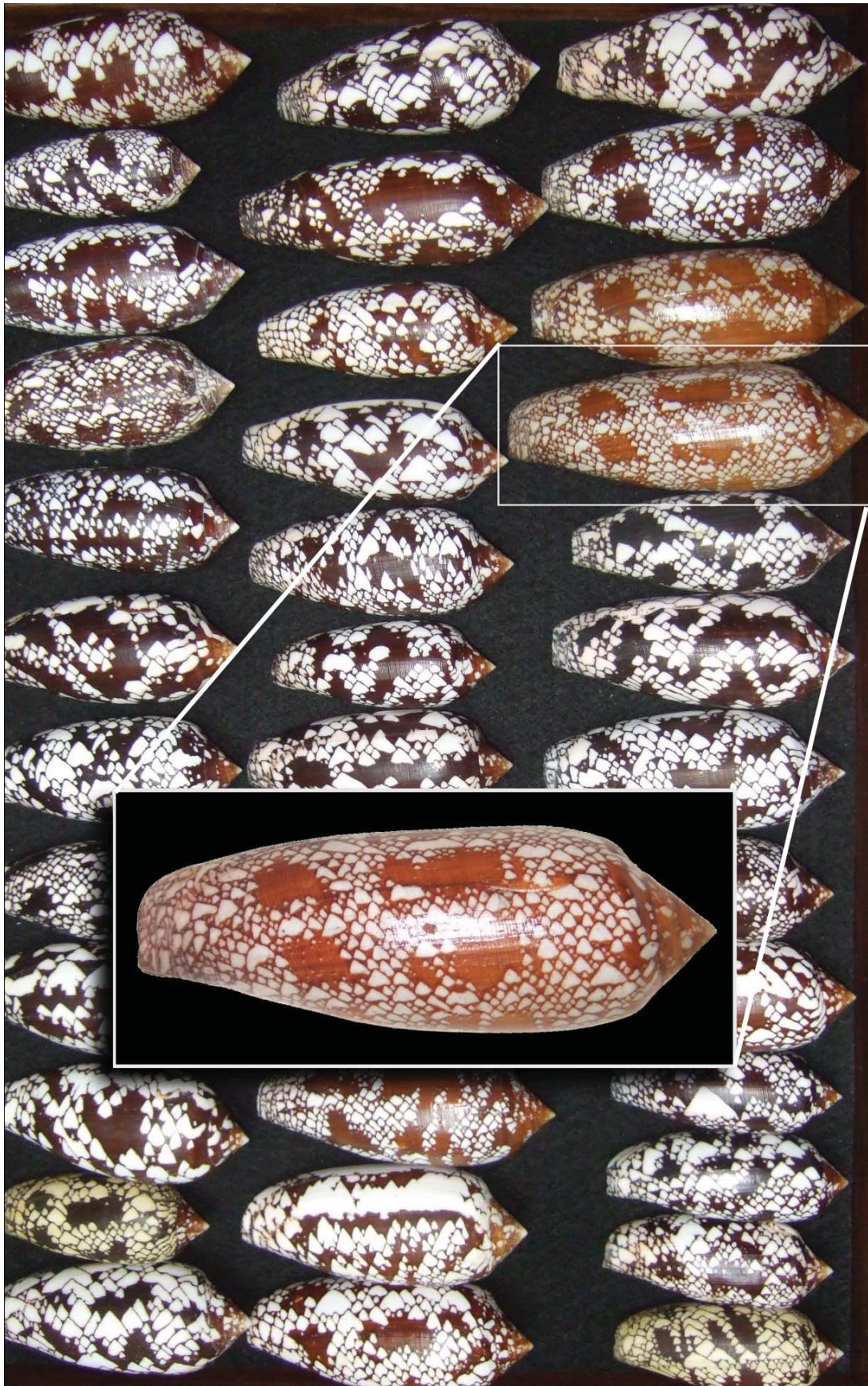


PLATE 6

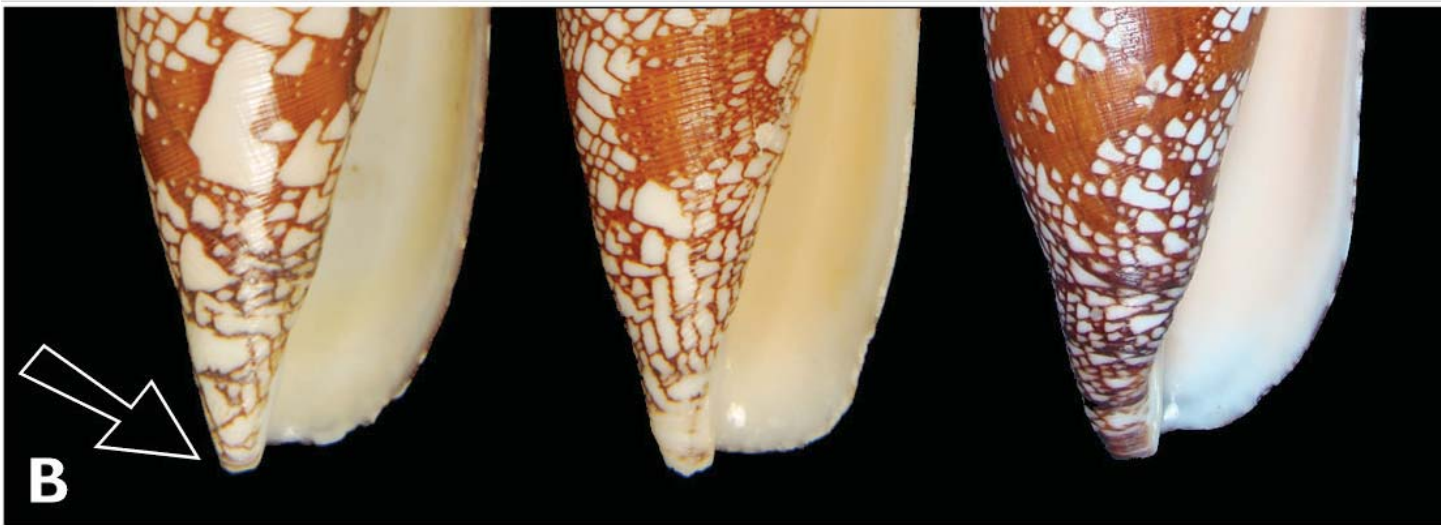


PLATE 7

Lautoconus ventricosus Gmelin, 1791

Julian Joseph

Here is a selection of specimens of *Lautoconus ventricosus* Gmelin, 1791. The shells were all beach collected in July and August, 1968 in Porec, Croatia (then Yugoslavia). It was a very rocky area, and I saw live specimens on rocks in a few feet of water (but didn't take any, I don't remember why).

Figures

1 - 25.8 x 15.0 mm

2 - 28.5 x 13.2 mm

3 - 26.2 x 12.3 mm

4 - 23.1 x 11.7b mm

5 - 20.5 x 11.3 mm

6 - 21.1 x 11.6 x mm

7 - 18.5 x 9.5 mm

8 - 19.6 x 9.6 mm

9 - 18.8 x 11.8 mm

10 - 14.2 x 8.0 mm



1



3



2



4





5



8



6



9



7



10



Juvenile Cones

Remy Devorsine

Our friend Remy Devorsine, from Australia, has sent us a selection of photos of juvenile Cones. Here are a few comments by Remy:

The little Cones I have called *Conus sp.* are Cones not buried in sand but found under rocks. The animal colour is bright red...very pretty...they would have looked very nice in my aquarium....but Bali was too far from home!!!! Can somebody identify them?

Figures

1-4 - *Conus sp.* (can you help with ID?)

5 - Unkown...

6 - *C. coronatus*

7 - *C. ebraeus*

8 & 9 - *C. pulicarius*

9 - *C. striatus*

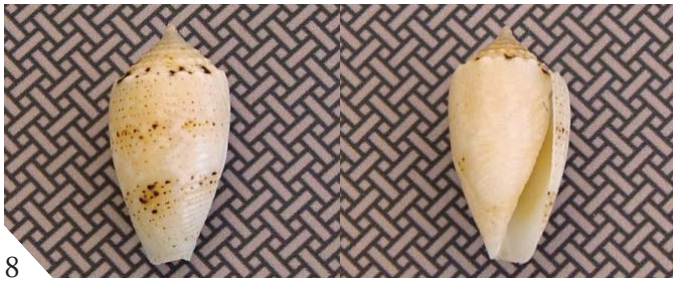
10 - *C. marmoreus*



Different forms of *Asprella iodostoma*

António Monteiro

Conus iodostoma Reeve, 1843 is a fairly common East African species that Tucker & Tenorio now place under the genus *Asprella*. Röckel et al state its geographical range as comprising only Mozambique and Madagascar only. As such, it is quite distinctive and not easily confused with any other species from the same region and in fact in the *Manual of the Living Conidae* it is compared only with *A. inscripta* Reeve, 1843, *A. neptunus* Reeve, 1843 and *A. lienardi* Bernardi & Crosse, 1861.



It lives in relatively shallow water, down to a depth of 30 metres, but can be found subtidally by snorkelling, usually half buried in sand.

A. iodostoma presents a fairly constant overall colouration, consisting of brownish dots (sometimes wavy axial lines) on a white to bluish grey background. The aperture is violet – which by the way explains the name “*iodostoma*”, which means “violet mouth”. Even so, two distinct forms can be separated, one of them extending from Nacala to the South (down to Mossuril), the other occurring in the region of Pemba (about 300 km North of Nacala Bay). Apart from the differences in colouration and pattern – which are clear from the accompanying photos – the specimens from Pemba apparently also reach larger dimensions than their southerly brothers.

References

- Röckel, D., Korn, W. & Kohn, A. J., 1995.
Manual of the Living Conidae, Volume I: Indo-Pacific Region. Christa Hemmen, Wiesbaden.
- Tucker, J. K. & Tenorio, M. J., 2009.
Systematic Classification of Recent and Fossil Conoidean Gastropods. ConchBooks, Hackenheim.

Acknowledgements

Thanks to Carlos Durães de Carvalho for suggesting this article and drawing attention to the different colour ways for this species and to José Rosado for supplying information on distribution range and photos.

Figures

1 - *A. iodostoma* (Pemba form), coll. Carlos Durães de Carvalho

2 - *A. iodostoma* (light-coloured form from Condúcia), coll. Carlos Durães de Carvalho

Röckel at el show (Plate 35) one specimen of the light-coloured form (fig. 22) as having been taken at Condúcia Bay, which is a bit to the south of Nacala Bay, as well as a specimen of the dark form with locality given as “Nacala”.

3 & 4 - Nacala Bay; São João Beach, Mossuril

5-6 - Condúcia Bay; Pemba Bay

7 - Sombreiro Island, Condúcia Bay

8 & 9 - Cabaceira Pequena Channel, Mozambique Island

All coll. José Rosado



3



4



5



6



7



8



9

100 Years Old Mystery

Jon Singleton

Back in 1910, the research vessel Endeavour was drifting off Cape Wiles and dragging a dredge along the sea-bed in search of marine specimens. Amongst one haul were a number of very small all white cones, all between 4 mm and 8.5 mm in length. These were eventually described and named *Conus superstes* Hedley, 1911. The description is reproduced below.

Conus superstes

Shell small, solid, regularly conical, angled at the shoulder, apex mamillate smooth, two whorled, slightly oblique. Sculpture: the whole shell is decorated with flat spiral cords defined by narrow, shallow grooves. On the last whorl there are three sulci above and twenty-five below the shoulder, anteriorly these become more crowded and oblique. The whole shell is transversely by delicate growth-striae. Colour white, in a few examples faint brown dashes appear on the shoulder. Aperture linear. Whorls six, including the protoconch. Length 8.5 mm × 4 mm.

Probably the species attains a larger size, but as the apex is the chief distinction, larger examples would be recognisable from the present information. Apparently its nearest relation is *C. convexus* Harris, 1897 from the Victorian Eocene, of which I have not seen specimens. Compared with *C. anemone* Lamarck, 1810, the apex of *C. superstes* is more mamillate, and the spiral grooves are stronger, the shoulders of the spire whorls are not tuberculate in *C. superstes*, as they are in *C. anemone*.

Habitat: Several specimens, mostly young, from 200 metres, 65 kilometres south of Cape Wiles, South Australia.

The rather bulbous protoconch on this cone would indicate to most collectors that this species is just an unidentified juvenile, but as yet it has never been matched to any well known Australian cone species. The most

likely candidate suggested by many, is *Conus clarus* E. A. Smith, 1881, an endemic species inhabiting the cooler southern waters, and ranging from West Australia, and eastwards through South Australian waters to the western Victoria coast. With this in mind, I made a point of specifically searching for small specimens of *C. clarus* whenever in the region.

Within West Australian waters, *C. clarus* is a shallow water species and can be found alive in knee deep water, to about 15 metres. Most are a uniform white colour to a pale pink, and slender in shape. However, one exception is from a colony found off Albany, which possess a broader shoulder, and are a match for the holotype. My smallest live taken specimen was 15 mm in length, so I started to search the drift-line rubble for smaller dead shells. I ended up with a few between 10 mm to 12 mm in length, with the smallest 9.9 mm. However, none of these showed any signs of the distinctive protoconch as seen on *C. superstes*.

So on to South Australia, where *C. clarus* seem to have a deeper water habitat than their W. A. cousins. Most collectors will be aware of the larger well patterned specimens which are found off the western side of the Eyre Peninsula. Although these are within a safe range of scuba diving, most seem to be obtained via the local fishing industries, which also bring up the high spired *C. anemone* from the same region. Although I have snorkelled from several locations, I was unable to find any live specimens off the Eyre Peninsula. A search through the tidal zones also was to prove negative. The Port Lincoln divers do occasionally find *C. clarus* around their locality, but the few I have talked to, state no small specimens were sighted.

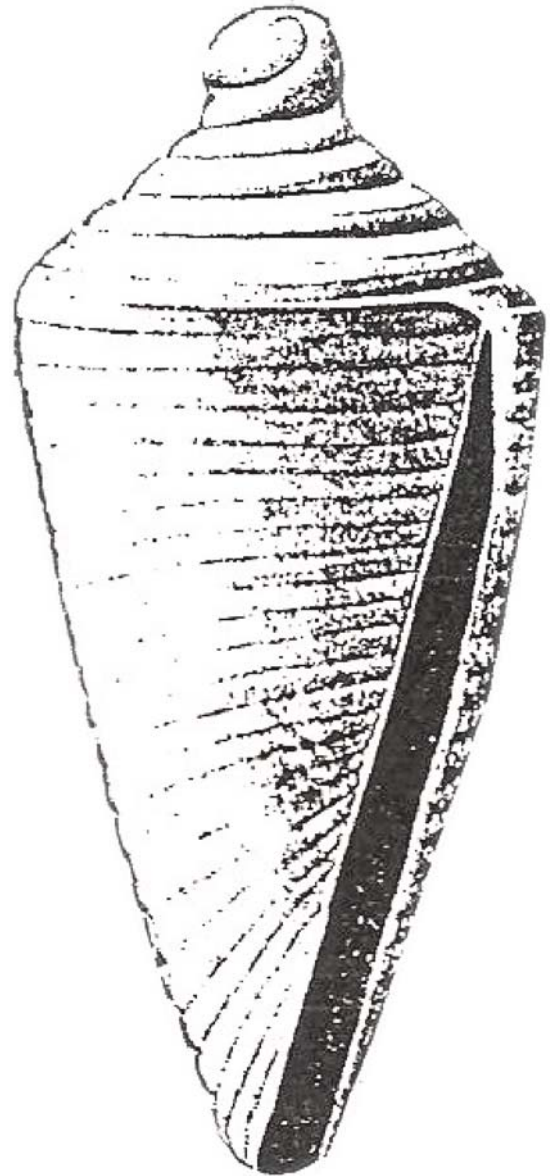
Within Victorian waters, *C. clarus* is rarely collected, and my own records show that Western Port Bay is the main source, and this is likely the eastern limit of the *C. clarus* range. I have not been able to do any searching amongst tidal rubble at Victorian locations.

So my own private conclusion is that *C. superstes* is unlikely to be a juvenile *C. clarus*. Hopefully some time in the future further specimens will be found, along with some larger sub-adults, or possibly a new species which may be a candidate. However, unless we are fortunate in seeing a growth series, it will remain difficult to match. So for now the 100 year old mystery remains.

I was fortunate in being able to sight and examine the type material at the S. A. Museum some years ago. Sadly, either my camera or lack of photographic talent, more likely the latter, proved my photos useless. A photographic illustration of *C. superstes* can be seen within the RKK Pl. 70, fig. 18.

References

1911. Hedley.
Aust. Dep. Trade, Customs & Fisheries, Endeavour
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1995. Röckel, Korn & Kohn.
Manual of the Living Conidae.



Errata

In TCC #14 we have published the article “Quaternary *Conidae* from Lanzarote (Canary Islands, Spain) – Witnesses of Another Period of Warming Only a Few Thousand Years Ago”, by Klaus Groh.

In that article, a number of corrections are needed, as follows:

Page 26, Column 1, Line 6

The genus name *Kalloconus* should be in italics

Page 27, Column 1, Line 5

Instead of “that may looks”, it should be “that may look”

Page 27, Column 2, Lines 7,8 from the bottom

Instead of “Malakozo-ologischen” it should be “Malako-zoologischen”

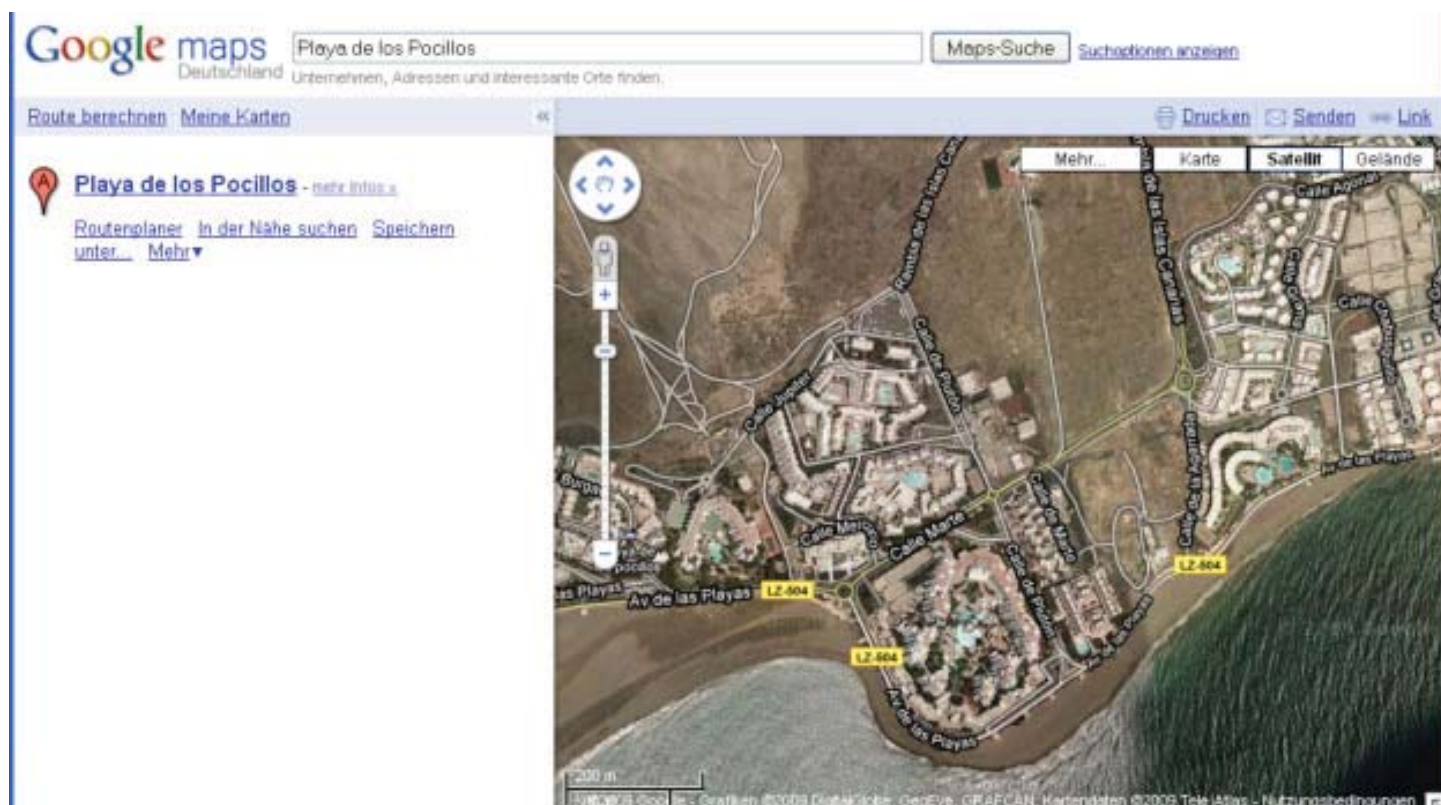
Page 28, Column 1, Lines 3,4

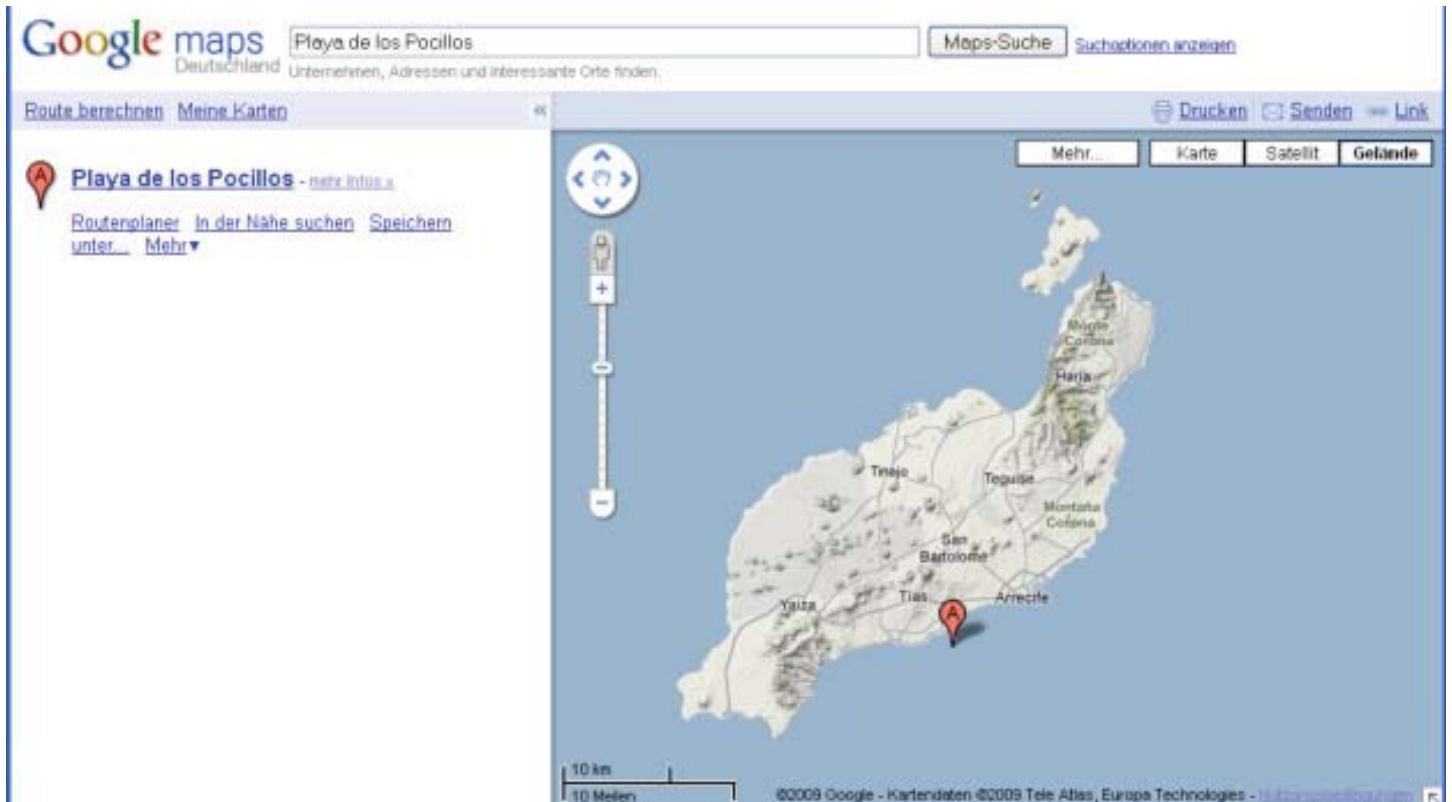
Instead of “Vulka-ninseln” it should be “Vulkan-inseln”

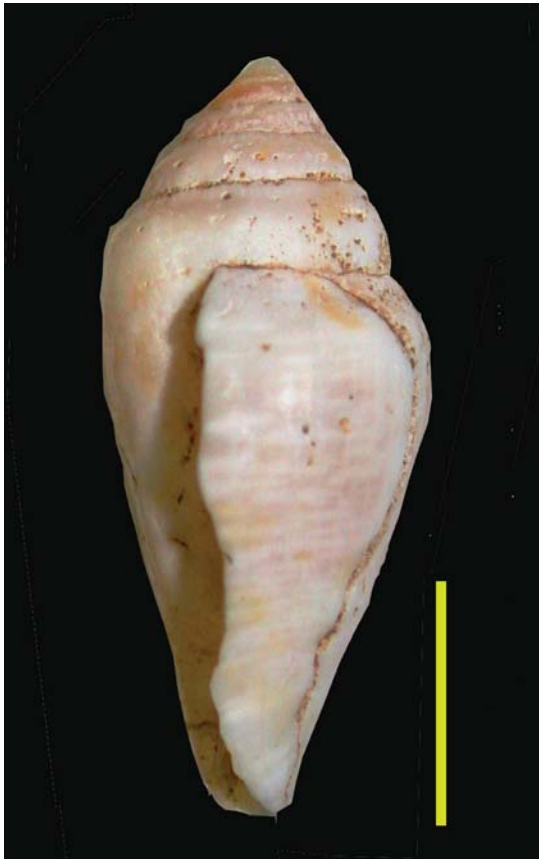
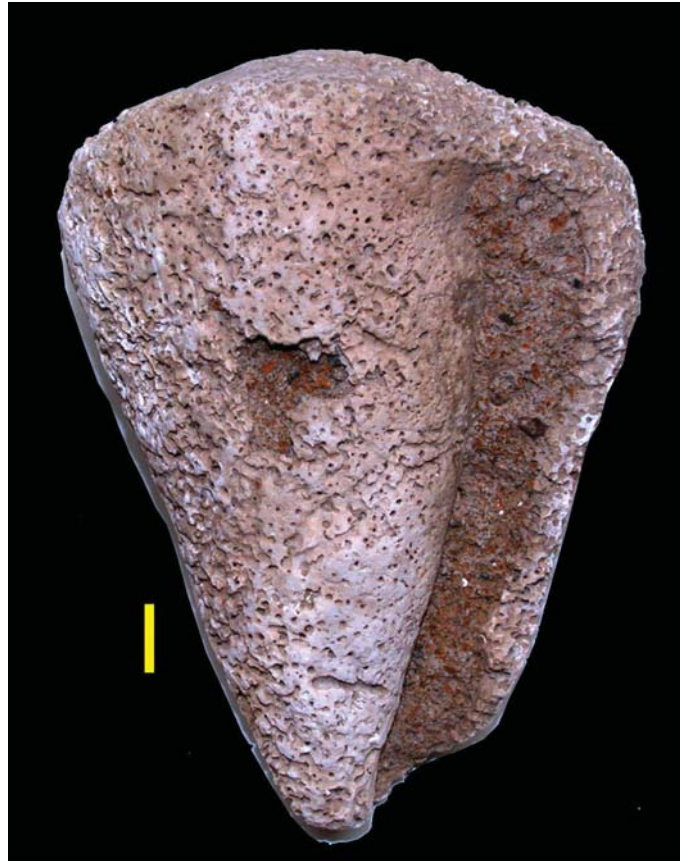
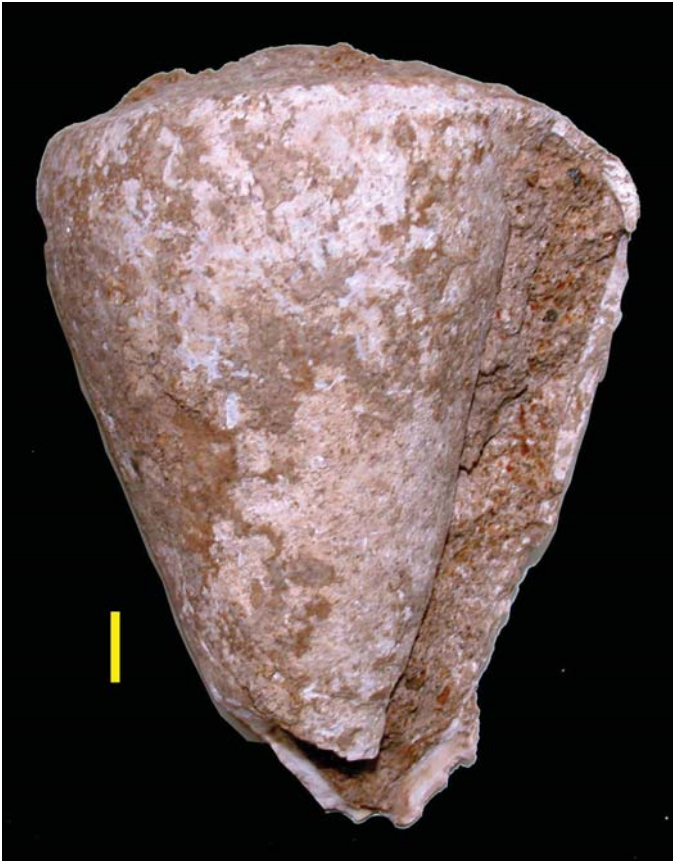
Page 28, Column 1, Lines 12,13

Instead of “Ge-ologischen” it should be “Geo-logischen”

On the other hand, the scales on the plates are missing or hardly visible and the map is missing. You will find all of these in our current issue.









We hope to see your
contribution in
the next TCC!

