



REVISION OF THE GENUS COLUBRARIA SCHUMACHER, 1817 AND RATIFUSUS IREDALE 1929 IN SOUTH AFRICAN WATERS

by
M. Lussi

Introduction

There are approximately 28 species of *Colubraria* distributed worldwide in tropical and subtropical waters. To date seven species have been recorded from South African waters. The closely allied genus *Ratifusus* is represented by one species in South Africa.

Ratifusus alfredensis (Bartsch, 1915) and *Colubraria eugenei* Bozzetti & Lussi, 1991 are endemic to South Africa. Along the Natal south coast, all species of *Colubraria* known to inhabit South African waters are parapatric.

The biology of the *Colubraria* genus is virtually unknown. Live specimens have been found buried in sand amongst rocks or coral from the low tide mark down to about 200 metres. The Colubrariidae are carnivorous. Prey is presumably swallowed by suction as the radula in this family is absent.

All species of the genus are rarely found locally, most finds being crabbed specimens. To the author's knowledge, *R. alfredensis* and *C. eugenei* have never been found live.

Characteristics of the Genus

The shell is robust, narrow and fusiform. The spire is high, acuminate and one and a half to two times the length of the relatively small aperture.

In some species the long tapering spire is curved, which no doubt influenced the naming of the genus *Colubraria*, meaning 'snake-like' in Latin.

The siphonal canal is short. The columella has a thick callus shield with the outer edge free in mature examples and extends over the parietal region as a smooth glaze.

The lip is thickened by a varix. Previous lip varices (one or two per whorl) are retained on the spire. The inner margin of the lip usually possesses denticles.

Sculpture is granular, especially on the spire whorls. The protoconch is smooth and conical.

The genus *Ratifusus* differs from that of *Colubraria* by having a domed axially ribbed protoconch and suppressed varices. A degenerate radula is also present in the former genus whereas *Colubraria* has none what-so-ever.

Colouration consists of brown markings on a cream/brown background.

The periostracum is inconspicuous or absent and the operculum is horny, with a terminal nucleus.

Species studied range in length from 28,1 to 79,6 mm.

Account of the species

Colubraria muricata (Lightfoot, 1786)

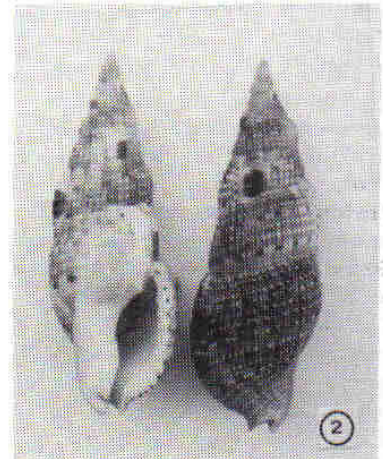
Photo no. 1

Found live in sand at Reunion rocks, Natal.

79,6 x 31,8 mm

Indo-Pacific to Natal south coast

This species is the largest and rarest in South African waters. Apart from the shell studied only two others have been recorded by the author, locally, one at Isipingo and one at Durban bay.



Colubraria obscura (Reeve, 1844)

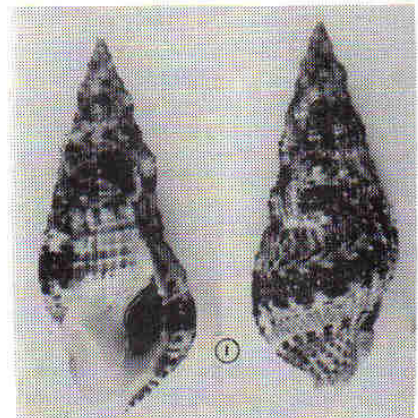
Photo no. 2

Found crabbed in the intertidal zone at Palm Beach (left) & at Scottburgh south (right).

57,1 x 20,5 mm (left) & 58,7 x 20,9 mm (right).

Indo-west Pacific to Transkei.

This is the most abundant species in South Africa and has been found live in the intertidal zone.



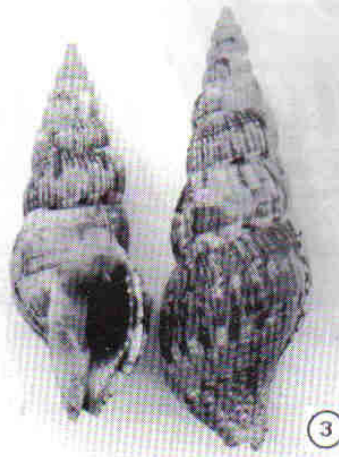
Colubraria eugenei Bozzetti & Lussi, 1991

Photo no. 3

The specimens illustrated were found crabbed in the intertidal zone at Umgazi (left) and Mzamba (right), northern Transkei.

54,3 x 20,3 (left) & 62,2 x 22,2 mm (right). Durban to northern Transkei.

This newly described species closely resembles *C. obscura* but is characterised by the brown aperture and the brown markings which overlap into the inner part of the labrum. The specimen (right) is the designated holotype and is deposited at the Natal Museum in Pietermaritzburg. It is larger than average and is in very good condition. (Refer Photo no. 9 for comparison of this species with *C. obscura* and *C. castanea*).



Colubraria ceylonensis (Sowerby, 1833)

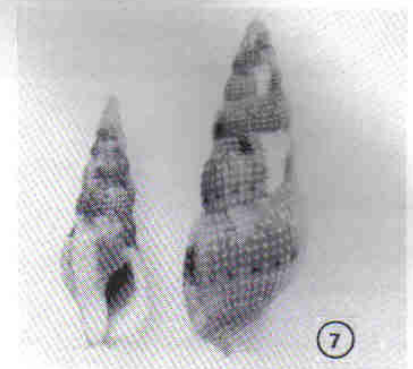
Photo no. 7

Both specimens illustrated were found in the 1982 Addington dredgings, Durban, Natal.

28,1 x 10,1 mm (left) & 37,8 x 14,6 mm (right).

Indo-Pacific to Durban, Natal.

Shells are similar to *C. obscura* but smaller with a shorter siphonal canal and a 'stromboid-like' notch at the lower

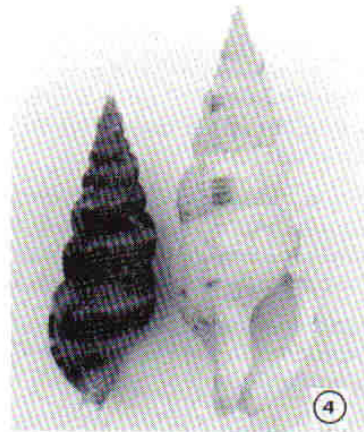


Colubraria castanea (Kuroda & Habe, 1952)

Photo no. 4

Trawled off northern Natal. A few examples have also been dredged locally. 50,5 x 18,0 (left) & 64,5 x 22,6 mm (right). Indo-Pacific to Transkei.

The name of this species is subject to controversy. The typical form of this species (left) is smaller and darker in colour than the specimen (right). The differences may be subjectively explained by bathymetric variations occurring in the species.



end of the labrum. (Refer Photo no. 10 for a close-up). The brown markings on the varices of *C. ceylonensis* are paler than those of *C. obscura*.

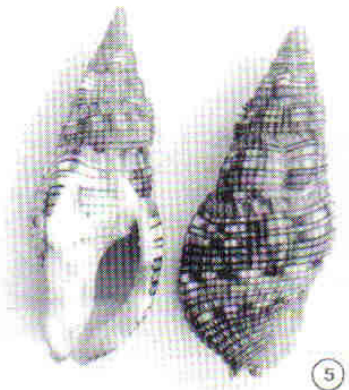
Colubraria soverbi (Reeve, 1844)

Photo no. 5

Dived approx. 35 metres at No. 1 fishing ground off Durban (left) and Aliwal Shoal (right). Has been found live on offshore reefs. One specimen is on record as having been found live in the intertidal zone at Rocky Bay, Natal south coast. 50,0 x 18,2 mm (left) & 47,9 x 20,5 mm (right).

Indo-Pacific to Natal south coast.

Characterised by orange/cream aperture and distinct dark brown well-defined lines around whorls.



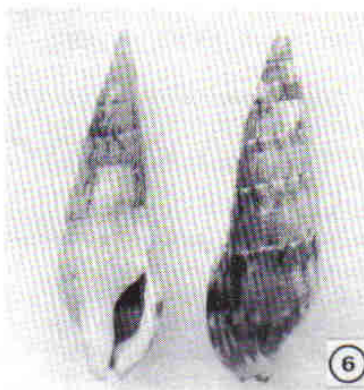
Colubraria nitidula (Sowerby, 1833)

Photo no. 6

Found crabbed in the intertidal zone at Rocky Bay (left) and Reunion Rocks (right).

38,8 x 12,1 mm (left) & 38,6 x 13,1 mm (right).

Indo-west Pacific to northern Transkei. Similar in shape to *R. alfredensis* but almost without sculpture.



Ratifusus alfredensis (Bartsch, 1915)

Photo no. 8

Both specimens illustrated were dived at approx. 22 metres off East London, Cape. This species is normally found beached throughout its range.

49,6 x 13,1 mm (left) & 47,4 x 12,8 mm (right).

Natal south coast to Jeffreys Bay.

This shell was previously referred to the genus *Colubraria*.



Photo no. 9

Lateral view of *Colubraria castanea* (left), *C. obscura* (centre) and *C. eugenei* (right). Note the rounded whorls of *C. castanea* compared to the depressed whorls of the other two species.

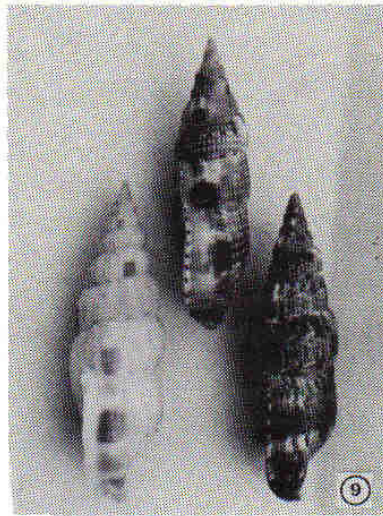
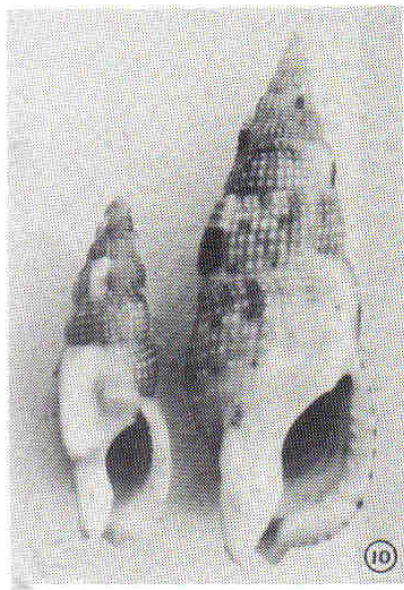


Photo no. 10

Ventral view of *Colubraria ceylonensis* (left) and *C. obscura* (right). Note the 'stromboid-like' notch on the lower end of the labrum of *C. ceylonensis*.



References

- Barnard, K.H., 1963. *Ann. S. Afr. Mus.* **47**(1): 35-37.
 Kilburn, R.N., 1972. *Ann. S. Afr. Mus.* **21**(2): 414
 Kilburn, R.N., 1975. *Strandloper* **174**: 1-3.
 Kilburn, R.N. & Rippey, E., *Sea Shells of Southern Africa*, MacMillan SA, 1982, pp. 95.
 Bozzetti, L. & Lussi, M., 1991. *Colubraria eugenei*, A new species from South Africa, *La Conchiglia*, **261**: 51-53.

NEW BOOK REVIEW

ADDITIONS TO THE PANAMIC PROVINCE BIVALVE (MOLLUSCA) LITERATURE-1971 to 1990 by Carol Skoglund.

Supplement 2 (1990) to Volume 22, *The Festivus* pp v + 74, 8 1/2" x 11" softcover format. \$10.00 plus postage. Send

orders to The San Diego Shell Club, 3883 Mt. Blackburn Avenue, San Diego, CA 92111.

Carol Skoglund, one of the most knowledgeable collectors specializing in Panamic province molluscs, has earlier provided similar updates to Polyplacophora and Opisthobranchia. She now shares with us the results of her years of compiling the numerous literature citations on Panamic bivalves that have appeared since Keen's monumental 1971 treatise *Sea Shells of Tropical West America*. As stated in the first paragraph, "The purpose of this paper is to draw together as many bivalve citations as possible and tie them to the fauna at the species level so that each reader can make his/her own final judgements". The compiler has critically reviewed each citation, consulted with specialists as necessary, and given us a work that can be used with confidence to accomplish her written purpose.

The paper begins with a 5-page table of contents listing the supraspecific taxa and the page on which the treatment of each genus begins. The numbers from Keen's 1971 book have been retained, but will be out of order in cases where a new arrangement has been proposed in the literature. Only species with changes since 1971 are included, and species are listed alphabetically within a genus. Taxa that have been revised since 1971 are in bold type, and the synonymy is as listed by the revisers and where differences of opinion exist, both versions are listed in the order in which they are published.

The bulk of this paper, some 55 pages, is devoted to the systematic classification, which certainly appears to be excellently done and eminently usable. The list of literature consulted covers seven pages, and the final 11 pages are an index to the scientific names from subspecies to subclass. The reader is therefore afforded every opportunity to become familiar with recent changes in the bivalves of the Panamic province and to learn the latest in bivalve systematics. This inexpensive volume is certain to be of first importance to collectors and professional malacologists alike.

(Ack: Irradians, Vol. 19, No. 2, p4)

Acknowledgements

The author thanks Val van der Walt of Durban, for the loan of *Colubraria muricata* and Dawn Brink, also of Durban, for the loan of *C. castanea*, *C. obscura*, *C. ceylonensis* and *Ratifusus alfedensis*, all of which are featured in this article.



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RANGE EXTENSION FOR CYPRAEA CITRINA

by
Werner Massier

During my recent visit to Reunion Island in the Indian Ocean I made a most surprising discovery. While admiring the extensive collection of my friend Jean Claude Martin, a keen and knowledgeable diver, my eye was caught by a beautiful *Cypraea citrina* Gray, 1825.

Mr Martin confirmed that he dived this shell himself in a depth of 25m on the west coast of Reunion in a habitat where usually *Cypraea helvola* Linne, 1758 are found. A few dead-taken shells from the same area were also present in the collection. *C. citrina* was thought to be endemic to the African mainland (South Africa and Southern Mozambique). This interesting find represents a considerable range extension for this species.

According to Mr Martin it is a very rare species in Reunion, but might be overlooked by divers. Firstly because of the superficial similarities with the common *C. helvola*, and secondly most divers in Reunion are interested in Conus and do not waste valuable under-water time inspecting supposedly common cowries. To build up a *Cypraea* collection in Reunion can be a frustrating experience. It will not take long and your glossy treasures become dull and flaky, due to fungus growing on the surface.

Seeing that the range of *C. citrina* extends so far into the Indian Ocean, the possibility of its being present in Mauritius, Madagascar and even the Comores cannot be ruled out. With a length of 21mm and a width of 13,9mm this specimen from Reunion is within the size range of South African and Mozambican specimens.

Request From Historian

Members are reminded that the Historian would like the questionnaires which she sent out completed and returned to her for the records.

Members are also asked to send her any up-dated information such as new finds, new shells named after members. She would also like any photographs, newspaper cuttings of interest and of course up-dated photographs of members.

Has anyone got Bokomo shell cards put out many years ago, for her?

Also the Barclays Quarterly Magazine of March 1983 with the article "Conchology" written by Nan Watt. (Barbara Fouche, 5 Purfleet, 507 Moore Road, Durban 4001. Phone 031-223834 after hours).

EXCHANGE

J. VARNAVAS of AHK-B-64, Dhekelia, Larnaca, CYPRUS would like to exchange seashells.

STRANDLOPER INDEXES

Would you like a copy of the indexes of all Strandlopers from No. 171 (April 1975) to date? Obtainable from Olive Peel (21 Clark Road, Durban 4001) for R10.00.

ANNUAL GENERAL MEETING

The next Annual General Meeting of the Society will be held at 2.30 pm on Saturday 2nd May at the Natal Parks Board Centre, 835 Marine Drive, Brighton Beach, Durban.

AGENDA

Welcome and notice of meeting
Apologies
Minutes of meeting held on 11/5/91.
Matters arising therefrom
9.1 VAT
9.4 Library
9.9 Exhibition at Margate
Treasurer's Report
Chairman's Report
General: *Constitution*: It will be recommended that all clauses of the Constitution be reviewed in order to up-date the wording and delete clauses which are no longer applicable.

No elections will take place as these are only held every second year.

At the conclusion of the meeting Dr Dai Herbert will talk on his and Dr Kilburn's recent trip to Mauritius.

Kindly let the secretary know if you will be attending the meeting in order to help with tea arrangements. (031 - 216720)



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CONUS TYPHON: A round-about way of obtaining it.

by

Dr Mike Hart, 54 Central Ave, Papatoetoe, New Zealand.

South African Conidae have always interested me greatly. While living in Cape Town, finding quality *Conus mozambicus* and the various forms of *C. algoensis* was always a challenge and a great thrill. I got so excited with them that I even wrote an article in Hawaiian Shell News (H.S.N.) about *C. algoensis*!! But it was the uncommon cones of Natal/Southern Mozambique that really fascinated me. The likes of *Conus milneedwardsi*, *typhon*, *eucoronatus*, *alconnelli*, *berdulinus*, *lohri*, *visagenus* and *teramachii* always seemed so elusive and difficult to obtain. Even while living in Cape Town with access to an active shell dealer I was not able to obtain many.

It would appear that I would have to move halfway around the world before obtaining quality east coast shells and then from a most unlikely source! Sometime ago a Russian scientist from Kaliningrad put an advertisement in H.S.N. offering worldwide trawled shells for exchange. As Russian fishing boats have certainly done a fair bit of fishing in Mozambiquan waters in recent years, I thought he may possibly have some local S.E. Coast trawled shells.

In recent times Russia has certainly had its ups and downs but an exchange parcel finally arrived on our doorstep in Auckland, New Zealand. Amongst the shells was *Conus typhon* - not a good specimen but at least I knew he had

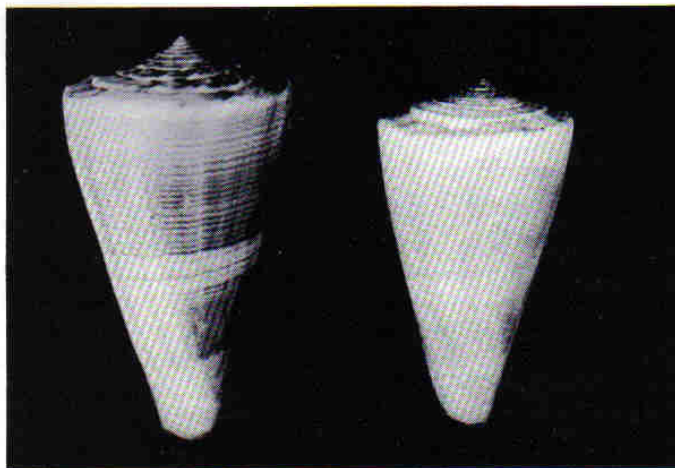
access to deep water shells from Mozambique. A second parcel arrived last week with three very collectable *Conus typhon*. To make things even more interesting one was an "albino".

Conus typhon was described by Kilburn in 1975. It is said to be an uncommon shell with a limited range of Natal and Southern Mozambique. Although it has occasionally been found by divers it is usually dredged in moderately deep water often by foreign trawlers.

It is a moderately light weight shell with high gloss. Low conical with the upper sides slightly convex. Body whorl almost straight with a few spiral ridges at the base. The shoulder is broad, sharply angled, and slightly concave on top. The spire is low to almost flat. The body whorl is white to cream in colour covered from above the base to the shoulder with numerous fine brown spiral hairlines. These are usually strong and heavy, although narrow. The hairlines are seldom broken except near axial flaws which are common.

The spiral hairlines are occasionally totally absent giving rise to the "albino" form. The shell size is quoted by Walls 30-49mm.

I would be very interested to hear from fellow cone collectors regarding the frequency of the "albino form" and the local availability of the normal form.



Collecting Shellfish in Transkei:

New Regulations under the Sea Fisheries Act, 1973

All shellfish collectors in Transkei should be aware that new regulations under the Sea Fisheries Act, 1973 (Act 58 of 1973), have been promulgated by the Minister of Agriculture and Forestry under Government Notice No. 107 of 24 October 1991, in Transkei Special Gazette No. 76. There are important consequences for conchologists, malacologists and others wishing to collect Mollusca in the sea or on the sea-shore in Transkei.

The provisions of special interest are that no person shall catch, attempt to catch or be in possession of any abalone *Haliotis midae* or other shellfish [regulation 10 (b)]. Shellfish are defined as any marine mollusc other than octopuses and squids.

The only exceptions to these provisions are empty sea shells and whole animals of the Class Polyplacophora (chitons), the Family Patellidae, the genera *Turbo*, *Oxystele*, *Littorina*, *Saccostrea*, *Striostrea*, *Solen*, *Maetra* and *Donax* and the species *Haliotis spadicea* and *Perna perna*. However, limits are imposed on the numbers of animals in these taxa which may be possessed at any one time by any person [Schedule K].

The Minister of Agriculture and Forestry may exempt persons engaged in scientific work from any of these provisions. Scientists wishing to collect the whole animal of any marine mollusc other than those excepted, or those excepted in numbers exceeding the bag limits, should apply in the first instance to the Director-General for Agriculture and Forestry, Nature Conservation Section, Private Bag X5002, Umtata, Transkei.

A DIRECTORY OF CONCHOLOGISTS

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interests so that your name can
be included for exchanges etc.
There is no charge for this
service.

Mussel Research in Natal

by
Dr Georgina Lambert

INTRODUCTION

There are four species of edible mussel along the southern African coastline. All four occur in the Cape and include the indigenous black mussel, *Choromytilus meridionalis*, and the ribbed mussel, *Aulacomya ater* (refer Griffiths & Griffiths 1987; Branch & Griffiths 1988), the introduced Mediterranean mussel, *Mytilus galloprovincialis* (refer Grant *et al* 1984; Grant & Cherry 1985); and the brown mussel, *Perna perna* (refer Berry 1978). The features characterising these four species are illustrated in Table 1. The Cape stocks are not harvested to any extent because the incidence of shell-fish poisoning is feared, human exploitation of the stocks is low and shell-fish have never been a traditional food source.

The situation is very different in Transkei and Natal. Only the brown mussel, *Perna perna*, occurs so far north. The incidence of shell-fish poisoning is very infrequent, the mussels are edible throughout the year and they have been a traditional food source for many generations. Yet, of the total southern African mussel stocks only 1% occurs in Transkei and 0,3% in Natal (van Erkom-Schurink & Griffiths 1990). In Natal, about one-third is harvested annually and the harvesting pressure is even greater in Transkei (Siegfried *et al* 1985; Lasiak & Dye 1989). They are exploited to such an extent that the fishery needs to be monitored with a view to its management and conservation. This is done by the Oceanographic Research Institute (ORI) in Durban; and the Zoology Department at the University of the Transkei.

DISTRIBUTION

Perna perna is not endemic to southern Africa but has a wide distribution in the Indian and Atlantic Oceans and the Mediterranean Sea. It is common along the South American coast where there have been efforts to establish mussel farms. In Transkei and Natal *Perna perna* forms dense beds on the lower rocky littoral and extends subtidally to a depth of about 5m.

MUSSEL BIOLOGY

The smallest mussels found are about 1 mm in length and would have settled in the previous few tides. They grow to reach about 20mm length in 3-4 months, about 70mm in one year and about 100mm in two years (Berry 1978). Each mussel bed contains at least three generations comprising those recently settled, and one and two year olds. Few survive into their third year or older because they are pushed out by the settlement and growth of the young ones in the interstices between the adult mussels; or they are harvested. The largest on record measure about 150mm length.

There is no evidence of hermaphroditism. At about 20mm length gametes develop into either male or female. The male has white flesh and the female orange, and when fully developed the greater proportion of the flesh is occupied with the production of gonads (Berry 1978). Mussels spawn sporadically throughout the year though possibly most heavily in the spring (Berry 1978). The eggs are fertilised in the sea as a swimming component of the plankton. Each egg goes through some larval stages and then produces a pair of shells or valves. It is now called a plantigrade and is ready to settle on a hard substratum. Somehow it finds its way back to the shore, actively seeks out a settlement site and anchors by tiny proteinaceous byssal threads which are the attachment structures. These plantigrades are actively motile and will move to other sites until they find a suitable place to attach. Plantigrades have been found attached to broken byssal threads, around barnacles or along rock crevices, on seaweeds and adult mussels; never on bare rock. They seem to settle most successfully along rock crevices and on adult mussels, because the other substrata are environmentally unsuitable.

PERNA PERNA AS A BAIT ORGANISM

Perna perna is the most popular bait organism in Natal. Permits are required to collect mussels: 50 are allowed on a

mussel licence and 20 on a bait licence per day. Any size can be collected but the regulations do require that all mussels collected should be included in the quota. With one-third of the stocks taken annually there is a need to monitor the effect of harvesting on the mussel stocks. The ORI research is thus 3-pronged:

1. To estimate changes in stock size and structure,
2. To obtain measures of effort and catch from a volunteer mussel catch programme, and
3. To investigate indiscriminate harvesting practices.

SOME ANSWERS

1. STOCK SIZE

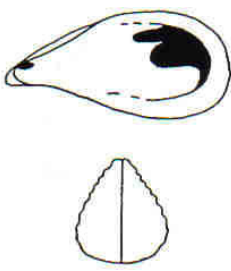
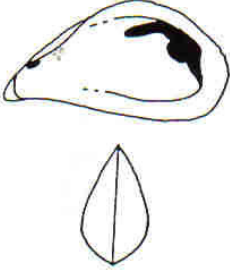
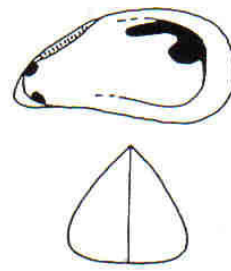
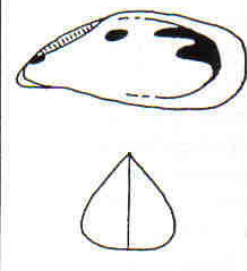
The change in size of the intertidal stocks at Newsell Beach, uMdloti, is known from 1986 to 1990 and it is probably a reflection of what is happening along the Natal Coast.

- i. In 1986 stock size was estimated to be 1008 tonnes dry weight of animal per 672m² shore; an average area of rock exposed during low tide anywhere along the Natal Coast. This dropped to 101t in 1987 and even further to 17t in 1988. This was attributed to the effects of the floods in September 1987 and February 1988. The decline was not primarily caused by the physical removal of mussels by rolling logs, but a decline in breeding activity and growth in response to the high sediment load and the dilution of seawater for some months after these events. By mid 1989 the stocks, at 302t were beginning to recover, and by 1990 they were healthy again at 504t. Even so, they were but half the 1986 stock size, which could be attributed partly to harvesting pressure. Although there are no records for 1991, it appears that this healthy situation has been maintained.

2. VOLUNTEER MUSSEL CATCH PROGRAMME

People must purchase licences to collect mussels and for a licence renewal a

Table 1. Characteristics of the four mussel species abundant along the southern African coastline. (Adapted from van Erkom -Schurink & Griffiths, 1990)

	Aulacomya ater	Choromytilus meridionalis	Mytilus galloprovincialis	Perna perna
Internal view of shell (showing muscle scars in Black) and cross section profile				
Resilial ridge	smooth	smooth	pitted	pitted
External shell colour and texture	BROWN to BLACK with marked wavy radial ribs	Usually BLACK occasionally dark brown, smooth	Typically BLACK shading to brown ventrally (rarely light brown throughout), smooth	BROWN sometimes tinged with GREEN especially on margins, smooth
Flesh colour	Brown Off-white to yellow ♀ ♂	Dark choc. Off-white to yellow ♀ ♂	Orange Off-white to yellow ♀ ♂	Orange Off-white ♀ ♂
Approximate maximum size	Intertidal 70 mm Sublittoral 95 mm	Intertidal 90 mm Sublittoral 150 mm	Intertidal 85 mm Sublittoral 140 mm	Intertidal 148 mm Sublittoral 150 mm

completed catch return must be sent to the Fisheries Licencing Board at the end of the year. These returns are forwarded to the Oceanographic Research Institute where they are analysed and the results reported annually. Unfortunately, few people actually submit their return and a very high proportion that are submitted contain incorrect information which cannot be analysed. To overcome this problem, licencees have been approached and invited to participate in an ORI mussel catch programme. These volunteers send in accurate quarterly information including the measurement of each mussel, how long they take to collect, a precise locality and date. From analyses of the information we have established that marginally more than the quota is being collected per licence-day, and this is increasing annually. If, over time, the same collectors take longer to harvest smaller mussels, we can conclude that shore is being more heavily exploited,

and we then monitor it more closely. Incidentally, any interested person with a valid licence and the commitment to submit information regularly is encouraged to join the programme. They can contact the ORI at P O Box 10712, Marine Parade 4056.

3. INDISCRIMINATE HARVESTING PRACTICES

There are two disturbing harvesting practices that are changing the ecology of the intertidal mussel stocks:

1. According to the regulations, all mussels collected on a licence should be part of the quota, and that includes all the small mussels. Collectors do not do this, for they select the largest mussels they can find, and wastefully discard unwanted ones. Unless they are returned to the mussel bed the juveniles will die.
2. Secondly, the regulations permit the

use of an implement, the dimensions of a screw driver, with which one mussel at a time can be taken. This practice has been abused as there is an increasing use of broad-bladed instruments, such as spades, to shovel off large quantities of mussels. Much illegal gathering is done in this way. The result is the creation of bare patches in the mussel beds. An experiment has been conducted to examine the effects of this practice: on the bare patch, on the surrounding communities and on the rate of return of mussels.

Upon clearance of the patch there was further die-back of the surrounding communities. If patches were cleared in areas dominated by coralline seaweeds, then within six months the seaweeds became the dominant organisms. In the case of zoanthids these returned to dominance after two years; but the mussels never returned. When patches were created in the dense

mussel bed, juveniles settled about six months after the patch had been cleared and *Perna perna* grew to cover the patch about two and half years later.

Within three years the mussels were being harvested once again, but even six years after the patch had been created, that mussel stand was still immature.

The consequences of this indiscriminatory practice is self-explanatory. Persistent harvesting of disturbed mussel beds could render them permanently immature and unproductive. Another fact determined during the study was that physical damage inflicted on the stocks by harvesters took longer to recover than that caused by severe storms.

CONCLUSIONS

1. Despite the negative findings that have been outlined, Natal's mussel stocks are currently healthy and in good condition.

2. The present harvest is sustainable, which means that the spawning frequency and the subsequent settlement of juveniles are sufficient to satisfactorily restock the mussel beds, but for how long?

3. The ecological consequences of clearing mussels in patches, the increasing demand for licences and the incidence of illegal harvesting indicate that now is the time to implement better conservation measures to preserve the stocks for future generations.

4. On the one hand the ORI will continue its research in liaison with management and conservation bodies, such as the Fisheries Licencing Board and the Natal Parks Board.

5. However, the mussel collectors can also contribute by improving their harvesting habits, and these suggestions are recommended:

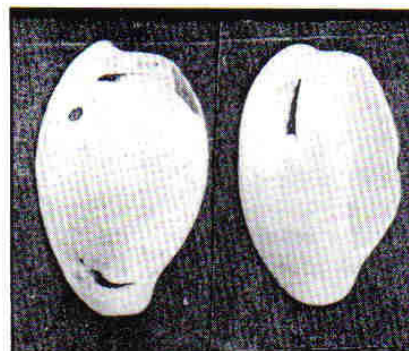
- i. collect only the quota prescribed: 50 for a mussel licence and 20 for a bait licence;
- ii. select individual mussels rather than removing them en masse which creates those damaging bare patches;
- iii. return any unwanted mussels to the mussel bed, especially those less than 40mm in length, for they will reattach within minutes and grow to adulthood;
- iv. avoid collecting where it is obvious there has been extensive mussel harvesting for the mussels are likely to be small and have little flesh; and further pickings

aggravate this problem. Rather collect individual mussels from well established beds;

v. don't collect from sub-tidal stocks as these comprise the parent reservoir for the future replenishment of the intertidal stocks.

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Cypraeovula algoensis

Werner Massier from Windhoek (Namibia*) has sent us the photo we publish here, showing two subfossil specimens of *Cypraeovula algoensis* (Gray, 1825). The first on the left was found in 1926 in the grave of a bushman at the edge of the lagoon of Lüderitz in the south of Namibia. It was radio carbon dated to have lived between approx. 900-1050 A.D. The shell was amongst various other objects and had two drill holes in it, indicating that it was probably an amulet. The specimen on the right (almost identical to the first one) was found in 1984 in a heap of shell fragments, in the Namib desert, not far from Lüderitz. The use of shells and in particular of cowries, considered a symbol of fertility and life, is well known in burial rites even from much older cultures, eg. for the Upper Paleolithic in many European regions. In the famous Grimaldi Grotto (Cote d'Azur), shells of definite Indian Ocean origin have been found. Also in this case, the two *C. algoensis* were brought to Namibia from a distance of at least 800km.

(Acknowledgement: *La Conchiglia: Notes & Tidings* page 10)

* Werner, a member of the society now lives in Margate on the Natal South Coast.

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by
Noggs Newman

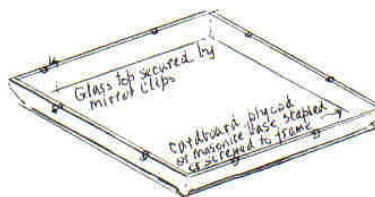
Museum collections are mostly stored away from light in fire-proof dust-tight temperature and humidity-controlled cabinets which cost a fortune - they are there for the benefit of posterity! Amateurs' collections on the other hand are in many instances to bring solace and comfort to their owners at the end of each busy day! If you are one more such amateur here are two suggestions as to how you could display your shells at minimal cost even if you have to seek help from a professional carpenter.

Model A is a simple semi-deep Display Frame which when loaded can stand on a shelf or hang on a wall. A square or oblong mitred frame is made from meranti or pine cornice obtainable from all timber merchants - my standard size is 60mm by 50mm on the top side. The necessarily easily removeable standard or non-reflecting picture glass cover has the same dimensions and is secured by simple wall-mirror clips. The base board (either corrugated cardboard or thin masonite will do the job) is cut to the size of the bottom side of the frame and having been painted a non-glossy colour of your choice is now loaded with your treasures beneath each of which is attached a self-adhesive label suitably inscribed - be sure to use permanent ink! Also be careful to provide a suitable margin on all sides. Then to secure your shells to the base board I recommend that silicon sealer supplied in a medium or large size "toothpaste" tube and which sets water while at manageable speed and remains flexible, which means it is easily removed from both your specimen and the base board should you wish to make changes. Finally you may wish to place a small adhesive label in a suitable place on the glass lid to serve as a reference link between the contents of your Display Frame and your Catalogue. For this Model I use the indicator "F" (for Frame) followed by numbers 1 up.

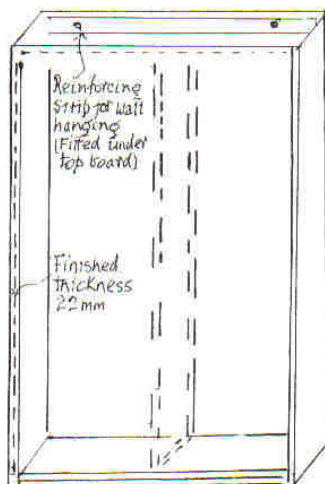
Model B is nothing more than a shallow lockable meranti or pine "box" grooved for glass sliding doors and fitted with vertical metal strips for adjustable shelves which leaves you to decide whether you will use it in conjunction with portable board mounts and/or whether you will fit glass shelves. You will make it to suit available space. In my opinion the following are maximum external dimensions for "single" units - Height 1200mm; Width 620mm; Depth 160mm. Catalogue references: Where boards are used label each board. Use indicator "D" (for Display). For shelves use indicator "S". Label each shelf. Where using boards these should be cut 15mm less than available width - for easier handling.

My final point is that you should steer clear of dark, coloured or shiny wood.

Model A



Model B



Shallow Display Cabinet

Top, bottom and side boards to be slotted to receive sliding glass doors. Doors to be "notched" both sides at half height to facilitate handling. Depth of cabinet 100-160cm, depending on size of shells. Height and width at your discretion. Back board could be masonite (4mm).

MEMORIES OF SHELLING IN EAST AFRICA

by
Isobel Lambert

When the cargo boats came into the bay the Captain lined up the crew and told them: "This is Dar-es-Salaam, which means The Haven of Peace, now go ashore and see you keep it that way!".

We owned a yacht, 22.5 ft. long, with a 3 ft.6 keel and 33 sq. ft. of sail. Initially we spent our recreation participating in race meetings, but on Sundays we would weigh anchor at sunrise and sail out to one of the coral islands some five miles off the coast. Spearfishing was our sport and our catch was cooked there and then on the beach.

These were early days for shell collecting, for no-one knew of any good book that could give any useful information on shells. However, we went on collecting the many different shells, and as our interest and knowledge increased, we discovered there was an incredible abundance of unknown shell life.

The eel grass beds were the habitat of hundreds of huge *Cypraea tigris* Linne, 1758, each one the same shape, but never two alike. Also in these areas were to be found *Cypraea moneta* Linne, 1758, with the sun striking the golden yellow

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... continued from page 9

dorsum, and always nearby many *Cypraea annulus* Linne, 1758, their dove-grey dorsum with the single golden ring. Also in the sand and eel grass would be found *Ovula ovum* Linne, 1758, whose animal has a jet black mantle dotted with golden papillae.

In sandy pockets between coral out-crops *Lambis lambis* Linne, 1758, could be found, clumsily lumbering along using finger-like operculum. Most of these shells have seven spines, but if you find one with eight spines, it is a rarity. There were so many of the former about one spent much time seeking the perfect mature shell.

The huge Wing and Trumpet shells were found crawling along the sandy bottom among the coral rocks in deep water. Often these were well camouflaged because they were so encrusted with lime on the dorsal side, you were apt to miss them. It was their jerky movement that gave them away, and another jewel of the sea had been found.

With friends we sometimes travelled over to Bongoyo Island, north of Dar-es-Salaam, in a native ngalou. It was great fun, two natives manned the boat which was very narrow, having been hewn out of a solid tree trunk. It had outriggers to steady it, and the sail consisted of pieces of material sewn together.

Sometimes if the sail area was inadequate to convey the boat, the natives put their shirts on a pole to get an extra pull.

On this particular island we used to find *Thais* spp. high up out of the water on the coral bank, but when the tide went out and exposed the coral reef, we could pick up *Cypraea felina* Gmelin, 1791, *C. clandestina* Linne, 1767, *C. fimbriata* Gmelin, 1791, *C. erosa* Linne, 1758, *C. carneola* Linne, 1758, *C. caurica* Linne, 1758, and many other species.

For the shell collector, the coral reefs around the East African coast are a veritable paradise. Very few areas of the world are blessed with the abundance and variety of shells which can be found along that coastline. The water is always warm and clear and conditions are peaceful. Even without a boat there are miles and miles of virgin coastline accessible by car, and rarely a person in sight.

How many times have you heard a sheller say "The shell must have been carried here by the current?" I re-print an interesting article in this connection. (Editor)

DO OCEAN CURRENTS DRIFT SHELLS?

by

John Grindlay, S.A. Museum

In the last circular (29:5) Mr Kennelly refers to a shell (*Ficus subintermedius*) from Bushmans River Mouth which was rather worn "and shows signs of having drifted to this part of the country with the aid of the Mozambique current".

Ocean currents are frequently invoked in attempts to explain such anomalies of distribution but in fact it is rather doubtful whether they do transport shells. Ocean currents are largely surface phenomena and decrease rapidly with depth so that even a powerful current like the Mozambique current becomes a hardly detectable drift deep down. The maximum velocity of this current at the surface is less than five miles per hour and in most places it is less than one m.p.h. On the bottom it would certainly be less than one m.p.h. Water drifting past at this speed would certainly not be enough to move a shell, even allowing for its apparent loss of weight in water. Photographs of the bottom of the sea sometimes show ripple marks indicating currents but only in the finest sediments. The pattern of deep currents is often unrelated to the surface currents and may be opposite in direction. Near the Bushmans River Mouth there is usually an inshore counter current flowing in the opposite direction to the Mozambique current. Taking these facts into consideration, it is unlikely that a shell like the one mentioned by Mr Kennelly could have been drifted far by the current.

Wave action is quite a different thing, and anyone who has collected shells washed up after a big storm will realise that the turbulent action of the stormwaves must stir up the bottom to a considerable depth. The action of surf along a sandy shore may also sweep shells gradually along for miles, but the same does not happen on rocky shores where shells soon fall into crevices or are washed into deep channels below the range of wave action. Shells transported in this way by wave action would become so beach worn as to be almost unrecognizable before they had been carried very far.

Dead shells are sometimes trawled on the Agulhas Bank of species which now only occur much further up the East Coast. At first this may seem to provide evidence for current drift, but such cases are more satisfactorily explainable by climatic changes in past ages. Such arguments, however, can only be applied to shells in the deep sea protected from the erosive action of waves which would destroy them within a short time on the shore.

Tidal currents in estuaries and in certain shallow areas of sea may be powerful enough to scour the bottom and wash shells along, but this does not apply to the open coastline of South Africa.

It would seem therefore that shells can

... continued on page 11

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not be carried very far by the sea (except for floating shells like *Janthina* or shells attached to floating objects) and that records of shells from unlikely places are far more probably due to incorrect labelling.

As regards the Mozambique current bringing larvae of more tropical Mollusca further south, I would agree that it probably does. The plankton of this current certainly includes many tropical species. One must remember however that many molluscs such as *Ficus subintermedius* do not produce pelagic larvae, and that the limiting factors for those tropical shells with pelagic larvae are almost certainly not their powers of dispersal. Their distribution is related

to particular living conditions, probably largely related to water temperature, and the shells will not develop no matter how many larvae reach our shores, if conditions are not suitable. Therefore while conditions remain unchanged it is unlikely that "a gradual extension of the known range of many species" will result (except for extensions due to further knowledge of existing distribution patterns). There may also be temporary changes in distribution to a small extent, due to fluctuations in conditions from year to year. Most sea creatures produce large numbers of eggs and their larvae are dispersed widely by the currents, only developing in favourable environments. Sometimes where conditions have been artificially changed, such as where power station

outflows warm the sea locally, species new to the area appear showing that their larvae must have been present before and just needed the right conditions to develop.

In conclusion then it seems safe to say that, except in rare circumstances, ocean currents are not capable of transporting shells long distances. Secondly, that the drifting of pelagic larvae is not going to change the existing distribution pattern of the adults greatly. Drifting by currents may seem a simple explanation of certain observed facts, but in almost all cases it is not really a valid explanation.

(Ack: Circular No. 30 March 1962 pages 1 & 5, Conchological Society of Southern Africa)

Will a Museum want your Old Shell Collection?

by
David Freeman

To answer this question, we have to understand what functions the collections housed in museums are expected to perform.

They document published research, so that students of tomorrow can verify the identity of organisms mentioned in past studies.

They provide raw material for new research in various fields.

They enable the study of changes in distribution and morphology of species.

They are tools in teaching and provide material for public exhibits.

We have to accept that a museum does not necessarily, or even primarily, want specimens for public display.

Unquestionably, the space available for storage of collections is severely limited, and museums today also lack curatorial

staff. In order to fulfil their purpose in society, museums therefore have to make maximum use of both personnel and space. This means that they have to be certain that new material added to collections is consistently of the highest quality and that only material of permanent scientific value is retained in collections.

Increasing sophistication of research has increased the amount and type of information that is desirable to have with molluscan specimens, so that minimum standards have to be laid down by any museum, regardless of how the data are stored, or of the purpose for which any particular specimen is to be used.

If we consider only molluscan material, the described diversity (excluding fossils) exceeds 100 000 species. No single museum anywhere in the world

contains more than one-third of the described molluscan taxa. This imbalance tends to force concessions on the standards normally required for assessing adequacy of data normally demanded to qualify for inclusion in a museum's collection, so that specimens of a species not already represented could be added to the collection regardless of inadequacies in their data base, at least until such time as better documented examples become available.

Nevertheless, basic minimum requirements for any specimen to have scientific value remain as follows:

1. Date of collection and name of collector.
2. Locality, so identified that a person in the future has a reasonable chance of finding the same exact spot to sample with assurance from the same population if it still exists.
3. Basic ecological occurrence according to habitat requirements, eg. nature of substratum; whether fixed to substratum or mobile, depth below surface; salinity.

And similarly for freshwater and land molluscs.

In contrast with other "natural history material", collections of Mollusca are unusual in that the great majority of material in museums was originally collected by amateurs. This is likely to remain so. Thus it is important that amateurs should understand

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not only the modern requirements for specimen annotation, but appreciate the problems faced by institutions in managing their existing and new acquisitions.

Institutions have to balance the desire for recognition of individual contributions against the needs for efficient management of materials so that they are readily available for research. New material must be accepted in such a way that permits eventual integration into the sequence of the main collection. Museums cannot accept gifts of molluscs from donors who require perpetual maintenance of their collections as separate units. An acceptable compromise might be an agreement for temporary display of a donor's collection for a limited period. By recording the name of the donor on the standard museum label that will go with every batch of specimens from the donated collection, the contribution of the donor will be permanently recorded through the years.

A museum will generally give the highest priority to material that would be immediately usable for research, or to "voucher specimens" directly connected with documented research.

The antithesis of the foregoing discussion is the removal or deaccessioning of material from a museum's collections, and this also requires care. This is usually done by a specialist in a particular taxon who is qualified to indicate which specimens are no longer of scientific importance. Deaccessioned specimens can still be useful for display or teaching; for exchange to amateurs; or they may as a last resort even be sold to raise funds for new acquisitions. Most institutions would have guidelines for dealing with this, to protect both donor and institution.

These remarks will hopefully assist those collectors, and inheritors of existing collections, who are faced with the decision of what to do with shells accumulated over a lifetime, either by themselves or by a relation. By all means offer them to a museum, but don't impose unreasonable conditions based on an overestimation of the value of the collection. And if the museum doesn't want them, and you haven't the space or the taste for them yourself, and can't find some conchomaniac to take them off your hands, just dump them in the

dustbin and be content in the knowledge that they once served the very good purpose of giving great joy to somebody who responded to the beauty of nature.

Reference:

- Standards for Malacological Collections; Alan Solem, Field Museum of Natural History;
 - William K Emerson, American Museum of Natural History;
 - Barry Roth, California Academy of Sciences;
 - Fred G Thompson, Florida State Museum.
- (Report prepared for Council of Systematic Malacologists and adopted by them in July, 1980)

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INDEX

	Page No.
AGM	4
Build and enjoy your own dust-proof Shell displays and save	
<i>Noggs Newman</i>	9
Conus typhon	
<i>Dr Mike Hart</i>	5
Collecting shellfish in Transkei	5
Directory of Conchologists	5
Do ocean currents drift shells?	
<i>John Grindley</i>	10
Exchange	4
Life Members	12
Memories of shelling in East Africa	
<i>Isobel Lambert</i>	9
Mussel Research in Natal	
<i>Dr Georgina Lambert</i>	6
New Book Review	3
New members	12
Range extension for <i>Cypraea citrina</i>	
<i>Werner Massier</i>	4
Revision of the genus <i>Colubraria Schumacher, 1817</i> and <i>Ratifusus Iredale, 1929</i> in South African waters	
<i>M Lussi</i>	1
<i>Werner Massier</i>	8
Will a museum want your old shell collection?	
<i>David Freeman</i>	11

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