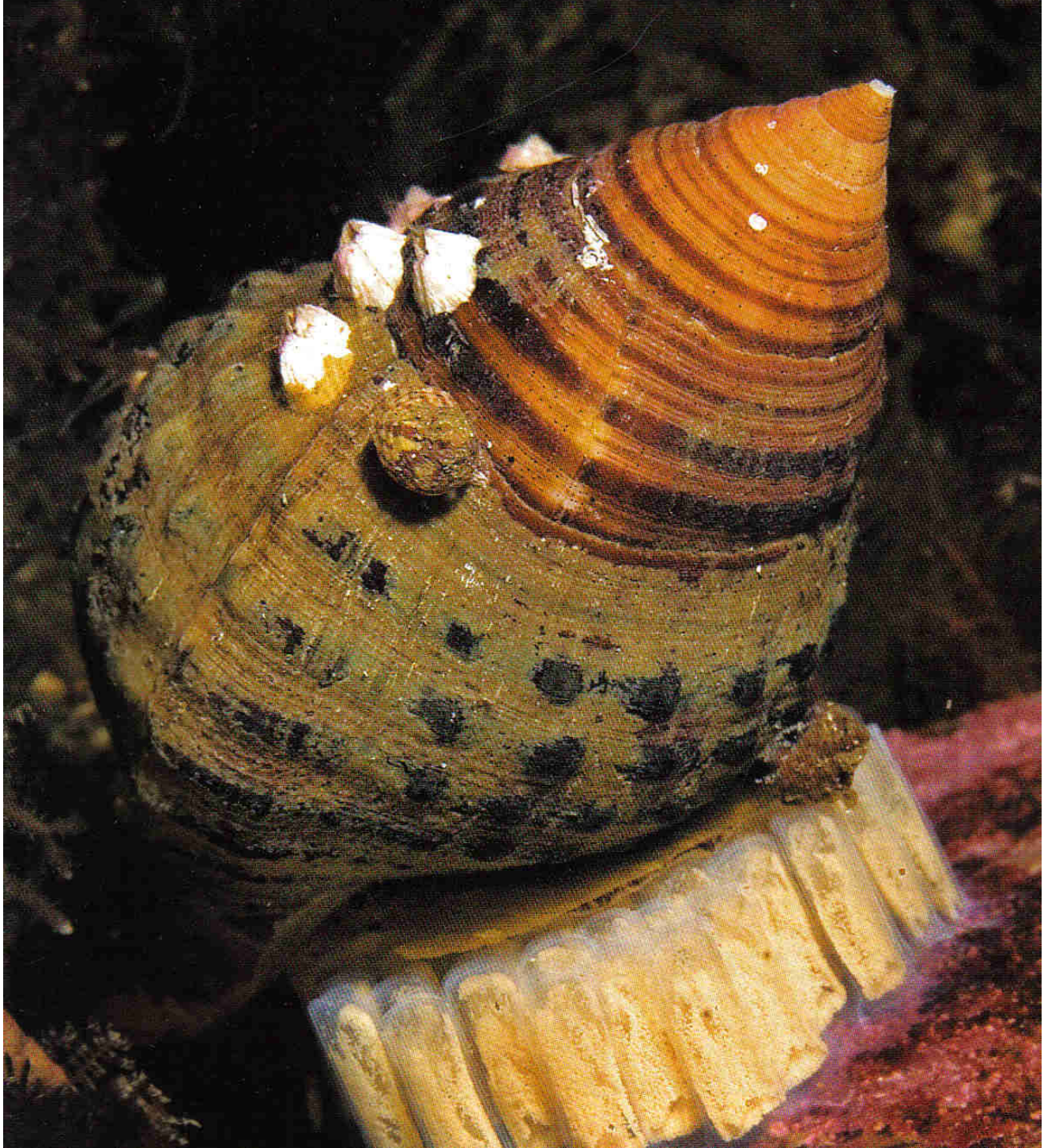


the Strandloper

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Strandloper 283 November 2006



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The Secretary CSSA, P.O. Box 1855, Rooihuiskraal, 0154, South Africa. Email - deysel@worldonline.co.za

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PRESIDENT:	Dr. Johan Marais. Tel: (033) 3473028
VICE-PRESIDENT:	Mrs. Rina Matthee. Tel. H (031)-2661795
TREASURER:	Mrs. Christelle Deysel. Tel: H (012)-6550428
SECRETARY:	Mrs. Christelle Deysel Tel: H (012)-6550428

EDITOR STRANDLOPER: Mr. Alwyn Marais,
alwyn@deark.co.za Tel: (082)-8665338

REGIONAL CONTACT PERSONS:

- BLOEMFONTEIN** (Vrystaat Groep) Ds. H. van der Walt,
P.O. Box 25913, Langenhoven Park, 9300
(051)-4464244
- DURBAN** (Group) Mrs. Rina Matthee,
30 Headingley Rd., Westville 3630, South Africa
(031)-2661795
- EAST LONDON** (Border Group) Miss R.M. Tietz,
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2 Highfield Drive, Westville, 3630, South Africa
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- PORT ELIZABETH** (Group) Mrs. Marie Slabbert,
13 Tilney Place, Framesby, Port Elizabeth, 6035,
South Africa
(041)-3606722
- PRETORIA** (Group) Mr. Alwyn Marais,
P.O. Box 187, Groenkloof, 0027, South Africa
(082)-8665338
- SOUTHERN NATAL** (Group) Mr. Geoff Wallace,
P.O. Box 513, Port Shepstone 4240, South Africa
(039)-6951100

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FRONT PAGE

Argobuccinum pustulosum (Lightfoot, 1786)
on egg-capsules.

Photographer: Elsa Hoffmann
Bluepixel Photography
083-7887169
www.bluepixel.co.za
elsa@bluepixel.co.za

In this Issue

Intraspecific variation in <i>Staphylaea limacina</i>	4
Gastropodial musings	9
Slinger, a source of rare shells	10
<i>Ex pisce</i> countdown	11
A gastropod bivalve or a bivalved gastropod?	12
Nautilus, a master of buoyancy control	14
Did you know?	17
A scarce endemic fissurellid	18
Shell puzzle No. 2	20

In Memorium



Mrs Clarice Connolly died on March 1 2006. As many of the older members will know, she was an indefatigable collector and a inspiration to the Cape Town Section for many years. Mrs Connolly was an Honorary Life member of the CSSA.

Mr Edwin van der Walt from Richards Bay died recently from a heart attack. Eddie was known for his *ex pisce* shells collected from the fishing trawlers.

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INTRASPECIFIC VARIATION IN

STAPHYLAEA LIMACINA

(LAMARCK, 1810)

by E.L. Heiman

Qualitative statistical shell characteristics of S. limacina are studied using 211 shells from different localities in order to clarify the taxonomic identity of several groups of populations of the species. No essential difference in the compared shell characteristics, which may confirm splitting of the species into several subspecies and their practical distinguishing, is found and consequently S. limacina is treated as a monotypic species.

Staphylaea limacina (Lamarck, 1810) inhabits the Indo-Pacific region from the Red Sea, East and South Africa in the West to Melanesia and Samoa in the East; it seems to be not known in the Hawaiian Islands—Kay (1979).

This species is split into three subspecies in the Prodrôme—Schilder & Schilder (1938):

<i>Staphylaea limacina limacina</i> (Lamarck, 1810)	from N. Malaysia to S.W. Sumatra, Amboina, Guam, and to the Southern Sea of Japan.
<i>Staphylaea limacina interstincta</i> (Wood, 1828)	from S.E. Africa to Mauritius and Ceylon.
<i>Staphylaea limacina facifer</i> Iredale, 1935	from S. Melanesia to Lord Howe Id., Torres Straits and Samoa.

Their description reads:

"In the Eastern *facifer* (22.57.22.18) the columellar teeth cross at least two-thirds of the lip, the shell is oblong-ovate, as the extremities are short and depressed; the base is more flattened and the dorsal tubercles are more crowded than in Malayan *limacina* (23.60.22.18), in which the columellar teeth attain about the middle of the lip; *limacina* is subpyriform or subdeltoidal, as the extremities are produced and slightly recurved; in both races the dorsal tubercles are irregular in size, but elevated at least laterally. In the Western *interstincta* (25.57.24.20), however, the tubercles are replaced by equally small and rather distant white specks, the left side is rounded instead of pitted throughout, the columellar teeth (especially the central teeth) are still shorter, finer, and closer, the terminal ridge is less dilated, the aperture is wider, and the fossula is always flattened, whereas it is often concave in *facifer* and chiefly in *limacina*.—The Japanese specimens of *limacina* usually resemble *interstincta* in the smooth dorsum, the short central columellar teeth, and the shallow fossula, but they can be distinguished by the narrow aperture, the broad terminal ridge and by the less numerous teeth; as such shells occur in Malaysia too among usual *limacina*, we abstain from establishing a fourth race."

This approach is the same in Schilder & Schilder (1952) and the authors added:

"The racial characters indicated in the «Prodrôme» (p. 129) have mostly been confirmed, though Dautzenberg's shells show that rather smooth shells, both in *limacina* and *facifer*, occur more frequently than we expected before; on the other hand, there are slightly granulated varieties in *interstincta* too. As suggested before, the Japanese shells cannot be separated from the Malayan *limacina*."

The Schilders studied altogether 387 shells of the species and in Schilder & Schilder (1971) listed *S. limacina* as a monotypic species.

Lorenz (1988) discussed several formae of *S. limacina*: small shells named 'nana', 'staphylaeaeformis' (with long columellar teeth attaining the margin), 'nungwiensis' with columellar teeth partly fused anteriorly and 'clarissa' with columellar teeth becoming shorter in the middle of the base (the main diagnostic shell character). The latter

forma distributed from Kenya to South Africa is elevated on a subspecific level in Lorenz (1989). Its diagnosis reads:

“Geographical (and probably also ecological) subspecies of *S. limacina* in southeastern Africa, characterized by midways shortened columellar teeth (similar to the Hawaiian *S. semiplota* MIGHELS), distinguished from that species by the lack of brown tinting in the marginal serrations.”

As is cited above, the Schilders described already a subspecies from SE Africa — *S. limacina interstincta*. Subspecies in molluscs are geographically isolated populations of a species of which the majority of shells differ from other populations of the same species by at least one diagnostic shell characteristic. Describing more than one subspecies from the same geographical area is in contradiction with that definition of subspecies—hence *S. limacina clarissa* cannot be recognized as subspecies. It is apparently a forma (variety), which can be found not only in South Africa but in other populations of the species also; it should be treated as a synonym. Quantitative statistical shell characteristics of the subspecies described in the Prodrôme (formulae consisting of eight digits; the first two digits represent the average shell length in a populations in millimeters, the second two digits give the average relation the shell width to length and the last four digits give a number of normalized labial and columellar teeth respectively, as explained in the Prodrôme) are close and cannot be used for their separation. Qualitative statistical shell characteristics of several groups of populations of *S. limacina* are studied below using 211 shells in order to clarify the taxonomic identity of these groups of populations. The result can be seen in Table 1. Shell characters mentioned in Table 1 are taken from the original descriptions of the relevant taxa; they are illustrated in Figs. 1-14.



1. *S. limacina limacina*, the Philippines



2. *S. limacina interstincta*, South Africa



3. *S. limacina interstincta*, Kenya



4. *S. limacina facifer*, OLD, Australia



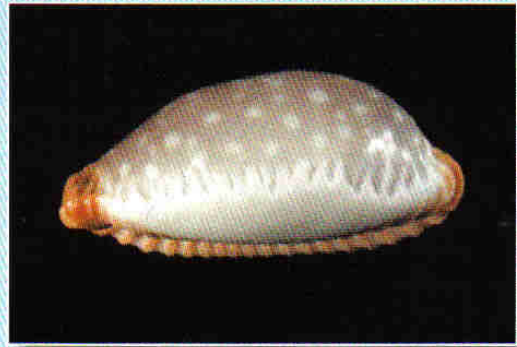
5. *S. limacina limacina*, the Philippines



6. *S. limacina facifer*, QLD, Australia



7. *S. limacina interstincta*, South Africa; left margin rounded, not pitted in its central part



8. *S. limacina facifer*, QLD, Australia left margin angular, pitted



9. *S. limacina limacina*, the Philippines; left margin rounded, pitted throughout



10. *S. limacina interstincta* f. *clarissa*, South Africa; midway shortened columellar teeth



11-12. *S. limacina limacina* f. *clarissa* Vietnam,



13. *S. limacina limacina*, Vietnam



14. *S. limacina limacina* f. *melanotic*, the Philippines

It follows from **Table 1** that the majority of shells in all the studied populations have the dorsum coloured brown grey, slightly curved posterior extremity, and their dorsal tubercles are mostly absent and replaced by equally small and rather distant white specks; the left margin is rounded and pitted throughout in the majority of shell of the eastern populations and it is rounded but not pitted in the western populations. This shell characteristic can perhaps be used as distinguishing between the western and eastern populations of the species (*S. limacina interstincta* and *S. limacina limacina*) but it is not prominent enough and difficult to apply for each specific shell. The same is true with columellar teeth: it is difficult to decide whether they are short, produced or very produced. Only if the teeth are almost absent in the center of the base or they almost reach the margin a decision is easier but such cases are rare. The shell characters given in the Prodrôme for distinguishing subspecies of *S. limacina* seem to be too subjective and not suitable for practical use.

The difference in the left margin and base of the shell (flattened or convex) is also not prominent enough considering subjectivity of a decision in this case.

The same seems to be true for *S. limacina facifer*: the difference in shell characteristics of this taxon and other populations of the species is not essential enough for their practical separation. Although the shell aperture seems to be narrow in all the studied shells of this taxon, and in other populations it is often more wide or dilated in front, it is too risky to base a separation of this taxon on that shell character.

Conclusions

Splitting *S. limacina* into subspecies is not confirmed by the present study of its qualitative statistical shell characteristics.

Notes:

1. 130 shells of *S. limacina limacina* include 3 from Okinawa, 4 from Vietnam and 23 from the Philippines.
2. 10 shells of *S. limacina facifer* include 7 from QLD, Australia and 3 from Caroline Islands.
3. 171 shells of *S. limacina interstincta* include 8 from Laccadive Islands, 25 from Kenya, 22 from Mozambique, 10 from S. Natal, S. Africa, and 106 from Zanzibar.
4. *Forma clarissa* is sporadically found in all populations of the species but more often in shells of S. Africa

Formae

Several formae described in the literature are mentioned above; all of them are uncommon to rare. Also rare is *forma melanotic*—Fig. 14, which differs by unusually dark coloration of the dorsum.

Table 1

Shell characteristics of *S. limacina* from different areas of its range of distribution
(the percentage of shells with given qualities)

number of studied shells →		30	10	171
localities → shell characters (qualities) ↓		<i>limacina</i>	<i>facifer</i>	<i>interstincta</i>
dorsal colour	different tinges of brown grey	100	100	100
posterior extremity	slightly curved	100	100	100
dorsal tubercules	irregular, less crowded, mostly elevated at least laterally Figs.	3	10	14
	absent and replaced by equally small and rather distant white specks Fig. 1-2, 4	97	90	86
left margin	angular, pitted Fig. 8	3	30	0
	rounded, pitted throughout Fig. 9	97	50	28
	rounded, not pitted in its central part Fig. 7	0	20	72
base	convex Fig. 7	7	70	44
	flattened Fig. 9	93	30	56
aperture	narrow Figs 12-13	37	100	6
	wide at least in front Fig. 6	63	0	94
columellar teeth in the middle of the base	very short Fig. 11-12	<1	<1	11
	short Fig. 10	10	20	48
	more produced Fig. 6, 13	90	80	40
	very produced, almost reach the margin Fig. 5	0	0	1

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Gastropodial MUSINGS

an informal column for questions, thoughts and answers

by Roy Aiken

Strange Morums

The first conundrum of this edition is that potentially, there could be more than one species of morum to be found in South African waters.



Morum praeclarum
Melvill, 1919

This beautiful specimen from off Scottburgh area, was dredged live at approximately 90m.

This famous, once very rare shell, is still distinctive for its relatively small size (30mm) when adult.



This shell was received with a batch of shells trawled off Richards Bay during 1984. Although a little jaded, it has been identified by a world expert on this family as either *M. mcandrewi* or *M. joelgreeni*. Its shape is completely different to *M. praeclarum* and it is much larger at just over 40mm.

Does anybody else have large examples from off South Africa?



Conus sazanka
Shikama, 1970

Cone 1 was dredged off Sodwana during the 1980's. It is only 30 mm in size and is a puzzling cross between *C. capitaneus* and *C. sazanka*. *C. sazanka* (above) does not seem to have fine brown lines around the body whorl?

& mystery cones

Cone 2 was dived off southern Transkei at 40 m and still defies identification. It is 23.5 mm in size with a flesh-brown background, central brown band and thinner brown lines interspersed with white dashes. It is fresh, albeit with broken lip.



Cone 1



Cone 2

Slinger

a source of rare shells

Danny Spengler, Johan Marais and Alwyn Marais

Molluscivorous fish are of considerable interest to the dedicated malacologist as a source of deep-water shells that would otherwise be difficult or even impossible to obtain. Slinger (*Chrysoblephus puniceus*) has become famous for this reason. It occurs from Mozambique to East London, but juveniles are sometimes found as far west as Knysna. In Natal it is considered an important line fish, especially during the summer months and the entrails are sometimes available from line-fish boats.

Some interesting observations have been made during many years of investigating the gut contents of slinger. The entrails of smaller slinger are much more likely to contain shells than those of the larger fish. It has also been found that for periods of several weeks, or perhaps even longer the gut contents of slinger contain no, or very few shells, while at other times it is a very rich source of shells.

In an attempt to explain these findings, we searched the literature for information on the feeding habits of the slinger. Slinger inhabit rocky bottoms in deepish water (20-100 m). Its diet varies from small gastropods, bivalves, crabs and hermit crabs, to shrimps, squid and sometimes sponges. Our field observations suggest that the larger fish probably prefer a diet of

crab and squid, while the smaller fish pick the slower moving hermit crabs and small molluscs from the bottom. It is noteworthy that slinger are not exclusive bottom feeders, but sometimes feed above the reef on midwater planktonic organisms such as pteropods or glass shells (fam. Cavolinidae).

Plankton consists of microscopic plants (phytoplankton) and animals (zooplankton). Growth of phytoplankton is dependent upon the availability of nutrients and sunlight for photosynthesis and is therefore restricted to the top layers of the ocean. Zooplankton obtains energy for growth by consuming phytoplankton and smaller forms of zooplankton. In turn, they are preyed upon by larger forms of life. Plankton therefore forms the base of the food chain in the ocean. One of the most intriguing aspects of zooplankton behaviour is their daily vertical migration. At night they congregate near the surface of the water, but sink down to lower levels during the day. The difference in depth may be as much as several hundred metres. Some species of zooplankton however show little vertical movement.

It is known that some fish feed on the bottom by day but follow this upward migration of the zooplankton. Light has been shown to be the prime factor initiating migration, but no information could be found on the effect of other factors such as the moon and the tides on the process. There could well be many other factors affecting the extent of migration or the specific species present in the plankton at certain periods of the lunar cycle. Whatever the underlying causes may be, there appear to be definite periods when slinger either do not eat at all or move away from the bottom to utilize other food sources, most probably some midwater planktonic species. A better understanding of these factors will enable us to exploit this source of deep water shells more efficiently.



Ex- Countdown

I have been collecting shells from fish guts since 1995 and over the past eleven years have found a total of 630 species in this way. A great many of these species are still unnamed, and some are in the process of being described.

It has always been exciting to find treasures within smelly fish guts and I would like to share some interesting shell finds with you. Over the next few Strandlopers we will show my top 25 favourite ex-pisce shell finds. This issue will feature the second set of five shells counting down from number 25.

Danny Spengler

20



Ethalia gilchristae
Herbert, 1992

A very pretty shell, 12mm

19



Pseudodaphnella barnardi

6mm

18



Pseudosimnia jeanae
(Cate, 1973)

Always nice to find an ovulid,
10 mm.

17



Triphora spp.

A selection of unknown Triphoras

16



Nassarius lawsonorum

Kilburn, 2000

Only recently described,
16mm

A gastropod bivalve

or a

bivalved gastropod?

Johan & Alwyn Marais



Julia sp.
Park Ryne tidal pool

A small family of bivalved shells, the Juliidae, has been known to science for a period of more than a century. They are no more than 10 mm in size, but well known and even their fossil ancestors were traced back to the Eocene, some 50 million years ago. Taxonomists classified them as bivalves. Everyone was happy – that was until the day in the late 1950's when a Japanese zoologist, Siro Kawaguti, brought back to his laboratory some green algae of the genus *Caulerpa*. To his intense surprise a few of the grape-like objects on the algae, which appeared to be merely parts of the alga itself, began to crawl around! What he saw under his dissecting microscope was without any doubt a gastropod slug with a head and elongated

foot, but instead of the usual spiral shell, a bivalved shell was draped across the slug's back like a vastly oversized saddle on a horse. This was the first time the sea slug *Tamanovalva limax*, or any other member of the Juliidae, was seen alive.

Tamanovalva limax has the anatomy of a sacoglossan opisthobranch (similar to the naked sea-slugs, the nudibranchs or the shelled sea-slugs), but has evolved a bivalved shell even though it begins life as a typical larva with a single coiled shell. Shortly after hatching, projections form on each side of the larval shell and extend downward to form two valves. The dorsal margin of the shell

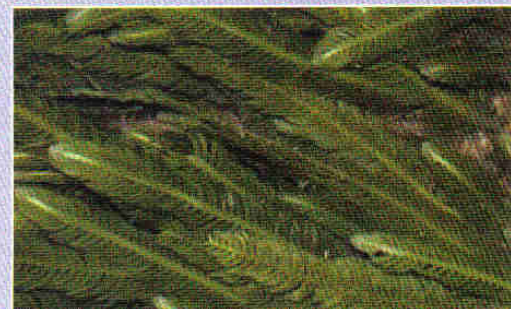
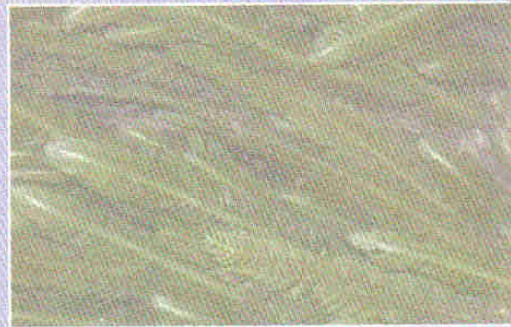
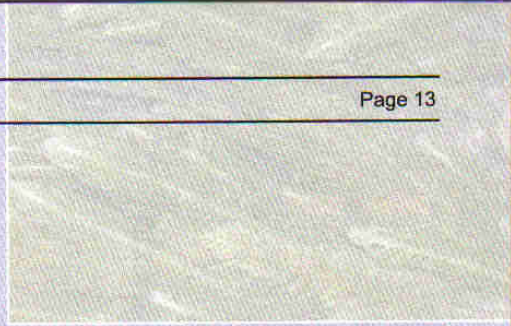
becomes joined by an elastic ligament, weak hinge teeth develop on the valve margins and a single adductor muscle pulls the valves together.

The family Juliidae includes at least two genera, *Julia* and *Tamanovalva* (*Berthelina*). In *Julia* the shell is dark, brownish green in colour, often with dark green radial bands over the whole or the front half of each valve. The shell is solid with a heavy ball and socket hinge and very small protoconch, often not retained in the adult. The animal is light or dark green. In *Tamanovalva* the shell is thin, yellowish green in colour and sometimes with radial stripes. The hinge is weak, often without hinge teeth. The protoconch is large and is retained in the adult. The animal is greenish brown, with yellow bands, sometimes with horizontal stippling.

During feeding, members of the family pierce the cells of the alga *Caulerpa* with the radula and ingest the cell contents. Closely related nudibranchs that also feed on *Caulerpa*, incorporate intact chloroplasts from the cell sap into folds on their own dorsal surface. The nudibranchs thus take on the green colour of their food plant and are perfectly camouflaged. Furthermore, the chloroplasts continue photosynthesizing within the nudibranch, thus providing it with energy-rich organic compounds. Whether or not the green colour of members of the Juliidae has a similar origin and function is not known.

Since 1959 living members of the family Juliidae have been discovered in all tropical and temperate seas, except in the eastern Atlantic and the Mediterranean. They all appear to be restricted to the green alga *Caulerpa* as food source. Several species of *Caulerpa* inhabit South African waters and a number of species belonging to the Juliidae have been found in beach-drift along our coastline.

The bivalved gastropods of the family Juliidae are excellent examples of convergent evolution, where the bivalve shell has evolved independently on more than one occasion.



NAUTILUS

a master of buoyancy control

Johan and Alwyn Marais

"The remarkable buoyancy control of nautilus might be one of the reasons why it survived."



The submarine has been a formidable war machine since World War 1. By literally appearing out of the blue, striking at its quarry and then slipping out of sight below the waves, the submarine must have instilled fear in everyone sailing the oceans during times of war. The surfacing and descending of these underwater vehicles depend on a critical balance of water and air within their ballast tanks. By pumping compressed air into the tanks to replace some of the water, the submarine rises, while replacing some of the air with water, causes it to dive. During the early development of the U-boat and submarine, buoyancy control was rather crude and difficult to achieve. This led to some of the more humorous incidents of World War 1, when frantic U-boat crews, in their haste to dive to safety, descended so fast that they often bounced back from the ocean floor. It also resulted in many a tragedy when crews were still struggling to get their submarines to safety by the time the retaliating enemy arrived on the scene. It took years of refinement to eliminate completely all buoyancy problems in these man-made crafts. However, in nature buoyancy control was perfected millions of years ago in swimming members of the Mollusca such as the nautiloids.

The present-day chambered or pearly nautilus is largely a scavenger living in deep water, usually on reef slopes. It has the interesting habit of descending to a depth of 300-400 m during the day and then migrating all the way up the reef slope by night into relatively shallow water of about 100 m. If the animal were to swim the distance of more than 200 m up the slope during its nightly

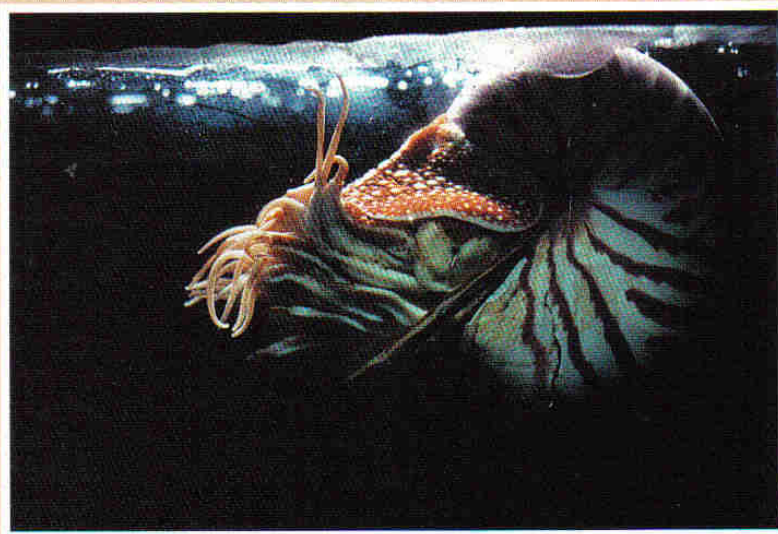


Fig 1 Live Nautilus below surface with tentacles extended.
(Photo courtesey - John Forsythe)

excursions, much energy would have been required. By covering the distance largely by means of buoyancy control, the energy cost of moving vertically is no more than swimming horizontally.

How does nautilus regulate its buoyancy? In principle the process is similar to that used in submarines, but in detail the natural process is much more subtle. As the name implies, the shell of the chambered nautilus consists of a series of gas chambers. Each chamber is formed when a septum is produced behind the body of the animal as it grows. In the middle of the septum is a permeable, calcareous tube that spirals back from the last septum through all chambers to the first chamber of the shell. The early chambers are empty, but the last few are partly filled with a fluid similar to seawater. Like seawater it contains a large concentration of dissolved salts. The body of the animal occupies the last open chamber, but remains in contact with the chambers behind it by

means of the siphuncle, a long, thin strand of tissue with a well-developed blood circulatory system, which fills the permeable, spiral tube.

A fully-grown nautilus weighs up to 1400 grams, but is almost weightless in water. The surrounding water exerts a pressure on the body of the nautilus. This hydrostatic pressure, which increases with depth, is transmitted to the blood of the animal and tends to drive fluid through the siphuncle tissue into the shell chambers, thus decreasing the buoyancy of the animal and causing it to descend. However, in nautilus osmotic forces counteract these hydrostatic forces, causing the Nautilus to rise. Osmotic forces are created when the siphuncle extracts some of the dissolved salt from the shell chambers into the blood stream, thereby increasing the salt content of the blood relative to that of the fluid in the chambers. Through the process of osmosis water is drawn against this concentration gradient,

from the chamber back through the siphuncle into the blood stream of the nautilus, thus increasing the buoyancy. Due to the removal of fluid from the chamber the pressure in the chamber drops, causing dissolved gases in the blood of the animal to escape through the siphuncle into the chamber. If the hydrostatic forces equal the osmotic forces, nautilus will remain static in the water. To move up the slope nautilus has to increase its buoyancy by speeding up the removal of dissolved salt in the chambers in order to increase the osmotic pressure relative to the hydrostatic pressure. If the animal wants to descend, the removal of salts from the chamber must be decreased. The osmotic pressure will then become too weak to counteract the hydrostatic pressure and the chamber will gradually fill with fluid. Increased pressure on the gas in the enclosed chamber will enhance its dissolution in the blood circulating through the siphuncle. This causes fluid to move out of the chambers into the blood



Fig 2 Live Nautilus over choral reef at night.
(Photo courtesey - John Forsythe)

stream, thereby increasing the buoyancy. An interesting feature of this system is that the air pressure inside the chamber, which is in equilibrium with gases in the blood and in the surrounding seawater, always stabilises at 1 atmosphere. However, when nautilus descends

the water pressure on the outside of the shell increases to 30 atmospheres or more at the depths where nautilus lives. As a result of this pressure difference inside and outside the chamber, the nautilus shell will eventually implode if it descends too far. This is contrary to all other shells where the internal and external pressure remains the same regardless of depth.

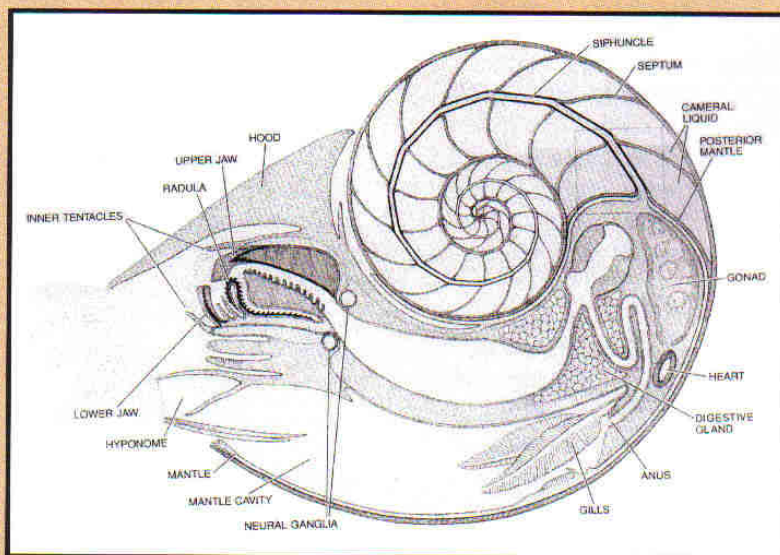


Fig. 3 Longitudinal section through nautilus showing the internal organs, the siphuncle and the shell chambers. (Ward, P., Greenwald, L. & Greenwald, O.E. The buoyancy of the chambered nautilus. *Scientific American*, Oct. 1980, pp.162-175)

The remarkable buoyancy control of nautilus might be one of the reasons why it survived, while a group as successful as the ammonites became extinct. From the earliest times it probably inhabited steep slopes in relatively deep water and could retreat beyond the range of the more dangerous neutrally buoyant bony fish that made their appearance in Mesozoic times. Even at present it occupies a niche where low transport costs and an ability to dive deep and change depth while maintaining neutral buoyancy enable it to compete successfully with modern fish and other cephalopods.

Did you know?



Bees and Chitons

Chitons have something in common with bees. The brains of bees have been shown to contain crystals of magnetite. These crystals are thought to be involved in magnetoreception, the ability to sense the polarity of the earth's magnetic field. Bees therefore have a keen sense of direction and can easily find their hives after foraging trips of more than 12 km. Chitons in turn, are unique among molluscs in having teeth hardened with magnetite. Whether this magnetite also plays a role in direction finding in chitons, is not known.



Chiton eyes

Chitons have eyes in their shells. The chiton's head and body are largely hidden below the girdle. The head therefore lacks eyes and sensory tentacles found in many other molluscs. However, chitons have evolved large numbers of eyes embedded in the dorsal surface of the eight shell plates. The eyes are arranged in a definite pattern and lie in pockets surrounded by pigment. Each eye has a lens, a cup of retina cells and an optic nerve running in an optic canal through the shell. The eyes appear to function as light receptors.



Nucella cingulata was one of the first molluscs described from South Africa. It was described by Linnaeus in 1758, about 100 years after the arrival at the Cape of the first white settlers. *Nucella cingulata* feeds mainly on the mussel *Aulacomya ater* and ranges from False Bay to Namibia.

The slippery limpet

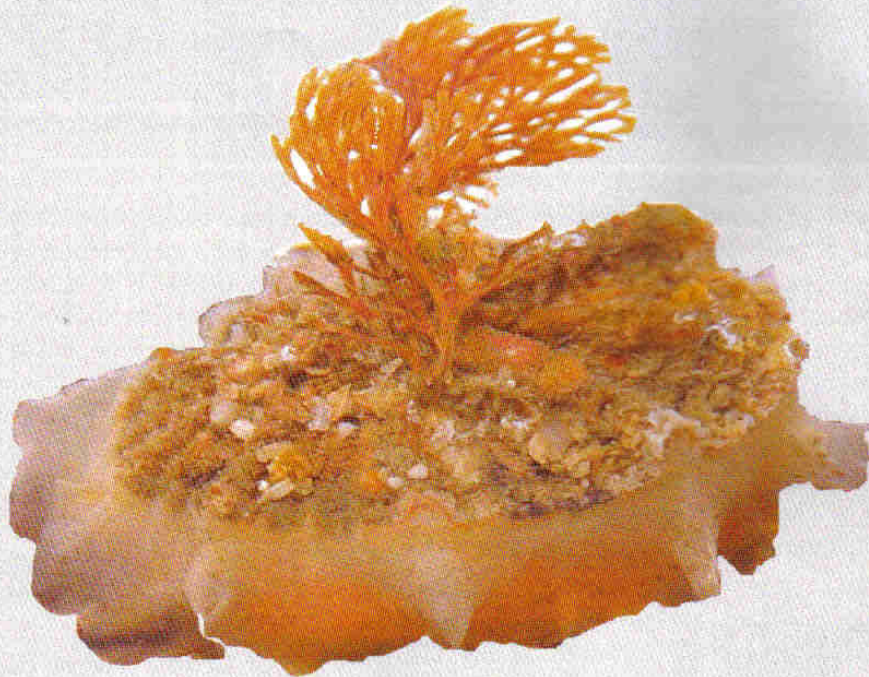
The limpet, *Cellana capensis* has the unique ability to slide its mantle over its shell (almost like cowries)



to fend off predators. The slippery mantle is almost impossible to grip and produces an offensive mucus that repels predators such as starfish and whelks. A starfish in contact with the mucous sometimes appears partly paralysed.

A scarce endemic fissurellid

by Mike Els



***Diodora elizabethae* EA Smith, 1901**

Diodora elizabethae is well-known to beach collectors in the Eastern Cape, but specimens in good condition are very difficult to find. They are robust shells, with strong ribbing, but much of the finer sculpture is usually worn away by the time it has reached the shore.

Over the years I have always hoped to find a living specimen, either intertidally or whilst diving, but had to wait many years until November 2004, when I was fortunate to find the illustrated live specimen. I was exploring a reef area off Cape Recife, Algoa Bay, in 16m depth, on low profile reef which

was richly covered in Coralline seaweeds (*Amphiroa ephedraea*, *Corallina* sp. etc.) which are abundant on slightly shallower reef in this area, usually with a fair to high amount of surge. Due to this brisk water movement loose rocks which may harbour shells beneath them are usually very hard to find in this environment, most rocks being deeply embedded in the sand in reef cracks.

On finding one such rock, I lifted it to find that approximately 15cm of Coralline weed encrusted rock lay above the sand. Immediately adjacent to my fingers I noticed a flat pale yellow structure surmounted by

weed. On close inspection this was indeed my long-hoped for *Diodora elizabethae*! I carefully removed it and placed it in my collecting bottle to photograph later.

The specimen was extremely cryptic in natural habitat and this factor is probably the main reason that so few live taken specimens have been reported by collectors. After some searching on the Web, I did encounter a photo of what appeared to be two live taken specimens, but small - (about 18mm). It appears to live on the reef in exposed position, relying on its camouflage to avoid detection. The numerous fine scales trap silt and the various attached organisms add to its rock-like appearance. The specimen measured 35mm.

There appears to be a significant difference in shells from the cooler southern waters to those in the warmer Transkei /Natal areas. Beach shells from the Xora area are more elevated with reddish tinge to the ribbing.

I have heard of *ex-piscibus* specimens from Natal and have a few dead taken specimens from 90m off Northern Transkei – see illustration. The northern deepwater specimens are markedly elevated (much more so than the beach specimens),



Variation within *Diodora elizabethae*

lightweight and more angular. I presume that some may have been taken live by dredging. The much squatter, heavier Eastern Cape specimens may be due to their shallower water habitat – or are they two different species? I have seen too little of the Transkei/Natal material to form an opinion.

I would appreciate feedback from other collectors via The Strandloper about their experiences with this South African endemic.



Shell Puzzle No. 2

Across

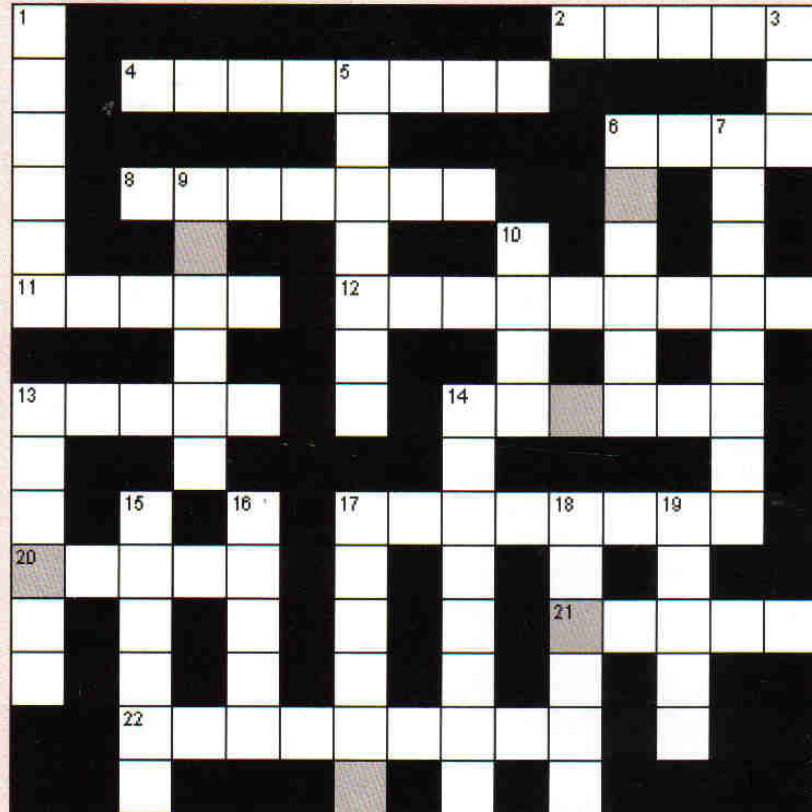
2. Very deep indeed
4. Largest marginella in SA waters
6. A tide
8. Venus ear
11. The shiny side
12. Most shells use it for protection
13. Fish eating mollusc
14. Money cowry
17. Most important specimen of them all.
20. Cowry with chocolate brown to black base.
21. Author of *Xenophora pallidula*
22. Slipper limpet

Down

1. Early 20th century collector & author in the eastern Cape.
3. Humans have them as well
5. Rounded
6. Small knob
7. With concentric rings
9. Famous early conchologist collecting mainly in Natal
10. Most common argonaut in SA waters.
13. A shell consisting of plates
14. Genus in the family Olividae with two species represented in SA.
15. For cleaning shells
16. The Cape steam trawler, Pieter -----
17. A crab in a shell.
18. A fine ridge.
19. A fold.

ANSWER: SHELL PUZZLE 1

Edgar Albert Smith (1847 - 1916) As conchologist of the British Museum EA Smith received many South African shells for study and description from local collectors such as WH Turton and HC Burnup. He described at least 160 valid South African species.



Win

1st Prize



A wonderful selection of essential oil products, distributed by **ESSENTIA PRODUCTS**

2nd Prize

A selection of trawled shells from Beira

WINNER: SHELL PUZZLE 1

1st Prize: Linda Swart (Pretoria Group)
2nd Prize: Markus Lussi (Durban Group)

Instructions

1. Complete the crossword puzzle.
2. Arrange the letters in the shaded blocks to form the name of a famous conchologist.
3. Put your one word answer on a post card with your name and address and send to Shell Puzzle No 1, P.O. Box 1855, Rooihuiskraal, 0154 or alternatively you can email the answer to alwyn@deark.co.za
4. The first two correct entries drawn will each receive a prize.
5. The decision of the Committee will be final.
6. The winners will be announced in the next Strandloper.
7. The closing date is 15th January 2007