

## A review of the *Marginella bicatenata* Sowerby, 1914 complex (Gastropoda: Marginellidae) with the description of a new southeast African *Marginella* species

Andrew WAKEFIELD

14 Forest Side, Buckhurst Hill, Essex, IG9 5SL, UK.

bmw.awake@btinternet.com

**KEYWORDS.** Marginellidae, South Africa, *Marginella bicatenata*, *M. tomlini*, *M. lemaitrei*, *M. seccombei*, species complexes, new species.

**ABSTRACT.** The taxa *Marginella bicatenata*, Sowerby, 1914, *M. tomlini* Shackleford, 1916 and *M. lemaitrei* Liltved & Millard, 1994, all rare deep-water South African marginellids from off the southern Cape to KwaZulu-Natal, are revised from their type material and additional lots from both public and private collections. *M. tomlini* is proposed to be a junior synonym of *M. bicatenata*, whereas *M. lemaitrei* is considered to be a sibling species. *Marginella seccombei* n. sp., a benthic species from KwaZulu-Natal often confused with *M. bicatenata* on account of its superficially similar shell pattern, is described.

### INTRODUCTION

In 1914, George Brettingham Sowerby (III) described a new species of *Marginella* from a then unique shell, lacking data, which had been discovered in the collection of a Mr. M. Denans. Since Denans had collected extensively in Senegal, Sowerby erroneously assumed the type locality to be Gorée. The otherwise plain whitish shell was named *Marginella bicatenata* on account of its double row of dark spots, one at mid-body and the other at the shoulder. Two years later Lewis J. Shackleford, without reference to Sowerby's taxon, described *Marginella tomlini* from a shell with a similar pattern, only this time its provenance was known with accuracy to be off Cape St. Blaize, on the southern Cape of South Africa. This shell was dredged from 105 fathoms (equivalent to 192 m) indicating a deep water habitat on the Agulhas Bank. Since that time, and especially in recent years with increased sampling of South African benthic environments down to several hundred metres and more, further specimens of shells resembling the type specimens of both taxa have come to light and have found their way into both private and public collections. There has also been relatively recent taxonomic activity in this small complex of similar shells, with the description of *Marginella lemaitrei* Liltved & Millard, 1994. Despite the continuing scarcity of specimens available for study sufficient material now exists to make a preliminary review of the complex.

*M. bicatenata* ranges from Africa's southern Cape, northeast to central KwaZulu Natal, with the shells of this species exhibiting morphologic differences at each end of the geographic range of distribution. These differences are exemplified by the type specimens of *M. bicatenata* and *M. tomlini*. A new deep water species from Natal, bearing a superficially similar pattern of a double row of markings at the

shoulder and mid-body, does not however appear to be directly related to *M. bicatenata*. It is described herein as *M. seccombei* n. sp.

### Materials and Methods

All specimens from private collections and all of the material of the new species described herein were obtained via suppliers who sourced material from South African commercial fishing vessels as dead dredged empty shells. Curators of national museums in the United Kingdom and South Africa permitted the use of images and data of their examples of the species under study. Since live animals are as yet unknown, the species were treated conchologically. The author used a Nikon D300 SLR, a 60mm AF Micro Nikkor 1:2.8D lens and ring flash for images of *M. bicatenata* and *M. seccombei* n. sp. taken by the author. Images are shown at the same relative scale.

### Abbreviations

NMW: Amgueddfu Cymru (National Museum, Wales), Cardiff.  
 NM: KwaZulu (Natal Museum), Pietermaritzburg.  
 SAM: Iziko (South African Museum), Cape Town.  
 AWC: Andrew Wakefield Collection, UK.  
 TMC: Tony McCleery Collection, UK  
 ad.: adult  
 juv.: juvenile  
 sh.: dead collected shell  
 n. sp.: new species

### SYSTEMATICS

Family **MARGINELLIDAE** Fleming, 1828  
 Subfamily **MARGINELLINAE** Fleming, 1828  
 Genus *Marginella* Lamarck, 1799

Type species: *Voluta glabella* Linnaeus, 1758, by monotypy.

*Marginella bicatenata* G.B. Sowerby (III), 1914  
Figs 1-21

*Marginella bicatenata* Sowerby (III), 1914: 147, pl. 19, fig. 7.

*Marginella tomlini* Shackelford, 1916: 193, text figs 3, 4.

**Type material.** *Marginella bicatenata*, 1 ad sh., holotype, preserved dry, 13 x 7 mm, Gorée, coll. Tomlin (ex. Coll Denans), NMW.1955.158.01434, (Figs 1, 2).

*Marginella tomlini*, 1 ad. sh., holotype, preserved dry, 18 x 10 mm, off Cape St. Blaize in 105 fms, SAM A3704 (Figs 13-15).

**Other material examined.** 6 ad and 1 juv. sh, from KwaZulu-Natal, preserved dry: 12.8 x 6.9 mm, 29.825° S 31.2383°E, NM ref. no. D3819 (Figs 3,4); 13.9 x 7.5 mm, 30.0132° S, 31.06°E, NM ref. no. D1159 (Figs 5,6); 15.7 x 8.5 mm, 30.0067° S 31.05°E, NM ref. no. D1094 (Figs 7,8); 13.5x6.6 mm, juv., NM ref. no. E8656 (Figs 9, 10); 11.7 x 6.8 mm, 30.0182° S 31.0533°E, NM ref. no. D800 (Figs 11, 12); 14.6 x 8.8 & 12.8 x 7.4 mm, 30.1067° S 31.0133°E, NM ref. no. D1946.

2 ad sh., from the southern Cape region, preserved dry: 17.8 x 9.95 mm, Agulhas Bank, dredged, depth unrecorded, AWC; 16.2 x 9.33 mm, southern Agulhas Bank at 100m, AWC (Figs 16, 17).

**Type Locality.** Gorée, Senegal (in error)

**Descriptive notes.** Shell thin, smooth, length 11.5-18 mm, W:L ratio 54-60% (mean 56%), strongly biconic to elongated biconic. Spire elevated, of 4.5 whorls including paucispiral protoconch, stepped (mainly between penultimate and last adult whorl) to straight sided. Shoulder smoothly rounded to slightly angulated, shell tapering to narrow, slightly truncated anterior end. Creamy white, pale straw to pale grey body whorl, with two spiral rows of blurred charcoal grey spots: anterior row of 6-8 spots emerges from aperture immediately posterior to 4<sup>th</sup> plication, ending at anterior 1/6<sup>th</sup> of lip; posterior row of 7-10 (on body whorl) spots at shoulder level. Posterior row continues onto spire to reach plain, glassy protoconch. Suture not impressed. Lip, plications, base of columella white. Aperture approximately 1.5 x as wide as labial varix. Lip smooth, straight to gently convex, thickened externally as a single moderately strong varix with a smooth rolled edge. Varix groove present externally. Siphonal notch absent, posterior notch weak, lip thins slightly in posterior 1/6<sup>th</sup> before inserting to body whorl at shoulder at level of posterior row of spots, or just anterior to it. Lip continues round anterior end, thinning out completely to join base of columella at

end of first plication. Columella with 4 moderately strong, thin, single plications, gradually increasing in separation from 1<sup>st</sup> to 4<sup>th</sup>. First two oblique, 3<sup>rd</sup> and 4<sup>th</sup> becoming more horizontal. Plications fill over 1/2 but less than 2/3 of aperture. Columella slightly concave in region of plications. Parietal surface smooth, weakly convex to straight. Anterior and posterior callus absent. Animal unknown.

**Distribution.** Off central KwaZulu-Natal to Cape St. Blaize, southern Cape, South Africa, depth range 100-200 metres.

**Remarks.** The species is listed by Tomlin (1917: 253) who records the holotype of *M. bicatenata* as being present in the Tomlin collection. The Melvill-Tomlin Collection was received by Amgueddfu Cymru (NMW) in 1955, and enquiries have confirmed that the holotype is present in the collection. It is biconic in profile (Figs 1, 2) and from the ventral view has three large spots at the shoulder and four at mid-body. It clearly is the shell depicted and described by Sowerby. Similarly robust, relatively small, dirty-white shells with charcoal coloured spots and with a variety of strong morphologic features such as stepped spires, and strongly angulated shoulders are found at the north-eastern end of the range, off KwaZulu-Natal (see the specimens from the NM in Figs 3-12). As the holotype exhibits these characters it is much more likely to have originated from Natal than from the southern Cape, and the original type locality has always been erroneous – this is emphatically not a West African shell.

Millard (1981, fig. Da, p. 6, 7) figured a specimen present in the SAM (ref. A3704), citing it as the type of *M. bicatenata*. As noted above, the holotype of *M. bicatenata* is in the NMW. The specimen to which Millard was referring is in fact the holotype of *M. tomlini* Shackelford, 1916 (Figs 13-15). The original description of it featured a quality photograph of the holotype - one of the earliest original descriptions to do so - and its identification as the holotype of *M. tomlini* is beyond any doubt. Shackelford recorded the type locality as off Cape St. Blaize, southern Cape, South Africa, 'N. by E. 1/2 E., distant 68 miles - 105 fathoms (*sic*)'. *M. tomlini* is considered to be a junior synonym of *M. bicatenata*, and represents the form found at the southern end of the range. These shells are larger and thinner walled than their northern counterparts, and they also inhabit relatively shallower waters in the south. This trend is observed in most other species of South African marginellidae with a similar distribution pattern. This progressive morphological change has been attributed to many factors, one being the availability of food (the cooler waters of the Cape are rich in nutrients compared to the warmer waters of KwaZulu-Natal).

One of the NM specimens (Figs 9, 10) of *M. bicatenata* is in exceptional condition and is very well marked, and even shows extra fine spiral lines of spots

between the two main ones. Most specimens of *M. bicatenata* are dead collected and worn – it may be that fresh specimens have traces of extra fine spiral lines in the surface layers of the shell. These markings are not as defined or as bold as those found in *M. lemaitrei*.

*M. bicatenata* is very distinctive and is unlikely to be confused with anything else. *M. nevellana* Kilburn, 1977 (7.6 x 4.5 mm) as yet only known from its holotype from the eastern Cape, is much smaller than *M. bicatenata*, has eight rows of large charcoal grey spots on a white background, a much thicker shell and because of its denticulate lip is better placed in the genus *Glabella* Swainson, 1840 (in the *G. obtusa* Sowerby, 1846 complex).

***Marginella lemaitrei*** Liltved & Millard, 1994

Figs 22-26

*Marginella lemaitrei* Liltved & Millard, 1994: 3, 4, fig 1.

**Type material.** 1 ad. sh., holotype, 18.4 x 10.0 mm, *ex. pisce*, trawled approx 100m, Cape St. Blaize, southern Cape, South Africa, SAM A37572 (Figs 22-24); 1 ad sh., paratype, 17.1 x 8.9 mm, *ex. pisce*, trawled approx 100m, Cape St. Blaize, southern Cape, South Africa, NM E7213/T184.

**Other material examined.** 1 ad. sh., unmeasured, no data, photographed by Markus Lussi (Figs 25, 26).

Specimen figured on p. 6, 7, fig. Db, in Millard, 1981 (21 x 11mm), '*ex. pisce*' off the Cape.

Specimen image by Brian Hayes (2011).

**Type locality.** Cape St Blaize, southern Cape, South Africa.

**Distribution.** Restricted to the Agulhas Bank off the southern Cape, South Africa.

**Descriptive notes.** Shell length 17.1 – 21.0 mm, W:L ratio 52-54% (mean 53%), straw coloured to greyish, thin, smooth, satin, elongate-biconic, of 4.5 whorls including paucispiral protoconch, weakly shouldered, tapering to a narrow anterior end. Suture not impressed. Lip with smooth, evenly thickened, white margin, smooth internally, with external varix groove. Plications strong, evenly spaced plications filling over half of aperture. First two oblique, third and fourth straighter. Columella slightly concave. Aperture narrowing posteriorly, otherwise of even width. 4-8 spiral rows of fine grey spots and streaks on body whorl. Holotype has 8 rows; 4 anteriorly, 2 at mid-body, 2 on the spire. Paratype has 4 rows with less frequent, more blurred markings. Axial pattern of pale grey narrow to wide flammules on body whorl.

**Remarks.** According to Liltved and Millard (1994: 4), *M. lemaitrei* occurs sympatrically with *M. bicatenata*

(' *M. tomlini* form') off the southern Cape. In fact the types of *M. lemaitrei* and the holotype of *M. tomlini* are syntopic. The types of *M. lemaitrei* were taken from the stomach contents of the fish *Congiopodus torvus* Walbaum.

*M. lemaitrei* differs from the '*M. tomlini* form' of *M. bicatenata* in that it is generally slightly larger, more slender (less shouldered), has multiple rows of dashes and dots rather than two, and often has an additional axial pattern of pale grey narrow to wide flammules. The slender thin shell and axial flammules are also characters seen in *Marginella diadochus* Adams & Reeve, 1848 and therefore the possibility of an ancestral link of the *M. bicatenata* group to the *M. musica* group should be considered.

***Marginella secombei*** n. sp.

Figs 28-39

**Type material.** 5 ad. sh., dredged, preserved dry, off Central KwaZulu-Natal in 150m; holotype, 12.61 x 7.46 mm, NM W8641/T2985 (Figs 27-30); paratype 1, 13.29 x 8.37 mm, NM, W8642/T2986, (Figs 31, 32); paratype 2, 12.48 x 8.28 mm, AWC (Figs 33, 34); paratype 3, 10.88 x 6.35 mm, TMC (Figs 35, 36); paratype 4, 13.75 x 8.48 mm, NMW.Z.2012.016.00001

**Type locality.** Off central KwaZulu-Natal, South Africa.

**Other material.** 1 ad. sh. unmeasured, off Durban, KwaZulu-Natal, photographed by Markus Lussi (Figs 37, 38)

**Distribution.** Off Central KwaZulu-Natal in 100-150 metres.

**Description.** Shell moderately sized (L=12.6 mm), W:L ratio 58 – 66 % (mean 61.4%), solid, biconic, of 4 ½ whorls including paucispiral protoconch, posteriorly tapering to moderately wide columella base. Pale straw coloured with two spiral bands of very short axially oriented red-brown dashes encircling body whorl. Anterior row appears darker due to dashes being closer together. Dashes regularly spaced and shaped ventrally, becoming more separated and irregular from mid-dorsum to lip. Anterior (mid-body) row of 24 closely spaced dashes emerges immediately posterior to 4<sup>th</sup> plication. Posterior row of 20 more spaced marks at shoulder on body whorl, continuing for another 2 ¼ whorls onto spire. Lip, base of columella and plications white. Shoulder rounded, spire moderately elevated, suture present, spire whorls shouldered. Posterior end of lip inserts at shoulder at level of posterior spiral band. Columella slightly concave anteriorly, parietal surface very slightly convex. Aperture widest in middle third, twice as wide as the lip, narrowing posteriorly and anteriorly to as wide as the lip. Lip evenly convex in

profile, smooth, denticles absent, external varix strong with varix groove externally. Posterior notch absent, siphonal notch weak. Four strong plications, first two oblique, third and fourth straighter, round crested, spacing between increasing from first to fourth, ends terminate at level of lip except for first which sweeps round to join with base of columella and anterior end of lip.

Animal unknown.

**Etymology.** The species is named after Alan Secombe (Cape Town), who first drew the authors attention to this species.

**Remarks.** The type series (Figs 27-36) displays the variability in this species. The number of short axial dashes in the two bands varies slightly, from 19 to 23 in the anterior band and from 19 to 24 in the posterior band. Whilst many shells are marked only with the two main spiral rows, others have extra rows of finer markings. Paratype 2 (Figs 33, 34) is exceptionally well marked and reveals these extra spiral lines of extremely fine dots and dashes on the body whorl, with 22 fine spiral dotted lines between the two main bands, but also several anteriorly, and posteriorly onto the spire. Paratype 1 (Figs 31,32) has these extra fine spiral lines of dashes and dots more organised so they line up in an axial pattern.

## DISCUSSION

Although the colour pattern of *M. seccombei* apparently links it to the *M. bicatenata* complex, there are several characters which when studied in detail, provide us with an indication that *M. seccombei* is not closely related to it at all. Firstly, the shells of the *M. bicatenata* complex are all relatively thin and have

lower W:L ratios; 54-60% (mean 56%) for *M. bicatenata* and 52-54% (mean 53 %) for *M. lemaitrei*. The W:L ratio of *M. seccombei* is much higher at 58-66 % (mean 61.4%) and is clearly a more robust, stockier shell than those of the *M. bicatenata* group. Secondly, the double row of reddish-brown axial dashes in *M. seccombei*, is fundamentally different in its genesis from the double row of smudged charcoal grey spots of the other species. This strongly suggests that *M. seccombei* has a different phyletic lineage, and that its pattern should be regarded merely as a convergent shell character with the *M. bicatenata* group. We must look elsewhere for links to its related species.

When the species in the *M. ornata* complex express spiral lined patterns, they tend to do so as bands of small axially orientated markings. This is very evident on reddish specimens of *M. ornata* Redfield, 1870 and also in *M. beltmani* Hart, 1993 and *M. peelae* Bozzetti, 1993. *M. seccombei* also shares the same general morphology of the shells in the *M. ornata* complex, with their stocky outline and convex, often stepped later spire whorls. On purely conchological grounds therefore, a relationship with the *M. ornata* complex would seem justified although the lack of external lip markings in *M. seccombei*, compared with strongly marked lips of those in the *M. ornata* complex, cannot be ignored.

Looking then to more northerly species for allies of *M. seccombei*, the pattern and morphology of two deep-water Mozambique species *M. verdascai* Hayes & Rosado, 2007 and *M. monicae* Bozzetti, 1997 appear close. *M. verdascai*, though much smaller at a length of 5.6 - 6.8 mm (in the type series), has a very fine spiral lined pattern very much like that seen in the better preserved specimens of *M. seccombei*.

## Figures 1-38

1-21. *Marginella bicatenata*, G.B. Sowerby (III), 1914;

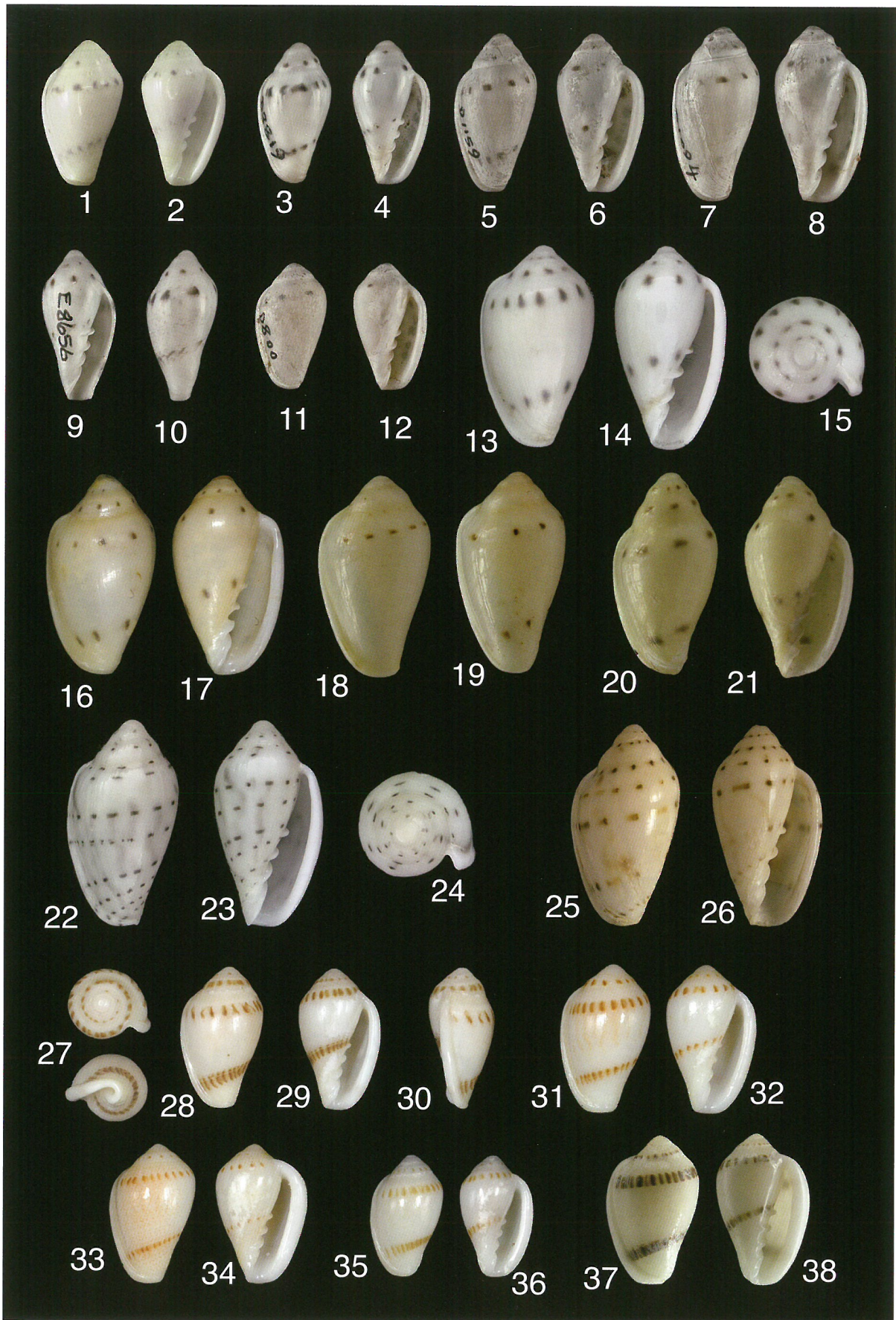
1-2. *M. bicatenata*, Holotype, 13 x 7 mm, Coll. Tomlin (NMW 1955.158.01434); 3-4. Off Durban, Natal, 12.8 x 6.9 mm, 29.825°S 31.2383°E (NM D3819); 5, 6. Off Durban, Natal, 13.9 x 7.5 mm, 30.0132°S 31.06°E (NM D1159); 7, 8. Off Durban, Natal, 15.7 x 8.5 mm, 30.0067°S 31.05°E (NM D1094); 9, 10. Off Durban, Natal, 13.5 x 6.6 mm (NM E8656); 11, 12. Off Durban, Natal, 11.7 x 6.8 mm, 30.0182°S 31.0533°E (NM, D800); 13-15. *M. tomlini*, Holotype, trawled off Cape St. Blaize, Southern Cape, South Africa in 192m, 18 x 10 mm (SAM A3704); 16, 17. Southern Agulhas Bank, Southern Cape, South Africa, 16.2 x 9.33 mm (AWC); 18-22. Series demonstrating pattern and morphologic variability, data unknown (photo Lussi).

22-26. *Marginella lemaitrei* Liltved & Millard, 1994;

22-24. Holotype, Cape St. Blaize, Southern Cape, South Africa, 18.4 x 10.0 mm (SAM, A37572); 25, 26. Data unknown (photo Lussi)

27-38. *Marginella seccombei* n.sp., off Durban, KwaZulu-Natal, dredged dead in 150m.

27-30. Holotype, 12.61 x 7.46 mm (NM, W8641/T2985); 31, 32. Paratype 1. 13.29 x 8.37 mm (NM, W8642/T2968); 33, 34. Paratype 2. 12.48 x 8.28 mm (AWC); 35, 36. Paratype 3. 10.88 x 6.35 mm (TMC); 37, 38. Data unknown (photo Lussi).



However, it lacks the two main spiral bands of brown axial markings and it has a weakly denticulate lip. Although smaller than *M. seccombei*, *M. monicae* is a shell of comparable shape though it is thicker and slightly pyriform. Although mainly lacking a colour pattern, it has a faint trace of dark markings (not clear spots or axial streaks) at the shoulder and at the anterior end in the same place as the spiral rows in *M. seccombei*. It appears to be the species closest morphologically to *M. seccombei* discovered to date. *M. tuguriana* Lussi, 1993, another benthic species occurring in northern Natal and possibly ranging further north into Mozambique, also has a faint anterior band, but its extremely biconic morphology, thicker shell and labial markings distinguish it clearly from *M. seccombei* n. sp.

#### ACKNOWLEDGEMENTS

Dr. Igor Muratov (KwaZulu-Natal Museum) kindly provided the images of *M. bicatenata* (Figs 3-12). Linda Davis (Collections Manager, KwaZulu-Natal Museum), Liz Hoenson (Iziko, South African Museum), and Harriet Wood (Amgueddfu Cymru, National Museum of Wales) generously provided access to type material and/or information. I would like to express special thanks to Alwyn Marais (Centre for Molluscan Studies, South Africa) for the images of the holotype of *M. tomlini* (Figs 13-15), and to

Markus Lussi (Durban) for his opinions on the distribution of *M. bicatenata*, for his excellent images (Figs 16-21, 25, 26, 37 and 38) and for being my referee. A final thanks to Alan Seccombe (Cape Town) for providing the author with type material of *M. seccombei*.

#### REFERENCES

- Cossignani, T. 2006. Marginellidae and Cystiscidae of the World. L'informatore Piceno, Ancona. ISBN 88-86070-10-1.
- Hayes, B., 2011. www.gastropoda.com (date of access 28/02/2012)
- Liltved, W.R., & Millard, V.G. 1994. Five New Species from Southern Africa. *World Shells*, 10: 3-10.
- Millard, V. G., 1981. Marginellidae of South Africa. *The Strandloper*, 206: 1-12, 2 pl.
- Shackleford, L.J., 1916. Two New Species of *Marginella* from South Africa. *Annals of the South African Museum*, 9 :193-194.
- Sowerby, G. B. III, 1914. Descriptions of New Mollusca from New Caledonia, Japan, Philippines, China and West Africa. *The Annals and Magazine of Natural History*, ser. 8, 14(84) : 475-480, pl. 19.
- Tomlin, J. R. Le B., 1917. A Systematic List of the Marginellidae. *Proceedings of the malacological Society of London*. XII, 242-307.