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This Month's article contains the first article received from

Dr Martin G. Hiscock of Australia

***Zoila mariellae* Raybaudi 1983 is likely to be *Zoila decipiens* Smith 1880**

Zoila mariellae was relatively recently named by the late Italian conchologist and shell dealer Dr Luigi Raybaudi Massilia in honour of his wife Mariella¹. When Raybaudi first identified this beautiful member of the genus he gave it species rank, with a word of caution that, "to propose a new species implies a considerable dose of responsibility and risk".

This very rare cowry has continued to be an enigma. Nothing is known of its animal, habitat, geographic or bathymetric range. Specimens were trawled in the latter half of the 1970s by Taiwanese commercial fishermen off the north-west coast of Western Australia and in the early 1980s by Korean vessels operating out of the port of Dampier. It is quite possible that fewer than fifty *adult* examples exist worldwide in varying condition. A well preserved specimen is therefore one of the most highly prized conchological treasures.

Mature shells are humped posteriorly, with heavy basal callus extending inferiorly over an exert spire. Dorsal colouration varies from cream to pale grey and the surface may be malleated and/or inscribed with fine, axial lines. The base may be off-white, pale yellow or occasionally orange as in the holotype (Plate I). Teeth are well defined, often yellow and more distinct on the labral side where they are deep and near vertical. The columellar dentition extends the full length of the aperture which itself is angulated posteriorly. The fossula is well developed and pure white. Canals are pale yellow-brown, orange-brown or truly brown. The anterior canal is often more developed on the columellar side and the posterior canal more so on the labral side.



Plate I: Holotype of *Zoila mariellae* (author's collection)

Specimens were originally sold by Taiwanese dealers and were labeled as "*decipiens contraria*", "*decipiens albino*" and even "golden *decipiens*". Since Australian authorities created a 200 nautical mile exclusion zone for foreign fishing vessels in 1979, the Taiwanese and Korean commercial fishing trawlers have long since left the waters off Western Australia and no further *Z. mariellae* have been found.

I have long suspected that *Z. mariellae* Raybaudi 1983 is most likely *Z. decipiens* Smith 1880, being a distinctive deep water form, devoid of dorsal spotting, inflated and having the expected cream or grey dorsum and orange-brown canals. In fact, Barry Wilson and Peter Clarkson in their monumental work, "Australia's Spectacular Cowries", comment that, "Viewing *mariellae* as a deep-water variant of *decipiens* is, at least, a credible proposition"². Plate II illustrates a Taiwanese commercial fishermen trawled specimen bearing strong resemblance to *Z. decipiens* in terms of morphology and apertural dentition. Not surprisingly, DNA sequences from samples of dead animal material from *Z. mariellae* closely resemble those from the Broome *Z. decipiens*³.



Plate II: *Z. mariellae* bearing close resemblance to *Z. decipiens* (author's collection)

Taiwanese boats also trawled *Z. decipiens* in large numbers from off the northern Western Australia coast indicating the species may also inhabit deeper water but intermediate forms have never been described, possibly as a result of inadequate sampling along this vast and remote stretch of coastline. Conclusive evidence of the taxonomic status of *Z. mariellae* would have to come one day in the form of a conchological intermediate with *Z. decipiens*. Well, that day has come.

Plate III illustrates the first specimens of this kind ever found. They were recently live-taken by pearl divers off Broome, Western Australia in just 12-15m of water. The right sided specimen (#2) was found with a normal *Z. decipiens* in the same cup sponge and bears remarkable affinity with *Z. mariellae* in shape, colouration and dentition. Importantly, they were not found in close proximity of each other.

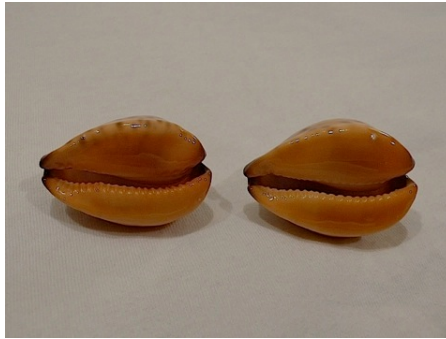
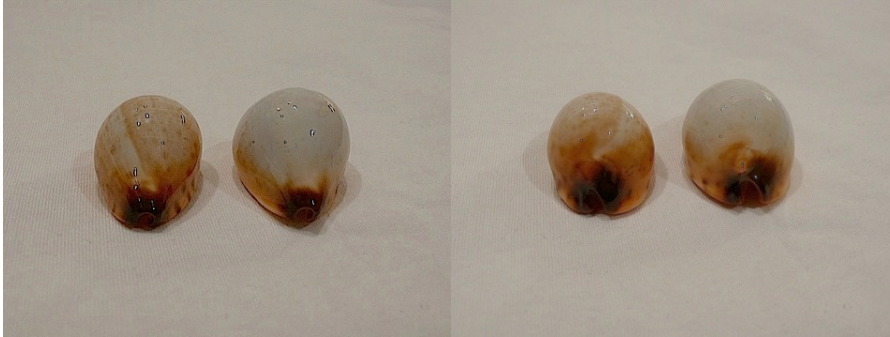
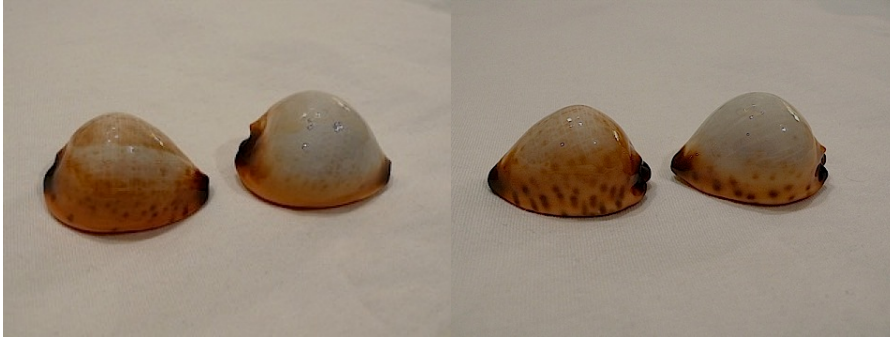


Plate III: *Z. decipiens* f. *kimbacki*

The first specimen found (specimen #1, left hand specimen, Plate III) is not immediately recognisable as *Z. decipiens*, as specimens of this species always are. The shell is malleated, the canals are dark brown and it has the typical shape of *Z. decipiens* but the dorsal colouration is quite different, being caramel in colour with a wide, grey mantle line and a paucity of spots. The margins are orange with distinct spotting particularly on the columellar side, quite unlike *Z. decipiens*. The base is intense orange with well developed callus which partially covers the spire. The teeth are like those of *Z. decipiens* and the fossula is stained orange, as in 'gold' *Z. decipiens* forms.

The right hand specimen (specimen #2) in Plate III could be interpreted as a freshly collected specimen of *Z. mariellae*. It is decidedly more inflated and pyriform in shape. The spire is exsert and covered with minimal callus. The canals are identical in morphology to those typically seen in specimens of *Z. mariellae*. It also has orange margins but spotting is confined to the columellar side, as is typical in *Z. mariellae*. The canals are dark brown and again the shell is malleated. The base is flat and more broad than the other specimen and the columellar teeth are more numerous, more prominent and carry the orange basal colouration, as is again the case with *Z. mariellae*. The only perceivable differences with *Z. mariellae* are the more understated gibbosity and the darker marginal spotting but these morphological differences are exactly what one might expect for a shell intermediate between the two. For these remarkable new forms, intermediate between *Z. decipiens* and *Z. mariellae*, I propose the form name *kimbacki* after Mr Kim Back* of Hilarys, Western Australia.

Table I: Comparisons between two *Zoila decipiens* f. *kimbacki* and two *Zoila mariellae*:

<p>Specimen #1 <i>Z. decipiens</i> f. <i>kimbacki</i> l: 50.9 mm, w: 33.4 mm, h: 30.1 mm columellar teeth: 10 labral teeth: 20</p>	<p>Specimen #2: <i>Z. decipiens</i> f. <i>kimbacki</i> l: 53.2 mm, w: 38.0 mm, h: 31.6 mm columellar teeth: 17 labral teeth: 21</p>
<p><i>Z. mariellae</i> (holotype) l: 56.0 mm, w: 42.4 mm, h: 37.0 mm columellar teeth: 17 labral teeth: 21</p>	<p><i>Z. mariellae</i> #2 l: 54.5 mm, w: 38.5 mm, h: 34.8 mm columellar teeth: 16 labral teeth: 21</p>

Whilst published opinion places *Z. mariellae* off the Kimberley coast which lies much further to the north^{1,2}, it appears more likely that there may be a number of populations of this beautiful *Zoila* inhabiting somewhat deeper water further offshore from the coastal distribution of *Z. decipiens* off Broome. It would not be unreasonable therefore to predict that future exploration of this region may yield fresh specimens. It has hitherto been assumed that *Z. mariellae* lives at depths of 100-200m. The discovery of intermediates living in relatively shallow water suggests that *Z. mariellae* may be found in as little as 20-30m depth. As the sea floor slopes very gently off this coast, this would place them approximately 20-30km off Broome and therefore within easy reach of SCUBA divers. These two recently discovered specimens represent one of the most exciting discoveries in the genus in recent times, filling a conchological gap between *Z. decipiens* and *Z. mariellae* for the first time.



Plate IV: Comparison between *Z. decipiens f. kimbacki* and *Z. mariellae*

Indeed, we can now appreciate a continuum between the two (Plate V). The species rank of *Z. mariellae* is thus justifiably challenged.



Plate V: A continuum between *Z. decipiens* and *Z. mariellae*

*Kim Back has contributed much to our knowledge of the deep water endemic Cypraeidae fauna from off the northern coast of Western Australia. He joined the WA Fisheries Research Department in 1974 as a biologist and worked in the Western Australia Scallop and Prawn Fisheries of Shark Bay, Exmouth Gulf, Nickel Bay and Onslow. Kim joined the Trawl Fishery of the Fisheries department in 1979 as an inspector principally on board foreign Taiwanese and Japanese fishing vessels that were given a special licence to research fish stocks off the Western Australian coast. He made the first trawled recordings of *Zoila jeaniana jeaniana* in Shark Bay, *Zoila jeaniana aurata* off Point Maud, *Zoila rosseii* off Point Quobba and *Zoila perlae eludens* in Exmouth Gulf. His extensive first hand knowledge of the habitat and distribution of these deep water cowries has now been applied in the first use of remote-operated vehicles (ROVs) to collect deep water *Zoila* off the Western Australian coastline. Kim is now a specimen shell dealer and an avid collector of the *Cypraea mappa* complex.

Bibliography

1. Raybaudi Massilia, L., 1983. La Conchiglia 176: 11-14
2. Wilson, B. & Clarkson, P., 2004. Australia's Spectacular Cowries: A Review and Field Study of Two Endemic Genera, *Zoila* and *Umbilia*
3. Meyer, C.P., 2003. Molecular systematics of cowries (Gastropoda: Cypraeidae) and diversification patterns in the tropics. *Biological Journal of the Linnean Society* 79: 401-459