

# A New Subspecies of *Leporicypraea rosea* (GRAY 1824) from the Red Sea, with Notes on the Name *alga* PERRY 1811 (Gastropoda: Cypraeidae)

By FELIX LORENZ, D-Buseck

With 2 Text-Figures and 8 Figures on Plates 1 + 2

## Keywords

Gastropoda, Cypraeidae, *Leporicypraea rosea*, new subspecies, Red Sea, *alga* PERRY 1811, nomen dubium.

## Abstract

*Leporicypraea rosea singularis* n. ssp. from the northern Red Sea differs from the East Africa *L. r. ultraviola* LORENZ & BRIDGES 2014 by its more numerous teeth, more inflated, slightly humped shell, the lower mass ratio and other conchological details. The recently proposed use of the name *alga* PERRY 1811 instead of *geographica* SCHILDER & SCHILDER 1933 is discussed.

## Zusammenfassung

*Leporicypraea rosea singularis* n. ssp. vom nördlichen Roten Meer unterscheidet sich von der Ostafrikanischen *L. r. ultraviola* LORENZ & BRIDGES 2014 durch zahlreichere Zähne, ein aufgeblähteres, leicht gebuckeltes Gehäuse, geringeres relatives Gewicht und andere conchologische Details. Die kürzlich vorgeschlagene Benutzung des Namens *alga* PERRY 1811, anstelle von *geographica* SCHILDER & SCHILDER 1933, wird diskutiert.

## Introduction

The *Leporicypraea mappa* (LINNAEUS 1758) species-complex is a highly diverse and widespread group of conchologically similar taxa, distributed across the Indo-Pacific. Two recent works elaborate on the complex: a description of a new subspecies by LORENZ & BRIDGES (2014), and a comprehensive review of all members of the complex by BERGONZONI & PASSAMONTI (2015). Due to its extreme rarity, the population from the northern part of the Red Sea has always been an enigma. I failed to obtain a specimen for many years, until in 2004, the late ISRAEL YERUSLAWSKI sold me an authentic specimen from Eilat, Israel (Paratype 2). Five years later, Dr. GABRIELLA RAYBAUDI had a display of map-cowries from her father's collection at a shell-bourse. There was a second "Red Sea *mappa*" among them, and as I picked it up she was

surprised I had spotted the shell among all the others. The label inside indeed stated "Eilat RRR" in Dr. LUIGI RAYBAUDI's handwriting. GABRIELLA sold me the shell at a symbolic price, with the remark "nobody else here would have a clue". This specimen is the Paratype 1 of the new taxon. Four diving expeditions to the Red Sea, covering the southern Sinai and southern parts of the Gulfs of Aqaba and Suez yielded a single fragment of a juvenile shell.

A few months ago, DAVID PRESTON, a diver and shell enthusiast from Australia directed me via Facebook to IBRAHEM "Mac" OLWY from Egypt, who happened to have no less than five (!) specimens, which I was able to acquire. These finally made the following description possible.

## Abbreviations

CLSF	CHIAPPONI LORENZ Seashell Foundation, Lecco, Italy
CT	columellar teeth
H/L	height/length ratio in %
H/W	height/width ratio in %
L	length (mm)
LT	labral teeth
mR	mass ratio
MSF	Molluscan Science Foundation, Inc., Dr. MICHAEL A. MONT, Owings Mills, Maryland, United States of America
MNHN	Museum National d'Histoire Naturelle, Paris, France
nl	normalized
W/L	width/length ratio in %

## Material and Methods

The morphometric analysis of shells considers only adult specimens of typical (not pathological) shape. Length, width, height, teeth-count, and weight were used to compare the shells. The results are presented in the formula proposed by BRIDGES & LORENZ (2012) as follows:

$L (W/L-H/L-H/W) LTnl : CTnl [mR]$

Raw shell measurements are listed as length  $\times$  width  $\times$  height (mm), (labral:columellar teeth, counted), and shell's weight (in grams).

*Leporicypraea rosea singularis* n. ssp.

**Material**

Seven live-collected specimens of the new subspecies, designated as holotype and paratypes, one fragment of a juvenile shell in CLSF No. 14152

Holotype: 75.2  $\times$  48.3  $\times$  41.0 (34:36) [39.3] Suez, Egypt; Coll. MNHN, Paris.

Paratype 1: 81.8  $\times$  50.5  $\times$  43.8 (31:37) [67.6] Eilat, Israel; Coll. LORENZ; Paratype 2: 76.3  $\times$  47.5  $\times$  41.9 (31:35) [56.3] Eilat, Israel; Coll. CLSF 10925; Paratype 3: 83.8  $\times$  48.1  $\times$  42.7 (35:34) [58.5] Suez, Egypt; Coll. MSF; Paratype 4: 79.0  $\times$  47.4  $\times$  42.3 (34:37) [46.7] Suez, Egypt; Coll. LORENZ; Paratype 5: 68.3  $\times$  41.4  $\times$  36.1 (32:35) [27.0] Suez, Egypt; Coll. LORENZ; Paratype 6: 66.7  $\times$  38.4  $\times$  32.8 (29:34) [27.2] Suez, Egypt; Coll. MSF.

**Formula:** 76 (61–53–87) 22:23 [10.9]

**Description**

The shell is large, inflated and humped dorsally. The base is convex, without notable step separating it from the margins. The development of callus is rather weak. The posterior extremity is rostrate and rather narrow. The labrum is narrow and pointed anteriorly. The spire is projecting, the protoconch partly covered with callus of the extremity. The borders of the anterior extremity are reduced and only slightly grooved. The aperture is slightly curved to the left towards the posterior end and widening anteriorly. The long terminal ridge constricts the canal on basal view. The teeth are fine and numerous, restricted to the aperture on both sides. They are slightly finer on columellar side, where they are restricted to the callused part of the base, while the columella is not calloused at all. The fossula is somewhat projecting and covered by ridges, which are thickened prolongations of the anterior columellar teeth.

The ground color is gray, with indistinct, darker dashes which are reminiscent of interrupted, wavy, embryonal banding. The basal and marginal callosities are whitish. The margins are densely spotted with small to medium-sized, distinct, brown spots, which continue on to the base, becoming smaller and less distinct towards the middle. There is a large, indistinct, somewhat darker blotch on the middle of the base. The

teeth, and their prolongations onto the fossula on columellar side, are bright orange-red.

The secondary dorsal pattern consists of brown, mostly longitudinal lines which confluent in some areas. The dorsal line is situated almost centrally. It is wide and blurred in the holotype. It has few finger-like branches of varying length left and right in most of the paratypes. The extremities are somewhat darker pink or red-brown.

The paratypes show little variation in the shape of the extremities, but some shells are slightly cylindrical. The two shells from the Gulf of Aqaba show slight development of marginal callus. The intensity of the purple color of the basal blotch and the marginal spots varies. In fresh shells, the purple color-elements are striking, but fade rapidly to grey-brown as the empty shell dries. The darker basal blotch is always present, but sometimes quite indistinct. The dorsal netting varies considerably in density and the degree in which the pattern condenses along the dorsal line and along the margins. In all shells, the netting abruptly stops far above the margins, forming a narrow, darker, wavy, longitudinal band. None of the specimens known shows regular round lacunae, only blurred indications.

Under UV light (365 to 400 nm) the entire shell shows a red fluorescence, which is most intense towards the extremities on basal view.

**Habitat and Distribution**

*Leporicypraea mappa singularis* n. ssp. is known only from three spots in the northern Red Sea. The type locality is Ain Sukhna, N Gulf of Suez, Egypt (29°39.7'N 32°22.7'E). Most paratypes were collected in this confined area, at 8-22 m under coral slabs and in crevices of reef. Two paratypes (1, 2) were found off Eilat, Israel, at 20-30 m. A recognizable fragment of a juvenile shell was found by the author on a rubble slope at 35 m at Sachwa Abu Galaba, northern Hurghada area, Egypt (27°17.4'N 33°47.6'E).

**Etymology**

The name *singularis* (Lat. alone, unique, unusual) refers to the isolate and rare occurrence in the northern Red Sea.

## Discussion

In their revision of the genus *Leporicypraea*, BERGONZONI & PASSAMONTI (2015) considered three populations from the Indian Ocean formerly assigned to *L. mappa* (LINNAEUS 1758) as subspecies of *rosea* (GRAY 1824), which they separated from *mappa* on species-level.

In the description of *mappa ultraviola*, we wrote:

"With the addition of *aliwalensis* (...) and *ultraviola* n. ssp., the Indian Ocean now has three subspecies of *mappa*, with a number of taxonomic consequences. First, it makes the name *rosea* a nomen dubium, due to the lack of an illustration and precise locality data, this name cannot be safely assigned to any of the subspecies in question. Secondly, the next younger available name of *mappa* from the Indian Ocean, *subsignata* (MELVILL 1888), becomes the name for the Mascarene populations, as it explicitly refers to a shell from St. Brandon, north of Mauritius. The illustration MELVILL refers to is in SOWERBY's Thesaurus Figures 24, 25 (...) and clearly shows a shell likely to be of that origin.

Therefore, *mappa subsignata* replaces *rosea* and refers to the population of *mappa* from the Mascarenes."

BERGONZONI and PASSAMONTI pointed out that GRAY referred to a "white shell" and noted that this feature separates Mascarene shells from those of the East African mainland. They hinted at the history of Mauritius as a French and British colony, and stated the availability of shells from that area at the time of GRAY. They proposed to retain *rosea* as name for the Mascarene populations and *subsignata* a synonym. Adding the aspect of taxonomic stability, their approach seems as justified as ours, but it also demands a lectotype of *rosea*, for which I am designating a shell from Mauritius, to be deposited in the MNHN (Figure 1). The consequences of their revision are, that in the Indian Ocean, the *mappa*-complex is represented by two species, *geographica* (see below) and *rosea*, which has four subspecies: *rosea rosea* (Mascarenes), *rosea aliwalensis* (South Africa), *rosea ultraviola* (East Africa and Madagascar, to the southern Red Sea) and *rosea singularis* (northern Red Sea).



**Text-Fig. 1:** Lectotype of *Leporicypraea rosea rosea* (GRAY 1824), 55.0 mm. Île Plate (also known as Flat Island), northern Mauritius. Coll. MNHN.

The new subspecies has first been illustrated by HEIMAN (2002, p. 31), who showed two shells from the Eilat area. The paratypes 3-6 of *r. singularis* have already been illustrated by BERGONZONI & PASSAMONTI (2015, fig. 18), who noted their similarity to *r. ultraviola*. The general appearance of the shell of *r. singularis* confirms their analysis. On closer comparison, there are numerous consistent differences which

separate it from all *rosea*-subspecies from the Indian Ocean. Shell formulae:

- L. r. singularis* n. ssp.: 76 (61–53–87) 22:23 [10.9]
- L. r. ultraviola* LORENZ & BRIDGES 2014:  
70 (59–50–85) 20:21 [14.8]
- L. r. aliwalensis* LORENZ 2002:  
67 (58–49–84) 19:20 [15.2]
- L. r. rosea* (GRAY 1824):  
60 (60–50–84) 20:22 [15.3]

The shell formulae reflect morphometric details that become apparent already on direct comparison: compared to its relatives, *r. singularis* is mostly larger and more inflated, with a rather humped dorsum ( $H/L = 53$ ). It is still wider than *r. ultraviola* and *r. rosea*, although it has no marginal callus that could influence the  $W/L$ . The next apparent feature is the finer and more numerous dentition on labral and columellar side. Although the difference of 2 normalized teeth seems small, it is visible on direct comparison of the shells, without counting. The most remarkable difference reflected by the formulae is the low mass ratio of all specimens from the Red Sea. It denotes that the inflated shell forms little callus compared to its relatives from the Indian Ocean. A structural difference not reflected by the formula is the narrowly rostrated posterior extremity in *r. singularis*, and the pointed instead of spatulate anterior tip of the labrum. The aperture is slightly wider than in *r. ultraviola* but comparable to *r. aliwalensis*. Other features such as the ground color and the distinctness of the basal blotch-like area are highly variable even within the seven paratypes. In most shells, the dorsal line is conspicuously wider and more irregular than in the other subspecies of *r. rosea*.

The distributions of *r. ultraviola* and *geographica* seem to extend into the southern part of the Red Sea, namely the Dahlak Archipelago. A specimen of *r. ultraviola* illustrated by BERGONZONI & PASSAMONTI (2015: plate 6 fig. 1) has an exceptionally high labral toothcount (32, which translates to 21 reduced teeth) but otherwise closely resembles specimens from the Indian Ocean. How far the population of *r. singularis* reaches south is unknown, but as it has never been found in the areas around the south of Hurghada, despite intense diving activities, it is suspected that the range is restricted to the north of Hurghada and the two Gulfs.

### Notes on the name *alga* PERRY 1811

In their revision, BERGONZONI and PASSAMONTI proposed to revive *alga* PERRY 1811 and used it as an earlier name for the species generally known as *geographica*. They postulated that the poor illustration in PERRY (Figure 2 A) shows enough evidence to allow this step (reproduced in italics), but there are as many arguments speaking against their viewpoint:

– *the name is based on an African specimen according to the author*. Even if the data available to PERRY was correct, there are five

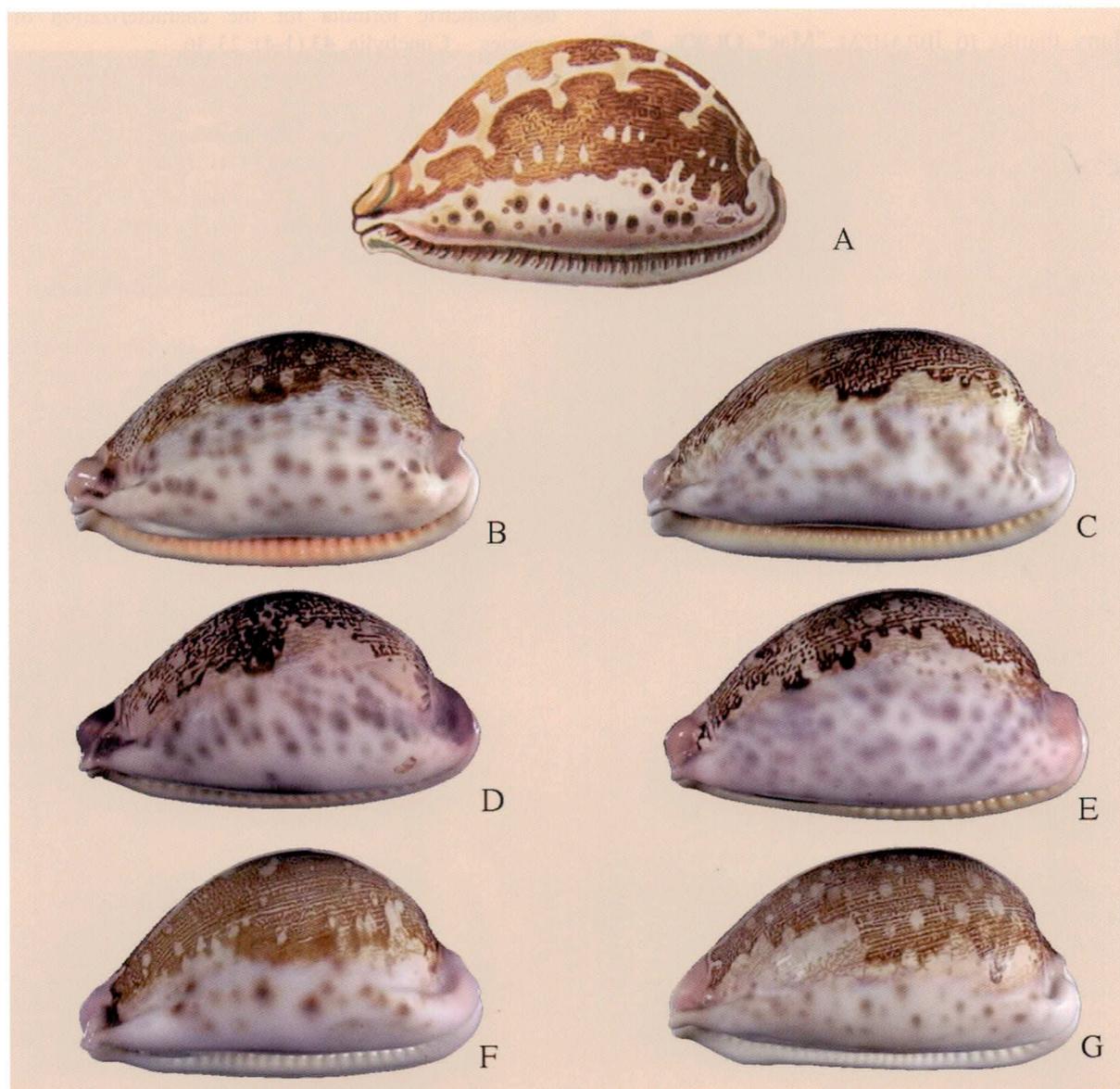
taxa of map-cowries along the coast of Africa, all of which may or may not be referred to the illustration and hence serve as candidates for the name *alga*. Shells from the Pacific can be as similar to it.

– *the base is unblotched*. An unblotched base with white callus can be found mainly in *mappa mappa*, while in *geographica* the base is always brownish. With no effort it is possible to find specimens of *r. rosea* (Figure 2 E), *r. aliwalensis* (Figure 2 D), and *r. ultraviola* (Figure 2 C), completely lacking a blotch, and more closely resembling PERRY'S figure of *alga* than any *geographica* on account of the coarser, confluent marginal spots characterizing that species.

– *the profile is arcuated*. More so, the dorsal profile is completely distorted: the anterior is way too strongly tapered, while the posterior is cut off, with a much too small extremity. A dome-shaped dorsal outline is also found in *mappa mappa* (Figure 2 G), *r. rosea* and other taxa of the complex. The most similar outlines were found in specimens of *r. aliwalensis* (Figure 2 D) and *mappa viridis* (KENYON 1902) var. *eluceta* (Figure 2 F).

– *the anterior right extremity is protruding*. The anterior extremities of *mappa*, *rosea* and *geographica* are variable and do not consistently differ, it is simply impossible to safely relate the illustration of *alga* based on this feature (Figure 2).

– *the teeth and lateral dotting is likely of a subfossil, old, faded, or ex pisce specimen*. The dorsal color is white (!) and not gray or reddish brown as in *geographica*, but the pattern is complete, of typical color and not faded or eroded as it would be in a subfossil or ex pisce shell. The teeth in PERRY'S figure show no color, which speaks in favor of *mappa* or *m. viridis*, but not *geographica*, in which the teeth are orange. The lateral spots are dark, small, distinct and sparse as in *mappa*, and not large and confluent as in *geographica*. The shell in the illustration has distinct circular lacunae which are rare in *geographica* but common in *mappa*. Finally, if the illustrated shell of PERRY really was faded, eroded, subfossil or disfigured in any other way, the reproduction of it was even more unsuitable for representing the concept of a species in a group of conchological look-alikes. Instead, PERRY'S illustration looks like the shell was in fresh condition, but it might have been a little subadult: note the barely produced posterior extremity and the discrete small lateral spotting, and... the lack of a basal blotch. All these features may hint at *alga* being based on a subadult shell, after all.



**Text-Fig. 2:**

**A:** The original figure of *alga* from PERRY, 1811.

**B-G:** Specimens of different taxa of *Leporicypraea*, all tilted and scaled to compare with the figure of *alga*. There is no way to safely assign the name *alga* to any of them; **B:** *geographica*, Tanzania. Note that the anterior extremity does not resemble *alga* at all, and the marginal spotting is coarser. The orange stain of the teeth are missing in the figure of *alga*; **C:** *rosea ultravioleta*, Tanzania. The dorsal profile is flatter; **D:** *rosea aliwalensis*, South Africa. Note the similarity of the dorsal profile. Spotting and the formation of the posterior extremity are quite different from the figure of *alga*; **E:** *rosea rosea*, Mauritius. Note the marginal callus. This specimen has no discernible basal blotch; **F:** *mappa viridis* var. *eluceta*, Kwajalein Atoll, Marshall Islands. This specimen shows the closest resemblance to the type figure of *alga* in terms of dorsal profile, pattern, coloration of the dorsum, the margins, and the teeth; **G:** *mappa mappa*, Philippines. As in F, coloration and pattern are remarkably similar to the type figure of *alga*, but the dorsal profile is less humped.

To me, there is no conclusive argument in favor of reviving *alga*. The strange illustration that combines both lateral views in a single shell could be based on any taxon in the *Leporicypraea mappa*-complex, as it shows only features that can be traced among shells of any population of map-cowrie. The resemblance of the figure of *alga* to

*mappa mappa* is at least as close or remote as to *geographica* or *rosea* and its subspecies. The lack of 1) a type specimen 2) a more precise locus typicus and 3) a reference to a better figure in another publication, makes it impossible to assign the name *alga* to any population of map-cowrie. It should be considered a nomen dubium.

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## Address of the author:

Dr. FELIX LORENZ  
Friedrich-Ebert-Straße 12  
D-35418 Buseck-Beuern, Germany  
E-mail: felix.lorenz@t-online.de

## Plate 1 (on opposite page 115)

- 1<sup>st</sup> row: *Leporicypraea rosea singularis*. 75.2 mm. Holotype. Ain Sukhna, N Gulf of Suez  
2<sup>nd</sup> row: *Leporicypraea rosea singularis*. 81.8 mm. Paratype 1. Eilat, Israel  
3<sup>rd</sup> row: *Leporicypraea rosea singularis*. 76.3 mm. Paratype 2. Eilat, Israel  
4<sup>th</sup> row: *Leporicypraea rosea singularis*. 83.8 mm. Paratype 3. Ain Sukhna, N Gulf of Suez

## Plate 2 (on page 116)

- 1<sup>st</sup> row: *Leporicypraea rosea singularis*. 79.0 mm. Paratype 4. Ain Sukhna, N Gulf of Suez  
2<sup>nd</sup> row: *Leporicypraea rosea singularis*. 68.3 mm. Paratype 5. Ain Sukhna, N Gulf of Suez  
3<sup>rd</sup> row: *Leporicypraea rosea ultraviola*. 68.6 mm. Holotype MNHN 26987. Mitsio Archipelago, N Madagascar  
4<sup>th</sup> row: *Leporicypraea rosea aliwalensis*. 68.0 mm. Aliwal Shoal, Natal, South Africa.

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### Plate 1



Explanation on opposite page 114

Plate 2



Explanation on page 114