

## A new subspecies of *Cypraeovula castanea* HIGGINS, 1868 (Gastropoda: Cypraeidae)

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### Figs 1-19

#### Keywords

*Cypraeovula castanea*, *iutsui atlantica*, *latebrosa*, Cape Agulhas, faunistic sub-provinces, South Africa.

#### Abstract

*Cypraeovula castanea malani* n. ssp. is described from the Cape Agulhas area. It is characterized by reduced size, fewer labral teeth, a steep fossula and short to reduced columellar teeth. It is conchologically intermediate between *Cypraeovula castanea castanea* HIGGINS, 1868 and *Cypraeovula iutsui atlantica* RAYBAUDI, 1988.

#### Zusammenfassung

*Cypraeovula castanea malani* n. ssp. wird aus der Gegend um Cape Agulhas beschrieben und von der Nominatform aus dem östlichen Verbreitungsgebiet durch geringere Größe und Unterschiede in der Bezahnung abgegrenzt. Es zeigt sich, dass auch *Cypraeovula castanea castanea* HIGGINS, 1868 innerhalb ihrer weiten Verbreitung entlang der südafrikanischen Küste in Unterarten aufgespalten ist, die geographisch denselben Grenzen folgen, die auch für andere Arten der Gattung gelten.

#### Abbreviations

FL = Collection FELIX LORENZ

MNHN = Muséum nationale d'Histoire naturelle, Paris, France

#### *Cypraeovula castanea malani* n. ssp. (Fig. 12-17)

**Material:** Seventeen fresh, diver-collected specimens, six of them live-collected. Data enumerated: length x width x height in mm (number of labral : columellar teeth, counted), depository. For comparison, 26 *Cypraeovula castanea castanea* HIGGINS, 1868 from Cape St. Francis and 19 from the Ciskei were available, eight further shells from areas inbetween these regions were studied. Additionally, 12 specimens of *Cypraeovula castanea latebrosa* SWARTS & LILTVED, in LILTVED 2000 for measurement and comparison.

Numerous specimens of *Cypraeovula iutsui iutsui* SHIKAMA, 1974 and *Cypraeovula iutsui atlantica* L. RAYBAUDI, 1988 were also studied. The shell formula was calculated based on the procedure suggested by LORENZ 2002, a modified version of the formula introduced by F. A. SCHILDER & M. SCHILDER 1938.

Holotype: 28.9 x 19.4 x 16.4 (17 : 14), Danger Point, coll. MNHN21235, Fig. 12.

Paratype 1: 31.3 x 21.0 x 18.3 (21 : 14), Cape Agulhas, coll. FL, Fig. 13.

Paratype 2: 31.4 x 18.9 x 17.1 (20 : 13), Cape Agulhas, coll. FL, Fig. 14.

Paratype 3: 28.8 x 19.7 x 17.1 (17 : 14), Cape Agulhas, coll. FL, Fig. 17.

Paratype 4: 32.9 x 21.0 x 17.6 (16 : 17), Danger Point, coll. FL.

Paratype 5: 30.0 x 19.8 x 16.5 (19 : 14), Danger Point, coll. FL, Fig. 15.

Paratype 6: 34.1 x 24.0 x 20.5 (19 : 18), Danger Point, coll. FL, Fig. 16.

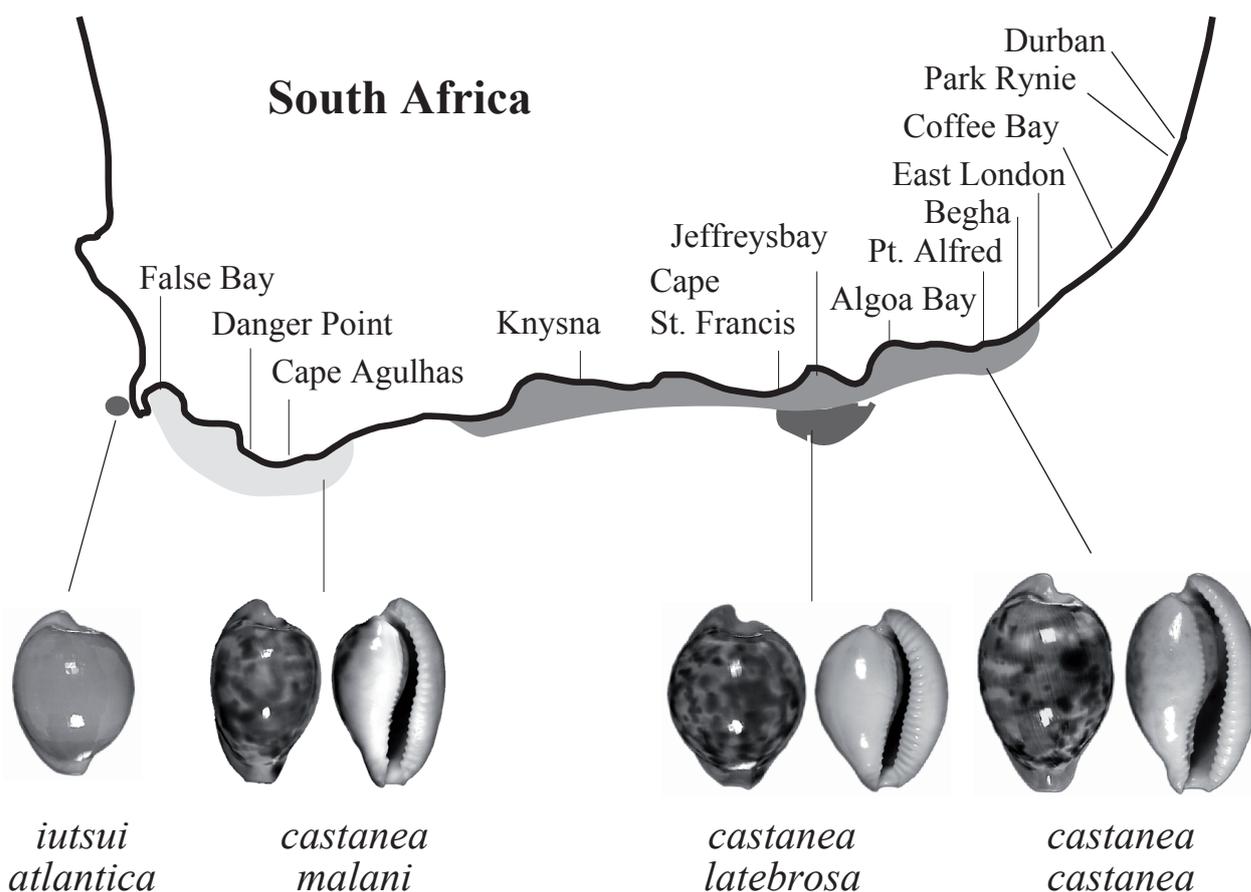
Paratype 7: 30.9 x 19.4 x 17.5 (20 : 18), Cape Agulhas, coll. JAN DEPREZ, Belgium

Paratype 8: 29.3 x 19.2 x 16.9 (18 : 15), Danger Point, coll. MIKE BROOKS, England

Paratype 9: 32.1 x 20.9 x 18.6 (17 : 15), Danger Point, coll. ANDREY KOSTIN, Russia

plus seven additional paratypes

**Description:** The holotype is medium sized and solid, of elegantly pyriform shape with a rounded dorsal dome. The spire is deeply umbilicate, covered with callus. The extremities are short and callused, the labral margin evenly callused and slightly angular. The anterior extremity is slightly pointed on both sides of the aperture. The base is convex and callused. The aperture is rather narrow and somewhat curved behind. The labral teeth are strong, extending onto the labrum, reaching the margin anteriorly. On columellar side, the teeth are minute, restricted to the



**Fig. 1:** Distribution map of subspecies of *Cypraeovula castanea* HIGGINS, 1868 and *Cypraeovula iutsui atlantica* L. RAYBAUDI, 1988, after LORENZ 2002, modified.

aperture throughout. There are weak crenulations extending onto the columella midways, the fossula region is steep, with two weak fossular teeth. The dorsum is covered with orange-brown mottling, leaving an indistinct dorsal line. The extremities are darker brownish dorsally. There are several weak darker tubercles along the labral margin. The base is plain white, the ground color of the dorsum slightly pinkish. The labral teeth are very indistinctly darker anteriorly. The shell's surface is glossy except of the basal part of the labrum which is slightly dull.

The paratypes show a great variability in all conchological features: some specimens (No. 2, 4, 5 and 7 are elongate, with little callus-development on margins and base, whereas some specimens are more inflated, with strong development of callus and notably darker tubercles along the sides (No. 1, 3 and 6). There may be large dark spots especially along the columellar side of the margins. All specimens have distinct dorsal pattern, which in some shells may be more saturate than in others. In some specimens, the columellar teeth become indistinct to obsolete in the posterior half. In more callused specimens, there is a callus-ridge along the anterior section above the fossula region (No. 1, 2 and 6)

The animal has a thick mantle with long, fingerlike papillae of class 2 a,b (after LORENZ & HUBERT 1993). The mantle and foot are greyish to yellow, with numerous irregular black stains. The radula characteristics are unknown.

**Habitat and distribution:** The locus typicus is offshore Danger Point, further specimens have been collected alive at Cape Agulhas and off False Bay, in the western limit of the Indian Ocean side of the South African coast (Fig. 1). Living shells have been collected by divers at depths ranging from 28 m to 45 m, on different types of rocky reef, hidden among soft corals and sponges. Empty shells cast ashore at Cape Agulhas and the Gaansbay area. A single specimen was dredged from 51 m off False Bay.

**Etymology:** Named in honour of JACQUES MALAN who collected some of the paratypes together with the second author.

**Discussion:** Typical *Cypraeovula castanea castanea* HIGGINS, 1868 [39(64–54)18:17] (Fig. 2) are rather large, elongate-oval, with little development of callus. The labral teeth are distinctly stained with reddish brown, the margins are unspotted. The columellar teeth are small but distinct throughout. The aperture is wide, the fossular region is gently sloping, the columellar teeth are extending into the aperture and across the anterior basal part of the extremity. *Cypraeovula castanea malani* n. ssp. differs in being smaller, more solid and slightly more inflated. The labral teeth are less distinctly stained, sometimes completely colorless. The base is more callused. The fossula is steep, the anterior columellar teeth hardly extend onto the extremity. The columellar teeth are less distinct and tend to become obscured

posteriorly. The aperture is slightly narrower but often more curved. The anterior extremity is more pointed rather than rounded as in typical *castanea*. The more inflated specimens of *malani* n. ssp. show great resemblance to *Cypraeovula iutsui* SHIKAMA, 1974, and especially its western subspecies *atlantica* L. RAYBAUDI, 1988, whose distribution neighbours that of *malani* n. ssp. The basal aspect of paratype 5 of *malani* n. ssp. is nearly identical to that of a specimen of *iutsui atlantica* we studied. The first specimen of *malani* n. ssp. that was collected by the second author (paratype 3) was provisionally identified as a new form of *iutsui*, only when further specimens were collected the affinity to *castanea* was more obvious. A deeper water subspecies from the Cape St. Francis area was described as *Cypraeovula castanea latebrosa* SWARTS & LILTVED, in LILTVED 2000 [32(67–59)19:17]. It is characterized by being heavier and more inflated, with a stronger tendency to show lateral spots and tubercles. Such shells are known from depths of 70 to 150 m, the conchological features become more enhanced with increasing depth. Also the specimens of *malani* n. ssp. show variations in shape and the degree of callosity, yet retaining the characteristic differences in dentition and fossula structure described above. However, those shells were all diver-collected and in the case of *malani*, no bathymetrical component seems to influence the *latebrosa*-like appearance especially obvious in paratype No. 6.

*Cypraeovula castanea castanea* HIGGINS, 1868 is a widespread species along the South African coast. Empty shells cast ashore as far east as Begha, Ciskei. Living shells (probably of another yet undescribed new subspecies see Fig. 6) have been dredged off Port Alfred, divers have

confirmed the centre of population to be in the Cape St. Francis area (LILTVED 2000). LORENZ (2002) discussed the zoogeography of the South African *Cypraeovula*-species and subdivided 7 provinces in which the species show conchological differences following the zoogeographic boundaries. Most species have been subdivided into several subspecies along their distributions, except for *C. castanea*, which was thought to be represented by just one subspecies in shallower waters within the provinces 2 and 6, on account of the poor availability of well preserved shells from places other than Cape St. Francis. The recent findings of the species in the western part of the Indian Ocean further supports the geographic pattern of *Cypraeovula*, as the province called “Cape of Good Hope to Cape Agulhas, KR 1/2” (see LORENZ 2002) bears further characteristic subspecies of other *Cypraeovula*-species (*C. coronata coronata* HIGGINS, 1864; *C. fuscudentata grohorum* LORENZ, 2002; *C. fuscorubra gondwanalandensis* BURGESS, 1970 and a subspecies of *C. fuscorubra algoensis* n. ssp. whose description is in preparation). It is so far uncertain where exactly the eastern border to the Cape Agulhas to Cape St. Francis-region (No. 3 in LORENZ 2002) lies. Divers have repeatedly found specimens of *Cypraeovula castanea malani* n. ssp., on low and high profile reefs at 30 to 45 m depth, along the coast between Danger Point and Cape Agulhas, South Africa. First findings of these western shells have been made in 1959 by a research vessel of the University of Cape Town dredged a typical *malani* n. ssp. off False Bay. This shell is illustrated in BURGESS 1985 p. 32. The repeated findings made by the second author and Jacques Malan finally confirm the conchological characteristics of this remarkable new addition to the South African fauna.

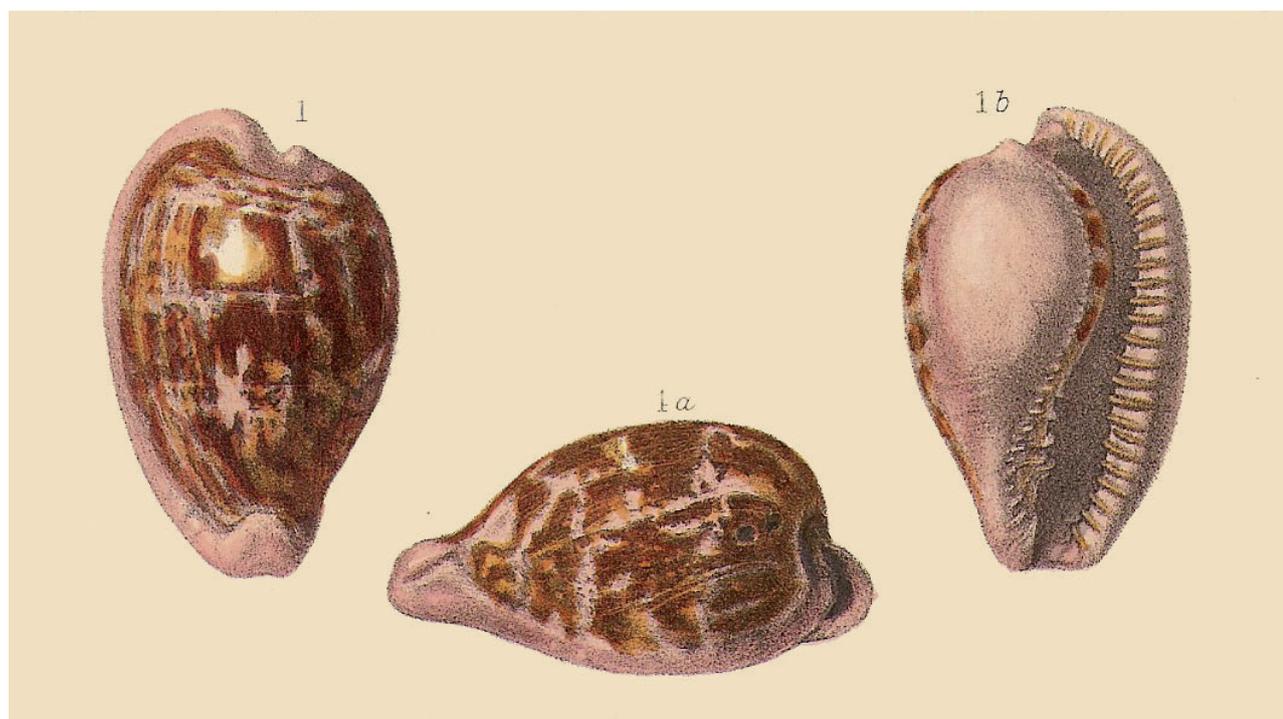


Fig. 2: Holotype of *Cypraeovula castanea castanea* HIGGINS, after G. B. SOWERBY II (1870)

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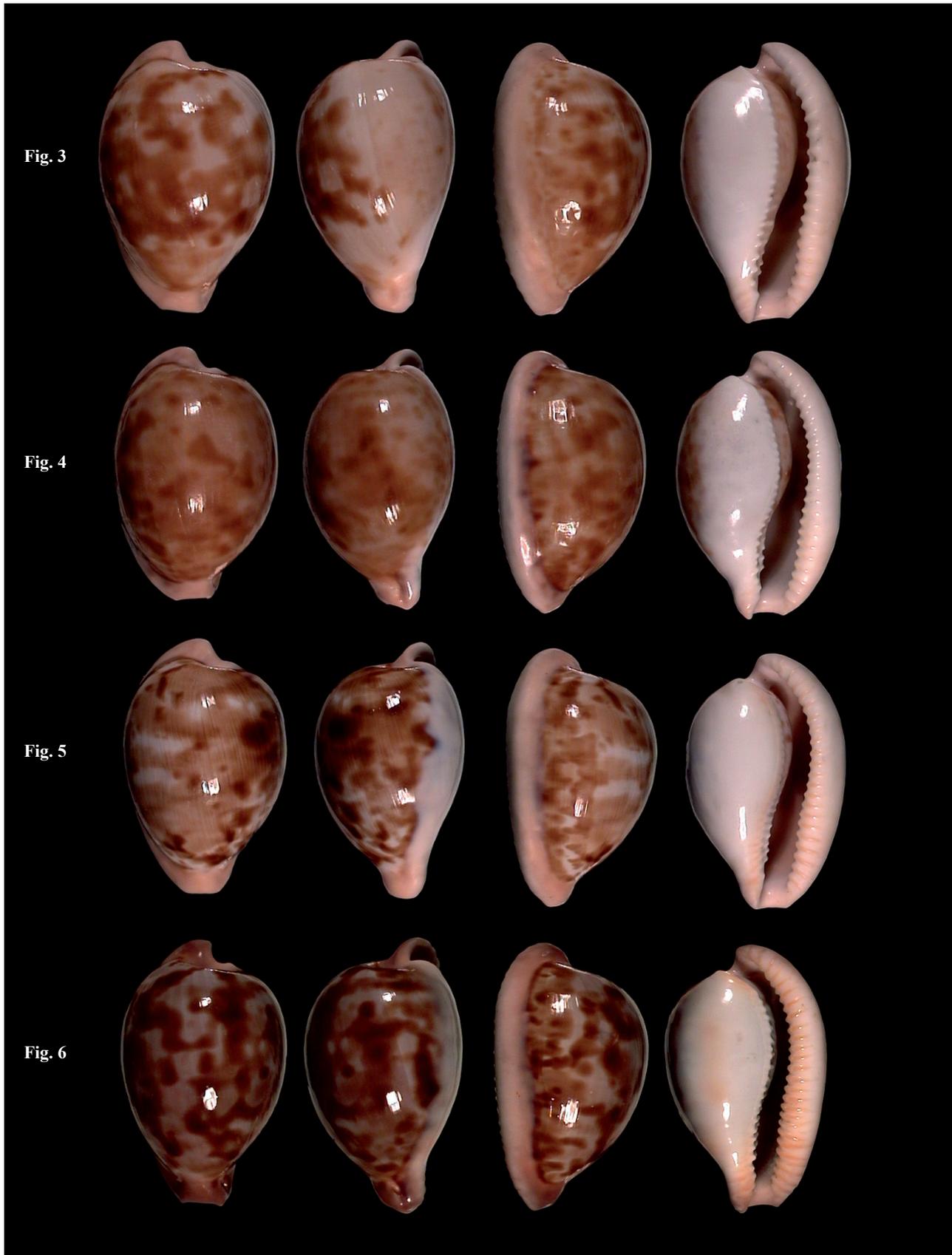
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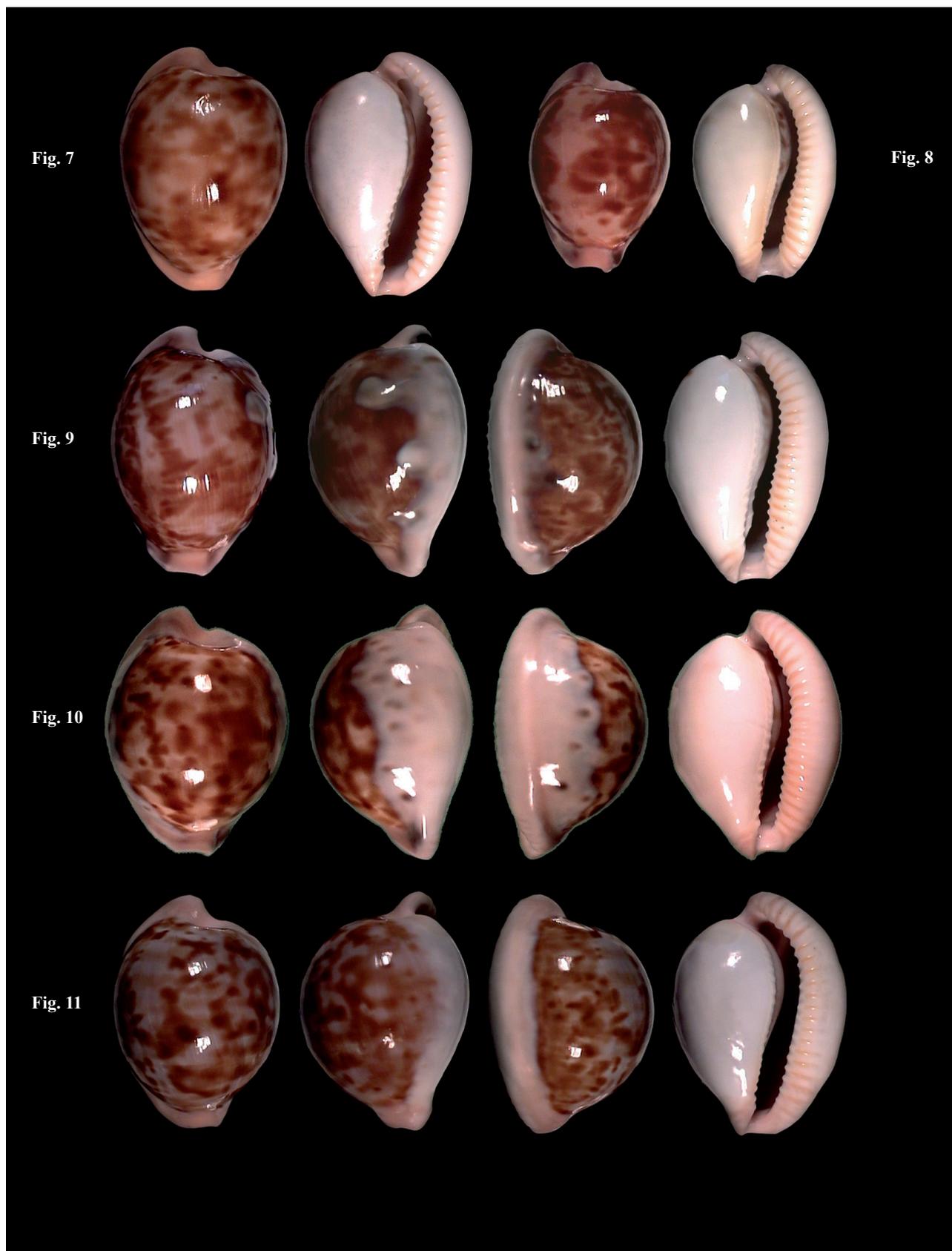
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**Fig. 3-5:** *Cypraeovula castanea castanea* HIGGINS, 1864.

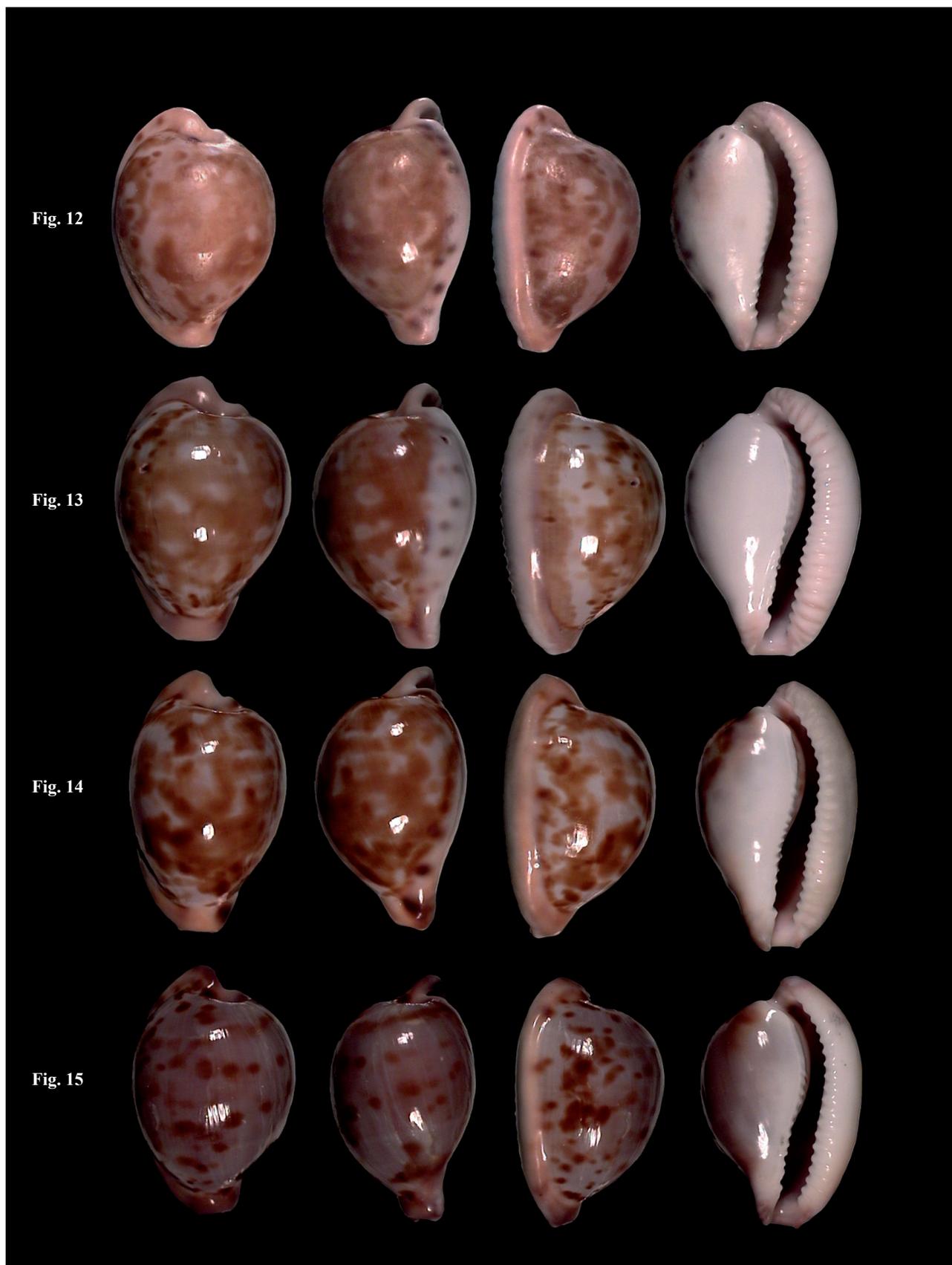
**Fig. 3:** 42.2 mm, Cape St. Francis area, 40 m; **Fig. 4:** 39.1 mm, Jeffreysbay area, 40 m; **Fig. 5:** 40.4 mm, Cape St. Francis area, 36 m; **Fig. 6:** *Cypraeovula castanea* ssp.?, 38,2 mm, Port Alfred area, 40 m



**Fig. 7:** *Cypraeovula castanea castanea* HIGGINS, 1864; 35,0 mm, Jeffreysbay area, 45 m - heavy shelled; 28.7 mm, Cape St. Francis area, 75 m;

**Fig. 8-11:** *Cypraeovula castanea latebrosa* SWARTS & LILTVED, in LILTVED 2000.

**Fig. 8:** 28.7 mm, Cape St. Francis area, 75 m; **Fig. 9:** 34.3 mm, Cape St. Francis area, 80 m; **Fig. 10:** 35.4 mm, Cape St. Francis area, 80 m; **Fig. 11:** 31.8 mm, Cape St. Francis area, 90 m.



**Fig. 12-15:** *Cypraeovula castanea malani* n. ssp.

**Fig. 12:** 29.3 mm, Danger Point, 35 - 40 m, Holotype; **Fig. 13:** 31.3 mm, Cape Agulhas, 35 - 40 m, Paratype 1.

**Fig. 14:** 31.4 mm, Cape Agulhas, 35 - 40 m, Paratype 2; **Fig. 15:** 30.0 mm, Danger Point, 35 - 40 m, Paratype 5.

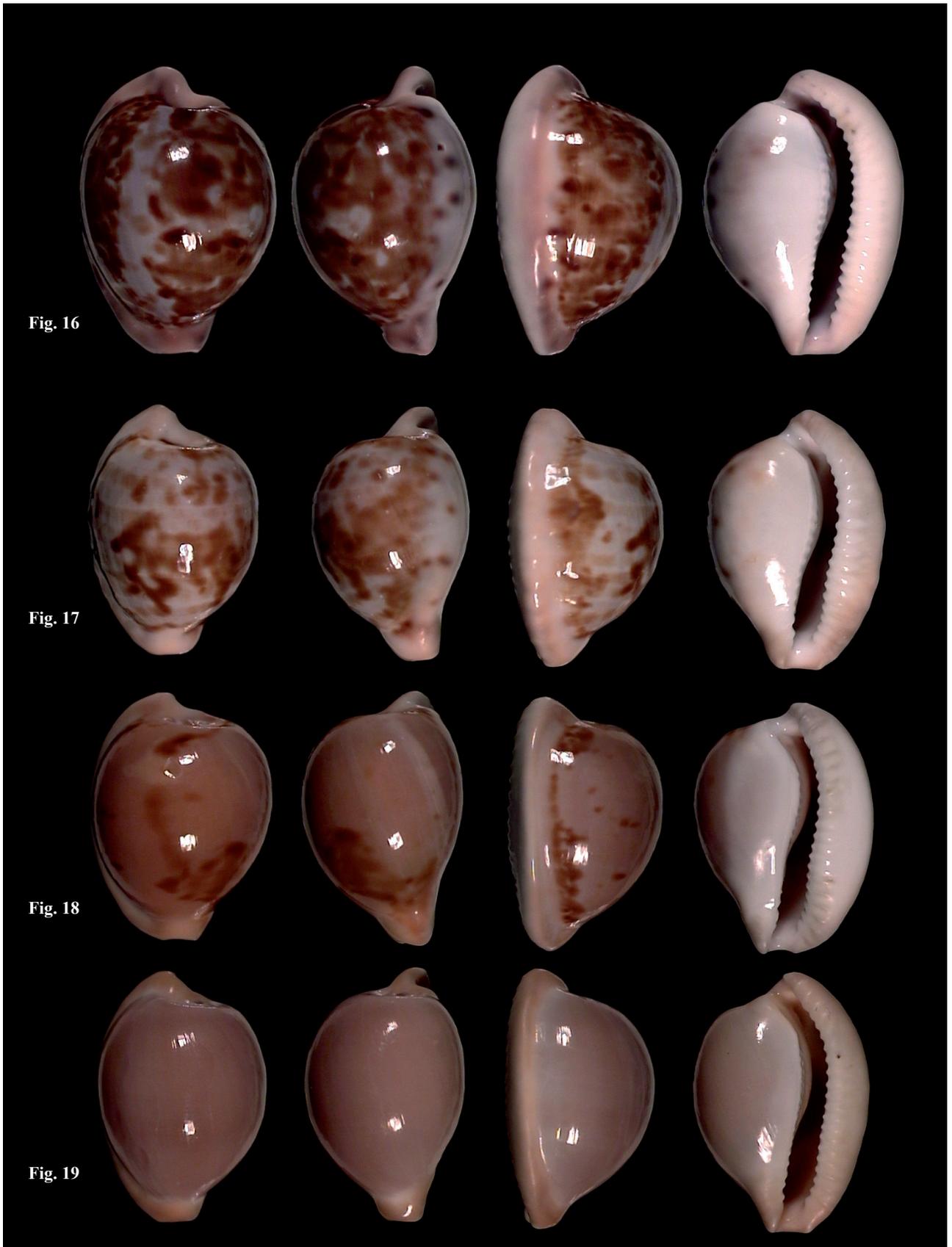


Fig. 16

Fig. 17

Fig. 18

Fig. 19

Fig. 16-17: *Cypraeovula castanea malani* n. ssp.

Fig. 16: 34.1 mm, Danger Point, 35 - 40 m, Paratype 6; Fig. 17: 28.8 mm, Cape Agulhas, 35 - 40 m, Paratype 3.

Fig. 18-19: *Cypraeovula iutsui atlantica* L. RAYBAUDI, 1988.

Fig. 18: 29.0 mm, Kommetjie, Western Cape, 55 m; Fig. 19: 28.9 mm, Kommetjie, Western Cape, 48 m.