

**Iconography and Distribution of the Cape Verde Island Abalone,
Haliotis tuberculata fernandesi Owen & Afonso, 2012, with Comparisons to
H. tuberculata coccinea Reeve, 1846, of the Canary Islands**

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ABSTRACT Specimens of *Haliotis tuberculata fernandesi* collected from Santa Luzia Island, Cape Verde Islands, are illustrated to provide additional representatives of this subspecies. Comparisons are made with *Haliotis tuberculata coccinea* Reeve, 1846, of the Canary Islands. Differences in shell morphology between the two subspecies are discussed in greater detail.

INTRODUCTION

The Cape Verde Islands, located nearly 600 km off the west coast of Senegal, are the southernmost archipelago in Macronesia and are unique amongst these island groups in possessing a mixture of marine fauna and flora composed of tropical (often amphi-) Atlantic and warm temperate Mediterranean - Atlantic elements, as well as extensive endemics (Afonso *et al.* 2008; Afonso & Tenorio 2011; Duda & Rolán 2004; John *et al.* 2004; Lüning *et al.* 1990; Morri *et al.* 2000; Wirtz 2001, 2009).

Haliotis tuberculata fernandesi Owen & Afonso 2012, the southernmost subspecies of *H. tuberculata* in the Cape Verde Islands, represents an endemic derived from the warm temperate Atlantic (Wirtz 2001; Owen & Afonso 2012). When *Haliotis tuberculata fernandesi* was initially described in 2012, only a handful of specimens were known from collections and were limited to Boavista, Sal, and São Vicente Islands (Owen & Afonso 2012; Fig. 1). Additional specimens were also reported from Santa Luzia and Santiago Islands, but were not available for study (Fig. 1). Recently, collected material from Santa Luzia

Island provides additional examples of *Haliotis tuberculata fernandesi* and reinforces the subspecific designation of this taxon in comparison to other Eastern Atlantic haliotids, particularly *H. tuberculata coccinea*. The aim of this report is to provide additional images of the Cape Verde subspecies of *Haliotis tuberculata*, characteristics that separate it from *H. tuberculata coccinea*, and an updated distribution map of the Cape Verde abalone.

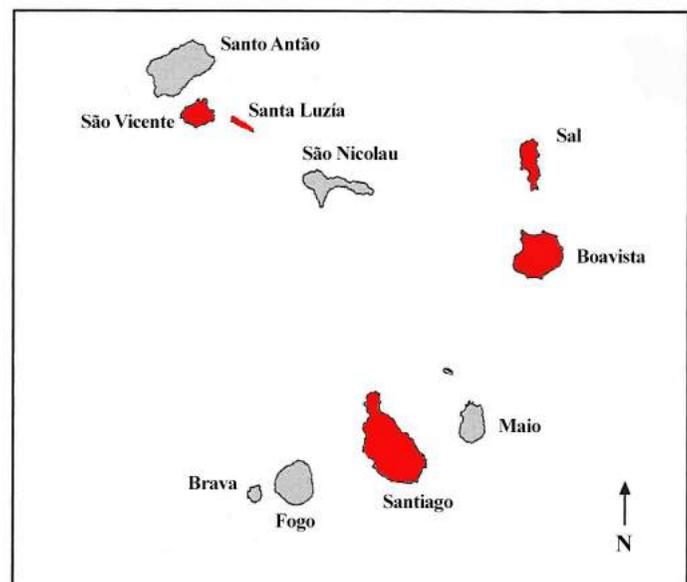


Fig. 1. Map of Cape Verde Islands. (Islands specimens taken from are shaded in red)

Material and Methods: Shells were faintly moistened with mineral oil and the excess was wicked away. Specimens were photographed with a Canon A650 digital camera (12 megapixel resolution) or scanned with a HP ScanJet G 4010 scanner.

Abbreviations of collections:

BOC: Buzz Owen Collection, Gualala, California, USA; DDC: Dwayne Dinucci Collection, Union City, California; FFC: Franck Frydman Collection, Paris, France; NMNZ: Museum of New Zealand Te Papa Tongarewa, Wellington, New Zealand; PRC: Peter Ryall Collection, Austria; RFC: Ramiro Fladeiro Collection, Valhascos, Portugal; RKC: Robert Kershaw Collection, Narooma, NSW, Australia.

Material Examined: *Haliotis tuberculata fernandesi*, Cape Verde Islands, >80 shells; *H. tuberculata coccinea*, Canary Islands, >100 shells.

Taxonomic Note: The type specimen of *H. tuberculata coccinea* (described in Reeve, 1846, as *Haliotis coccinea*) is incorrectly attributed as being from “Cape Verd Islands”. However, the strong spiral ribbing and bright red coloration of the specimen are indicative of the Canary Islands population (Geiger & Owen, 2012).

RESULTS

Four photo plates are included and show the differences between these two *Haliotis tuberculata* subspecies: three illustrate 45 specimens of *H. tuberculata fernandesi* from the Cape Verde Islands, and a single plate illustrates 15 shells of *H. tuberculata coccinea* from the Canary Islands. The latter were selected from five different islands in the archipelago. Most of the Cape Verde material was collected from Santa Luzía Island from March - July 2015.

Description: Most Santa Luzía Is. shells of *H. tuberculata fernandesi* are similar in coloration to specimens collected from the other islands in the Cape Verde archipelago (particularly Sal Island), usually moderate pink to dark purple-red. However, the large sample size also shows other color variants including brown and (mostly) yellow specimens. Additionally, many of the shells are marked with bright flammæ or display patches of green, white, brown and yellow. Specimens lack strong spiral ribbing, being smooth or with very faint and shallow ribs (Pl. 3). By contrast, *H. tuberculata coccinea* (Pl. 4) has very deep and pronounced ribbing, with an occasional exception (bottom row this plate). They also lack purple-red coloration, which is the dominant color form in the Cape Verde Island subspecies.

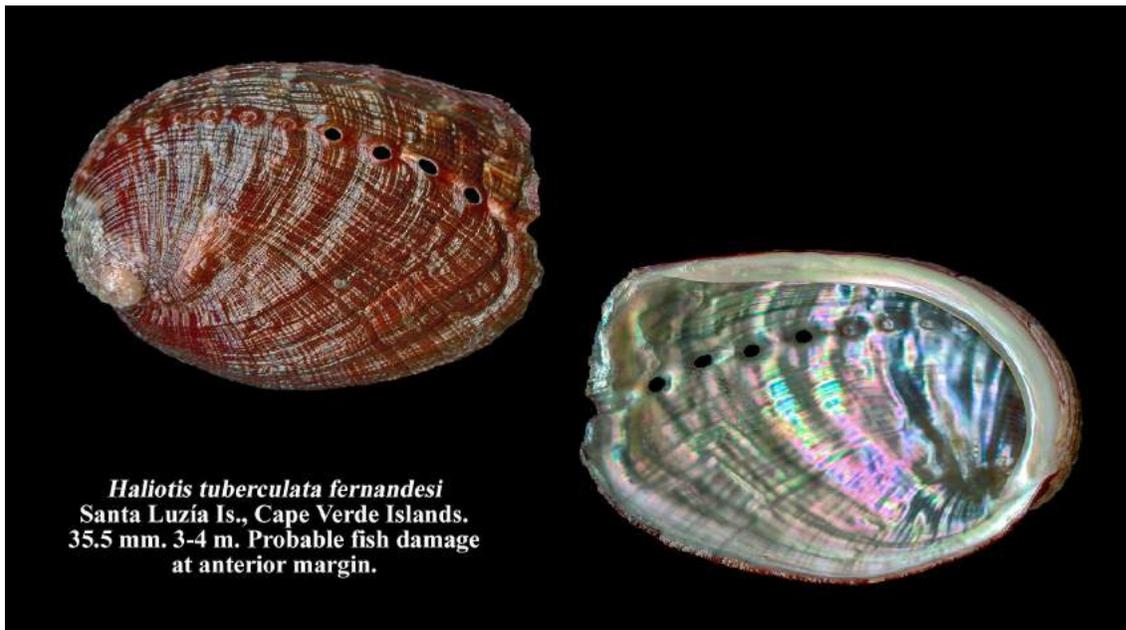
Biological Note: Of the greater than 75 specimens examined from Santa Luzía Island, approximately 25% exhibit predation damage at the anterior margin (Plate 3). Each of these specimens survived a predation attempt and later deposited new shell growth. Interestingly, this predation damage is similar to that produced by labrid (wrasse) or balistid (triggerfish) reef fish. Similar damage can be observed among shells of *Haliotis rubiginosa* Reeve, 1846, from Lord Howe Island (Owen, pers. obs.).

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Haliotis tuberculata fernandesi
 Santa Luzia Is., Cape Verde Islands.
 35.5 mm. 3-4 m. Probable fish damage
 at anterior margin.



Plate 1. *Haliotis tuberculata fernandesi* Owen & Afonso, 2012. Cape Verde Islands, various localities.

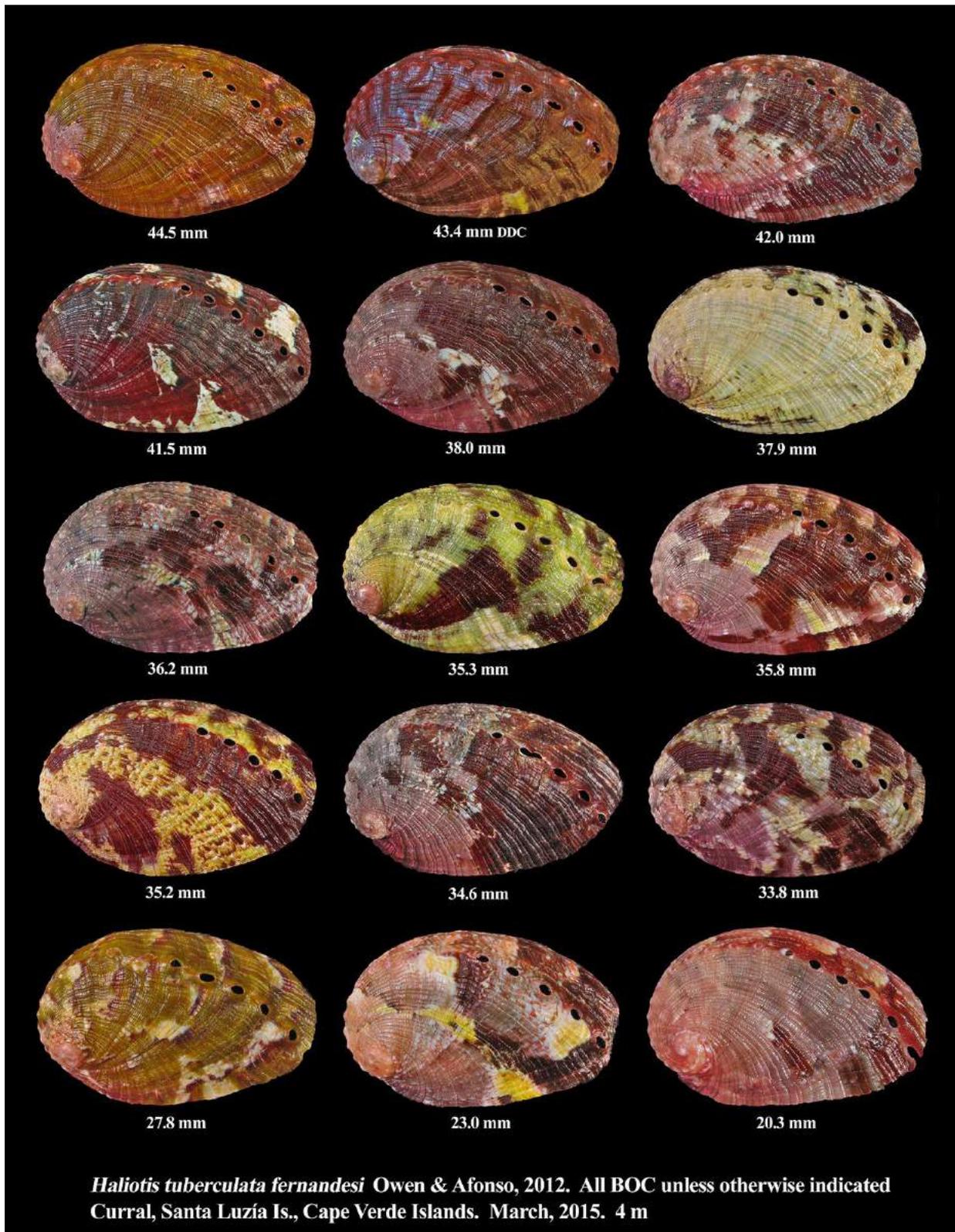


Plate 2. *Haliotis tuberculata fernandesi* Owen & Afonso, 2012. Buzz Owen Collection. Curral, Santa Luzia Is., Cape Verde Is.

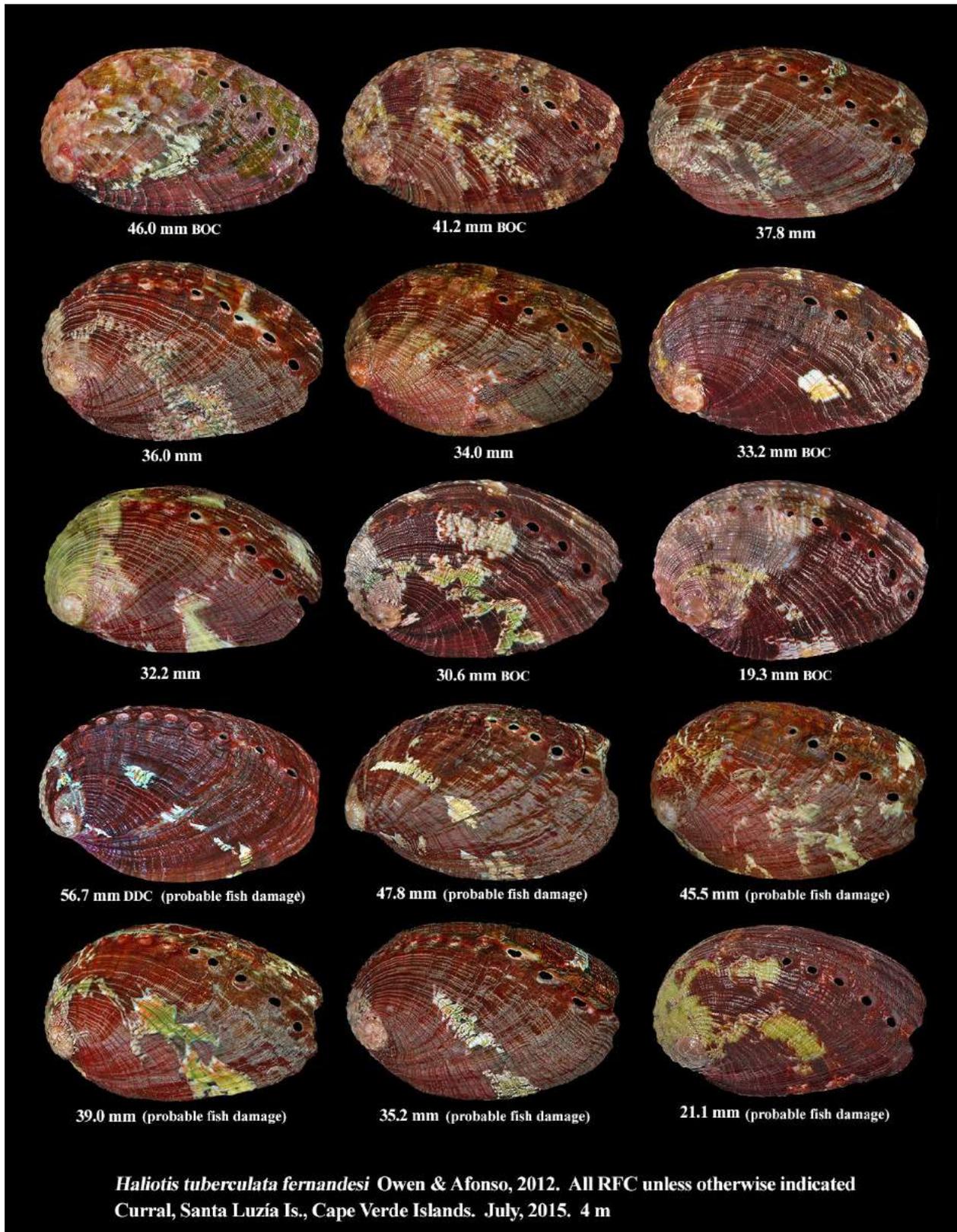


Plate 3. *Haliotis tuberculata fernandesi* Owen & Afonso, 2012. Ramiro Fladeiro Collection. Curreal, Santa Luzia Is.

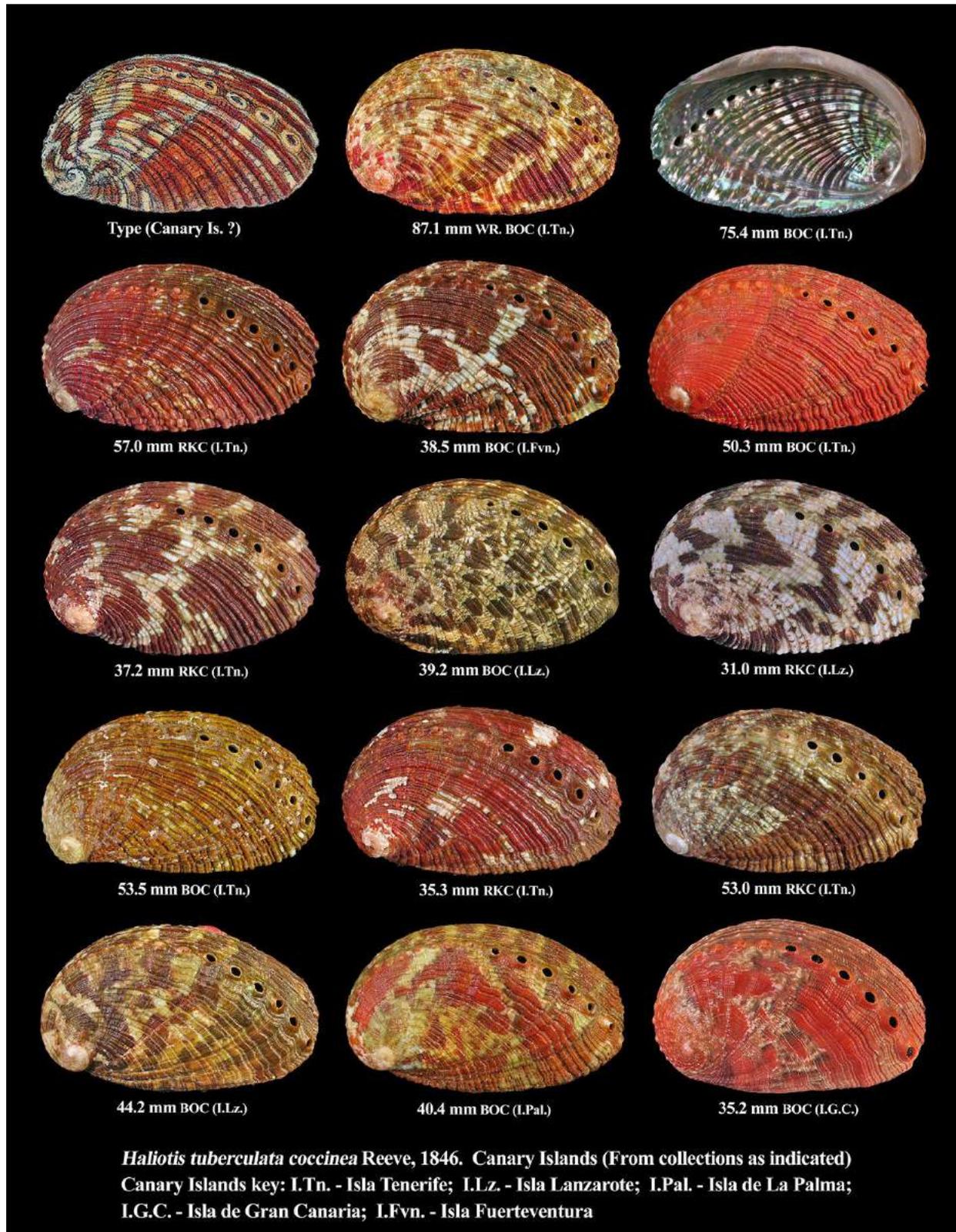


Plate 4. *Haliotis tuberculata coccinea* Reeve, 1846. Canary Islands.