

3-1985

Notes on the Distribution and Ecology of the Western Atlantic Abalone, *Haliotis pourtalesii* Dall, 1881 (Mollusca: Gastropoda)

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DOI: 10.18785/negs.0702.03

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Recommended Citation

Titgen, R. H. and T. J. Bright. 1985. Notes on the Distribution and Ecology of the Western Atlantic Abalone, *Haliotis pourtalesii* Dall, 1881 (Mollusca: Gastropoda). *Northeast Gulf Science* 7 (2). Retrieved from <https://aquila.usm.edu/goms/vol7/iss2/3>

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Short Papers and Notes:

NOTES ON THE DISTRIBUTION AND ECOLOGY OF THE WESTERN ATLANTIC ABALONE, *Haliotis pourtalesii* DALL, 1881 (MOLLUSCA: GASTROPODA)

The small abalone *Haliotis pourtalesii* Dall, 1881, was discovered by Count Pourtales in 1869 on rocky bottom just off the Florida Reefs (Henderson, 1915). The single specimen, along with the other mollusks from the Bibb collection, was sent to the U.S. National Museum in Washington, D.C. In 1870, Dall examined the specimens from the Bibb collection. He took special note of the single haliotid because it was the first to be found in the western Atlantic (Henderson, 1915). This was fortunate because the collection was sent to Dr. William Stimpson at the Chicago Academy of Sciences and was subsequently destroyed in the Chicago fire of 1871. Dall (1881) published the description of *Haliotis pourtalesii* from memory in his preliminary report of the Blake Expedition.

The interesting history of this species' discovery, destruction of the type specimen, and misidentification from the Galapagos Islands is reported in the literature (Dall, 1881; Henderson, 1911, 1915; Foster, 1946; and Harry, 1966). Of present interest is the fact that only one live specimen seems to have been reported in the literature. Though not noted in the original description (Dall, 1881), Dall (1889) stated that the "original type of *H. pourtalesii* contained the animal."

A number of *Haliotis pourtalesii* shells have been collected during cruises conducted by Texas A&M University around hard banks in the northwest Gulf of Mexico (Table 1, "Present

Study"). In 1978, two live specimens were collected, one each from Little Sister and Sidner banks. These were photographed and kept alive several days for observation. Two live specimens had previously been collected at the West Flower Garden Bank.

Due to the destruction of the holotype of *Haliotis pourtalesii* there has been no description of the soft parts of the animal. Therefore, a brief description of the vivid color pattern is given, with notes on the animal's habitat, behavior, and distribution.

DESCRIPTION

The original description of *Haliotis pourtalesii* is inadequate, having been done from memory ten years after observation. In 1911, Henderson collected a single shell near the type locality from which he redescribed the species. This specimen was designated the neotype (USNM No. 271601), replacing the destroyed holotype (Henderson, 1915).

The shell is small, delicate and reddish-orange (brick red) in color, tending to be darker toward the apex in live specimens (Figure 1). A tan line runs distally from each of the branchial holes toward the aperture. There was mucous over the shell's surface, but this may have been due to handling. No fouling was observed. There is no muscle scar. The shell's interior is iridescent, the major colors being pink and green. The columella is pearly white. The largest recorded shell has a length of 30 millimeters (Guice, 1969).

The cephalic tentacles are yellowish-tan in color with a thin longitudinal, dark line on the dorsal surface (Figure 1). They are also banded with several thick and thin dark rings. The foot is large, oval and tan colored on the bottom. The sides of the foot



Figure 1. Dorsal view of *Haliotis pourtalesii* Dall, 1881.



Figure 2. Ventral view of *Haliotis pourtalesii* Dall, 1881. Note that foot is folded medially.

are yellowish to tan with reticulated dark lines and markings (Figure 2). The epipodium is yellowish with large and small sensory tentacles. The large tentacles originate from a U- or V-shaped dark mark. Judging from the tan and green colors of the gonads of the two 1978 specimens, a male was collected at Little Sister Bank and a female at Sidner Bank.

HABITAT

Most records of *Haliotis pourtalesii* are based on shells that have been dredged or collected with a bottom grab (Dall, 1881; Henderson, 1915; Foster, 1946; Parker, 1960; Harry, 1966; Jung, 1968; Sarasua, 1968; Guice, 1969; and the present study). This collecting has commonly been done in sand, but there is reference to rocky areas (Henderson, 1915; Parker, 1960; Harry, 1966; and Sarasua, 1968). The empty shells are collected in sand, having been washed off hard banks or from rocky areas. As with other abalones, *Haliotis pourtalesii* lives on hard substrata. However, abalones may prefer areas where sand is present (Cox, 1962).

The live specimen from Little Sister Bank was found on an algal nodule taken with a rock dredge. The Sidner Bank specimen was on the shell of an Atlantic thorny oyster, *Spondylus americanus* Hermann, 1871, taken from the algal nodule zone by the Texas A&M University submersible Diaphus. Both of the live specimens from the West Flower Garden Bank were collected in the depth zone where algal nodules occur. One of these was collected by the Diaphus and the other with a van Veen grab sampler. The southwest Florida specimen (Table 1, Martin unpub.) was dredged from an *Agaricia* plate coral assemblage.

Finding the live haliotids on hard

substrata is not surprising and helps explain why so few have been collected. Hard substrates are difficult to sample and the depth range for *Haliotis pourtalesii* is too deep for SCUBA diving operations. Live specimens have been collected from depths of 57-366 meters, and empty shells have been collected from a depth range of 37-183 meters (Table 1). This species may not be as rare as records indicate, but it is unlikely that many live *Haliotis pourtalesii* will be collected. Although these small abalones seem not to be subject to incrustation, recognition in its natural habitat is difficult due to its cryptic behavior and coloration.

Because so few live specimens have been collected, no data exist on population levels. Generally, only a few empty shells have been collected at any locality. However, 101 shells were collected during a commercial sand dredging operation in Cuba (Sarasua, 1968).

BEHAVIOR

Observations of the two live specimens aboard ship in 1978 indicated certain behavioral patterns. The specimens were placed in trays along with a few algal nodules. Movement occurred primarily at night or early morning. No attempt to move onto any of the algal nodules was observed. However, there was a tendency for the animals to stay on the vertical sides of the trays.

Haliotis pourtalesii appears to be very agile. The specimen from Little Sister Bank moved quickly over the algal nodule on which it was captured. The Sidner Bank specimen was able to move rapidly over and between the spines of the *Spondylus americanus*.

The specimens were placed upside

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TABLE 1. Distribution records of *Haliotis pourtalesii* Dall, 1881.

REFERENCE	COLLECTOR	DEPTH	LOCATION	LAT. & LONG.		REMARKS
Dall, 1881	Pourtales	366m	Off Florida reefs			Live specimen
Henderson, 1911	Henderson	165m	Off Sand Key, FL			Neotype
Foster, 1946	Henderson	155m	Off Sand Key, FL			5 shells
"	Henderson	119m	Off Western Dry Rocks, FL			
"	Burry	121m	SE of Sombrero Light, FL			Fragments
"	Burry	168-183m	Key Largo, FL			1 shell
Parker, 1960	?	>110m	N. Gulf of Mexico			1 shell
Harry, 1966	NSF*	123m	NE Yucatan Peninsula	21°21'N	86°30'W	1 shell
Jung, 1968	Rutsch	99m	E. of Miss. Delta	29°20'32"N	87°46'05"W	3 shells
Sarasua, 1968	?	37-64m	La Habana, Cuba			101 shells
Klappenbach, 1968	Tommasi	110m	Brazil	24°18'S	44°50'W	1 shell
"	"	130m	Brazil	24°20'S	44°40'W	1 shell
Merrill & Petit, 1969			N. & S. Carolina			
Guice, 1969	U.S. Fish & Wild. Ser.	82m	Off SW Florida	24°56.8'N	83°40'W	1 shell
Nelson, in prep.	LGL**	79m	West Flower Garden Bk.	27°52'50"N	93°35'99"W	1 shell
Martin, unpub.	LGL**	60-85m	Off SW Florida	27°47.2'N	83°40.9'W	Live specimen
Present Study	Gettleston	136m	28 Fathom Bank	27°53'24"N	93°27'18"W	14 shells
"	Bright	67m	West Flower Garden Bk.			Live specimen
"	"	84m	"			Live specimen
"	"	85m	Little Sister Bank	27°52'30"N	94°15'16"W	Live specimen
"	"	57m	Sidner Bank	27°57'N	92°22'W	Live specimen
"	"	56-166m	"	"	"	6 shells
"	"	68-83m	Alderdice Bank	28°04'24"N	91°59'12"W	2 shells
"	"	66-74m	"	"	"	1 shell
"	"	95-123m	Elvers Bank	27°50'12"N	92°53'36"W	2 shells
"	"	82-110m	Rezak Bank	27°55'N	92°23'W	2 shells

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down to further test agility. The righting response followed that described for haliotids by Minchin (1975). The lateral edges of the foot fold medially. The posterior portion then unfolds slightly, stretching posteriorly and moving from side to side as the columellar muscle rotates. Once contact is made with solid substrate, the foot further unfolds until sufficient purchase is attained for the abalone to right itself. The specimens observed commonly righted themselves in less than ten seconds.

Almost nothing is known about the interspecific associations of *Haliotis pourtalesii*. However, one shell was found in the stomach of a fish, *Haemulon melanurum* (Family Pomadasyidae), along with five partially digested anomurans (R. Nelson, in prep.). And one live specimen was found on a live *Spondylus americanus*.

DISTRIBUTION

Haliotis pourtalesii shells have been collected in western Atlantic tropical and subtropical waters (Figure 3) from North and South Carolina (Merrill & Petit, 1969), Florida (Dall, 1881; Henderson, 1911; Foster, 1946; Guice, 1969; and Martin unpub.), the northeast Gulf of Mexico (Jung, 1968), the northwest Gulf of Mexico (Parker, 1960; and present study), the northeast corner of the Yucatan Peninsula (Harry, 1966), Cuba (Sarasua, 1968), and Brazil (Klappenbach, 1968).

Present data indicate that this small abalone occurs on hard substrata in deeper shelf waters. It has not been reported from shallow reefs or shallow hard banks within its geographic range, although these areas have been more thoroughly studied than deeper areas. This species may be intolerant to

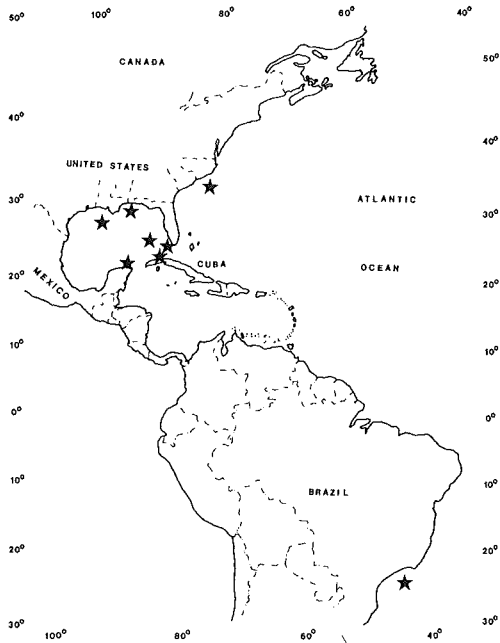


Figure 3. Distribution of *Haliotis pourtalesii* Dall, 1881.

continual immersion in warm water.

ACKNOWLEDGMENTS

The authors would like to thank Mary K. Wicksten, Texas A&M University, Carl C. Christensen, Bishop Museum, and Larry Martin, LGL Ecological Research Associates, for critically reviewing this manuscript.

The live specimen from southwest Florida was collected by LGL Ecological Research Associates, Bryan, Texas, while sampling for Minerals Management Service's Southwest Florida Shelf Benthic Communities Study, Contract No. 14-12-0001-30071.

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