JOHNSONIA

Published by
THE DEPARTMENT OF MOLLUSKS
Museum of Comparative Zoölogy, Harvard University
Cambridge, Massachusetts

MAY 11, 1946 | *HALIOTIDAE* | VOL. 2, NO. 21

THE FAMILY HALIOTIDAE IN THE WESTERN ATLANTIC

BY
RICHARD W. FOSTER

Representatives of the family Haliotidae, commonly known as abalones, are found in most of the tropical and temperate seas of the world. They even reach up into the colder waters of the English Channel, Alaska, and northern Japan. The vast majority of the more than eighty recognized species live on the reefs and rocky ledges just off shore in depths of less than ten fathoms.

This family has followed a biological trend common to many other molluscan groups in achieving its greatest diversification into species complexes in Australian and East Indian seas and in producing a smaller number of species characterized by large size and abundance of individuals in the temperate portions of the Northern Pacific. Some of these northern forms have proved to be of considerable economic value. For example, in 1935 the catch of abalone in the waters of California yielded some 774,200 pounds of steaks valued at $115,319.[1] In Europe, the people of the Channel Islands harvest *Haliotis tuberculata* Linné, or "ormer," for use not only as food but also in the manufacture of buttons. The iridescent, nacreous shells of the larger abalones lend themselves well to the fabrication of various kinds of jewelry.

Haliotis *Linné*

Haliotis Linné 1758, Syst. Nat. ed. 10, p. 779.

Genotype; *H. asinina* Linné (subsequent designation, Denys de Montfort 1810, Conch. Syst., **2,** p. 119).

Shell nacreous, subcircular to elongate, depressed, with a small spire and a very large body whorl having a row of pores along the left side for the escape of waste products. As the new pores are formed the old ones are closed by the formation of a callus. Aperture occupying nearly the whole under surface of the shell. Muscle impression truncately ovate in form and very large, often equivalent in area to two-thirds the size of the aperture. Operculum lacking.

The anatomy of this group has been worked out in great detail by D. R. Crofts (1929 Trans. Liverpool Biol. Soc., **43,** pt. 2, pp. 1–174, pl. 1–8).

[1] R. H. Fiedler 1937; Fishery Industries of the United States, 1936. Bureau of Fisheries Administrative Report no. 27, p. 222.

Haliotis pourtalesii, *Dall*, Plate 22

Haliotis (*Padollus*) *pourtalesii* Dall 1881, Bull. Mus. Comparative Zoölogy, **9**, p. 79 (off Florida Reefs, 200 fathoms [Florida]).

Haliotis (*Padollus*) *pourtalesii* Dall, Henderson 1915, Proc. United States National Mus., **48**, p. 660, pl. 45–46 (upper figures).

Haliotis pourtalesii Dall, Smith 1937, East Coast Marine Shells, Lantana, Florida, p. 78, pl. 29, fig. 3.

Description. Shell fairly thin, sub-elliptical, 10 to 25 mm. (two-fifths to one inch) in length. Whorls two and three-quarters. Color ranges from wax yellow to light brown with an occasional irregular patch of reddish orange on the body whorl. A uniform light orange band runs from each hole to the columella. On one specimen this lateral portion is speckled with dark orange pin-point maculations. Spire small, low, submarginal, and situated on the posterior fifth of the shell. Aperture subelliptical, nacreous. Base of the shell concave with some lateral torsion. Columella with a sulcus inside the raised parietal margin of the aperture. An 11 mm. specimen has five oval shell pores with elevated margins preceded by twelve moderately prominent tubercles representing perforations in the earlier growth stages. Spiral sculpture consists of sharp rather widely-spaced wavy cords between which finer threads are occasionally intercalated. The area adjacent to the terminal margin of the body whorl and bounded by the suture and the pores contains from 22 to 27 of these cords and threads. The lateral portion of the body whorl has three cords followed by a strong, angular, peripheral ridge or carina. Immediately below this are three more cords. The axial sculpture consists of radiating lamellae which roughly correspond to the pores in their position. They may occur as continuous folds across the whorl; as two distinct rows of lamellae (one next to the suture, the other midway between this and the rows of holes); or they may be present only near the suture. A single specimen often shows several of these stages. It is unfortunate that the figure of the neotype did not show its somewhat poorly developed lamellae. Surface with very fine growth lines. No periostracum apparent.

length	width	height [1]	
10.2–3	6.9	3 mm.	Key Largo, Florida
11	8	—	neotype, off Sand Key, Florida

According to Dall, Pourtalès' shell was "about an inch and a half in diameter." We have a large fragment dredged off Key Largo which must have come from a specimen at least 1 inch in length.

Types. Neotype, United States National Museum no. 271601, 3 miles off Sand Key, Florida, in 90 fathoms, J. B. Henderson, collector, 1913.

Common name. Pourtalès' Abalone.

Remarks. The history of this species is so remarkable that we feel this paper would be incomplete without a brief summary of the background of its original discovery, loss, and rediscovery.

Count Louis François de Pourtalès while engaged in dredging operations for the U.S. Fish Commission aboard the "Bibb" during March of 1869, collected a single live speci-

[1] The height given here was determined by placing the shell on a plane surface and measuring the altitude, which, in this case, is actually the greatest distance from the base to a point on the body whorl.

men in 200 fathoms off the Florida Reefs. The collections made on that expedition were deposited for a short time in the National Museum in Washington before being sent to Dr. William Stimpson at the Chicago Academy of Sciences. Stimpson, at that time Director of the Academy, was laboring on the manuscript for his monumental work on the marine invertebrates of the eastern coast of North America from Maine to Georgia which was to be published by the Smithsonian Institution. For his researches he had assembled within the supposedly fireproof walls of the new building what was probably the finest array of marine animals and related literature which had ever been gathered together in one place up to that time. The museums of Europe and this country had been unusually generous in the loan of study material. In fact, Dall (Proc. Biol. Soc. Washington, **4**, p. 132, 1888) states that the National Museum had shipped him all of their alcoholic collections of crustaceans and mollusks. In the fall of 1871, a great fire swept through Chicago, leaving nothing but charred embers in its wake. The wealth of marine invertebrates, including Pourtalès' abalone, accumulated by half a dozen museums and scores of individuals was destroyed in a few hours together with all of Stimpson's notes, manuscripts and engravings. The shock of the catastrophe was too great a blow for Stimpson's already weakened condition. He died seven months after the conflagration.

No specimens of Pourtalès' Abalone were to be seen again for forty-two years.

Dall had examined the shells collected by the "Bibb" while they were still in Washington and was so amazed to find a *Haliotis* from the Western Atlantic that he was able to briefly describe the species from memory ten years later in his preliminary report on the mollusca of the "Blake" Expedition. The dredgings of the "Albatross" off the Galápagos Islands brought forth several specimens of a *Haliotis* which Dall believed to be identical with his *H. pourtalesii* from the Western Atlantic. In the report on the mollusca obtained on the cruise (Dall 1889, Proc. United States National Mus., **12**, p. 355, pl. 12, figs. 1, 3) he figured and redescribed the species in considerable detail. The interest associated with the supposed rediscovery of the species was further enhanced by the fact that no representatives of this family had previously been known to exist in the Eastern Pacific south of the Gulf of California.

A quarter of a century elapsed. In the course of his very extensive dredging operations aboard the yacht "Eolis," John B. Henderson secured another specimen of the Western Atlantic form in 90 fathoms off Sand Key, Florida. It is interesting to note that it was found on Pourtalès' Plateau, that great shelf so suitably named by Alexander Agassiz, which extends the entire length of the Lower Florida Keys. Dall certified that the specimen belonged to the species he had described from memory. It is evident that he probably was in error when he characterized Pourtalès' shell as ". . . ., above smoothish except for two strong spiral ribs, ..." A critical comparison of the Atlantic and Galápagos specimens resulted in the discovery that the latter was a distinct species. In 1915 Henderson finally clarified the picture and gave the "Galápagos" shells (USNM Cat. no. 96392) the name *Haliotis* (*Padollus*) *dalli*. Unlike *H. pourtalesii*, it was a true *Padollus* by virtue of the fact that it possessed a spiral ridge centrally located on the upper surface with a corresponding sulcus on the ventral side.

In 1916 Henderson collected five more imperfect shells in the Key West Region and in 1944 L. A. Burry dredged several fragments and one nearly perfect specimen off Key Largo and Sombrero Light.

Range. Off the Lower Florida Keys.

Records. Florida: $5\frac{1}{2}$ miles S.E. of the Elbow, Key Largo, in 92–100 fathoms; 6 miles S.E. of Sombrero Light in 66 fathoms (all L. A. Burry and MCZ); 3 miles off Sand Key in 90 fathoms; off Sand Key in 85 fathoms; off Western Dry Rocks in 65 fathoms (all USNM).

Haliotis barbouri, new species, Plate 23

Description. Shell moderately heavy, roundly ovate, 22.6 mm. (0.9 inches) in length. Whorls 2.75 to 3, convex. Nuclear whorl indistinct. Base color white with radiating flame-shaped patches of orange, gold, and light yellow which blend from dark to light in a postero-anterior direction. These bands correspond to the position of the holes and are particularly well defined in the region of the carina. Spire somewhat elevated and situated on the posterior third of the shell. Aperture ovate, nacreous. Base of shell concave in the long axis with some lateral torsion. Columella smooth with a sulcus inside the parietal margin of the aperture. The four active shell pores are oval to round in shape with elevated margins. These are preceded by twenty-four quite prominent tubercles representing perforations in the earlier growth stages. The spiral sculpture consists of from 16 to 18 closely packed cords. Up to about 2.5 whorls every fifth or sixth cord is much more pronounced. Nodules develop at the intersections of major cords and low axial lamellae. These radiating lamellae are coincident with the pores. At 2.5 whorls quite an abrupt change in the sculpture takes place. At this point the relatively indistinct lamellae become very prominent and the individual nodules are absorbed into these heavy, occasionally bifurcated, coarsely granose ridges. The cords become even more crowded together and irregular in size. The lateral portion of the body whorl has three cords followed by a strong, angular peripheral ridge or carina. Below the carina two broad spiral ribs overlap the margin of the columella so that the sulci appear to be diagonally impressed. Growth lines fine. Periostracum straw colored.

length	width	height	
22.6	16.9	7.4 mm.	Holotype

Types. Holotype, Museum of Comparative Zoölogy, no. 152469, collected on the beach at Praia de Copacabana, Districto Federal, Brasil, by J. Modesto dos Santos and sent to us by Dr. Mathias de Oliveira Roxo. Only this single specimen is known.

Common name. Barbour's Abalone.

Remarks. This species can be readily distinguished from *H. pourtalesii* Dall by its greater convexity, the broader, more oval shape, the more anteriorly placed spire, and the radial sculpture consisting of individual nodules on poorly defined lamellae in the earlier portion of the shell. These develop into prominent, sometimes bifurcated, lamellae on the body whorl.

Named for the late Dr. Thomas Barbour, distinguished director of the Museum of Comparative Zoölogy for the past eighteen years.

Range and Records. Known only from the type locality.