

## Scaphopods of the *Atlantis* dredgings in the Western Atlantic with a catalogue of the scaphopod types in the Museum of Comparative Zoölogy \*

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THE FOLLOWING report is based mainly on the collection of scaphopods made by the *Atlantis* in 1938 and 1939 during two trips to Cuba. A small amount of hitherto unworked material in the collection of the Museum of Comparative Zoölogy is also recorded where it is of significance in the distribution of the species concerned. This material includes a number of lots collected by the late Dr. LEO A. BURRY of Pompano Beach, Florida, who did a great deal of dredging off the Florida Keys and in the region off Fort Walton, Florida. In addition there are several lots of *Blake* and *Hassler* material that had not been previously worked, as well as miscellaneous lots that have come in from various sources. Localities given by HENDERSON (1920) have not been duplicated in this report; all records are of new localities or new depth records.

Though there are no new species in this material, it is of great value in extending the ranges of many species, and in several cases these constitute the second known record for the species. Except for a few intertidal species which may be common, records of scaphopods are always rare, consequently it seems advisable to put these new data on record. This is especially important since HENDERSON'S report is relatively recent and quite complete, so that a new monograph probably will not be attempted for some time.

It is interesting to compare the results of the *Atlantis* trips with those of the Johnson-Smithsonian Expedition to the Puerto Rican Deep as reported by W. K. EMERSON (1952). Both collected fifteen species which could be positively identified, and of these only eight were taken by both, which would indicate a purely chance factor in collecting. Undoubtedly many species are far more widely and evenly distributed than would appear from the published record. Only after continued dredging over a long period of time will it be possible to derive accurate distribution patterns of these deep-sea groups. When sufficient material is collected, most of the subspecies and even some of the species now recognized will probably be shown to be mere populations of widespread, polymorphic species. This was certainly evident from the study of the material covered in this present report. In most cases classification has been to species only, as it would appear that many of HENDERSON'S subspecies are of doubtful value; in many cases the ranges of two subspecies overlap almost completely.

According to his introduction, HENDERSON, at the time he wrote his monograph, had the entire collection of the Museum of Comparative Zoölogy for study; however,

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except in rare cases and in the case of a few types, he made no mention of this material. Much of the *Blake* material is in the Museum of Comparative Zoölogy and in most cases the specimens figured and so labelled by DALL, are contained in this collection. A catalogue of all of the types of Western Atlantic scaphopods in the Museum collection is appended to this report for the convenience of interested workers.

HENDERSON gave an excellent historical account of the work done in this group up to 1920, consequently only a brief bibliography is given here. No attempt has been made to describe the various species, for descriptions and figures may be found in the works of WATSON (1895); DALL (1889); PILSBRY and SHARP (1898) and HENDERSON (1920). The classification to genera and subgenera follows that of HENDERSON.

Maps indicating the course of the *Atlantis* during the two circumnavigations of Cuba in 1938 and 1939, together with a complete list of the stations, are given by CHACE (1940). Unfortunately, several localities where the *Blake* and the *Atlantis* did a small amount of dredging were not given station numbers. Consequently in this report where reference is made to the ship without station number it is because none was allotted.

#### NEW SCAPHOPOD RECORDS FOR THE WESTERN ATLANTIC

##### *Dentalium (Dentalium) laqueatum* Verrill

*Dentalium laqueatum* VERRILL 1885, Trans. Connecticut Acad. Arts and Sci. 6, pt. 2, p. 431, pl. 44, fig. 18; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 23, pl. 1, figs. 6-7.

*Notes.* Though HENDERSON lists a large number of lots for this species, they are largely restricted to the region of Cape Hatteras, North Carolina and to the Lower Florida Keys. The following *Atlantis* records extend our knowledge of its distribution to Cuba. One exceedingly large specimen from off Punta Alegre, Cuba, measured 85 mm in length, or 23 mm longer than any previously recorded. HENDERSON's subspecies *regulare* appears to be of doubtful value. Its range overlaps that of the typical form and, in addition, in the typical form there appears to be a wide range of variation in the strength of the secondary costae.

*Records.* CUBA: *Atlantis*, station 2963, off Bahía de Cochinos, Las Villas (N. Lat. 22° 07'. W. Long. 81° 08') in 180-190 fathoms; *Atlantis*, station 2982E, off Punta Alegre, Camagüey (N; Lat. 22° 45'; W. Long. 78° 45') in 150-180 fathoms; *Atlantis*, station 2999, off Bahía de Matanzas, Matanzas (N. Lat. 23° 10'; W. Long. 81° 29') in 145-230 fathoms.

FLORIDA: off Carysfort Light, Key Largo in 66-117 fathoms (L. A. BURRY—5 lots); off Beacon D, Key Largo in 65-108 fathoms (L. A. BURRY—2 lots); 3½ miles N.E. of Pacific Reef, Key Largo in 66 fathoms (L. A. BURRY).

##### *Dentalium (Dentalium) obscurum* Dall

*Dentalium gouldii obscurum* DALL 1889, Bull. Mus. Comp. Zoöl. 18, p. 425, pl. 27, fig. 4.

*Dentalium obscurum* DALL, HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 32, pl. 3, figs. 1, 3.

*Notes.* This is an exceedingly rare though probably widely distributed species. DALL thought it was only a variety of *gouldii* but I agree with HENDERSON that it is quite a different species. It has previously been known only from the Barbados, where it has been collected several times.

*Records.* CUBA: *Blake*, station 62, off Habana in 80 fathoms.

*Dentalium* (*Dentalium*) *carduum* Dall

*Dentalium carduus* DALL 1889, Bull. Mus. Comp. Zoöl. 18, p. 423, pl. 27, fig. 3; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 33, pl. 3, figs. 4, 5, 7.

*Notes.* Five lots of this rare species were taken by the *Atlantis*, and these are the first recorded for Cuba and Florida. The species is probably widespread throughout the West Indies for, though only eleven lots are known, they are distributed from the Little Bahama Bank, south to Cuba, St. Thomas, Grenada and Barbados. One large specimen taken by the *Atlantis* measured 10 mm in greatest diameter, and if complete would probably have measured some 95 mm in length, or some 8 mm greater than the largest recorded specimen.

*Records.* FLORIDA: *Atlantis*, station 2951, about 55 miles off Fort Lauderdale (N. Lat. 26° 08'; W. Long. 79° 02') in 155 fathoms. CUBA: *Atlantis*, station 2982A (N. Lat. 22° 48'; W. Long. 78° 50') in 210 fathoms; *Atlantis*, station 2981D (N. Lat. 22° 48'; W. Long. 78° 51') in 190-230 fathoms; *Atlantis*, station 2982E (N. Lat. 22° 45'; W. Long. 78° 45') in 150-180 fathoms; *Atlantis*, station 2980A (N. Lat. 22° 48'; W. Long. 78° 41') in 220-260 fathoms. All the above are from off Punta Alegre, Camagüey, Cuba.

*Dentalium* (*Antalis*) *entale stimpsoni* Henderson

*Dentalium striolatum* STIMPSON 1851, Proc. Boston Soc. Nat. Hist. 4, p. 114 (non *D. striolatum* RISSO 1826).

*Dentalium entale stimpsoni* HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 35 (new name for *striolatum* STIMPSON, non RISSO 1826).

*Notes.* Only one lot of this rather common northern species was obtained by the *Atlantis*. Though there are many lots in the collection of the Museum of Comparative Zoölogy they do not extend the range beyond that given by HENDERSON.

*Records.* *Atlantis*, station 2661, off Nova Scotia (N. Lat. 43° 40'; W. Long. 67° 49') in 126 fathoms.

*Dentalium* (*Antalis*) *antillarum* d'Orbigny

*Dentalium antillarum* d'Orbigny (in) SAGRA, Histoire l'île de Cuba, *Mollusques*, Atlas pl. 25, figs. 10-13; *ibid.* 1847, text 2, p. 202; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 44, pl. 5, figs. 1-4, 6-8

*Notes.* Though this more shallow water species was not collected by the *Atlantis*, several lots in the Museum collection are from localities not previously reported and so seem worthy of note here. These were collected largely by WILLIAM J. CLENCH.

*Records.* BAHAMA ISLANDS: Simms, Long Island; Arthurs Town, Cat Island; Little San Salvadore, 18 miles W. of Cat Island. HISPANIOLA: Cape Haitien, Haiti; Monte Cristi, Santo Domingo. PUERTO RICO: Lóiza Vieja. LESSER ANTILLES: Guadeloupe.

*Dentalium* (*Antalis*) *disparile* d'Orbigny

*Dentalium disparile* d'Orbigny 1842, (in) SAGRA, Histoire l'île de Cuba, *Mollusques*, Atlas pl. 25, figs. 14-17; *ibid.* 1847, text 2, p. 202; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 47, pl. 6, figs. 4-8.

*Notes.* HENDERSON records only eleven lots for this species and, though it was not taken by the *Atlantis*, two new records are noted.

*Records.* TRINIDAD: Gaspari. BRASIL: Maranhão.

*Dentalium* (*Antalis*) *ceratum* Dall

*Dentalium ceratum* DALL 1881, Bull. Mus. Comp. Zoöl. 9, p. 38; DALL 1889, Bull. Mus. Comp. Zoöl. 18, p. 424, pl. 26, fig. 5, pl. 27, fig. 2; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 49, pl. 7, figs. 2-7.

*Notes.* The lot collected by the *Atlantis* at station 2996 greatly extends the depth at which this species is known to live. HENDERSON's subspecies *flavum* and *tenax* appear to be the only variants with no geographic significance, for it has been possible to find gradients between these and the typical form.

*Records.* FLORIDA: 3½ miles N.E. of Pacific Reef, Key Largo in 66 fathoms (L. A. BURRY). CUBA: *Atlantis*, station 2996, off Bahía de Cardenas, Matanzas (N. Lat. 23° 22'; W. Long. 81° 05') in 470–665 fathoms; *Atlantis*, station 2963, off Bahía de Cochinos, Las Villas (N. Lat. 22° 07'; W. Long. 81° 08') in 180–190 fathoms.

***Dentalium (Antalis) taphrium* Dall**

*Dentalium taphrium* DALL 1889, Bull. Mus. Comp. Zool. 18, p. 422; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 53, pl. 7, fig. 8.

*Notes.* This is a very characteristic species. It generally lives in depths from about 20 to 120 fathoms. The specimen from Yucatan Straits in 640 fathoms was dead at the time it was collected, and it does not necessarily follow that the species lives at such depths.

*Records.* MEXICO: *Blake* station, Yucatan Straits in 640 fathoms. FLORIDA: off Beacon D, Key Largo in 38–100 fathoms (6 lots); off Carysfort Light, Key Largo in 100–117 fathoms (2 lots); off Molasses Reef, Key Largo in 66–75 fathoms (2 lots); 3 miles S.E. of Sombrero Light, Marathon in 58 fathoms (all L. A. BURRY).

***Dentalium (Antalis) bartletti* Henderson**

*Dentalium (Antalis) bartletti* HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 55, pl. 8, figs. 2, 7.

*Notes.* Specimens taken by the *Atlantis* off Puerto Sagua la Grande and Puerto de Tánamo were 66 mm and 74.5 mm long respectively, the latter being 19.5 mm longer than HENDERSON's largest specimen.

*Records.* CUBA: *Atlantis*, station 2991, (N. Lat. 23° 21'; W. Long. 80° 23') in 475 fathoms; *Atlantis*, station 2988, (N. Lat. 23° 15'; W. Long. 79° 57') in 380 fathoms; *Atlantis*, station 2989 (N. Lat. 23° 10'; W. Long. 80° 04') in 360 fathoms,—All off Puerto Sagua la Grande, Las Villas; *Atlantis*, station 3370, off Puerto de Tánamo, Oriente, (N. Lat. 20° 47'; W. Long. 75° 11') in 450 fathoms; *Blake*, station, off Bahía Honda, Pinar del Río in 418 fathoms. BRITISH HONDURAS: *Blake*, station 18, off Belize (N. Lat. 18° 08'; W. Long. 87° 16') in 600 fathoms. LESSER ANTILLES: *Blake*, station 265, off Grenada (N. Lat. 12° 03'; W. Long. 61° 49') in 576 fathoms.

***Dentalium (Fissidentalium) meridionale verrilli* Henderson**

*Dentalium solidum* VERRILL 1884, Trans. Connecticut Acad. Arts and Sci. 6, p. 215, pl. 44, fig. 16 (non *D. solidum* Hutton 1873).

*Dentalium (Fissidentalium) meridionale verrilli* HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 62, pl. 9, fig. 3.

*Notes.* A number of lots of this rather common northern species were collected by the *Atlantis* while working along the continental slope from New Jersey to Virginia. This is a large, strong species and one of the few that are readily obtained in large numbers by a dredge, and, at the same time, are not broken in the process. This fact probably accounts for its greater abundance in collections, and therefore the belief that it is common, though perhaps it is no more so than many other species.

*Records.* NEW JERSEY: *Atlantis*, 4 stations, off Cape May in 935–1050 fathoms; *Atlantis*, 2 stations, off Little Egg Harbor in 820 and 935 fathoms; *Atlantis*, 2 stations, off Point Pleasant in 1105 and 1230 fathoms; *Atlantis*, off Long Branch in 520 fathoms. DELAWARE: *Atlantis*, station (N. Lat. 38° 31'; W. Long. 73° 03') in 915–975 fathoms. MARYLAND: *Atlantis* station, off Assateague Bay (N. Lat. 39° 05'; W. Long. 73° 30') in 970 fathoms. VIRGINIA: *Atlantis* station, off Accomack (N. Lat. 37° 43'; W. Long. 73° 40') in 1105 fathoms.

**Dentalium (Graptacme) eboreum** Conrad

*Dentalium eboreum* CONRAD 1846, Proc. Acad. Nat. Sci. Philadelphia 3, p. 37; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 66, pl. 10, figs. 3-5, 8-9; pl. 11, fig. 6.

*Notes.* This may be a very common species in some localities. It lives apparently in fairly shallow water and down to depths of 80 to 100 fathoms. The shells being solid and strong are often washed up on the beaches in considerable numbers. The following data add to the distribution records of this species on the west coast of Florida and extend the range to Mustang Island, Texas.

*Records.* FLORIDA: Clearwater; Gulfport; Bradenton Beach. TEXAS: Mustang Island.

**Dentalium (Graptacme) semistriolatum** Guilding

*Dentalium semistriolatum* GUILDING 1834, Trans. Linn. Soc. London 17, pt. 1, p. 34, pl. 3, figs. 1-6; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 69, pl. 11, figs. 1-3, 8-9.

*Notes.* Several additional records of this rather common West Indian species are added. The one from off Fort Walton, Florida, adds one more species to the list of West Indian forms that are found in deeper water in the northern Gulf. The record for Swan Island carries the distribution of the species well into the western Caribbean.

*Records.* FLORIDA: 15-35 miles off Fort Walton in 13-19 fathoms (L. A. BERRY). CUBA: Pueblo Nuevo and Cárdenas, Matanzas Bay, Matanzas. VIRGIN ISLANDS: Virgin Gorda. HISPANIOLA: Monte Cristi, Santo Domingo; LESSER ANTILLES: Guadeloupe. CARIBBEAN ISLANDS: Swan Island in 60 fathoms.

**Dentalium (Graptacme) calamus** Dall

*Dentalium calamus* DALL 1889, Bull. Mus. Comp. Zoöl. 18, p. 421; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 72, pl. 12, figs. 7-8.

*Notes.* This is a rare but very characteristic species which is found in rather shallow water. The two records from the Bahamas were collected by Owen Bryant.

*Records.* BAHAMA ISLANDS: Whale Cay Channel, Great Abaco Island in 3 fathoms; Dick's Point, Nassau, New Providence.

**Dentalium (Laevidentalium) callipeplum** Dall

*Dentalium callipeplum* DALL 1889, Bull. Mus. Comp. Zoöl. 18, p. 419, pl. 27, fig. 12b; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 74, pl. 12, fig. 5.

*Notes.* A very large, fine specimen of this rare species was collected by the *Atlantis* in 2075 fathoms, which greatly extends the known depth for this species.

*Records.* FLORIDA: 2½ miles E.S.E. of Beacon D, Key Largo in 58 fathoms (L. A. BERRY). CUBA: *Atlantis*, station 2964, Banco Paz, Las Villas (N. Lat. 20° 56'; W. Long. 80° 11') in 2075 fathoms. VIRGIN ISLANDS: St. Thomas (T. BLAND).

**Dentalium (Laevidentalium) perlongum** Dall

*Dentalium perlongum* DALL 1881, Bull. Mus. Comp. Zoöl. 9, p. 36; DALL 1889, Bull. Mus. Comp. Zoöl. 18, p. 419, pl. 27, fig. 6; HENDERSON, 1920, Bull. U.S. Nat. Mus. No. 111, p. 75, pl. 9, fig. 1

*Notes.* Four fine lots, one of them with 8 specimens, were collected by the *Atlantis*. The following are apparently the first Cuban records for this species.

*Records.* *Atlantis*, station 2992B, off Bahía de Santa Clara, Matanzas (N. Lat. 23° 26'; W. Long. 80° 28') in 535 fathoms; *Atlantis*, station 2993, off Bahía de Santa Clara (N. Lat. 23° 24'; W. Long. 80° 44') in 580 fathoms; *Atlantis*, station 3345, off Banco Paz, Las Villas (N. Lat. 21° 08'; W. Long. 79° 56' 30") in 700 fathoms; *Atlantis*, station 3370, off Puerto de Tánamo, Oriente (N. Lat. 20° 47'; W. Long. 57° 11') in 450 fathoms.

**Dentalium (Episiphon) sowerbyi** Guilding

*Dentalium sowerbyi* GUILDING 1834, Trans. Linn. Soc. London 17, p. 35, pl. 3, fig. 7; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 77, pl. 13, figs. 2-3, 10.

*Notes.* L. A. BURRY obtained this species at seven stations during his dredging off Key Largo. It is a very small but characteristic and easily recognized species.

*Records.* FLORIDA: off Beacon D, Key Largo in 66-90 fathoms (4 lots); off Carysfort Light, Key Largo in 92 and 100 fathoms (2 lots);  $3\frac{1}{2}$  miles N.E. off Pacific Reef, Key Largo in 66 fathoms.

**Dentalium (Bathoxiphus) didymum** Watson

*Dentalium didymum* WATSON 1879, J. Linn. Soc. London 14, p. 517; WATSON 1885, *Challenger* Rept. Zoöl. 15, p. 10, pl. 1, fig. 11; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 83, pl. 14, fig. 10.

*Notes.* Dr. WILLIAM J. CLENCH obtained a large series of *Dentalium* from the channel dredgings at Puerto Plata Harbor, Santo Domingo. Among them were a number of fragments and a few nearly complete specimens of this very rare species. They were taken from a fine grey mud brought up from a depth of 20 to 30 feet. A single specimen was found in a lot of *Blake* material from off Tortugas.

*Records.* FLORIDA: *Blake*, station 43, from south of Dry Tortugas (N. Lat.  $24^{\circ} 08'$ ; W. Long.  $82^{\circ} 15'$ ) in 33 fathoms. HISPANIOLA: Puerto Plata Harbor, Santo Domingo in 20 to 30 feet.

**Entalina platamodes** Watson

*Siphodentalium platamodes* WATSON 1879, J. Linn. Soc. London 14, p. 519; WATSON 1885, *Challenger* Rept., Zoöl. 15, p. 13, pl. 2, fig. 4.

*Entalina platamodes* PILSBRY and SHARP 1897, Manual of Conchology (1) 17, p. 133, pl. 23, fig. 3-5; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 87, pl. 15, figs. 1, 4, 5, 7.

*Entalina quadrata* HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 88, pl. 15, figs. 2, 3, 6, 10.

*Notes.* A lot of four specimens of this apparently rare species was taken by the *Atlantis*. HENDERSON records three specimens from two localities off the coast of Florida and his *quadrata* was represented by a single specimen from off Grenada, Lesser Antilles. EMERSON reported five lots from off Puerto Rico totaling some 200 specimens which would indicate that in some localities at least they may be quite common. This is the first record for Cuba.

*Records.* *Atlantis*, station 2989, off Puerto Sagua la Grande, Oriente (N. Lat.  $23^{\circ} 10'$ ; W. Long.  $80^{\circ} 04'$ ) in 360 fathoms.

**Cadulus (Polyschides) tetrachistus** Watson

*Siphodentalium tetrachistum* WATSON 1879, J. Linn. Soc. London 14, p. 521; WATSON 1885, *Challenger* Rept. Zoöl. 15, p. 15, pl. 2, fig. 8.

*Cadulus (Polyschides) tetrachistus* [sic] WATSON, HENDERSON 1920, Bull. U. S. Nat. Mus. No. 111, p. 97, pl. 17, fig. 1.

*Notes.* Two lots of this species are in the collection of the Museum of Comparative Zoölogy. I agree with HENDERSON that this South American species appears to be distinct from *quadridentatus* Dall. It is a slightly shorter, stouter species with a more solid shell. The apical lobes are shorter with broader clefts between them. The shell surface has a slight chalky texture and is marked by distinct opaque white rings. In *quadridentatus* the shell is very shiny, a clear translucent blue-white, and in perfect specimens the apical lobes are long, straight sided and with very narrow clefts between them. The only other known record is from Fernando Noronha in 25 fathoms, collected by the *Challenger*.

*Records.* URUGUAY: off Montevideo (S. Lat.  $35^{\circ} 12', 15''$ ; W. Long.  $55^{\circ} 30'$ ) in 7 fathoms (*Hassler* Exped.) ARGENTINA: Puerto Quequen, Buenos Aires.

**Cadulus (Polyschides) quadridentatus** Dall

*Siphonodentalium quadridentatum* DALL 1881, Bull. Mus. Comp. Zool. 9, p. 36.

*Cadulus quadridentatus* DALL 1889, Bull. Mus. Comp. Zool. 18, p. 428, pl. 27, fig. 5; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 97, pl. 17, fig. 2-3.

*Notes.* Three new records for this rather common and characteristic species are added.

*Records.* FLORIDA: 18 miles S by W of Destin in 18-20 fathoms (T. MCGINTY). CUBA: La Chorrera, Habana. BERMUDA (O. BRYANT).

**Cadulus (Polyschides) tetradon** Pilsbry and Sharp

*Cadulus (Polyschides) tetradon* PILSBRY and SHARP 1897, Manual of Conchology (1) 17, p. 151, pl. 29, figs. 14-18; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 101, pl. 17, fig. 5.

*Notes.* The lot from off Carysfort Light in 100 fathoms makes a new depth record for this species.

*Records.* FLORIDA: Boynton Beach in 40 feet (T. MCGINTY); 4 mi. N.E. of Beacon D, Key Largo in 66 fathoms; 5 mi. N.E. of Carysfort Light, Key Largo in 100 fathoms (both L. A. BERRY).

**Cadulus (Polyschides) carolinensis** Bush

*Cadulus carolinensis* BUSH 1885, Trans. Connecticut Acad. Arts and Sci. 6, p. 471, pl. 45, fig. 19; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 102, pl. 17, figs. 6-7.

*Notes.* This is a very common species in the region of Cape Hatteras, North Carolina, but records from Florida, particularly the west coast, are rare.

*Records.* FLORIDA: 15-35 miles off Fort Walton in 13-20 fathoms (L. A. BERRY, 2 lots).

**Cadulus (Platyschides) grandis** Verrill

*Cadulus grandis* VERRILL 1884, Trans. Connecticut Acad. Arts and Sci. 6, pt. 1, p. 219; pt. 2, pl. 44, fig 20; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 105, pl. 17, fig. 12.

*Notes.* Three lots of this large and common *Cadulus* were taken by the *Atlantis*.

*Records.* NEW JERSEY: *Atlantis* station (N. Lat. 39° 40'; W. Long. 71° 43') in 820 fathoms; *Atlantis* station (N. Lat. 39° 34'; W. Long. 71° 44') in 935 fathoms, both about 120 miles E. of Great Bay. VIRGINIA: *Atlantis* station about 80 miles N.E. of Cape Charles (N. Lat. 37° 21'; W. Long. 74° 12') in 860 fathoms.

**Cadulus (Platyschides) agassizii** Dall

*Cadulus agassizii* DALL 1881, Bull. Mus. Comp. Zool. 9, p. 35; DALL 1889, Bull. Mus. Comp. Zool. 18, p. 430; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 110, pl. 18, figs. 1, 3.

*Notes.* Only a single new record for this rather common species is added. The species ranges from off Chesapeake Bay south to Key West, Florida, and HENDERSON records large series from off Fowey Light and Sand Key Florida.

*Records.* FLORIDA: *Bibb* station 179, off Tennessee Reef (N. Lat. 24° 35' 00"; W. Long. 80 39' 00") in 115 fathoms.

**Cadulus (Platyschides) watsoni** Dall

*Cadulus watsoni* DALL 1881, Bull. Mus. Comp. Zool. 9, p. 34; DALL 1889, Bull. Mus. Comp. Zool. 18, p. 429, pl. 27, fig. 12a; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 120, pl. 18, fig. 12.

*Notes.* A large fine specimen of this very rare species was taken by the *Atlantis*; this is the third known record. The original lot was taken off Cape San Antonio, Cuba, and a second lot of five specimens in the United States National Museum is from off Old Providence Island, Caribbean Islands.

*Records.* CUBA: *Atlantis* station 2989, off Sagua la Grande, Las Villas (N. Lat. 23° 10'; W. Long. 80° 04') in 360 fathoms.

**Cadulus (Platyschides) elongatus** Henderson

*Cadulus (Platyschides?) elongatus* HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 122, pl. 19, fig. 15.

*Notes.* This species was described by HENDERSON from a unique specimen dredged off the mouth of the Mississippi River in 68 fathoms. A series of five specimens and a number of fragments was obtained by Mrs. L. A. WEISENHAUS by washing the mud from a shrimp boat net and anchor. The specimens agree well with HENDERSON'S description.

*Records.* TEXAS: off Port Isabel in 50 fathoms.

**Cadulus (Platyschides) braziliensis** Henderson

*Cadulus (Platyschides) braziliensis* HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 124, pl. 19, fig. 16.

*Notes.* The single specimen dredged by the *Hassler* makes the second known record for this species. HENDERSON described the species from a lot of two specimens dredged by the *Albatross* off Rio de Janeiro, Brazil. This coast is so poorly known that the few records available are no indication of the abundance or distribution of the species.

*Records.* URUGUAY: off Montevideo (S. Lat. 35° 12'; W. Long. 55° 30') in 7 fathoms (*Hassler* Exped.).

**Cadulus (Platyschides) simpsoni** Henderson

*Cadulus (Platyschides) simpsoni* HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 127, pl. 19, fig. 17.

*Notes.* The *Atlantis* obtained two lots of this species, bringing the known records up to five. It is probably not a rare species, however, to judge by the size of some of the lots.

*Records.* CUBA: *Atlantis* station 2987E, off Sagua la Grande, Las Villas (N. Lat. 23° 19'; W. Long. 79° 59') in 315 fathoms; *Atlantis*, station 2963, off Bahía Cochinos, Las Villas (N. Lat. 22° 07'; W. Long. 81° 08') in 180–190 fathoms.

**Cadulus (Gadila) mayori** Henderson

*Cadulus (Gadila) mayori* HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 133, pl. 19, fig. 3.

*Notes.* Like *Cadulus elongatus* this species was obtained by Mrs. WEISENHAUS from the mud on the net and anchor of a shrimp boat. The records from Cuba are the first for that island.

*Records.* FLORIDA: 2½ miles S.S.E. of Looe Key, Marathon in 50 fathoms; 5 miles E. of Carysfort Light in 96–107 fathoms (both L. A. BURRY). TEXAS: off Port Isabel in 50 fathoms. CUBA: *Blake*, station 20, off Bahía Honda (N. Lat. 23° 02'; W. Long. 83° 11') in 220 fathoms; *Atlantis*, station 2981C, off Punta Alegre, Camagüey (N. Lat. 22° 47'; W. Long. 78° 49') in 195 fathoms; *Atlantis*, station 2963, off Bahía Cochinos, Las Villas (N. Lat. 22° 07'; W. Long. 81° 08') in 180–190 fathoms.

**Cadulus (Gadila) acus** Dall

*Cadulus acus* DALL 1889, Bull. Mus. Comp. Zool. 18, p. 432, pl. 27, fig. 11.

*Cadulus (Gadila) acus* Dall, HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 140, pl. 20, figs. 11, 13.

*Cadulus (Gadilopsis) acus* Dall, EMERSON 1952, Smithsonian Misc. Coll. 117, No. 6, p. 10.

*Notes.* A very large lot of 250 or more specimens was collected by Dr. CLENCH from a fine grey mud brought up during the channel dredging operations in Puerto Plata Harbor, Santo Domingo.



*Records.* CUBA: La Chorrera, Habana. HISPANIOLA: Puerto Plata Harbor, Santo Domingo. VIRGIN ISLANDS: St. Thomas.

*Cadulus (Gadila) verrilli* Henderson

*Cadulus (Gadila) verrilli* HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 136, pl. 19, fig. 13.

*Notes.* HENDERSON records only four lots of this species, all from off Martha's Vineyard, Mass.

*Records.* RHODE ISLAND: 76 miles south of Block Island in 180–190 fathoms (J. MILLER).

*Cadulus (Cadulus) ampullaceus* Watson

*Cadulus ampullaceus* WATSON 1879, J. Linn. Soc. London **14**, p. 529; WATSON 1885, *Challenger* Rept., Zoöl. **15**, p. 23, pl. 3, fig. 11; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 144, pl. 19, fig. 7.

*Notes.* Two lots that are referable to this minute but characteristic species were collected by the *Atlantis*. The only other known lot is that taken by the *Challenger* off Culebra Island.

*Records.* CUBA: *Atlantis*, station 2961C, off Bahia Cochinos (N. Lat. 22° 07'; W. Long. 81° 08') in 190–370 fathoms; *Atlantis*, station 2967B, off Guantanamo Bay, Oriente (N. Lat. 19° 43'; W. Long. 74° 57' 30") in 1330–1650 fathoms.

*Cadulus (Cadulus) exiguus* Watson

*Cadulus exiguus* WATSON 1879, J. Linn. Soc. London **14**, p. 528; WATSON 1885, *Challenger* Rept., Zoöl. **15**, p. 23, pl. 3, fig. 10; HENDERSON 1920, Bull. U.S. Nat. Mus. No. 111, p. 145, pl. 20, fig. 9.

*Notes.* This is the seventh known record for this species. It has been recorded from Culebra Island, Barbados; from three stations off Puerto Rico, and one from the "Bahamas". This is the first record for Cuba, and the specimens were dredged from a much greater depth than any previous lots.

*Records.* CUBA: *Atlantis*, station 2959, off the Isle of Pines (N. Lat. 21° 17'; W. Long. 83° 06') in 2050 fathoms.

CATALOGUE OF THE SCAPHOPOD TYPES IN THE MUSEUM OF COMPARATIVE ZOOLOGY

In the following catalogue of the types it will be noted that the holotypes of many of the species that DALL described in the "Blake Report" are in the Museum of Comparative Zoology. It is difficult to know just what HENDERSON (1920) meant by his use of the word "Type". If he was referring to the holotype, he made some rather curious errors. He was probably using it to refer to any of the primary types, for indeed all his references are to either holotypes or paratypes. It is curious that he says, under *Cadulus aequalis* Dall "The type Cat. No. 95373, U.S.N.M. is from a lot of two specimens taken by the *Blake* . . ." and later "This is the unique museum record", when, in the original description, DALL stated that he had three specimens. This third specimen was the one selected by DALL as the holotype and returned to the Museum of Comparative Zoology. Though HENDERSON says in the introduction to his paper that he had the entire collection from the Museum of Comparative Zoology for study, one wonders if he actually did. In any event, he put very little of this material on record.

*acus* Dall *Cadulus* 1889, Bull. Mus. Comp. Zoöl. **18**, p. 432, pl. 27, fig. 11. Holotype, MCZ 7751 Samana Bay, Santo Domingo in 16 fathoms. This is the specimen figured by DALL and was so labelled by him.

- aequalis* Dall, *Cadulus* 1881, Bull. Mus. Comp. Zoöl. 9, p. 34; DALL 1889, Bull. Mus. Comp. Zoöl. 18, p. 429, pl. 27, fig. 9. Holotype, MCZ 7740, *Blake*, station 43, from off Tortugas, Florida (N. Lat. 24° 08'; W. Long. 82° 51') in 339 fathoms. This is the specimen figured by DALL.
- agassizii* Dall, *Cadulus* 1881, Bull. Mus. Comp. Zoöl. 9, p. 35; DALL 1889, Bull. Mus. Comp. Zoöl. 18, p. 430, pl. 27, fig. 12c. Holotype, MCZ 7746, *Blake*, station 5, from south of Marquesas Keys, Florida (N. Lat. 24° 05'; W. Long. 82° 13') in 229 fathoms. This is the specimen figured by DALL.
- amiantus* Dall, *Cadulus* 1889, Bull. Mus. Comp. Zoöl. 18, p. 431, pl. 27, fig. 7. Holotype, MCZ 7749, *Blake*, station 19, from off Bahía Honda, Pinar del Río, Cuba (N. Lat. 23° 03' 00"; W. Long. 83° 10' 30") in 310 fathoms.
- atlanticus* Henderson *Cadulus* (*Gadila*) 1920, Bull. U.S. Nat. Mus. No. 111, p. 137, pl. 20, fig. 2. Paratype, MCZ 186815, from U.S.B.F. *Albatross* station 2862, from off Nantucket Island, Mass. (N. Lat. 39° 38' 00"; W. Long. 70° 22' 00") in 1004 fathoms.
- barbadensis* Henderson *Cadulus* (*Cadulus*) *transitorius* 1920, Bull. U.S. Nat. Mus. No. 111, p. 144, pl. 19, fig. 7. Paratype MCZ 7744, *Blake*, station without number, from off the Barbados in 100 fathoms. This specimen was labelled as type by HENDERSON though curiously he does not mention the specimen in his paper.
- bushii* Dall *Cadulus* (*carolinensis* var.?) 1889, Bull. Mus. Comp. Zoöl. 18, p. 430, not figured. Holotype MCZ 7745, *Blake*, station from off Barbados in 100 fathoms. This is the specimen measured by DALL and returned to the Museum of Comparative Zoology.
- bushi* Henderson *Siphonodentalium* (*Pulsellum*) 1920, Bull. U.S. Nat. Mus. No. 111, p. 94, pl. 16, fig. 6. Paratype MCZ 186822, *Albatross* station 2710, off [Barneget Bay], New Jersey (N. Lat. 40° 06' 00"; W. Long. 68° 01' 30") in 984 fathoms.
- callipeplum* Dall, *Dentalium* 1889, Bull. Mus. Comp. Zoöl. 18, p. 419, pl. 27, fig. 12b. Holotype MCZ 7672, *Blake*, station 167, from off Guadeloupe, Lesser Antilles (N. Lat. 16° 09'; W. Long. 61° 29') in 175 fathoms. This is the specimen figured by DALL and so labelled by him. It even shows the hole in the side which is indicated in the figure. The type locality is that given above rather than U.S.B.F. station 2400, between the Mississippi River delta and Cedar Keys in 169 fathoms as given by HENDERSON.
- callithrix* Dall *Dentalium* 1889, Bull. Mus. Comp. Zoöl. 18, p. 427, pl. 27, fig. 10. Holotype MCZ 7734, *Blake*, station 236, off Bequia, Grenadines (N. Lat. 12° 52'; W. Long. 61° 96') in 1591 fathoms. This is the specimen labelled by DALL as 'Figured type' and is the one figured in the *Blake* Report. HENDERSON reports the type as from a *Blake* station, in Yucatan Straits in 640 fathoms.
- carduus* Dall, *Dentalium* 1889, Bull. Mus. Comp. Zoöl. 18, p. 423, pl. 27, fig. 3. Holotype MCZ 7692, *Blake*, station 220, off St. Lucia, Lesser Antilles (N. Lat. 13° 50'; W. Long. 61° 03') in 116 fathoms. This is the figured specimen.
- carolinensis* Bush, *Cadulus* 1885, Ann. Report of the Commissioner of Fish and Fisheries for 1883, p. 587; BUSH 1885, Trans. Connecticut Acad. Arts and Sci. 6, pt. 2, p. 471, pl. 45, fig. 19. Paratypes MCZ 186818, *Albatross*, station 2114, off Cape Hatteras, North Carolina (N. Lat. 35° 20' 00"; W. Long. 75° 20' 00") in 14 fathoms.
- ceratum* Dall *Dentalium* 1881, Bull. Mus. Comp. Zoöl. 9, p. 38; DALL 1889, Bull. Mus. Comp. Zoöl. 18, p. 424, pl. 26, fig. 5, pl. 27, fig. 2. Paratype MCZ 7697, *Blake*, station 2, off Habana, Cuba (N. Lat. 23° 14'; W. Long. 82° 25') in 805 fathoms.
- circubita* Dall *Cadulus* 1881, Bull. Mus. Comp. Zoöl. 9, p. 35; DALL 1889, Bull. Mus. Comp. Zoöl. 18, p. 431, pl. 27, fig. 12d. Holotype MCZ 7750, *Blake*, station 19, off Bahía Honda, (Pinar del Río) Cuba in 310 fathoms.
- elephas* Henderson *Cadulus* (*Platyschides*) 1920, Bull. U.S. Nat. Mus. No. 111, p. 107, pl. 17, fig. 10. Holotype MCZ 7741, *Blake*, station 230, off St. Vincent, Lesser Antilles (N. Lat. 13° 13' 20"; W. Long. 61° 18' 45") in 464 fathoms.

- gouldii* Dall *Dentalium* 1889, Bull. Mus. Comp. Zoöl. 18, p. 424 (not figured). Paratype MCZ 7707, Blake, station 65, off Habana, Cuba in 127 fathoms. This was a poor and badly worn specimen. Better specimens were obtained off the Barbados at Blake station 299 in 140 fathoms along with *obscurum* Dall.
- grandis* Verrill *Cadulus* 1884, Trans. Connecticut Acad. Arts and Sci. 6, pt. 1, p. 219; 6, pt. 2, pl. 44, fig. 20. Paratype MCZ 186804, Albatross, station 2076, about 230 miles E. of Martha's Vineyard, Massachusetts (N. Lat. 41° 13' 00"; W. Long. 66° 00' 50") in 906 fathoms.
- lunula* Dall *Cadulus* 1881, Bull. Mus. Comp. Zoöl. 9, p. 35; DALL 1889, Bull. Mus. Comp. Zool. 18, p. 431, pl. 27, fig. 8. Holotype MCZ 7747, Blake, station 2, off Morro Light, Habana, Cuba in 805 fathoms.
- mayori* Henderson *Cadulus* (*Gadila*) 1920, Bull. U.S. Nat. Mus. No. 111, p. 133, pl. 19, fig. 3. Paratype MCZ 48411, Eolis, station 43, off Key West, Florida in 63 fathoms.
- miamiensis* Henderson *Cadulus* (*Platyschides*) 1920, Bull. U.S. Nat. Mus. No. 111, p. 129, pl. 19, fig. 18. Paratype MCZ 48413, Eolis, station 348, off Fowey Light, Florida in 110 fathoms.
- nanus* Clench and Aguayo *Cadulus iota* 1939, Mem. de la Soc. Cubana de Hist. Nat. 13, No. 3, p. 197. Holotype MCZ 89222, Gibara, Oriente Province, Cuba in 40 fathoms.
- obscurum* Dall *Dentalium gouldii* var. 1889, Bull. Mus. Comp. Zoöl. 18, p. 424, pl. 27, fig. 4 (not pl. 26 as given in the text). Holotype MCZ 7708, Blake, station 299, off Barbados, Lesser Antilles (N. Lat. 13° 05' 00", W. Long. 59° 39' 40") in 140 fathoms. This is the specimen figured by DALL and so labelled by him, [not station 229 as given by HENDERSON.]
- occidentale* Henderson, *Siphonodentalium* (*Pulsellum*) 1920, Bull. U.S. Nat. Mus. No. 111, p. 93, pl. 16, fig. 4. Paratype MCZ 186823, from U.S.B.F. Fish Hawk, station 871, off Martha's Vineyard, Massachusetts (N. Lat. 40° 02' 54"; W. Long. 70° 23' 40") in 115 fathoms. HENDERSON records 86 fathoms for this station in his original description, but the station lists give 115.
- ophiodon* Dall *Dentalium* 1881, Bull. Mus. Comp. Zoöl. 9, p. 38; DALL 1889, Bull. Mus. Comp. Zoöl. 18, p. 427, pl. 26, fig. 9. Paratype MCZ 7729, Blake, station 21, off Bahía Honda (Pinar del Río) Cuba in 827 fathoms.
- pandionis* Verrill and Smith *Cadulus* 1880, Amer. J. Sci. 20, p. 399. Paratypes MCZ 186811, Fish Hawk, station 877, south of Martha's Vineyard, Massachusetts (N. Lat. 39° 56'; W. Long. 70° 54' 18") in 126 fathoms.
- parvus* Henderson *Cadulus* (*Platyschides*) 1920, Bull. U.S. Nat. Mus. No. 111, p. 113, pl. 18, figs. 2, 4. Paratypes MCZ 48414, State Univ. of Iowa, station 44 off the Barbados, Lesser Antilles in 90 fathoms.
- perlongum* Dall *Dentalium* 1881, Bull. Mus. Comp. Zoöl. 9, p. 36; DALL 1889, Bull. Mus. Comp. Zoöl. 18, p. 419, pl. 27, fig. 6. Holotype MCZ 7752, Blake, station 33 from north of the Yucatan Bank (N. Lat. 24° 01'; W. Long. 88° 58') in 1568 fathoms. This specimen is the only one in the four lots mentioned by DALL in his original description that measures 80 mm and agrees with his figure. Consequently, though DALL did not label it as the figured specimen, there seems no question but that it is the holotype. HENDERSON states that "the type is not in the United States National Museum".
- poculum* Dall *Cadulus* 1889, Bull. Mus. Comp. Zoöl. 18, p. 429 (not figured). Holotype MCZ 7743, Blake station, off Cape San Antonio, Cuba [Yucatan Strait] in 640 fathoms. DALL did not figure this species but the specimen which he measured, the largest of those obtained, is in the MCZ collection.
- quadridentatus* Dall *Siphonodentalium* 1881, Bull. Mus. Comp. Zoöl. 9, p. 36; Dall 1889 *Cadulus quadridentatus*, Bull. Mus. Comp. Zoöl. 18, p. 428, pl. 27, fig. 5. Holotype MCZ 7739, Pourtales dredgings on the west coast of Florida in 30 fathoms.
- sigsbeanum* Dall *Dentalium* 1881, Bull. Mus. Comp. Zoöl. 9, p. 38. Holotype MCZ 7737, Blake, station from Yucatan Strait in 640 fathoms.

- spectabilis* Verrill *Cadulus* 1885, Trans. Connecticut Acad. Arts and Sci. **6**, pt. 2, p. 432, pl. 44, fig. 19. Paratype MCZ 186801, *Albatross*, station 2221, about 180 miles off Ocean City, New Jersey (N. Lat. 39° 05' 30"; W. Long. 70° 44' 30") in 1525 fathoms. HENDERSON was in error when he stated that the type of this species was from U.S.B.F. station 2711. This station was not included in VERRILL's original description, and in fact station 2711 was made on September 16, 1886, and VERRILL's description was published in June 1885. The holotype is in the U.S. Nat. Mus. No. 40,498 from station 2221.
- taphrium* Dall *Dentalium* 1889, Bull. Mus. Comp. Zoöl. **18**, p. 422, (not figured). Paratype MCZ 7690 from off the Carolina Coast in 52 fathoms.
- watsoni* Dall *Cadulus* 1881, Bull. Mus. Comp. Zoöl. **9**, p. 34; DALL 1889, Bull. Mus. Comp. Zoöl. **18**, p. 429, pl. 27, fig. 12a. Holotype MCZ 7742 from *Blake*, station off Cape San Antonio, Cuba in 413 fathoms.
- verrilli* Henderson *Cadulus* (*Gadila*) 1920, Bull. U.S. Nat. Mus. No. 111, p. 136, pl. 19, fig. 13. Paratype MCZ 186819 U.S.B.F. *Fish Hawk*, station 871, off Martha's Vineyard, Massachusetts (N. Lat. 40° 02' 54"; W. Long. 70° 23' 40") in 115 fathoms.
- verrilli* Henderson *Siphonodentalium* (*Siphonodentalium*) 1920, Bull. U.S. Nat. Mus. No. 111, p. 91, pl. 16, figs. 2 and 7. Paratype MCZ 186821 from *Albatross*, station 2710, off Nantucket (N. Lat. 40° 06' 00"; W. Long. 68° 01' 30") in 984 fathoms.

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