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# Additions to the Scaphopod Fauna (Mollusca: Scaphopoda) of the Colombian Caribbean

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**ABSTRACT.—Twelve scaphopods species were obtained during the "Invemar-Macrofauna" trawling campaigns along the continental shelf and slope of the Colombian Caribbean (70-500 m depth). Of these six (*Dentalium gouldii, D. laqueatum, Calliodentalium callipeplum, Entalina platamodes, Gadila watsoni,* and *Compressidens pressum*) were recorded for the first time from southern Caribbean waters. In addition, the genus *Striocadulus* was recorded for the first time in Atlantic waters. With the new records the number of scaphopods for the area increased to 23 species.**

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**KEYWORDS.—Scaphopoda, *Calliodentalium, Compressidens, Dentalium, Entalina, Gadila, Striocadulus***

The Scaphopoda constitutes a small class of recent mollusks, with approximately 500 known living species from marine sediments in shallow to hadal depths of all world oceans (Scarabino 1994). Based on previous records and collecting efforts from shallow waters in the Santa Marta area Díaz (1988, see also Díaz 1985) and Díaz and Puyana (1994) reported 13 and 16 scaphopod species, respectively. The scaphopod fauna of the continental shelf and shelf slope in depths beyond 100 m remained less investigated. As part of an ambitious program to inventory the benthic macrofauna of this less explored deep zone, between 1998 and 2001 a series of research cruises were conducted, in the *R/V Ancón* of the Instituto de Investigaciones Marinas y Costeras, INVEMAR, along the shelf and upper shelf slope (70 to 520 m deep) off the coast of the Colombian Caribbean. Our purpose is to report the scaphopod species collected during these campaigns. Special attention is given to 7 species which are new records for Colombia and southern Caribbean waters.

During the research cruises, 80 stations were sampled off the Colombian Caribbean coast between the Guajira Peninsula (12°34′N, 71°50′W) and the Gulf of Urabá (09°02′N, 76°02′W), depths ranged from 20 to 520 m. A bottom surface area of about 25 000 $m^2$ was swept at each station using a semi-balloon trawl net (ca. 9 x 1 m mouth opening, mesh size 1 cm, 20 min trawling at 3 knots). Scaphopods collected were aboard preliminary preserved in 70% ethanol. Taxonomic identification was carried out at INVEMAR, Santa Marta, and the U.S. National Museum of Natural History, Washington, D.C. Voucher specimens were deposited in the Museo de Historia Natural Marina de Colombia (MHNMC) at Santa Marta, Colombia. The taxonomic arrangement followed Steiner and Kabat (2001).

Eleven scaphopod species and one undetermined taxon of Dentaliidae were collected from only 36 stations (45% of all stations, Table 1). Seven species (marked with

TABLE 1. Coordinates, depth range, approximate location, and date of stations where scaphopod specimens were collected during the Invemar-Macrofauna research cruises.

| Stations INV | Coordinates | | Depth range (m) | Locality (approximate) | Date (d/m/y) |
|---|---|---|---|---|---|
| 2 | 12°31′ | 72°07′ | 442-460 | off Punta Gallina | 21/11/1998 |
| 3 | 12°29′ | 72°15′ | 434-450 | Bahía Portete | 22/11/1998 |
| 7 | 11°29′ | 73°27′ | 476-490 | off Dibulla | 25/11/1998 |
| 9 | 11°26′ | 73°31′ | 286-312 | off Palomino | 26/11/1998 |
| 10 | 11°27′ | 73°42′ | 492-502 | off Palomino | 26/11/1998 |
| 12 | 11°27′ | 73°51′ | 488-494 | off Rio Piedras | 27/11/1998 |
| 13 | 11°27′ | 74°01′ | 500-510 | off Chengue | 01/12/1998 |
| 15 | 11°24′ | 74°12′ | 288-308 | off Nenguange | 02/12/1998 |
| 16 | 11°26′ | 74°13′ | 494-504 | off Nenguange | 02/12/1998 |
| 18 | 11°25′ | 74°11′ | 398-448 | off Aguja Island | 03/12/1998 |
| 19 | 11°23′ | 74°12′ | 200-222 | off Aguja Island | 03/12/1998 |
| 22 | 11°13′ | 75°39′ | 402-414 | East of Bocas de Ceniza | 02/12/1998 |
| 25 | 11°06′ | 75°08′ | 480-492 | off Bocas de Ceniza | 07/12/1998 |
| 27 | 10°28′ | 75°42′ | 270-292 | off Cartagena | 06/12/1998 |
| 28 | 10°10′ | 76°01′ | 461-519 | off Rosario Islands | 15/04/1999 |
| 29 | 10°09′ | 76°00′ | 278-306 | off Rosario Islands | 15/04/1999 |
| 30 | 09°56′ | 76°09′ | 268-302 | NW San Bernardo Islands | 14/04/1999 |
| 31 | 09°53′ | 76°13′ | 482-490 | NW San Bernardo Islands | 13/04/1999 |
| 32 | 09°49′ | 76°15′ | 482-520 | Gulf of Morrosquillo | 13/04/1999 |
| 33 | 09°45′ | 76°15′ | 269-321 | Gulf of Morrosquillo | 13/04/1999 |
| 35 | 09°27′ | 76°25′ | 272-313 | off Ensenada la Rada | 10/04/1999 |
| 36 | 09°17′ | 76°29′ | 490-500 | off Puerto Escondido | 09/04/1999 |
| 37 | 09°16′ | 76°28′ | 288-340 | off Puerto Escondido | 09/04/1999 |
| 38 | 09°05′ | 76°37′ | 500-511 | off Arboletes | 08/04/1999 |
| 39 | 09°02′ | 76°36′ | 290-309 | off Arboletes | 08/04/1999 |
| 41 | 12°29′ | 71°43′ | 72-73 | off Punta Gallinas | 14/03/2001 |
| 45 | 12°03′ | 72°38′ | 70-70 | off Manaure | 15/03/2001 |
| 46 | 11°53′ | 72°36′ | 22-22 | off Manaure | 16/03/2001 |
| 56 | 11°22′ | 74°08′ | 150-151 | off Nenguanje | 19/03/2001 |
| 57 | 11°22′ | 74°10′ | 150-154 | off Bahía Concha | 19/03/2001 |
| 62 | 11°08′ | 74°41′ | 70-70 | Golfo de Salamanca | 21/03/2001 |
| 65 | 11°00′ | 75°07′ | 70-72 | off Morro Hermoso | 22/03/2001 |
| 66 | 11°02′ | 75°11′ | 145-150 | off Morro Hermoso | 22/03/2001 |
| 67 | 10°32′ | 75°37′ | 309-309 | off Cartagena | 23/03/2001 |
| 68 | 10°31′ | 75°39′ | 487-510 | off Cartagena | 23/03/2001 |
| 71 | 10°04′ | 75°56′ | 150-151 | off Tigua | 24/03/2001 |
| 33 | 09°45′ | 76°15′ | 270-300 | off Tolú | 26/03/2001 |
| 73 | 09°47′ | 76°13′ | 155-160 | off Tolú | 26/03/2001 |
| 74 | 09°33′ | 75°40′ | 22-22 | Golfo de Morrosquillo | 29/03/2001 |
| E161 | 09°14′ | 76°26′ | 71 | off Puerto Escondido | 29/03/2001 |
| 80 | 09°46′ | 75°42′ | 20-20 | off Tigua | 31/03/2001 |

an asterisk, Table 2) are first records to Colombian and southern Caribbean waters; these include an apparently yet undescribed species of *Striocadulus*, the latter represents the first member of this genus in Atlantic waters; its description is still in progress. These seven records increased the number of scaphopod species known to occur in the Colombian Caribbean to 23 (cf. Díaz and Puyana 1994).

*Order Dentaliida*

*Family Dentaliidae*

*Antalis* H. and A. Adams, 1854

"***Antalis/ Dentalium***" sp. Plate 1.—fig. 1

Bathymetric range: 270 to 520 m. Collected at stations: 7, 13, 28, 31, 32, 33, 36, 38,

TABLE 2. Scaphopod taxa collected during the Invemar-Macrofauna cruises. Taxa marked with * are new records for the continental shelf of the Colombian Caribbean.

| Order and Family | Genus and species | Stations INV |
|---|---|---|
| Dentaliida | | |
| Gadiminidae Chistikov, 1975 | *Episiphon didymum* (Watson, 1879) | 33 |
| Dentaliidae Gray, 1834 | *Antalis*(?)/*Dentalium*(?) sp. | 7, 13, 28, 31, 32, 33, 36, 38, 68 |
| | *Dentalium gouldii* Dall, 1889* | 41, E161 |
| | *Dentalium laqueatum* Verrill, 1885* | 57, 73 |
| | *Graptacme eboreum* (Conrad, 1846) | 46, 65 |
| | *Paradentalium americanum* (Chenu, 1843) | 62, 65, 72, 74, E161, 80 |
| Calliodentaliidae Chistikov, 1975 | *Calliodentalium callipeplum* (Dall, 1889)* | 2, 3, 7, 9, 10, 12, 13, 15, 16, 18, 19, 25, 27, 28, 29, 30, 32, 33, 35, 36, 37, 39, 56, 66, 68, 71 |
| Gadilida | — | — |
| Entalinidae Chistikov, 1979 | *Entalina platamodes* (Watson, 1879)* | 2, 7, 28, 31, 33, 38, 67, 68, 71 |
| Gadilidae Stolicza, 1868 | *Striocadulus* sp.* | 22 |
| | *Gadila acus* (Dall, 1889) | 41 |
| | *Gadila watsoni* (Dall, 1881)* | 2, 7, 12, 13, 25, 28, 39, 45, 68 |
| *Incertae sedis* | *Compressidens pressum* Pilsbry & Sharp, 1897* | 2, 7, 12, 25, 68, 71 |

68; only empty shells were collected (INV MOL2244—2251, 2795-2797, 3113, 3415).

Remarks: Both shell shape and sculpture of the available material exhibit a blend of features characteristic of *Antalis* and *Dentalium*, which made difficult placement in any of these genera or another recognized genus of Dentaliidae. An analysis of radular morphology is necessary for a more accurate taxonomic determination, but soft parts of the animal were not present among the collected material. The shell of *Dentalium gouldii*, another of the species reported here (see below), exhibits fewer longitudinal ribs and the intercostal spaces are striate. The shell of the collected material in some way resembles that of *Antalis circumcinctum,* but the latter has more rounded and irregular ribs cancellated by growth lines.

*Dentalium* Linnaeus, 1758

***Dentalium gouldii*** Dall, 1889. Plate 1. —fig. 2

*Dentalium gouldii* Dall, 1889:424-425

*Dentalium sexangulare* Hilgard and Hopkins, 1878 *non* Lamarck, 1818 *fide* Pilsbry and Sharp, 1897:21

*Dentalium* (*Dentalium*) *gouldii gouldii*: Henderson, 1920:30, pl. 2, figs. 6-7

*Dentalium* (*Dentalium*) *gouldii colonense*: Henderson, 1920:31, pl. 3, fig. 6

*Dentalium* (*Dentalium*) *gouldii portoricense*: Henderson, 1920:30-31, pl. 2, fig. 5

Other references: *Dentalium* (*Dentalium*) *gouldii*: Henderson, 1920:29-30; Scarabino, 1975: 183 (no pl. 58, fig. 892); Scarabino, 1979:55, fig. 56, 83; Rios, 1994: 305, pl. 105, fig. 1495.

*Dentalium* (*Dentalium*) *gouldii colonense*: Henderson, 1920:31, pl. 3, fig. 6; Warmke and Abbott, 1961:222, fig. 34c; Altena, 1971: 86. *Dentalium* (*Dentalium*) *gouldii portoricense*: Emerson, 1952:2.

Geographic distribution: Tropical western Atlantic from South Carolina (USA), Bermuda, Puerto Rico, and northern Brazil. Bathymetric range: 20 to 1050 m. Collected at stations: 41 and E161, only two empty shells were collected between 71-73 m (INV MOL4405, 4506).

***Dentalium laqueatum*** Verrill, 1885. Plate 1. —fig. 3

*Dentalium laqueatum* Verrill, 1885:431, pl. 44, fig. 18

Other references: *Dentalium laqueatum*: Henderson, 1920: 23-24, pl. 1, figs. 6-7; Turner, 1955: 310; Rios, 1994: 306, pl. 106, fig. 1496.

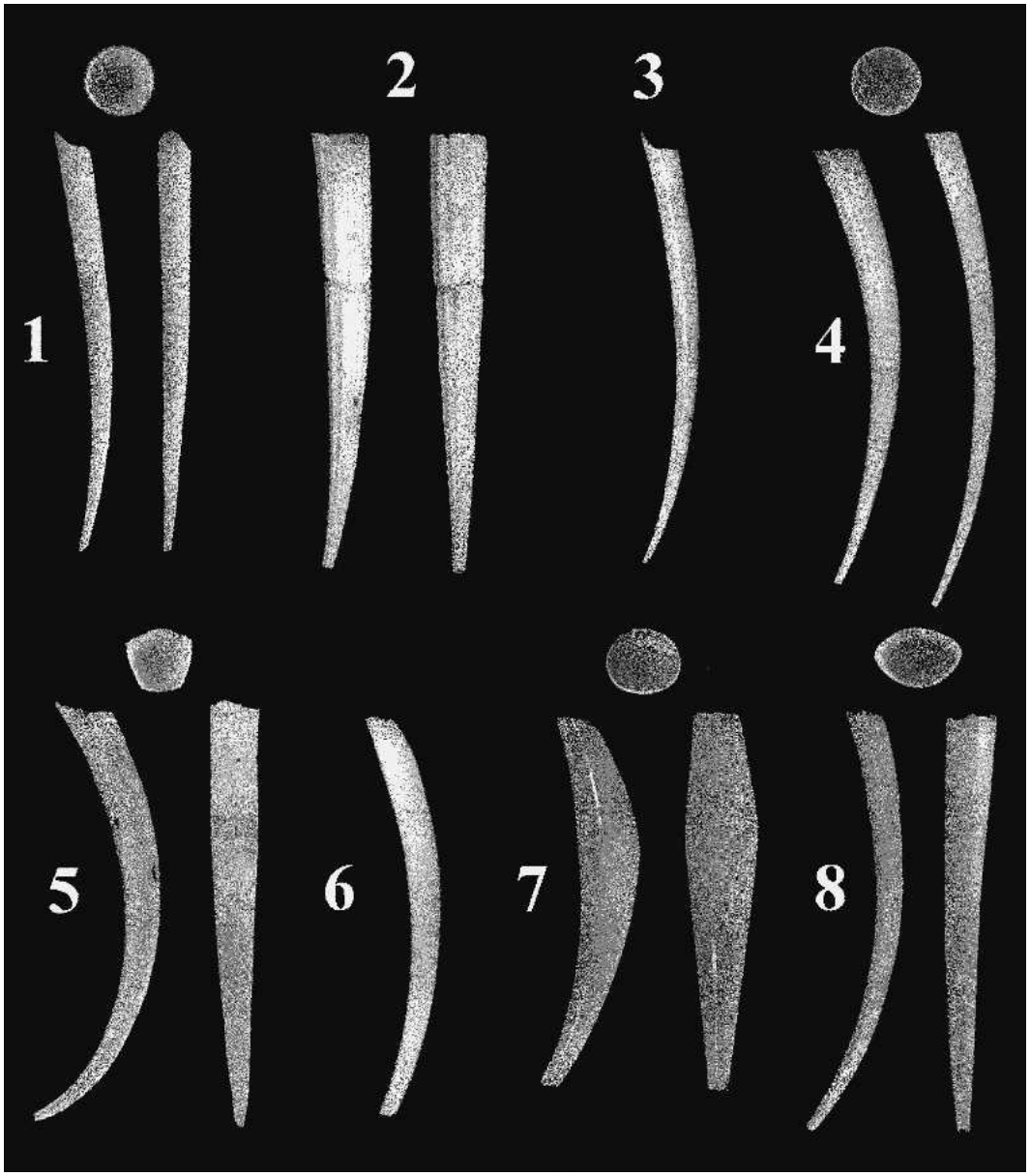


FIG. 1. Lateral and dorsal views *Antalis / Dentalium* sp. (INV MOL2795, L. 22.34 mm).
FIG. 2. Lateral and dorsal views *Dentalium gouldii* (INV MOL4505, L. 26.60 mm).
FIG. 3. Lateral view *Dentalium laqueatum* (INV MOL4508, L. 41.16 mm).
FIG. 4. Lateral views *Calliodentalium callipeplum* (INV MOL2222, L. 66.71 mm).
FIG. 5. Lateral and dorsal views *Entalina platamodes* (INV MOL2793, L. 15.4 mm).
FIG. 6. Lateral view *Striocadulus* sp. (INV MOL2828, L. 27.4 mm).
FIG. 7. Lateral and dorsal views *Gadila watsoni* (INV MOL2255, L.13.57 mm).
FIG. 8. Lateral and dorsal views *Compressidens pressum* (INV MOL3112, L. 20.4 mm).

Geographic distribution: Western Atlantic from Cape Hatteras (USA) to Guyana. Bathymetric range: From very shallow water to 900 m. Collected at stations: 57 and 73, only two empty shells were collected between 150-160 m of depth (INV MOL4507, 4508).

*Family Calliodentaliidae*

*Calliodentalium* Habe, 1964

***Calliodentalium callipeplum*** (Dall, 1889). Plate 1.—fig. 4

*Dentalium callipeplum* Dall, 1889:419, pl. 27, fig. 12b

*Dentalium* (*Laevidentalium*) *callipeplum* Dall, 1889: Pilsbry and Sharp, 1897:100

*Laevidentalium callipeplum* (Dall, 1889): Scarabino, 1979:61-62, figs. 69, 95

*Calliodentalium callipeplum* (Dall, 1889), *fide* Scarabino, 1995:273

Other references: *Dentalium callipeplum*: Pilsbry and Sharp, 1897:100, pl. 19, fig. 9; *Dentalium* (*Laevidentalium*) *callipeplum*: Henderson, 1920:74, pl. 12, fig. 5; Emerson, 1952: 4; Turner, 1955:313.

Geographic distribution: Tropical western Atlantic from South Carolina (USA) and the Gulf of Mexico to the Lesser Antilles. Bathymetric range: 14 to 4000 m. Collected at stations: 2, 3, 7, 9, 10, 12, 13, 15, 16, 18, 19, 25, 27-30, 32, 33, 35-37, 39, 56, 66, 68, 71; live specimens (33) were found between 268 to 520 m depth and numerous empty shells (134) were collected between 145 to 520 m depth (INV MOL2220-2238, 2871, 2890, 2959, 3005, 3126, 3163, 3208, 3242, 3333, 3365, 3403, 3489, 3514, 4512-4516).

Remarks: As mentioned by Dall (1889) in the original description of the species, we also observed, among the abundantly collected material, a lot of shell color variation (from samon pink to milky white).

*Order Gadilida*

*Family Entalinidae*

*Entalina* Monterosato, 1872

***Entalina platamodes*** (Watson, 1879). Plate 1.—fig. 5

*Siphodentalium platamodes* Watson, 1879:519; 1885:13, pl. 2, fig. 4

*Entalina quadrata*: Henderson, 1920: 88, pl. 15, fig. 2, 3, 6, 10, *fide* Emerson, 1952:7-8

*Entalina platamodes* (Watson, 1879), *fide* Pilsbry and Sharp, 1897:133, pl. 23, fig. 3-5

Other references: *Dentalium platamodes*: Dall 1889:76; *Entalina platamodes*: Henderson, 1920:87, pl. 15, fig. 1, 4, 5, 7; Emerson, 1952:7; Turner, 1955:314; Penna-Neme, 1974:114; Scarabino, 1975:181, pl. 58, fig. 883; Scarabino 1979:64; Rios, 1994:308, pl. 107, fig. 1514.

Geographic distribution: Tropical western Atlantic: Florida to Brazil. Bathymetric range: 200 to 1400 m, here extended to 151 m for empty shells. Collected at stations: 2, 7, 28, 31, 33, 38, 67, 68, 71; only empty shells were found between 151-519 m of depth (INVMOL2240-2243, 2791-2945, 3117, 4521, and 4522).

Remarks: As stated by Emerson (1952), for the Puerto Rican Deep, most of the specimens were attached to the side of an undeterminated membranous polychaets tubes habitually found empty.

*Family Siphonodentaliidae*

*Striocadulus* Emerson, 1962

***Striocadulus*** sp. Plate 1.—fig. 6

Bathymetric range: 404-412 m. Collected at stations: 22, only 4 live specimens were found (INV MOL 2384, 2828, 2829).

Remarks: This is probably a new species and we still have to do more work on it. *Striocadulus* is a widely distributed genus in the tropical Pacific and Indian Oceans (Scarabino 1995; Steiner and Kabat 2001), and this represents the first report for the Atlantic waters.

*Family Gadilidae*

*Gadila* Gray, 1847

***Gadila watsoni*** (Dall, 1881). Plate 1.—fig. 7

*Cadulus watsoni* Dall 1881:34; 1889: 429, pl. 27, fig. 12°

*Cadulus* (*Gadila*) *watsoni*: Pilsbry and Sharp, 1898:167, pl. 25, fig. 50

*Cadulus* (*Platyschides*) *watsoni*: Henderson, 1920:120, pl. 18, fig. 12

*Gadila watsoni* (Dall 1881), *fide* Scarabino 1979:82

Other references: *Cadulus* (*Platyschides*) *watsoni*: Turner, 1955:315.

Geographic distribution: The species has also been recorded from the Yucatan Strait and Cuba.

Bathymetric range: In depths between 260-1165 m. Collected at stations: 2, 7, 12, 13, 25, 28, 39, 45, 68; numerous empty shells (75) and only 2 specimens were collected between 70-510 m of depth, live material between 480-492 m (INVMOL2253-2256, 2799-2800, 2957, 3116, 3310, 3355, 3392, and 4518).

Remarks: Shell morphology and sculpture of the collected material are consistent with those of the paralectotype (USNM 95380, Yucatan Strait, 1152 m) and material from off Old Providence Island (USNM 94054). Scarabino (1979) reported this species from off Old Providence Island, a record missed by both Díaz (1988) and Díaz and Puyana (1994). Our record is the first one for the Colombian continental shelf area and the southern Caribbean.

*Incertae sedis*

*Compressidens* Pilsbry and Sharp, 1897

***Compressidens pressum*** (Sharp and Pilsbry *in* Pilsbry and Sharp, 1897) Plate 1.—fig. 8

*Dentalium compressum* Watson, 1879: 516 (non *D. compressum* Orbigny, 1850); 1885:9,

fig. 9; Dall, 1889:426

*Dentalium* (*Compressidens*) *pressum* Sharp and Pilsbry *in* Pilsbry and Sharp, 1897: 124,

pl. 7, fig. 11; pl. 22, fig. 50-52

*Pulsellum* (*Compressidens*) *pressum*: Kraeuter, 1972:22-23, fig. 1

*Compressidens pressum* (Pilsbry and Sharp, 1897): Scarabino 1979:72

Other references: *Dentalium* (*Compressidens*) *pressum*: Henderson, 1920:83, pl. 14, fig. 3, 6, 8; Emerson, 1952:7; *Pulsellum* (*Compressidens*) *pressum*: Rios, 1994:309, pl. 107, fig. 1516.

Geographic distribution: Western Atlantic from North Carolina (USA) to northeastern Brazil.

Bathymetric range: 172 to 1431 m. Collected at stations: 2, 7, 12, 25, 68, 71; only empty shells were found between 151 to 492 m of depth (INVMOL2252, 2798, 2977, 3112, 3359, 4523).

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