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TRUNCATELLIDAE

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THE GENUS TRUNCATELLA IN THE WESTERN ATLANTIC

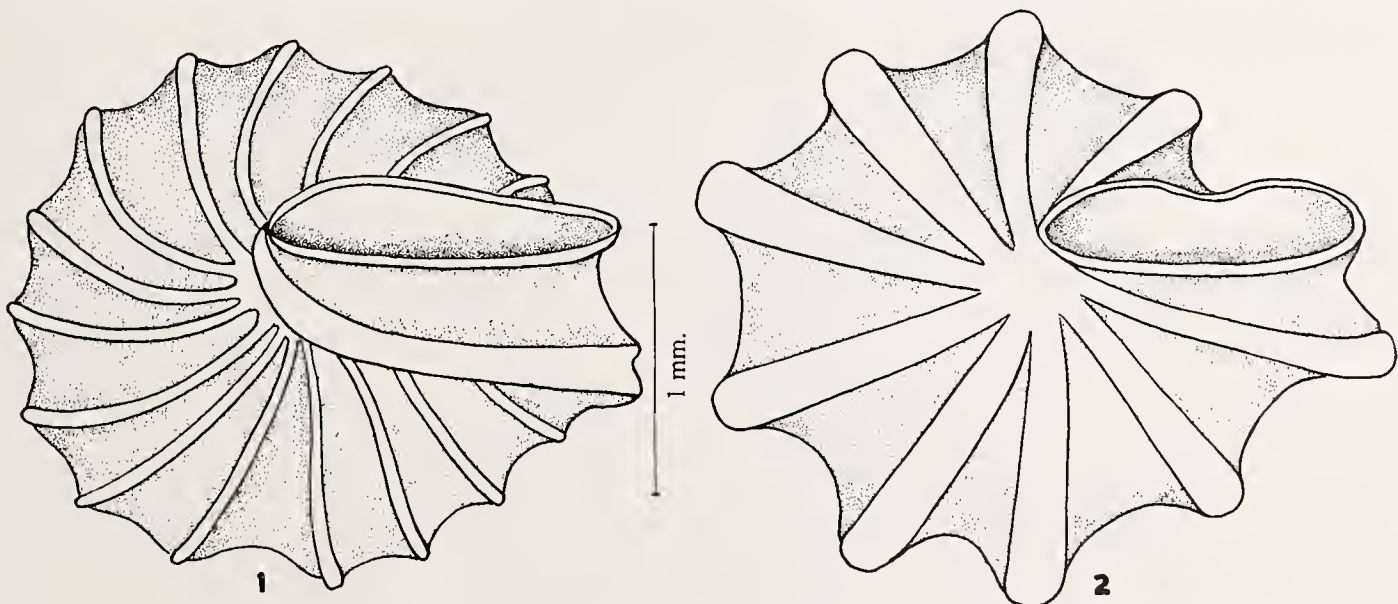
BY

WILLIAM J. CLENCH AND RUTH D. TURNER

The genus *Truncatella* occurs in nearly all tropical and in warmer portions of the temperate seas. A few species have managed to survive beyond these limits, notably *T. subcylindrica* Linné, in the British Isles and on the Central European coasts.

Most species in the genus *Truncatella*, as is the case with nearly all true halophytic mollusks, possess a rather wide distribution. All species probably can exist for a shorter or longer period of time submerged in salt water, though they are generally found at high tide line or a little above, usually under some protective material such as seaweed, boards or rocks. Local distribution can be surprisingly discontinuous. A colony may occupy only a few feet of rubble in the midst of a long stretch of beach where living conditions are presumably identical or at least, similar. The answer is possibly that they are more or less readily transported by flotsam, become established locally for varying periods of time and then eventually die out as subsequent conditions prove inimical to their existence. So far as we can find out, little is known about the life history of members of this genus and the problem is one that needs investigation.

The peculiar habits of *Truncatella* have resulted in inadequate treatment of this genus



Drawn by Ruth D. Turner

Plate 65. Fig. 1. *Truncatella scalaris piratica*, basal view, Holotype. Fig. 2. *Truncatella scalaris* Michaud, basal view, Neoholotype.

by writers whose studies have been limited to either the marine or the land shells of a given region. A writer on marine shells may consider the species of *Truncatella* to be land forms while a writer on terrestrial species may look upon them as belonging to the sea. Thus they may or may not receive attention, depending on the attitude of the individual author.

In the strict sense, the terms marine, land and freshwater refer only to habitat preference and are only lightly superimposed upon the much broader and more exact systematic arrangement of our mollusks. Border line families and genera and even species naturally overlap in the three major habitats so that their inclusion in any faunal study should be based upon their ecological preference rather than their systematic position. In the case of *Truncatella* however, both ecological considerations and systematic relationships justify calling it a marine genus.

It is notable, however, that some primitive members of the Truncatellidae have given rise on at least two occasions to land genera: *Geomelania* in Jamaica and elsewhere in the West Indies and *Taheitia* in Polynesia and other islands in the Western Pacific.

There are several species of *Truncatella* that appear to have two forms: smooth or nearly smooth and strongly costate. This does not seem to be a case of sex dimorphism, as in many instances colonies of one form or the other exist as "pure" races. In other colonies these two forms are mixed, usually with many intermediate individuals difficult to assign to either form. This naturally has given rise to many names applied locally to the species or species complex in which this ambiguous sculpture occurs. Size variation is also a common character which again has complicated the taxonomy of this genus, especially in Europe. We wish in particular to focus attention on the characters of smooth and costate forms for those who have access to fresh material and those living in a region where several different colonies can be studied in the field. Such a study should prove of considerable interest and value and may solve problems of the same sort that exist on many of the temperate and tropical coasts of the world.

All known species in the genus *Truncatella* are mechanically truncated: that is, at or near maturity a mid whorl is plugged by a rounded septum, usually between the fourth and fifth whorls, and the unoccupied whorls are broken off. The shell walls where the septum joins the whorls appears to be slightly weakened by the absorption of the lime so that the fracture is usually fairly clean, though this is not always the case. The actual break is probably never consciously attempted by the mollusk but is generally brought about by the stresses of the environment, such as wave action or other mechanical means. This condition exists in other genera, particularly in the Urocoptidae (terrestrial) in which most genera are mechanically truncated. We cannot recall any other marine genus in which this condition exists. Under purely aquatic conditions, of course, there would be a buoyancy factor of considerable importance which would render the amputation of the unoccupied whorls less necessary. In fact, cross sections of *Terebra* show that many of the early whorls are completely plugged with lime. We are unable to explain why certain genera or families of mollusks produce far more whorls than they eventually occupy.

Non-truncated specimens are occasionally found in the genera mentioned above, particularly in the field, though we have seen but comparatively few complete and mature examples of *Truncatella* in over 50,000 specimens that we have examined in this genus.

The young shell of *Truncatella* is quite typical of most multicoiled mollusks. The first

two or three whorls are generally smooth. Beyond these whorls sculpture appears and becomes heavier as the whorls increase in number and size. Normally smooth forms in the adult, of course, lack any kind of sculpture on any of their early whorls.

The operculum of *Truncatella* is paucispiral and may or may not develop a thin calcified plate on its outer surface. The amount of calcium deposited seems to vary exceedingly, even on specimens in a single locality series. Certain species from the Indo-Pacific have this character well developed; the outer surface is even ridged, the ridges curved and emanating from a common center more or less directly over the opercular nucleus.

A. Vayssière (1885, p. 253-288, pls. 12-13) gives a fine account of the anatomy of *Truncatella truncatula* Draparnaud, discussing in detail the digestive, respiratory, nervous and reproductive systems which are also well illustrated. As shown in this publication *Truncatella* are prosobranchiate mollusks closely related to the Rissoidae, the sexes being separate as is the case with most prosobranchs. He notes that the absence or presence of costae on the shells is in no way a sex character. Vayssière also gives an account of his observation on this species in the field as well as in aquaria in his laboratory and describes the method of creeping by using the proboscis as well as the foot. This "measuring worm" method of progression has been fully described by Pilsbry and Brown also (1914, p. 426-428, pl. 14).

In the Western Atlantic, *Truncatella* extends from the Bermudas, northern Florida and the West Indies as far south as Trinidad. The records from southern New England and North Carolina are based upon mechanical introduction by man or sporadic introductions by drift. Records from the northern Gulf of Mexico may also be chance introductions which in these areas may survive for only a short period of time.

The common name for members of this genus is "looping snails" in reference to the way they progress by means of both foot and proboscis.

We have had the use of the very large collections of *Truncatella* of the United States National Museum and the American Museum of Natural History. These two collections have added materially to our geographical records and our understanding of the several species involved. Our thanks are due to Dr. C. G. Aguayo for the gift of several lots of *Truncatella* from Cuba and for the loan of a type series of *Truncatella pulchella* Pfeiffer, a series collected originally by Gundlach.

Genus *Truncatella* Risso

Acmea Hartmann 1821,¹ *Neue Alpina* 1, p. 204-212. This use of *Acmea* was for a *Truncatella* but was published after his use of *Acmea* and *Acme* in Sturm's *Deutschlands Fauna* for a species which is not in the genus *Truncatella*.

¹There has been considerable confusion regarding the use of the name *Acmea* Hartmann 1821 in place of *Truncatella* Risso 1826. The confusion was originally initiated by Iredale (1915, p. 332) when he stated that *Acmea* Hartmann would have to replace *Truncatella* Risso. He based his conclusion on Hartmann's use of the name *Acmea* in *Neue Alpina* 1, p. 204-212, 1821. Iredale had overlooked an earlier use of *Acmea* by Hartmann in the *System der Erd-und Süsswasser Gastropoden Europa's* [in] Sturm's *Deutschlands Fauna*, Abth. 6, Heft 5, p. 48-49, 1821. According to Sherborn this work appeared before the *Neue Alpina* given above. In this earlier work Hartmann used the spelling *Acme* and *Acmea* (pp. 31, 37). Only a single species is mentioned, *Acmea lineata* Draparnaud, on page 49, and the diagnosis is not that of a *Truncatella*. Pilsbry (1926, p. 32) has clarified this entire situation and as first reviser has selected *Acme* Hartmann to stand for

Acmea of Authors, not of Hartmann in Sturm's Deutschlands Fauna; Iredale 1915, Proc. Malacological Soc., London **11**, p. 332; Pilsbry 1926, Nautilus **40**, p. 32; Keene 1946, Minutes of the Conchological Club of Southern California No. 56, p. 7.

Truncatella Risso 1826, Histoire Naturelle de l'Europe Méridionale **4**, p. 124; Gude 1921, Fauna of British India, Mollusca **3**, p. 360.

Fidelis Risso 1826, Histoire Naturelle de l'Europe Méridionale **4**, p. 121 (genotype, *Fidelis theresa* Risso, monotypic).

Truncatella Lowe 1832, Zoological Journal **5**, p. 300 (genotype, *Cyclostoma truncatulum* Draparnaud, monotypic).

Erpetometru Lowe 1832, Zoological Journal **5**, p. 300 (genotype *Cyclostoma truncatulum* Draparnaud, monotypic).

Choristoma J. de Cristophori and Jan 1832, Cat. Mus. (Mantissa Test.) p. 3, non Hartmann 1840. [We have not seen this publication.]

Truncatula Leach 1847, Annals and Magazine of Natural History (1) **20**, p. 271 (genotype, *Truncatula truncata* Montagu = *Turbo truncatus* Montagu) [= *Helix subcylindrica* Linné, here selected].

Zeanoë Leach 1852, Synopsis of the Mollusca of Great Britain, London, p. 198 (genotype, *Turbo nitida* Adams, monotypic).

Glaucothoë Leach 1852, Synopsis of the Mollusca of Great Britain, London, p. 199 (genotype, *Glaucothoë montaguana* Leach, monotypic).

Herpetometra 'Lowe' Gray 1856, Proc. Zool. Soc., London, p. 22 [error for *Erpetometra* Lowe].

Albertisia Issel 1880, Ann. del Museo Civico di Storia Nat. di Genova **15**, p. 275 (genotype, *Albertisia puuca* Issel, monotypic).

Truncatula 'Risso' Caziot, 1910, Etude Moll. Princip. Monaco p. 450 (error for *Truncatella* Risso); non Leach 1847, non Hagenow 1851.

Genotype, *Truncatella laevigata* Risso, subsequent designation, Gude 1921 (= *Helix subcylindrica* Linné).

The shells are small, rarely exceeding 10 mm. in the adult truncated form. They possess a paucispiral operculum which may or may not have a thin accessory plate of calcium on its outer surface. The shell has many whorls but most of these are lost when the animal becomes adult. Sculpture, when present, consists of rather strong axial costae which may extend from suture to suture or disappear on the whorl periphery. In a few species or members of a single species this sculpture may be entirely absent.

Members of the genus *Truncatella* are prosobranchiate mollusks with the sexes separate, aquatic or semiaquatic and live in the vicinity of the high water line. They rarely occur where there is much brackish water. In relationship they are close to the Bulimidae and Rissoidae.

Key to the Western Atlantic *Truncatella*

1. Costae 17 or more on the body whorl	3
2. Costae 16 or less on the body whorl	7
3. Outer lip duplex	<i>bilabiata</i> and <i>bahamensis</i>
4. Outer lip simple	5
5. Costae well developed; lip thickened	<i>succinea</i>
6. Costae rather poorly developed; lip usually thin	<i>pulchella</i>
7. Costae 8 to 11 on the body whorl	<i>scalaris</i>
8. Costae 13 to 16 on the body whorl	<i>piratica</i>

the genus with *Acmea* Hartmann a synonym. This was accepted by Thiele 1929, Handbuch der Systematischen Weichtierkunde **1**, p. 136. Keene (1946, p. 7) has added to the confusion by accepting the dictum of Iredale, overlooking the clarification of this problem by Pilsbry.

Subgenus *Truncatella* Risso

Truncatella Risso 1826, Histoire Naturelle de l'Europe Méridionale 4, p. 124.

This subgenus is characterized by having shells which may be smooth or which may exhibit more or less numerous costae. However, costae are seldom completely absent. Operculum corneous, with or without a thin accessory calcified plate on its outer surface.

Subgenotype, *Truncatella laevigata* Risso, subsequent designation Gude 1921 (= *Helix subcylindrica* Linné).

Truncatella (Truncatella) bilabiata Pfeiffer, Plate 66, fig. 1-7

Truncatella bilabiata Pfeiffer 1840, Archiv. für Naturgeschichte (6) 1, p. 253 (Cuba).

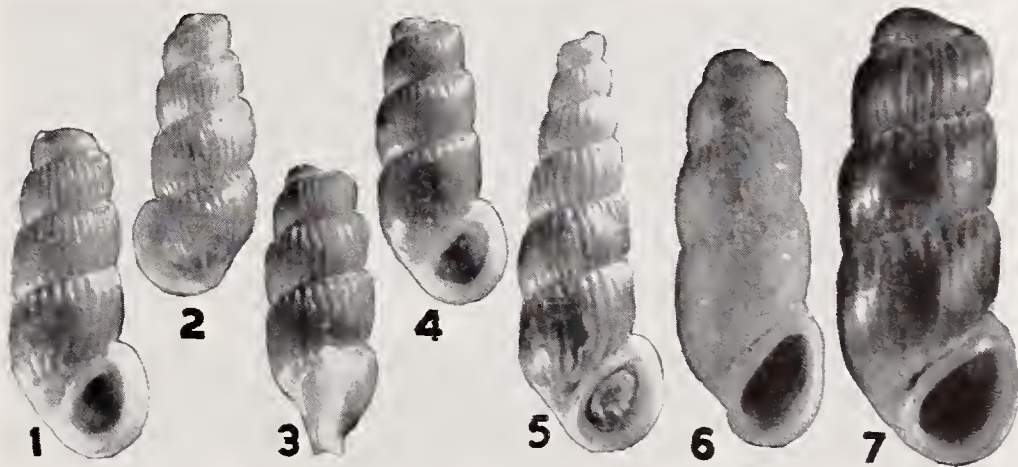
Truncatella bairdiana C.B. Adams 1852, Ann. Lyceum Nat. Hist. New York 5, p. 437 [p. 213 in separate] ([West] Panama [Lectotype, MCZ 177110]).

Truncatella barbalensis Pfeiffer 1856 [1857], Proc. Zool. Soc. London 24, p. 337 (Barbados, West Indies) [Heautotypes, MCZ 136008].

Truncatella debilis Mousson 1874, Jahrbücher Malakozoologischen Gesellschaft 1, p. 99, pl. 5, fig. 3 (Rabat, Morocco).

Truncatella capillacea 'Gundlach' Pfeiffer 1859, Malakozoologische Blätter 6, p. 77 (Caimanera [Guantánamo] Cuba) [Cotypes, MCZ 178982, 178983].

Description. Shell small, variable in size, from 3 to 6½ mm. in length. Costate to nearly smooth and rather solid. Whorls 3½ to 4½ and rather strongly convex. Color pale straw-yellow to red-brown with a white lip. Spire lengthened and truncated. Suture rather deeply impressed. Aperture holostomatous, subcircular to subovate. Parietal wall thickened with the inner lip extending above. Outer lip duplex with the lower lip very much thickened. Basal ridge short, thickened and merging into the lower lip. Shell imperforate or at best with a very minute rimation. Columella not apparent. Sculpture generally consisting of numerous well formed axial ribs which extend from suture to suture. Many specimens, however, have the sculpture much reduced, consisting only of



Photographs by F. P. Orchard

Plate 66. *Truncatella bilabiata* Pfeiffer

Fig. 1-5. Coconut Grove, Florida (all about 6½x). Fig. 6. Cotype of *T. capillacea* Pfeiffer (= *bilabiata* Pfeiffer) Caimanera, Cuba (about 9x). Fig. 7. Lectotype of *T. bairdiana* C.B. Adams (= *bilabiata* Pfeiffer) Panama (about 9x).

very short riblets which appear only above and below the suture, the peripheral area being quite smooth and shiny. All grades of sculpture from those that are nearly smooth to those that are strongly costate may exist in specimens from a single locality. Operculum paucispiral, corneous and generally with a thin calcified plate on the outer face. In young specimens the first two whorls are smooth, the third whorl finely costate and the remaining whorls increasingly so.

	length	width	
(large)	6.5	2.5 mm.	Barbados, Lesser Antilles
(average)	5.5	2.2	Key West, Florida
(small)	3	1.3	Punta Alegre, Camagüey, Cuba

Types. The type of this species is probably in the museum at Stettin, Germany. We here restrict the type locality to Matanzas, Cuba.

Remarks. It is quite possible that *T. bilabiata* is adventitious in the Eastern Atlantic. It is exceedingly common in the West Indian region and distribution from this area eastward to Madeira and the adjacent coast of Africa is not impossible.

We are unable to separate *Truncatella bairdiana* Adams, from the Pacific at Panama, from *T. bilabiata* Pfeiffer. Just why Adams compared his new form with *T. scalariformis* Reeve of Polynesia instead of *T. bilabiata* Pfeiffer of the West Indies is a little difficult to understand. *T. scalariformis* is a very different species and in no way related to the Panamanian form. *T. bilabiata* possesses a well developed duplex lip and a strongly developed basal ridge, characters which readily separate it from *T. pulchella*.

We have seen three cotype series of *T. capillacea* Pfeiffer. Two of these lots (MCZ) consist of depauperate specimens of *T. bilabiata* Pfeiffer while the third is made up (USNM) of depauperate specimens of both *T. bilabiata* Pfeiffer and *T. scalaris* Michaud. The type locality, Caimanera, Cuba, near the Guantánamo Naval Base is in Guantánamo Harbor and at a considerable distance from the harbor entrance. Habitat conditions at this place are probably not very favorable for their existence.

Range. Florida and the West Indies south to Trinidad, Lesser Antilles. Also the Eastern Atlantic at Morocco and the Madeira Islands and the Eastern Pacific at Panama.

Records. EASTERN ATLANTIC: MADEIRA IDS. (J. R. leB. Tomlin). WESTERN ATLANTIC: FLORIDA: New Smyrna (USNM); Mosquito Lagoon, Indian River; Palm Beach (both MCZ); Coconut Grove (R. Humes); Lignumvitae Key (MCZ); Big Pine Key (P. McGinty); Key West; Cape Sable; Mareo; Sanibel Island (all MCZ); Boea Grande (H. Dodge); Sarasota; Gulfport; Cedar Keys (all MCZ). BERMUDA: Hungry Bay; Shelly Bay (both MCZ). BAHAMAS: Riding Point, Grand Bahama; Cave Cay, Little Abaco; Mores Island and Marsh Harbor, Great Abaco; Nassau, New Providence; Mangrove Cay, Andros Island; Upper Pimlico Id. and Roek Sound, Eleuthera; Arthurs-town, Cat Island; Matthewtown, Great Inagua (all MCZ); Booby Cay, Mariguana Id.; Plana Cays; Knife Cay, Ragged Ids.; Pinnacle Point and Mason Bay, Aclin Id.; Grand Caicos Id., Caicos Ids. (all USNM). CUBA: Punta del Cajon (USNM); Playa Manimani, Pinar del Río (A. del Valle); Jaimanitas, Habana; Playa de Bellamar, Matanzas (both P. J. Bermúdez); Cárdenas (MCZ); Cayo Santa Maria, Camagüey (R. Humes); Gibara (C. G. Aguayo); Peninsula del Ramon, Antilla (A. Quiñones); Cinco Reales,

Santiago (C. G. Aguayo); Batabano (J. T. Acosta); Bahía de Cochinos (USNM). ISLE OF PINES: Nueva Gerona (MCZ). PUERTO RICO: Fajardo (MCZ). VIRGIN ISLANDS: St. Thomas (MCZ). HISPANIOLA: Port au Prince; St. Louis; Port Salut; Bizonton; Aquin; Les Cayes; Gonave Id.; Ile à Vache (all USNM). JAMAICA: Kingston; Spanish Town Road (both MCZ); Rockfort (USNM). LESSER ANTILLES: St. Kitts; St. Bartholomew; Simson's Bay, St. Martins; Martinique; Barbados (all MCZ); Antigua; Trinidad (both USNM). CARIBBEAN ISLANDS: Roatan Island, Bay Islands (MCZ); Cayman Brac and Little Cayman, Cayman Ids. (both USNM).

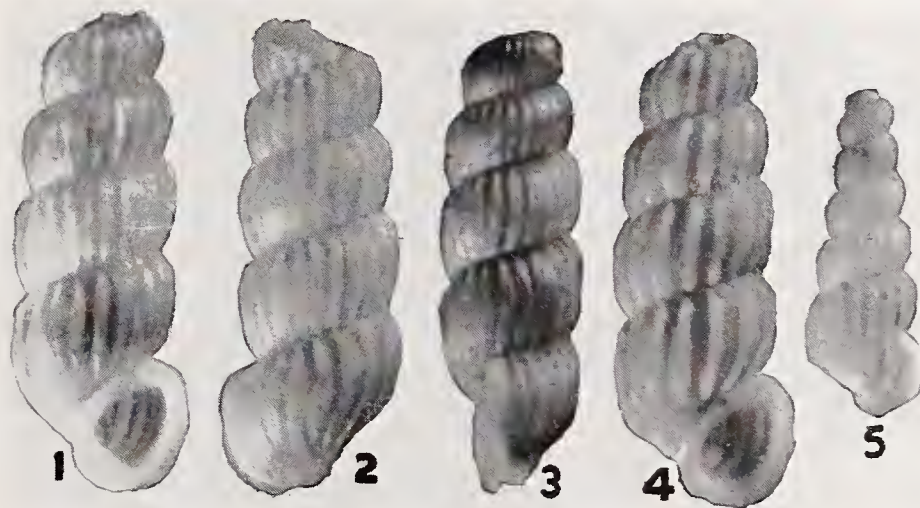
Truncatella bilabiata bahamensis, new subspecies, Plate 67, fig. 1-5

Description. Shell smaller, narrower and less robust than typical *bilabiata*. The costae are more blade-like and show a considerable variation in their spacing; they are of equal height and show no tendency to become smooth at the whorl periphery. The lip is bilabiate and the aperture is holostomatous, the inner lip not being attached to the parietal area.

length	width	
4.7	1.8 mm.	Holotype
4.4	1.8	Matthewtown, Great Inagua, Bahama Islands

Types. Holotype, Museum of Comparative Zoölogy no. 158794, Northwest Point, Little Inagua Island, Bahama Islands. R. A. McLean and B. Shreve collectors.

Remarks. This subspecies appears to be quite well marked. It differs from typical *bilabiata* by being smaller and narrower and is in general a far more delicate shell. As stated in the description, the costae are more blade-like, quite different from the more rounded and lower costae of *bilabiata*. All specimens so far seen have the costae strongly developed and of equal height throughout their length. In *bilabiata* there are many specimens that have the peripheral area smooth and others are almost entirely smooth. The whorls in *bahamensis* are nearly of equal size so that the sides of the shell are almost parallel. In *bilabiata*, successive whorls are slightly larger, resulting in a more tapering spire.



Photographs by F. P. Orchard

Plate 67. *Truncatella bilabiata bahamensis* Clench and Turner

Fig. 1. Holotype, Northwest Point, Little Inagua, Bahama Islands. Fig. 2-5. Paratypes from the same locality (all about 10x).

Range. Limited to the Bahama Islands.

Records. BAHAMAS: Sand Bank, Crossing Bay, Great Abaco; Canfield Bay and Matthewtown, Great Inagua; Northwest Point, Little Inagua (all MCZ). Lagoon, Watling Id.: East Caicos, Caicos Islands (both USNM).

Truncatella (Truncatella) pulchella Pfeiffer, Plate 68, fig. 1-6; Plate 69

Truncatella pulchella Pfeiffer 1839, Archiv. für Naturgeschichte von Wiegmann (5th year) **1**, p. 356 (Cuba); Küster 1855, Conchylien-Cabinet (2) **1**, pt. 23, p. 10, pl. 2, fig. 11-15.

Truncatella caribaeensis 'Sowerby' Reeve 1842, Conchologia Systematica **2**, p. 94, pl. 182, fig. 2 (no locality given).

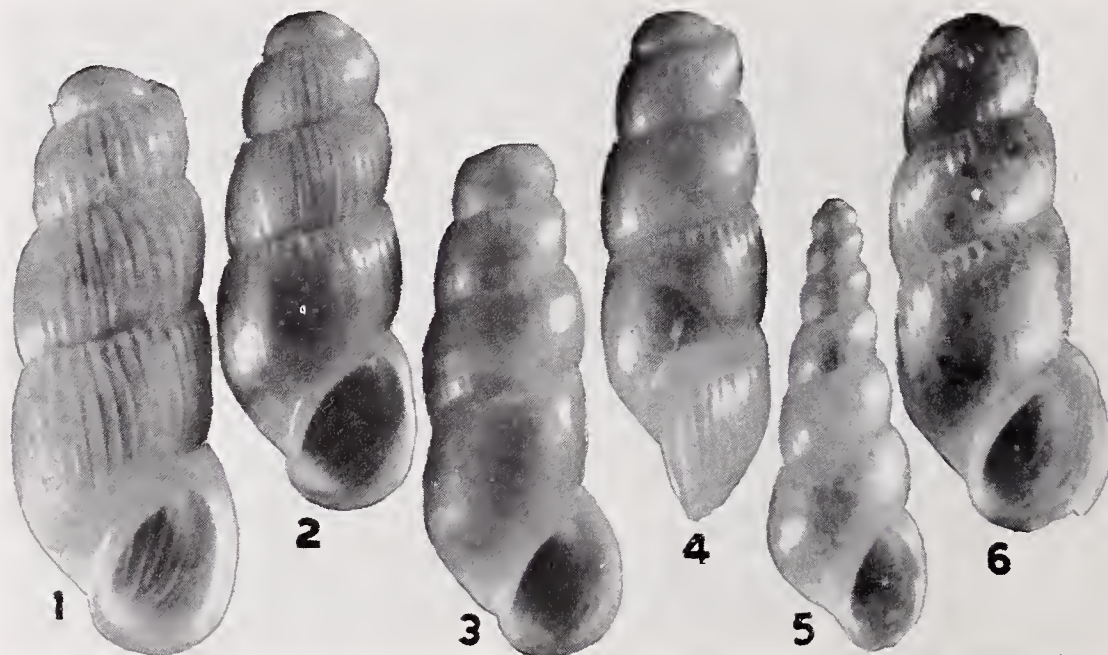
Truncatella variabilis Pfeiffer 1846, Zeitschrift für Malakozoologie **3**, p. 183 [nude name in the synonymy of *T. caribaeensis* Pfeiffer].

Truncatella caribaeus 'Sowerby' Petit 1856, Jour. de Conchy. **5**, p. 152 (Guadeloupe) [error for *caribaeensis* Sowerby].

Truncatella guerinii 'Parreyss' Pfeiffer 1856, Monographia Auriculaceorum Viventium, p. 185 [nude name included in the synonymy of *T. caribaeensis*]; *non T. guerinii* Villa 1841.

Truncatella turrita 'Pfeiffer' Dall 1885, Bull. United States Geological Survey no. 24, p. 314. [This was an error by Dall in which he misread the letter T. for *Truncatella* and not an abbreviation of the word Testa as originally meant by Pfeiffer.]

Description. Shell small, variable in size, from $5\frac{1}{2}$ to $7\frac{1}{2}$ mm. in length. Costate to nearly smooth, rather shining and somewhat solid. Whorls 4 to $4\frac{1}{2}$ and convex. Color straw-yellow to light amber with the aperture generally whitish. Spire lengthened and truncated. Suture rather deeply impressed. Aperture holostomatous, ovate and somewhat flaring, rounded below and angled above. Parietal wall margined by the thickened inner lip. Outer lip simple and noticeably thickened at its union with the body whorl above. Basal ridge absent or only slightly developed. Shell imperforate or at best with a very minute rimation. Columella not apparent. Sculpture consisting of numerous axial



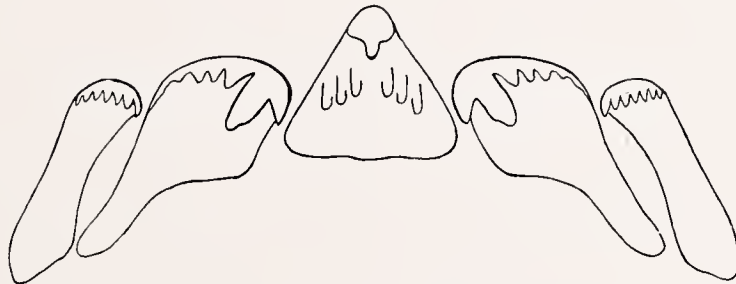
Photographs by F. P. Orchard

Plate 68. *Truncatella pulchella* Pfeiffer

Fig. 1. Coconut Grove, Florida. Fig. 2-5. Nueva Gerona, Isle of Pines, Cuba (all $9\frac{1}{2}x$). Fig. 6. Lectotype of *Truncatella pulchella* Pfeiffer, Cárdenas, Cuba (10x).

ribs; generally few specimens are completely costate. In moderately costate forms the ribs appear only on the upper portion of the whorls, leaving the peripheral and lower areas of the whorls smooth. Operculum paucispiral, corneous and generally with a thin calcareous plate on the outer surface. Young specimens have the first two whorls smooth with the remaining whorls moderately to rather fully costate.

	length	width	
(large)	7.3	2.8 mm.	Homosassa, Florida
(average)	6.1	2.5	Nueva Gerona, Isle of Pines
(small)	5.5	2.6	Simms, Long Island, Bahama Ids.



Drawn by Ruth D. Turner

Plate 69. Radula of *Truncatella pulchella* Pfeiffer

Types. Lectotype, here selected, Museo Poey, Habana, no. 181, Cárdenas, Cuba. Paratype, Museum of Comparative Zoölogy, no. 158170, from the same locality. Additional types are probably in the Museum of Stettin, Germany.

Remarks. Both *Truncatella pulchella* and *T. bilabiata* have approximately the same distribution in the Western Atlantic. Many times these two species will occur together at the same locality.

Truncatella pulchella is readily separated from *T. bilabiata* by being larger and having a simple lip. Considering the species as a whole there are probably far more specimens of *pulchella* than of *bilabiata* that lack strong costae. It is quite probable that certain of these smooth forms were erroneously considered to be *T. subcylindrica* Linné of Europe. In a reduction of the costae in *T. pulchella* they disappear over the peripheral area and the base of the whorl while in *T. bilabiata* the reduction takes place only in the peripheral area. This is, in addition, reflected in the weakened basal ridge in *T. pulchella* and the strong basal ridge in *T. bilabiata*.

Range. North Carolina, Florida and the West Indies south to Barbados, Lesser Antilles.

Records. NORTH CAROLINA: Beaufort (AMNH). FLORIDA: Coconut Grove (R. Humes); Key Largo; Lignumvitae Key (both MCZ); Key West (D. Thaanum); Cape Sable; Marco; Sanibel Island; Pass-à-grille (all MCZ); Sarasota Bay (D. Thaanum); St. Petersburg; Cedar Keys; Homosassa (all MCZ). TEXAS: Aransas Pass; Metagorda Co. (both USNM). BERMUDA: Shelly Bay (MCZ). BAHAMAS: Angel Fish Point and Sand Bank, Crossing Bay, Great Abaco; Culbert Point, Nassau, New Providence; North Bimini Id., Bimini Islands; Mangrove Cay, Andros Island; James Cistern and Rock Sound, Eleuthera; Arthurstown, Cat Island; Simms, Long Island; Matthew-

town, Great Inagua (all MCZ); Watling Id.; Mariguana Id.; Providenciales Id., Caicos Islands (all USNM). CUBA: Playa Manimani, Pinar del Río (A. del Valle); Cárdenas (C. G. Aguayo); Varadero (USNM); Punta Alegre, Camagüey (R. Humes); Punta de Piedra, Banes (A. Quiñones); Cabo Cruz (MCZ). ISLE OF PINES: Nueva Gerona (MCZ). PUERTO RICO: Ensenada Honda (USNM). VIRGIN ISLANDS: St. Thomas; St. Croix (MCZ). JAMAICA: St. Ann's Bay; Port Royal (both MCZ). HISPANIOLA: Gonave Id. (MCZ); Aquin; Ile à Vache; Cap Haitien; Port-au-Prince; Barahona; Santa Bárbara de Samaná (all USNM). LESSER ANTILLES: St. Bartholomew; Martinique; Guadeloupe; Barbados (all MCZ); Trinidad (USNM). CARIBBEAN ISLANDS: Curaçao (MCZ).

***Truncatella (Truncatella) succinea* C. B. Adams, Plate 70, fig. 1-6**

Truncatella succinea C. B. Adams 1845, Proc. Boston Society Natural History 2, p. 12 (Jamaica).

Truncatella gouldii 'C. B. Adams' Pfeiffer 1846, Zeitschrift für Malakozoologie 3, p. 183 [nude name in the synonymy of *caribaeensis* Reeve [Cotypes, MCZ 177133].

Truncatella gouldii 'Bronn' Pfeiffer 1856, Monographia Auriculaceorum Viventium, p. 185. [This was a nude name given in a price list of Bronn and included by Pfeiffer as a synonym of *caribaeensis*.]

Description. Shell rather large for the genus, reaching to about 9 mm. ($\frac{5}{8}$ of an inch) in length, rather solid and generally strongly sculptured. Color ranging from grayish-white to yellowish-brown. Whorls remaining, 4 to $4\frac{1}{2}$, moderately convex. Suture well defined. Aperture holostomatous, subcircular to subovate. Outer lip simple though occasionally thickened by the first costa behind. Parietal lip thickened and smoothly arched over the columellar area. Both outer and inner lip slightly reflected. Basal ridge well developed. Umbilical area minutely rimate or smooth. Columella short. Sculpture consisting of numerous (generally 30 to 40) axial costae which may be evenly developed throughout their length or so reduced that the peripheral area of the whorl is smooth, the costae being developed only at the suture. Operculum generally with a calcareous plate on a chitinized base.



Photographs by F. P. Orchard

Plate 70. *Truncatella succinea* C. B. Adams

Fig. 1. Lectotype, Jamaica. Fig. 2-5. Paratypes, Jamaica; fig. 5 shows the non-truncated adult shell. Fig. 6. Cotype of *Truncatella gouldii* 'C. B. Adams' Pfeiffer (= *succinea* C. B. Adams), Jamaica (all 6x).

	length	width	
(large)	8.4	3.5 mm.	Jamaica
(average)	8	3.3	Turks Island, Bahamas
(small)	7	2.9	Key Largo, Florida

Types. Lectotype, here selected, Museum of Comparative Zoölogy, no. 177154, Jamaica, C. B. Adams collector. Many paratypes from the same locality.

Remarks. For the time being, at least, it seems best to retain the name *succinea* C. B. Adams for this Western Atlantic species. However, it is impossible in most cases to separate this form from that of *guerinii* A. and J. B. Villa of the Indo-Pacific area. *T. succinea* is generally more amber in color and less grayish than is usually the case with *T. guerinii*. Also, the calcareous opercular plate is less well developed in *succinea*. Even in these minor qualifications, however, the two forms completely overlap.

The peculiar distributional pattern of *succinea* is rather difficult to explain unless we take into consideration the possibility of an early introduction of this form from the Indo-Pacific area. This may well be the case though we completely lack factual evidence. Ballast, seaweed for packing material, or any other means may have been responsible for its introduction during the nineteenth century and as a consequence, its spread from a possible Jamaican center has been erratic and discontinuous. It is also possible that *succinea* may hybridize with *T. pulehella* as these two species certainly do merge into one another and certain specimens cannot be separated with any certainty. It is also interesting to note that the largest examples, and those which duplicate exactly the characters of *guerinii* Villa of the Indo-Pacific, are the specimens of the type series of C. B. Adams which he obtained about 1845.

Range. The Bahamas, Cuba, Hispaniola, Jamaica and the Cayman Islands.

Records. BAHAMAS: Turks Island (USNM). CUBA: Cabo Cruz; Matanzas (both USNM). HISPANIOLA: Les Cayes; Ile à Vache; L'Acul River (all USNM). JAMAICA: Ackendown; Port Antonio (both MCZ). CAYMAN ISLANDS: Little Cayman Island (USNM).

Subgenus **Tomlinella**, new subgenus¹

This subgenus is characterized by possessing only a few, but exceedingly strong, axial costae. So far as known, the costae are always strongly developed with little tendency toward reduction at the periphery or complete loss. These costae seldom if ever group to form a basal ridge. Lip generally duplex, the outer being an enlargement of the last costa, the inner being a slightly forward development of the body whorl. Operculum paucispiral and corneous without any accessory calcified plate so far as known.

Tomlinella is known to occur only along the tropical and subtropical coasts of both sides of the Atlantic.

Subgenotype, *Truncatella scalaris* Michaud.

¹ Named for J. R. leB. Tomlin of St. Leonards-on-Sea, England.

Truncatella (Tomlinella) scalaris Michaud, Plate 65, fig. 2; Plate 71, fig. 1-6

Rissoa scalaris Michaud 1830, Descr. Genre Rissoa, p. 18 [this paper not seen by us] (locality unknown); 1832 Descriptions de Plusieurs Nouvelles Espèces de Coquilles du Genre Rissoa (Fremenville) 2nd Ed., p. 21, fig. 31-32.

Truncatella clathrus Lowe 1832, Zoological Journal 5, p. 303 (locality unknown); Reeve 1842, Conchologia Systematica 2, pl. 182, fig. 3 (locality unknown).

Truncatella costata Pfeiffer 1839, Archiv für Naturgeschichte von Weigmann (5th year) 1, p. 356 (Cuba); non Cossmann 1895.

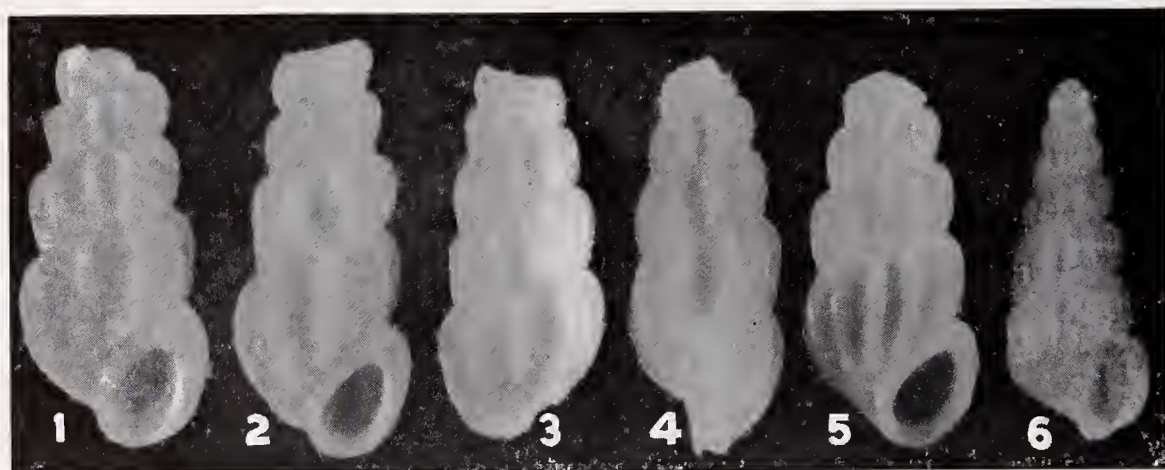
Truncatella cumingii C. B. Adams 1845, Proc. Boston Society of Nat. Hist. 2, p. 12 (Jamaica) [Lectotype, MCZ 177155].

Truncatella scalariformis C. B. Adams 1845, Proc. Boston Society Nat. Hist. 2, p. 12 (Jamaica); non Reeve 1842.

Truncatella adamsi Pfeiffer 1846, Zeitschrift für Malakozoologie 3, p. 119, 189 [new name for *T. scalariformis* C. B. Adams, non Reeve 1842].

Description. Shell small, about $4\frac{1}{2}$ to 5 mm. in length, imperforate, solid, with strong axial costae. Whorls remaining, $3\frac{1}{2}$ to $4\frac{1}{2}$, moderately convex. Color generally a dull gray to light straw-brown. Spire extended and truncated. Suture deeply impressed. Aperture holostomatous and subovate. Outer lip double, its inner portion a thin ridge, the outer portion greatly thickened. Inner lip continuous, consisting of the inner margin only. Columella short and inconspicuous. Sculpture consisting of 8 to 11 very prominent axial costae (body whorl). These costae terminate at the sutures and seldom oppose evenly the costae on the whorl above. At the umbilical region of the body whorl these costae end without forming a basal ridge. There are very faint spiral threads between the costae ($45\times$). Operculum thin and corneous. In young specimens the first two whorls are smooth, the third whorl finely costate and the remaining whorls coarsely costate.

	length	width	
(large)	4.6	1.9 mm.	Guadeloupe
(large)	4.5	2	Jamaica
(small)	3.5	1.6	Matanzas, Cuba



Photographs by F. P. Orchard

Plate 71. *Truncatella scalaris* Michaud

Fig. 1. Neoholotype, Port Antonio, Jamaica. Fig. 2. Lectotype, of *T. cumingii* C.B.Adams (= *scalaris*), Jamaica. Fig. 3-4. Paratypes of *T. cumingii* C.B.Adams. Fig. 5-6. South Bight, Mangrove Cay, Andros Island, Bahamas (all $9\times$).

Types. As Michaud's type of this species is not known to exist, we here designate as a neoholotype, Museum of Comparative Zoölogy no. 165706, from Port Antonio, Jamaica, the latter to be the type locality.

Remarks. This species appears to be rather rare. We have seen but one large lot, from the United States National Museum, collected by C. R. Orcutt at Saltrou, Haiti.

Truncatella scalaris differs from *T. s. piratica* by having fewer and much stronger costae. In *scalaris* there are 8 to 11 costae while *piratica* possesses 13 to 16. In young *scalaris* the third whorl is very finely costate and the remainder coarsely so. In *piratica* the third to sixth whorls are generally very finely costate and the later whorls more strongly so. The duplex lip of *piratica* is much stronger and heavier than that of *scalaris*.

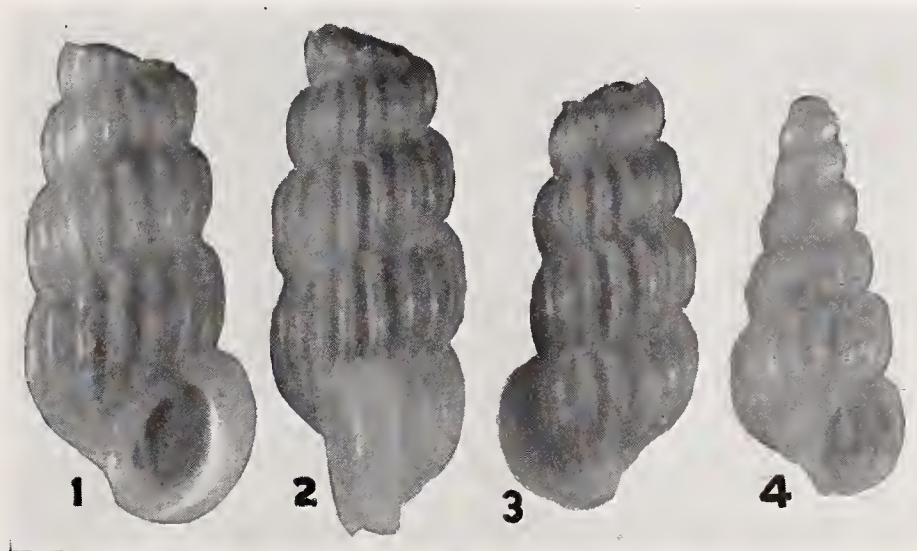
Variation in the number of costae is quite limited in specimens from any one locality. There appear, however, to be definitely more costae in specimens from the more northern localities.

Range. Florida, the Bahamas and south to the Lesser Antilles.

Records. FLORIDA: West Summerland Key (R. Humes). BAHAMAS: Sweetings Village, Great Abaco; Mangrove Cay, Andros Id. (both MCZ). CUBA: Matanzas (C. G. Aguayo); Punta de Piecha, Banes (A. Quiñones); Cinco Reales, Santiago (C. G. Aguayo). HISPANIOLA: Port Salut; Les Cayes; St. Louis; Saltrou; Bizonton; Baie Anglaise near Aquin (all USNM). JAMAICA: Port Antonio (MCZ); Montego Bay; Jacks Bay and Robins Bay, St. Mary's (all USNM). LESSER ANTILLES: Guadeloupe; St. Martins (both MCZ).

***Truncatella scalaris piratica*, new subspecies, Plate 65, fig. 1: Plate 72, fig. 1-4**

Truncatella clathra 'Lowe' Pilsbry 1900, Trans. Connecticut Academy 10, p. 506, pl. 62, fig. 13; *non* Lowe 1832.



Photographs by F. P. Orchard

Plate 72. *Truncatella scalaris piratica* Clench and Turner

Fig. 1. Holotype, St. George's Causeway, Bermuda. Fig. 2-4. Paratypes from the same locality (all about 10x).

Description. Shell small, about $4\frac{1}{2}$ to 5 mm. in length, imperforate, solid and with strong axial costae. Whorls remaining, $3\frac{1}{2}$ to $4\frac{1}{2}$, moderately convex. Color generally a straw-yellow to light reddish-brown sometimes with almost a golden tinge. Spire extended and truncated. Suture deeply impressed. Aperture holostomatous and subovate. Outer lip double, its inner portion a thin ridge, the outer portion greatly thickened. At the umbilical region of the body whorl the costae end without forming a basal ridge. Columella short and inconspicuous. Sculpture consisting of 13 to 16 very prominent axial ribs (body whorl). These ribs terminate at the sutures and seldom oppose evenly the ribs on the whorl above. Inner lip continuous, consisting of the inner margin only. Very faint spiral threads exist between the costae ($45\times$). Opereulum thin and corneous. In young specimens the first two whorls are smooth, the third and fourth very finely, and the rest rather coarsely, costate.

length	width
4.7	2.2 mm. Bermuda

Types. Holotype, Museum of Comparative Zoölogy, no. 178985, from St. George's Causeway, Bermuda. Paratypes in the MCZ and USNM from the Bermudas.

Remarks. See under *Truncatella scalaris* Michaud.

Range. Known only from the Bermudas.

Records. BERMUDA: St. George's Causeway (MCZ); Gibbet Island; Eves Pond (both USNM).

Notes

The following notes and the description of *T. rostrata* Gould are included to complete our studies of *Truncatella* in the Western Atlantic. These are species erroneously assigned to the Western Atlantic or representing introductions that have been unable to survive. We give a description of *T. rostrata* Gould since this species was described as coming from Rio de Janeiro, Brasil, though actually from West Africa.

Truncatella aurea Prime

Truncatella aurea Prime 1853, List of Shells and Corals Collected at Bermuda by Temple Prince [sic] L.L.B. of New York. Bermuda Pocket Almanac for 1852, p. 55 [nude name].

Truncatella modesta C. B. Adams

Truncatella modesta C. B. Adams 1851, Ann. Lyceum Nat. Hist., New York 5, p. 48 (Jamaica).

We have the sole specimen of this species (holotype, MCZ no. 177159). It is not a *Truncatella* but a species of *Turbouilla*.

Truncatella (*Tomlinella*) *rostrata* Gould, Plate 73, fig. 1-2

Truncatella rostrata Gould 1847 [1848], Proc. Boston Society Nat. Hist. 2, p. 209; Gould 1852, United States Exploring Expedition 12, p. 111, pl. 8, fig. 128a-b (Rio de Janeiro [Brasil]).

Truncatella princeps Dohrn 1866, Malakozoologische Blätter 13, p. 134 (Ilha do Principe [Princes Island, Gulf of Guinea, Africa]); Pfeiffer 1867, Novitates Conchologicae 3, p. 317, pl. 76, fig. 10-11.

Description. Shell small, 5 to 6½ mm. in length, imperforate, solid, with strong axial costae. Whorls remaining, 4½, moderately convex. Color a rather dull brownish-yellow. Spire extended and truncated. Suture deeply impressed. Aperture subovate and nearly holostomatous. Outer lip double, its inner portion a rather thickened and somewhat flaring ridge, the outer portion greatly thickened. Inner lip continuous and much thickened but hardly extending vertically. Columella short and inconspicuous. Sculpture consisting of 14–15 very prominent axial costae (body whorl). These costae terminate at the sutures and seldom oppose evenly the ribs on the whorl above. The costae end at the umbilical region of the body whorl without forming a basal ridge. No spiral sculpture (45×). Operculum thin and corneous with no apparent calcified plate. In young specimens the first 2½ whorls are smooth; from the third whorl on they become increasingly costate.

length	width	
6	2.5 mm.	Princes Island, Gulf of Guinea, Africa
5	2.3	“Rio de Janeiro”

Types. Lectotype of *T. rostrata* Gould, here selected, New York State Museum no. G2541a, Rio de Janeiro, Brasil. Lectotype of *T. princeps* Dohrn, here selected, Museum of Comparative Zoölogy no. 104559, Princes Island, Gulf of Guinea, Africa.

Remarks. The locality, Rio de Janeiro, Brasil, for Gould's *T. rostrata* is open to question. We have been unable to trace any published record of *Truncatella*, other than Gould's, from south of Trinidad. Nor are there any records south of Trinidad in the large collections of this genus that we have studied. We have made a careful comparison of Gould's types of *T. rostrata* with types of Dohrn's *T. princeps* and can detect no differences.

Truncatella rostrata Gould differs from *T. scalaris* Michaud by being a larger and



Photographs by F. P. Orchard

Plate 73. *Truncatella rostrata* Gould

Fig. 1. Lectotype of *T. princeps* Dohrn (= *rostrata* Gould), Princes Island, Gulf of Guinea, Africa. Fig. 2. Lectotype of *T. rostrata* Gould, Rio de Janeiro, Brasil (both about 9x).

much heavier shell with more whorls, and much darker coloration. It is intermediate between *scalaris* and *scalaris piratica* in the number of costae on the body whorl.

Range. Princes Island and south to Gaboon, West Africa.

Records. EASTERN ATLANTIC: Princes Island (MCZ), Gaboon, West Africa (AMNH).

The Western Atlantic record from Rio de Janeiro is quite certainly in error. Gould received much material from Cape Palmas, Liberia and it is quite possible that the specimens he described from Rio de Janeiro came originally from this locality in Africa.

Truncatella subcylindrica *Linnaeus*

Helix subcylindrica Linnaeus 1767, Systema Naturae 12 Ed., 1, p. 1248 (Northern Europe).

This European species has been referred to the West Indies in several reports, but unquestionably in error. These references were probably based upon certain forms of *Truncatella pulchella* Pfeiffer. (See Pilsbry 1902, Nautilus 15, p. 119.)

Truncatella truncata *Montagu*

Turbo truncatus Montagu 1803, Testacea Britannica 2, p. 300, pl. 10, fig. 7 (Southampton and Plymouth, England).

Truncatella truncata Montagu, Johnson 1915, Occasional Papers, Boston Soc. Nat. Hist. 7, pt. 13, p. 111 (Newport, Rhode Island).

This reference is based entirely on Verrill's *T. truncatula* Draparnaud (see below).

Truncatella truncatula *Draparnaud*

Truncatella truncatula Draparnaud 1805, Histoire Naturelle des Mollusques Terrestres et Fluviales de la France, p. 40, pl. 1, fig. 28-31 (Coast of Mediterranean); Verrill 1880, American Journal Science 20, p. 250; Verrill 1882, Trans. Connecticut Acad. 5, p. 525, pl. 58, fig. 8a-b (all Newport, Rhode Island).

This European form occurred alive in seaweed at high water line in the dock area of Newport, Rhode Island. Verrill, who had collected the material at Newport, stated that he suspected this form was introduced from Europe. It has failed to survive. No records of this species have been obtained since from anywhere in New England or even south of this area.

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