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THE SUBFAMILY TELLININAE IN THE WESTERN ATLANTIC THE GENERA TELLINA (PART II) AND TELLIDORA[1]

BY
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Subgenus **Eurytellina** *Fischer*

Peronaeoderma 'Poli' Stoliczka 1870, Cretaceous Fauna of Southern India, **3**: 116 (type species, *Tellina punicea* Born 1778, original designation), *non* Poli 1795, *nec* Mörch 1853.

Eurytellina Fischer 1887, Manuel de Conchyliologie, p. 1147 (type species, *Tellina punicea* Born 1778, monotypy).

Tellinota Iredale 1936, Rec. Aust. Mus., **19**(5): 281 (type species, *Tellinota roseola* Iredale 1936, original designation).

Description. Shell elongate-elliptical to subtrigonal, somewhat compressed and slightly inequilateral; posterior flexure to the right, weak, obsolete or absent; surface sculpture rather poorly developed; ligament posterior, more or less protuberant, and strong; lateral teeth of the left valve poorly developed with a weak, tubercle-like proximal anterior tooth and an obsolete distal posterior lateral tooth; in the right valve, the distal posterior tooth is often well developed and the proximal anterior is generally well developed and strong; pallial sinus rather flattened dorsally and extending far anteriorly, near to or contiguous with the anterior adductor; confluence of the pallial sinus with the pallial line extensive. Anterior internal rib extends from the umbonal region to the anterior adductor scar and is strong, especially in the left valve.

The group of *Eurytellina* forms a natural assemblage of species characterized by the right lateral dentition, the more or less elongate elliptical shape of the shell, the compression of the valves, the strength of the internal radial rib and the relatively smooth superficial sculpture on the anterior slope and disc of each valve. The group appears to be most highly developed within the Western Atlantic and Eastern Pacific regions and constitutes a large element of the fauna. It is, furthermore, represented in the Indo-Pacific region by such species as *Tellina albinella* Lamarck of South Australia.

In the Western Atlantic, *Eurytellina* is more or less restricted to the shallow subtropical and tropical seas although a single species extends north to Cape Hatteras. The central area of concentration of species is the Caribbean. Three species are found in

[1] *Correction.* In Johnsonia no. 45 on pp. 268 and 271, Plates 141 and 142 are reversed. The plate caption on p. 268 applies to the plate on p. 271 and the plate caption on p. 271 applies to the plate on p. 268.

the Brasilian fauna but none of these is endemic. In the Eastern Pacific, the group is represented by more species, which have developed since the appearance of the subgenus in the Oligocene and Lower Miocene of North America.

KEY TO THE SPECIES OF THE SUBGENUS *EURYTELLINA* IN THE WESTERN ATLANTIC

1. Posterior dorsal slope of the right valve with differentiated strong concentric sculpture 2
   Posterior dorsal slope sculpture on the right valve not differentiated, similar to the sculpture on the central disc 3

2. Shell with an orange-apricot colored periostracum; adult size larger than 20 mm. . . . . *nitens*
   Shell white to pellucid; very small in size (smaller than 15 mm. in adult) with a sharp posterior ridge in the right valve: left valve broadly tumid and convex . . . . . *vespuciana*

3. Shell with numerous colored radial rays extending from the umbonal area to the periphery . . . . . *guildingii*
   Shell unrayed or with one or two radial streaks extending anteriorly and posteriorly from the umbo but not extending to the periphery . . . 4

4. Shell sharply flexed to the right posteriorly; left valve broadly convex . . . . . *lineata*
   Shell not flexed or only very weakly flexed to the right posteriorly . . . 5

5. Shell bright red or purple; pallial sinus usually touching the anterior adductor muscle scar . . . . . *punicea*
   Shell not bright red or purple; pallial sinus usually free from the anterior adductor muscle scar 6

6. Shell high and subtrigonal in shape 7
   Shell elongate-subtrigonal in shape 8

7. Shell with regular widely spaced incised sulci . . . . . *angulosa*
   Shell with sulci poorly incised and irregular . . . . . *trinitatis*

8. Shell white or suffused with yellow or pink internally; lateral surface of anterior dorsal margin narrow; left valve weakly convex . . . *alternata*
   Shell pink; lateral surface of anterior dorsal margin wide; left valve flattened on the disc . . . . . *tayloriana*

Tellina (Eurytellina) punicea *Born*

Plate 143, fig. 2; Plate 144, fig. 2; Plate 150, fig. 3

Tellina punicea Born 1778, Index Museum Caesarum Vindobinensis, p. 22; 1780, Index Mus. Caes. Vind., p. 33, pl. 2, fig. 8 (Patria ignota) [type locality, here restricted, Guayaguayare Beach, Trinidad; types not seen].

Tellina punicea Born. d'Orbigny 1853 [*in*] Sagra, Hist. L'Ile Cuba, Mollusques, **2**: 298 (*pars*).

Tellina (*Peronaeoderma*) *punicea* Born. H. and A. Adams 1856, Genera Recent Mollusca, **2**: 396.

Tellina (*Eurytellina*) *punicea* Born. Fischer 1887, Manuel de Conchyliologie, p. 1147.

Tellina (*Eurytellina*) *angulosa* 'Gmelin' Gardner 1928, United States Geol. Survey, Prof. Papers 142-e, p. 193, *non* Gmelin 1791.

Tellina (*Eurytellina*) *punicea* Born. Warmke and Abbott 1962, Caribbean Seashells, p. 195, pls. 4g and 40d.

Description. Shell extending to 45 mm. (about $1\frac{3}{4}$ inches) in length and to 28 mm. (about 1 inch) in height, elongate, nearly equilateral, moderately inflated, with the right

valve more convex and with an extremely weak posterior flexure to the right. Umbos just posterior to the middle, rounded, and rather inconspicuous. Anterior margin broadly and smoothly rounded; ventral margin straight or slightly convex, rising gently posteriorly; anterior and posterior dorsal margins usually subequal in length and gently sloping; posterior margin short, straight or slightly convex, giving a somewhat truncated appearance to the outline of the shell. Sculpture consisting of weakly incised concentric sulci separated by broad bands; these concentric bands are nearly equal in breadth in opposite valves. Ligament dark brown and somewhat sunken in a broad but shallow escutcheon; lunule narrow, shallow and long. Calcareous element of the ligament subtended by a rather strongly developed nymphal callosity in the right valve. Hinge line moderately developed. In the left valve, the cardinal complex consists of an interior thin, bifid tooth with subequal lobes and of a posterior, widely divergent, thin, laminate tooth; proximally anterior to the cardinal complex is a well developed but small lateral tooth. In the right valve, the cardinal complex consists of a posterior strong, skewed, deltoid, bifid tooth with the posterior lobe the larger and of an anterior strong, thickened, subdeltoid, laminate tooth; anterior lateral tooth well developed and proximal to the laminate cardinal tooth; posterior lateral tooth distal to the cardinal complex, strong and well developed. A rib extends from the umbonal region to the anterior adductor muscle. Muscle scars well impressed. Anterior adductor scar a little narrower and longer but not much higher than the posterior adductor scar. Pallial sinus equal in both valves, flattened

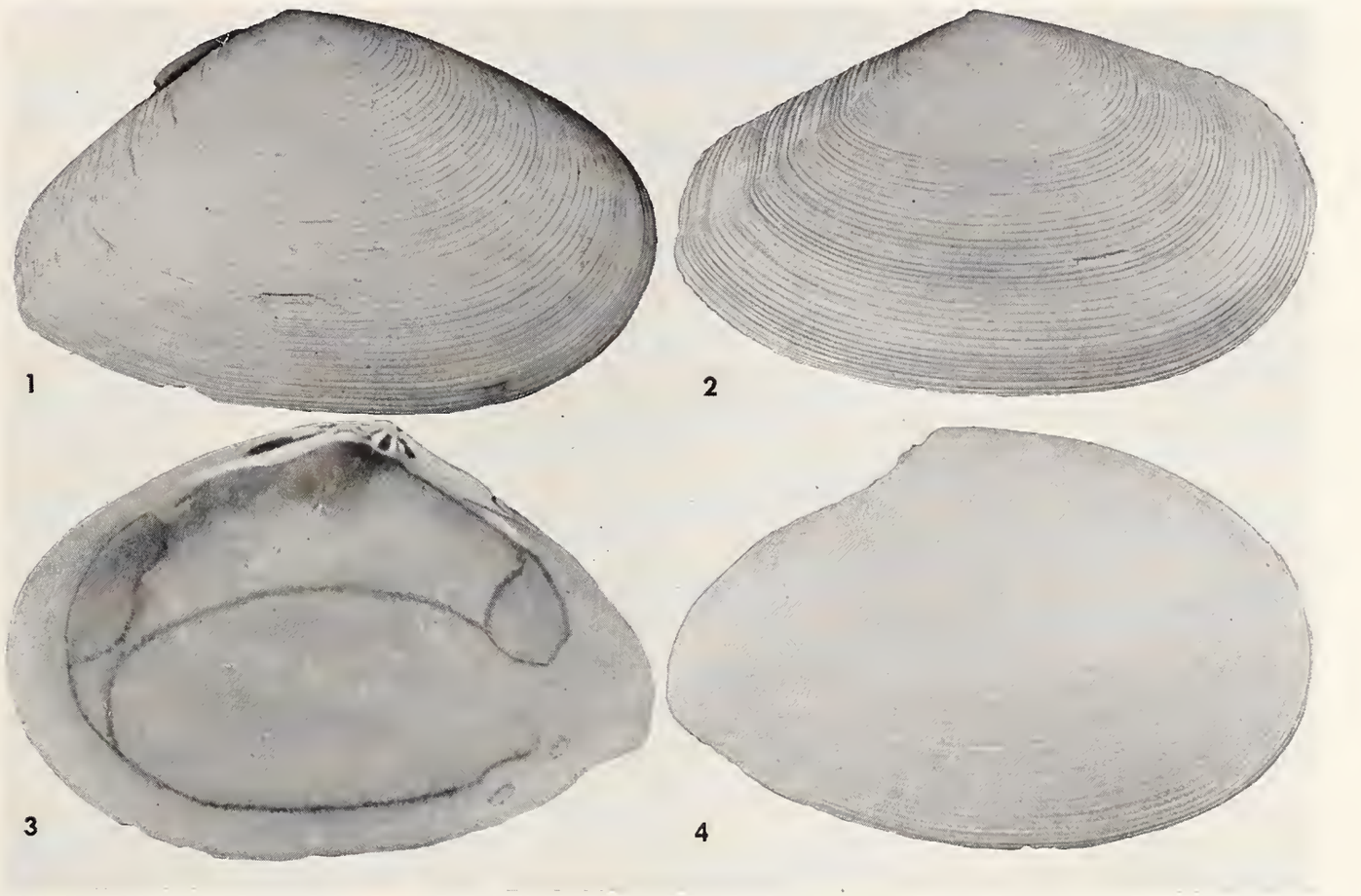

Plate 143. Fig. 1. *Tellina angulosa* Gmelin, external view of the right valve, St. Croix, Virgin Islands, MCZ 236382 (about 1.6x) [L=40 mm.]. Fig. 2. *Tellina punicea* Born, external view of the right valve, Punta Guanajibo, Puerto Rico, MCZ 236395 (about 2.4x) [L=31 mm.]. Figs. 3–4. *Tellina lineata* Turton. Fig. 3. Internal view of the right valve (about 2.5x) [L=30 mm.]. Fig. 4. External view of the right valve, Marco, Florida, MCZ 166044 (about 3.7x) [L=21 mm.].

above and extending to and most often coalescing with the anterior adductor scar. The pallial sinus falls abruptly and straight to the pallial line and is confluent with it for most of its length. Externally, the shell is alternately and irregularly banded with white and dark red or purple. Internally the shining surface is generally a deep red or purple with a white periphery and with some suffusion of white especially in the region of the anterior rib and umbonal cavity.

length	height	width	
44.5 mm.	27.5 mm.	11.5 mm.	Gulf of Paria, Trinidad
42.5	27.0	10.5	Waunta Haulover, Nicaragua
40.0	25.0	9.2	Belize, British Honduras
38.9	24.6	10.3	Waunta Haulover, Nicaragua
38.5	22.5	8.5	Punta Guanajibo, Puerto Rico
27.4	16.6	5.3	Cartagena, Colombia
23.0	17.0	4.5	Puerto Plata, Santo Domingo
17.2	10.8	3.3	Cartagena, Colombia

Remarks. A great deal of confusion has reigned in the problem of recognizing this species. The name itself was originally introduced by Born in his Index in the 1778 edition; at that time no figure or locality was given. The description makes a considerable point of the coloration of the shell as well as the concentric striations and the growth lines. In 1780, a plate constituting the type figure accompanied the text, but unfortunately a view of the internal surface of either valve is not given; however, the shape of the shell, specifically its outline, as well as the external sculpture give a good representation of what today is considered *punicea.* A further difficulty lies in the fact that no type locality was given and subsequent workers, deciding that the species was West Indian, were not wont to restrict the locality. Since the species is very closely allied to *Tellina simulans* Adams of the Eastern Pacific, the difficulties encountered in the discussion of these species have been considerable.

Coloration is one of the major keys for recognizing *Tellina punicea;* indeed, Born's descriptive 'dunkel-rot' succinctly identifies most specimens. However, individuals in any population show considerable variation in degrees of purple or redness. As a matter of fact, a cline exists through the north-south range of the species where the most intensely red individuals are to be found in the Caribbean and where the proportions of deep redness decreases towards the south in Brasil. Another characteristic, employed to separate this species from others closely related to it or confused with it, is the fact that the pallial sinus extends to, touches, and even coalesces with the anterior adductor muscle scar. But even this character is not infallible, since in some lots, in one valve of a specimen, the sinus may not quite touch the anterior muscle scar but be connected to it by means of a short linear scar. Nevertheless, there can be no doubt about *punicea* when complete specimens taken in a series are examined. The coalescence of the pallial sinus with the muscle scar, the elongate shape of the shell, the irregularly concentric sculpture, the concentric banding of coloration of the interior best characterize the species.

Allometric differences also occur. Younger specimens, in general, have a slightly different proportion than the adult or larger specimens. The shells are lower and appear more elongate; the posterior rise or arcuation of the ventral margin is more noticeable and the posterior dorsal margin tends to be markedly convex. In addition to the previously mentioned cline in coloration, some clinal variation occurs with respect to the

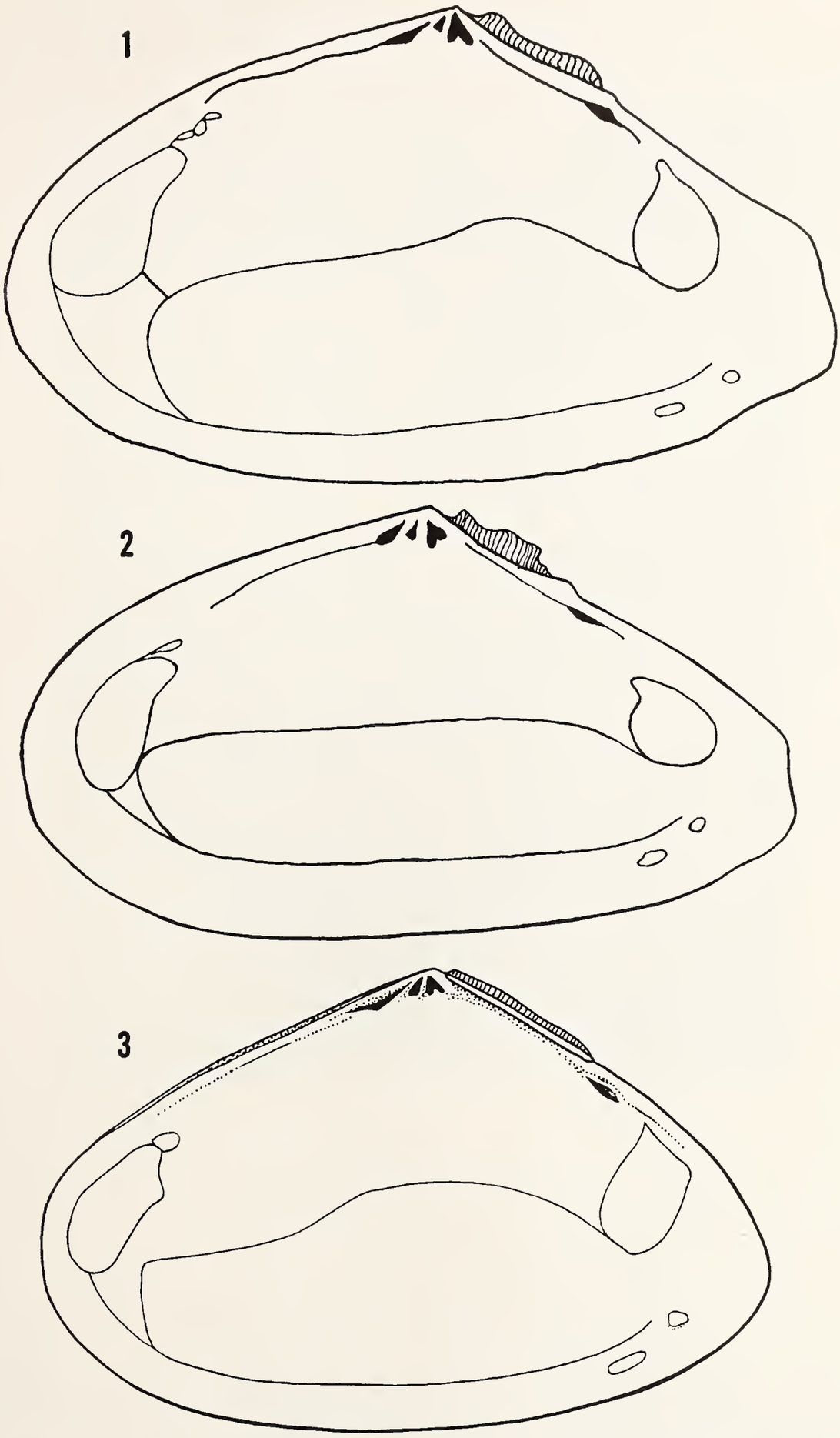

Plate 144. Figs. 1-3. Diagrammatic illustration of the internal surface of the right valve showing the dental configuration and muscle scars. Fig. 1. *Tellina alternata* Say (about 1.9x) [L=65 mm.]. Fig. 2. *Tellina punicea* Born (about 2.9x) [L=40 mm.]. Fig. 3. *Tellina angulosa* Gmelin (about 2.6x) [L=40 mm.].

thickness and the convexity of the shell. Most specimens from the Caribbean, or northernmost extent of the range, tend to possess a thinner shell which is quite compressed while in the southern portion of the range, more specimens have thicker shells which exhibit an increased convexity.

According to Hertlein and Strong (1949) and Olsson (1961) *Tellina punicea* Born is closely allied to *Tellina simulans* Adams of the Eastern Pacific fauna. The former authors who have had the opportunity of comparing a series of both species have concluded that: "The west coast shells are more pointed posteriorly, there is a low depressed area anterior to the posterior angulation on the right valve, and the concentric grooves along the posterior dorsal margin bend more acutely upward than those on the east coast shells." It is also probable that a species, *T. cibaoica*, described by Maury from the Lower Miocene of Santo Domingo represents an early precursor of this complex; it is treated under *Tellina angulosa*.

The species lives in relatively shallow, off-shore waters; it has been taken at 30 feet. Although little information is available as to its substrate preference, many samples have come from soft, black muddy bottoms.

Range. This species appears to be limited to the Caribbean Region and South America. It is found from British Honduras and Jamaica south through the Antilles and along the Caribbean coast of Central and South America and as far south as Estado de Santa Catarina, Brasil.

Specimens examined. British Honduras: Belize (USNM). Nicaragua: Waunta Haulover (USNM; MCZ). Costa Rica: Port Limon (ANSP; USNM). Panama: Bocas de Toro (ANSP); Lobobo Light, Chiriqui Lagoon; mouth of Rio Code del Norte; Fort Sherman, Devil's Beach; Colon (all USNM). Jamaica: Lucea Harbour (USNM); White River Beach (MCZ); Black River; Great Pedro Bay; Kingston; Morant Key (all USNM). Hispaniola. Haiti: Port au Prince; Torbeck; Les Cayes; Saltrou (all USNM). Santo Domingo: Manzanillo Bay (MCZ); Monte Cristi (ANSP; MCZ); Puerto Plata; Santa Barbara de Samana (both MCZ). Puerto Rico: Mayaguez (IMBPR; MCZ); Punta Guanajibo (IMBPR; ANSP; MCZ); Cayos Trios, in 30 feet (IMBPR); Humacao Playa (MCZ); Bahia Bramadero (ANSP). Virgin Islands: St. Thomas (USNM); St. Croix (ANSP). Lesser Antilles: Bridgetown, Barbados (USNM); 2 miles S of Scarborough, Tobago, in 36 fathoms; Trinidad side of the Gulf of Paria; Ortoire River, Mayaro; Manzanilla Beach, Trinidad; Guayaguayare Beach, Trinidad (all MCZ). Colombia: Gulf of Uraba; Punta Brazules (both USNM); Cartagena (USNM; MCZ); Puerto Colombia (USNM). Venezuela: Lake Maracaibo; Beaches at Macuto, Maiquetia (both ANSP); La Guaira; 4.3 kilometers W of Barcelona (both USNM); Guante (ANSP); Cumaná (USNM); Cubagna Island (MCZ); Margarita Island (ANSP). Surinam: Surinam (MCZ). Brasil: Fernando de Noronha; Fortaleza, Ceara; Ilha de Itaparica, Bahia (all MCZ); Ilheus, Bahia (USNM); Vitoria, Espirito Santo (ANSP; MCZ); Carapebus, Espirito Santo; Praia Comprida; Mambucaba, Rio de Janeiro (all MCZ); Rio de Janeiro (ANSP); Ilha de São Sebastiao and Santos, São Paulo (both USNM); Praia Grande, Itanhaém, São Paulo (MCZ); São Francisco do Sul, Santa Catarina (USNM).

Tellina (Eurytellina) trinitatis *Tomlin*

Plate 145, fig. 1–2; Plate 149, fig. 5

Eurytellina trinitatis Tomlin 1929, Jour. Conch., **18**(11): 310 (Colón Harbour, Panamá) [Holotype, BMNH].

Plate 145. *Tellina trinitatis* Tomlin. Fig. 1. Internal view of the right valve, Payarde, Panamá, MCZ 258317 (about 2.8x) [L=37 mm.]. Fig. 2. External view of the right valve, Marco, Florida, MCZ 258316 (about 4.4x) [L=23 mm.].

Description. Shell extending to 38 mm. (about 1½ inches) in length and to 25 mm. (about 1 inch) in height, elliptical-subtrigonal, equivalve, nearly equilateral, solid, moderately inflated, with both valves of a more or less equal convexity and with an obsolete posterior flexure to the right. Umbos central, but little elevated, not inflated, conspicuous, white in color, smooth and pointed. Anterior margin smoothly and somewhat narrowly rounded; ventral margin convex and rising gently posteriorly; anterior dorsal margin more or less straight, long and gently inclined; posterior dorsal margin straight and long; posterior margin very short and forming an oblique truncation. Sculpture consisting of weak, closely and irregularly spaced concentric bands; sulci poorly incised; weak radial lirations evident. Weak posterior ridge present in both valves. Ligament

brown, short, slightly protuberant, set in a lanceolate escutcheon; lunule obsolete. Calcareous portion of the ligament subtended by poorly developed nymphal callosities. Hinge line with strong lateral dentition in the right valve. In the left valve, the cardinal complex consists of an anterior thin bifid tooth with more or less equal lobes and of a thin elongate posterior laminate tooth; no true lateral dentition, but obsolete tubercles present along the hinge line anteriorly and posteriorly. In the right valve, the cardinal complex consists of a posterior, small, slightly thickened bifid tooth with subequal lobes and of an anterior small subdeltoid laminate tooth; anterior lateral tooth well developed, thin, elongate, slightly upcurled and subproximal to the cardinal complex; posterior lateral tooth distal to the cardinal complex, elongate and somewhat upcurled. Internal radial rib obsolete. Adductor muscle scars moderately impressed. Anterior adductor muscle scar irregularly sublunate; posterior adductor scar subquadrate. Pallial sinus hardly rising behind, slightly convex above, extending to, nearly coalescing with, but generally slightly free from the anterior adductor muscle scar, and then falling in a more or less straight short line to the pallial line. The pallial sinus is generally united to the anterior adductor muscle scar by a short straight interlinear scar. Color pink with whitened periphery, posterior slope and umbo; pink coloration more intense internally and often disposed in variable bands externally; in adults a concentrated radial streak of color parallels the posterior ridges externally.

length	height	width	
32.6 mm.	19.4 mm.	7.5 mm.	Holotype of *trinitatis* Tomlin
38.0	25.0	—	off Surinam
36.0	23.5	—	Guantanamo Bay, Oriente, Cuba
25.5	15.5	6.5	Coronie, Surinam
19.5	12.0	5.0	Coronie, Surinam

Remarks. This species is a poorly known member of the *Eurytellina* complex. In the Western Atlantic fauna, it is probably most closely related to *Tellina punicea* Born. *Tellina trinitatis* is not as intensely purple as is *punicea* and the pallial sinus of *trinitatis* is generally separated from the anterior adductor muscle scar. The short oblique posterior margin and the characteristically pointed umbo as well as the convexly rising ventral margin distinguish *trinitatis*. *Tellina angulosa* is also nearly allied but is much different in regard to its sculpture which is stronger and more widely spaced. Further, the right anterior lateral tooth of *trinitatis* is more distally removed from the cardinal complex than it is in either *angulosa* or *punicea*. In the Eastern Pacific, *Tellina prora* Hanley is the analog of *trinitatis*.

Range. This species has been found as far north as Marco, Florida and as far south as Arroyo de Pando, Canelones, Uruguay; however, both of these records may be questioned since the specimens were not complete. Certainly the central concentration of the range of *trinitatis* is the Caribbean Sea; it was taken in abundance in a soft black muddy substrate at 10 fathoms in the Gulf of Venezuela.

Specimens examined. Florida: Marco (MCZ). Cuba: Guantanamo Bay, Oriente (MCZ). Panama: Payarde (MCZ, Olsson); Colón (type, BMNH); Fort Sherman, Devil's Beach, 5 miles N of Colón (USNM). Venezuela: *Oregon* station 5669, Gulf of Venezuela (MCZ). Surinam: Coronie Strand (Leiden, Altena). Uruguay: Arroyo de Pando, Canelones (USNM).

Tellina (Eurytellina) angulosa *Gmelin*

Plate 143, fig. 1; Plate 144, fig. 3; Plate 148, fig. 2

Tellina angulosa Gmelin 1791, Systema Naturae, Ed. 13, p. 3244 (ad insulas Americae) [type locality, here restricted, St. Croix, Virgin Islands; types not seen], *non* Röding 1798, *nec* Renier 1804.

Tellina striata Spengler 1798, Skrivter Naturhistorie Selskabet, Copenhagen, 4(2): 105 [type locality, here restricted, St. Croix, Virgin Islands; types, Zoological Museum, Copenhagen], *non* Costa 1829.

Tellina laeta Montagu 1804, Testacea Britannica, p. 57 (*pars*).

Tellina punicea 'Born' Lamarck 1818, Animaux s. Vertebres, **5**: 525; d'Orbigny 1853 [in] Sagra, Hist. L'Ile Cuba, Mollusques, **2**: 298 (*pars*).

Donax martinicensis Lamarck 1818, Animaux s. Vertebres, **5**: 552 (Martinique); 1841, Delessert, pl. 6, fig. 15 [types, Museum d'Histoire Naturelle, Paris].

Tellinides rosacea King and Broderip 1832 (*teste* Hanley), Zool. Journ., **5**: 19 (Santos, Brasil) [types not seen].

Tellina hanleyi 'Deshayes MS' H. and A. Adams 1856 (*teste* Dall), Genera Recent Mollusca, **2**: 396, *non* Dunker 1853, *nec* Bertin 1878 (*nomen nudum*).

Tellina subradiata 'Schumacher' Arango 1880, Contrib. Fauna Mala., Cubana, p. 244 (*nomen nudum*).

Tellina (*Eurytellina*) *angulosa* Gmelin. Dall 1900, Proc. U.S. Nat. Mus,, **23**: 294.

Tellina (*Arcopagia*) *angulosa* Gmelin. McLean 1951, New York Acad. Sci., **17**(1): 93.

Tellina (*Eurytellina*) *punicea* 'Born' Gardner 1928, United States Geol. Survey, Prof. Papers 142-e, p. 193, *non* Born 1778.

Description. Shell extending to 50 mm. (about 2 inches) in length and to 38 mm. (about $1\frac{1}{2}$ inches) in height, subtrigonal, nearly equilateral, slightly inflated, with the left valve more convex and with usually a very slight flexure to the right posteriorly. Umbos only slightly posterior to the middle, little elevated, somewhat inconspicuous and often pointed. The anterior margin broadly and smoothly rounded; the ventral margin straight or somewhat convex with a slight postbasal arcuation; anterior dorsal margin gently sloping and short, usually straight, but sometimes convex; posterior dorsal margin rather long and moderately steep; posterior margin short, straight and producing a truncated appearance to the outline of the shell. Sculpture consisting of rather deeply incised concentric sulci separated by rather broad elevated bands; this concentric sculpture is unlike in opposite valves; in the left valve, the elevated bands are broader and the sulci fewer. A slight posterior ridge occurs on the right valve and a concomitant sulcus on the left. Ligament brown, protuberant, set in a narrow escutcheon and subtended by developed nymphal callosities. Hinge line moderately developed. In the left valve, the cardinal complex consists of an anterior, deltoid bifid tooth with subequal lobes and of a posterior, thin laminate tooth which is adpressed to the calcareous element of the ligament; proximally anterior to the bifid cardinal tooth is the small anterior lateral tooth; the distal posterior lateral is moderately well developed. In the right valve, the cardinal complex consists of a posterior, slightly skewed, bifid tooth with subequal lobes and of an anterior thickened laminate cardinal tooth; posterior lateral tooth well developed, strong, and distal; anterior lateral tooth well developed, but weaker than the posterior lateral and located next to the laminate cardinal tooth. A rib extends from the umbonal region to the anterior adductor muscle scar in the left valve. Adductor muscle scars well impressed. Pallial sinus equal in opposite valves, long, rising gently behind, forming a slightly pointed apex far below the umbo, extending almost to but separated and not contiguous with the anterior adductor scar, and falling at a slight angle to the pallial line with which it is extensively confluent. A small interlinear scar often extends between the pallial sinus and the anterior adductor scar. Externally the shell is predominantly

white and pink, shining and somewhat glabrous; localized concentrations of pink occur as rays extending from the umbo. There are usually three such radiations, one paralleling the posterior ridge, another in the posterior quarter of the disc and a third along the anterior slope, more or less parallel to the anterior dorsal margin. Tints of yellow or apricot may augment or replace the pink, and rarely specimens may be nearly pure white. Some specimens also have indications of concentric bandings of white and pink. Internally, the shell is polished and usually suffused with white. A peripheral band of white is most often present.

length	height	width	
50.0 mm.	38.0 mm.	—	Altona Lagoon, St. Croix, Virgin Islands
46.0	30.5	12.0	São Paulo, Brasil
40.0	26.0	9.5	Altona Lagoon, St. Croix, Virgin Islands
39.0	26.5	8.0	Boca Chica Key, Florida
37.5	22.5	7.5	Manguinhos, Ilha de Itaparica, Bahia, Brasil

Remarks. *Tellina angulosa* Gmelin has been variously interpreted by numerous workers; the type figure is in Chemnitz (Conch. Cab., 1st Ed., vol. 10, pl. 120, figs. 1654 and 1655). It may be most easily confused with *Tellina alternata* and some discussion of the important traits which characterize each species have been given (see *Remarks* under *T. alternata*). *Tellina angulosa* is typically subtrigonal, its height is higher in proportion to its length when compared with *T. alternata.* In addition, the orange-red rays which color the umbonal region of *angulosa* are distinctive. In the northernmost extension of its range, *angulosa* overlaps with the range of *alternata.* In certain areas of Florida, *angulosa* tends to possess a thicker and heavier shell; the shell may exhibit more elongate proportions, but usually the posterior dorsal slope maintains a typical convexity which is diagnostic. Since some lots from southern Florida are mixed or nearly impossible to distinguish, it is possible that hybridization is occurring; however, some different or peculiar ecological conditions may prevail in certain areas to which *angulosa* has become adapted.

Tellina punicea Born, which is almost completely Caribbean in its distribution, may also be confused with *T. angulosa*, but in the latter, the pallial sinus remains distinctly free from the anterior adductor muscle scar and the orange-red coloration of the shell never approaches the intense purple-red of *T. punicea.*

The fossil history of *Tellina angulosa* has its recognizable beginning in the Miocene. *Tellina roburina* Dall from the Oak Grove Sands in Florida is markedly similar to *angulosa.* Gardner (1928) records the presence of *T. roburina* in the Alum Bluff formation of the Middle Miocene; she mentions that the lateral teeth attain a greater strength and are somewhat farther removed from the cardinal complex than similar modern forms. Maury (1917) described *Tellina cibaoica* from the Lower Miocene of Santo Domingo which though comparable to the recent *Tellina punicea* Born, is by virtue of its subtrigonal shape quite similar to *angulosa.* In the Bowden formation of Jamaica, none of the *Eurytellina* bears a resemblance to *angulosa.*

Although *Tellina rubescens* Hanley of the Eastern Pacific has been considered an analog of *T. angulosa*, it is certainly quite dissimilar in regard to the pallial sinus which is coextensive with the anterior adductor muscle scar. *Tellina eburnea* Hanley (=*panamensis* Li; =*liliana* Hertlein and Strong) is comparable in shape, in outline, and in the

configuration of the pallial sinus; it differs from *angulosa* in its heavier valves and pure white coloration.

Range. This species is found as far north as the southeastern and southwestern coasts of Florida. It occurs along the Gulf and Caribbean coasts of the Yucatan Peninsula and throughout the Greater and Lesser Antilles south to Brasil and Uruguay.

Specimens examined. FLORIDA: Virginia Key (MCZ); Biscayne Bay (Bulloch; ANSP); Boca Chica Key (MCZ); East Cape Sable; Marco Beach and Marco River (all D. and N. Schmidt); Sarasota Bay (USNM). MEXICO: Isla del Carmen (MCZ). Campeche; Yucatan (both ANSP). BRITISH HONDURAS: Belize (USNM). GUATEMALA: Puerto Barrios (ANSP). PANAMA: Payarde (Olsson). CUBA: *Barrera* station 220, Havana: *Barrera* station 213, Varadero Beach; *Barrera* station 221, Cardenas, in 1–3 fathoms (all USNM); Icacos Peninsula, in 3–4 fathoms (ANSP). JAMAICA: Green Island Harbour, Hanover; Black River, St. Elizabeth (both USNM); Little Goat Island, Portland Bight (MCZ). HISPANIOLA. HAITI: Bizoton; Aquin (both USNM). SANTO DOMINGO: Monte Cristi (MCZ); Puerto Plata (USNM); Santa Barbara de Samana (USNM; MCZ). PUERTO RICO: Punta Guanajibo (ANSP; MCZ); Ponce; La Parquera (both MCZ); Las Croahas, Fajardo (ANSP). VIRGIN ISLANDS: Magen's Bay, St. Thomas (ANSP); St. John's (ANSP; MCZ); Altona Lagoon, St. Croix (MCZ). LESSER ANTILLES: Guadeloupe (ANSP; MCZ); Roseau, Dominica (ANSP); St. Lucia, in 10 fathoms (USNM; MCZ); Chaguaramas Bay, Trinidad (USNM); Guayaguayare Beach, Trinidad (MCZ). VENEZUELA: Cumana (USNM); Margarita Island (MCZ). BRASIL: Praia Grande and Manguinhos, Ilha de Itaparica, Bahia; Pedra Furada, Bahia (all MCZ); Ilha Grande, Federal District (USNM); Praia de Caraquatatuba, São Paulo; São Paulo (both MCZ). URUGUAY: Arroyo de Pando, Canelones (MCZ).

Tellina (Eurytellina) alternata *Say*

Plate 144, fig. 1; Plate 146, figs. 2–4

Tellina alternata Say 1822, Jour. Acad. Nat. Sci., Philadelphia, **2**: 275; 1833 (?) Conrad [*in*] Say, American Conchology, **7**: pl. 65, fig. 1 (inhabits the coast of Georgia and East Florida) [type locality, here restricted, Sea Island, Georgia; holotype apparently lost].

Tellina (*Peronaeoderma*) *alternata* Say. H. and A. Adams 1856, Genera Recent Mollusca, **2**: 396.

Tellina planulata Sowerby 1867 [*in*] Reeve, Conch. Icon., **17**, **Tellina**, pl. 33, fig. 186 (type locality unknown) [type locality, here restricted, Sea Island, Georgia; holotype, BMNH, no. 74.12.11.244].

Tellina (*Eurytellina*) *alternata* Say. Dall 1900, Trans. Wagner Free Inst. Sci., Philadelphia, **3**(5): 1029.

Description. Shell extending to 72 mm. (about $2\frac{3}{4}$ inches) in length and to 40 mm. (about $1\frac{1}{2}$ inches) in height, elongate-subtrigonal, slightly inequilateral, somewhat compressed with the left valve slightly more convex and with a gentle flexure to the right posteriorly. Umbos slightly posterior to the middle, scarcely elevated, small, and often pointed. Anterior margin smoothly and broadly rounded; ventral margin more or less straight and rising posteriorly in a gentle arcuation; anterior dorsal margin gently sloping, convex and rather long; posterior dorsal margin straight, not too steeply sloping and very long; posterior margin extremely short, straight, rarely perpendicular to the dorsoventral axis. In outline, the shell appears to be attenuate posteriorly with a slight but marked truncation. Sculpture consisting of incised concentric sulci separated by

broad bands. A discrepancy exists between the valves; the left valve has broader bands and less sulci. A posterior ridge occurs in the right valve and a poorly developed concomitant sulcus on the left valve. Ligament light brown to black, strong, protuberant, and set in an ill defined escutcheon. Calcareous portion of the ligament well developed and subtended by nymphal callosities. Hinge line moderately developed. In the left valve, the cardinal complex consists of an anterior somewhat strong, bifid cardinal tooth with equal lobes and of a posterior, thin, laminate tooth which is often broken or lost. Proximally anterior to the bifid cardinal tooth is a rather well developed, but small lateral tooth; the distal posterior lateral tooth is weakly developed or obsolete. In the right valve, the cardinal complex consists of a posterior skewed, moderately strong bifid tooth with the posterior lobe the larger and of an anterior, thickened laminate cardinal tooth: anterior lateral tooth small, thin, and located next to the laminate cardinal tooth; posterior lateral tooth distal and stronger. In both valves an internal rib extends from the umbo to the anterior adductor muscle scar. Adductor muscle scars usually well impressed. Pallial sinus equal in both valves, rising slightly to a high point far beneath the umbos and extending far anteriorly near to but not contiguous with the anterior adductor scar. Often a small linear scar connects the pallial sinus with the anterior adductor scar. The pallial sinus falls arcuately to the pallial line; confluence extensive. Externally, the shell is shining, glabrous, and nearly always white, often with slight suffusions of pink or yellow; a yellowish-brown periostracum may augment the superficial coloration. Internally, the base color is a polished white with suffusions of yellow and rarely pink or apricot.

length	height	width	
68.0 mm.	37.8 mm.	12.0 mm.	Holotype of *planulata* Sowerby
72.0	40.0	13.0	Amelia Island, Florida
55.0	29.5	9.5	Cocoa Beach, Florida
50.5	32.0	13.5	Biscayne Bay, Florida
49.0	28.0	11.0	Fort Myers Beach, Florida
44.5	25.5	9.5	Treasure Island, off Pasadena, Florida

Remarks. Tellina alternata is one of the largest and most common tellens of the Atlantic coast of North America. It appears to prefer the sandy substrates along the shelf region in depths from 10–70 fathoms. It is typically elongate, white and with some yellowish suffusions internally. Its similarity to a number of other species is remarkable. With *Tellina nitida* Lamarck of European waters, it may be confused because of the similarity in shape and coloration, but the lack of eurytellinid dentition in *nitida* as well as the absence of intercalated sculpture on the posterior slope of *alternata* serve sufficiently to distinguish each species. Records of *alternata* in European waters have, no doubt, been established upon its outward similarity to *nitida*.

Certain species in the Western Atlantic with which *alternata* may be confused include *T. tayloriana* and *T. angulosa*. *Tellina tayloriana* has been considered a synonym of *alternata* by some authors (Dall 1900a) but herein both species are recognized in accordance with the interpretation of Olsson and Harbison (1953). Traits which distinguish *tayloriana* and *alternata* are discussed elsewhere (see *Remarks* under *T. tayloriana*). Color is the simplest and, in this case, one of the most reliable characteristics employed to distinguish *tayloriana*, which is pink, and *alternata*, which is white or yellow-white. There appears to be a slight overlapping in the ranges of these species along the Gulf coast and no clear cut line separates the populations.

Tellina angulosa Gmelin replaces *T. alternata* in the Antillean and Caribbean Regions. In general, *alternata* is much more elongate than *angulosa* and, therefore, less subtrigonal. The sculptural pattern of *alternata* is dissimilar in opposite valves. The right valve has the concentric sculpture more crowded with the concentric band consequently narrowed; the left valve possesses proportionally fewer sulci and consequently the sculpture is less crowded with the concentric bands broader. The right valve has from four to nine more sulci per centimeter than the left. In contradistinction to this condition, *T. angulosa* possesses valves upon which the concentric sculpture is less dissimilar. This characteristic is best employed in conjunction with a discreet appraisal of shape and color. *Tellina angulosa* has a tendency to have an anterior and a posterior orange-red ray emanating from the umbonal region; the shell tends to be thinner and more translucent; the angle of declination of the posterior dorsal slope is steeper and the margin itself is more convex than *alternata*.

In the Eastern Pacific, the subgenus *Eurytellina* is considerably richer in species but no single species from this region may be recognized as an analog of *Tellina alternata*. In general outline, *T. laceridens* Hanley and *T. hertleini* Olsson approach *alternata* but the pallial sinus is confluent with the anterior adductor muscle scar in both of the former.

In the fossil record, *Tellina alternata* has been recorded in the Pleistocene of the Gulf States by Maury (1920), the Pliocene of Florida by Dall (1900b), Olsson and Harbison (1953), and in the Pliocene of the Carolinas by Tuomey aud Holmes (1857). Mansfield (1932) has given also a record from the upper Miocene of Harver's Creek, Florida. From the Lower Miocene of Santo Domingo, Maury (1917) has described *Tellina riocanensis* which bears some resemblance to *alternata* and is a probable ancestor to the recent species.

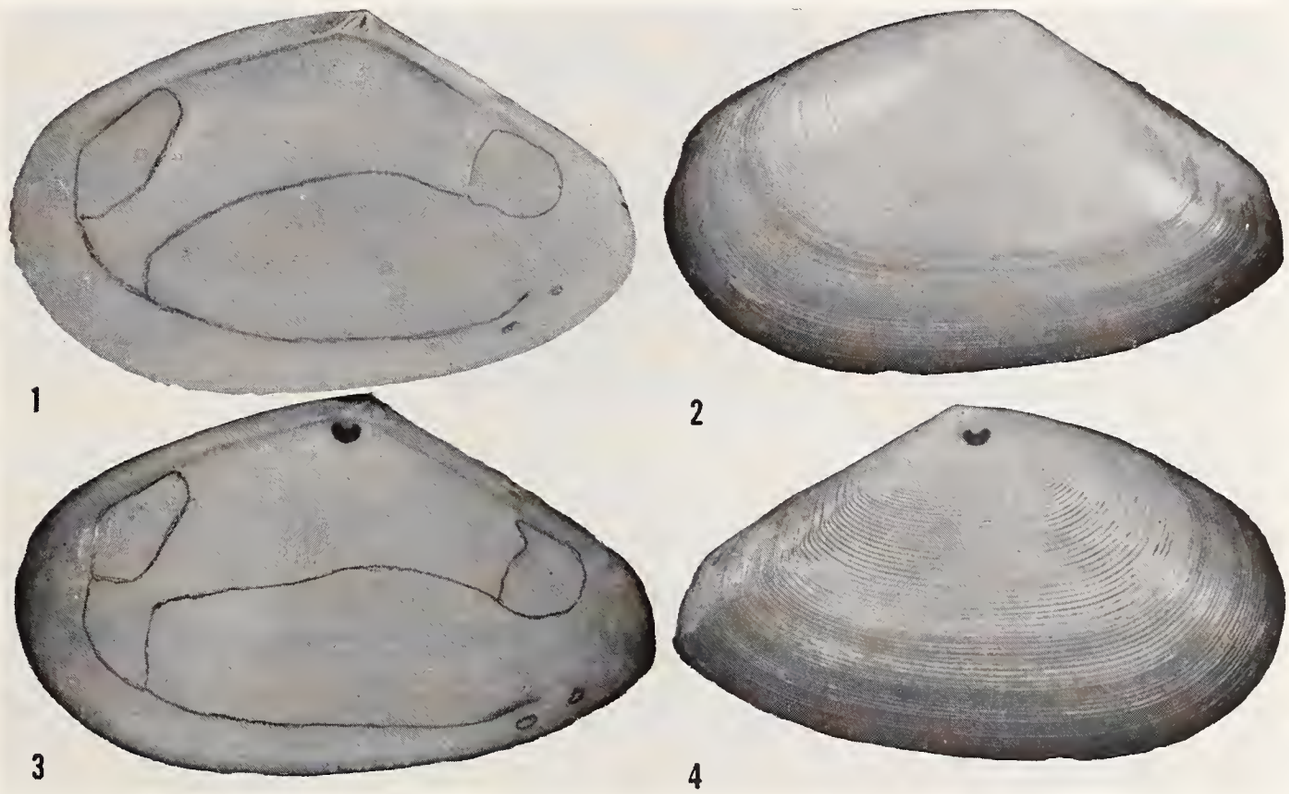

Plate 146. Fig. 1. *Tellina tayloriana* Sowerby, internal view of the right valve of the holotype, Mexico, BMNH (about 1.2x) [L=57.8 mm.]. Figs. 2–4. *Tellina planulata* Sowerby [=*Tellina alternata* Say]. Fig. 2. External view of the left valve of the holotype. Fig. 3. Internal view of the right valve of the holotype. Fig. 4. External view of the right valve of the holotype, no locality given, BMNH (about 1x) [L=68 mm.].

Range. This species occurs along the Atlantic and Gulf coasts of the United States from Cape Hatteras, North Carolina south through the Florida Keys around the Gulf of Mexico to Matagorda Island, Texas. Records and ranges published by Dall (1889) and others mention the occurrence of this species in the Antillean and Caribbean areas. This is not probable, for specimens from Haiti, Santo Domingo, British Honduras, and Puerto Rico which have been examined appear to be referable to *Tellina angulosa* Gmelin.

Specimens examined. North Carolina: Cape Hatteras; *Albatross I* station 2275, 19 miles NE of Cape Hatteras (35°20′ N; 75°18′ W), in 16 fathoms; *Albatross I* station 2112, 15 miles NNE of Cape Hatteras (35°20′ N; 75°13′ W), in 15½ fathoms; *Albatross I* station 2596, 19 miles SE of Cape Hatteras (35°05′ N; 75°10′ W), in 49 fathoms; *Albatross I* station 2609, 20 miles SEE of Cape Lookout (34°26′ N; 76°12′ W), in 22 fathoms; Fort Macon, Beaufort (all USNM); Bird Shoal, Beaufort; Shark Shoal, Boque Sound (both ANSP); Boque Id.; Shackleford Id. (both MCZ); Middle Sound, near Wilmington (USNM); Cape Fear, Smith Id. (ANSP). South Carolina: Merry's Inlet (MCZ); Cain Hoy, Wando (post Pliocene, USNM); Isle of Palms (CM; ANSP; MCZ); Charleston (CM; USNM; MCZ); Edisto Beach (CM). Georgia: Sea Id. (ANSP; MCZ); St. Simon's Bay (USNM). Florida: Fernandino Beach (D. and N. Schmidt; USNM); Amelia Id. (ANSP; USNM); Mayport (ANSP); Jacksonville Beach (ANSP: MCZ); mouth of St. Johns River; St. Augustine (both ANSP); beach N of St. Augustine Inlet (MCZ); Matanzas Inlet (ANSP); 4 miles NE of Daytona Beach, in 10 fathoms (USNM); Coronado Beach; Cape Canaveral; Cocoa Beach; 2 miles SE of Cocoa Beach, in Banana River; Atlantic Beach (all MCZ); Fort Pierce, Hutchinson Id. (D. and N. Schmidt); North Inlet, Lake Worth (ANSP); off Lantana, in 70 fathoms; Fair Isle Basin, Biscayne Bay; Virginia Key (all MCZ); Hawk Channel, in 3–4 fathoms (USNM); 4 miles NNE of The Elbow, Key Largo, in 66 fathoms (MCZ); Lower Matecumbe Key; 3 miles SSE of Key West (both USNM); Boca Grande Key; NW of Dry Tortugas, in 10 fathoms (both MCZ); Madeira Bay, Florida Bay (CNM); Marco; Bonita Springs; Fort Myers Beach; Blind Pass, Sanibel Id. (all D. and N. Schmidt); 2 miles and 30 miles W of Sanibel Id. (both MCZ); Boca Grande, Little Gasparilla; Punta Gorda Beach (both ANSP); Charlotte Harbor; Long Boat Key; Anna Maria Key; Mullet Key (all USNM); Tampa Bay (ANSP; USNM); Treasure Id.; Boca Ceiga Bay (both MCZ); Pass-a-grille (USNM; MCZ); Clearwater (MCZ); Cedar Key (USNM; MCZ); Alligator Harbor (ANSP; MCZ); Indian Pass, Apalachicola Bay (ANSP); Port St. Joe (MCZ); Beacon Beach (ANSP); Panama City (USNM); Pensacola (MCZ). Mississippi: Horn Id. (ANSP). Louisiana: Chandeleur Id.; Grand Isle; Cameron; Grand Lake (all USNM). Texas: High Id., Bolivar Peninsula (MCZ); Galveston (ANSP; USNM; MCZ); Padre Id., Corpus Christi (USNM); Sebrile Banks, off Padre Id. (ANSP); Matagorda Id. (MCZ).

Tellina (Eurytellina) tayloriana *Sowerby*

Plate 146, fig. 1

Tellina tayloriana Sowerby 1867 [*in*] Reeve, Conch. Icon., **17, Tellina,** pl. 30, fig. 168 (Mexico) [type locality, here restricted, Tampico, Mexico; holotype, BMNH, no. 74.12.11.318].

Tellina taylori Sowerby 1867, American Jour. Conch., **3**: 327, error for *tayloriana*.

Tellina (*Eurytellina*) *tayloriana* Sowerby. Olsson and Harbison 1953, Pliocene Mollusca of Southern Florida, Acad. Nat. Sci., Philadelphia, Monograph 8, p. 124, pl. 14, figs. 1–1b.

Description. Shell extending to 60 mm. (about $2\frac{1}{2}$ inches) in length and to 36 mm. (about $1\frac{1}{2}$ inches) in height, elongate subtrigonal, slightly inequilateral, slightly compressed with the right valve somewhat flattened, and with a weak flexure to the right posteriorly. Umbos only slightly behind the middle, little elevated, rather small and inconspicuous, and often sharply pointed. Anterior margin broadly and smoothly rounded; ventral margin usually slightly convex with a gently rising postbasal arcuation; anterior dorsal margin rather long, gently sloping and straight; posterior dorsal margin long, straight, and not steeply sloping; posterior margin short, straight, and at an angle to the dorso-ventral axis. In outline, the shell appears somewhat attenuate and truncate posteriorly. Sculpture consisting of incised concentric sulci, separated by broad bands. A discrepancy exists between the valves, the sulci are more dense on the right valve with concomitantly narrower bands. Ligament brown, protuberant and set in a narrow ill-defined escutcheon. The posterior dorsal slope of the left valve is flattened and broad. Calcareous portion of the ligament subtended by moderately developed nymphal callosities in both valves. Hinge line moderately developed. In the left valve, the cardinal complex consists of an anterior deltoid bifid tooth with subequal lobes and a posterior thin weak laminate cardinal tooth partly adpressed to the calcareous portion of the ligament and often broken or lost in some specimens; proximally anterior to the cardinal complex is a variously developed lateral tooth; the distal posterior lateral tooth is weak or obsolete. In the right valve, the cardinal complex consists of a posterior skewed, strong, deltoid bifid tooth with the posterior lobe the larger and of an anterior thin, elongate laminate cardinal tooth; anterior lateral tooth small and thin and very close to the laminate cardinal; posterior lateral rather well developed and distal to the cardinal complex. A heavy and well developed rib extends from the umbonal region to the anterior adductor scar in both valves. Adductor muscle scars well impressed. Pallial sinus rather variable, but usually subequal in each valve, flattened above, extending anteriorly but usually not contiguous with the anterior adductor. Sometimes an interlinear scar may connect the anterior adductor and the pallial sinus. The sinus falls rather abruptly and straight to the pallial line; confluence entire. Externally, the shell is white suffused with pink, with some alternations in bands of color, and with a darkening of the pink to nearly brownish peripherally. Internally, the shell is predominantly pink with some white suffusion and bands.

length	height	width	
57.8 mm.	34.5 mm.	11.7 mm.	Holotype of *tayloriana* Sowerby
60.0	36.0	11.5	Tampico, Mexico
54.5	30.5	11.5	Mustang Id., Texas
52.0	30.5	9.5	Corpus Christi, Texas
37.0	22.5	7.0	Port Isabel, Texas

Remarks. Heretofore, most authors, including Dall, have considered *Tellina tayloriana* Sowerby as a synonym of *Tellina alternata* Say. Recently Olsson and Harbison (1953) have differentiated these two species and have documented their occurrence in the Pliocene at Clewiston, Florida; they have gone so far as to infer that many fossil records of *T. alternata* are in reality those of *T. tayloriana*. Parker (1960) in his ecological studies of the macroinvertebrate fauna of certain areas along the Gulf of Mexico has recognized

the existence of *T. tayloriana* which he included as an important element in the inner shelf fauna (2–12 fathoms) along the coast of Texas.

In the Recent fauna, *Tellina tayloriana* appears to possess a discontinuous distribution; however, the records of the occurrence of this species along the Atlantic coast of Florida near St. Augustine and the area around Charleston, South Carolina are of doubtful authenticity. Notwithstanding these reservations, the central populations of *tayloriana* are to be found west of the Mississippi River.

There is no doubt that *tayloriana* and *alternata* are extremely closely related, but enough characteristics appear to distinguish each so that the treatment accorded these species by Olsson and Harbison seems justified. In color, *tayloriana* is bright pink, and this coloration appears to be present through the whole shell and is not disposed in distinct rays or patterns. The interior of the valves are generally highly polished with strong muscle impressions and a well differentiated and broad anterior radial rib. In contrast to *T. alternata*, the internal cavity of *tayloriana* is narrower, a trait reflected by the shallowness of the concavity of both valves. The right valve of *tayloriana* is noticeably more flat than that of *alternata*. The anterior dorsal marginal plate, present in each valve and adpressed when the valves are closed, is broad and flattened; in the right valve this structure carries the anterior lateral tooth. Externally, the anterior dorsal surface of the left valve possesses in a well developed state the concentric sculptural pattern; in *alternata*, the concentric sulci in this region are less well defined, poorly developed and more widely separated by concentric bands. It appears that *tayloriana* and *alternata* may be ecologically separated; there is some evidence which indicates that *tayloriana* lives in off-shore waters at greater depths than *alternata*.

Range. This species appears to be localized along the Gulf Coast of Texas and Mexico; the records from South Carolina and Florida are subject to questionable authenticity.

Specimens examined. South Carolina: Charleston (MCZ). Florida: St. Augustine (USNM; MCZ). Texas: High Id., Bolivar Peninsula (ANSP); Galveston (ANSP; MCZ); Matagorda Id. (USNM; MCZ); Port Aransas (ANSP; MCZ); Mustang Id.; Corpus Christi (both MCZ); Freeport (Bulloch); Port Isabel; Boca Chica Beach, 3 miles N of Rio Grande (both MCZ); Brazas Id. (ANSP); Rio Grande (USNM). Mexico: Tampico; Tuxpan; 15 miles N of Tecolutla (all MCZ).

Tellina (Eurytellina) nitens *C. B. Adams*

Plate 147, figs. 3–4; Plate 148, fig. 1; Plate 149, fig. 4; Plate 150, fig. 1

Tellina nitens Adams 1845, Proc. Boston Soc. Nat. Hist., **2**: 10 (Jamaica), *non* Deshayes 1854, *nec* Gregorio 1890, *nec* 'Lea' Dall 1900; Clench and Turner, 1950, Occ. Papers. Moll., Harvard University, **1**(15); 317, pl. 44, figs. 3–4 [holotype, MCZ 155606].

Tellina (*Angulus*) *nitens* Adams. Tryon 1869, American Jour. Conch., **4**: 94.

Tellina nitida Lamarck var. *Carolinensis* Dall 1889, Bull. U.S. Nat. Mus., **37**: 60, *non* Conrad 1875 (*nomen nudum*).

Tellina (*Eurytellina*) *georgiana* Dall 1900, Proc. U.S. Nat. Mus., **23**: 294, 310, pl. 2, fig. 3 (*Albatross I* station 2387, 66 miles S of Mobile Bay, Gulf of Mexico (29°34′ N; 88°04′ W), in 32 fathoms) [holotype, USNM 93777], *non* Gabb 1876.

Tellina (*Eurytellina*) *inaequistriata* 'Donovan' Dautzenberg 1900, Mem. Soc. Zool., Paris, **13**: 260, *non* Donovan 1802.

Description. Shell extending to 39 mm. (about $1\frac{1}{2}$ inches) in length and to 21 mm. (about $\frac{3}{4}$ inch) in height, elongate-elliptical, slightly inequilateral, moderately compressed with the left valve markedly more convex than the right and equivalve with a very slight posterior flexure to the right. Umbos just posterior to the middle, somewhat inflated, slightly raised above the hinge line and somewhat pointed. Anterior margin smoothly and narrowly rounded; ventral margin straight, rising gently posteriorly; anterior dorsal margin long, gently sloping and slightly convex; posterior dorsal margin variable in

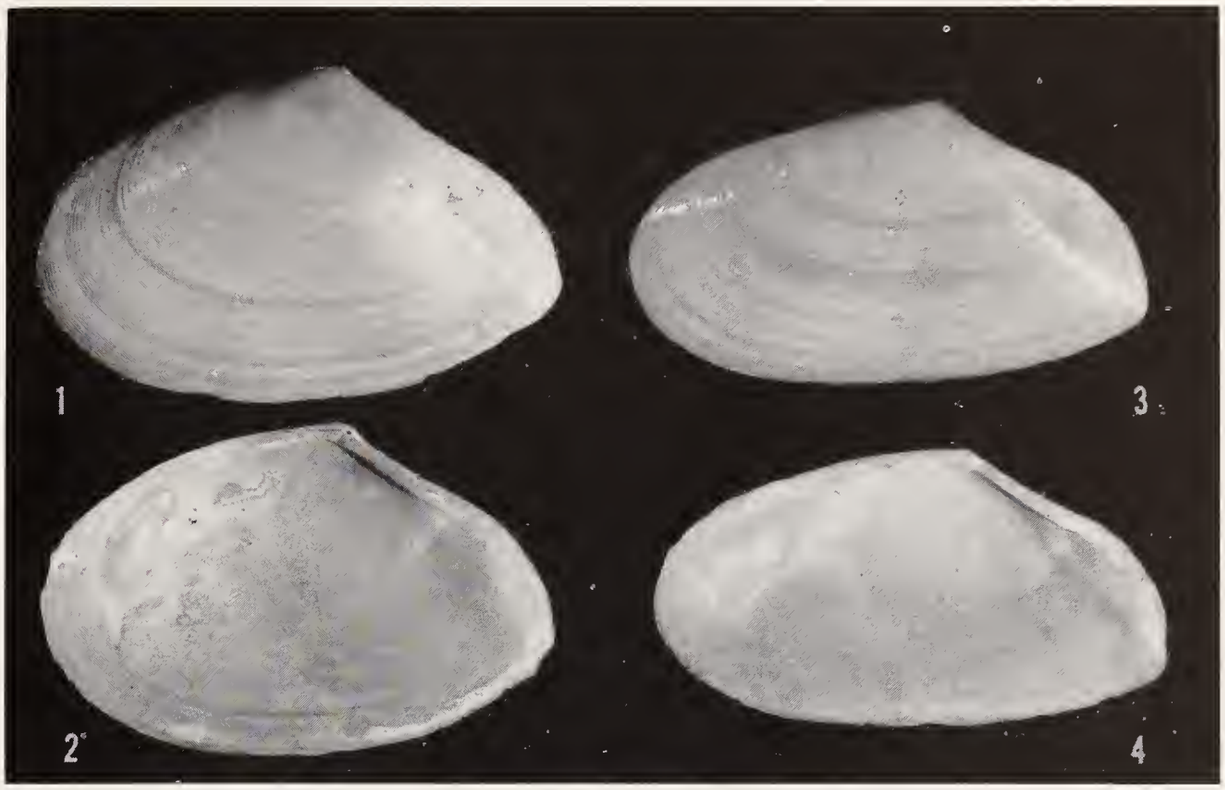

Plate 147. Figs. 1–2. *Tellina decussatula* C. B. Adams [= *Tellina lineata* Turton]. Fig. 1. External view of the left valve of the lectotype. Fig. 2. Internal view of the right valve of the lectotype, Jamaica, MCZ 156459 (about 2.4x) [L = 25 mm.]. Figs. 3–4. *Tellina nitens* C. B. Adams. Fig. 3. External view of the left valve of the holotype. Fig. 4. Internal view of the right valve of the holotype, Jamaica, MCZ 155606 (about 3x) [L = 18.5 mm.].

length, straight and gently sloping; posterior margin straight and at an angle to the dorso-ventral axis. In outline, the posterior portion of the shell appears attenuate, truncate and slightly alate above. Sculpture consisting of finely incised concentric sulci separated by narrow bands; various irregularities occur over the disc where some sulci tend to assume a pattern out of phase with the concentric growth lines. The posterior portion of the right valve is characterized by stronger, less dense concentric bands or riblets. Posterior ridge well developed in the right valve and with a concomitant sulcus in the left; the peculiar posterior riblet sculpture begins either just anterior to or upon the posterior ridge. Ligament light brown, strong, somewhat sunken in a narrow deep escutcheon. Calcareous portion of the ligament subtended by poorly developed nymphal callosities. Hinge line moderately developed. In the left valve, the cardinal complex consists of an anterior, narrow, weak, bifid tooth with subequal lobes and a posterior thin laminate tooth adpressed to the calcareous portion of the ligament and often broken or lost; subproximal anterior lateral tooth weak or obsolete; distal posterior lateral tooth rather poorly developed and weak but stronger than the anterior lateral. In the right

valve, the cardinal complex consists of a posterior, strongly skewed, usually strong, bifid tooth with the posterior lobe the larger, and an anterior thickened, subdeltoid, strong laminate cardinal tooth; the anterior lateral tooth is subproximal to the laminate of the cardinal complex, strong and well developed; the posterior lateral tooth is distal, moderately well developed and slightly weaker than the anterior lateral. A radial rib extends from the umbonal region to the anterior adductor scar and it is stronger in the left valve. Adductor muscle scars fairly well impressed. Pallial sinus convex above with a slight apex in front of the posterior adductor, extending nearly to the anterior adductor scar but most often not touching it. The pallial sinus descends in an arcuation to the pallial line; confluence entire. Externally, the shell is pink or apricot in color with some interspersed bands of white; the posterior slope tends to be whitish; internally, a pink or apricot color suffused with white occurs; the periphery is white.

length	height	width	
18.5 mm.	10.5 mm.	4.0 mm.	Holotype of *nitens* Adams
32.2	17.2	7.1	Holotype of *georgiana* Dall
39.1	21.3	8.2	Montego Bay, Jamaica
28.0	15.2	6.5	Lucea Bay, Jamaica
24.5	14.0	5.5	off Port Isabel, Texas
11.2	6.2	2.2	*Albatross I* station 2610, 34°20′ N: 76°12′ W, 27 miles SE of Cape Lookout, North Carolina

Remarks. Tellina nitens is distinguished from all its near relatives in the subgenus *Eurytellina* by a peculiar vitreous, apricot-colored external surface and an intercalated concentric sculpture along the posterior slope of the right valve. Dall originally related

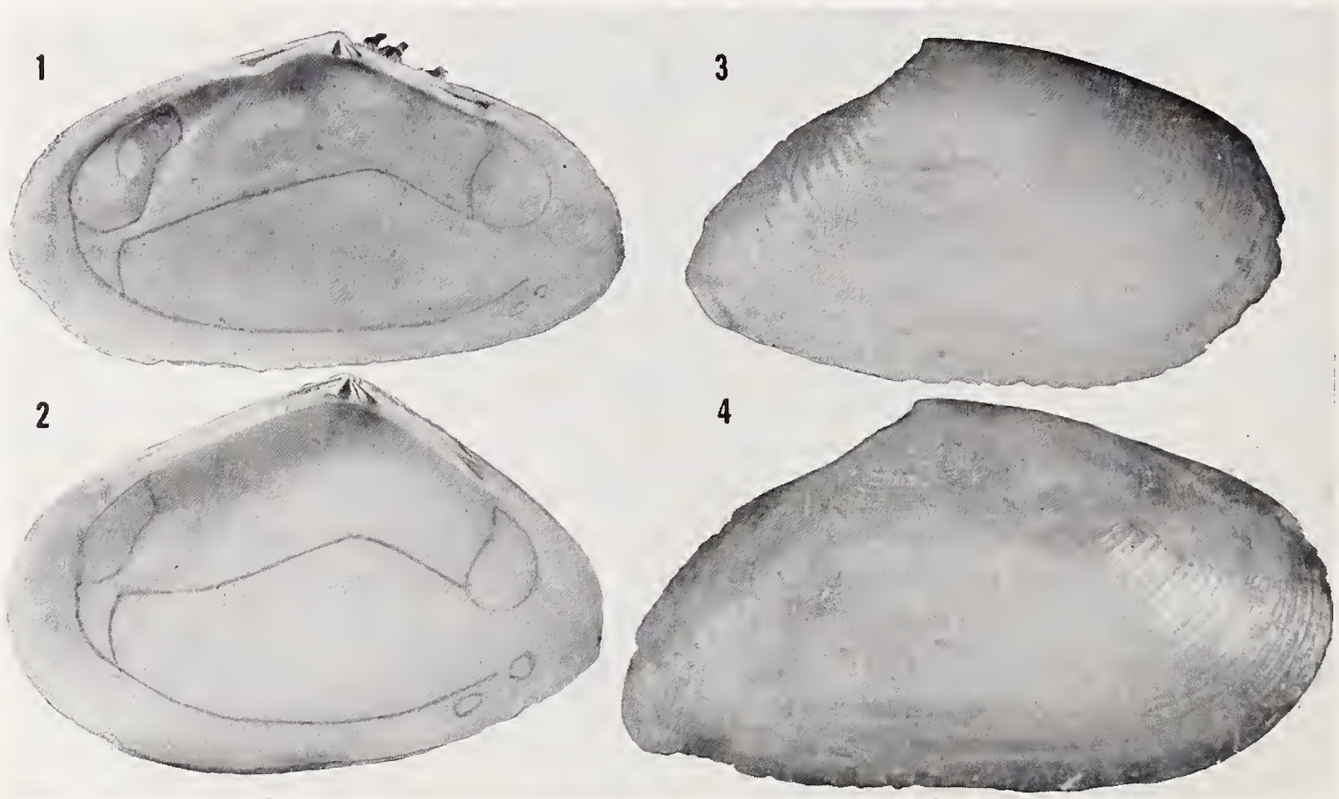

Plate 148. Fig. 1. *Tellina nitens* C. B. Adams, internal view of the right valve, Lucea Bay, Jamaica, MCZ 212137 (about 2.6x) [L=26 mm.]. Fig. 2. *Tellina angulosa* Gmelin, internal view of the right valve, St. Croix, Virgin Islands, MCZ 236382 (about 1.4x) [L=48 mm.]. Figs. 3–4. *Tellina vespuciana* d'Orbigny. Fig. 3. External view of the right valve, Livingston, Guatemala, MCZ 239109 (about 11x) [L=6 mm.]. Fig. 4. External view of the right valve of a syntype, Jamaica, BMNH (about 12x) [L=6.5 mm.].

this species to *Tellina nitida* Lamarck of European seas and called it a variety, *carolinensis*. Later, he recognized its distinctiveness and placed it within *Eurytellina* as *T. georgiana*, a name preoccupied by Gabb. Superficially, *T. nitida* may be confused with *T. nitens*, but the former lacks the eurytellinid syndrome, particularly the developed lateral teeth in the right valve. With some specimens of *T. alternata*, *nitens* may be confounded, but the former lacks a differentiated posterior slope sculpture in the right valve. In point of fact, the anterior right lateral tooth of *T. nitens* is farther removed from the cardinal complex than it is in *alternata*, *punicea* or *angulosa*, and in respect to this character, *nitens* most closely approaches *T. guildingii*. However, *T. guildingii* may readily be distinguished from *nitens* by its closely set, finely incised, concentric sulci and its radial color pattern. To *T. vespuciana*, the smallest and apparently one of the rarest *Eurytellina* of the Western Atlantic, *nitens* is also closely allied by the differential sculpture on the posterior slope of the right valve, but in *vespuciana* this sculpture tends only to be stronger and not intercalated as it is in *nitens* and the strength of the posterior ridge and posterior flexure to the right, in *vespuciana*, are adequately distinctive traits.

Among some of the variations apparent in *Tellina nitens*, none is so obvious as the difference in coloration. Some individuals are apricot or peach in color with brilliantly lustrous surfaces whereas others tend toward pink suffusions and still fewer tend to be

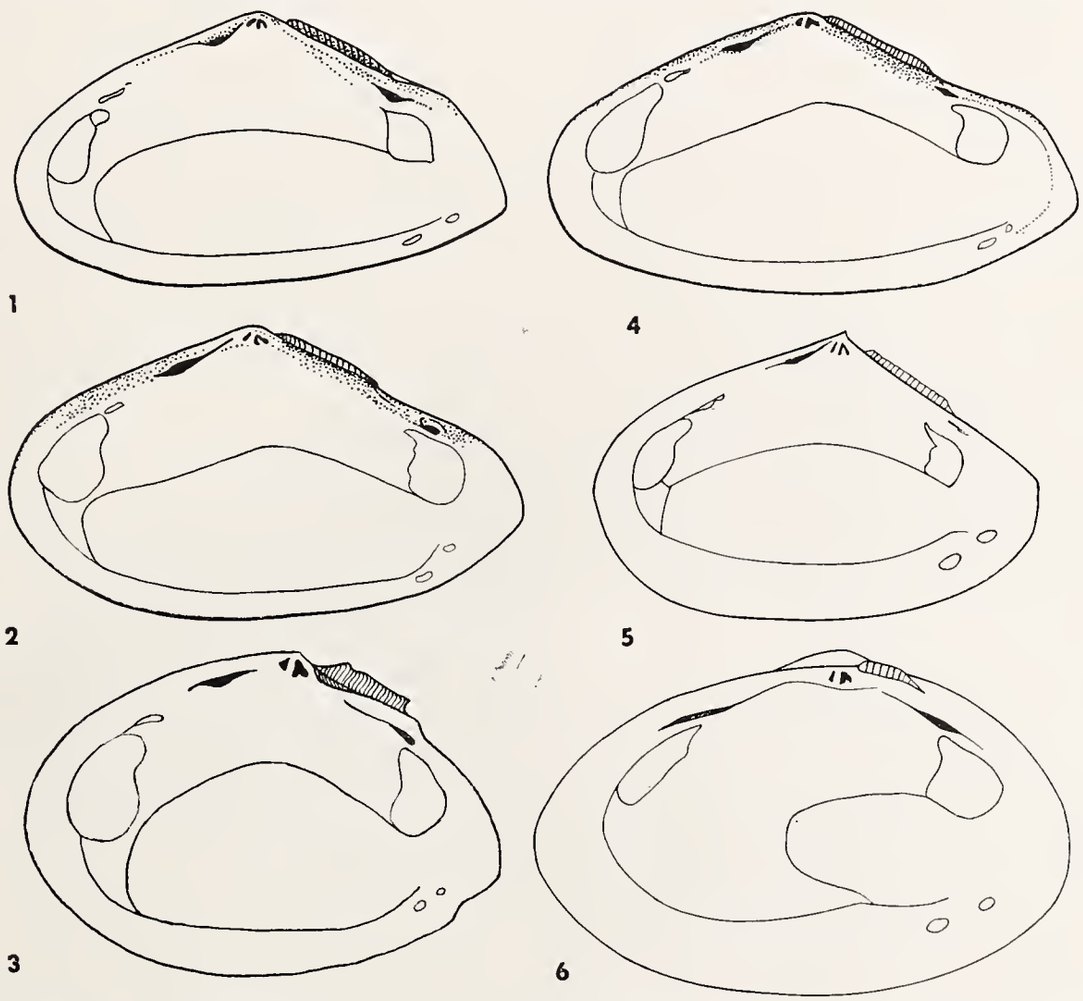

Plate 149. Figs. 1–6. Diagrammatic illustration of the internal surface of the right valve showing the dental configuration and muscle scars. Fig. 1. *Tellina vespuciana* d'Orbigny (about 9x) [L=6 mm.]. Fig. 2. *Tellina guildingii* Hanley (about 2x) [L=30 mm.]. Fig. 3. *Tellina lineata* Turton (about 1.9x) [L=30 mm.]. Fig. 4. *Tellina nitens* Adams (about 2x) [L=30 mm.]. Fig. 5. *Tellina trinitatis* Tomlin (about 1.5x) [L=32 mm.]. Fig. 6. *Tellina americana* Dall (about 9x) [L=7 mm.].

more predominantly white. The placement of the pallial sinus is not always constant; in some specimens, the pallial sinus appears to be coalescent with the anterior adductor muscle scar whereas in others it falls just short of connecting to the scar; even opposite valves may be unlike in this regard. The umbos are particularly pointed, protuberant and conspicuous in the young of *nitens*, and the prodissoconch is smooth, shining and often devoid of any indication of sculpture.

In the Eastern Pacific, *Tellina inaequistriata* Donovan represents the nearest ally to *T. nitens*. They are no doubt analogous and have arisen from a common stock. Records from the Western Atlantic which have cited the occurrence of *T. inaequistriata* represent *T. nitens*. The species are similar in proportion and in coloration but they may be separated by the differentiated posterior slope sculpture which in *inaequistriata* is more extensive, being found on the posterior portion of the disc and the concentric sculpture itself appears to be finer. According to Olsson (1961), *T. inaequistriata* is unique in the possession of fine crenulations along the anterior ventral margin of the shell.

The fossil history of *Tellina nitens* may be traced back to the Lower Miocene, and fossil species which apparently are antecedents of *nitens* have been found in numerous Tertiary deposits in the Caribbean area. Olsson and Harbison (1953) have described *Tellina strictolineata* from the Pliocene of southern Florida, and Woodring (1925) has figured, from the Miocene Bowden marls of Jamaica, *Tellina browni* which has an outline as well as the protuberant umbos similar to *Tellina nitens*. *Tellina hallistrepta* Dall (1900b) from the Bowden formation appears to be more closely allied to *Tellina* (*Phyllodina*) *persica*. In all these cases, the resemblance of the fossil to the living species is obvious and each species might be assumed to be a precursor to the Recent form. It is of interest to note that there appears to be a trend in the phylogeny of *Tellina nitens*. The characteristic intercalated sculpture of the posterior slope seems to have progressed posteriorly, for in the Miocene species and even in the Pliocene species, the extent of the peculiar sculpture is greater. In the fossil species, this sculpture occurs on part of the disc as well as on the posterior slope and through time the extent of this sculpture has been gradually diminished, so that in *nitens*, it is more or less limited to the bounds of the posterior slope.

Range. This species is found as far north as Cape Hatteras, North Carolina and as far south as Tobago in the Lesser Antilles; it occurs in the Gulf of Mexico along the southwestern coast of Texas and the western tip of Pinar del Rio, Cuba.

Specimens examined. North Carolina: *Albatross I* station 2276, 17 miles NNE of Cape Hatteras (35°20′ N; 75°19′ W), in 16 fathoms; *Albatross I* station 2596, 19 miles SE of Cape Hatteras (35°08′ N; 75°10′ W), in 49 fathoms; *Pelican* station 190-1, 9 miles SW of Cape Hatteras (35°06′ N; 75°32′ W), in 11 fathoms; *Albatross I* station 2610, 27 miles SE of Cape Lookout (34°20′ N; 76°12′ W), in 22 fathoms. Florida: 3½ miles NE of Pacific Reef, in 66 fathoms; 2½ miles SSE of Looe Key, in 37 fathoms; Western Dry Rocks; Dry Tortugas (all MCZ). Texas: about 68 miles SE of Freeport, in 48 fathoms; about 80 miles S of Port Isabel, in 40 fathoms (both MCZ). Cuba: *Barrera* station 200, Santa Lucia, in 2–4 fathoms; *Barrera* station 208, Bahia Honda, in 1–12 fathoms; *Barrera* station 203, Cabanas Harbor, in 3–12 fathoms (all USNM); Caibarien; Fish Point, Guantánamo Bay (both MCZ). Jamaica: Green Island Bay; Lucea Bay (both MCZ); Montego Bay (USNM); Port Antonio (MCZ; USNM).

Hispaniola. Haiti: Saltrou (USNM). Puerto Rico: mouth of Anasco River, in 40–60 feet (IMBPR); Mayaguez Harbor, in 10–13 fathoms (USNM; MCZ); La Parguera (MCZ); Salinas Beach, near Guanica (IMBPR); Farjado (MCZ); Johnson Smithsonian Station 75, off Palominas Id., in 26 fathoms (USNM). Lesser Antilles: St. Johns, Antigua, in 5 fathoms (ANSP); English Harbour, Antigua, in 7 fathoms; St. Lucia, in 7 fathoms; St. Lucia, in 10 fathoms; Carlisle Bay, Barbados, in 12 fathoms (all USNM); 2 miles S of Scarborough, Tobago, in 36 fathoms (MCZ).

Tellina (Eurytellina) guildingii *Hanley*

Plate 149, fig. 2; Plate 151, figs. 1–2

Tellina guildingii Hanley 1844, Proc. Zool. Soc. London, **12**: 60 (West Indies); 1846. Thesaurus Conchyliorum, **1**: 230, pl. 56, fig. 1 [type locality, here restricted, White River Beach, Jamaica: holotype, BMNH].
Tellina (*Tellinella*) *guildingii* Hanley. Bertin 1878, Nouvelles Arch. Mus. (2nd series), Paris, **1**: 240.
Tellina (*Tellina*) *guildingii* Hanley. Aguayo y Jaume 1949, Catalogo Moluscos de Cuba, no. 592.
Tellina (*Arcopagia*) *guildingii* Hanley. McLean 1951, New York Acad. Sci., **17**(1): 94.

Description. Shell extending to 53 mm. (about 2 inches) in length and to 30 mm. (about $1\frac{1}{4}$ inches) in height, elongate-elliptical, thin to subsolid, slightly inequilateral, moderately compressed but with the left valve markedly more convex and with a slight posterior flexure to the right. Umbos just behind the middle, slightly elevated above the hinge line and rather blunt. Anterior margin smoothly and somewhat narrowly rounded; ventral margin straight, rising only slightly posteriorly; anterior dorsal margin gently sloping but stronger in its descent to the anterior dorsal margin; posterior margin more or less straight, at an angle to the dorso-ventral axis and forming an oblique truncation. Sculpture consisting of rather deeply incised, closely set, concentric sulci separated by narrow, crowded bands; radial lirations are variously developed, cover the disc and are

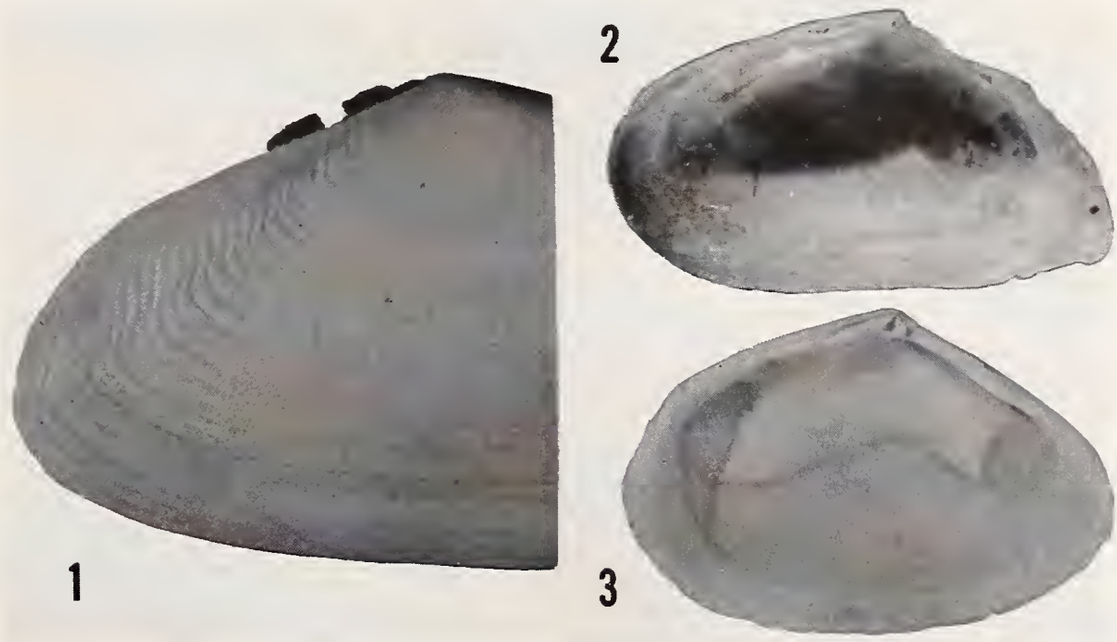

Plate 150. Fig. 1. *Tellina nitens* C. B. Adams, external view of the posterior dorsal slope of the right valve, Lucea Bay, Jamaica, MCZ 212137 (about 4x) [L=about 15 mm.]. Fig. 2. *Tellina vespuciana* d'Orbigny, internal view of the right valve of a syntype, Jamaica, BMNH (about 8.7x) [L=6.5 mm.]. Fig. 3. *Tellina punicea* Born, internal view of the right valve, Guayaguayare Beach, Trinidad, MCZ 236375 (about 1.6x) [L=35 mm.].

more or less absent from the posterior slope and its vicinity. Ligament short, thick, dark to light brown, somewhat protuberant, set in a shallow elongate escutcheon. Calcareous portion of the ligament subtended by a short strong nymphal callosity, especially in the right valve. Hinge moderately well developed. In the left valve, the cardinal complex consists of an anterior, narrow, bifid tooth whose anterior lobe is much the larger and a posterior, thin, laminate tooth which is adpressed to the calcareous portion of the ligament and which is often broken or lost; the anterior lateral tooth is somewhat removed from the cardinal complex, subproximal rather than distal to it and extremely poorly

Plate 151. *Tellina guildingii* Hanley. Fig. 1. External view of the right valve of the holotype, West Indies, BMNH (about 3.2x) [L=29.8 mm.]. Fig. 2. External view of the right valve, White River Beach, Jamaica, MCZ 208598 (about 2.4x) [L=34 mm.].

developed; the posterior lateral tooth is distal and variously developed although never strong. In the right valve, the cardinal complex consists of a posterior, strongly skewed, moderately strong, bifid tooth with subequal lobes and an anterior, thickened, well developed subdeltoid laminate tooth; the strong anterior lateral tooth is proximal to the laminate of the cardinal complex; the posterior lateral tooth is distal to the cardinal complex, moderately developed but markedly weaker than the anterior lateral. An internal rib extending from the umbonal area to the anterior adductor muscle scar is well developed in both valves. Adductor muscle scars strongly impressed. Pallial sinus flattened to convex above, extending to and (in younger specimens) coalescing with the anterior adductor scar and falling abruptly with a slight arcuation to the pallial line; confluence entire. Externally, the shell is predominantly white, sometimes with concentric bands of orange or red and usually with radial bands of orange or red which widen peripherally. Inter-

nally, the shell is usually completely white but the transparency of the shell allows the radial and concentric pattern of the external surface to show through.

length	height	width	
29.8 mm.	16.0 mm.	7.0 mm.	Holotype of *guildingii* Hanley
53.5	29.5	—	Bermuda
37.9	29.9	7.8	Rio Bueno, Trelawny, Jamaica
37.4	29.9	7.5	White River Beach, Ocho Rios, Jamaica
34.6	18.2	6.6	White River Beach, Ocho Rios, Jamaica
31.5	14.5	7.5	St. Croix, Virgin Islands

Remarks. This species, as rare as it is and distributed as it is over a wide range, is nevertheless distinct from all the other Western Atlantic *Tellina*. It is not synonymous with *T. nitens* as McLean (1951) has indicated. Of all the Western Atlantic *Eurytellina*, *nitens* is probably the most closely related species to *guildingii*. The latter, however, is immediately characterized by its concentric sculpture which is strong, deeply incised and closely set; in addition, the peculiar orange sheen of *nitens* is completely lacking in *guildingii*, which instead has a distinctly rayed pattern of coloration. The valves of *guildingii* are heavier and thicker than those of *nitens* and there is no intercalated sculpture on the posterior slope of the right valve. Unfortunately, there is no information as to the habitat preferred by this species. *Tellina waylandvaughani* described by Maury (1917) from the Lower Miocene of Santo Domingo bears some resemblance to the shape and outline of *guildingii*.

Range. This species is rare and poorly represented in museum collections. The Bermuda record from a lot in the MCZ is doubtful, and Peile (1926) does not list this species from there. The lot from Dick's Point, Nassau, New Providence in the Bahamas is also doubtful. It is certain, however, that the species is to be found in Jamaica and that it also probably occurs in the Virgin Islands; such a discontinuous distribution will only be corroborated with further collecting in other Antillean areas.

Specimens examined. Bermuda: Bermuda (MCZ). Bahama Islands: Dick's Point, Nassau, New Providence (MCZ). Cuba: *Atlantis* station 3328, Bahia Cochinas, 22°08′ N: 81°10′ W, in 260–275 fathoms (MCZ). Jamaica: Rio Bueno, Trelawny (USNM); White River Beach (Yale; USNM; MCZ). Virgin Islands: St. Thomas (ANSP); St. Croix (MCZ). Lesser Antilles: off Pelican Island in 100 fathoms and in Carlisle Bay in 12 fathoms, both Barbados (both MCZ).

Tellina (Eurytellina) lineata *Turton*

Plate 143, figs. 3–4; Plate 147, figs. 1–2; Plate 149, fig. 3

Tellina striata 'Gmelin' Montagu 1804, Testacea Britannica, pp. 60 and 61, *non* Gmelin 1792, *nec* Spengler 1798, *nec* Costa 1829.

Tellina brasiliana Lamarck 1818, Animaux s. Vertebres, **5**: 532 (l'Océan du Brésil, à Rio de Janeiro) [syntypes, Museum d' Histoire Naturelle, Paris], *non* Spengler 1798.

Tellina lineata Turton 1819, Conch. Dict., p. 168, pl. 4, fig. 16 (coast of Dorsetshire) [type locality, here corrected and restricted, Jamaica; holotype, USNM 172658], *non* Hoeninghaus 1829.

Tellina decussatula C. B. Adams 1845, Proc. Boston Soc. Nat. Hist., **2**: 10 (Jamaica); Clench and Turner 1950, Occ. Papers Moll., Harvard University, **1**(15): 272, pl. 44, figs. 1–2 [lectotype, selected by Clench and Turner, MCZ 156459].

Tellina (*Telinella*) *lineata* Turton. H. and A. Adams 1856, Genera Recent Mollusca, **2**: 395 (error for *Tellinella*).

Tellina (*Tellinella*) *lineata* Turton. Römer 1871, Conchilien-Cabinet (2), **Tellina, 10**(4): 53, pl. 15, figs. 8–12.

Tellina decussata Adams. Krebs 1864, West Indian Shells, p. 101 (error for *decussatula*), *non decussata* Lamarck 1818.

Tellina (*Tellina*) *lineata* Turton. Dall 1900, Proc. U.S. Nat. Mus., **23**: 293.

Tellina (*Moerella*) *lineata* Turton. Dautzenberg 1900, Mem. Soc. Zool., Paris, **13**: 261.

Tellina (*Eurytellina*) *lineata* Turton. Dall and Simpson 1901, Bull. U.S. Fish. Commission, **20**(1): 480.

Tellina (*Tellina*) *decussata* Adams. Maury 1920, Bull. American Paleo., **8**(34): 79 (error for *decussatula*).

Description. Shell extending to 38 mm. (about $1\frac{1}{2}$ inches) in length and to 25 mm. (about 1 inch) in height, subtrigonal or elongate-oval, inequilateral, somewhat inflated with both valves of nearly equal convexity and with a marked and sharp flexure to the right. Umbos raised slightly above the hinge line, inflated with a cavity below, pointed, markedly opisthogyrous and located just posterior to the middle. Anterior margin more or less broadly rounded; ventral margin straight or convex and gently rising; anterior dorsal margin convex, short and gently curving; posterior dorsal margin rather steeply sloping; posterior margin more or less straight, short and forming an oblique truncation. Sculpture consisting of rather closely set, weakly incised, concentric sulci separated by narrow and hardly raised bands of irregular breadth. Weak and broad radial lirations cover the disc. Posterior ridge present but generally not too well developed and stronger on the left valve. Ligament generally dark brown, short, broad and sunken into a broad but shallow escutcheon. Calcareous portion of the ligament very much narrowed posteriorly and subtended by a nymphal callosity, which is rather well developed in the right valve. Hinge line well developed. In the left valve, the cardinal complex consists of an anterior, elongate, bifid tooth with subequal lobes and a posterior narrow and weak laminate tooth which is adpressed to the calcareous element of the ligament; the anterior lateral tooth subproximal, weak and obsolete; the posterior lateral tooth distal, slightly stronger than the anterior but still rather poorly developed. In the right valve, the cardinal complex consists of a posterior, skewed, strong, bifid tooth with irregular lobes and an anterior subdeltoid, strong laminate tooth; the anterior lateral tooth is subproximal to the cardinal complex, strong and well developed; the posterior lateral is weaker and distal. A variously developed anterior rib extends from the umbonal area to the anterior adductor scar. Adductor muscle scars well impressed. Pallial sinus convex above, not rising above the adductor muscle scars, extending anteriorly but usually not coalescing with the anterior adductor scar and falling more or less obliquely to the pallial line; confluence entire. Externally, the shell may be pure white to pure pink; in specimens with pink concentrated on the disc, there are evidences of concentric banding of white and pink. Some suffusion of yellow and apricot may also appear. Internally, the shell is white, pink, or a mixture thereof; the marginal borders are generally white.

length	height	width	
25.0 mm.	16.0 mm.	7.5 mm.	Lectotype of *decussatula* Adams
37.5	24.5	11.6	Marco Pass, Florida
35.5	23.0	12.0	Marco Pass, Florida
34.0	24.0	11.5	Marco Pass, Florida
31.5	21.0	8.5	Isla Coche, Venezuela
16.0	10.5	5.0	Cape Sable, Florida

Remarks. The inclusion of Montagu's interpretation of Gmelin's *striata* in the synonymy is made because of Turton's reference to Montagu in the type description of *lineata*, and all later authors have interpreted Montagu's remarks as being descriptive of Turton's *lineata*. Under the synonyms of *T. lineata* Turton, Dall (1900a) listed Conrad's reference to *Tellina tenuis* daCosta in Say's American Conchology; the specimen figured by Conrad later became the type of *Tellina omoia* Ravenel, which is herein treated as a *nomen oblitum* under *Tellina colorata* Dall.

The range of variation within this species is in part responsible for the synonyms cited above. Certainly the most characteristic trait for this species is the strong posterior flexure to the right, which is absent or only poorly developed in other species in the subgenus *Eurytellina*. Dall (1900a) had tentatively placed it within the framework of the subgenus *Tellina*, as interpreted by him. In the present thesis the concept of *Eurytellina* has been broadened to allow inclusion of *T. lineata*. This species posseses a variously developed internal anterior rib which extends between the umbonal area and the scar of the anterior adductor muscle. The anterior lateral tooth in adult specimens is subproximal and in immature and very young specimens, it appears to be distal. The extent and shape of the pallial sinus is also variable, the distance separating the anteriormost border of the sinus and the scar of the anterior adductor muscle is not constant. The sinus may fall straight or obliquely to its union with the pallial line. In color, *lineata* ranges between a pure white and a pure pink with numerous gradations between, including suffusions of yellow and apricot. As far as can be ascertained, this range of coloration is found within any local population and there does not appear to be any clinical phenomenon involved. As indicated by the measurements, the same may be said for the astonishing variation in shape. In similar localities, shells may be markedly subtrigonal, elongate, subquadriform, or subovate; however, in youthful stages, there is a tendency for the shell to appear quadriform in outline. The posterior dorsal slope may incline steeply or gently, the ventral margin may be straight or convex, and the posterior portion of the shell may appear produced, truncated, or bluntly rounded. Nevertheless, the species is well characterized by its adult dentition, the posterior flexure, the subequal convexity of the valves and the rather conspicuously pointed and strongly opisthogyrous umbo.

The affinities of *Tellina lineata* are somewhat obscured, for there are no documented fossil records and no apparent predecessor species (Maury, 1920). In the fauna of the Eastern Pacific, there is no distinct analog and the closest relatives of this species in the Western Atlantic appear to be *T. nitens* and *T. punicea*. The similar placement of the right anterior tooth as well as the configuration of the pallial sinus are indicative of the propinquity of *nitens* and *lineata*, but *nitens* possesses a distinct and distinguishing intercalated sculpture on the posterior slope of the right valve and lacks the tumidity and convexity of *lineata*. *Tellina punicea* is even more distantly related, for its right anterior lateral tooth is closer to the cardinal complex than that of *lineata*. In addition, it is of a much more elongate shape with lower proportions and the posterior flexure is but poorly developed. It is to be concluded that *T. lineata* stands more or less alone in the Western Atlantic fauna and that even from its nearest relatives it is quite widely divergent and unique.

Certain species may be superficially confused with *Tellina lineata* but each is easily distinguished by close examination. *Tellina tampaensis*, when compared with *lineata*, shows a lack of a developed right posterior lateral tooth and its pallial sinus is distinctly

separated from the anterior adductor muscle scar. *Macoma cerina* 'C. B. Adams' Dall appears to have some similarity in outline to *T. lineata* but the former totally lacks lateral teeth.

Range. This species occurs as far north as St. Augustine, Florida; it is found along the coast of the Gulf of Mexico from Florida to Yucatan. It appears to be very rare in the Bahamas. It occurs throughout the Greater and Lesser Antilles, in the Caribbean Sea, along the coast of eastern Central America and northern South America, and along the shores of eastern South America to São Paulo, Brasil.

Specimens examined. FLORIDA: St. Augustine (USNM); Banana River, near Cocoa Beach (MCZ); Jupiter Inlet (ANSP); mouth of St. John's River (USNM); Lake Worth; North Inlet, Palm Beach (both ANSP); Pelican Shoals; Middle Cape and North Cape, Cape Sable; Small Key, 7½ miles NNW of Lostman's River; Plover Key (all MCZ); Lostman's Key (ANSP); Pavilion Key (MCZ); Cape Romano (USNM); Cape Haze; Horse Key, 11½ miles SE of Marco; Caxambas Pass (all MCZ); Marco, in 2 fathoms; Marco Pass (both USNM); Naples (MCZ); Bonita Beach, Bonita Springs (ANSP; MCZ); Big Carlos Pass; Fort Myers Beach (both ANSP); Bunch Beach (D. and N. Schmidt); Punta Rassa (D. and N. Schmidt; ANSP; USNM; MCZ); Tarpon Bay and Blind Pass, Sanibel Id.; Captiva; Charlotte Harbor (all MCZ); Gasparilla Key (USNM); Little Gasparilla Id. (ANSP); Lemon Bay; Sarasota Bay; Pass-a-grille (all MCZ). TEXAS: Port Aransas (MCZ). MEXICO: Veracruz (USNM; MCZ): Isla del Carmen, and near Chenkan, Campeche; Yucatan (all MCZ). GUATEMALA: Puerto Barrios (MCZ). NICARAGUA: (ANSP). BAHAMA ISLANDS: Abaco (ANSP). CUBA: *Barrera* station 209, Santa Rosa, in 3–6 fathoms (USNM); Veradero Beach, Matanzas (MCZ); Playa Larga, Cardenas (CNM); Cayo Frances, and Cayo Conuco, Caibarien; Nicaro, Mayari (all MCZ); Batabano (ANSP); Nueva Gerona, Isla de Pinos (MCZ); Siguanea Bay, and Punta Colombo, Isla de Pinos (both USNM); ½ mile E of La Milpa, Cienfuegos Bay (MCZ); Cienfuegos Harbor; Ensenada de Cochinos, in 100–150 fathoms (both USNM). JAMAICA: Mamee Bay, St. Anne's Parish (MCZ); Old Harbor, St. Catherine; Hunts Bay; Kingston; Palisadoes (all USNM). HISPANIOLA. HAITI: Ile a Vache; Les Cayes; St. Louis de Sud; Aquin; Bizoton (all USNM). SANTO DOMINGO: Santa Barbara de Samana (MCZ). PUERTO RICO: Catano (IMPBR); Cabras Id.; Mayaguez (both USNM); Salinas de Guanica (IMBPR); El Caja de Santiago (USNM). VIRGIN ISLANDS: St. Thomas (USNM). LESSER ANTILLES: Guadeloupe; St. Lucia (both ANSP); Grenada (USNM); Trinidad (MCZ). COLOMBIA: Cartagena (MCZ). VENEZUELA: Isla Coche; Cumana; Margarita Id. (all MCZ). BRASIL: Fortaleza (USNM); Recife; Ilha de Itaparica, Bahia; Vitoria, Espirito Santo (all MCZ); São Sebastião, São Paulo (USNM).

Tellina (Eurytellina) vespuciana *d'Orbigny*

Plate 148, figs. 3–4; Plate 149, fig. 1; Plate 150, fig. 2

Tellina vespuciana d'Orbigny 1842 [*in*] Sagra, Hist. L'Ile Cuba, Atlas, pl. 26, figs. 12–14; 1845, Spanish Text, **5**(2): 305 (Martinica y Jamaica); 1853, French Text, Mollusques, **2**: 254 [type locality, here restricted, Jamaica; syntypes, BMNH 54.10.4.515].

Tellina (*Arcopagia*) *vespuciana* d'Orbigny. McLean 1951, New York Acad. Sci., **17**(1): 93, pl. 19, fig. 5.

Tellina (*Eurytellina*) *vespuciana* d'Orbigny. Warmke and Abbott 1961, Caribbean Seashells, p. 196.

Description. Shell extending to 7.5 mm. in length (about 5/16 inch) and to 4.5 mm. (about 3/16 inch) in height, elongate, subsolid, moderately inflated, with the left valve of markedly greater convexity and with a flexure to the right posteriorly. Umbos posterior to the middle, opisthogyrous, not elevated and pointed. Anterior margin somewhat broadly rounded; ventral margin more or less straight, rising in a gentle arcuation posteriorly; anterior dorsal margin steeply inclined and convex; posterior margin more or less straight and forming a broad truncation. Sculpture consisting of incised concentric sulci separated by narrow, rather flattened bands; the concentric sculpture increasing in strength along the posterior ridge. Ligament yellowish, short and very protuberant. Calcareous portion of ligament supported by short nymphal callosities. In the left valve, the cardinal complex consists of an anterior slightly thickened bifid tooth with subequal lobes and of a posterior very thin, elongate, laminate tooth; no true lateral teeth present. In the right valve, the cardinal complex consists of a posterior, skewed, weak bifid tooth with narrow lobes and of an anterior small, slightly thickened laminate cardinal tooth; anterior lateral tooth proximal, elongate and upcurled; posterior lateral tooth distal, pointed and socketed above. Adductor muscle scars moderately well impressed. Pallial sinus equal in both valves, rising rather abruptly behind, rounded above, gently descending, approaching very near to but not touching the anterior adductor muscle scar and falling in a smooth arcuation to the pallial line; confluence extensive. Color white to pellucid, rarely with a brownish periostracum externally, not rayed or suffused with red; internally somewhat polished.

length	height	width	
6.5 mm.	3.2 mm.	—	Syntype of *vespuciana* d'Orb.
7.5	4.5	—	La Parquera, Puerto Rico
5.6	3.3	1.7 mm.	La Parquera, Puerto Rico
5.0	3.0	1.4	Jamaica

Remarks. Tellina vespuciana is placed within *Eurytellina* because it conforms to the syndrome of characters exhibited by this group. It is unlike all other members of *Eurytellina* in regard to its extremely small size, and in this trait it indicates the relationship between *Eurytellina* and *Angulus.*

Tellina vespuciana is possibly closely allied to *T. nitens* for there is some sculptural similarity between the two species. In contrast to *nitens*, *vespuciana* in its maximum size is less than 10 millimeters in length, the posterior ridge of the right valve is strong, and the shell lacks any orange-apricot coloration. There does not appear to be any direct eurytellinid analog of *vespuciana* in the Eastern Pacific and it is difficult to assign any ancestral status to fossils in the Western Atlantic which resemble *vespuciana.*

Tellina vespuciana bears the closest resemblance to *T. sybaritica.* The convergence exhibited by these two species is so great as to render the subgeneric status of the species questionable. Both are similar in regard to the superficial sculpture and the configuration of the pallial sinus. *T. sybaritica* possesses an obsolete right distal posterior lateral tooth, but in its variation, this structure very closely approaches the strength of the homologous tooth in *T. vespuciana.* Typically the right posterior lateral tooth in *vespuciana* is pointed, socketed above and strong. In addition, *vespuciana* never possesses bright coloration as *sybaritica* does.

Range. This species is so poorly known that the assignment of a definite range is impossible. It is primarily Caribbean; the single record from the Gulf of Mexico, because of its fragmentary nature, is somewhat questionable.

Specimens examined. Texas: off Port Isabel, in 50 fathoms (MCZ). British Honduras: Belize and Monkey River (ANSP). Guatemala: Puerto Barrios and Livingston (ANSP). Jamaica: (MCZ). Hispaniola. Santo Domingo: Bahia de Samana, in 16–17 fathoms (USNM). Puerto Rico: Bahia de Añasco; Mayagüez (both MCZ); La Parquera (IMBPR). Lesser Antilles: St. Johns, Antigua, in 30 feet (ANSP); Martinique; Gulf of Paria, Trinidad (both MCZ).

Subgenus **Angulus** *Megerle von Mühlfeld*

Angulus Megerle von Mühlfeld 1811, Gesellschaft Naturforschender Freunde Berlin, Magazin, **5**: 47 (type species, *Tellina lanceolata* Gmelin 1791, subsequent designation, Gray 1847, p. 186).

Oudardia Monterosato 1884, Nomenclatura generica e specifica di alcune Conchiglie Mediterranee, Palermo, p. 22 (type-species, *Tellina oudardii* Payraudeau 1826 [= *T. compressa* Brocchi 1814], original designation).

Moerella 'Fischer' Gardner 1928, U.S. Geol. Sur., Prof. Paper 142-E, p. 195, *non* Fischer 1887.

Anbulus Megerle von Mühlfeld. McLean 1951, New York Acad. Sci., **17**(1): 96, error for *Angulus*.

Description. Shell small to medium in size, fragile to solid, ovate to elliptical in shape, with the left valve generally more convex and with a flexure to the right posteriorly. Sculpture primarily concentric and weakly incised over the surface of the valves; rarely differentiated along the posterior dorsal slope. Hinge without lateral dentition in the left valve. Right valve with the anterior lateral tooth adjacent to the cardinal complex and with an obsolete lateral tubercle. Pallial sinus generally extensive, confluent with the pallial line for much of its ventral length.

Various interpretations have been allotted the group *Angulus*. Megerle von Mühlfeld's original discussion includes a truly heterogeneous assemblage of species with some four kinds of *Angulus* delineated. Later, when Gray (1847) designated *Tellina lanceolata* Gmelin of the Philippines as type, the content of the group was diminished. Salisbury (1934) stated that the type designation of Gray served to restrict *Angulus* to only two Recent species; however, five species bearing the name *Angulus* occur in Salisbury's illustrations. With specific reference to the fauna of North America, Gardner (1928) introduced *Moerella* Fischer to replace *Angulus* which had up to that time become widely used in the literature, and Olsson and Harbison (1953) in following the procedure outlined by Gardner have illustrated the type species of both and described *Moerella* as having 'two strong laterals in the right valve.' The problem is the interpretation of the dental structure of *Tellina donacina*, the type species of *Moerella*, and of *T. lanceolata*, the type species of *Angulus*. *Angulus* lacks any left lateral dentition, and the type species does not have a developed right posterior lateral tooth. However, a fold or slight tubercle along the posterior end of the hinge line in the right valve may be discerned. The anterior lateral tooth in the right valve is well developed, upcurled, and shelf-like. On the other hand, *Tellina donacina*, the type of *Moerella*, has a strong right posterior lateral tooth similar to that developed in *Eurytellina*. The shell is heavy and the concentric sculpture strong.

The morphology of the species in the Western Atlantic exhibits a pattern most closely expressed in *Angulus*. Not only is the right posterior lateral tooth poorly developed or

obsolete in the Western Atlantic species, but the general shell construction, in terms of thickness and sculpture, also indicates the relationship with the Indo-Pacific species.

It may be concluded that the anguloid syndrome consists of a right anterior lateral tooth adjacent to the cardinal complex and of an obsolete, absent or poorly developed right distal posterior tooth. The subgenus as herein defined is cosmopolitan in its distribution but with a primary concentration and development of species in the tropics. The group is represented as early as the Eocene in North America.

KEY TO THE SPECIES OF *ANGULUS* IN THE WESTERN ATLANTIC

1. Shell of high proportions, height more than 70% of length 2
   Shell of lower proportions, height less than 70% of length 5
2. Shell rounded or ovate in outline; not highly colored 3
   Shell subquadrate in outline; highly colored . . . . . *colorata*
3. Shell with the right anterior lateral tooth subproximal to the cardinal complex 4
   Shell with the right anterior lateral tooth closely adjacent to the cardinal complex . . . . . *tampaensis*
4. Pallial sinus uniting with the pallial line some distance from the anterior adductor muscle scar . . . . . *mera*
   Pallial sinus uniting with the pallial line at or near its junction with the anterior adductor muscle scar . . . . . *paramera*
5. Sculpture consisting of raised concentric lirations 6
   Sculpture consisting of finely incised sulci 7
6. Shell pellucid, highly colored and sharply flexed . . . . . *sybaritica*
   Shell dull white and not sharply flexed . . . . . *tenella*
7. Shell solid, subtrigonal and pointed behind 8
   Shell thin to subsolid and elongate-elliptical 9
8. Posterior slope sharply cleft by a radial sulcus; periostracum grayish-green . . . . . *gibber*
   Posterior slope not cleft by a single radial sulcus; shell mostly red in color . . . . . *exerythra*
9. Pallial sinus separated from the anterior adductor muscle scar by at least one millimeter 10
   Pallial sinus closely approaching the anterior adductor muscle scar, separated by less than one millimeter 13
10. Anterior dorsal margin nearly parallel with the ventral margin, distinctly separated from the anterior margin; shell vitreous . . *euvitrea*
    Anterior dorsal margin gently inclined, somewhat convex and not parallel with the ventral margin 11
11. Shell greatly inflated; right posterior bifid cardinal skewed . . . *diantha*
    Shell not greatly inflated; right posterior bifid cardinal tooth not strongly skewed 12
12. Shell compressed; flesh-color with rays posteriorly . . . . . *probrina*
    Shell not compressed; white or pink in color . . . . . *agilis*
13. Sculpture along the posterior dorsal slope of the right valve differentiated; often rayed with pink or red posteriorly . . . . . *versicolor*
    Sculpture along the posterior dorsal slope of the right valve not differentiated; white to pellucid yellow in color; not rayed posteriorly . . . . . *texana*

Tellina (Angulus) tampaensis *Conrad*

Plate 152, fig. 3; Plate 153, fig. 4

Tellina tampaensis Conrad 1866, American Jour. Conchology, **2**: 281, pl. 15, fig. 8 (Tampa Bay, Florida) [syntypes, ANSP 52434].

Tellina (*Angulus*) *tampaensis* Conrad. Dall 1900, Proc. U.S. Nat. Mus., **23**: 296.

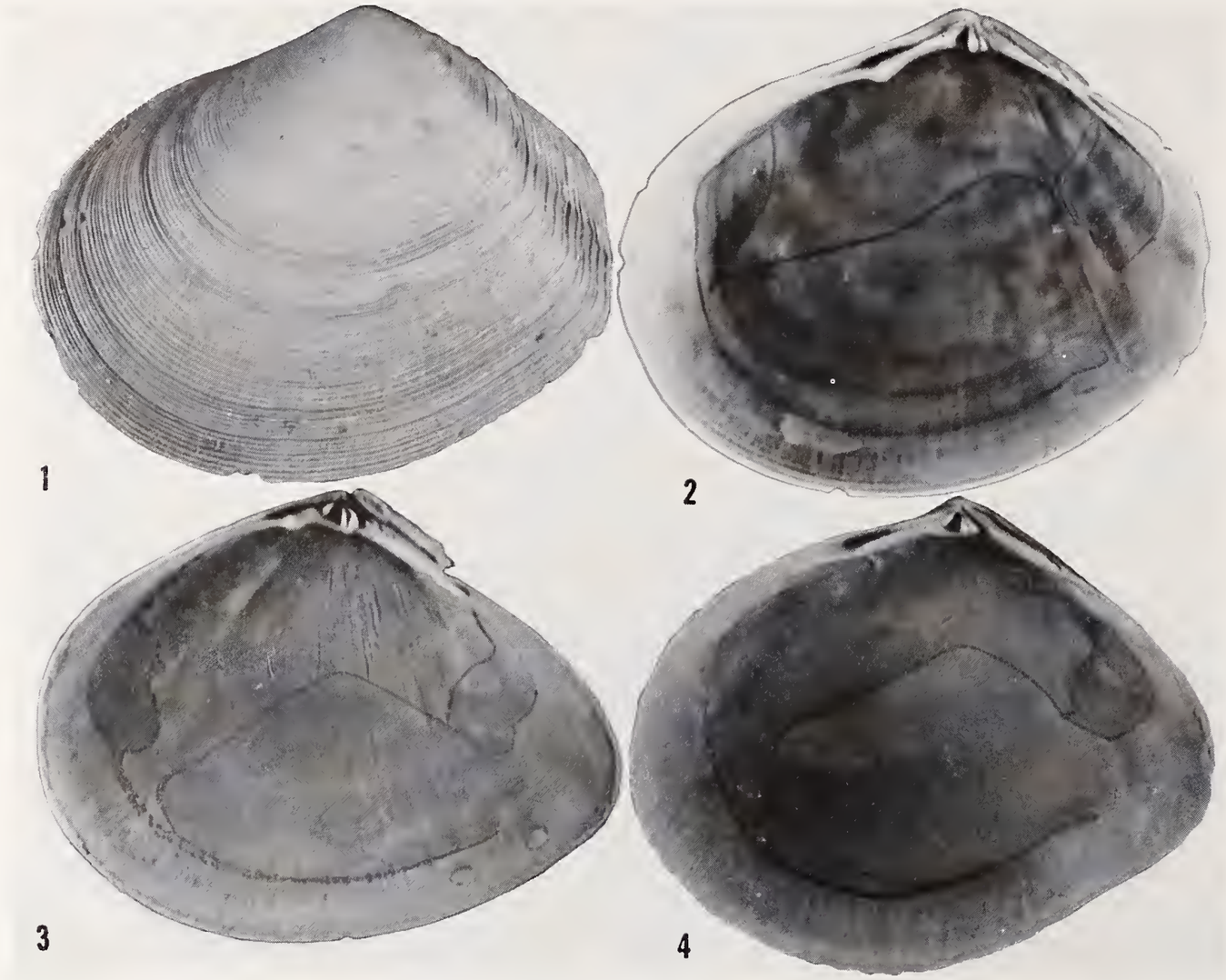

Plate 152. Figs. 1–2. *Tellina paramera* Boss. Fig. 1. External view of the left valve of the holotype. Fig. 2. Internal view of the right valve of the holotype, off Miami Beach, Florida, MCZ 242904 (about 5.6x) [L= 12.5 mm.]. Fig. 3. *Tellina tampaensis* Conrad, internal view of the right valve, Tampa Bay, Florida, MCZ 59480 (about 4.2x) [L=16.5 mm.]. Fig. 4. *Tellina mera* Say, internal view of the right valve, Madera Bay, Florida, MCZ 236461 (about 4.8x) [L=15 mm.].

Description. Shell extending to 24 mm. (about 1 inch) in length and to about 18 mm. (about $\frac{3}{4}$ inch) in height, ovate-subtrigonal, produced posteriorly, with the left valve slightly more convex and with a strong posterior flexure to the right. Umbos central and pointed. Anterior margin broadly rounded; ventral margin convex and with a post-basal arcuation; anterior dorsal margin short and gently sloping; posterior dorsal margin steeply sloping; posterior margin short and slightly truncate. Sculpture consisting of concentric lirations separated by narrow, well incised sulci. Ligament brown and protuberant. Calcareous portion of the ligament well developed and subtended by weak nymphal callosities. In the left valve, the cardinal complex consists of an anterior subdeltoid bifid tooth, the anterior lobe being the larger, and of a posterior thickened laminate

tooth; no true lateral teeth present. In the right valve, the cardinal complex consists of a posterior skewed, subdeltoid bifid tooth with subequal lobes and of an anterior strong laminate tooth; anterior lateral tooth thin and very close to the cardinal complex; posterior lateral tooth distal and obsolete. Adductor muscle scars well impressed. Anterior adductor longer, narrower and higher than the posterior adductor. Pallial sinus generally similar in both valves, descending to the pallial line in a characteristic short, straight drop and becoming confluent with it some distance from the adductor scar. Externally, shell white, smooth, sometimes iridescent and rarely suffused with a pale peach coloration. Internally, white, shining and often chalky.

length	height	width	
24.0 mm.	18.0 mm.	8.0 mm.	Key West, Florida
18.5	13.5	6.0	Key West, Florida
16.6	17.3	5.7	Tampa Bay, Florida
14.6	11.4	5.0	Tampa Bay, Florida
11.0	9.0	4.5	Trout Bayou, Texas

Remarks. In the Western Atlantic, there are two other species which are closely related and sometimes rather easily confused with *tampaensis*. *Tellina mera* Say may be differentiated by its right anterior lateral tooth which is more distally removed from the cardinal complex than the same structure in *tampaensis;* furthermore, the pallial sinus in *mera* has only a short posterior confluence with the pallial line. *Tellina paramera* is a heavier and more thickly shelled species; its color is usually pure white and unlike the peach coloration found in *tampaensis*. The anterior lateral tooth of *paramera* though subproximal to the cardinal complex is trigonal, heavy and strong, and the pallial sinus connects directly to the pallial line just beneath the anterior adductor muscle scar.

Tellina tampaensis appears to be related to *Tellina suffusa* of the Eastern Pacific which is distinguished by its unusually large lunular area. In the Indo-Pacific, certain highly colored species, including *Tellina rutila* Dunker from Japan, are very similar to *tampaensis*.

Dall (1900b) listed this species as occurring in the Pliocene marls of the Caloosahatchie River, Florida. The species appears to prefer sandy substrates in shallow water; the maximum depth record is twenty feet.

Range. Tellina tampaensis is found as far north along the Atlantic coast of Florida as Mosquito Lagoon. It is found all along the Gulf coast of Florida and the southern states to Port Isabel, Texas and has been recorded from Jamaica and Haiti.

Specimens examined. Florida: Mosquito Lagoon, near Haulover; Banana River; Lake Worth; Coconut Grove; Biscayne Bay; Madeira Bay (all MCZ); Key Largo; Big Pine Key (both USNM); Boca Chica Key; Key West (both ANSP); Boca Grande Key; Eagle Key; Punta Rassa; Blind Pass and Tarpon Bay, Sanibel (all MCZ); Charlotte Harbor; Useppa Island; Little Gasparilla (all MCZ); Lemon Bay; Sarasota Key; Mullet Key; Gulfport; Tampa Bay (all MCZ); St. Andrew's Bay; Pensacola (both USNM). Texas: Espiritu Santo Bay (ANSP); Kellers Bay; Matagorda Bay (both USNM); Trout Bayou, Rockport; Corpus Christi; Port Isabel (all MCZ). Bahama Islands: Nassau, New Providence (ANSP). Jamaica: Montego Bay; Old Harbor, St. Catherine (both ANSP). Hispaniola. Haiti: Aquin (USNM).

Tellina (Angulus) mera *Say*

Plate 152, fig. 4: Plate 153, fig. 1

Tellina mera Say 1834, American Conchology, **7**: pl. 64, fig. 2 (coast of South Carolina) [type locality, here corrected and restricted, Bermuda; types lost].

Tellina obtusa Sowerby 1868 [*in*] Reeve, Conch. Icon., **17**, **Tellina**, pl. 46, fig. 271 (Isle of St. Thomas) [holotype, BMNH], *non* Sowerby 1817.

Tellina (*Angulus*) *mera* Say. H. and A. Adams 1856, Genera Recent Mollusca, **2**: 397.

Tellina (*Angulus*) *promera* Dall 1900, Proc. U.S. Nat. Mus., **23**: 296, pl. 2, fig. 11 (Bermuda) [holotype, USNM 94465].

Tellina (*Angulus*) *obtusa* Sowerby. Salisbury 1934, Proc. Malac. Soc., London, **21**(2): 85, pl. 12, fig. 4.

Tellina (*Angulus*) *guadeloupensis* [*sic*] 'd'Orbigny' Abbott 1958, Acad. Nat. Sci., Philadelphia, Monograph 11, p. 134, pls. 5a–b, Map 8, *non* d'Orbigny 1842.

Description. Shell extending to 25.5 mm. (about 1 inch) in length and to 21.5 mm. (about $\frac{7}{8}$ inch) in height, subovate, sometimes produced posteriorly, thin to subsolid, inflated, with both valves of more or less equal convexity and with a short and sharp posterior flexure to the right. Umbos posterior to the middle, conspicuous and rather pointed. Anterior margin broadly rounded; ventral margin convex and rising posteriorly; anterior dorsal margin gently sloping and concave; posterior dorsal margin steeply inclined and straight; posterior margin parallel to the dorso-ventral axis and forming a blunt truncation. Concentric sculpture consisting of irregularly spaced lirations; radial sculpture weak. Ligament yellowish brown, weak and short. Calcareous portion of the ligament moderately developed; no nymphal callosities. In the left valve, the cardinal complex consists of an anterior subdeltoid bifid tooth with subequal lobes and of a posterior small and thin laminate tooth; no true laterals present. In the right valve, the cardinal complex consists of a posterior, slightly skewed and elongate bifid tooth and of an anterior subdeltoid laminate tooth; anterior lateral tooth subproximal to the cardinal complex and laminate; posterior lateral tooth absent or obsolete. Adductor muscle scars generally well impressed. Anterior adductor elongate and with irregular margins; posterior adductor small and subquadrate. Pallial sinus equal in opposite valves, rising abruptly behind, descending gently toward the anterior adductor scar, but not touching it. The sinus is broadly rounded in front and parallel to the pallial line for some distance before becoming confluent with it. Shell white, shining and rarely iridescent.

length	height	width	
14.5	11.0 mm.	6.6 mm.	Holotype of *obtusa* Sowerby
18.0	14.5	7.0	Holotype of *promera* Dall
25.5	21.0	—	New Providence, Bahamas
19.5	16.0	9.0	St. George's Island, Bermuda
12.0	10.0	5.0	Watling Island, Bahamas

Remarks. The holotype of *Tellina mera* Say which came originally from the Ravenel Collection is apparently lost; it is neither in the Academy of Natural Science, Philadelphia nor in the Charleston Museum; no original measurements were included. The type locality was given as 'the coast of South Carolina' and is erroneous; it is herein corrected to 'Bermuda', which is the type locality of one of the synonyms.

Tellina mera may be immediately distinguished from its closest relatives by the nature of the pallial sinus. This character is diagnostic and separates *T. tampaensis* and *T. paramera* from *T. mera*. The recently described *T. paramera* is the nearest relative of *mera*

in the Western Atlantic. The pallial sinus of *paramera* extends to the anterior adductor muscle scar and unites with the pallial line at the base of that scar; the confluence of the pallial sinus with the pallial line is complete and extensive. In *mera*, the sinus is confluent with the pallial line posteriorly and is not coalescent with the anterior adductor muscle scar.

Tellina mera, as presently recognized, possesses an extraordinary degree of variation. Dall proposed the specific name *promera*, which he considered to be a very close relative of *mera*. A review of specimens in major museum collections and a critical examination of Dall's types show that *promera* is a synonym of *mera*. Dall indicated that sculptural differences could separate *promera* from *mera* although the sculptural pattern might be worn away. Such an unstable trait certainly fails in the practical aspects of specific identification and can, therefore, be of little use. Some specimens possess distinct, widely spaced and strong concentric ridges whereas others, at the opposite extreme, are sculptureless, smooth and shining. The range of intermediates representing the whole continuum from sculptureless to heavily ridged may be sampled in a single population. The thickness of the shell also varies between two great extremes; some specimens are fragile and vitreous while others are heavy, solid, and chalky. In conclusion, *mera* is an extremely variable species with numerous plastic characteristics but with certain sufficiently stable, diagnostic traits which form a distinguishably valid syndrome of characters by which the species is recognized.

The Eastern Pacific analog of *Tellina mera* is *T. meropsis* Dall (=*paziana* Dall) which, according to Olsson (1961), is found from California to Ecuador.

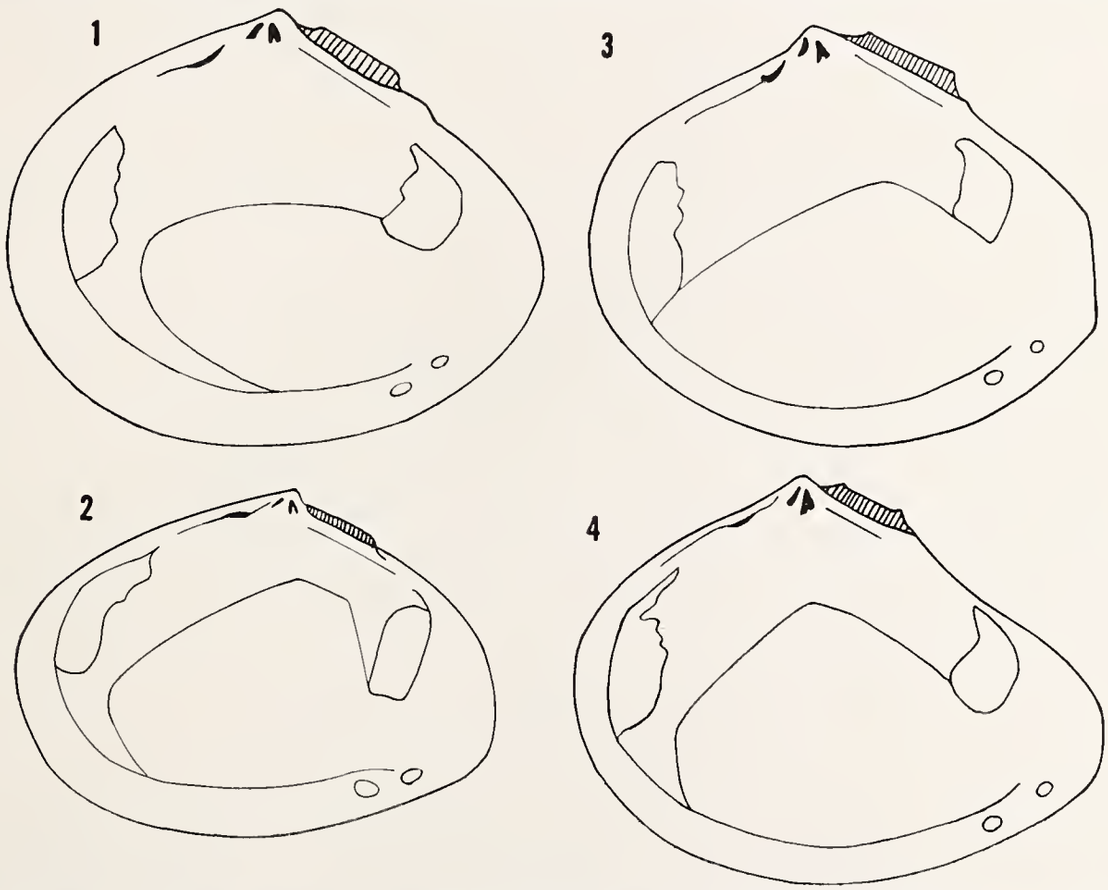

Plate 153. Figs. 1–4. Diagrammatic illustration of the internal surface of the right valve showing the dental configuration and muscle scars. Fig. 1. *Tellina mera* Say (about 4x) [L=15 mm.]. Fig. 2. *Tellina colorata* Dall (about 4x) [L=13 mm.]. Fig. 3. *Tellina paramera* Boss (about 4x) [L=15 mm.]. Fig. 4. *Tellina tampaensis* Conrad (about 4x) [L=15 mm.].

Range. Tellina mera is found from Florida and Bermuda in the north through the Bahama Islands and the Antilles to Barbados and Curacao.

Specimens examined. Florida: Lake Worth; Ocean Beach; Key Largo; Hawk Channel (all USNM); Lignum Vitae Key (ANSP); Grassy Key; Bonefish Key (both MCZ); Missouri Key; Bahia Honda Key; Sugar Loaf Key; Key West (all ANSP); Barracouda Key; Boca Grande Key; Dry Tortugas; Cape Sable (all USNM); Tarpon Bay, Sanibel; Tampa Bay; Pass-a-grille (all MCZ). Bermuda: St. George's Island (MCZ); Harrington Sound (USNM). Bahama Islands: Little Abaco; New Providence; Cat Island; Watling Island (all MCZ); Great Exuma (USNM). Cuba: Cabo Cajon; Dimas; Santa Lucia; Bahia Honda (all USNM); Cayo Lucas, Las Villas, La Sortiga, Cayo Caiman, and Cayo Salina, Caibarien (all MCZ). Hispaniola. Santo Domingo: Puerto Plata; Puerto Sosua (both MCZ). Puerto Rico: San Juan; Vieques (both USNM). Virgin Islands: St. Thomas (ANSP). Lesser Antilles: Antigua; Barbados (both USNM). Caribbean Islands: Grand Cayman (ANSP); Curacao USNM).

Tellina (Angulus) paramera *Boss*

Plate 152, figs. 1–2; Plate 153, fig. 3

Tellina (*Angulus*) *paramera* Boss 1964, Occ. Pap. Dept. Mollusks, Harvard University, **2**: 311, pl. 55, figs. 3 and 8 (off Miami Beach, Florida, in 8½ fathoms; holotype, MCZ 242904).

Description. Shell extending to 14.5 mm. (about $\frac{5}{8}$ inch) in length and to 12.5 mm. (about $\frac{1}{2}$ inch) in height, ovate, subsolid to solid, moderately inflated with both valves of more or less equal convexity and with or without a slight posterior flexure to the right. Umbos posterior to the middle, somewhat elevated, inflated and blunt. Anterior margin broadly rounded; ventral margin convex and rising slightly posteriorly; anterior dorsal margin straight and gently sloping; posterior dorsal margin rather steeply inclined, short and slightly convex; posterior margin short and forming an irregular blunt truncation. Concentric sculpture consisting of closely set, raised ridges (about 8–10 per millimeter) separated by shallow sulci; radial sculpture consisting of poorly developed, evenly spaced lirations which more or less cover the disc. Ligament reddish brown, poorly developed, not protuberant and sunken in an elongate and narrow escutcheon; lunule poorly defined, shallow and broad. Calcareous element of the ligament moderately developed and resting on a flattened hinge plate; no true nymphal callosities. In the left valve, the cardinal complex consists of an anterior deltoid bifid tooth with subequal lobes and of a posterior elongate thickened laminate tooth; no true lateral teeth present. In the right valve, the cardinal complex consists of a posterior, elongate slightly skewed bifid tooth with subequal lobes and of an anterior thickened, subdeltoid laminate tooth; anterior lateral tooth large, strong, thickened and subproximal to the cardinal complex; posterior lateral absent or obsolete, consisting of a weak enlargement in the distal terminus of the hinge plate with an indented socket above. Adductor muscle scars not strongly impressed. Anterior adductor elongate and lunate; posterior scar transversely quadrate. Pallial sinus usually equal in opposite valves, rising abruptly behind, forming a rounded apex above and descending gently to the pallial line below; confluence entire. The pallial sinus generally does not coalesce with the anterior adductor scar but unites with the pallial line just before the anterior adductor scar. Externally, the shell is dull

white; internally, shining, not highly polished and tending to become chalky; the internal surface often possesses radial vermiculations which reflect the external radial sculpture.

length	height	width	
12.5 mm.	10.0 mm.	5.2 mm.	Holotype of *paramera* Boss
14.5	12.5	6.5	'Florida Keys'
10.3	8.4	4.3	off Miami, Florida
9.2	7.2	—	off Miami, Florida
6.2	4.5	—	off Miami, Florida

Remarks. This species may be most easily confused with *Tellina mera*, its nearest ally in the fauna of the Western Atlantic. The similarity in shape and color combined with the morphological similarities of the hinge line serve to indicate the close relationship of *mera* and *paramera*. In the latter, however, the shell is noticeably thicker and heavier and, in addition, the posterior margin forms a diagnostic blunt truncation. The configuration of the pallial sinus distinguishes *paramera* from its relatives. In *mera*, the sinus, though extending toward the anterior adductor muscle scar, is separated from it; the sinus then parallels the pallial line for some distance of its ventral length before it falls and unites with it so that the confluence is relatively short. In *paramera*, the pallial sinus is closely aligned to the anterior adductor muscle scar, if not contiguous with it, and the confluence of the pallial sinus with the pallial line is virtually complete, extending the entire ventral length of the pallial line.

Tellina paramera occurs from the shore line to depths of fifty fathoms. Since specimens are relatively rare and the species remained unrecognized until recently, it may be postulated that an offshore habitat in moderate depths is preferred. An analog of *Tellina paramera* does not seem to be recorded for the Eastern Pacific.

Range. The species occurs from Bermuda, through the Bahama Islands and off the coast of southeastern Florida to the Barbados, Lesser Antilles.

Specimens examined. Florida: off Miami Beach, in 6–30 fathoms; off Bear's Cut, Miami, in 18–20 fathoms; off Government Cut, in 3–38 fathoms; off Bell Buoy, Miami, in 15–22 fathoms; off Fowey Light, in 22–40 fathoms; Bird Key, Biscayne Bay, in 2–10 feet (all USNM); off American Shoals, in 45 fathoms (MCZ); Key West; Tortugas, in 15 fathoms (both USNM). Bermuda: Ferry Point, St. George's Island (USNM). Bahama Islands: Grand Bahama (USNM); Thompson's Bay, Long Island (MCZ). Cuba: Cape Cajon; Cayo Levisa; Bahia Honda, in 1–12 fathoms (all USNM). Hispaniola. Santo Domingo: Puerto Sosua (MCZ). Lesser Antilles: off Payne's Bay Church, in 50 fathoms, and Carlisle Bay, in 6 fathoms, Barbados (both USNM).

Tellina (Angulus) colorata *Dall*

Plate 153, fig. 2; Plate 155, fig. 2

Tellina tenuis 'da Costa' Say 1834, American Conchology, pt. 7, pl. 64, fig. 3.

Tellina omoia Ravenel 1886, Proc. Elliot Soc., 2(5): 38 (Sullivan's Island, South Carolina) [type lost; *nomen oblitum*].

Tellina (*Angulus*) *colorata* Dall 1900, Proc. U.S. Nat. Mus., **23**: 313, pl. 2, fig. 9 (Guadeloupe, Lesser Antilles) [holotype, USNM 42865].

Description. Shell extending to 19.5 mm. (about $\frac{3}{4}$ inch) in length and to 13 mm. (about $\frac{1}{2}$ inch) in height, thin, subquadrate, compressed with the valves of equal convexity and with a weak posterior flexure to the right. Umbos nearly central, small and pointed. Anterior margin narrowly to broadly rounded; ventral margin convex and rising

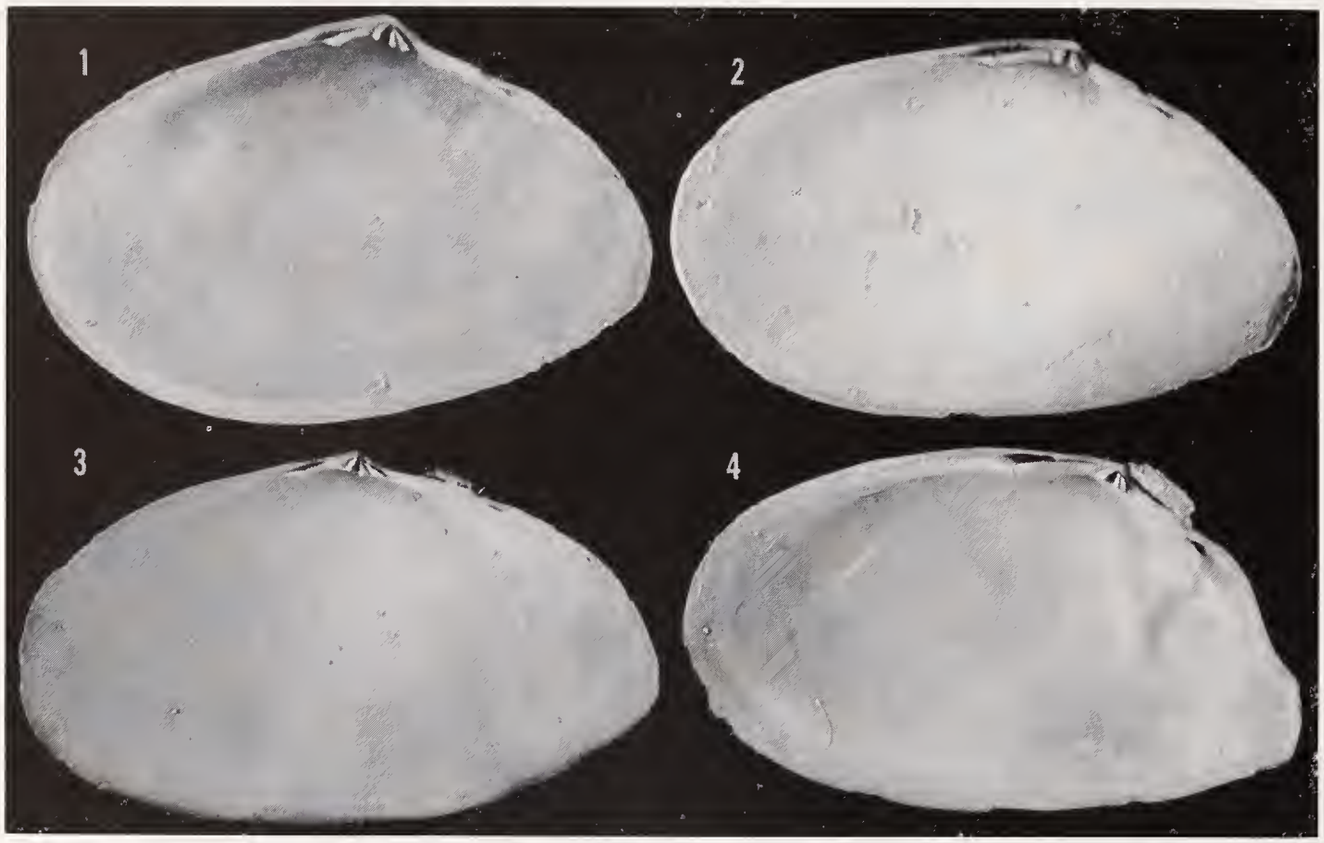

Plate 154. Fig. 1. *Tellina agilis* Stimpson, internal view of the right valve, Revere, Massachusetts, MCZ 230574 (about 4.7x) [L=15 mm.]. Fig. 2. *Tellina texana* Dall, internal view of the right valve, Sanibel Island, Florida, MCZ 53395 (about 6x) [L=12 mm.]. Fig. 3. *Tellina diantha* Boss, internal view of the right valve of the holotype, Barbados, West Indies, MCZ 239110 (about 2.7x) [L=26.5 mm.]. Fig. 4. *Tellina gibber* von Ihering, internal view of the right valve, Puerto Quequen, Argentina, MCZ 118678 (about 4.3x) [L=16 mm.].

gently posteriorly; anterior dorsal margin long, slightly convex and gently descending; posterior margin forming an oblique truncation. Sculpture consisting of poorly defined, closely set concentric lirations; weak radial lirations also evident. Ligament short, brown and protuberant. Calcareous portion of the ligament well developed and subtended by extremely well developed nymphal callosities. In the left valve, the cardinal complex consists of an anterior subdeltoid bifid tooth with subequal lobes and of a posterior divergent, thin laminate tooth; no true lateral teeth. In the right valve, the cardinal complex consists of a posterior protuberant bifid tooth and of an anterior thickened laminate tooth; anterior lateral tooth immediately proximal to the cardinal complex, thin and laminate; posterior lateral tooth absent or obsolete. Adductor muscle scars well impressed. Anterior adductor narrowly lunate; posterior adductor elongate and quadrate. Pallial sinus more or less equal in opposite valves rising abruptly posteriorly, gently rounded above, well separated from the anterior adductor scar and arcuately descending to unite with the pallial line below; confluence extensive. Externally and internally the shell is smooth and shining, transparent, white and often suffused with apricot, yellow, orange or red.

length	height	width	
19.5 mm.	13.0 mm.	5.0 mm.	Florida
15.5	11.5	4.0	St. Thomas, Virgin Islands
13.5	9.5	3.8	Guadeloupe, Lesser Antilles

Remarks. This species appears to be very rare and is sporadically dispersed in the Western Atlantic. It does not appear to have an Eastern Pacific analog and is most closely allied to *Tellina tenuis* da Costa of Europe. The similarities between these species are so great and the documentation of living records for *colorata* so poor that some question as to the existence of *colorata* is not unfounded. However, herein *colorata* will be accorded full specific rank until further evidence to the contrary is available. *Tellina colorata* possesses slightly different proportions, being higher and more quadrate with the ventral margin less convex and arcuated than *tenuis*. In addition, the nymphal callosities of *colorata* are more strongly developed, thicker and more protuberant.

Range and specimens examined. Only two lots with specific locality data were available: St. Thomas, Virgin Islands and Guadeloupe, Lesser Antilles (USNM). A lot from Florida (MCZ) is questionable, and specimens from South Carolina are not to be found. At this time no definite range can be stated.

Tellina (Angulus) agilis *Stimpson*

Plate 154, fig. 1; Plate 157, fig. 2

Tellina tenera Say 1822, Jour. Acad. Nat. Sci., Philadelphia, **2**: 303 (inhabits the coast of New Jersey. . . Great Egg Harbor) [syntypes, ANSP 52446], *non* Schrank 1803.

Tellina elucens Mighels 1844 [*teste* Dall 1900], Proc. Boston Soc. Nat. Hist., **1**: 188 (Casco Bay, Maine) [holotype lost; *nomen dubium*].

Tellina (*Angulus*) *tenera* Say. H. and A. Adams 1856, Genera Recent Mollusca, **2**: 398.

Tellina agilis Stimpson 1857, Amer. Jour. Sci., **25**: 125, new name for *tenera* Say.

Angulus tener Say. Verrill 1872, Amer. Jour. Sci., **3**: 290, pl. 6, 1–1a.

Description. Shell extending to 16 mm. (about $\frac{5}{8}$ inch) in length and to 10 mm. (about $\frac{3}{8}$ inch) in height, elongate-subquadrate, rather fragile, somewhat compressed with the valves of more or less equal convexity and with a slight posterior flexure to the right. Umbos posterior to the middle, small and blunt. Anterior margin narrowly rounded; ventral margin gently convex and rising posteriorly; anterior dorsal margin elongate and gently inclined; posterior dorsal margin steeply inclined and short; posterior margin irregular and forming a weakly rounded oblique truncation. Sculpture consisting of weakly incised very closely spaced concentric sulci, imposed on broad growth bands; no true radial sculpture present. Ligament dark yellowish brown, short and slightly protuberant. Calcareous portion of the ligament subtended by weak nymphal callosities. In the left valve, the cardinal complex consists of an anterior subdeltoid bifid tooth with equal lobes and of a posterior thin and elongate laminate tooth; no true lateral teeth. In the right valve, the cardinal complex consists of a posterior, skewed, subdeltoid bifid tooth whose posterior lobe is the larger and of an anterior, thickened laminate tooth; anterior lateral tooth proximal, thickened and often upcurled; posterior lateral tooth distal, weak and obsolete. Adductor muscle scars generally well impressed. Anterior adductor elongate and rounded below; posterior adductor rounded. Pallial sinus more

or less equal in opposite valves, arched above, falling with a gentle slope to the pallial line and separated from the anterior adductor. Shell generally white, but rarely suffused with pink or red; interior of valves generally not shining, but of a dull powdery lustre.

length	height	width	
16.1 mm.	9.3 mm.	3.2 mm.	Revere, Massachusetts
16.0	10.6	4.7	" "
13.3	8.4	3.9	" "
10.5	5.6	2.4	Westerly, Rhode Island
4.5	2.8	1.2	Duxbury, Massachusetts

Remarks. Tellina agilis is the northernmost representative of the genus in the Western Atlantic, being the only species of *Tellina* found north of Cape Cod, Massachusetts. The species possesses an extreme range of variation. Immature specimens from one to five millimeters in size tend to be elongate while the proportions in adults are more subquadrate. The color of the shell is nearly always white, but red and pink colored individuals do occur and the color may be concentrated in bands or concentric areas on the valves.

Tellina agilis is replaced by another common species, *Tellina texana*, in the south, although there is some overlap in their ranges. From *texana*, *agilis* may be distinguished by its thinner valves, its greater compression and its disposition of the pallial sinus. In *agilis*, the pallial sinus is impressed and removed from the anterior adductor muscle scar whereas in *texana*, the sinus is less well impressed, generally not as highly arched, and closer to, but not coextensive with the anterior adductor muscle scar. The umbonal sculpture of *texana* is sharp, distinct and slightly intercalated posteriorly, that of *agilis* is smooth, tending to be worn and not intercalated.

Another species related to *Tellina agilis* and often confused with it is *Tellina tenella* Verrill, which because of its rarity has scarcely been documented in the literature. Johnson (1932) has discussed in some detail the traits which separate *tenella* from *agilis*. The outline of *tenella* is distinguished by its narrowly rounded anterior margin, convexly truncate posterior margin and its elongate, slightly concave anterior dorsal margin. Although the umbos are more highly elevated, the general proportions of *tenella* are lower than those of *agilis*. The sculpture in *tenella* consists of lirations separated by well incised sulci which are quite broadly spaced whereas the sculpture of *agilis* consists of very weak, obsolete, closely spaced and fine sulci.

Macoma phenax Dall closely approaches the shape and smooth sculpture of *agilis*, but the former is distinguished by its lack of lateral dentition.

Range. This species is found along the eastern coast of North America from the Gulf of St. Lawrence in the north to Sapelo Island, Georgia in the south.

Specimens examined. CANADA: Gulf of St. Lawrence, in 40–45 meters (USNM); North Ingoish, Cape Breton Island; Ellerslie and Bideford River, Prince Edward Island; Pugwash and East Jeddore, Nova Scotia (all MCZ); Barrington and Three Fathoms Harbour, Nova Scotia (both CNM). MAINE: Quahog Bay; Cushing (both MCZ); Casco Bay; Scarboro (both USNM); Old Orchard (ANSP). MASSACHUSETTS: Ipswich; Annisquam; Danvers; Salem; Marblehead; King's Beach, Swampscott; Lynn Beach; Nahant; Revere; Chelsea (all MCZ); Cohasset; Sam Winsor's Flat, Duxbury (both USNM); Plymouth, in 2–3 fathoms; Provincetown; Georges Bank (all USNM); South

Harwich Beach; Dennisport (both MCZ); Woods Hole; The Gutters, Naushon (both USNM); Five Fingered Point, Eel Point, East Jetty and Wyers Point, Nantucket; Katama Bay, Martha's Vineyard (all MCZ); S of Gay Head; N of Noman's Land: Buzzards Bay (all USNM); Swifts Beach, Wareham; New Bedford; Horseneck Beach (all MCZ). RHODE ISLAND: off Sakonnet, in 5 fathoms; off Newport, in 13 fathoms: Narraganset Bay; Canonicut Island (all USNM); Quonocontave Pond; Noyes Beach (both MCZ); Westerly (USNM). CONNECTICUT: Stonington; Noank (both USNM): Branford (MCZ). NEW YORK: Orient, Peconic Bay and Saybrook, Long Island (all USNM); Far Rockaway Bay, Great South Bay, Point o'Woods, Fire Island Beach and Cold Spring Harbor, Long Island (all MCZ); NEW JERSEY: Point Pleasant: Atlantic City; Norbury's Landing; Holgate, Ocean City; Wildwood (all ANSP); Cape May (CM). DELAWARE: Brandywine Shoal, Old Bare Shoal, Prime Hook Creek, Brown Shoal and Broadkill Creek, Delaware Bay; off Henlopen, in 25 fathoms; 8 miles E of Rehoboth, in 17 fathoms (all USNM). MARYLAND: Plum Point (MCZ): Crisfield: Chesapeake Bay (both USNM). VIRGINIA: Chincoteague (USNM). NORTH CAROLINA: off New Bern (USNM); Smiths Island, Cape Fear (ANSP). SOUTH CAROLINA: Isle of Palms; Folly Island (both CM). GEORGIA: Deboy Channel, Sapelo Island (MCZ).

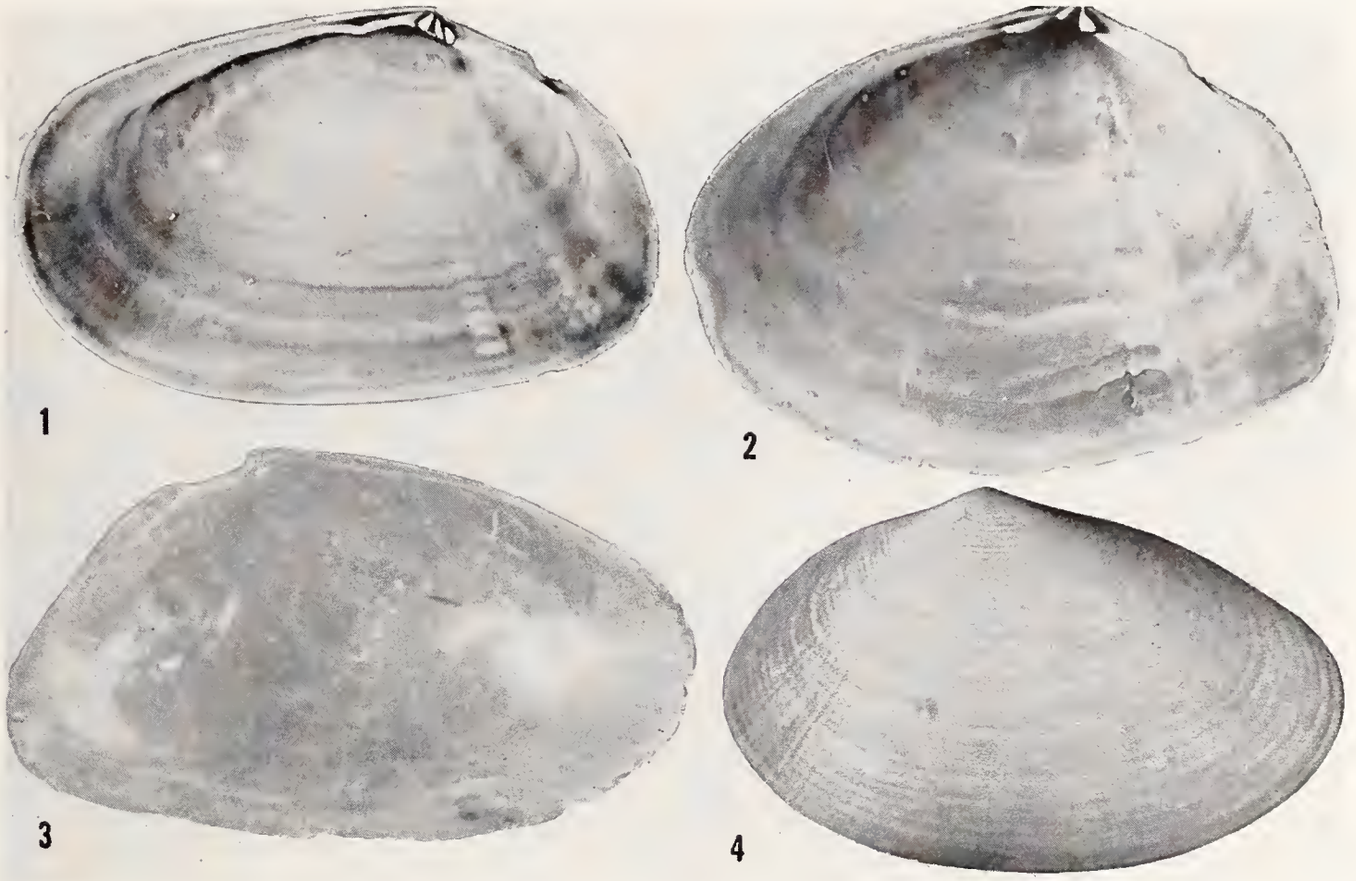

Plate 155. Fig. 1. *Tellina probrina* Boss, internal view of the right valve of the holotype, off Fowey Light, Florida, USNM 461905 (about 4x) [L=18.5 mm.]. Fig. 2. *Tellina colorata* Dall, internal view of the right valve, 'Florida', MCZ 239111 (about 4.8x) [L=15 mm.]. Fig. 3. *Tellina pauperata* d'Orbigny [=*Tellina versicolor* DeKay], external view of the right valve of a paratype, Martinique, BMNH (about 13x) [L=5.8 mm.]. Fig. 4. *Tellina americana* Dall, external view of the right valve, Lantana, Florida, MCZ 208587 (about 10x) [L=6.9 mm.].

Tellina (Angulus) texana *Dall*

Plate 154, fig. 2; Plate 157, fig. 6

Tellina polita Say 1822, Jour. Acad. Nat. Sci., Philadelphia, **2**: 276; 1834, American Conchology, pt 7, pl. 65 fig. 2 (inhabits the southern coast . . . South Carolina and N. Florida) [type locality, here restricted, Charleston, South Carolina; syntypes, ANSP], *non* Poli 1795, *nec* Spengler 1798, *nec* Pulteney 1799.

Angulus polita Say. H. and A. Adams 1856, Genera Recent Mollusca, **2**: 398.

Tellina (*Angulus*) *texana* Dall 1900, Proc. U.S. Nat. Mus., **23**: 295 (Charlotte Harbor, Florida) [holotype, USNM 125539].

Tellina (*Angulus*) *sayi* 'Deshayes MS' Dall 1900, Trans. Wagner Free Inst. Sci., Philadelphia, **3**(5); 1034, new name for *Tellina polita* Say.

Description. Shell extending to 16.5 mm. (about $\frac{5}{8}$ inch) in length and to 9 mm. (about $\frac{3}{8}$ inch) in height, subelliptical to subtrigonal, rather solid, inflated with both valves of equal convexity and with a sharp posterior flexure to the right. Umbos posterior to the middle and blunt. Anterior margin somewhat narrowly rounded; ventral margin straight to convex and rising posteriorly; anterior dorsal margin elongate and gently descending; posterior dorsal margin very elongate and steeply inclined; posterior margin short and forming a blunt end. Sculpture consisting of weak, finely incised, closely spaced concentric sulci; no true radial sculpture. Ligament yellowish brown, strong and protuberant. Calcareous portion of the ligament subtended by protuberant nymphal callosities. In the left valve, the cardinal complex consists of an anterior thickened bifid tooth with subequal lobes and of an elongate posterior laminate tooth; no true lateral teeth. In the right valve, the cardinal complex consists of a posterior skewed thickened bifid tooth with subequal lobes and of an anterior slightly thickened, short, laminate tooth; anterior lateral tooth proximal, thin and slightly upcurled; posterior lateral tooth obsolete and distal. Adductor muscle scars fairly well impressed. Anterior adductor scar elongate and rounded below; posterior adductor scar rounded. Pallial sinus more or less equal in opposite valves, generally convex above, gently inclined and somewhat concave anteriorly and falling arcuately to the pallial line close to but not touching the anterior adductor scar. Shell generally white, sometimes with yellow suffusions. Some iridescence externally and generally highly polished internally.

length	height	width	
16.5 mm.	9.3 mm.	4.8 mm.	Sea Island, Georgia
13.2	7.5	4.2	Port St. Joe, Florida
12.6	6.9	3.8	Grassy Key, Florida
9.8	5.8	3.0	Port Aransas, Texas
6.2	3.6	1.7	Missouri Key, Florida

Remarks. *Tellina texana* is most closely related to *Tellina agilis* and replaces it along the Atlantic coast of the southeastern states and in the Gulf of Mexico. The range of variation possessed by *texana* is similar in some respects to that of *agilis*. Of the differences which separate *agilis* from *texana*, many have been discussed previously. In *texana*, the valves are more convex, thicker and heavier, the pallial sinus approaches the anterior adductor muscle scar much more closely, and the umbonal sculpture is slightly intercalated. For more extensive comparison of these two species, see *Remarks* under *agilis*.

According to Dall (1900b), *Tellina* (*Angulus*) *declivis* Conrad from the Lower Miocene of Shiloh, New Jersey is very close to *texana*, but the Recent species has a more ventricose shell and the right anterior lateral tooth is longer than in the fossil. Dall also

documented the occurrence of *declivis* in the Upper Miocene of Virginia and the Pliocene and Pleistocene of Florida. Richards (1962) has given the Pleistocene records of *T. texana* in North and South Carolina.

Range. This species occurs from North Carolina south through the Bahamas, Florida Keys to Cuba and in the Gulf of Mexico to Progreso, Yucatan.

Specimens examined. North Carolina: Beaufort; Pirens Island (both USNM). South Carolina: Isle of Palms; Sullivan's Island (both CM); off Charleston (MCZ); Morris Island (CM); Black Bear Island (MCZ); Porcher's Creek, Porcher's Bluff (CM). Georgia: Sea Isle (MCZ); Cumberland Island (CM). Florida: St. Johns River (ANSP); St. Augustine; Palm Beach (both USNM); South Inlet, Lake Worth; Hillsboro Light (both MCZ); Ocean Beach (USNM); Coconut Grove (MCZ); off Miami, in 10 fathoms; SE of Fowey Light, in 25 fathoms (both USNM); Virginia Key (MCZ); Bird Key (USNM); Cards Sound (ANSP); off Caesar's Creek Bank, in 110 feet; off Hawk Channel, in 2–4 fathoms (both USNM); Grassy Key; Missouri Key (both MCZ); Newfound Harbor Key (USNM); Boca Chica Key (MCZ); Key West (USNM); Madeira Bay (MCZ); Marco Island; Bunch Beach (both D. and N. Schmidt); Tarpon Bay and Blind Pass, Sanibel; Punta Gorda (all MCZ); Lemon Bay; Sarasota Bay; Tampa Bay; Gulfport (all ANSP); Pine Island USNM); Seahorse Key and Goose Cove, Cedar Keys; Port St. Joe (all MCZ). Texas: Corpus Christi Bay (USNM); off Port Aransas, in 12 fathoms (MCZ). Mexico: Progreso (ANSP). Bahama Islands: North side of Abaco (USNM). Cuba: Bahia Honda, in 1–12 fathoms (USNM).

Tellina (Angulus) versicolor *'Cozzens' DeKay*

Plate 155, fig. 3; Plate 156, figs. 1–2; Plate 159, fig. 1

Tellina versicolor Cozzens 1836 [*in*] Jay, Catalog of Shells, 2nd Ed., p. 15 (New York), *nomen nudum.*

Tellina pauperata d'Orbigny 1842 [*in*] Sagra, Hist. L'Ile Cuba, Atlas, pl. 26, figs. 18–20; 1845, Spanish Text, **2**(5): 306 (Guadalupe y Martinica); 1853, French Text, Mollusques, **2**: 255 [type locality, here restricted, Martinique; holotype, BMNH 54.10.4.510], *nomen oblitum.*

Tellina versicolor 'Cozzens' DeKay 1843, Nat. Hist. New York, Pt. 1, Zoology, p. 209, pl. 26, fig. 172 (Hudson River at Glass-house Point, New York) [type lost].

Tellina (*Angulus*) *versicolor* 'Cozzens' DeKay. Dall 1900, Proc. U.S. Nat. Mus., **23**: 295.

Tellina (*Angulus*) *pauperata* d'Orbigny. Dall 1900, Proc. U.S. Nat. Mus., **23**: 296.

Description. Shell extending to 17.5 mm. (about $\frac{5}{8}$ inch) in length and to 9 mm. (about $\frac{3}{8}$ inch) in height, elongate, subelliptical, generally thin to fragile, moderately inflated, with both valves of nearly equal convexity and with a posterior flexure to the right. Umbos just posterior to the middle, depressed and pointed. Anterior margin narrowly rounded; ventral margin straight and rising slightly posteriorly; anterior dorsal margin elongate and gently inclined; posterior dorsal margin generally steeply inclined, short and slightly concave; posterior margin long, with a biangulation basally and forming a blunt oblique truncation. Sculpture consisting of widely spaced, strongly incised concentric sulci; no true radial sculpture. Ligament yellowish brown, short, protuberant and subtended by moderately developed nymphal callosities. In the left valve, the cardinal complex consists of an anterior, narrowly elongate bifid tooth and of a posterior thin laminate tooth; no true lateral teeth evident. In the right valve, the cardinal com-

plex consists of a posterior skewed bifid tooth with subequal lobes and of an anterior subdeltoid laminate tooth; the proximal anterior lateral tooth is relatively thin, elongate and upcurled; a weak distal vestige of the posterior lateral tooth is sometimes evident. Adductor muscle scars moderately impressed. Anterior adductor scar elongate and rounded below; posterior adductor scar rounded. Pallial sinus more or less equal in both valves, gently rising posteriorly, convex above and descending arcuately to a fusion with the pallial line below. The sinus comes very close to and sometimes is coextensive with the anterior adductor muscle scar. Color from white to red, translucent to transparent, with variously developed red, pink or white rays which extend radially from the umbo to the postbasal biangulation along the posterior slope. External surface generally shining and iridescent; internal surface polished.

length	height	width	
17.5 mm.	9.0 mm.	—	Santa Rosa, Cuba
13.5	7.5	3.4	Alligator Harbor, Florida
11.0	6.1	3.2	Santa Rosa, Cuba
9.7	5.5	2.1	Chesapeake Bay
6.0	3.0	—	Cape Hatteras, North Carolina

Remarks. The types of *Tellina versicolor* are apparently lost. *Tellina pauperata* d'Orbigny is synonymized herein because its characteristics grade into those of *T. versicolor*. The types of *pauperata* are typically white and pellucid, the posterior slope is very broadly and obliquely truncate, and the posterior dorsal margin is short and strongly concave. Specimens which fit this description occur in populations of *T. versicolor*. In accordance with Article 23b of the Internature Code, *pauperata* is considered as a *nomen oblitum*, or a forgotten name, and *versicolor*, which has been widely used in the literature, is preserved.

The distinguishing characters possessed by *Tellina versicolor* include: 1) its relatively thin, fragile shell; 2) its evenly spaced, incised concentric sculpture with a differentiated area on the posterior slope of the right valve being stronger and nearly lamellose; and 3) its pallial sinus which approaches the anterior adductor muscle scar so closely that at times it appears coextensive with it. Earlier authors considered *T. versicolor* as a species closely related to *T. consobrina*, and the latter was often considered the southern subspecies of the former. However, *Tellina consobrina* possesses a pattern of sculpture which allies it with *Scissula* and it may therefore be quickly separated from *versicolor*. Closely allied to *versicolor* via the placement of the pallial sinus and the thin, fragile nature of the valves is *Tellina probrina* which may be distinguished by its lateral compression, higher, more quadrate proportions and its lack of differentiated posterior slope sculpture.

The species most closely related to *Tellina versicolor* appears to be *T. cœrythra*. The characters which identify and distinguish *T. cœrythra* as an entity distinct from *T. versicolor* are difficult, if not impossible to quantify, especially at the extremes of variation where overlap occurs and where individual specimens are difficult to place. *Tellina cœrythra* is subtrigonal with a thicker shell and higher proportions than *versicolor*. Most specimens of *cœrythra* are bright red in color with white peripheral areas. The nature of the pallial sinus, the iridescence of the exterior surface of the valves, the slightly differentiated sculpture of the posterior slope, the incised concentric sculpture on the disc and the presence of red coloration are all traits which indicate the close relationship between *versicolor* and *cœrythra*.

Range. This species is found from south of Cape Cod to Trinidad; it occurs in the Gulf of Mexico along the coast of Florida to west Texas.

Specimens examined. Rhode Island: Sakonnet (MCZ). Virginia: Chesapeake Bay, in 3–9 fathoms (USNM). North Carolina: off Cape Hatteras, in 14–48 fathoms; off Cape Lookout, in 18–31 fathoms; Beaufort, in 6–9 fathoms (all USNM). South Carolina: Charleston Harbor (CM). Florida: Banana River; South and North Inlet, Lake Worth; Coconut Grove; Virginia Key; Card Sound; off Elbow, Key Largo; Sombrero Key; Key West; Sand Key; Boca Grande Key (all MCZ); Dry Tortugas (USNM); Marco Island; Punta Rassa (both D. and N. Schmidt); Sanibel; Charlotte Harbor; Sarasota Bay, in 13 fathoms; Bradenton Beach; Gulfport (all MCZ); Sea Horse Key, Cedar Keys; Alligator Harbor (all MCZ); St. Joseph Bay (ANSP); Port St. Joe; Beacon Hill; off Destin, in 14 fathoms; off Fort Walton, in 21 fathoms (all MCZ); Indian Pass, Apalachicola Bay (ANSP). Mississippi: Horn Island (ANSP). Louisiana: Chandeleur Island; Barataria Bay, Grand Isle (both MCZ). Texas: Pass Cabello, Matagorda (USNM); off Port Aransas, in 10 fathoms (MCZ). Mexico: off Cabo Catoche, Yucatan, in 25 fathoms (MCZ). Panama: Mount Hope, Pleistocene (ANSP); Bocas del Toro (Olsson). Cuba: Cape Cajon; Punta Tolete, in 2–3 fathoms; Punta Colorado, in 2–3 fathoms; Dimas, in 4–5 fathoms; Santa Rosa, in 3–6 fathoms; Santa Lucia, in 2–4 fathoms; Esperanza, in 2–3 fathoms; Cayo Arenas, in 2 fathoms; Bahia Honda, in 1–12 fathoms; Cabanas, in 3–12 fathoms (all USNM); Buena Vista Bay, Caibarien (MCZ). Jamaica: Green Island Harbor; Montego Bay; Portland; Little Goat Island, Portland Bight (all USNM). Hispaniola. Haiti: Port au Prince; Les

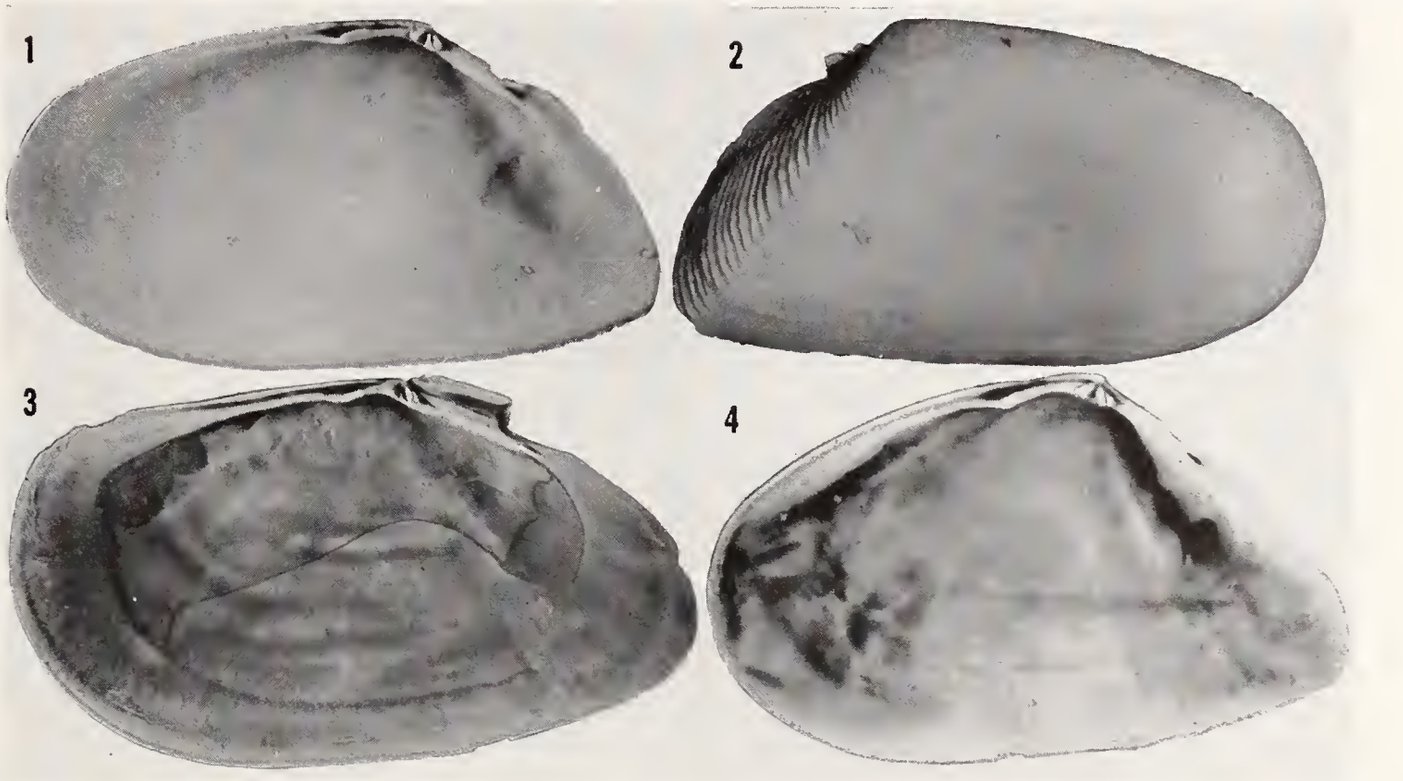

Plate 156. Figs. 1–2. *Tellina versicolor* DeKay. Fig. 1. Internal view of the right valve. Fig. 2. External view of the right valve, Destin, Florida, MCZ 239113 (about 6x) [L = 12 mm.]. Fig. 3. *Tellina euvitrea* Boss, internal view of the right valve of the holotype, Santa Lucia, Cuba, USNM 461952 (about 3.8x) [L = 20.5 mm.]. Fig. 4. *Tellina exerythra* Boss, internal view of the right valve of the holotype, Boca del Infierno, Bahia de Samana, Santo Domingo, MCZ 239220 (about 6x) [L = 12 mm.].

Cayes (both USNM). Santo Domingo: Puerta Plata (MCZ); Samana Bay, in 17–18 fathoms (USNM). Virgin Islands: Charlotte Amelie, St. Thomas, in 30 feet (ANSP). Lesser Antilles: Falmouth Harbor and English Harbor, Antigua, in 3–6 fathoms; Barbados (both USNM); Gulf of Paria, Trinidad (MCZ).

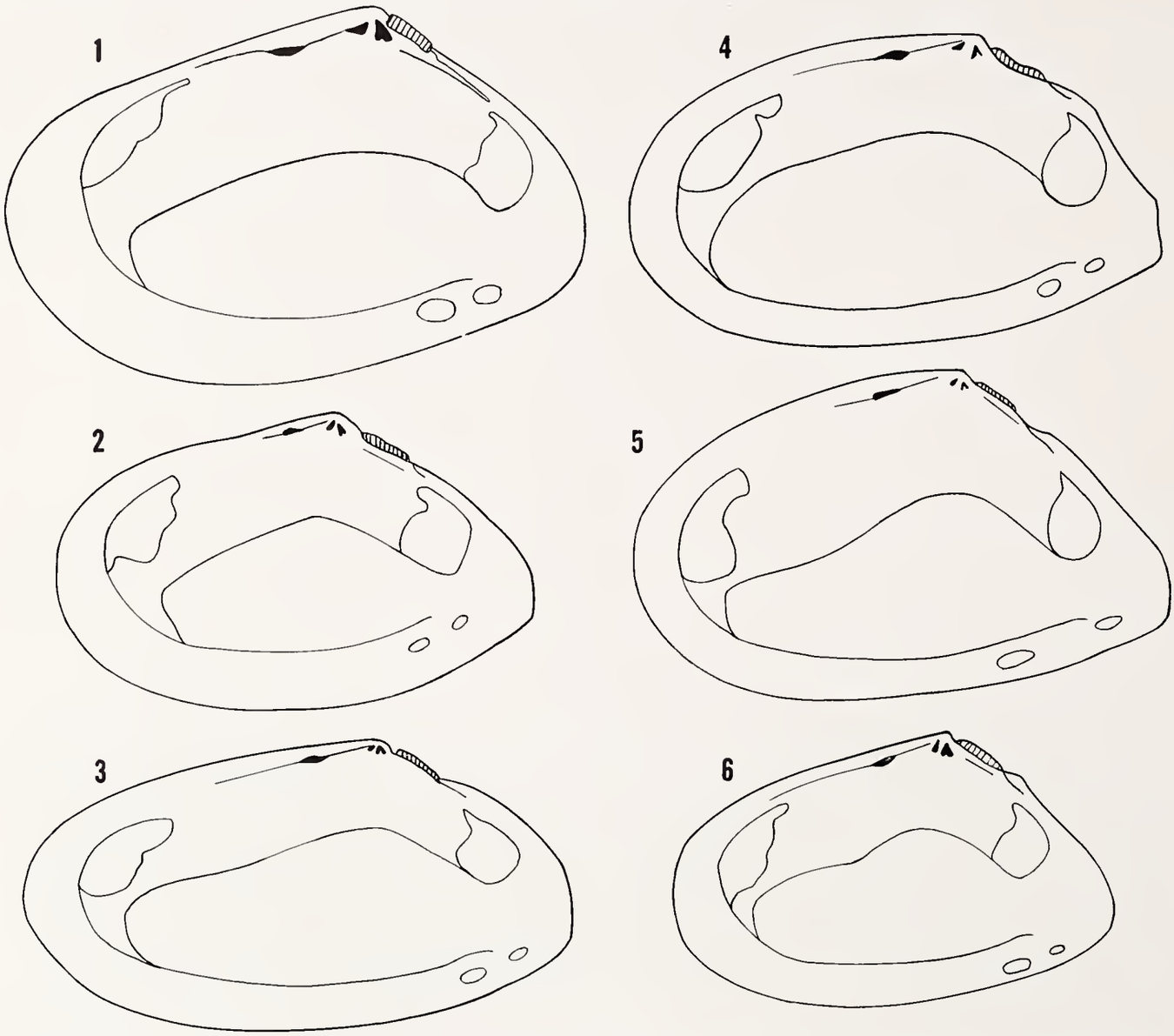

Plate 157. Figs. 1–6. Diagrammatic illustration of the internal surface of the right valve showing the dental configuration and muscle scars. Fig. 1. *Tellina tenella* (Verrill) (about 8x) [L=8.5 mm.]. Fig. 2. *Tellina agilis* Stimpson (about 5x) [L=12.5 mm.]. Fig. 3. *Tellina sybaritica* Dall (about 9x) [L=6.8 mm.]. Fig. 4. *Tellina gibber* von Ihering (about 5.5x) [L=15 mm.]. Fig. 5. *Tellina exerythra* Boss (about 7x) [L=10.3 mm.]. Fig. 6. *Tellina texana* Dall (about 4.4x) [L=13 mm.].

Tellina (Angulus) exerythra *Boss*

Plate 156, fig. 4; Plate 157, fig. 5

Tellina (*Angulus*) *exerythra* Boss 1964, Occ. Pap. Dept. Mollusks, Harvard Univ. **2**: 315, pl. 55, fig. 7 (Boca del Infierno, Bahia de Samana, Santo Domingo, Hispaniola; holotype, MCZ 239220).

Tellina (*Eurytellina*) *vespuciana* 'd'Orbigny' Dall and Simpson 1901, Bull. U.S. Fish. Comm., **20**(1): 480, *non* d'Orbigny 1842.

Description. Shell extending to 18.5 mm. (about $\frac{3}{4}$ inch) in length and to 11 mm. (about $\frac{3}{8}$ inch) in height, subtrigonal, subsolid to solid, inflated with the left valve more

convex and with a variously developed posterior flexure to the right. Umbos just posterior to the middle, slightly elevated and pointed. Anterior margin broadly rounded: ventral margin slightly convex and rising in a gentle arcuation posteriorly; anterior dorsal margin elongate and convex; posterior dorsal margin rather steeply inclined and straight; posterior margin short, parallel to the dorso-ventral axis and forming a small truncation. Concentric sculpture consisting of more or less widely and evenly spaced sulci separated by broad, flattened bands; no radial sculpture. Ligament light brown, weak and protuberant. Calcareous portion of the ligament subtended by short and weak nymphal callosities. In the left valve, the cardinal complex consists of an anterior elongate bifid tooth with subequal lobes and of a posterior elongate laminate tooth; no true lateral teeth present. In the right valve, the cardinal complex consists of a posterior, skewed and thickened bifid tooth with subequal lobes and of an anterior subdeltoid laminate tooth; anterior lateral tooth thickened, upcurled and proximal to the cardinal complex; small distal vestige of the posterior lateral tooth evident. Adductor muscle scars moderately impressed. Anterior adductor scar elongate and rounded below; posterior adductor scar rounded. Pallial sinus more or less equal in both valves, rising gently posteriorly, descending in a concave line, extending nearly to but separated from the anterior adductor muscle scar and falling in a short rounded arcuation to the pallial line. Shell basically ivory white in color with a predominance of red suffusion; the periphery is generally white, and variously formed rays of red, white or pink underlie the posterior ridge; external surface shining and sometimes iridescent; internal surface generally highly polished.

length	height	width	
12.0 mm.	7.0 mm.	3.5 mm.	Holotype of *exerythra* Boss
18.3	11.0	—	West Indies
14.8	8.5	—	Santa Barbara de Samana, Santo Domingo
12.8	7.4	3.4	" " " " " "
10.3	6.5	3.0	Mayaguez, Puerto Rico
7.0	4.3	1.9	Bahia de Samana, Santo Domingo

Remarks. *Tellina exerythra* occurs in considerable numbers in the two easternmost islands of the Greater Antilles. It is most easily confused with and closely related to *T. versicolor*. In general, *exerythra* is subtrigonal in shape, bright red in color and relatively high in proportions. In this respect it can be contrasted with the elongate elliptical shape and whitish coloration of *versicolor*. The shell of *exerythra* is thicker, heavier and of a greater convexity than that of *versicolor*. The posterior ridges of *exerythra* are rather strongly developed, and there are generally one or two supernumerary ridges separated by weak sulci upon the posterior slope. In contrast, *versicolor* possesses less definitively developed posterior ridges, and extra ridges do not seem to be present.

In the south Atlantic, *Tellina gibber*, because of its strong shell and the configuration of its pallial sinus, may be related to *exerythra* but *gibber* lacks the red coloration and possesses a distinctly divided posterior margin with a peculiar and strongly developed posterior sulcus.

Tellina erythronotus Pilsbry and Lowe of the Eastern Pacific is quite similar to *T. exerythra* but the Pacific species attains a greater size.

Range. The species appears to be concentrated in the area of the Greater Antilles exclusive of Cuba. Some specimens have been found at Colón, Panamá and others in Brasil.

Specimens examined. British Honduras: Belize and Monkey River (ANSP). Guatemala: Livingston and Puerto Barrios (ANSP). Jamaica: Little Goat Island, Portland Bight (MCZ). Hispaniola. Haiti: Aquin; Bizoton (both USNM). Santo Domingo: Monte Cristi (ANSP); Puerto Plata (MCZ); Matanzas (USNM); Santa Barbara de Samana (MCZ); 3 miles E of Sanchez (USNM); Boca del Infierno (MCZ). Puerto Rico: Mayaguez (IMBPR; USNM; MCZ); Puerto Real; Cayos Finos, off Ponce (both IMPBR). Panamá: Colón (MCZ); Mt. Hope, Pleistocene (ANSP). Brasil: Thayer Expedition (MCZ).

Tellina (Angulus) probrina *Boss*

Plate 155, fig. 1; Plate 159, fig. 3

Tellina (*Angulus*) *probrina* Boss 1964, Occ. Pap. Dept. Mollusks, Harvard Univ., **2**: 319, pl. 55, fig. 4 (*Eolis* station 151, off Fowey Light, Florida, in 55 fathoms; holotype, USNM 461905).

Description. Shell extending to 25 mm. (about 1 inch) in length and to 14 mm. (about 9/16 inch) in height, elongate to subrectangular in shape, fragile, compressed, with the left valve of slightly greater convexity and with a slight posterior flexure to the right. Umbos posterior to the middle, small and pointed. Anterior margin broadly rounded; ventral margin straight to slightly convex; anterior dorsal margin long and gently sloping; posterior dorsal margin short, slightly concave and slightly inclined; posterior margin long and forming an oblique and blunt truncation. Sculpture consisting of weakly incised and irregularly spaced, incised concentric sulci; no radial sculpture present. Ligament light brown and protuberant. The calcareous portion of the ligament is subtended by strongly developed and protuberant nymphal callosities in both valves. In the left valve, the cardinal complex consists of a narrow anterior bifid tooth with elongate lobes and of a thin and curved laminate tooth; no true lateral teeth. In the right valve, the cardinal complex consists of a strongly skewed posterior bifid tooth whose posterior lobe is the larger and of an anterior slightly thickened subdeltoid laminate tooth; anterior lateral proximal, laminate and curved upward; posterior lateral absent or obsolete. Adductor muscle scars moderately impressed. Anterior adductor muscle scar irregularly shaped, but elongate and rounded below; posterior adductor more or less rounded. Pallial sinus rising very abruptly from the posterior adductor muscle scar to a high point beneath the umbo, then gently descending, rounded anteriorly and arcuately falling to the pallial line. The pallial sinus is well separated from the anterior adductor muscle scar. Shell white to pink or flesh-colored with a variously shaped posterior ray which may be absent in bleached individuals. The periostracum imparts an iridescence to the external surface of the valves, and the internal surface may be shining.

length	height	width	
18.5 mm.	10.0 mm.	—	Holotype of *probrina* Boss
25.3	14.0	—	off Freeport, Texas
16.0	9.4	—	Bird Key, Florida
14.2	8.4	2.5 mm.	off Fowey Light, Florida
11.1	6.5	2.1	Sombrero Key, Florida
8.3	4.8	—	Bird Key, Florida

Remarks. Tellina probrina is most easily recognized by its subrectangular shape and its broad flattened and oblique posterior truncation. Young individuals closely assume

the proportions of average adults but very large individuals have the truncation more oblique and the anterior dorsal margin less gently inclined. The vitreous external appearance also identifies this species, but its nearest relative in the Western Atlantic, *Tellina euvitrea*, may be confused with it. However, *euvitrea* has a straight and peculiar anterior dorsal margin, nearly parallel with the ventral margin. In contrast to *probrina*, *euvitrea* is more tumid, much more pointed behind, and the pallial sinus does not rise so abruptly from the posterior adductor muscle scar.

Another species with which *Tellina probrina* may be confused is *T. consobrina;* however, the latter is distinctly allied to *Scissula* and its sculpture may be used to distinguish it from *probrina*. In addition, *probrina* is more compressed, higher in proportions, and more strongly and broadly truncate.

Range. This species occurs in depths up to 100 fathoms. It is found from off North Carolina south to Tobago.

Specimens examined. North Carolina: *Eastward* station 1086, 33°42′ N; 76°39.5′ W, S of Cape Lookout, 140–145 meters (MCZ). South Carolina: *Gosnold* station 1403 (M 15), 32°50′ N; 78°18.5′ W, in 140–145 m. (A. Merrill). Florida: off Government Cut, Miami; off Fowey Light; off Ragged Key; off Bird Key; off Triumph Reef (all USNM); off Sombrero Key (MCZ); off Sand Key; Key West; Dry Tortugas (all USNM). Texas: 68 miles SE of Freeport, in 48 fathoms; 80–100 miles S of Port Isabel, in 40 fathoms (both MCZ). Bahama Islands: (USNM). Lesser Antilles: Grenada (USNM); 2 miles S of Fort George, Scarborough, Tobago, in 36 fathoms (MCZ).

Tellina (Angulus) euvitrea *Boss*

Plate 156, figs. 3; Plate 159, fig. 2

Tellina (*Angulus*) *euvitrea* Boss 1964, Occ. Pap. Dept. Mollusks, Harvard Univ., **2**: 321, pl. 55, fig. 5 (*Barrera* station 200, Santa Lucia, Cuba, in 2–4 fathoms; holotype, USNM 461952).

Description. Shell extending to 21 mm. (about 3/4 inch) in length and to 11 mm. (about 7/16 inch) in height, elongate-elliptical, thin, only slightly inflated with the right valve of a greater convexity and with only a slight flexure to the right posteriorly. Umbos just posterior to the middle, opisthogyrous, pointed and not elevated. Anterior margin very broadly rounded; ventral margin straight and with a slight postbasal arcuation; anterior dorsal margin not descending, long, straight and parallel to the ventral margin; posterior dorsal margin variously sloping and short; posterior margin short and poorly defined. Sculpture consisting of weak concentric sulci which are separated by broad bands. Radial sculpture consisting of extremely weak and obscure lirations which are more or less restricted to the peripheral areas. Ligament light brown, strong and protuberant. Calcareous portion of the ligament well developed and subtended by a short nymphal callosity. In the left valve, the cardinal complex consists of an anterior fragile bifid tooth and of a posterior thin and weak laminate tooth; no true lateral teeth present. In the right valve, the cardinal complex consists of a strong posterior bifid tooth with a poorly developed sulcus and of a strong anterior and heavy laminate tooth; no true posterior lateral tooth present; anterior lateral proximal to the cardinal complex,

rather small and laminate. Adductor muscle scars generally well impressed. Anterior adductor scar irregularly elongate, smaller than the posterior scar. Pallial sinus equal in opposite valves, pointed above, descending rather steeply and smoothly arcuate anteriorly. The sinus is deep but is well separated from the anterior adductor muscle scar. Externally the shell is iridescent and banded with white or pink; internally, the shell is usually white.

length	height	width	
21.0 mm.	11.0 mm.	4.5 mm.	Holotype of *euvitrea* Boss
20.0	11.0	4.0	Bahia de Samana, Santo Domingo
11.0	6.0	—	Puerto Plata, Santo Domingo

Remarks. This species had actually been recognized by Dall and Simpson in their report on the mollusks of Puerto Rico, and it was at that time called '*Tellina vitrea* d'Orbigny', but the holotype of *vitrea* d'Orbigny is a young individual of *Tellina magna* Spengler. *Tellina euvitrea* is characterized by its periostracum which imparts a vitreous lustre to the external surface of the valves. Its closest relative in the Western Atlantic is *Tellina probrina*, from which *euvitrea* may be separated by a more gently rising pallial sinus, a more pointed posterior end, and by a peculiar anterior dorsal margin which is parallel to the ventral margin. In addition, *Tellina probrina* is compressed whereas *euvitrea* is somewhat inflated. Some individuals of *T. versicolor* may be confused with *euvitrea*, but generally the red coloration and the pallial sinus, which is closely aligned to the anterior adductor muscle scar in *versicolor*, serve to identify it.

Range. This species appears to be more or less restricted to the Greater Antilles except for Jamaica where it has not been recorded.

Specimens examined. Cuba: Santa Lucia, in 2–4 fathoms; La Esperanza, in 4–6 feet; Bahia Honda, in 1–12 fathoms; Cabanas Harbor, in 3–12 fathoms (all USNM). Hispaniola. Santo Domingo: Puerto Plata (MCZ); Bahia de Samana (USNM). Puerto Rico: Aquadilla; mouth of Añasco River, in 40–60 feet (both MCZ); Mayagüez, in 42–60 feet (IMBPR; USNM); off Ponce, in 50 feet (IMBPR).

Tellina (Angulus) diantha *Boss*

Plate 154, fig. 3; Plate 159, fig. 4

Tellina (*Angulus*) *diantha* Boss 1964, Occ. Pap. Dept. Mollusks, Harvard Univ., **2**: 323, pl. 55, fig. 6 (Barbados, British West Indies; holotype, MCZ 239110).

Description. Shell extending to 26 mm. in length (about 1 inch) and to 15 mm. (about $\frac{5}{8}$ inch) in height, elongate-subelliptical, thin, fragile, with the right valve of a greater convexity and with a slight flexure to the right posteriorly. Umbos posterior to the middle, inflated and blunt. Anterior margin generally narrowly rounded; ventral margin straight to slightly convex and rising posteriorly; anterior dorsal margin long and gently sloping; posterior dorsal margin straight and short; posterior margin short and forming a poorly defined, oblique truncation. Sculpture consisting of closely set, weakly developed concentric lines; no true radial sculpture present. Ligament light to dark brown and slightly protuberant. Calcareous portion of the ligament subtended by slightly protuberant nymphal callosities. In the left valve, the cardinal complex consists of an anterior

small, subdeltoid bifid tooth with subequal lobes and of a posterior, very thin, extremely elongate laminate tooth; a subproximal anterior lateral thickening represents a vestige of the anterior lateral tooth; no posterior lateral dentition. In the right valve, the cardinal complex consists of a posterior skewed bifid whose posterior lobe is much the larger and of an anterior short slightly thickened laminate tooth; the anterior lateral tooth is proximal to subproximal, thin, laminate and often weakly upcurled; no true lateral tooth present. Adductor muscle scars moderately impressed. Anterior adductor muscle scar narrow and rounded below; posterior adductor scar subquadrate. Pallial sinus more or less the same in opposite valves, rising gently behind, rounded above, descending gently in a more or less straight line and falling in an arcuation to the pallial line; the sinus is distinctly removed from the anterior adductor scar. Externally, shell smooth, shining and suffused with pink or yellowish green; internally, chalky.

length	height	width	
26.5 mm.	15.0 mm.	7.0 mm.	Holotype of *diantha* Boss
23.0	14.0	7.5	Totness, Coronie, Surinam
22.3	13.0	6.4	Rio de Janeiro, Brasil
22.0	13.1	6.0	Belem, Brasil

Remarks. The relationship of this species with others obviously allied to it is obscured by its apparent rarity and the fact that no ontogenetic series of specimens has yet been collected. The large adult size of this species quickly distinguishes it from other members of *Angulus*, but such a character is unsatisfactory as a diagnostic trait. The peculiarly elongate posterior cardinal tooth in the left valve possesses some diagnostic value. In addition, the width and general tumidity of the valves constitutes a further aid in identification.

The closest relatives of this species are *Tellina euvitrea* and *T. probrina.* With respect to both of these species, *diantha* is more tumid and of a different outline, possessing a poorly differentiated posterior truncation and a comparatively shorter anterior dorsal margin. The umbo in *diantha* is more nearly equilateral although still behind the middle and the pallial sinus does not rise abruptly from the posterior adductor muscle scar and extends more anteriorly than in either *euvitrea* or *probrina.*

A fine series of *diantha* has been found by Altena in Surinam. The series from Totness, Coronie, consists of two complete specimens plus five right valves and two left valves. They are designated as paratypes for this species; the specimens are preserved in the Rijksmuseum van Natuurlijke Historie, Leiden.

Range. Although there are only a few records for the species they indicate a rather extensive range, from the Barbados in the Lesser Antilles south to Rio de Janeiro, Brasil.

Specimens examined. Lesser Antilles: Barbados (MCZ). Surinam: Totness, Coronie (Rijksmuseum, Leiden). Brasil: Belem, Para (MCZ); Rio de Janeiro (USNM).

Tellina (Angulus) gibber *von Ihering*

Plate 154, fig. 4; Plate 157, fig. 4

Tellina (*Angulus*) *gibber* von Ihering 1907, Anales del museo Nacional de Buenos Aires, 14, Ser. 3a, 7: 456, pl. 18, figs. 126 a-b (Puerto Militar, Bahia Blanca) [holotype, Museo Nacional de Buenos Aires, Argentina].

Description. Shell extending to 19.5 mm. (about $\frac{3}{4}$ inch) in length and to 10.5 mm. (about $\frac{3}{8}$ inch) in height, elongate-elliptical, fragile to subsolid, rather compressed, with the valves more or less equal in convexity and with little or no posterior flexure. Umbos posterior to the middle and blunt. Anterior margin narrowly rounded; ventral margin rounded in front, convex and rising posteriorly; anterior dorsal margin rather long and more or less straight; posterior dorsal margin often divided into two sections, one a straight and short portion immediately above the hinge line and the other a longer convex posterior portion; posterior margin short and forming a small blunt truncation. Sculpture consisting of regularly spaced, finely incised concentric sulci (about 4–7 per millimeter) separated by broad flattened bands; extremely fine radial lirations may occur on the disc. A posterior ridge and a variously developed sulcus, which bisects the posterior slope, occurs in both valves. In the left valve the cardinal complex consists of an anterior thickened bifid tooth with subequal lobes and of a posterior thin laminate tooth; no true lateral teeth developed. In the right valve, the cardinal complex consists of a posterior subdeltoid, slightly skewed bifid tooth whose posterior lobe is larger and of an anterior thickened subdeltoid laminate tooth; the anterior lateral tooth thin, elongate and proximal to the cardinal complex; the posterior lateral tooth distal, thin and socketed. Adductor muscle scars poorly impressed. Anterior adductor larger, longer and narrower than the posterior. Pallial sinus equal in opposite valves, rising only slightly behind, convex above and descending in an arcuation to the pallial line. The sinus does not touch and is rather widely separated from the anterior adductor scar. Externally, the shell is white, shining and somewhat iridescent; periostracum greenish or brownish; internally, polished and white.

length	height	width	
16.0 mm.	9.5 mm.	4.0 mm.	Holotype of *gibber* von Ihering
19.5	10.5	5.0	off Benninga, Argentina
16.5	9.5	4.5	Puerto Quequen, Argentina
12.5	7.5	3.5	Puerto Quequen, Argentina
9.2	5.0	2.1	La Paloma Rocha, Uruguay
5.0	2.6	—	off Montevideo, Uruguay

Remarks. The character which clearly separates this species is the presence of a sulcus which bisects the posterior slope. The sulcus is variously developed and in some specimens is so strong as to give the shell a constricted appearance. The posterior dorsal slope is also divided into two portions by the sulcus, thereby making the posterior slope appear very short and blunt.

The species is an off-shore dweller and seems to have a preference for depths between 7 and 30 fathoms. The nearest discernible relative is *Tellina hiberna* Hanley of the Eastern Pacific, which compares with *gibber* in the similarity of the peculiar sulcal configuration of the posterior margin and slope; however, *hiberna* is more attenuated posteriorly, the sculpture a little more coarse, the umbo further behind the middle and the shell a bit thinner. *Tellina gibber* was originally described as a fossil and is present in the Tertiary of Argentina and Uruguay (Figueiras, 1962).

Range. This species is strictly southern in its distribution. It is found from off the coast of Uruguay at La Paloma Rocha south along the coast of Argentina to Golfo San Matias.

Specimens examined. URUGUAY: La Paloma Rocha; off Montevideo, in 7 fathoms

(both MCZ). ARGENTINA: Puerto Quequen, Buenos Aires; off Cabo Bermeja, off Benninga Head, and off Balem Head, Golfo San Matias, in 17–25 fathoms (all USNM).

Tellina (Angulus) tenella *Verrill*

Plate 157, fig. 1; Plate 158, figs. 3–4

Angulus modesta Verrill 1872, Amer. Jour. Sci., **3**: 211 (typographical error).

Angulus modestus Verrill 1872, Ibid., p. 285, pl. 6, figs. 2–2a (Vineyard Sound, Buzzard's Bay, and Long Island Sound, off New Haven) [syntypes, Peabody Museum, Yale Univ.], *non* Carpenter 1864.

Angulus modestatus Verrill [*in*] Verrill and Smith 1874, Report upon Invert. Animals of Vineyard Sound and Adjacent Waters, p. 124 (typographical error).

Angulus tenellus Verrill [*in*] Verrill and Smith 1874, Ibid., p. 383, pl. 30, fig. 224, *non tenella* Jeffreys 1881, new name for *modestus* Verrill.

Tellina tenella Verrill. Dall 1889, Bull. no. 37, U.S. Nat. Mus., p. 60, pl. 56, fig. 12.

Tellina (*Angulus*) *tenella* Verrill. Dall 1900, Proc. U.S. Nat. Mus., **23**: 295.

Description. Shell extending to 10 mm. (about $\frac{3}{8}$ inch) in length and to 6.4 mm. (about $\frac{1}{4}$ inch) in height, subelliptical, solid, slightly tumid, with both valves of equal convexity and without a posterior flexure. Umbos elevated, small and blunt. Anterior margin narrowly rounded; ventral margin rounded and with a postbasal arcuation; anterior dorsal margin long and concave; posterior dorsal margin steeply inclined, short and concave; posterior margin short, convex and forming a rounded blunt truncation. Sculpture consisting of closely spaced, concentric sulci separated by rounded bands; no true radial sculpture present. Ligament light brown, short and protuberant. Calcareous portion of the ligament not strongly developed; nymphal callosities not prominent. In the left valve, the cardinal complex consists of an anterior small subdeltoid bifid tooth with subequal lobes and of a posterior, short and thin laminate tooth; no lateral teeth present. In the right valve, the cardinal complex consists of a posterior slightly skewed subdeltoid bifid tooth whose posterior lobe is much the larger and of an anterior thickened subdeltoid laminate tooth; anterior lateral tooth proximal to the cardinal complex and thickened; no posterior lateral present. Adductor muscle scars generally well impressed. Anterior adductor scar narrow, subrectangular and rounded below; posterior adductor scar almost perfectly round. Pallial sinus more or less equal in both valves, gently and only slightly rising, convex above, rounded anteriorly and falling in a smooth arcuation to the pallial line. The pallial sinus is distinctly separated from the anterior adductor muscle scar. Interior surface of valves roughened and thick. Color generally white but sometimes brownish or reddish.

length	height	width	
10.0 mm.	6.4 mm.	2.5 mm.	Vineyard Sound, Massachusetts
9.3	6.2	2.5	Woods Hole, Massachusetts
9.0	5.5	2.5	Sanibel Island, Florida
8.2	5.4	2.5	Sarasota, Florida
3.5	2.0	—	off Cape Hatteras, North Carolina

Remarks. Part of the obscurity which has surrounded this specific name was caused by the plethora of errors committed in its original designation and its comparison with *Angulus tener* (*Tellina agilis*). The specific name was first introduced as *Angulus modesta;* the spelling is a typographical error since Verrill used '*modestus*' in the original description. The type figure, pl. 6, figs. 2–2a, is good, but in the text of the description,

Verrill refers to pl. 7 (also an error), fig. 1 as that of *modestus* and fig. 2 as that of *A. tener* (*T. agilis*) so unfortunately some workers confused the two.

Tellina tenella is a distinct and somewhat rare species, being originally restricted to the Long Island and Vineyard Sound area in the north; however, its range was greatly extended by Dall (1889) and then later altered by him (1900a). Under the present interpretation, the species extends from the Woods Hole region in the north to the west

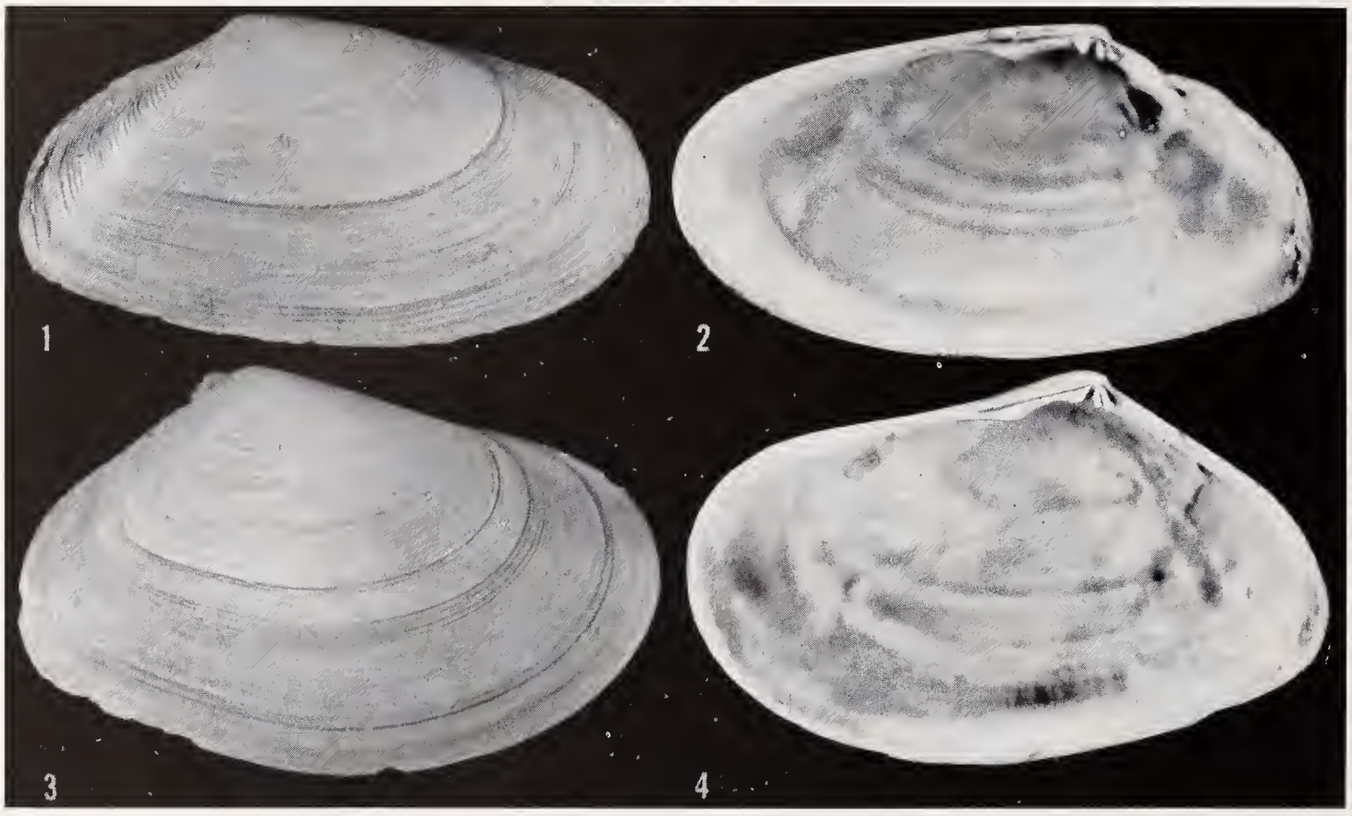

Plate 158. Figs. 1–2. *Tellina sybaritica* Dall. Fig. 1. External view of the right valve. Fig. 2. Internal view of the right valve, off Cabo Catoche, Mexico, USNM 323145 (about 8x) [L=8.5 mm.]. Figs. 3–4. *Tellina tenella* (Verrill). Fig. 3. External view of the right valve. Fig. 4. Internal view of the right valve, Vineyard Sound, Massachusetts, Yale 76973 (about 8x) [L=9 mm.].

coast of Florida. Over the extent of this range, a considerable amount of variation is evident. As shown in the descriptive measurements given above, the normal proportions are somewhat altered in the southern populations of *tenella*. With its finely incised, regularly spaced sculpture, *Tellina tenella* is allied to *T. sybaritica* but the latter is much more inflated, more highly colored, flexed behind, and of lower proportions. From *T. agilis*, which is more distantly removed than *T. sybaritica*, *tenella* may be distinguished by its arcuate ventral margin, its elongate, concave anterior dorsal margin and its shorter and more blunt posterior truncation. In addition, the pallial sinus approaches the anterior adductor muscle scar much more closely in *tenella* than in *agilis*. *Tellina pygmaea* Philippi of Europe bears some resemblance to *T. tenella*, but the former possesses a more distantly removed right anterior lateral tooth, is more highly colored and of a greater convexity.

Range. This species occurs from Woods Hole to south of Cape Lookout, and in the Gulf of Mexico, it is found along the west coast of Florida to Mississippi.

Specimens examined. Massachusetts: Swift's Beach, Wareham (USNM); Buzzards Bay (ANSP); Woods Hole (USNM; MCZ); off Gay Head Light, in 10–13 fathoms

(USNM); off Martha's Vineyard (ANSP); off Noman's Land (USNM). North Carolina: off Beaufort, in 6–9 fathoms; off Cape Hatteras, in 15–18 fathoms; off Cape Lookout, in 18–31 fathoms (all USNM). Florida: Sanibel (MCZ); Charlotte Harbor; Sarasota Bay (both USNM); Destin (MCZ); St. Josephs Bay; Crooked Island, St. Andrews Sound (both ANSP). Mississippi: Horn Island (ANSP).

Tellina (Angulus) sybaritica *Dall*

Plate 157, fig. 3; Plate 158, figs. 1–2

Tellina sybaritica Dall 1881, Bull. Mus. Comp. Zool., **9**: 134; 1886, Bull. Mus. Comp. Zool., **12**(6): 27, pl. 6, fig. 11 (Yucatan Strait, in 640 fathoms) [holotype, USNM 333600].

Tellina (*Angulus*) *flagellum* Dall 1900, Proc. U.S. Nat. Mus., **23**: 312, pl. 2, fig. 6 (off Cape San Roque, Brasil, in 20 fathoms) [holotype, USNM 108534].

Tellina (*Angulus*) *rubricata* Perry 1940, Nautilus, **53**(3): 79 (off Blind Pass, Sanibel Island, Florida, in 5 fathoms) [holotype, ANSP].

Description. Shell extending to 11 mm. (about $\frac{3}{8}$ inch) in length and to 5.7 mm. (about $\frac{1}{4}$ inch) in height, elongate, bluntly pointed behind, solid, rather inflated with the left valve of greater convexity and with a posterior flexure to the right. Umbos posterior to the middle, small and pointed. Anterior margin narrowly rounded; ventral margin convex and rising in a gentle arcuation behind; anterior dorsal margin elongate and gently inclined; posterior dorsal margin short and convex; posterior margin irregular, biangulate and forming a produced and blunt truncation. Concentric sculpture consisting of regularly spaced incised sulci separated by rounded lirations; no true radial sculpture. Ligament light brown, strong and set in a shallow escutcheon. Calcareous portion of ligament subtended by weak nymphal callosities. In the left valve, the cardinal complex consists of an anterior narrowly elongate bifid tooth with equal lobes and of a posterior thin, short laminate tooth; no true lateral teeth present. In the right valve, the cardinal complex consists of a posterior skewed, slightly thickened bifid tooth whose posterior lobe is the larger and of an anterior laminate tooth often coextensive with the anterior lateral tooth; anterior lateral tooth proximal to the cardinal complex, thickened and upcurled; posterior lateral tooth obsolete. Adductor muscle scars moderately well impressed, often obscured by the polished internal surface of the valves. Anterior adductor scar elongate to ovate, irregular above, rounded below; posterior adductor scar irregularly subquadrate. Pallial sinus equal in opposite valves, descending in a concave line to and nearly touching the anterior adductor muscle scar and then falling to the pallial line. Basic color predominantly white and suffused with red, yellow, pink or peach; red or pink rays extend postbasally from the umbonal region along the posterior slope.

length	height	width	
10.5 mm.	5.5 mm.	3.7 mm.	Holotype of *sybaritica* Dall
9.0	5.0	3.0	Holotype of *flagellum* Dall
8.0	4.1	—	Holotype of *rubricata* Perry
10.9	5.7	—	Castle Harbour, Bermuda
4.4	2.1	—	Cabo Catoche, Yucatan

Remarks. Tellina sybaritica is typically elongate with a long and slightly convex anterior dorsal margin and a short concave posterior dorsal margin; the posterior margin is irregularly biangulate and obliquely truncated. The shell is solid, thick and strong

with a tendency to be highly polished internally; the tumidity of the valves is considerable and distinctive, as is the more or less strong posterior flexure to the right. The sculpture consists of raised rounded ribs or lirations separated by shallow incised sulci, and as Dall noted, this configuration imparts a silky sheen to the surface of the valves.

By its relatively strong sculpture, *Tellina sybaritica* is related to *T. tenella;* however, the latter is distinguished by its lateral compression, its broad, blunt posterior truncation, and its lack of a posterior flexure to the right.

Tellina sybaritica converges with *Tellina vespuciana* d'Orbigny of the subgenus *Eurytellina.* The size, coloration, sculpture and shape of some individuals of these two species are extremely similar. The main trait which differentiates them is the strong development of the distal posterior lateral tooth in the right valve of *vespuciana.* In addition, *vespuciana* seems to possess a finer, intercalated umbonal sculpture and the umbo appears to be more pointed and elevated.

Range. This species is found from Beaufort, North Carolina south through the Greater and Lesser Antilles to Brasil.

Specimens examined. North Carolina: off Beaufort, in 6–9 fathoms; off Cape Hatteras, in 11–22 fathoms; off Cape Lookout, in 18–52 fathoms; off Cape Fear, in 14–18 fathoms (all USNM). Florida: St. Augustine; Lake Worth; Palm Beach; Triumph Reef; Long Reef; Ajax Reef; Key Largo; Turtle Harbor; Sambo Reef; Key West; Dry Tortugas (all USNM); Blind Pass and Tarpon Springs, Sanibel (both ANSP); Destin (MCZ). Mexico: off Cabo Catoche, Yucatan, in 640 fathoms (USNM). Bermuda: Castle Harbour; Harrington Sound (both MCZ). Bahama Islands: Bimini;

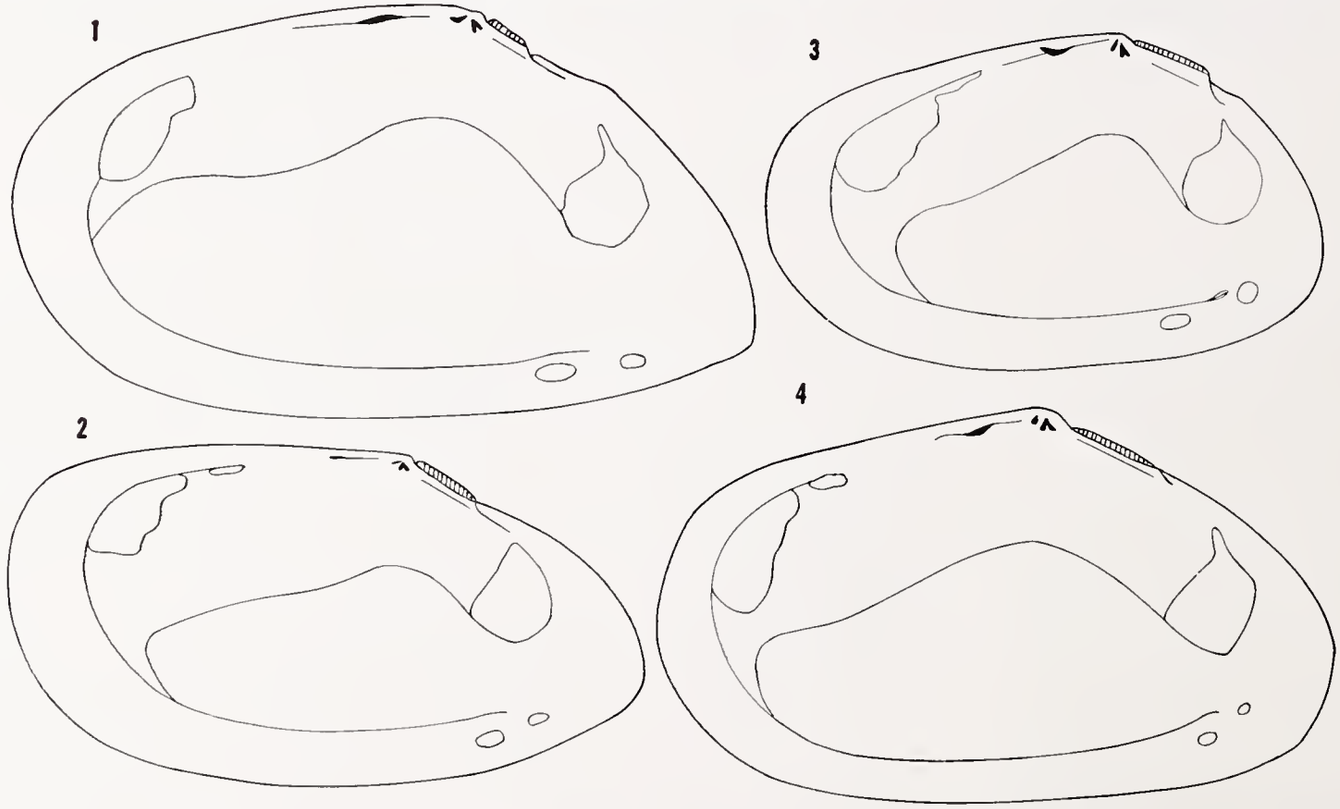

Plate 159. Figs. 1–4. Diagrammatic illustration of the internal surface of the right valve showing the dental configuration and muscle scars. Fig. 1. *Tellina versicolor* DeKay (about 6.8x) [L=12 mm.] Fig. 2. *Tellina euvitrea* Boss (about 3.4 x) [L=21 mm.]. Fig. 3. *Tellina probrina* Boss (about 3.5x) [L=18 mm.]. Fig. 4. *Tellina diantha* Boss (about 3.5x) [L=22 mm.].

New Providence; Andros (all USNM). CUBA: Cape Cajon; Punta Tolete; Santa Rosa; Bahia Honda; Cabanas (all USNM); Habana; Matanzas; Banes (all MCZ). JAMAICA: (MCZ). HISPANIOLA. HAITI: Jeremie (USNM); Bizoton (MCZ). PUERTO RICO: Mayagüez (IMBPR); La Parguera (MCZ); San Juan Harbor (USNM). LESSER ANTILLES: St. Lucia; Tobago (both MCZ). CARIBBEAN ISLANDS: Grand Cayman (ANSP). BRASIL: off Natal; off Cape San Roque, in 20 fathoms; off Aracaju, Bahia in 12 fathoms (all MCZ).

Subgenus **Scissula** *Dall*

Scissula Dall 1900, Proc. U.S. Nat. Mus., **23**: 291 (type species, *Tellina decora* Say 1826 [= *Tellina similis* Sowerby 1806], original designation).

Cirsula Dall. Cary and Spaulding 1909, Bull. Gulf. Biol. Sta., **12**: 21, error for *Scissula*.

Description. Shell of small to medium size (up to $1\frac{1}{8}$ inches), and with or without a posterior flexure to the right. Sculpture consisting of weak, concentric lirations crossed by incised lines or scissulations which descend from the anterior slope or margin to the ventral margin. The posterior slope lacks the scissulate pattern of sculpture. Right anterior lateral tooth strong, laminate, and immediately proximal to the cardinal complex: all other laterals absent or obsolete. Pallial sinus rather extensive and deep but not coalescent with the anterior adductor muscle scar. Color of the shell white or red, suffused or rayed with white, red or yellow.

Scissula reaches its greatest development in the Eastern Pacific and, particularly, in the Western Atlantic regions. It is more or less tropical and subtropical in its distribution. In the Western Atlantic only a single species has a normal range which extends as far north as Cape Hatteras. In the Eastern Pacific, the northernmost limit for the subgenus appears to be the Gulf of California. In the Indo-Pacific, the group does not seem to have attained a similar level of development but such species as *Tellina micans* Hanley are decidedly scissulate and represent the subgenus in that realm. According to Woodring (1925), the earliest ancestors of the Western Atlantic species appeared in the Lower Miocene.

The precise definition of the subgenus delimits those species with scissulate sculpture on both valves. The content and status of *Scissula* has been contested by Salisbury (1934) who included the group with *Fabulina* Gray. The latter is uniquely typified by *Tellina fabula* Gmelin in which only the right valve is scissulate; this species is European and Mediterranean in its distribution. Since the structure of the right lateral dentition and the configuration of the pallial sinus in *Fabulina* and *Scissula* are very similar, a close relationship between the two groups cannot be denied. The approach of Thiele (1935) however will be employed in the present consideration, and *Scissula* and *Fabulina* will be treated as separate but closely allied subgenera.

Scissula is clearly related to the anguloid subgenera. The right valve possesses the diagnostic dental characteristics. The right anterior lateral tooth is typically long, thin, or shelf-like, more or less upturned, and closely adjacent to the cardinal complex. The right posterior lateral tooth is generally obsolete, except in *Tellina candeana*.

KEY TO THE SPECIES OF *SCISSULA* IN THE WESTERN ATLANTIC

1. Shell subtrigonal and subsolid . . . . . *candeana*
   Shell elongate-elliptical 2
2. Shell thin and fragile; generally with two posterior rays 3
   Shell thicker, not fragile, and often with numerous rays 4
3. Shell white; scissulations broadly spaced (4–6 mm.) . . . . . *iris*
   Shell purple; scissulations closely spaced (6–10 mm.) . . . . . *sandix*
4. Shell with strong concentric sculpture differentiated along the right posterior slope . . . . . *similis*
   Shell without distinctly differentiated concentric sculpture on the right posterior dorsal slope . . . . . *consobrina*

Tellina (Scissula) similis *Sowerby*

Plate 160, figs. 1–2

Tellina similis Sowerby 1806, British Miscellany, **2**: 29, pl. 75 (Brighton, England) [type locality, here restricted and corrected, Pelican Shoal, Florida; lectotype, here selected and figured, BMNH].

Tellina decora Say 1826, Jour. Acad. Nat. Sci., Philadelphia, **5**: 319 (southern coast of East Florida) [type locality, here restricted, South Inlet, Lake Worth, Florida; syntypes, ANSP 52427].

Tellina caribaea d'Orbigny 1842 [*in*] Sagra, Hist. L'Ile Cuba, Atlas, pl. 25, figs. 47–49; 1845, Spanish Text, **2**(5): 303 (Cuba y la Guadalupe); 1853, French Text, Mollusques, **2**: 251 [type locality, here restricted, Cuba; lectotype, here selected and figured, BMNH].

Tellina iris 'Say' Philippi 1845, Abbildungen und Beschreibungen, **2**: **Tellina**, p. 25, pl. 3, fig. 5.

Tellina eupareia Ravenel 1885, Proc. Elliot Soc., **2**(5): 37 (Sullivan's Island, South Carolina) [type lost].

Tellina (*Scissula*) *similis* Sowerby. Dall 1900, Proc. U.S. Nat. Mus., **23**: 296.

Description. Shell extending to 27.5 mm. (about $1\frac{1}{8}$ inches) in length and to 18.5 mm. (about $\frac{3}{4}$ inch) in height, elongate, subsolid to fragile, with the left valve more convex and with a strong posterior flexure to the right. Umbos posterior to the middle, opisthogyrous and blunt. Anterior margin smoothly and narrowly rounded; ventral margin convex and rising slightly posteriorly; anterior dorsal margin long, gently sloping and convex; posterior margin long and forming an oblique truncation. Sculpture consisting of weak concentric lirations which are strong on the right posterior slope and of acentric scissulations (about 7–9 per millimeter). Ligament light brown, short, broad, and protuberant. Calcareous portion of the ligament well developed and subtended by nymphal callosities. In the left valve, the cardinal complex consists of an anterior narrow, elongate, and strongly sulcated bifid tooth with equal lobes and of a thin, but strong laminate tooth; no true lateral teeth present. In the right valve, the cardinal complex consists of a posterior skewed bifid tooth whose posterior lobe is the larger and of an anterior thickened laminate tooth; anterior lateral tooth proximal to the cardinal complex, strong, and flangelike; posterior lateral tooth absent. Adductor muscle scars well impressed. Anterior adductor slightly larger and higher than the posterior adductor. Pallial sinus equal in both valves, rising slightly behind, convex above, and extending very near to but not coalescing with the anterior adductor. Externally the shell is predominantly white, sometimes suffused with yellow, red, or apricot; there are bands and rays of pink or red. Internally, the shell is shining and sometimes highly polished with the general color characteristics of the external surface.

Plate 160. Fig. 1. *Tellina similis* Sowerby, external view of the right valve of the lectotype, Brighton, England, BMNH (about 9x) [L = 17.5 mm.]. Fig. 2. *Tellina caribaea* d'Orbigny [= *Tellina similis* Sowerby], external view of the right valve of the lectotype, Cuba, BMNH (about 9x) [L = 16.6 mm.].

length	height	width	
17.5 mm.	10.5 mm.	—	lectotype of *similis* Sowerby
16.6	9.7	4.3	lectotype of *caribaea* d'Orbigny
27.5	18.5	9.0	Tarpon Bay, Sanibel, Florida
18.0	11.5	6.0	Missouri Key, Florida
13.5	8.5	4.0	Cayo Caiman, Caibarien, Cuba
11.0	7.0	3.0	Grassy Key, Florida

Remarks. Among other Western Atlantic tellinids, *similis* might well be confused with *Temnoconcha brasiliana* Dall, for there is a superficial similarity of shape in these two species. A careful examination of the hinge mechanism and the dental formula will always show *similis* to be laterally dentate and *brasiliana* laterally edentate.

Tellina consobrina appears to be most closely related to *T. similis*. In the lack of differentiated posterior slope sculpture and in the obsolete condition of the scissulate sculpture, *consobrina* departs markedly from *similis*. *Tellina candeana*, because of the thickness of its valves and the disposition and spacing of the scissulations, may also be considered a close relative of *similis*. The two differ greatly in shape, *similis* being subquadrate, and *candeana* being subtrigonal, and the latter possesses a rather distinct right posterior lateral tooth. There is no analog of *similis* in the Eastern Pacific.

The fossil history of *Tellina similis* begins in the Oligocene [Miocene] of the Chipola horizon at Alum Bluff where Dall (1900b) has described *Tellina lampra*, which differs from the modern *similis* in being more inequilateral and, according to Dall, being differently shaped posteriorly. True *T. similis* appears in the Pliocene of the Caloosahatchie River, Florida, and it has been recorded in Pleistocene deposits on Grand Cayman Island in the Caribbean by Rehder (1962).

The depth range of this species includes shallow shore as well as off-shore records up to 130 fathoms. Bottom type preference seems to be limited to sand, particularly coarse sand.

Range. This species occurs normally from along the east coast of Florida in the vicinity of Lake Worth, south through the Antilles to Barbados and west as far as Panama; it has not been recorded in Trinidad nor along the coast of eastern South America.

Specimens examined. South Carolina: Isle of Palms (CM). Florida: South Inlet, Lake Worth (ANSP); off Palm Beach), in 10–130 fathoms (MCZ); off Miami, in 10–24 fathoms; Bird Key, Biscayne Bay; off Fowey Light, in 6–40 fathoms; Hawk Channel, in 3–4 fathoms; Elliott Key (all USNM); Sand Key (MCZ); Ajax Reef, in 4 fathoms; Caesar's Creek Bank, in 10 feet; off Turtle Harbor, in 20 fathoms (all USNM); off The Elbow, Key Largo, in 21 fathoms (MCZ); Lower Matecumbe Key; Long Key (both USNM); Little Duck Key (D. and N. Schmidt); Grassy Key; Bonefish Key; Marathon, Key Vaca (all ANSP); SE of Looe Key, in 25–50 fathoms (MCZ); Sugar Loaf Key (ANSP); Pelican Shoal; Tea Table Key; Missouri Key (all MCZ); off Key West, in 5–10 fathoms; Dry Tortugas (both USNM); Naples (ANSP); Tarpon Bay, Sanibel; Boca Grande Key; Longboat Key; Gulfport (all MCZ); Anclote (USNM). Mexico: Progreso; off Isla Mujeres (both MCZ). Panama: Colon (USNM). Bahama Islands: Holmes Cay; Angel Fish Point, Little Abaco (both MCZ); Pensacola Cays, in 3 fathoms; Cat Cay, in 3 fathoms (both USNM); Whale Cay Channel; Dick's Point, Nassau, New Providence; Savannah Sound, Eleuthera; Little San Salvador; Russell Creek, Cat Island; Simms, Long Island; Matthew Town, Great Inagua (all

MCZ). Cuba: Cape Cajon; Punta Colorado, in 2–3 feet; Bahia Hondo, in 1–12 feet; Santa Rosa, in 3–6 feet; Esperanza, in 4–6 feet; Habana; Cabanas Harbor, in 3–12 fathoms; Cardenas, in 1–3 fathoms (all USNM); Cayo Caiman, Cayo Frances, Cayo Salina and Cayo Lucus, Caibarien (all MCZ); Punta Alegre, Camaguey; Cayo Largo, Oriente (both ANSP). Jamaica: (BMNH). Hispaniola. Santo Domingo: Samana (USNM). Puerto Rico: Cabo Rojo Light House (IMBPR). Virgin Islands: SE of East Point, in 6–20 feet, Anegada; West End Point, in 2–6 feet, Anegada; St. Thomas (all ANSP). Lesser Antilles: Guadeloupe (MCZ); St. Vincent (BMNH); off Paynes's Bay Church and off Telegraph Street, Barbados (both USNM). Caribbean Islands: E end of Frank South and Georgetown, Grand Cayman (both ANSP).

Tellina (Scissula) consobrina *d'Orbigny*

Plate 161, fig. 3; Plate 162, fig. 1

Tellina consobrina d'Orbigny 1842 [*in*] Sagra, Hist. L'Ile Cuba, Atlas, pl. 26, figs. 9–11; 1845, Spanish Text, **2**(5); 305 (en la arena de la Martinica); 1853, French Text, Mollusques, **2**: 254 [syntypes, BMNH 54.10.4.514].

Tellina (*Angulus*) *consobrina* d'Orbigny. McLean 1951, New York Acad. Sci., **17**(1): 96, p. 19, fig. 8.

Description. Shell extending to 14 mm. (about 9/16 inch) in length and to 8 mm. (about 5/16 inch) in height, elongate, fragile to subsolid, rather tumid with the left valve of a greater convexity and with a posterior flexure to the right. Umbos posterior to the middle, not elevated, small and blunt. Anterior margin smoothly and narrowly rounded; ventral margin straight to gently convex; anterior dorsal margin elongate, gently sloping, and slightly convex; posterior dorsal margin short and concave; posterior margin straight and forming an oblique truncation. Sculpture consisting of narrowly spaced, weakly developed and somewhat irregular concentric lines crossed by acentric scissulations (about 3–5 per millimeter) which are often obscure. Ligament light brown in color and protuberant. Calcareous portion of the ligament subtended by flattened and thickened nymphal callosities. In the left valve, the cardinal complex consists of a narrow anterior bifid tooth with equal lobes and of a posterior, thin, elongate laminate tooth often adpressed to the calcareous element of the ligament; no true lateral teeth present. In the right valve, the cardinal complex consists of a posterior, strongly skewed bifid tooth whose posterior lobe is much the larger and of an anterior thin to subdeltoid laminate tooth; the proximal anterior lateral tooth of varying thickness, projecting and often slightly upcurled; no posterior lateral tooth. Adductor muscle scars usually well impressed. Anterior adductor irregularly shaped, but elongate and rounded below; posterior adductor rounded. Pallial sinus more or less equal in opposite valves, rising abruptly and descending gently, and rounded in front. The shell is white, variously colored with red or pink rays, rarely completely white, or with anterior suffusions of pink. The external surface is smooth and shining and generally not iridescent.

length	height	width	
14.2 mm.	7.9 mm.	3.8 mm.	off Fowey Light, Florida
13.5	7.7	3.3	Key West Channel, Florida
10.8	6.1	—	Key Largo, Florida
9.3	5.5	2.0	Barbados, Lesser Antilles
8.3	4.8	1.9	St. Thomas, Virgin Islands

Remarks. Early authors considered *Tellina consobrina* to be a variety or southern form of *Tellina versicolor* DeKay. Although the latter encompasses a great range of variation, it may be segregated from *consobrina* by its pallial sinus which is closely adjacent to the anterior adductor muscle scar, its lack of scissulate sculpture and its more highly polished anterior surface. The internal surface of the valves of *consobrina* often tends to be thickened, irregular and not highly polished. In the present consideration, *versicolor* and *consobrina* are much more distantly related than previously assumed.

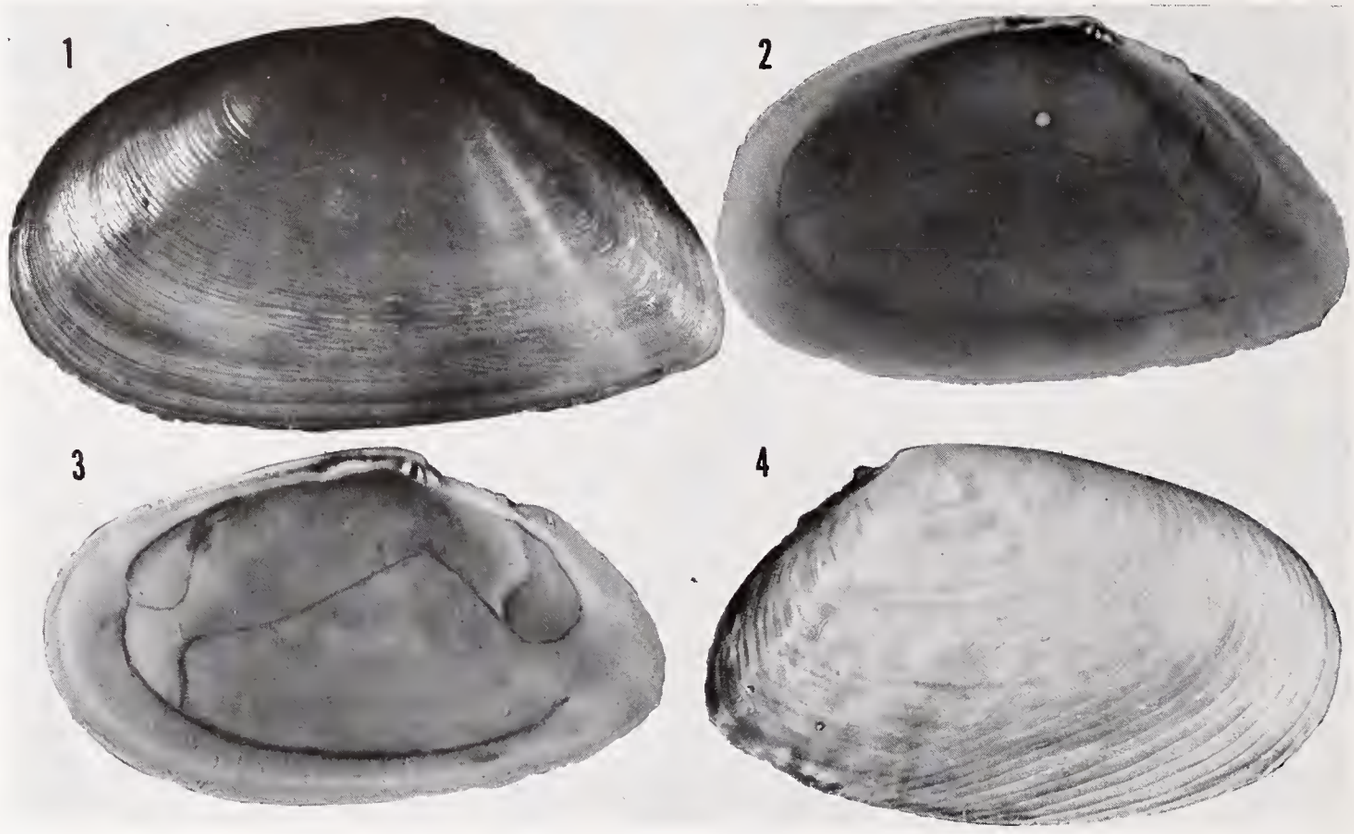

Plate 161. Figs. 1–2. *Tellina sandix* Boss. Fig. 1. External view of the left valve (about 4.7x) [L=17 mm.]. Fig. 2. Internal view of the right valve, Santa Barbara de Samana, MCZ 236333 (about 5.5x) [L=13 mm.]. Fig. 3. *Tellina consobrina* d'Orbigny, internal view of the right valve, off Fowey Light, Florida, USNM 462116 (about 5x) [L=14 mm.]. Fig. 4. *Tellina iris* Say, external view of the right valve, Fort Myers Beach, Florida, MCZ 243052 (about 7x) [L=10 mm.].

Tellina consobrina appears to be most closely related to *Tellina similis.* The acentric scissulate pattern of sculpture in *consobrina* is relatively obscure or obsolete when compared with the more closely set, well developed scissulations found in *similis.* No heavy and strongly developed concentric sculpture on the posterior slope of the right valve is differentiated in *consobrina*, whereas in *similis*, the presence of strong concentric sculpture in that area is diagnostic. In addition, the two species may be separated by the pallial sinus which in *consobrina* is higher and more distantly removed from the anterior adductor muscle scar.

Among the other species with which *Tellina consobrina* may be confused is *T. probrina.* The characters used to differentiate these two species have been discussed elsewhere (see *Remarks* under *T. probrina*).

Range. This species occurs from Miami, Florida through the Greater and Lesser Antilles to Tobago; it has also been discovered in Bermuda.

Specimens examined. Florida: off Miami, in 24 fathoms; off Fowey Light, in 38–70 fathoms; Turtle Harbor; Key Largo; Key Vaca; Looe Key; Sambo Reef; Key West Channel; Dry Tortugas (all USNM). Bermuda: Castle Rock (MCZ). Cuba: Cayo Arenas; Santa Lucia; Santa Rosa; Bahia Honda; Cabanas; Bahia de Cochinos (all USNM). Puerto Rico: Mayagüez; La Parguera (both IMBPR); off Cape San Juan Light, in 26 fathoms (USNM). Virgin Islands: St. Thomas (USNM). Lesser Antilles: Martinique (BMNH); English Harbour and Falmouth Harbour, Antigua; Barbados (all USNM); 2 miles S of Fort George, Scarborough, Tobago, in 36 fathoms (MCZ).

Tellina (Scissula) iris *Say*

Plate 161, fig. 4

Tellina iris Say 1822, Jour. Acad. Nat. Sci., Philadelphia, **2**: 302 (inhabits the southern shores) [type locality, here restricted, Sullivan's Island, South Carolina; holotype, ANSP 52375].

Tellina (*Angulus*) *iris* Say. H. and A. Adams 1856, Genera Recent Mollusca, **2**: 397.

Tellina plagia Ravenel 1885, Proc. Elliot Soc., **2**(5); 40 (on the beach near Charleston, South Carolina) [types lost].

Tellina (*Scissula*) *iris* Say. Dall 1900, Proc. U.S. Nat. Mus., **23**: 291.

Tellina (*Scissula*) *caribaea* 'd'Orbigny' Dall 1900, Proc. U.S. Nat. Mus., **23**: 297, *non* d'Orbigny 1842.

Tellina (*Cirsula*) *irrus* Say. Cary and Spaulding 1909, Bull. Gulf Biol. Sta., **12**: 21, errors for *Scissula* and *iris*.

Description. Shell extending to 15.3 mm. (about $\frac{5}{8}$ inch) in length and to 9 mm. (about $\frac{3}{8}$ inch) in height, elongate, elliptical, thin, rather compressed with both valves of equal convexity and with or without a very weak flexure to the right. Umbos posterior to the middle, small and somewhat pointed. Anterior margin smooth and rather narrowly rounded; ventral margin long, more or less straight, and rising slightly posteriorly; anterior dorsal margin long, gently sloping and slightly convex; posterior dorsal margin long, straight to slightly convex, and forming a broad slightly oblique truncation. Sculpture consisting of closely set, poorly developed, concentric incremental lines which are most noticeable on the posterior slope. The concentric sculpture is intersected and crossed by well developed, widely spaced scissulations which descend across the shell at an angle of 20–30 degrees (about 4–6 per millimeter). No radial sculpture. Ligament light yellow brown, short, generally weak and slightly protuberant. Calcareous portion of the ligament subtended by flange-like, elevated nymphal callosities. In the left valve, the cardinal complex consists of an anterior, small, narrowly elongate and protuberant bifid tooth with subequal lobes and of a posterior thin, elongate laminate tooth: no true lateral teeth present. In the right valve, the cardinal complex consists of a posterior strongly skewed bifid tooth whose posterior lobe is the larger and of an anterior thickened laminate tooth; anterior lateral tooth proximal to the cardinal complex, thin and laminate; posterior lateral tooth absent or obsolete, consisting of a distal thickening of the hinge plate. Adductor muscle scars rather poorly impressed. Anterior adductor irregularly quadrate; posterior adductor somewhat rounded. Pallial sinus rises abruptly posteriorly, descends gently and unites in an arcuation with the pallial line below; confluence extensive. The pallial sinus is separated by about one millimeter from the anterior adductor. Shell transparent to translucent, often extremely fragile, predominantly white or clear, but with some suffusion of red or pink. Two prominent white rays often occur in the posterior quarter of the disc. Internally the shell is smooth and polished.

length	height	width	
15.3 mm.	9.0 mm.	—	South Carolina
13.0	6.3	2.5 mm.	Galveston, Texas
12.5	7.0	2.5	Sea Island, Georgia
9.0	5.8	2.0	St. Petersburg, Florida

Remarks. This species possesses a small iridescent shell not unlike that of *T. versicolor*, and it has probably been confused with the latter a number of times since the two species are sympatric over most of their ranges. However, *versicolor* is distinctly separated from *iris* in the lack of scissulations. *Tellina iris* has scissulations, but often these sulci are obscured or in part destroyed or worn away, especially in the region of the central disc; therefore, one must be extremely careful in examining specimens to insure a proper identification. Scissulations even on old and worn specimens may generally be discerned along the ventral margin or on the extreme anterior slope. In addition, the pallial sinus of *iris* is removed from the anterior adductor muscle scar whereas that of *versicolor* is closely adjacent to that scar.

In the Western Atlantic, *iris* is most closely related to *T. sandix* which has a more southerly range. The former is a smaller species with a much shorter posterior dorsal slope and without the total pink or red coloration of *sandix;* the sculpture of *iris* is also noticeably more widely spaced. In the Eastern Pacific, *Tellina virgo* represents the nearest relative to *iris* though *iris* has a smaller shell with more widely spaced sulci and a differently angled posterior ridge.

In the fossil record of the Western Atlantic, Dall (1900b) described *Tellina scitula* (*non* Meek and Hayden, 1827) which has been renamed *healyi* by Woodring (1925). Dall indicated that this species occurs in the Miocene of Santo Domingo and of Bowden, Jamaica. Maury (1917) found it in the formations at Cercado de Mao and Rio Cana which illustrate its range through the Lower Miocene. In contrast to *iris*, *healyi* has finer, more oblique sulci and its posterior end is more pointed. Woodring (1925) in his discussion on *healyi* noted the resemblance of this species to certain *Eurytellina* and also mentioned that specimens of *healyi* from Santo Domingo, when compared to Bowden specimens possessed a thinner shell and a more slender nymph.

Range. This species extends as far north as North Carolina, in the vicinity of Cape Hatteras, south through the lower Florida Keys and west along the Gulf coast to Galveston, Texas. The greatest recorded depth is 17 fathoms and the species seems to prefer the inshore shallow areas along beaches.

Specimens examined. North Carolina: Cape Hatteras Point; off Cape Hatteras, in 14–17 fathoms (both USNM). South Carolina: Sullivan's Island; Charleston; Folly Beach (all CM). Georgia: Sea Island (MCZ); Cumberland Island (CM). Florida: Mayport; St. Augustine; Daytona Beach (all MCZ); off Miami, in 3 fathoms; Bahia Honda Key; Dry Tortugas; Caximba Pass; Marco Island; Bunch Beach; Punta Rassa (all D. and N. Schmidt); Sanibel; Bradenton Beach; St. Petersburg (all MCZ). Louisiana: Cameron (USNM). Texas: Sabine (MCZ); Galveston (ANSP).

Tellina (Scissula) sandix, new name

Plate 161, figs. 1–2

Tellina exilis Lamarck 1818, Animaux s. Vertebres, **5**: 527 (no locality given) [type locality, here restricted, Port Antonio, Jamaica; syntypes, Museum d'Histoire Naturelle, Geneva], *non* Meuschen 1787, *nec* Link 1808.

Tellina (*Angulus*) *exilis* Lamarck. H. and A. Adams 1856, Genera Recent Mollusca, **2**: 397.

Tellina (*Scissula*) *exilis* Lamarck. Dall 1900, Proc. U.S. Nat. Mus., **23**: 297.

Description. Shell extending to 19 mm. (about $\frac{3}{4}$ inch) in length and to 11 mm. (about $\frac{1}{2}$ inch) in height, elongate-subtrigonal, thin, fragile, compressed with both valves of equal convexity and with or without a very slight flexure to the right. Umbos posterior to middle, inconspicuous and rather blunt. Anterior margin smoothly and somewhat narrowly rounded; ventral margin nearly straight and rising only slightly posteriorly; anterior dorsal margin long, gently sloping, and convex; posterior dorsal margin long and rather steeply sloping; posterior margin short, ill defined, generally straight, and forming a small posterior truncation. Sculpture consisting of poorly defined, closely set concentric incremental bands which are intersected by closely set and finely incised scissulations (about 10 per millimeter) which cross at an angle of 30 degrees. No radial sculpture present. Ligament brown, rather short, weak and not protuberant. Calcareous portion of the ligament subtended by short, but slightly raised nymphal callosities. In the left valve, the cardinal complex consists of an anterior narrow, elongate, deeply cleft bifid tooth with equal lobes and of a posterior divergent, extremely long and thin laminate tooth; no true lateral dentition present. In the right valve, the cardinal complex consists of a posterior, strongly skewed, well developed bifid tooth whose posterior lobe is much the larger and of an anterior, variously developed laminate tooth; anterior lateral tooth proximal to the cardinal complex, long, thin and laminate; posterior lateral tooth absent or obsolete, consisting of a distal thickening of the hinge plate. Adductor muscle scars moderately well impressed. Anterior adductor irregularly elongate; posterior adductor round. Pallial sinus rising rather abruptly posteriorly, extending almost to, but not confluent with the anterior adductor, descending gently and arcuately falling to the pallial line; confluence complete. Shell transparent, translucent, predominately crimson suffused with pink or white, often with white rays posteriorly. Rarely iridescent. The internal surface is shining, but not highly polished.

length	height	width	
15.6 mm.	9.2 mm.	3.2 mm.	Syntype of *exilis* Lamarck
19.0	11.0	—	Monte Cristi, Santo Domingo
17.2	10.2	3.3	Guadeloupe
14.5	10.5	—	"
12.0	8.0	—	Jamaica

Remarks. This species has often been confused with the more northerly *Tellina iris* Say to which it is very closely allied. The scissulations of *sandix* number about 10 per millimeter whereas in *iris* they are more widely spaced, numbering about 4–6 per millimeter. The angle of descent of the sulci across the surface of the valves is nearly the same in both species. In color, *sandix* is nearly always pink or red with some indication of colored rays posteriorly while *iris* is usually white and its posterior rays may be poorly or well developed. The descent of the posterior dorsal slope is especially diagnostic in *sandix* and serves to differentiate *iris* as well. In *sandix*, this slope is characteristically

elongate and somewhat steeply inclined, giving the posterior portion a produced appearance whereas the posterior slope in *iris* is markedly shorter and more steeply inclined. The pallial sinus of *iris* is typically further removed from the anterior adductor muscle scar than it is in *sandix*.

Among the variations exhibited by *Tellina sandix*, none seems as important as the thickness of the valves; some specimens are heavier than others, being opaque rather than completely translucent or even at times transparent. The extreme thinness of the valves makes them relatively fragile.

According to Dall (1900a), *Tellina sandix* is related to the Eastern Pacific species, *Tellina virgo* Hanley, and they may be separated in that the former is more compressed, more arcuate and less pointed behind. However, *T. esmeralda* Olsson seems even more closely allied to *sandix* than *virgo*, and the latter may, in turn, be considered closely related to *iris* (see *Remarks* under *iris*). In the Tertiary of the Western Atlantic, there does not seem to be any obvious precursor to *sandix*.

Range. This species appears to possess a distribution that is distinctly Antillean and South American. Although Aguayo and Jaume list this species in their catalog of the mollusks of Cuba, the northernmost record which is preserved in the museums in this country is from Jamaica. Excluding Cuba, the range of this species extends from the Greater Antilles, through the Lesser Antilles, and along the South American coast to Uruguay.

Specimens examined. Jamaica: Port Antonio; Port Morant (both MCZ). Hispaniola. Haiti: Baie Anglaise; Aquin (both USNM). Santo Domingo: Monte Cristi; Santa Barbara de Samana (both MCZ). Puerto Rico: Isla Desecheo; Punta Guanajibo (both IMBPR). Lesser Antilles: Guadeloupe (ANSP; MCZ). Brasil: Thayer Expedition (MCZ); Santos (USNM). Uruguay: La Paloma Rocha (USNM).

Tellina (Scissula) candeana *d'Orbigny*

Plate 162, fig. 2

Tellina candeana d'Orbigny 1842 [*in*] Sagra, Hist. L'Ile Cuba, Atlas, pl. 25, figs. 50–52; 1845, Spanish Text, **2**(5): 303 (Martinica); 1853, French Text, Mollusques, **2**: 254 [lectotype, here selected and figured, BMNH 54.10.4.503].

Tellina (*Scissula*) *candeana* d'Orbigny. Dall 1900, Proc. U.S. Nat. Mus., **23**: 297.

Tellina (*Anbulus*) *candeana* d'Orbigny. McLean 1951, New York Acad. Sci., **17**(1): 97, pl. 20, fig. 2 (error for *Angulus*).

Description. Shell extending to 16 mm. (about $\frac{5}{8}$ inch) in length and to 10 mm. (about $\frac{3}{8}$ inch) in height, elongate-subtrigonal, inflated with the left valve of greater convexity and with a strong posterior flexure to the right. Umbos posterior to the middle, opisthogyrous and blunt. Anterior margin smoothly and narrowly rounded; ventral margin convex and rising gently in the posterior arcuation; anterior dorsal margin very long, gently sloping, more or less straight; posterior dorsal margin long, steeply sloping and straight; posterior margin rather ill defined, straight and forming an oblique truncation. Sculpture consisting of closely set, raised concentric lirations limited to the posterior slope; the disc of the shell and the anterior slope are covered with closely set scissulations (about 7–8 per millimeter) which descend obliquely across the surface of the shell at an

angle of about 50 degrees. No radial sculpture present. Ligament light brown, short, rather weak and slightly protuberant. Nymphal plate without raised callosities. In the left valve, the cardinal complex consists of an anterior narrow and elongate bifid tooth with subequal lobes and of a posterior thin, laminate tooth; no true lateral teeth present. In the right valve, the cardinal complex consists of a posterior, slightly skewed bifid tooth whose posterior lobe is the larger and of an anterior, somewhat thickened laminate tooth; anterior lateral tooth strong, proximal to the cardinal complex, elongate and laminate; the posterior lateral tooth is distal to the cardinal complex, small, pointed and variously developed though never as strong as the anterior lateral. Adductor muscle scars fairly well impressed. The anterior adductor quadrate; the posterior adductor round. Pallial sinus equal in both valves, rising slightly posteriorly to a blunt apex, descending gently and falling arcuately to the pallial line; confluence extensive. The pallial sinus is separated from the anterior adductor by about 0.5 mm. The shell is smooth, shining, white, and often suffused with yellow or pink; the suffusion may be localized on the disc or include the entire valve. Internally, smooth and rather highly polished, white, or with yellow or pink suffusions.

length	height	width	
10.5 mm.	8.0 mm.	3.8 mm.	Lectotype of *candeana* d'Orb.
16.0	10.0	5.0	Turks Island, Bahamas
14.0	8.5	4.5	Grassy Key, Florida
12.0	8.1	3.5	Santa Rosa, Cuba
8.2	5.5	2.8	Grand Cayman Island

Remarks. This species, as evidenced by the measurements, possesses some variability with regard to shape, but in outline, the shell always appears to be subtrigonal. In color, *candeana* is predominantly white but occasionally specimens which are completely pink are encountered. The usual coloration in young individuals is white with umbonal suffusions of yellow or yellow-green. From the basic morphological pattern of *Scissula*, *candeana* is divergent, and there is some evidence, particularly in the strength of the right posterior lateral tooth, that may indicate that the species could be removed from the scissulate group. However, the thickness of the shell, the angle of the descent of the oblique sulci and the character of the pallial sinus present evidence that *candeana* is related to *similis*. Among other characters, these species may be separated most easily on

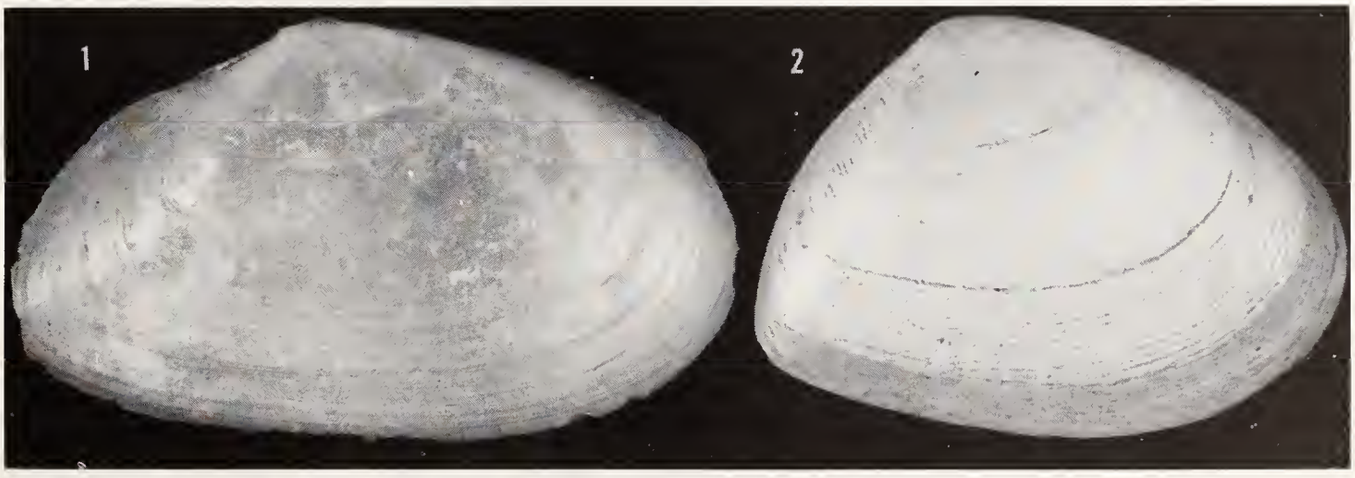

Plate 162. Fig. 1. *Tellina consobrina* d'Orbigny, external view of the right valve of the syntype, Martinique, BMNH (about 6.3x) [L=12.3 mm.]. Fig. 2. *Tellina candeana* d'Orbigny, external view of the right valve of the lectotype, Martinique, BMNH (about 6x) [L=10.5 mm.].

shape alone, where *similis* is subquadrate and *candeana* is subtrigonal. There are no species in the Eastern Pacific with which *candeana* could be closely related or confused. In the fossil record of the Western Atlantic, *Tellina calliglypta* Dall seems most closely allied to *candeana* and Olsson and Harbison (1953) have recorded the occurrence of the latter in the Pliocene of Florida. Rehder (1962) has listed *candeana* from the Pleistocene deposits on Grand Cayman Island.

Robertson (1959) has described the habitat of this species in the Bahamas. Usually, the species occurs among the rhizomes of *Thalassia*, but sometimes it may be found in sand substrates which are devoid of large plants. He also found large numbers of dead specimens of *candeana* in mud substrates at the northern end of North Sound, Bimini. The greatest depth recorded for this species is 6 fathoms, and Abbott (1958) has given its depth range at Grand Cayman as being between 6 and 25 feet.

Range. The northernmost continental extension of the range of this species is the southeastern coast of Florida, off Palm Beach; it is found in Bermuda, through the Bahamas, and south through the Lesser Antilles to Guadeloupe.

Specimens examined. Florida: off Palm Beach (MCZ); off Miami; off Caesar's Creek Bank (both USNM); Grassy Key; Key Vaca (both D. and N. Schmidt); Newfound Harbor Key; Key West; Boca Grande Key; Cedar Key (all USNM). Bermuda: Castle Island (USNM); Castle Rock; North Rock, in 4 fathoms (both MCZ). Bahama Islands: Bimini (MCZ); Cat Cay; off Mintie Bar, Andros; New Providence (all USNM); Governor's Harbour and Savannah Sound, Eleuthera; Orange Creek and Camptown, Cat Island; Little San Salvador; Simms, Long Island; Turks Island (all MCZ). Cuba: Cayo Levisa; Santa Rosa (both USNM); La Sortija, Caibarien; Guarda la Vaca, Banes, Oriente (both MCZ). Virgin Islands: Anegada; St. Thomas: St. Croix (all ANSP). Lesser Antilles: Martinique (BMNH); Guadeloupe (MCZ). Caribbean Islands: Gun Bay, West Beach, and Frank Sound, Grand Cayman (all ANSP).

Genus **Tellidora** *H. and A. Adams*

Tellidora (Mörch MS) H. and A. Adams 1856, Genera Recent Mollusca, **2**: 401 (type species, *Tellina burneti* Broderip and Sowerby 1829, subsequent designation Stoliczka, 1870, p. 116).

Tellipiura Olsson 1944, Bull. Amer. Paleo., Ithaca, N.Y., **28**: 221 (type species, *Tellidora* (*Tellipiura*) *peruana* Olsson 1944, original designation).

Description. Shell of medium size, trigonal, valves of unequal convexity, relatively thin, more or less equilateral, somewhat compressed; umbos high and centrally located; dorsal margin in distinct anterior and posterior portions both of which are spinose; two cardinal teeth in each valve, one bifid and one laminate; two lateral teeth in each valve, stronger in the right valve; surface of the valves more or less smooth but with growth lines and concentric sculpture. Ligament immersed and relatively short. Pallial sinus extensive, ascendant and nearly half of its lower margin confluent with the pallial line.

As has been noted by Dall (1900) and Olsson and Harbison (1953), the generic name *Tellidora* has often been attributed to Mörch, as indeed it had been by H. and A. Adams; however, there is no published usage of this name by Mörch prior to 1856. Two Recent species of this genus occur, one in the Western Atlantic region and another in the Eastern Pacific. Adams described two species, *pellyana* from the Persian Gulf

and *pusilla* from the Red Sea which he assigned to *Tellidora* but both appear to belong to *Merisca* or another related group.

Tellidora cristata (*Recluz*)

Plate 163, figs. 1–2

Lucina cristata Recluz 1842, Revue Zool. Societé Cuvier., 5: 270 (Campeche Banks); Guerin 1843, Mag. de Zool., pl. 60, 5 figs. [types not seen].

Tellidora (*Tellina*) *lunulata* H. and A. Adams 1856, Genera Recent Mollusca, 2: 401 [types not seen].

Tellidora lunulata H. and A. Adams [*in*] Holmes 1860, Post-Pleiocene Fossils of South Carolina, p. 47, pl. 9, figs. 7–7d (St. Andrews, South Carolina).

Tellidora cristata Recluz. Dall 1889, Bull. No. 37, U.S. Nat. Mus., p. 62.

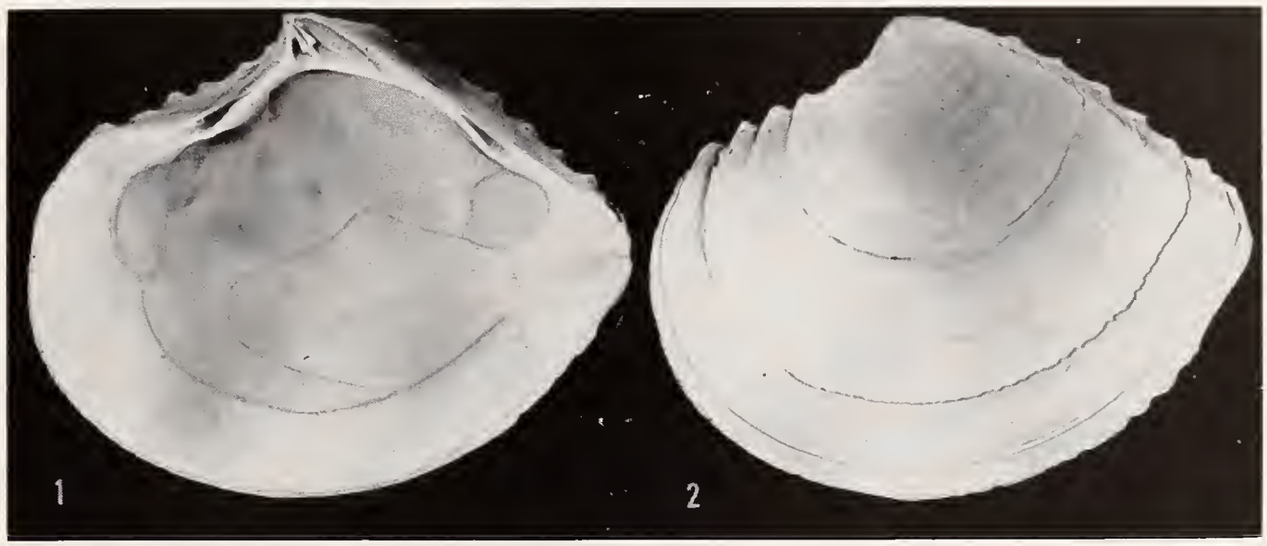

Plate 163. *Tellidora cristata* (Recluz). Fig. 1. Internal view of the right valve. Fig. 2. External view of the left valve, Progreso, Yucatan, MCZ 23589 (about 1.8x) [L=37 mm.].

Description. Shell reaching 37 mm. (about 1½ inches) in length and 30 mm. (about 1¼ inches) in height, subtrigonal, subsolid, compressed, without or with only a slight posterior flexure to the right and with the valves thin to fragile in immature stages. The left valve is much flattened and the right valve is tumid and convex. Umbos central, acute and elevated. Anterior margin broadly rounded; ventral margin rounded, rising posteriorly in an arcuation; posterior margin straight, extremely short and forming a truncation. Anterior and posterior dorsal margins with triangular spinosities. Sculpture consisting of strong narrow ridges somewhat irregularly and broadly spaced and not raised in older specimens. Ligament light brown, short and partially internal. The spines of the dorsal margin form a deep lunule and escutcheon. In the left valve, the posterior single laminate cardinal tooth generally weak and tending to become obsolete; anterior cardinal tooth weakly bifid; both lateral teeth distal to the cardinal complex. In the right valve, the single anterior laminate cardinal tooth narrow and weak in young specimens, obsolete in adults; posterior bifid cardinal tooth long and narrow; posterior lateral tooth distal to the cardinal complex and well developed but weaker than the strong, subproximal anterior lateral tooth. Adductor muscle scars well impressed. Anterior and posterior adductor muscle scars subequal; posterior scar nearly rounded. Pallial sinus similar in both valves, short, widely separated from the anterior adductor scar, falling arcuately to the pallial line and uniting with it posteriorly. The shell and umbo are milk-white internally and externally.

length	height	width	
36.8 mm.	29.0 mm.	6.5 mm.	Progreso, Yucatan
29.0	22.9	5.5	Cortez, Florida
26.7	20.2	4.2	Sanibel Island, Florida
13.0	10.2	2.2	Little Marco Island, Florida

Remarks. This species is the only living member of the genus in the Western Atlantic, and as such is easily recognized. Its peculiar trigonal shape combined with the dorsal extensions of the concentric sculpture immediately separate it from other species. Its nearest relative and closest ally, *Tellidora burneti*, occurs in the Eastern Pacific. From this species *cristata* may be distinguished by its convex right valve, flattened left valve, lower proportions and less convex anterior dorsal margin. It is interesting to note that the convexity and concavity of the valves in *burneti* is directly opposite in *cristata;* in *burneti*, the right valve is much flattened and noticeably concave whereas the left valve is convex.

Tellidora cristata is represented in the fossil history of the Western Atlantic by what has been called *Tellidora lunulata* 'Holmes' H. and A. Adams. This Pliocene and Pleistocene fossil is considered to be a synonym of the Recent species following the treatment by Dall (1900a). It has been recorded in the Pliocene and Pleistocene strata of Florida, the Carolinas and the Gulf Coast States.

This species is a shallow water form and Parker (1960) has delineated it in the inlet and deep channel faunal assemblages in the northern Gulf of Mexico. It prefers a bottom type which is predominantly sandy, at depths ranging from 8 to 45 feet.

Range. This species is found from Beaufort, North Carolina to the Florida Keys and along the Gulf Coast to Yucatan, Mexico.

Specimens examined. North Carolina: Beaufort (USNM). South Carolina: Isle of Palms (CM). Florida: Fort George; Key Largo; Pine Key; Cape Romano (all USNM); Little Marco Island; Sanibel; Tarpon Bay; Charlotte Harbor; Lemon Bay; Siesta Key; Cortez; Gulfport; Sea Horse Key, Cedar Keys (all MCZ). Alabama: Fort Morgan (MCZ). Louisiana: Santa Rosa Sound (USNM). Texas: Pass Cabello (USNM); Port Aransas (MCZ). Mexico: Campeche (ANSP); Progreso, Yucatan (MCZ).

BIBLIOGRAPHY

Abbott, R.T. 1958. The marine mollusks of Grand Cayman Island, British West Indies. Acad. Nat. Sci. Philadelphia, Monograph 11, 138 pp., 5 pls.

Adams, H. and A. Adams. 1856. The genera of Recent Mollusca, London, **2**: 388–403.

Afshar, F.A. 1950. Taxonomic revision of the Cretaceous and Cenozoic Tellinidae. Unpublished Ph.D. Dissertation, Johns Hopkins University, Baltimore, 137 pp.

Atkins, D. 1937a. On the ciliary mechanisms and interrelationships of lamellibranchs. Pt. 2. Quart. Jour. Micro. Sci., **79**: 339–373.

Atkins, D. 1937b. On the ciliary mechanisms and interrelationships of lamellibranchs. Pt. 3. Quart. Jour. Micro. Sci., **79**: 375–421.

Barrois, T. 1885. Les glandes du pied et les pores aquifères chez les lamellibranches. Danel, Paris, 169 pp.

Bartsch, P. 1933. Station records of the first Johnson-Smithsonian deep-sea expedition. Smith. Misc. Coll., **91**(1): 1–31.

Bertin, V. 1878. Révision des Tellinides. Nouv. Arch. Mus., Paris, ser. 2, **1**: 201–361, pls. vii and ix.

Born, I. 1778. Index rerum naturalium Musei Caesarei Vindobonensis. Pt. 1. Testacea. Vienna. 458 pp., 1 pl.

Born, I. 1780. Testacea Musei Caesarei Vindobonensis. Vienna, 442 pp., 18 pls.

Boss, K.J. and V.C. Kenk. 1964. Anatomy and relationships of *Temnoconcha brasiliana* Dall. Occ. Papers Dept. Mollusks, Harvard University, **2**(30): 325–344, pls. 56–60.

Carrière, J. 1879. Über die Drüsen im Fuss der Lamellibranchiaten. Arbeit. Zool. Inst. Wurzburg, **5**: 56–92.

Children, J.G. 1823. Lamarck's Genera of Shells. Quart. Jour. Sci., Lit., and Arts, **14**: 32.

Coomans, H.E. 1962. The marine mollusk fauna of the Virginian area as a basis for defining zoogeographical provinces. Beaufortia, **9**: 83–104.

Cossman, M. 1886. Catalogue illustré des coquilles fossiles de l'Éocène des environs de Paris. Ann. Soc. Roy. Mal. Belg., **21**: 68–99.

Dall, W.H. 1881. Preliminary report on the Mollusca [*Blake*]. Bull. Mus. Comp. Zool., Harvard College, **9**(2): 33–144.

Dall, W.H. 1889. A preliminary catalogue of the shellbearing marine mollusks and brachiopods of the southeastern coast of the United States. U.S. Nat. Mus., Bull. No. 37, 212 pp., 74 pls.

Dall, W.H. 1900a. Synopsis of the family Tellinidae and of the North American species. U.S. Nat. Mus., **23**: 285–326, pls. 2–4.

Dall, W.H. 1900b. Tertiary fauna of Florida. Transactions of the Wagner Free Institute of Science of Philadelphia, **3**(5): 1002–1039.

Dall, W.H. and C.T. Simpson. 1901. The Mollusca of Porto Rico. U.S. Fish. Comm., Bull., **20**(1): 351–524.

Dall, W.H., P. Bartsch, and H.A. Rehder. 1938. A manual of the Hawaiian Islands. Bull. Bishop Museum, Honolulu, No. 153, 230 pp., 58 pls.

Deshayes, G.P. Exploration scientifique de l'Algérie . . . 1840–42, Paris. Zoologie, vol. 1. Histoire naturelle des Mollusques, pp. xx, 609. Atlas, pp. 160, 155 pls.

Dodge, H. 1947. Lamarck's Prodrome d'une nouvelle classification des coquilles. Nautilus, **60**(1): 26–31; **61**(2): 60–70; **61**(4): 134–143.

Dodge, H. 1952. A historical review of the mollusks of Linnaeus. Part 1. The Classes Loricata and Pelecypoda. Bull. Amer. Nat. Hist., New York, **100**(1): 1–264.

Duvernoy, M. 1853. Mémoires sur le système nerveux des Mollusques Acephales. Mém. Acad. Sci., Paris, **24**: 3–312.

Ekman, S. 1953. Zoogeography of the sea. Sedgwick and Jackson Ltd., London.

Figueiras, A. 1962. Sobre nuevos hallazgos de Moluscos subfosiles de la transgresion querandina. Comunicaciones Soc. Mala. Uruguay, **1**(3): 53–68.

Fischer, P. 1887. Manuel de Conchyliologie. Paris, 1369 pp., 1158 text figs., 23 pls.

Gardner, J.A. 1928. The molluscan fauna of the Alum Bluff Group of Florida. U.S. Geol. Sur., Prof. Paper 142 A–I, Pt. 5, Chapter E, Tellinacea . . . , pp. 185–249.

Graham, A. 1934a. The cruciform muscle of lamellibranchs. Proc. Roy. Soc. Edinb., **54:** 17–30.

Graham, A. 1934b. The structure and relationships of lamellibranchs possessing a cruciform muscle. Proc. Roy. Soc. Edinb., **54:** 158–187.

Graham, A. 1937. On the ciliary currents on the gills of some Tellinacea (Lamellibranchiata). Proc. Roy. Soc. Edinb., **57:** 128–134.

Graham, A. 1949. The molluscan stomach. Trans. Roy. Soc. Edinb., **61**(3): 737–778.

Gray, J.E. 1847. A list of the genera of Recent Mollusca, their synonyms and types. Proc. Zool. Soc. London, **15:** 129–219.

Gualtieri, N. 1742. Index testarum conchyliorum quae adservantur in Museo Gualtieri. Florence, 23 pp., 110 pls.

Hanley, S. 1846. A monograph of the genus *Tellina*. [*in*] Sowerby, Thesaurus Conchyliorum, **1:** 221–336, pls. 57–66.

Hanley, S. 1855. Ipsa Linnaei Conchylia. The shells of Linnaeus determined from his manuscripts and collections. London, 556 pp., 5 pls.

Herrmannsen, A.N. 1846–49. Indicis generum malacozoorum primordia. Cassellis, vol. 1 (1846-47), 637 pp.; vol. 2 (1847–49), 717 pp.

Hertlein, L.G. and A.M. Strong. 1949. Eastern Pacific expeditions of the New York Zoological Society. Mollusks from the west coast of Mexico and Central America. Part VII. Zoologica, **34**(2): 63–97, 1 pl.

Hoffmann, F. 1914. Beiträge zur Anatomie und Histologie von *Tagelus dombeyi* (Lamarck). Jena Zeit. Naturw., **52:** 521–561.

Holmes, F.S. 1860. Post-Pleiocene fossils of South Carolina. Charleston, S.C., 128 pp., 28 pls.

Ihering, H. von. 1876. Die Gehörwerkzeuge der Mollusken in ihrer Bedeutung für das natürliche System. Erlangen, Habilitationsschrift, 33 pp.

Ihering, H. von. 1901. The musculus cruciformis of the order Tellinacea. Proc. Acad. Nat. Sci. Philadelphia, pp. 480–481.

Ihering, H. von. 1907. Les mollusques fossiles du Tertiaire et du Crétacé Supérieur de l'Argentine. Anales del Museo Nacional de Buenos Aires, 14 (ser. 3), **7:** 1–611.

Ihering, H. von. 1927. Die Geschichte des Atlantischen Ozeans. Jena, 237 pp.

Jeffreys, J.G. 1863. British Conchology, London, vol. 3, 393 pp., 8 pls.

Johnson, C.W. 1932. Some notes on the New England species of *Tellina*. Nautilus, **45**(4): 109–111.

Johnson, C.W. 1934. List of marine Mollusca of the Atlantic coast from Labrador to Texas. Proc. Boston Soc. Nat. Hist., **40**(1): 1–204.

Keen, A.M. 1958. Sea shells of tropical west America. Stanford Univ. Press, 624 pp., 10 color plates, 1709 figs.

Kellogg, J.L. 1915. Ciliary mechanisms of lamellibranchs with descriptions of anatomy. Jour. Morph., **26:** 625–701.

Kennard, A.S., A.E. Salisbury and B.B. Woodward. 1931. The types of Lamarck's Genera of Shells as selected by J.G. Children in 1823. Smith. Misc. Coll., **82**(17): 1–40.

Kobelt, W. 1876–1881. Illustrirtes conchylienbuch. Nürnberg. 391 pp. (see Rehder, H. 1952. Nautilus, **6:** 59–60).

Lamarck, J.B. 1799. Prodrome d'une nouvelle classification des coquilles. Mém. Soc. Hist. Nat. Paris, pp. 63–90.

Lamarck, J.B. 1801. Système des animaux sans vertèbres ou tableau general des classes, des orders et des genres de ces animaux. Paris, 432 pp.

Lamarck, J.B. 1818. Histoire naturelle des animaux sans vertèbres. Paris, **5:** 519–535.

Lister, M. 1678. Historiae Animalium Angliae. London, 250 pp., 9 pls.

Lister, M. 1770. Historiae sive synopsis methodicae conchyliorum. Editio Altera. Oxonii.

Lovén, S. 1848. Beiträge zur Kenntniss der Entwicklung der Mollusca Acephala Lamellibranchiata. Stockholm, 39 pp., 15 pls.

Lynge, H. 1909. The Danish Expedition to Siam 1899–1900. IV. Marine Lamellibranchiata. D.Kon. Dansk. Viden. Selsk. Skrift., Kobenhavn, 7 Raekke, Natur. og Math., Afdel. 5, no. 3, pp. 97–299, 5 pls., 1 map.

Magalhaes, J. and S. Mezzalira. 1953. Moluscos fosseis do Brasil. Biblioteca Cientifica Brasileira, Ser. A–IV, 283 pp., 94 pls.

Mansfield, W.C. 1932. Miocene pelecypods of the Choctawhatchee Formation of Florida. Florida State Geol. Sur., Bull. 8, 164 pp., 34 pls.

Mansfield, W.C. 1938. Mollusks of the Tampa and Suwannee Limestones of Florida. Geological Bull. 15, Florida Dept. of Conservation, 282 pp., 21 pls.

Maury, C.J. 1917. Santo Domingo type sections and fossils. Bull. Amer. Paleontology, **5**(29): 419–459.

Maury, C.J. 1920. Recent Mollusca of the Gulf of Mexico and Pleistocene and Pliocene species from the Gulf States. Pt. 1. Pelecypoda. Bull. Amer. Paleontology, **8**(34): 33–148.

Maury, C.J. 1925. A further contribution to the paleontology of Trinidad. Bull. Amer. Paleontology, **10** (42): 152–402.

Maury, C.J. 1934. Fossil invertebrata from NE Brasil. Bull. Amer. Mus. Nat. Hist., **67**(4): 123–179.

Mazyck, W.G. 1913. Catalogue of Mollusca of South Carolina. Contrib. No. 2, Charleston Museum, 39 pp.

McLean, R.A. 1951. The pelecypoda or bivalve mollusks of Porto Rico and the Virgin Islands. Scientific Survey of Porto Rico and the Virgin Islands. New York Acad. Sci., **17**(1): 1–183.

Megerle von Mühlfeld, J.D. 1811. Entwurf eines neuen Systems der Schalthiergehause. Gesellschaft Naturforschender Freunde Berlin, Magazin, **5**: 38–72.

Melvill, J.C. and R. Standen. 1907. The Mollusca of the Persian Gulf, Gulf of Oman, and Arabian Sea. Proc. Zool. Soc. London, pp. 783–848.

Moore, H.B. 1930. The specific identification of faecal pellets. Jour. Mar. Biol. Assoc. U.K., **17**: 359–365.

Moore, H.B. 1931. The systematic value of a study of molluscan faeces. Proc. malac. Soc. London, **19**: 281–290.

Odhner, N. 1912. Morphologische und phylogenetische Untersuchungen über die Nephridien der Lamellibranchien. Zeit. wissen. Zool., **100**(2): 287–391.

Odhner, N. 1914. Notizen über die Fauna der Adria bei Rovigno. Zool. Anz., **44**: 156–170.

Olsson, A.A. 1961. Mollusks of the Tropical Eastern Pacific. Panamic-Pacific Pelecypoda. Paleontological Research Inst., Ithaca, N.Y., 574 pp., 86 pls.

Olsson, A.A. and A. Harbison. 1953. Pliocene Mollusca of southern Florida. Acad. Nat. Sci. Philadelphia, Monograph 8, Pt. 1, 361 pp.

Olsson, A.A. and T. McGinty. 1958. Recent marine mollusks from the Caribbean coast of Panama. Bull. Amer. Paleontology, **39**(177): 1–58, 5 pls.

Owen, G. 1955. Observations on the stomach and digestive diverticula of the Lamellibranchia. 1. The Anisomyaria and Eulamellibranchia. Quart. Jour. Micro. Sci., **96**(4): 517–537.

Paetel, F. 1890. Catalog der Conchylien-Sammlung. Berlin, vol. 3.

Parker, R.H. 1956. Macro-invertebrate assemblages as indicators of sedimentary environments in east Mississippi delta region. Bull. Amer. Assoc. Pet. Geol., **40**(2): 295–376.

Parker, R.H. 1960. Ecology and distributional patterns of macroinvertebrates, northern Gulf of Mexico. Recent Sediments, Northwest Gulf of Mexico, 1951–1958. Published by the Amer. Assoc. Pet. Geol., Tulsa, pp. 302–381.

Peile, A.J. 1926. The mollusca of Bermuda. Proc. malac. Soc. London, **17**: 71-98.

Pelseneer, P. 1911. Les lamellibranches de l'expedition du Siboga. Partie Anatomique. Leiden, 125 pp., 25 pls.

Poli, I.X. 1795. Testacea Utriusque Siciliae. Parma, vol. 1.

Purchon, R.D. 1960. The stomach in the Eulamellibranchia; Stomach Types IV and V. Proc. Zool. Soc. London, **135**(3): 531–489.

Ravenel, E. 1885. Tellinidae of South Carolina. Proc. Elliot Society, **2**(5): 33–40.

Rees, C.B. 1950. Identification and classification of lamellibranch larvae. Hull Bull. Mar. Ecology, **3**(19): 73–104.

Rehder, H.A. 1962. The Pleistocene mollusks of Grand Cayman Island with notes on the geology of the islands. Jour. of Paleo., **36**(3): 583–585.

Richards, H.G. 1962. Studies on the marine Pleistocene, Pts. I and II, Trans. Amer. Phil. Soc. Philadelphia, New Ser., **52**(3): 5–141, 21 pls.

Ridewood, W.G. 1903. On the structure of the gills of the Lamellibranchia. Phil. Trans. Roy. Soc. London, Ser. B, **195**: 147–284.

Robertson, R. 1959. Marine mollusks of Bimini, Bahama Islands. Unpublished Ph.D. Dissertation, Harvard University, 294 pp.

Romer, E. 1870–1873. Die Familie der Tellmuscheln, Tellinidae. [*in*] Martini-Chemnitz, Conchilien-Cabinet [*sic*] (2), **10**(4): 1–291, 52 pls.

Salisbury, A.E. 1934. On the nomenclature of Tellinidae. Proc. malac. Soc. London, **21**(2): 74-91, pls. 9–14.

Schmidt, F.C. 1818. Versuch der Conchylien-Sammlungen. Gotha, 252 pp.

Smith, E.A. 1890. On the marine Mollusca of St. Helena. Proc. Zool. Soc. London, pp. 247–322.

Sowerby, G.B. 1869. [*in*] Reeve, Conchologia Iconica, **17, Tellina,** 58 pls.

Spengler, L. 1798. Over det toskallede slaegt tellinerne. Skrivter af Naturhistorie Selskabet, Kobenhavn, **4**(2); 67–127.

Stoliczka, F. 1870–1871. Memoirs Geol. Survey India. Palaeontologia Indica. Cretaceous Fauna of southern India, **3**: 1–537.

Sullivan, C.M. 1948. Bivalve larvae of Malpeque Bay, Prince Edward Id. Res. Board, Canada, Bull. 77, 36 pp.

Thiele, J. 1935. Handbuch der systematischen Weichtierkunde. Jena, **2**: 779–1154.

Trueman, E.R. 1942. The structure and deposition of the shell of *Tellina tenuis.* Jour. Roy. Micro. Soc., **62**: 69–92.

Trueman, E.R. 1949. The ligament of *Tellina tenuis.* Proc. Zool. Soc. London, **119**(3): 717–742.

Tryon, G.W. 1869. Catalogue of synonymy of the genera, species and varieties of Recent Mollusca. Pt. 2. American Jour. Conch., **4**: 72–106.

Tuomey, M. and F.S. Holmes. 1857. Pleiocene Fossils of South Carolina. Charleston, S.C., 152 pp., 30 pls.

Verrill, A.E. and K.J. Bush. 1898. Revision of the deepwater Mollusca of the Atlantic coast of North America. Pt. 1 Bivalvia. Proc. U.S. Nat. Mus., **20**: 775–901, pls. 71–97.

Warmke, G.L. and R.T. Abbott. 1961. Caribbean Seashells. Narberth, Pennsylvania, 346 pp., 44 pls.

White, K.M. 1942. The pericardial cavity and the pericardial gland of the Lamellibranchia. Proc. malac. Soc. London, **25**: 37–88.

Woodring, W.P. 1925. Miocene mollusks from Bowden, Jamaica. Pelecypods and Scaphopods. Carnegie Inst. Washington, Publ. No. 366, 222 pp., 28 pls.

Woodring, W.P. 1954. Caribbean land and sea through the ages. Geol. Soc. Amer., Bull. 65, **8**: 719–732.

Yonge, C.M. 1949. On the structure and adaptations of the Tellinacea. Phil. Trans. Roy. Soc. London, Ser. B, No. 609, **234**: 29–76.