

MEMOIR 1: MIAMI GEOLOGICAL SOCIETY

A SYMPOSIUM OF RECENT SOUTH FLORIDA FORAMINIFERA

by

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Bulimina spicata Phleger and Parker, 1951 (Plate 17, Fig. 7)

Bulimina spicata Phleger and Parker, 1951, Mem. G.S.A., vol. 46, pt. 2, p. 16, Pl. 7, Figs. 25a-c, 30, 31.

Diagnosis. Test small, one-and-one-half to two times as long as broad, initial end sometimes with small spine, consisting of three or four whorls, last-formed whorl forming at least three-fifths of test; chambers fairly distinct, those of each whorl overhanging previous ones slightly, chambers of last-formed whorl somewhat inflated; sutures of last-formed chambers distinct, depressed, earlier ones indistinct; wall of most of last-formed whorl smooth, finely perforate, lower part of last-formed whorl and remainder of test ornamented by indefinite low costae terminated by sharp spines pointing downward below margin of chambers; aperture elongate, extending over apex of test from base of last chamber well above suture joining second and third chambers.

Discussion. This species occurs at seven stations, all of which are in deeper waters outside the actual confines of Florida Bay, usually in low frequencies.

GENUS GLOBOBULIMINA Cushman, 1927Globobulimina mississippiensis Parker, 1954 (Plate 17, Fig. 8)

Globobulimina mississippiensis Parker, 1954, Bull. Mus. Comp. Zool., vol. 111, no. 10, p. 511, Pl. 7, Figs. 3, 4, 10.

Diagnosis. Test of medium size, ovate, with greatest width usually below or near middle, sometimes almost as long as broad; initial end rounded in megalospheric form, slightly pointed in microspheric; chambers slightly inflated, last-formed whorl making up one-eighth to one-seventh of test; sutures very slightly depressed; wall thin, translucent, finely perforate; aperture with thickened border, tongue extending from test, curved, with regular, non-tooth border.

Discussion. This species is represented by only a few species at station 103.

SUBFAMILY CHRYSALIDINELLA Schubert, 1908Chrysalidinella dimorpha (Brady), 1881 (Plate 17, Fig. 9)

Chrysalidina dimorpha Brady, 1881, Quart. Journ. Micro. Soc., vol. 21, p. 24.

Chrysalidinella dimorpha Schubert, 1907, Neues Jahrb. fur Min., vol. 25, p. 243.

Diagnosis. Test about twice as long as broad, triangular in transverse section, early triserial portion with sides nearly parallel, periphery acute, earlier portion typically with backward-projecting spinose processes, sides slightly concave; chambers distinct, not inflated; sutures distinct, not depressed, slightly limbate, strongly curved, especially towards angles of test; wall smooth, distinctly perforate; aperture consisting of series of fine rounded pores on apertural face.

Discussion. This species occurs as single specimens at three stations.

GENUS REUSSELLA Galloway, 1933Reussella atlantica Cushman, 1947 (Plate 17, Fig. 10)

Reussella spinulosa (Reuss) var. atlantica Cushman, 1947, Contr. Cush. Lab. Foram. Res., vol. 23, pt. 4, p. 91, Pl. 20, Figs. 6, 7.

Diagnosis. Test small, slender; chambers triserial extending downward forming sawtooth edge to periphery; wall thin, transparent, coarsely perforate; aperture triangular.

Discussion. This species occurs at four widely separated stations, in very low frequencies.

FAMILY UVIGERINIDAE Haeckel, 1894

GENUS UVIGERINA d'Orbigny, 1826

Uvigerina flintii Cushman, 1923 (Plate 17, Fig. 11)

Uvigerina tenuistriata Flint, (not Reuss), 1897 (1899), Rep. U.S. Nat. Mus., p. 320, Pl. 68, Fig. 1.

Uvigerina flintii Cushman, 1923, U.S. Nat. Mus., Bull. 104, pt. 4, p. 165, Pl. 42, Fig. 13.

Diagnosis. Test somewhat elongate, not more than twice as long as broad, fusiform or oval; chambers rather obscure; sutures only slightly depressed, partially hidden by ornamentation of surface which consists of numerous very fine longitudinal costae only slightly raised above general surface, entire test thin, translucent, shiny; apertural end slightly depressed, apertural neck with base in this hollow, outer end with flaring lip, sides of neck with two or three ring-like projections.

Discussion. This species occurs at seven stations, usually in low frequencies. All the stations where it occurs are either located in the adjacent Gulf of Mexico waters or between the Florida Keys and the reef tract.

Uvigerina peregrina Cushman, 1923 (Plate 17, Fig. 12)

Uvigerina pygmaea Flint (not d'Orbigny), 1897 (1899), Rep. U.S. Nat. Mus., p. 320, Pl. 68, Fig. 2.

Uvigerina peregrina Cushman, 1923, U.S. Nat. Mus., Bull. 104, pt. 4, p. 166, Pl. 42, Figs. 7-10.

Diagnosis. Test elongate, about two-and-one-half times as long as broad, widest in middle, ends rounded; chambers fairly numerous, inflated, distinct; sutures depressed, lines of sutures indistinct; wall ornamented with longitudinal costae, about ten on full-grown chamber, those of each chamber usually not continuous with those of adjacent chambers, high, very thin, sharp, becoming discontinuous in spinose or irregular short portions at either end of test; wall between costae and costae themselves distinctly granular; aperture circular at end of distinct cylindrical neck, often spinose, with phialine lip.

Discussion. This species occurs at five stations in low frequencies. It occurs at station 1 in the deep water of the Straits of Florida and at four stations in the adjacent Gulf of Mexico waters.

GENUS TRIFARINA Cushman, 1923

Trifarina bella (Phleger and Parker), 1951 (Plate 17, Fig. 13)

Angulogerina bella Phleger and Parker, 1951, Mem. U.S. Nat. Mus., vol. 46, p. 12, Pl. 6, Figs. 7, 8.

Diagnosis. Test elongate, nearly uniform breadth in microspheric form, shorter, broader with greatest breadth about middle in megalospheric, initial end subacute often with few short, blunt terminal spines, later portion irregularly triangular in cross section, early portion irregular; periphery of later portion of test sharply angled, of early portion irregular due to chamber overhang; early chambers sharply undercut with pointed projections giving spinose appearance, later chambers with flattened sides projecting into sharp overhang at angles; sutures indistinct in early portion of test, slightly depressed in later portion; wall thin, coarsely perforate with short, blunt spines in initial portion of test; aperture with slender neck, well defined lip.

Discussion. This species is represented by a single specimen at station 106.

Trifarina bradyi Cushman, 1923 (Plate 17, Fig. 14)

Rhabdogonium tricarinarum Brady, 1884, Rep. Voy. Challenger, Zool., vol. 9, p. 525, p. 67, Figs. 1-3.

Trifarina bradyi Cushman, 1923, U.S. Nat. Mus., Bull. 104, pt. 4, p. 99, Pl. 22, Figs. 3-9.

Diagnosis. Test elongate, slightly tapering toward either end, often somewhat twisted, triangular in transverse section, with carinae at three angles, thin, fragile, high, running from initial end to aperture, even onto neck in self; chambers distinct, those of earlier portion irregularly spiral, later ones less distinctly so; sutures distinct, not depressed; wall thin, translucent, finely punctate, smooth; aperture terminal, central, at end of short, tubular neck, usually with fine phialine lip.

Discussion. This species is represented by two specimens from station 1.

SUPERFAMILY DISCORBACEA Ehrenberg, 1838

FAMILY DISCORBIDAE Ehrenberg, 1838

SUBFAMILY DISCORBINAE Ehrenberg, 1838

GENUS DISCORBIS Lamarck, 1804

Discorbis rosea (d'Orbigny), 1826 (Plate 17, Figs. 15, 16)

Rotalia rosea d'Orbigny, 1826, Ann. Sci. Nat., vol. 7, p. 272, no. 7.

Truncatulina rosea Brady, 1884, Rep. Voy. Challenger, Zool., vol. 9, p. 667, Pl. 96, Fig. 1.

Rotorbinella rosea Bandy, 1944, Journ. Paleont., vol. 18, p. 372.

Discorbina rosea Hornibrook and Vella, 1954, The Micropal., vol. 8, no. 1, p. 26.

Diagnosis. Test trochoid, biconvex, dorsal side often with high spire, periphery acute, or with small spinose projections, or with irregular plate-like extensions at each chamber, umbilical area with distinct plug; chambers usually nine to ten in last-formed whorl, increasing gradually in size as added, not inflated; sutures limbate, not raised, oblique on dorsal side, nearly radial on ventral side, flush on dorsal side, depressed on ventral side; wall coarsely perforate, smooth or ornamented with bead-like projections, especially near periphery; aperture elongate slit at inner margin of ventral side of chamber, with considerable lip developed above it; color rose-red to reddish-brown.

Discussion. This species occurs at only four stations, 2, 3, 4 and 16, but at these stations it is common or abundant. Stations 2, 3 and 4 are located between the reef tract and the Florida Keys and is a typical back reef area. From observing Discorbis rosea from similar areas throughout the Bahama Islands it appears to be characteristic of back reef environments. In some places such as the pink beach sands of Eleuthera and Cat Islands in the Bahamas tests of this species makes up a considerable portion of the particles which give the pink hue to the sands. The occurrence of this species at station 16 within Florida Bay is unexpected and the reasons for this occurrence problemetical.

Discorbis aguayoi Bermudez, 1935 (Plate 18, Figs. 1, 2)

Discorbis aguayoi Bermudez, 1935, Soc. cubana hist. nat. Mem., vol. 9, p. 204, Pl. 15, Figs. 10-14.

Discorinopsis aguayoi (Bermudez) - Phleger, Parker and Peirson, 1953, Cush. Found. Foram. Res., Spec. Publ. 2, p. 7, Pl. 4, Figs. 23, 24.

Diagnosis. Test vitreous, lightly trochoid, periphery circular, slightly lobulated, margin rounded; dorsal side formed by numerous subglobular chambers, ten in last-formed coil, finely perforate; sutures limbate in first-formed coils, depressed in last-formed coil, in some specimens limbate throughout with initial chambers visible on dorsal side; ventral side flat,

with spongy shell material occupying nearly entire surface, formed by layer of radial, rugose costae which do not reach peripheral margin of chambers; aperture slit-like at base of last-formed chamber.

Discussion. This species occurs at only two stations, but at one station it is very abundant and at the other it is common. The stations where it occurs are very shallow with depths of less than one meter.

Discorbis mira Cushman, 1922 (Plate 18, Figs. 3, 4)

Discorbis mira Cushman, 1922, Carnegie Inst. Washington, Publ. 311, p. 39, Pl. 6, Figs. 10, 11.

Discorbis mirus (Cushman). Graham & Militante, 1959, Stanford Univ. Publ., Geol. Sci., v. 6, no. 2, p. 93, Pl. 13, Fig. 23.

Discorbina turbo d'Orbigny, sp.-Brady, 1884, Rep. Voy. Challenger, Zool., v. 9, p. 642, Pl. 87, Fig. 8.

Rotorbinella mira (Cushman). Todd, 1965, U.S. Nat. Mus., Bull. 161, pt. 4, p. 18, Pl. 8, Fig. 2.

Diagnosis. Test plano-convex, dorsal side forming low cone, ventral side flattened, very slightly convex, trochoid, last-formed whorl consisting of about six chambers; sutures oblique, curved very slightly, if at all, depressed on dorsal side, on ventral side depressed, area thus formed often filled by alar prolongations from center; periphery slightly lobulate, on dorsal side sutures often slightly limbate; walls coarsely punctate, on dorsal side irregularly so, punctae near outer margin of chamber, less frequent elsewhere; aperture elongate, slightly arched slit at inferior margin of chamber.

Discussion. This species occurs at 26 stations, usually in medium frequencies. It appears to be most common in the shallow waters adjacent to the lower Florida Keys.

GENUS LATICARININA Galloway and Wissler, 1927

Laticarinina halophora (Stache), 1864 (Plate 18, Figs. 5, 6)

Pulvinulina repanda var. menardii, subvar. pauperata Parker and Jones, 1865, Philos. Trans., vol. 155, p. 395, Pl. 16, Figs. 50, 51.

Pulvinulina pauperata Brady, 1884, Rep. Voy. Challenger, Zool., vol. 9, p. 696, Pl. 104, Figs. 3-11.

Robulina halophora Stache, 1864, Novara Exped. 1857-59, Wien, vol. 1, pt. 2, p.

Laticarinina halophora (Stache) Finlay, 1940, Trans. Roy. Soc. N.Z., vol. 69, p. 467-8.

Diagnosis. Test in young trochoid, in adult becoming planispiral or nearly so, early chambers close-coiled, later ones becoming loosely coiled with broad plate between coils; periphery with broad, thin, transparent carina; chambers numerous, inflated, ten to fifteen in last-formed coil; sutures depressed; aperture narrow opening on ventral side near periphery.

Discussion. A single specimen of this species occurred at station 4.

GENUS NEOCONORBINA Hofker, 1951

Neoconorbina orbicularis (Terquem), 1876 (Plate 18, Figs. 7, 8)

Rosalina orbicularis Terquem, 1876, Ess. Anim. Plage Dunkerque, pt. 2, p. 75, Pl. 9, Figs. 4a, b.

Discorbis orbicularis Berthelin, 1878, Foram. de Borgneuf et Pornichet, p. 39, no. 63.

Discorbina orbicularis Brady, 1884, Rep. Voy. Challenger, Zool., v. 9, p. 647, Pl. 88, Figs. 4-8.

Neoconorbina orbicularis Hofker, 1951, Arch. Neerlandaises Zool., v. 8, pt. 4, p. 357.

Conorbina orbicularis Parker, 1954, Bull. Mus. Comp. Zool., v. 111, no. 10, p. 522, Pl. 8, Figs. 13, 14.

Diagnosis. Test plano-convex, dorsal side forming low cone, ventrally flat or more often somewhat concave, circular in outline, periphery acute; chambers elongate, each often making up nearly half of circumference, distinct; wall finely to coarsely perforate, smooth; aperture ventral, elongate opening beneath somewhat extended central portion of last-formed chamber.

Discussion. This species had rare to common occurrences at eight stations located in Florida Bay and the lower Florida Keys.

GENUS ROSALINA d'Orbigny, 1826

Rosalina candeiana d'Orbigny, 1839

Rosalina candeiana d'Orbigny, 1839, in De la Sagra, Hist. Phys. Pol. Nat. Cuba, "Foraminiferes", p. 97, Pl. 4, Figs. 2-4.

Truncatulina candeiana (d'Orbigny) Cushman, 1921, Proc. U.S. Nat. Mus., vol. 59, no. 2360, p. 57, Pl. 13, Figs. 4, 5.

Truncatulina cora Cushman, (not d'Orbigny), 1922, Carnegie Inst. Wash., vol. 17, Publ. 311, p. 48, Pl. 7, Figs. 3-5.

Discorbis candeiana (d'Orbigny) Cushman, 1931, Bull. 104, U.S. Nat. Mus., pt. 8, p. 19, Pl. 7, Fig. 4.

Diagnosis. Test rotaliform, dorsal side convex, ventral side concave; chambers comparatively few, early ones large; wall coarsely punctate on dorsal side, smooth on inner concave portion; aperture elongate, arched opening at base of last-formed chamber, opening into umbilical area.

Discussion. This species closely resembles Rosalina floridana, and probably the two should be considered as a single species. The variability shown by both these species is probably due to their method of attachment, as suggested by Todd (1965, p. 11). Banner and Blow (1960a, p. 37) suggest that Rosalina candeiana be considered a nomen dubium and be abandoned.

Rosalina floridana (Cushman), 1922 (Plate 18, Figs. 9, 10)

Discorbis floridana Cushman, 1922, Carnegie Inst. Wash., Publ. 311, p. 39, Pl. 5, Figs. 11, 12.

Rosalina floridana (Cushman) Parker, 1954, Bull. Mus. Comp. Zool., vol. 111, no. 10, p. 524, Pl. 8, Figs. 19, 20.

Diagnosis. Test rotaliform, dorsal side convex, ventral side concave; chambers relatively few, early ones small; wall punctate on dorsal side, punctate near periphery on ventral side, smooth on inner concave portion; aperture elongate, arched opening at base of last-formed chamber, opening into umbilical area.

Discussion. The same discussion as appears under Rosalina candeiana applied here. The two species considered simultaneously occur at 58 stations, all in the shallow waters of Florida Bay proper. They are absent, however, from the stations adjacent to the Florida mainland which become very brackish during the rainy season.

Rosalina floridensis (Cushman), 1931 (Plate 18, Figs. 11, 12)

Discorbis bertheloti (d'Orbigny) var. floridensis Cushman, 1931, Bull. 104, U.S. Nat. Mus., pt. 8, p. 17, Pl. 3, Figs. 3-5.

Diagnosis. Test large, rotaliform, dorsal side convex, ventral side concave; chambers very few; periphery nearly round with keel; last-formed chamber with extension covering umbilical

area on ventral side; wall very coarsely punctate; aperture arched opening at base of last-formed chamber on ventral side.

Discussion. This species is present at only three stations in very low frequencies.

GENUS TRETOMPHALUS Mobius, 1880

Tretomphalus atlanticus Cushman, 1934 (Plate 19, Figs. 1-3)

Tretomphalus atlanticus Cushman, 1934, Contr. Cushman Lab. Foraminifera Res., vol. 10, pt. 4, p. 86, Pl. 11, Fig. 3, Pl. 12, Fig. 7.

Diagnosis. Test in earliest portion close-coiled, later with chambers becoming arranged radially in fours, finally developing a large, globular float chamber, becoming planktonic; chambers distinct, numerous, about six to whorl in early portion, later radiate, generally triangular on ventral side; wall coarsely perforate; aperture arched opening at base of last-formed chamber, opening into umbilical area in benthic portion, consisting of areal pores on pelagic float chamber.

Discussion. This species occurs at 12 stations in very low frequencies. There seems to be no definite pattern to its distribution.

SUBFAMILY BAGGININAE Cushman, 1927

GENUS CANCRIS Montfort, 1808

Cancris oblonga (Williamson), 1858 (Plate 19, Figs. 4, 5)

Rotalina oblonga Williamson, 1858, Rec. Foraminifera Great Britain, p. 51, Pl. 4, Figs. 98-100.

Cancris oblonga Phleger and Parker, 1951, Mem. G.S.A., vol. 46, pt. 2, p. 20, Pl. 9, Figs. 17-19.

Diagnosis. Test trochoid, large, biconvex; chambers few, rapidly enlarging, lobe-like extension from last-formed chamber covering umbilical area; periphery lobulate; wall perforate; aperture narrow, on inner border of ventral side of last-formed chamber.

Discussion. This species occurs at only five stations in very low frequencies.

Cancris sagra (d'Orbigny), 1839 (Plate 19, Figs. 6, 7)

Rotalina sagra d'Orbigny, 1839, in De la Sagra, Hist. Fis. Pol. Nat. Cuba, "Foraminifera", p. 77, Pl. 5, Figs. 13-15.

Pulvinulina sagra Cushman, 1918, Bull. 103, U.S. Nat. Mus., p. 70, Pl. 24, Figs. 6a, b.

Pulvinulina semipunctata Cushman, 1922, Publ. 311, Carnegie Inst. Wash., p. 51, Pl. 8, Figs. 5, 6.

Pulvinulina oblonga Brady, Parker and Jones, 1888, Trans. Zool. Soc. London, v. 12, p. 229, Pl. 46, Fig. 5.

Cancris sagra Cushman, 1931, Bull. 104, U.S. Nat. Mus., pt. 8, p. 74, Pl. 15, Figs. 2a-c.

Diagnosis. Test unequally biconvex, dorsal side more flattened than ventral; chambers comparatively few, 7 to 10, rapidly increasing in size in last-formed coil, last-formed chamber on ventral side making up nearly half area of test; periphery sharply carinate; sutures depressed slightly, distinct, curved; wall very finely punctate, except inner part of ventral side, which is of clear shell material without punctate, wall very thin, translucent, or even transparent where no punctae exist; aperture small opening at ventral side of last-formed chamber, narrow, slightly curved.

Discussion. This species was very rare, single specimens only being found at three stations.

GENUS VALVULINERIA Cushman, 1926

Valvulineria cf. V. araucana (d'Orbigny), 1839 (Plate 19, Figs. 8, 9)

Rosalina araucana d'Orbigny, 1839, in De la Sagra, Hist. Phys. Pol. Nat. Cuba, "Foraminiferes", p. 44, Pl. 6, Figs. 16-18.

Diagnosis. Test trochoid, plano-convex; lobe-like plate extending from last-formed chamber covering umbilical area.

Discussion. This species occurs at eight stations, usually as single specimens.

FAMILY SIPHONINIDAE Cushman, 1927

GENUS SIPHONINA Reuss, 1850

Siphonina pulchra Cushman, 1919 (Plate 19, Figs. 10, 11)

Siphonina pulchra Cushman, 1919, Publ. 291, Carnegie Inst. Wash., p. 42, Pl. 14, Figs. 7a-c.

Siphonina reticulata Cushman (not Czjzek), 1919, Publ. 291, Carnegie Inst. Wash., p. 42.

Diagnosis. Test nearly circular, about equally biconvex, periphery subacute or even somewhat rounded, compressed; chambers usually five in last-formed volution, not inflated; sutures distinct, not depressed, limbate; wall smooth, conspicuously perforate; aperture elliptical, with distinct lip, short, well-marked neck.

Discussion. This species is represented by single specimens at stations 77 and 89.

FAMILY ASTERIGERINIDAE d'Orbigny, 1839

GENUS ASTERIGERINA d'Orbigny, 1839

Asterigerina carinata d'Orbigny, 1839 (Plate 19, Fig. 12; Plate 20, Fig. 1)

Asterigerina carinata d'Orbigny, 1839, in De la Sagra, Hist. Fis. Pol. Nat. Cuba, "Foraminiferes", p. 118, Pl. 5, Fig. 25; Pl. 6, Figs. 1, 2.

Diagnosis. Test unequally biconvex, coiled, dorsal side very slightly convex, ventral side strongly so, almost conical; chambers numerous about 3 coils; six or seven chambers forming last-formed coil; sutures oblique, very slightly limbate, produced to form slight translucent keel, sutures curved, oblique on dorsal side, on ventral side supplementary chambers extending nearly to periphery, forming rhomboid areas; sutures distinct, very slightly depressed; wall smooth, finely punctate, usually glistening, often somewhat roughened by lines of small granules near aperture which is elongate, narrow slit extending from umbilical area about halfway to periphery, usually with slight, thin lip.

Discussion. This species is represented by a few specimens at station 107.

FAMILY EPISTOMARIIDAE Hofker, 1954

GENUS PSEUDOEPONIDES Uchio, 1950

Pseudoeponides umbonatus (Reuss), 1851

Rotalina umbonata Reuss, 1851, Zietschr. Deutsch. Geol. Res., vol. 3, p. 75, Pl. 5, Figs. 35a-c.

Diagnosis. Test trochoid, plano-convex; umbilical region closed with central plug of clear shell material; wall coarsely perforate; main aperture low opening at base of last-formed chamber between umbilicus - periphery on ventral side, may have supplementary apertures on dorsal side.

Discussion. This species is represented by a single specimen at station 90.

SUPERFAMILY SPIRILLINACEA Reuss, 1862

FAMILY SPIRILLINIDAE Reuss, 1862

SUBFAMILY SPIRILLININAE Reuss, 1862

GENUS SPIRILLINA Ehrenberg, 1843

Spirillina denticulata Brady, 1884 (Plate 20, Fig. 2)

Spirillina limbata Brady var. denticulata Brady, 1884, Rep. Voy. Challenger, Zool. Vol. 9, p. 632, Pl. 85, Fig. 17.

Spirillina denticulata Parr, 1929, B.A.N.Z. Ant. Res. Exped., ser. B, vol. 5, no. 6, p. 351.

Diagnosis. Test planispiral, thin, equilateral, discoidal; lateral faces flat or only slightly concave; peripheral edge square; raised spiral band covering sutural line furnished with buttress-like teeth, set at regular intervals along inner margin.

Discussion. This species occurs at only three stations in very low frequencies.

Spirillina obconica Brady, 1879 (Plate 20, Fig. 3)

Spirillina obconica Brady, 1879, Quart. Journ. Micr. Sci., vol. 19, p. 279, Pl. 8, Fig. 27.

Diagnosis. Test free, spiral; contour elliptical, superior surface conical, inferior surface concave; composed of seven or eight convolutions of narrow, non-septate tube; shell wall very thin, foramina minute.

Discussion. This species is represented by a single specimen at station 102.

Spirillina vivipara Ehrenberg, 1841 (Plate 20, Fig. 4)

Spirillina vivipara Ehrenberg, 1841, Abhandl. d. Akad. Wiss. Berlin, p. 422, Pl. 3, sec. 7, Fig. 41.

Diagnosis. Test circular, planispiral, evolute; periphery round; sutures distinct; chamber long spiral, increasing gradually in diameter, overlapping slightly on sides; wall coarsely perforate; aperture at end of tube, simple.

Discussion. This species occurs at eight stations, usually in very low frequencies.

SUPERFAMILY ROTALIACEA Ehrenberg, 1839

FAMILY ROTALIIDAE Ehrenberg, 1839

SUBFAMILY ROTALIINAE Ehrenberg, 1839

GENUS AMMONIA Brünnich, 1772

Ammonia beccarii var. parkinsoniana (d'Orbigny), 1839 (Plate 20, Figs. 5, 6)

Rosalina parkinsoniana d'Orbigny, 1839, in De la Sagra, Hist. Phys. Pol. Nat. Cuba, "Foraminiferes", p. 99, pt. 4, Figs. 25-27.

Rotalia beccarii (Linne) var. parkinsoniana (d'Orbigny), Phleger and Parker, 1951, Mem. Geol. Soc. Amer., v. 46, pt. 2, p. 23, Pl. 12, Figs. 6a, b.

Diagnosis. Test biconvex, periphery broadly rounded; chambers numerous, last-formed whorl containing 8-12; sutures dorsally limbate, straight, radiate, marked by raised ornamentation

of clear shell material; sutures ventrally limbate, straight, radiate, flat; umbilical area usually filled with rounded mass of material surrounded by excavated area running to sutures, encircled by series of small isolated knobs of clear shell material, situated between sutures at extremities; wall smooth; aperture near peripheral margin.

Discussion. This species occurs at 32 stations, but is abundant only at those stations immediately adjacent to the Florida mainland where fresh-water runoff in the rainy season creates brackish-water conditions. At these stations it may be the dominant species often making up over 90 per cent of the fauna.

FAMILY ELPHIDIIDAE Galloway, 1933

SUBFAMILY ELPHIDIINAE Galloway, 1933

GENUS ELPHIDIUM Montfort, 1808

Elphidium advenum (Cushman), 1922 (Plate 20, Figs. 7, 8)

Polystomella subnodosa Brady, (not von Munster), 1884, Rep. Voy. Challenger, Zool., vol. 9, p. 743, Pl. 110, Fig. 1.

Polystomella advena Cushman, 1922, Carnegie Inst. Wash., Publ. 311, p. 56, Pl. 9, Figs. 11, 12.

Elphidium advenum Cushman, 1930, Bull. 104, U.S. Nat. Mus., pt. 7, p. 25, Pl. 10, Figs. 1, 2.

Diagnosis. Test equally biconvex; periphery acute, with narrow carina, somewhat lobulate; umbilical region depressed, with small central boss of clear shell material; retral processes about one-third width of chamber; wall with very minute perforations; aperture series of small pores at base of apertural face.

Discussion. This species occurs at fifteen stations, usually in very low frequencies.

Elphidium discoidale (d'Orbigny), 1839 (Plate 20, Figs. 9, 10)

Polystomella discoidalis d'Orbigny, 1839, in De la Sagra, Hist. Phys. Pol. Nat. Cuba, "Foraminiferes", p. 56, Pl. 6, Figs. 23, 24.

Elphidium discoidale Cushman, 1930, U.S. Nat. Mus., Bull. 104, pt. 7, p. 22, Pl. 8, Figs. 8, 9.

Diagnosis. Test of medium size, somewhat compressed, periphery subacute, margin slightly lobulate, sides convex in peripheral view, umbilical regions each with large rounded boss, in peripheral view protruding beyond outline of test; chambers only slightly inflated, distinct, about ten in last-formed coil; sutures slightly depressed, somewhat broadening toward inner end, marked by retral processes, short, ten to twelve in number; wall smooth, very distinctly perforate, umbones of clear shell material, nearly transparent, with numerous coarse tubules; aperture composed of several small, rounded openings at base of apertural face.

Discussion. This species occurs at 18 stations, usually in low to medium frequencies. All the stations where it was present are in the more restricted areas of Florida Bay adjacent to the Florida mainland. It appears to be indicative of very shallow water where the yearly range of salinity varies greatly.

Elphidium sagrum (d'Orbigny), 1839 (Plate 20, Figs. 11, 12)

Polystomella sagra d'Orbigny, 1839, in De la Sagra, Hist. Phys. Pol. Nat. Cuba, "Foraminiferes", p. 55, Pl. 6, Figs. 19, 20.

Polystomella lanieri Cushman, 1920, U.S. Geol. Surv. Prof. Paper 128-B, p. 72, Pl. 11, Fig. 22.

Elphidium sagrum Cushman, 1930, U.S. Nat. Mus., Bull. 104, pt. 7, p. 24, Pl. 9, Figs. 5, 6.

Diagnosis. Test biconvex, with periphery broadly rounded, last-formed portion wider than earlier portions; chambers in last-formed portion slightly inflated; sutures not depressed except between last few chambers, marked by short, broad retral processes continuous over earlier portion of test to form ridges slightly oblique to periphery, about ten in number; wall fairly thick, perforate; aperture composed of series of small, round openings at base of apertural face.

Discussion. This species occurs at 12 stations, usually in low frequencies.

GENUS CRIBROELPHIDIUM Cushman and Brönnimann, 1948

Criboelphidium poeyanum (d'Orbigny), 1839 (Plate 21, Figs. 1, 2)

Polystomella poeyana d'Orbigny, 1839, in De la Sagra, Hist. Phys. Pol. Nat. Cuba., "Foraminiferes", p. 55, Pl. 6, Figs. 25, 26.

Elphidium poeyanum (d'Orbigny) Cushman, 1930, U.S. Nat. Mus., Bull. 104, pt. 7, p. 25, Pl. 10, Figs. 4, 5.

Diagnosis. Test strongly compressed, periphery broadly rounded, sides nearly parallel; umbilical region slightly depressed; chambers distinct; sutures slightly depressed, marked by very short, broad retral processes; wall thin, translucent, smooth, finely perforate; aperture composed of series of small, rounded openings on apertural face.

Discussion. This is the most abundant and widespread of all the species of the Elphidiinae present throughout the area. It occurs at 66 stations in low to high frequencies. Its distribution is restricted to the shallow water of Florida Bay. It is absent from the more restricted bays immediately adjacent to the Florida mainland where the waters become quite brackish during the rainy season.

FAMILY NUMMULITIDAE de Blainville, 1825

SUBFAMILY CYCLOCLYPEINAE Butschli, 1880

GENUS HETEROSTEGINA d'Orbigny, 1826

Heterostegina depressa d'Orbigny, 1826 (Plate 21, Fig. 3)

Heterostegina depressa d'Orbigny, 1826, Ann. Sci. Nat., vol. 7, no. 2, Pl. 17, Figs. 5-7.

Diagnosis. Test in section lenticular, early chambers embracing, thickened, later whorls thin, periphery with thin keel, chambers subdivided into chamberlets by transverse partitions, chamberlets near interior border of whorl much larger than those of peripheral portion, division apparent from exterior.

Discussion. This species is represented by a single specimen at station 107.

Eponides antillarum (d'Orbigny), 1839 (Plate 21, Figs. 4, 5)

Rosalina antillarum d'Orbigny, 1839, in De la Sagra, Hist. Phys. Pol. Nat. Cuba., "Foraminiferes", p. 75, Pl. 5, Figs. 4-6.

Truncatulina antillarum Fornasini, 1902, Mem. Accad. Sci. Inst. Bologna, ser. 5, vol. 10, p. 63.

Pulvinulina incerta Cushman, Publ. 311, Carnegie Inst. Wash., p. 51, Pl. 9, Figs. 1-3.

Eponides antillarum Cushman, 1931, Bull. 104, U.S. Nat. Mus., pt. 8, p. 42, Pl. 9, Fig. 2.

Diagnosis. Test unequally biconvex, dorsal side somewhat more convex than ventral side; chambers numerous; sutures oblique, rather indistinct; wall finely punctate; aperture elongate,

at base of last-formed chamber.

Discussion. This species occurs at 17 stations, mainly in the lower Florida Keys, in low to medium frequencies.

• Eponides regularis Phleger and Parker, 1951

Eponides regularis Phleger and Parker, 1951, Mem. G.S.A., vol. 46, p. 21, Pl. 11, Figs. 3a, 3b, 4a-c.

Diagnosis. Test small, about four whorls in adult, somewhat compressed, biconvex; periphery subacute; chambers distinct, increasing in size very gradually as added, eight or nine in last-formed whorl, last-formed ones very slightly inflated on ventral side; sutures straight on both sides, slightly limbate, flush with surface except for last-formed ones on ventral side which may be slightly depressed; wall smooth, very finely perforate; aperture low, arched opening slightly below periphery on ventral side.

Discussion. This species is represented by a single specimen at station 107.

Eponides repandus (Fichtel and Moll), 1798 (Plate 21, Figs. 6, 7)

Nautilus repandus Fichtel and Moll, 1798, Test. Micr., p. 35, Pl. 3, Figs. a-d.

Eponides repandus Montfort, 1808, Conch. Syst., vol. 1, p. 127, 32^e genre.

Pulvinulina repanda Carpenter, 1862, Introd. Foram., p. 210.

Diagnosis. Test almost equally biconvex, peripheral margin acute, often slightly lobulate, carinate; chambers usually seven or eight in last-formed whorl, distinct, not inflated, increasing rather evenly in size as added, ventral side somewhat truncated; sutures distinct, limbate on both sides, dorsal ones greatly curved, ventral ones nearly radiate; wall smooth except for slightly raised sutures on dorsal side, finely perforate, final chamber often with large pores; aperture about midway between umbilicus, peripheral margin on ventral side.

Eponides turgidus Phleger and Parker, 1951 (Plate 21, Figs. 8, 9)

Eponides turgidus Phleger and Parker, 1951, Mem. G.S.A., vol. 46, pt. 2, p. 22, Pl. 11, Figs. 9a, 9b.

Diagnosis. Test very small, biconvex, consisting of about four whorls; periphery rounded; chambers distinct, four in last-formed whorl, slightly inflated on dorsal side, very inflated on ventral; sutures distinct, slightly curved, slightly depressed on dorsal side, more depressed on ventral side; wall thin, translucent, finely perforate; aperture long, low, arched opening midway between umbilicus and periphery, with narrow lip.

Discussion. This species is represented by a few specimens at station 107.

FAMILY AMPHISTEGINIDAE Cushman, 1927

GENUS AMPHISTEGINA d'Orbigny, 1826

Amphistegina lessonii d'Orbigny, 1826 (Plate 21, Fig. 10)

Amphistegina lessonii d'Orbigny, 1826, Ann. Sci. Nat., vol. 7, p. 304, no. 3, Pl. 17, Figs. 1-4.

Diagnosis. Test lenticular, circular in side view, often involute on dorsal side, ventral side with supplementary chambers irregularly rhomboid; wall calcareous, finely perforate; aperture ventral.

Discussion. This species occurs at 14 stations, most of which are located in Gulf of Mexico waters adjacent to Florida Bay, in low to high frequencies.

FAMILY CIBICIDIDAE Cushman, 1927

SUBFAMILY PLANULININAE Bermudez, 1952

GENUS PLANULINA d'Orbigny, 1826

Planulina exorna Phleger and Parker, 1951 (Plate 21, Figs. 11, 12)

Planulina exorna Phleger and Parker, 1951, Mem. G.S.A., vol. 46, pt. 2, p. 32, Pl. 18, Figs. 5-8.

Diagnosis. Test plano-convex, evolute in early stages, becoming involute in later stages; last-formed chambers lobulate, irregular; sutures limbate, slightly raised in early portion, depressed in later portion; wall of early portion with small bead-like processes, later portion perforate; aperture arched opening extending onto evolute side.

Discussion. This species occurs at four station, usually in low frequencies.

Planulina foveolata (Brady), 1884 (Plate 22, Figs. 1, 2)

Anomalina foveolata Brady, 1884, Rep. Voy. Challenger, Zool., v. 9, p. 674, Pl. 94, Fig. 1.

Planulina foveolata Phleger and Parker, 1951, Mem. Geol. Soc. Amer., v. 46, pt. 2, p. 33, Pl. 18, Figs. 9, 10.

Diagnosis. Test compressed, discoidal, composed of three whorls, more or less visible from both sides, dorsal side flat, somewhat concave near umbilicus, ventral side slightly convex, periphery thick, rounded, final whorl composed of about 9 chambers; sutures limbate on ventral side, slightly raised, slightly depressed on dorsal side; surface more or less areolated by exogenous shelly deposits, especially on ventral side; aperture arched slit, oblique, at inner margin of terminal chamber.

Discussion. This species is represented by a few specimens at station 103.

SUBFAMILY CIBICIDINAE Cushman, 1927

GENUS CIBICIDES Montfort, 1808

Cibicides cicatricosus (Schwager), 1866 (Plate 22, Figs. 3, 4)

Anomalina cicatricosa Schwager, 1866, Geol. Theil, vol. 2, no. 2, p. 260, Pl. 7, Figs. 4, 108.

Cibicides cicatricosus Cushman and Stainforth, 1951, Journ. Paleont., vol. 25, p. 163, Pl. 28, Fig. 27.

Diagnosis. Test circular spiral, moderately thick, somewhat flattened dorsal surface, rounded on ventral side; chambers with simple radial arrangement or somewhat backward sloping, nine to twelve per whorl, initial portion rather low, flat, later arched, on dorsal side sometimes almost spherical, slightly broadened, only last whorl visible on ventral side; umbilicus usually covered with encrusting material, similar encrustations sometimes also found in early portion of dorsal side, usually over chamber partition, remaining chambers with irregularly scattered perforations, sometimes interconnected; surface pitted; sutures sometimes irregularly depressed; aperture simple large slit over periphery of last-formed chamber, sometimes extending down onto ventral side.

Discussion. This species occurs at only two stations, being represented by a single specimen at station 3 and being quite common in the deep water of station 1.

Cibicides robustus (Flint), 1897 (Plate 22, Figs. 5, 6)

Cibicides robustus Phleger and Parker, 1951, Mem. G.S.A., vol. 46, pt. 2, p. 31, Pl. 17, Figs. 1-4.

Diagnosis. Test large, biconvex, about three-and-one-half whorls in adult, inner whorls of adult on evolute side covered with shell material forming plug; periphery rounded; sutures limbate; wall thick, smooth, coarsely perforate; aperture peripheral extending over onto evolute side.

Discussion. This species occurs at only three stations; in low frequencies at two, and with a medium frequency at the third.

Cibicides cf. C. rugosa Phleger and Parker, 1951 (Plate 22, Figs. 7, 8)

Cibicides rugosa Phleger and Parker, 1951, Geol. Soc. America, Mem. 46, pt. 2, p. 31, Pl. 17, Figs. 5a, b, 6a, b.

Diagnosis. Test large, usually plano-convex with evolute side in some specimens slightly convex, almost circular in outline, partially involute, consisting of 3 whorls; periphery sub-acute, slightly lobulate in last-formed chambers; chambers distinct, 10-12 in last-formed whorl, narrow, last-formed ones slightly inflated; sutures distinct on evolute side, may be obscured by surface ornamentation on involute, curving back very sharply along periphery on both sides, heavily limbate, raised on evolute side, flush with surface, limbate on involute side, coarsely papillate on involute side, papillae often form an almost reticulate pattern, with considerable variation in amount of ornamentation in different specimens; aperture peripheral, extending over on dorsal side, inner edges of chambers of last-formed whorl form overlapping processes over earlier chambers.

Discussion. The few specimens of this species found in Florida Bay closely resemble the types of Phleger and Parker. However, the Florida Bay specimens were found in water shallower than 4 m. while the specimens of Phleger and Parker were taken from a depth of 914 m.

FAMILY PLANORBULINIDAE Schwager, 1877

GENUS PLANORBULINA d'Orbigny, 1826

Planorbulina acervalis Brady, 1884 (Plate 22, Figs. 9, 10)

Planorbulina acervalis Brady, 1884, Rep. Voy. Challenger, Zool., vol. 9, p. 657, Pl. 92, Fig. 4.

Diagnosis. Test typically adherent, composed of numerous chambers, early ones spiral, later ones irregularly annular, those of periphery lobulated, newly added chambers extending outward considerably beyond preceding ones; ventral surface often covered by mass of small acervuline chambers; wall conspicuously porous; aperture lipped.

Discussion. This species occurs at only four stations, usually in low frequencies.

Planorbulina mediterranensis d'Orbigny, 1826 (Plate 22, Figs. 11, 12)

Planorbulina mediterranensis d'Orbigny, 1826, Ann. Sci. Nat., vol. 7, p. 280, no. 2, Pl. 14, Figs. 4-6.

Diagnosis. Test in early portion coiled, attached by ventral surface; very earliest chambers slightly trochoid, closely spiraled, later in irregular series of single layers about periphery; wall of last-formed chambers coarsely perforate; sutures depressed, often clearly marked on dorsal side by distinct band of shell material; apertures at either side of the chamber in adult, simple, each with raised lip.

Discussion. This species is represented by single specimens at only three stations.

FAMILY CYMBALOPORIDAE Cushman, 1927

GENUS CYMBALOPORETTA Cushman, 1928

Cymbaloporetta squamosa (d'Orbigny), 1826 (Plate 23, Figs. 1, 2)

Rotalia squamosa d'Orbigny, 1826, Ann. Sci. Nat., v. 7, p. 272, no. 8.

Rosalina squamosa d'Orbigny, 1839, in De la Sagra, Hist. Fis. Pol. Nat. Cuba, "Foraminiferes", p. 91, Pl. 3, Figs. 12-14.

Rosalina poeyi d'Orbigny, 1839, in De la Sagra, Hist. Fis. Pol. Nat. Cuba, "Foraminiferes", p. 62, Pl. 3, Figs. 18-20.

Cymbalopora poeyi Carpenter, Parker and Jones, 1862, Introd. Foram., p. 215, Pl. 13, Figs. 10-12.

Cymbalopora poeyi Carpenter, Parker and Jones, var. squamosa Chapman, 1902, Journ. Linn. Soc. Zool., v. 28, p. 385, 405.

Cymbalopora squamosa Cushman, 1922, Publ. 311, Carnegie Inst., Wash., p. 41, Pl. 6, Figs. 4-6.

Cymbaloporetta squamosa Cushman, 1928, Contr. Cush. Lab. Foram. Res., v. 4, p. 7.

Diagnosis. Test subconical, trochoid, dorsal side very convex, bluntly pointed, variable height, ventral side flattened or slightly concave, usually consisting of 6 or 7 chambers, widest at outer border, then contracted, widening again, finally contracted again, tapering toward center where all chambers unite; chambers separated by definite depressed area; wall coarsely perforate on dorsal side, pores confined to middle of chambers on ventral side; aperture at margin of base of last-formed chamber, thin extensions of inner end of chamber often arch leaving large openings at either side into central umbilical area.

Discussion. Cymbaloporetta occurs at eight stations in very low frequencies.

FAMILY HOMOTREMATIDAE Cushman, 1927

SUBFAMILY HOMOTREMATINAE Cushman, 1927

GENUS HOMOTREMA Hickson, 1911

Homotrema rubrum (Lamarck), 1816 (Plate 23, Fig. 3)

Millipora rubra Lamarck, 1816, Hist. Nat. Anim. sans Vert., v. 2, p. 202.

Polytrema rubra Dujardin, 1841, Hist. Nat. Zooph., p. 259.

Homotrema rubrum Hickson, 1911, Trans. Linn. Soc. London, Zool., ser. 2, v. 14, p. 445, 454, Pl. 30, Fig. 2; Pl. 31, Fig. 9; Pl. 32, Figs. 19, 22, 28.

Diagnosis. Test attached, earliest chambers in whorl trochospiral, later ones forming irregular mass, honeycombed, surface composed of reticulate pattern, central portion of each mesh with thin perforated plate, walls of mesh-work solid, nonporous; whole mass raised into irregular subcylindrical masses in early stages, later fusing, spreading so that whole test becomes irregularly rounded mass rising above surface of attachment with papillae raised above rest of surface; dull to bright red.

Discussion. This species occurs at only four stations. At three of these, located between the outer reef trace and the Florida Keys it is abundant, forming a noticeable portion of the sediment by imparting a pink hue to it. At the fourth station it is very rare. This species is commonly attached to coral, and upon death and breakup becomes part of the sediment.

SUBFAMILY VICTORIELLINAE Chapman and Crespin, 1930

GENUS CARPENTERIA Gray, 1858

Carpenteria proteiformis Goës, 1882 (Plate 23, Fig. 4)

Carpenteria balaniformis Gray, var. proteiformis Goës, 1882, Kongl. Svensk. Vet. Akad. Handl., v. 19, no. 4, p. 94, Pl. 6, Figs. 208-214; Pl. 7, Figs. 215-219.

Carpenteria proteiformis Brady, 1884, Rep. Voy. Challenger, Zool., v. 9, p. 679, Figs. 8-14.

Diagnosis. Test attached, columnar, basal portion usually somewhat spreading, buttressed; early chambers coiled, attached by dorsal side, covered by later chambers which become much inflated, built up into irregular, subcylindrical column of few chambers; wall coarsely perforate; aperture often with tubular neck, slight lip.

Discussion. This species is represented by only a few specimens at station 103.

SUPERFAMILY CASSIDULINACEA d'Orbigny, 1839

FAMILY PLEUROSOMELLIDAE Reuss, 1860

SUBFAMILY PLEUROSOMELLINAE Reuss, 1860

GENUS PLEUROSOMELLA Reuss, 1860

Pleuromella sp. (Plate 23, Fig. 5)

Discussion. Only a single specimen of this species was found in the deep water at station 1.

FAMILY CAUCASINIDAE Bykova, 1959

SUBFAMILY FURSENKOININAE Loeblich and Tappan, 1961

GENUS FURSENKOINA Loeblich and Tappan, 1961

Fursenkoina complanata (Egger), 1893 (Plate 23, Fig. 6)

Virgulina schreibersiana Czjzek var. complanata Egger, 1893, Abhandl. K. bay. Akad. Wiss. Munchen, vol. 18, p. 292, Pl. 8, Figs. 91, 92.

Diagnosis. Test elongate; early chambers strongly triserial, later ones irregularly biserial; whole test twisted; wall smooth, finely perforate; aperture broadly loop-shaped.

Discussion. This species occurs at 12 stations, usually in low frequencies.

Fursenkoina compressa (Bailey), 1851 (Plate 23, Fig. 7)

Bulimina compressa Bailey, 1851, Smiths. Contr., vol. 2, art. 3, p. 12, Pl. 12, Figs. 35-37.

Bulimina presli Reuss, var. (Virgulina) schreibersii (part) Parker and Jones, 1865, Philos. Trans., vol. 155, p. 375, Pl. 17, Fig. 72.

Virgulina schreibersiana Flint (not Czjzek), 1897 (1899), Rep. U.S. Nat. Mus., p. 291, Pl. 37, Fig. 6.

Virgulina compressa Cushman, 1922, U.S. Nat. Mus., Bull. 104, pt. 3, p. 116, Pl. 24, Figs. 2, 3.

Diagnosis. Test large, elongate; chambers numerous, early few triserial, later ones biserial, somewhat twisted; wall smooth, thick, polished, finely perforate; aperture loop-shaped.

Discussion. This species occurs at three stations in low to medium frequencies.

Fursenkoina mexicana (Cushman), 1922 (Plate 23, Fig. 8)

Virgulina mexicana Cushman, 1922, U.S. Nat. Mus., Bull. 104, pt. 3, p. 120, Pl. 23, Fig. 8.

Diagnosis. Test elongate, compressed, broadly fusiform, broadly rounded at initial end, apertural end bluntly pointed; chambers few, rounded, not well distinguished from one another;

sutures indistinct, not depressed; wall smooth, polished, translucent; aperture elongate, oval, broadest at inner end, narrowing toward edge of chamber.

Discussion. This species is represented by single specimens at only three stations.

Fursenkoina pontoni (Cushman), 1932 (Plate 23, Fig. 9)

Virgulina pontoni Cushman, 1932, Contr. Cush. Lab. Foram. Res., vol. 8, pt. 1, p. 17, Pl. 3, Fig. 7.

Diagnosis. Test elongate, tapering, greatest breadth formed by two last-formed chambers, early chambers triserial, later ones biserial, somewhat twisted; wall smooth, finely perforate; aperture elongate, narrow.

Discussion. This species occurs at nine stations, always in very low frequencies.

FAMILY LOXOSTOMIDAE Loeblich and Tappan, 1962

GENUS LOXOSTOMUM Ehrenberg, 1854

Loxostomum abruptum Phleger and Parker, 1951

Loxostomum truncatum Phleger and Parker, 1951, Mem. G.S.A., vol. 46, pt. 2, p. 17, Pl. 7, Figs. 15-19.

Loxostomum abruptum Phleger and Parker, 1952, Contr. Cush. Found. Foram. Res., vol. 3, pt. 1, p. 14.

Diagnosis. Test small, gradually tapering; chambers extending at base into overhanging ridges, very slightly at initial end, uniformly increasing toward apical end; wall smooth with coarse perforations, except at sutures which are raised; aperture loop-shaped, terminal.

Discussion. This species is represented by a single specimen at station 93.

Loxostomum mayori (Cushman), 1922 (Plate 23, Fig. 10)

Bolivina mayori Cushman, 1922, Carnegie Inst. Wash., Publ. 311, p. 27, Pl. 3, Figs. 5, 6.

Loxostomum mayori Bermudez, 1935, Mem. Soc. Cubana Hist. Nar., vol. 9, p. 197.

Diagnosis. Test elongate, slender, often arcuate or somewhat twisted, somewhat compressed, periphery rounded, early portion somewhat tapering, later with sides nearly parallel throughout their length; chambers numerous, distinct, becoming gradually higher as added until, in later development, height becomes greater than breadth, last-formed chambers uniserial, usually with oblique sutures, somewhat more rounded in form than early portion; sutures distinct, limbate, slightly depressed, more so in later portion, in early portion oblique, nearly straight, later becoming sigmoid as chambers tend to become uniserial, wall coarsely perforate, perforations often in longitudinal lines, surface with few, short, weakly developed costae; aperture in adult terminal, narrowly elliptical, often with slight rounded lip.

Discussion. This species is represented by a single specimen at station 104.

Loxostomum porrectum (Brady), 1884 (Plate 23, Fig. 11)

Bolivina porrecta Brady, 1884, Rep. Voy. Challenger, Zool., vol. 9, p. 106, Pl. 52, Fig. 22.

Bifarina porrecta Millett, 1900, Jour. Roy. Micr. Soc., p. 540, Pl. 4, Fig. 3.

Loxostomum porrectum Cushman, 1937, Cush. Lab. Foram. Res., Spec. Publ. 9, p. 190.

Diagnosis. Test elongate, slightly tapering, apex rounded; apertural end truncate, compressed, edges rounded; chambers high, later ones triangular, sutures in later growth passing entirely

across test forming almost uniserial stage; wall smooth, perforate; aperture subterminal, removed from inner edge of chamber, elongate, with raised border.

Discussion. This species is represented by a single specimen at station 104.

FAMILY CASSIDULINIDAE d'Orbigny, 1839

GENUS CASSIDULINA d'Orbigny, 1826

Cassidulina subglobosa Brady, 1881 (Plate 23, Fig. 12)

Cassidulina subglobosa Brady, 1881, Quart. Journ. Micr. Sci., vol. 21, p. 60.

Diagnosis. Test subglobular, somewhat compressed on two lateral faces, inequilateral; segments few, slightly inflated; alternation irregular; aperture oblique or nearly erect loop-shaped slit on face of projecting terminal segment.

Discussion. A single specimen of this species occurs at station 1.

GENUS EHRENBERGINA Reuss, 1850

Ehrenbergina pacifica Cushman, 1927 (Plate 23, Fig. 13)

Ehrenbergina serrata Brady (part) (not Reuss), 1884, Rep. Voy. Challenger, Zool., vol. 9, Pl. 55, Figs. 6, 7.

Ehrenbergina serrata Cushman (not Reuss), 1911, U.S. Nat. Mus., Bull. 71, pt. 2, p. 101, Figs. 155a, b.

Ehrenbergina pacifica Cushman, 1927, Proc. U.S. Nat. Mus., vol. 70, no. 2665, p. 5, Pl. 2, Fig. 2.

Diagnosis. Test triangular in front view, chambers numerous, low, broad, dorsal side convex, ventral side with narrow median furrow which may be entirely closed; sutures distinct, on dorsal side flush with surface, on ventral side depressed; periphery with long spinose processes from upper angle of each chamber extending straight out from test, each chamber with ventral angle having raised ridge continuing to spine at periphery; aperture elongate, narrow.

Discussion. This species is represented by only a few specimens at station 1.

FAMILY NONIONIDAE Schultze, 1854

SUBFAMILY NONIONINAE Schultze, 1854

GENUS NONION Montfort, 1808

Nonion depressulum var. matagordanum Kornfeld, 1931 (Plate 23, Fig. 14)

Nonion depressulum (Walker and Jacob) var. matagordanum Kornfeld, 1931, Stanford Univ., Dept. Geol., Contr., vol. 1, no. 3, p. 87, Pl. 13, Figs. 2a, b.

Diagnosis. Test nearly circular in side view, eight to nine chambers in last whorl, in apertural view with parallel sides, broadly rounded angles, narrow, slightly longer than wide; very slightly, if at all, depressed at umbilicus; chambers somewhat inflated, sutures depressed, forming lobulated periphery; umbilical regions with slight tendency toward filling in of shell material, slight trace of stellate extension of this material along sutures; wall smooth, finely punctate; aperture narrow arched slit at base of apertural face.

Discussion. This species occurs at 58 stations, all within Florida Bay proper, in low to medium frequencies. It appears to be concentrated in the shallow water around the Keys, and the very shallow water over grass flats and mud banks.

Nonion grateloupi (d'Orbigny), 1826 (Plate 23, Fig. 15)

Nonionina grateloupi d'Orbigny, 1826, Ann. Sci. Nat., vol. 7, p. 294, no. 19.

Nonion grateloupi Cushman, 1930, U.S. Nat. Mus., Bull. 104, pt. 7, p. 10, Pl. 3, Figs. 9-11, Pl. 4, Figs. 1-4.

Diagnosis. Test planispiral, bilaterally symmetrical, periphery rounded; chambers numerous, increasing rapidly in length, especially in last few chambers; sutures distinct; wall smooth, finely perforate; aperture small, at base of last-formed chamber.

Discussion. This species occurs at 15 stations, usually in very low frequencies.

GENUS ASTRONONION Cushman and Edwards, 1937

Astrononion stelligerum (d'Orbigny), 1839 (Plate 24, Figs. 1-3)

Nonionina stelligera d'Orbigny, 1839, in Webb and Berthelot, Hist. Nat. des Iles Canaries, vol. 2, pt. 2, p. 128, Pl. 3, Figs. 1, 2.

Astrononion stelligerum Cushman and Edwards, 1937, Contr. Cushman Lab. Foram. Res., vol. 13, p. 31, Pl. 3, Figs. 7A, B.

Diagnosis. Test strongly compressed, umbilical region slightly depressed, periphery rounded; chambers of primary coil distinct, of rather uniform shape, increasing regularly in size as added, slightly if at all inflated, apertural face much higher than broad, supplementary chambers elongate, narrow, very irregularly rhomboid, with very sharp, distinct angle toward umbilical end, pointing posteriorly; sutures distinct, rather strongly curved, little if at all depressed, those between supplementary chambers very distinct; wall smooth, finely perforate; aperture low, arched, opening at base of apertural face at median line.

Discussion. This species is represented by a single specimen at station 107.

FAMILY OSANGULARIIDAE Loeblich and Tappan, 1964

GENUS OSANGULARIA Brotzen, 1940

Osangularia cultur (Parker and Jones), 1865 (Plate 24, Figs. 4, 5)

Planorbulina cultur Parker and Jones, 1865, Philos. Trans., p. 421, Pl. 19, Fig. 1.

Truncatulina cultur (Parker and Jones) Brady, 1884, Rep. Voy. Challenger, Zool., vol. 9, p. 668, Pl. 96, Fig. 3.

Pulvinulinella cultur (Parker and Jones) Cushman, 1927, Bull. Scripps Inst. Oceanography, Tech. Ser., vol. 1, no. 10, p. 164, Pl. 5, Figs. 8, 9.

Parella cultur (Parker and Jones) Hofker, 1951, Siboga-Exped., Mon. IVa, pt. III, p. 336, Text Figs. 229-232.

Osangularia cultur (Parker and Jones) Phleger, Parker and Peirson, 1953, Rep. Swedish Deep-Sea Exped., vol. 7, no. 1, p. 42, Pl. 9, Figs. 11, 16.

Diagnosis. Test trochoid, close-coiled, biconvex; umbilical area with distinct solid mass; sutures strongly oblique; periphery acute, with irregular keel forming sawtooth edge; wall perforate; aperture narrow opening into umbilical area on ventral side.

Discussion. This species occurs at only five stations, usually being represented by single specimens.

GENUS GYROIDINOIDES Brotzen, 1942

Gyroidinoides soldanii var. altiformis (R.E. and K.C. Stewart), 1930

Gyroidina soldanii d'Orbigny var. altiformis R.E. and K.C. Stewart, 1930, Journ. Paleont., vol. 4, no. 3, p. 67, Pl. 9, Fig. 2.

Diagnosis. Test trochoid, plano-convex, dorsal side flattened, ventral side convex, umbilicate; all chambers visible from dorsal side, only those from last-formed whorl from ventral side; umbilical area large; sutures dorsally raised, ornate; wall perforate; aperture elongate slit at base of last-formed chamber on ventral side.

Discussion. This species is represented by single specimens at only two stations.

FAMILY ANOMALINIDAE Cushman, 1927

SUBFAMILY ANOMALININAE Cushman, 1927

GENUS ANOMALINA d'Orbigny, 1826

Anomalina globulosa Chapman and Parr, 1937 (Plate 24, Fig. 6)

Anomalina globulosa Chapman and Parr, 1937, Aust. Atn. Exped., Sci. Repts., Ser. C, vol. 1, pt. 2, p. 117.

Diagnosis. Test consisting of about two and one-half coils, all visible on superior surface, only last-formed coil showing on inferior face; about seven chambers in last coil, strongly inflated; periphery rounded; sutures deeply impressed; superior face more or less flattened, inferior face depressed in umbilical region, otherwise strongly convex; surface of test deeply pitted; aperture crescentric, placed almost symmetrically in median line.

Discussion. This species is represented by a single specimen at station 103.

SUPERFAMILY ROBERTINACEA Reuss, 1850

FAMILY CERATOBULIMINIDAE Cushman, 1927

SUBFAMILY EPISTOMININAE Wedekind, 1937

GENUS HOEGLUNDINA Brotzen, 1948

Hoeglundina elegans (d'Orbigny), 1826 (Plate 24, Figs. 7-10)

Rotalia (Turbinulina) elegans d'Orbigny, 1826, Ann. Sci. Nat., vol. 7, p. 276, no. 54.

Pulvinulina elegans Parker, Jones and Brady, 1871, Ann. Mag. Nat. Hist., ser. 4, vol. 8, p. 174, Pl. 12, Fig. 142.

Epistomina elegans Martinotti, 1926, Boll. R. Ufficio geol. Ital., vol. 51, p. 3.

Hoeglundina elegans Brotzen, 1948, Sver. Geol. Undersok., vol. 42, no. 2, p. 92.

Diagnosis. Test biconvex, either with sides nearly equally convex or ventral side more strongly so, especially in microspheric form, periphery rounded or in small specimens more acute; chambers usually distinct, typically seven to nine in megalospheric form, increasing to as many as fourteen in largest microspheric specimens; sutures distinct, limbate, not raised, on dorsal side strongly oblique, on ventral side obliquely radial ending at center in umbonate mass; wall finely perforate, in thin-walled specimens often showing complex pattern of thickenings, in thick-walled specimens opaque; aperture usually narrow, on ventral side at base of last-formed chamber toward periphery, with supplementary aperture in axis of coiling, parallel to peripheral margin, just ventral to it, elongate.

Discussion. This occurs at only three stations, but where it is present it is common or abundant. It is most abundant at station 1 where the water depth is 587 meters. The other two

stations where it occurs also have greater depths than the rest of the area.

FAMILY ROBERTINIDAE Reuss, 1850

GENUS ROBERTINOIDES Höglund, 1947

Robertinoides bradyi Cushman and Parker, 1936 (Plate 24, Fig. 11)

Bulimina subteres Brady, 1884, Rep. Voy. Challenger, Zool., vol. 9, Pl. 50, Figs. 18a, b.

Robertina bradyi Cushman and Parker, 1936, Contr. Cush. Lab. Foram. Res., vol. 12, p. 99.

Robertinoides bradyi Hofker, 1956, Spolia. Zool. Mus. Hauniensis, vol. 15, p. 128.

Diagnosis. Test somewhat longer than broad, fusiform, initial end bluntly pointed, apertural end broadly rounded; chambers slightly inflated, four to five pairs in last-formed whorl, increasing rapidly in size as added, next to last chamber in series with apertural one meeting median line; sutures distinct, slightly depressed, strongly limbate; wall smooth, polished, fairly thick; aperture very elongate, open, only slightly curved in median line of axis, supplementary aperture short, fairly high.

Discussion. This species is represented only at station 1 by a very few specimens. (In Table 1 this species is listed under two genera, Robertina and Robertinoides, they should both be placed under Robertinoides.)

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