I. ABSTRACT

A Pleistocene ostracode fauna with 41 species was recovered from carbonate sediments that occur in Palm Beach County, Florida. The fauna is described and three new species are named: these are "Aurila" bellegladensis, Megacythere edwardsi and Hemicytherura vokesae. Ostracode occurrence data and petrological evidence indicate that the sediments were deposited under fully marine conditions at a water depth of from 0 to 23 meters and in a tropical or subtropical climate regime.

II. INTRODUCTION

Ostracode remains were recovered from Pleistocene sediments located near the town of Belle Glade in Palm Beach County, Florida. Five samples were examined, three of which were collected at Tulane University Locality 201 (TU 201) and one each from localities TU 580 and TU 733 (see Section VIII for description). Four of the five samples were washed before they were received by the author. The unwashed sample (from TU 201) was analysed for grain size distribution and composition.
Two of the samples (TU 580 and TU 733) contained only juvenile valves, fragments of large species and complete valves and carapaces of small species (less than .55 mm in length). Inasmuch as all washed samples were prepared in the same manner, the samples containing only small specimens and fragments are interpreted as representing the results of differential transportation of the original material.

III. SEDIMENT ANALYSIS

The sample (from TU 201) used for lithologic analysis (379.2 grams) was a very light gray shell marl. More than 90% of the sediment grains were in the size range of 0.07 to 20.0 mm, that is, fine sand and larger. Those grains larger than 0.420 mm were whole or broken fossils.

The total carbonate fraction, 86.2% by weight, was composed chiefly of bivalves, gastropods, echinoid spines, bryozoans and coral fragments. The other material was insoluble residue composed of quartz (90%) and minor quantities of clay minerals, organic matter and a few dark mineral grains. The quartz grains were mostly angular or subangular with a few being subrounded or rounded.

Using Folk's classification (1962) for such materials, the sediment is categorized as a lime mud with fossils; it is the Type II carbonate composed of allochems and micrite. Conditions of short-lived currents or a rapid rate of formation of the microcrystalline ooze are thus indicated. The sediments may be placed in the Type II class of Plumley et al. (1962), which represents deposition in waters that were alternately quiet and agitated.

IV. AGE OF THE SEDIMENT

The stratigraphy of the region has been reviewed by Olsson (in Olsson and Petit, 1964), who concluded that the “Caloosa-hatchee Formation” of earlier workers was comprised of several units that should be described separately. The uppermost of the units was designated by Olsson to be “Unit A” (ibid, p. 521) and is the source of the material used in the present study. Olsson indicated that “the unit is referred to the late Pliocene, but an early Pleistocene age is also possible” (ibid, p. 525).

Emily H. Vokes (1973, personal communication) stated that “Unit A” is of Pleistocene age; this conclusion is based upon her studies of the molluscan faunas and their relationships to the Moín Formation of Costa Rica. Akers (1972) also indicated that the Moín Formation is of Pleistocene age. DuBar (1974) suggested that “Unit A” of Olsson was of a “medial Pleistocene age” and he informally proposed the name “Ber­mont Formation” for the unit.

Qualitative and quantitative comparisons (Cheetham and Hazel, 1969) to other nearby Pleistocene ostracode faunas are of little use in the determination of the exact age of the “Bermont Formation.” That is, there are so few similarities at the species level that the results are inconclusive in an attempt to delineate which portion of the Pleistocene record is represented (see Hall, 1965; Hazel, 1968; Valentine, 1971).

V. PALEOENVIRONMENT

A summary of environmental conditions of modern representatives of fossil species is given in the systematics portion of this paper. It is not possible to compare the fauna directly with assemblages from nearby modern localities because there are few species in common with any single living assemblage (Puri, 1960; Benson and Coleman, 1963; Keyser, 1975). The closest relationships exist between this fauna and those from the Florida Keys-Florida Bay area. For example, 10 of the 14 species reported by Puri (1960) from the Keys are present in the “Bermont” material, but only 15 of Puri’s 40 species from Alligator Point were recovered. This may indicate that differences in sediment characteristics are strongly reflected in the composition of faunal assemblages.

Based upon the modern occurrences of the ostracode species of the Belle Glade area the salinity range at the time of deposition ranged from 25 to 40 o/oo. About one-half of the species that occur in modern sediment (15 of 29) are normally found under such
conditions, while most of the other forms have been reported only from marine waters.

The species restricted to fresh or brackish waters comprise less than 5% of the total valve count. *Limnocythere* sp. and *Physocypris pustulosa* were probably transported from areas with relatively lower salinity to an area that was polyhaline or ultrahaline (Ager, 1963) or those specimens represent contamination from the overlying fresh water sediments (McGinty, 1970). *Paracytheridea vandenboldi* has been reported from only brackish water but its modern occurrence has been noted in only one study (Swain, 1955) therefore its total range is probably not known. Other taxa present in the assemblage from Belle Glade have been reported only from marine environments; these include *Bairdoppilata* (*Bairdoppilata cushmani*, *Loxocorniculum fischeri*, *Loxocorniculum postdorsolatum*, *Orionina bradyi*, *Paracypris sublensis*, *Paranesidea bradyi*, *Proteoconcha multipunctata*, and *Protocytheretta pumicosa*). The marine ostracode species indicate the same environment represented by the "Molluscan 'Glades' fauna" mentioned by McGinty (1970).

Some of the previous publications on modern ostracodes do not present exact information on water depth of sample sites, but it is usually possible to interpret the approximate depth range of a particular species. In the present study, if *Physocypris* and *Limnocythere* are eliminated from consideration, the remaining taxa are indicative of depths from near the shoreline to 23 meters. It is a depth range that the reported species have in common, that is, an interval in which all the species sometimes occur.

The marine climate is interpreted as having been subtropical or tropical. *Cyprideis mexicana*, *Cytherura* sp. C and *Xestoleberis rigbyi* have been reported only from tropical regions, whereas *Cyprideis salebrosa*, *Loxocorncha fischeri* and *Paracytheridea vandenboldi* have been reported only in subtropical areas. It should be noted that the species mentioned above are recorded in few papers dealing with modern sediments; the total of such environmental range of each species may not be known. All remaining species reported from modern sediments have been recovered from both subtropical and tropical areas. The climatic terms are used as proposed by Trewartha (1954) and Rumney (1968) and are based upon physical criteria.

In conclusion, the ostracode fauna (see Table 1) is interpreted to indicate that the deposition of the "Bermont Formation" at Belle Glade, occurred in a low-energy environment, at a water depth of less than 23 meters under fully marine conditions in a subtropical or tropical region.

VI. ACKNOWLEDGMENTS

All samples were provided by Emily H. Vokes of Tulane University. She also offered much useful advice related to the preparation of this paper. Eileen Romeo Kontrovitz provided valuable assistance in locating certain old and rare bibliographic items. Laboratory materials used in this study were purchased with funds provided by a Rider College Grant-in-Aid. Richard H. Benson and Louis S. Kornicker of the U.S. National Museum, Robert V. Kesling of The University of Michigan and Alvin M. Phillips, Jr. of Louisiana State University kindly loaned type specimens for comparisons.

VII. SYSTEMATIC PALEONTOLOGY

All figured and type specimens are deposited at the U.S. National Museum (USNM). All illustrations for this paper are scanning electron micrographs.

Subclass OSTRACODA Latreille, 1806
Order PODOCOPIDA Müller, 1894
Suborder PODOCOPINA Sars, 1866
Superfamily BAIRDIACEA Sars, 1866
Family BAIRDIIDAE Sars, 1866
Genus BAIRDOPPILATA Coryell, Sample and Jennings, 1935
BAIRDOPPILATA (BAIRDOPPILATA) CUSHMANI (Tressler, 1949)
Plate 1, figure 5

*Mesidea cushmani* TRESSELER, 1949, p. 342, figs. 4-8.

*Bairdoppilata carinata* KORNICKER, 1961, p. 66, pl. 1, figs. 5a-e: text figs. 9A-J, 10B-C, E.

*Bairdoppilata triangulata* Edwards. BENSON and COLEMAN, 1963, p. 20-21, pl. 3, figs. 1-3; text fig. 3 (not *Bairdoppilata triangulata* Edwards, 1944, p. 507, pl. 85, figs. 5-7).
<table>
<thead>
<tr>
<th>Locality</th>
<th>TU 201</th>
<th>TU 580</th>
<th>TU 733</th>
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<td>Actinocythereis triangularis Morales</td>
<td>9*</td>
<td>1AF</td>
<td>1AF</td>
</tr>
<tr>
<td>Aurila sp. cf. A. amygdala (Stephenson)</td>
<td>2</td>
<td>4JV</td>
<td>—</td>
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<tr>
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<td>4AF</td>
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<td>1AF</td>
<td>1AF</td>
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<td>3</td>
<td>—</td>
<td>1JV</td>
</tr>
<tr>
<td>Basslerites sp.</td>
<td>—</td>
<td>2</td>
<td>1JV</td>
</tr>
<tr>
<td>Cyprideis mexicana Sandberg</td>
<td>3</td>
<td>1JV</td>
<td>—</td>
</tr>
<tr>
<td>Cyprideis salebrosa van den Bold</td>
<td>7</td>
<td>9JV</td>
<td>8JV</td>
</tr>
<tr>
<td>Cytherella sp.</td>
<td>2</td>
<td>2JV</td>
<td>3JV</td>
</tr>
<tr>
<td>Cytherelloidea sp. aff. C. leonensis Howe</td>
<td>4</td>
<td>2JV</td>
<td>2JV</td>
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<tr>
<td>Cytheromorpha paracastanea (Swain)</td>
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<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Cytherura sp. cf. C. sandbergi Morales</td>
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<td>1JV</td>
<td>1JV</td>
</tr>
<tr>
<td>Cytherura sp. A</td>
<td>3</td>
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<td>1</td>
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<tr>
<td>Cytherura sp. B</td>
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<td>2</td>
<td>—</td>
</tr>
<tr>
<td>Cytherura sp. C</td>
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<td>Haplocythereidea bradyi (Stephenson)</td>
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<tr>
<td>Haplocythereidea setipinnata (Brady)</td>
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<tr>
<td>Hemicytherura vokesae, n. sp.</td>
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<td>8</td>
<td>7</td>
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<td>Megacythere edwardsi, n. sp.</td>
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<td>Neocaudites sp. cf. N. triplistrata (Edwards)</td>
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<td>—</td>
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<tr>
<td>Neonesidea sp. cf. N. gerda (Benson and Coleman)</td>
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<td>Orionina bradyi van den Bold</td>
<td>16</td>
<td>3AF</td>
<td>2AF</td>
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<tr>
<td>Paracypris sablensis Benson and Coleman</td>
<td>6</td>
<td>2JV</td>
<td>—</td>
</tr>
<tr>
<td>Paracytheridea tshoppi van den Bold</td>
<td>3</td>
<td>1JV</td>
<td>1JV</td>
</tr>
<tr>
<td>Paracytheridea sp. cf. P. vandenboldi Puri</td>
<td>4</td>
<td>1JV</td>
<td>—</td>
</tr>
<tr>
<td>Paradoxostoma sp.</td>
<td>1AF</td>
<td>1AF</td>
<td>1JV</td>
</tr>
<tr>
<td>Paranesidea sp. cf. P. bradyi (van den Bold)</td>
<td>3</td>
<td>—</td>
<td>3JV</td>
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</tbody>
</table>

TABLE 1. OSTRACODE FAUNAL LIST
Pellucistoma sp. aff. P. atkinsi Hall

Physocypris sp. cf. P. pustulosa Sharpe

Proteoconcha multipunctata (Edwards)

Protocytheretta punicosa (Brady)

Puriana rugipunctata (Ulrich and Bassler)

Radimella confragosa? (Edwards)

Xestoleberis rigbyi Morales

* valve count, adults
AF = fragments, adults
JV = valve count, juveniles

Bairdoppilata (Bairdoppilata) cushmani (Tressler).
MADDOCKS, 1969, p. 68-71, figs. 34, 35h-m,
DIMENSIONS: Left valve, length 1.00 mm, height .68 mm.
MATERIAL: Four valves.
ENVIRONMENT: Previously reported from modern sediments deposited at water depths of about 0.9 to 72.9 meters; marine; subtropical and tropical.

Genus PARANESIDEA Maddocks, 1969
PARANESIDEA sp. cf. P. BRADYI (van den Bold, 1957)
Plate 1, figure 6

Bairdia foveolata BRADY, 1868, p. 56, pl. 7, figs. 4-6. BRADY, 1880, p. 55, pl. 8, figs. 1a-f, 2a-f (not Bairdia foveolata Bosquet, 1852, p. 21, pl. 1, figs. 5a-d).

Bairdia sp. cf. B. bradyi van den Bold. BENSON and COLEMAN, 1963, p. 18-19, pl. 2, figs. 1-3, text fig. 7.
DIMENSIONS: Carapace, length .85 mm; height .54 mm; width .45 mm.
MATERIAL: A damaged carapace, four valves.
ENVIRONMENT: Previously reported from modern sediments deposited at water depths from near the shoreline to 2103 meters; marine; subtropical and tropical.

Genus NEONESIDEA Maddocks, 1969
NEONESIDEA sp. cf. N. GERDA (Benson and Coleman, 1963)
Plate 1, figure 8

Bairdia cf. B. crosskeyana Brady. BENDA and PURI, 1962, p. 324, pl. 5, figs. 12, 13 (not Bairdia crosskeyana Brady, 1866, p. 366, pl. 57, fig. 10).

Neonesidea gerda (Benson and Coleman). MADDOCKS, 1969, p. 24-26, figs. 7a-k.
MATERIAL: A single damaged valve.

REMARKS: The shape and muscle scars of the single valve appear to be identical to N. gerda (Benson and Coleman).
ENVIRONMENT: Previously reported from modern sediments deposited at water depths from near the shoreline to 15.2 meters; marine; subtropical and tropical.

Family MACROCYPRIDIDAE Müller, 1912
Genus MACROCYPRINA Triebel, 1960
MACROCYPRINA sp.
Plate 1, figure 7
DIMENSIONS: Juvenile, left valve, length .60 mm, height .28 mm.
MATERIAL: Two juvenile valves and two fragments of adult valves.

REMARKS: The limited nature of the material precludes identification at the species level. The juveniles were recovered from the sample taken at locality TU 733; the fragments are from TU 580.

Superfamily CYPRIDACEA Baird, 1845
Family PARACYPRIDIDAE Sars, 1925
Genus PARACYPRIS Sars, 1866
PARACYPRIS SABLENSIS
Benson and Coleman, 1963
Plate 1, figure 4
Paracypris? saliensis BENSON and COLEMAN, 1963, p. 16-17, pl. 1, figs. 11-13; text fig. 5. 
DIMENSIONS: Left valves, length .80-.83 mm; height .29-40 mm. 
MATERIAL: Eight valves.

REMARKS: The muscle scars could not be seen on any specimen, but all other characters were identical to those of the lectotype (USNM 113181).

ENVIRONMENT: Previously reported from modern sediments deposited at water depths of 5.8 to 29.0 meters; marine; subtropical.

Family CYPRIDEIDAE Sars, 1925
Subfamily CYPRIDEINAE Sars, 1925
Genus CYPRIDEIS Jones, 1857

CYPRIDEIS SALEBROSA van den Bold, 1963 Plate 1, figure 9

Cyprideis salebrosa VAN DEN BOLD, 1963b, p. 377-378, pl. 7, figs. 9a-d; pl. 11, figs. 1a-c.
SANDBERG, 1964b, p. 144-152, pl. 8, figs. 10-25; pl. 9, figs. 1-12; pl. 14, figs. 1-3; pl. 17, figs. 3a-f; pl. 18, fig. 10; pl. 20, figs. 5-10; pl. 22, figs. 5, 8 (with synonymy). VAN DEN BOLD, 1971, p. 452, 454. VAN DEN BOLD, 1972b, p. 486. KEYSER, 1975, p. 490, 493, text fig. 3. KONTROVITZ, 1976, p. 93, pl. 2, fig. 1.
DIMENSIONS: Right valve, length 1.20 mm; height .65 mm.
MATERIAL: Twenty-four valves.

REMARKS: The specimens are larger than those reported by van den Bold (1963b), but are similar in size to the range presented by Sandberg (1964b).

ENVIRONMENT: Previously reported from modern sediments deposited in estuaries, mangrove swamps and on the continental shelf of the Gulf of Mexico; water depths from near shore to more than 18.3 meters; brackish and marine; subtropical.

CYPRIDEIS MEXICANA Sandberg, 1964 Plate 1, figure 1

Cyprideis mexicana SANDBERG, 1964b, p. 125, pl. 11, figs. 11-14; pl. 12, figs. 1-5; pl. 17, fig. 1; pl. 20, figs. 1, 2; pl. 22, figs. 2, 9a,b.
MORALES, 1966, p. 32, pl. 2, figs. 1a,b.
DIMENSIONS: Carapace, length 1.05 mm; height .56 mm; width .41 mm.
MATERIAL: One carapace, two valves.

REMARKS: This species is similar to Anomocytheridea locketti Stephenson, 1938, but lacks the “thickened flange of clear shell material” at the posteroventral margin of the right valve.

ENVIRONMENT: Previously reported from modern sediments deposited in shallow lagoons and from depths as great as 6.1 meters; brackish to marine; tropical.

Genus HAPLOCYTHETERIDEA Stephenson, 1936

HAPLOCYTHETERIDEA BRADYI (Stephenson, 1938) Plate 1, figure 2

Cytheridea (Haplocytheridea) bradyi STEPHENSON, 1938, p. 129-132, pl. 23, fig. 22; pl. 24, figs. 5, 6; text fig. 10.

Haplocytheridea bradyi (Stephenson). SWAIN, 1955, p. 618, pl. 59, figs. 12a,b. PURI, 1960, p. 110, pl. 2, figs. 3, 4; pl. 6, fig. 19; text figs. 4, 5. SANDBERG, 1964a, p. 362-363, pl. 2, figs. 2-8. HALI, 1965, p. 41, figs. 1-11. HULINGS and PURI, 1965, p. 321, fig. 12. HULINGS, 1966, p. 50, fig. 6f. HULINGS, 1967, p. 642, fig. 3p. GROSSMAN, 1967, p. 54a, pl. 11, fig. 2; pl. 17, figs. 15, 16, 18. SWAIN, 1968, p. D8, pl. 1, figs. 7a,b, 8a,b; pl. 2, fig. 8. KRUTAK, 1971, p. 16, pl. 2, figs. 5a,b. VALENTINE, 1971, p. D6, pl. 2, figs. 42, 46. SWAIN, 1974, p. 13, pl. 1, figs. 9, 10, 13; pl. 8, figs. 10a,b. KONTROVITZ, 1976, p. 93, pl. 2, fig. 3.

Haplocytheridea bradyi Swain (sic). BYRNE, LEROY, and RILEY, 1959, p. 240, pl. 4, fig. 10; pl. 5, fig. 11.

Cytheridea (Haplocytheridea) wadei STEPHENSON, 1941, p. 428-429, text figs. 3, 4, 14-18.

Haplocytheridea wadei (Stephenson). PURI, 1953b, p. 231, pl. 3, figs. 5, 6; text fig. 3p.

Cytheridea (Haplocytheridea) proboscidiala EDWARDS, 1944, p. 508-509, pl. 85, figs. 8-11.

Haplocytheridea proboscidiala (Edwards). BENSON and COLEMAN, 1963, p. 28-29, pl. 3, figs. 4-9; text fig. 15.


DIMENSIONS: Right valves, length .73-75 mm; height .43-45 mm.
MATERIAL: Eight valves.

ENVIRONMENT: Previously reported from modern sediments deposited at water depths of 0.9 to 62.2 meters; brackish and marine; mild temperate, subtropical and tropical. Also reported from the Cape Hatteras area, North Carolina (Hazel, 1975).

HAPLOCYTHETERIDEA SETIPUNCTATA (Brady, 1869) Plate 1, figure 2
Cytheridea setipunctata BRADY, 1869, p. 124, pl. 14, figs. 15, 16.


DIMENSIONS: Left valve, female, length 1.13 mm; height .74 mm.

MATERIAL: Thirty-two valves; one juvenile carapace.

ENVIRONMENT: Previously reported from modern sediments deposited at water depths of 0.6 to 21.3 meters; brackish and marine; subtropical and tropical.

Subfamily NEOCYTHERIDEINAE
Puri 1957

Genus HULINGSINA Puri, 1957

HULINSIGA ASHERMANI (Ulrich and Bassler, 1904)
Plate 2, figure 8

Cytheridea ashermani ULRICH and BASSLER, 1904, p. 126, pl. 37, figs. 10-16.


Portocythere ashermani (Ulrich and Bassler). HULINGS, 1966, p. 51, figs. 2a-g. 6n. HULINGS, 1967, p. 645, fig. 5e. SWAIN, 1968, p. D10, pl. 2, figs. 1a-d; pl. 6, fig. 4; text fig. 8. SWAIN, 1974, pl. 1, figs. 21, 24; pl. 2, figs. 1-3; pl. 9, figs. 12a,b.

DIMENSIONS: Left valve, ? juvenile, length .73 mm; height .38 mm.

MATERIAL: Eighteen valves.

ENVIRONMENT: Previously reported from modern sediments deposited at water depths of 1.5 to 91.4 meters; brackish to marine; subtropical and tropical.

Family CYTHERURIDAE Müller, 1894
Genus CYTHERURA Sars, 1866

Cytherura sp. cf. C. sandbergi
MORALES, 1966
Plate 2, figure 1

cf. Cytherura sandbergi MORALES, 1966, p. 50, 52, pl. 4, figs. 6a-d (with synonymy).

KRUTAK, 1971, p. 20-21, pl. 2, figs. 3a,b. KONTROVITZ, 1976, p. 63, pl. 3, fig. 1.

DIMENSIONS: Right valve, length .60 mm; height .35 mm.

MATERIAL: Three valves.

REMARKS: The valves are larger than the specimens examined by Morales (1966); other characters are similar.

ENVIRONMENT: Previously reported from modern sediments deposited at water depths of 3.1 to 54.9 meters; brackish to marine; subtropical and tropical.

Cytherura sp. A
Plate 2, figure 5

Cytherura sp. A KONTROVITZ, 1976, p. 63, pl. 3, fig. 7.

DIMENSIONS: Left valve, ? juvenile, length .41 mm; height .24 mm.

MATERIAL: Five valves.

REMARKS: The five valves reported here and the three previously described are insufficient to name the species.

ENVIRONMENT: Previously reported from modern sediments deposited at water depths of 33.0 to 56.7 meters; marine; subtropical.

Cytherura sp. B
Plate 2, figure 3

DESCRIPTION: Right valve, moderately calcified, small. Lateral view, subrectangular. Cardinal angles rounded. Dorsal margin nearly straight with slight concavity at mid-length, ventral margin parallel with slight concavity in front of mid-length. Anterior margin, broadly rounded; posterior, triangular with apex equal to the caudal process just above mid-height.

Surface: About 12 distinct longitudinal ridges joined to a posterior sub-vertical rib; three join anterior rim. The posteroventral rib is high, ala-like. Eyespots, weak.

Internal features: Marginal area, wide at anterior, narrow elsewhere. Inner margin may be serrate (possibly eroded). Radial pore canals at anterior, few, sinuous or simply curved, a few false; at posterior, few, simple. Hinge normal for genus. Muscle scars not seen.

DIMENSIONS: Right valve, length .58 mm; height .31 mm.

MATERIAL: Four valves.

REMARKS: This species differs from Cytherura wardensis HOWE and BROWN,
1935, and Cytherura pseudostriata Hulings, 1966, in its shape and in lacking a reticulate surface. Valentine (1971) reported specimens identified as C. pseudostriata Hulings that are similar in shape, but those have a reticulate surface in contrast to this species.

**CYTHERURA** sp. C
Plate 2, figure 7

? Cytherura sp. aff. C. forulata Edwards. MORALES, 1966, p. 46, 48, pl. 4, figs. 7a,b (not Cytherura forulata Edwards, 1944, p. 526, pl. 88, figs. 17-20).

**DIMENSIONS**: Left valve, length \$59 mm; height .33 mm.

**MATERIAL**: One valve.

**REMARKS**: This species differs from Cytherura forulata Edwards by not having an arched dorsal margin; it is slightly concave at mid-length.

**ENVIRONMENT**: Previously reported from modern sediments deposited at water depths of less than 1.8 meters; marine; tropical.

Genus **HEMICYTHERURA** Elofson, 1941

Genus **HEMICYTHERURA** VOKESAE Kontrovitz, n. sp.
Plate 2, figures 2, 4

**DIAGNOSIS**: Distinguished by its elongate rectangular shape, prominent horizontal ridges and distinct cross-ridges.

**DESCRIPTION**: Moderately calcified, small, rectangular in lateral view. Females, dorsal margin nearly straight; ventral margin slightly convex and subparallel. Males, dorsal and ventral margins nearly straight and parallel. Both sexes have anterior margin evenly rounded; posterior evenly rounded below mid-length, a slightly upturned caudal process above.

Surface is reticulate with high, delicate horizontal ribs. The dorsal and ventral marginal ribs are most prominent being fluted on well preserved specimens. Rib just above ventral rib bifurcates then unites again reaching the low anterior rim. All horizontal ribs connect to sinuous vertical rib just in front of posterior.

Sexual dimorphism: As above, males also lower.

**Internal view**: Valves deep. Hinge, right valve, selvage is extended into high blade-like elements that reach toward center just beyond cardinal angles; above hinge elements there is a distinct flange groove. Left valve, a long blade-like medial element expanded at each end; fits between terminal elements of right valve.

Inner lamella is wide at anterior, narrow elsewhere. Inner margin, slightly serrate at anterior, No vestigial. Radial pore canals, few and curved. Muscle scars not seen.

**HOLOTYPE**: Left valve, female, figured, USNM 236001; length .47 mm; height .26 mm.

**PARATYPES**: Right valve, female, figured, USNM 236002; length .44 mm, height .24 mm.

Left valve, female, USNM 236003; length .45 mm, height .26 mm. Right valve, male, USNM 236004; length .46 mm, height .23 mm. Left valve, male, USNM 236005; length .45 mm, height .24 mm.

**TYPE LOCALITY**: Tulane University Department of Geology Locality 580 (see section VIII of this study).

**DIMENSIONS**: Females, right valves, length .44-.48 mm; height .24-.26 mm. Males, right valves, length .45-.46 mm; height .21-.24 mm.

**MATERIAL**: Nineteen valves.

**REMARKS**: This specimen is similar to Hemicytherura sablensis Benson and Coleman, 1963, in outline, but differs from the latter by having distinct cross-ribs between the horizontal ribs. An examination of the lectotype (USNM 113199) also revealed that H. sablensis has straight horizontal ribs; horizontal ribs are sinuous on *H. vokesae*, n. sp.

The species is named in honor of Dr. Emily H. Vokes of Tulane University for her contributions to paleontology.

Genus **PARACYTHERIDEA** Müller, 1894

**PARACYTHERIDEA** sp.
cf. *P. VANDENBOLDI* Puri, 1953

Plate 3, figure 1

**Cytheropteron nodosum** ULRICH and BASSLER, 1904, p. 129-130, pl. 38, figs. 37-40. (Not Cytheropteron nodosum Brady, 1868, p. 448, pl. 34, figs. 31-34.)

**Paracytheridea noda** (Ulrich and Bassler), HOWE et al., 1935, p. 37, pl. 3, fig. 7. VAN DEN BOLD, 1946, p. 86, pl. 16, fig. 7. SWAIN, 1951, p. 51, pl. 3, figs. 19-22.

**Paracytheridea vandenboldi** Puri, 1953c, p. 751. PURI, 1953b, p. 238, 240, pl. 3, fig. 7; text figs. 5a,b. MALKIN, 1953, p. 780, pl. 79, fig. 5. SWAIN, 1955, p. 625, pl. 62, figs. 2a, b. MCLEAN, 1957, p. 75-76, pl. 8, figs. 4a, 4b. HALL, 1965, p. 49, pl. 18, figs. 22-30. MCLEAN, 1966, p. 61-62.

**Paracytheridea** cf. *P. vandenboldi* Puri. SWAIN, 1968, p. D11, pl. 2, figs. 4a,b.

**DIMENSIONS**: Left valve, length .81 mm, height .42 mm.

**MATERIAL**: Five valves.

**REMARKS**: Although these specimens are larger than those reported by Ulrich and Bassler (length .68 mm; height .30 mm) they are similar in all other characteristics.

**ENVIRONMENT**: Previously reported from modern sediments deposited at water
depths of about 1.7 meters; brackish; subtropical (Swain, 1955).

**Paracytheridea tschoppi**
van den Bold, 1946
Plate 2, figure 6

*Paracytheridea tschoppi* Van Den Bold, 1946, p. 85, pl. 16, figs. 6, 7. **Kingma**, 1954, p. 220, pl. 4, fig. 4. Van Den Bold, 1957, p. 245, pl. 4, fig. 7. **Benson and Coleman**, 1963, p. 33-34, pl. 6, figs. 7, 9, 10; text figs. 20a,b. Van Den Bold, 1967a, p. 313. Van Den Bold, 1968, p. 76, pl. 4, figs. 8a-d. Van Den Bold, 1972a, p. 434.

*Paracytheridea vanweesemi* Van Den Bold, 1946, p. 86, pl. 16, fig. 13.

**Paracytheridea** sp. 1, **Drooger and Kaas-Rieter**, 1958, p. 91.

**Aurila** sp. cf. A. *Amygdala* (Stephenson, 1944)
Plate 2, figure 9

*Hemicytheridae* Puri, 1953
**Subfamily Hemicytherininae** Puri, 1953
**Genus Aurila** Pokorny, 1955

*Aurila floridana* (Howe and McGuirt) floridana
Benson and Coleman, 1963, p. 35-36, pl. 8, figs. 10-12; text fig. 21. **Hall**, 1965, p. 32, pl. 6, figs. 20-22, 24, 29.


**Radimella** floridana (Benson and Coleman).
**Hazel**, 1971a, p. 6.


**Dimensions:** Right valves, length .65-.68 mm; height .43-.45 mm.

**Material:** Two carapaces (juvenile), 43 adult valves.

**Remarks:** The adult specimens examined for this study are larger than those of Benson and Coleman (1963) and Morales (1966), but are identical in other characters. A new genus is being proposed by J. E. Hazel (Smithsonian Contributions to Paleobiology, in press) for *A. conradi*, *A. floridana* and related North American forms.

**Environment:** Previously reported from modern sediments deposited at water depths of 1.5 to 62.2 meters; brackish to marine (27-40 o/oo); mild temperate, subtropical and tropical. Also reported by Hazel (1975) from the Cape Hatteras area, North Carolina.

"**Aurila**" *Bellegladensis*
Kontrovitz, n. sp.
Plate 3, figures 4, 5

**Diagnosis:** Distinguished by the highly arched dorsal, polished ridges, blunt caudal process of the right valve and small tooth in the bottom of the posterior socket of the left valve hinge.

**Description:** Almond shaped, moderately calcified, medium size. In lateral view, ovate, pronounced overlap by left valve only at dorsum; dorsal margin is broadly rounded. In left view,
anterior cardinal angle is broadly rounded; posterior or cardinal angle more sharply rounded. Dorsal margin slopes markedly to rear. Greatest height is at anterior cardinal angle, greatest length below middle (length/height ratio, left valves, 1:4). Anterior margin, rimmed and broadly curved below mid-height, more oblique above. Posterior margin has concavity above mid-height, caudal process below. Ventral margin, gently convex with slight sinuosity near mid-length. Sexual dimorphism not apparent.

Dorsal view: Ovate, greatest width at mid-length, slopes evenly to anterior and posterior. Left valve slightly larger.

End view, anterior: Ovate, greatest width below mid-height, venter slightly flattened.

Surface: Anterior is reticulate with about six coarse reticulations parallel to anterior rim. Smaller reticulations at mid-length; at posterior, shape of depressions becomes irregular. Area between depressions (the ridges) are flattened and polished. Some specimens have smooth subcentral area and weak posteroventral ridge. A low ventrolateral ridge has about 10-11 pits giving a weakly fluted appearance. Eyespot small but distinct and on an arcuate ridge that is parallel to nearest margin.

Internal features: Valves deep; caudal process blunt in right valve. Hinge, right valve, anterior element is an oval tooth on a ramp, followed by a rounded socket, then a curved medial groove, a posterior tooth that is crescent-shaped and slightly enlarged at each end. Left valve, a rounded anterior socket followed by a large oval tooth that is the element is an oval tooth on a ramp, enlarged at each end. Left valve, a rounded anterior groove like depression with flange (a flange ridge that is parallel to nearest margin. Inner lamella is narrow; anterior vestibule is very narrow; posterior vestibule small and only at caudal process. Radial pore canals, numerous and closely spaced at lower anterior margin, more widely spaced and slightly sinuous at upper anterior.

Selvage, right valve, low but distinct at anterior, higher and sharper at the ventral margin where it is flexed inward just in front of mid-length; at posterior selvage is parallel to margin and forms a groove like depression with flange (a flange groove). Selvage continues onto caudal process. Selvage of left valve is low but distinct, fits into groove of right valve, is removed from outer margin on caudal process.

Muscle scars: Central scars, a group of three with the upper one circular; middle is horizontally elongate and divided; lower scar is elongate, divided and sloping toward anteroveltral margin. Frontal scar is divided into three areas, slopes forward.

HOLOTYPE: Left valve, figured, USNM 235996; length .60 mm, height .39 mm.

PARATYPES: Right valve, figured, USNM 235997; length .55 mm, height .29 mm. Left valve, USNM 255998; length .60 mm, height .39 mm. Right valve, USNM 255999; length .59 mm, height .33 mm. Carapace, ? juvenile, USNM 236000; length .53 mm, height .35 mm, width .29 mm.

TYPE LOCALITY: Tulane University Department of Geology Locality 201 (see section VIII of this study).

DIMENSIONS: Carapaces, ? juveniles, length .53-.56 mm; height .35-.38 mm; width .29-.30 mm; left valves length .55-.60 mm; height .38-.41 mm. L/H ratio of left valves = 1.4.

MATERIAL: Eight carapaces, 52 valves.

REMARKS: This species is similar to Aurila conradi (Howe and McGuirt) californica Benson and Kaesler, 1963, but differs by having a blunt caudal process in the right valve, not a pointed one. This species also has a less distinct posteroventral ridge and larger eyespots. The course of the selvage is different in the ventral portion of the valves and this species lacks marginal denticles below the caudal process.

The species differs from Aurila floridana Benson and Coleman, 1963, by lacking marginal denticles, by the presence of a small tooth in the posterior socket of the left valve hinge and in the more subdued ridges of the surface ornamentation. This species is probably a member of a new genus that will be described by Joseph E. Hazel (Hazel, 1977, personal communication).

The species is named for its occurrence near the town of Belle Glade, Florida.

Genus RADIMELLA Pokorny, 1969

RADIMELLA CONFRAGOSA? (Edwards, 1944)

Plate 3, figure 3


? Radimella confragosa (Edwards). VAN DEN BOLD, 1975, p. 697, pl. 1, figs. 14, 16, 17; text figs. 3a, b (with synonymy).

DIMENSIONS: Carapaces, length .56-.60 mm; height .34-.36 mm; width .36-.38 mm.

MATERIAL: Six carapaces, 13 valves.

REMARKS: This species differs slightly from the Holotype of Radimella confragosa (Edwards) by having a more evenly rounded anterior margin, somewhat heavier ornamentation and by having two posterior marginal spines above the caudal process. The posterior or marginal spines are similar to those of Radimella confragosa form A of van den Bold (1975) but the shape and general ornamentation differ from that form. The details
of the shape and ornamentation serve to differentiate this species from the other forms described by van den Bold (1975) in his study of *Radimella* ex gr. *confragosa* (Edwards).

Genus **ORIONINA** Puri, 1953

**ORIONINA BRADYI** van den Bold, 1963

Plate 3, figure 6

*Orionina bradyi* VAN DEN BOLD, 1963a, p. 45, 47, pl. 3, figs. 7, 8, text fig. 6, figs. 5-7 (with synonymy), MORALES, 1966, p. 85, 87, pl. 8, figs. 2a-c. VALENTINE, 1971, p. 8. VAN DEN BOLD, 1974, p. 217. HAZEL, 1975, p. 477.

? *Orionina bermudae* (Brady), BENSON and COLEMAN, 1963, p. 45-46, pl. 8, fig. 7; text fig. 29 (not *Cythere bermudae* Brady, 1880, p. 90, pl. 21, figs. 2a-d).

**DIMENSIONS:** Carapaces, length .56-.61 mm; height .31-.35 mm; width .26-.30 mm.

**MATERIAL:** Three carapaces, 18 valves.

**REMARKS:** The marginal area, hinge and "pillar" structures are identical to those described by van den Bold (1963a). The ornamentation is variable and is similar on some specimens to that of *Orionina vaughni* (Ulrich and Bassler, 1904).

**ENVIRONMENT:** Previously reported from modern sediments deposited from shallow depths to about 792.5 meters; marine; subtropical and tropical.

Subfamily **CAMPYLOCYTHERINAE**

Puri, 1960

Genus **PROTEOCONCHA** Plusquellec and Sandberg, 1969

**PROTEOCONCHA MULTIPUNCTATA** (Edwards, 1944)

Plate 3, figure 8

*Acuiticythereis multipunctata* EDWARDS, 1944, p. 520, pl. 87, figs. 14-16.

*Proteoconcha multipunctata* (Edwards). PLUSQUELLEC and SANDBERG, 1969, p. 457-459, pl. 2, figs. 1-11; pl. 5, fig. 9; pl. 6, figs. 12-13; pl. 8, fig. 5; pl. 9, figs. 6, 10, 12-16; text figs. 2h-i, 3d, 4, 12. HAZEL, 1971b, p. 370. VALENTINE, 1971, p. 8. HAZEL, 1975, p. 378.

**DIMENSIONS:** Right valve, ? female, length .65 mm; height .36 mm,

**MATERIAL:** One carapace, six valves.

**ENVIRONMENT:** A modern specimen from Florida Bay has been identified, tentatively, as a representative of this species (Plusquellec and Sandberg, 1969, p. 458). In addition, the species has been reported from the Cape Hatteras area, North Carolina (Hazel, 1975).

Subfamily **THAEROCYTHERINAE**

Hazel, 1967

Genus **PURIANA** Coryell and Fields, in Puri, 1953

**PURIANA RUGIPUNCTATA** (Ulrich and Bassler, 1904)

Plate 3, figure 7

*Cythere rugipunctata* ULRICH and BASSLER, 1904, p. 118 pl. 38, figs. 16, 17.

*Cythereis rugipunctata* (Ulrich and Bassler), HOWE et al., 1935, p. 23, pl. 1, figs. 18, 20-22; pl. 4, figs. 22, 23.

*Favella rugipunctata* (Ulrich and Bassler). EDWARDS, 1944, p. 524, pl. 88, figs. 5, 6. VAN DEN BOLD, 1950, p. 797, pl. 83, fig. 24.

**DIMENSIONS:** Left valves, length .58-.60 mm; height .28-.32 mm.

**MATERIAL:** Five carapaces, nine valves.

**REMARKS:** The specimens reported here are smaller than those described by Ulrich and Bassler (left valve, length .71 mm, height .38 mm).

**ENVIRONMENT:** Previously reported from modern sediments deposited at water depths of 1.5 to 381 meters with the most common occurrences at depths of less than 76.2 meters; brackish and marine; mild temperate, subtropical and tropical.

Family **LOXOCONCHIDAE** Sars, 1925

Genus **LOXOCONCHA** Sars, 1866

**LOXOCONCHA sp. cf. L. SARASOTANA** Benson and Coleman, 1963

Plate 4, figure 2

*cf. Loxoconcha sarasotana* BENSON and COLEMAN, 1963, p. 37, pl. 7, figs. 7-10; text fig. 23a.

**DIMENSIONS:** Female, right valve, length .55 mm; height .35 mm; male, right valve, length .59 mm; height .33 mm.
MATERIAL: Eleven valves.

REMARKS: None of the specimens examined have the distinct posterior ridge described by Benson and Coleman (1963). A posterior ridge is weakly formed on several valves, but it is not equally developed on all specimens. In addition, the valves reported here are smaller than the type specimens.

ENVIRONMENT: Previously reported from modern sediments deposited at water depths of 6.1 to 19.2 meters; marine; subtropical. Morales (1966) reported a similar form from shallow, brackish to marine waters in the tropics.

LOXOCONCHA sp. cf. L. MATAGORDENSIS Swain, 1955
Plate 4, figure 1
cf. Loxoconcha matagordensis SWAIN, 1955, p. 629, pl. 63, figs. 9a, b; pl. 64, figs. 1a, b; text figs. 36b, 39: 7a,b, MORALES, 1966, p. 66, 69, pl. 6, figs. 4a,b (with synonymy). GROSSMAN, 1967, p. 74, pl. 15, fig. 3; pl. 18, figs. 7, 8, 11, VALENTINE, 1971, p. D6, pl. 4, figs. 39-39, 43-44, HAZEL, 1971b, p. 370. HAZEL, 1975, p. 477. KONTROVITZ, 1976, p. 72, pl. 5, fig. 1.


DIMENSIONS: Carapace, length .55 mm; height .30 mm; width .16 mm.

MATERIAL: One carapace, three juvenile valves.

REMARKS: The subsidiary ridges described by Swain (1955) as characteristic of this species are visible only with low angle lighting on the adult specimen.

ENVIRONMENT: Previously reported from modern sediments deposited at water depths of 0.6 to 128.0 meters; brackish to marine; subtropical and tropical.

Genus LOXOCORNICULUM Benson and Coleman, 1963

LOXOCORNICULUM POSTDORSOALATUM (Puri, 1960)
Plate 4, figure 4

Loxoconcha anderseni Puri, PURI and HULINGS, 1957, fig. 11 (not L. anderseni Puri, 1953b, p. 269, pl. 10, fig. 4: text fig. 10c).

Loxoconcha postdorsolata PURI, 1960, p. 111, pl. 3, figs. 17, 18; text figs. 35, 37.

Loxocorniculum postdorsolatum (Puri), BENSON and COLEMAN, 1963, p. 39-40, pl. 7, figs. 1, 2; text fig. 25.

DIMENSIONS: Carapace, male, length .65 mm; height .38 mm; width .30 mm.

MATERIAL: One carapace, 15 valves.

ENVIRONMENTS: Previously reported from modern sediments deposited at water depths from the shore line to 19.2 meters; marine; subtropical and tropical.

LOXOCORNICULUM FISCHERI (Brady, 1869)
Plate 4, figure 3

PLATE 1

1. Cyprideis mexicana Sandberg, right valve
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2. Haplocytheridea bradyi (Stephenson), right valve
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7. Macrocyprina sp., left valve
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8. Neonesidea sp. cf. N. gerda (Benson and Coleman), right valve, damaged
   USNM 236035, X60 ............................................. 139
9. Cyprideis salebrosa van den Bold, right valve
   USNM 236017, X60 ............................................. 140
Cythere fischeri BRADY, 1869, p. 152, 154, pl. 18, figs. 15, 16.
Loxoconcha fischeri (Brady). VAN DEN BOLD, 1963b, p. 393-394, pl. 8, figs. 8, 9 (with synonymy). VAN DEN BOLD, 1966, p. 51, pl. 3, fig. 7. HOWE and VAN DEN BOLD, 1975, p. 307, pl. 2, fig. 17.
Loxocorniculum fischeri (Brady). BENSON and COLEMAN, 1963, p. 39, pl. 7, figs. 3, 4; text fig. 24.
DIMENSIONS: Left valves, female, length .50 mm; height .33 mm; male, length .58 mm; height .34 mm.
MATERIAL: Four carapaces, 63 valves.
ENVIRONMENT: Previously reported from modern sediments deposited in waters ranging from shallow depths to about 259.1 meters; marine; tropical.

Genus CYTHEROMORPHA Sars, 1925
CYTHEROMORPHA PARACASTANEA (Swain, 1955) Plate 4, figure 9
Leptocythere paracastanea SWAIN, 1955, p. 640, pl. 62, fig. 7; ? pl. 63, figs. 1a-c; ? text figs. 39: 5a, b. CURTIS, 1960, p. 478, pl. 2 (top), fig. 13. ENGEL and SWAIN, 1967, p. 413, pl. 2, fig. 20. SWAIN, 1974, p. 26, pl. 4, figs. 5-8, pl. 9, figs. 6a, b. KONTOVITZ, 1976, p. 74, 76, pl. 5, fig. 9. Not DARBY, 1965, p. 20, pl. 3, figs. 1-10; pl. 4, figs. 1-9.

DIMENSIONS: Left valve, length .51 mm, height .26 mm.
MATERIAL: Eight carapaces and 15 valves.

REMARKS: The medial sulcus is less distinct than on the type specimen (Swain, 1955). All other characters are similar. Darby (1965) reported a form as being this species but his specimens differ by having more arched dorsal margins and by having the greatest length at or above mid-height. The hingement of this species is that of Cytheromorpha (see Van Morkhoven, 1963, p. 396-398).

ENVIRONMENT: Previously reported from modern sediments deposited at water depths of 1.5 to 152.4 meters; brackish to marine; subtropical and tropical.

Family PARADOXOSTOMATIDAE
Brady and Norman, 1889
Subfamily PARADOXOSTOMATINAE
Brady and Norman, 1889
Genus PARADOXOSTOMA Fischer, 1855
PARADOXOSTOMA sp. Plate 2, figure 10
DIMENSIONS: Damaged valve, length .71 mm.

PLATE 2

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1. Cytherura sp. cf. C. sandbergi Morales, right valve USNM 236020, X110 ........................................ 141
2. Hemicytherura vokesae Kontrovitz, n. sp., Holotype, left valve USNM 236001, X100 ........................................ 142
3. Cytherura sp. B, right valve USNM 236022, X100 ........................................ 141
4. Hemicytherura vokesae Kontrovitz, n. sp., Paratype, right valve USNM 236002, X100 ........................................ 142
5. Cytherura sp. A, left valve USNM 236021, X100 ........................................ 141
6. Paracytheridea tschoppi van den Bold, left valve USNM 236038, X100 ........................................ 143
7. Cytherura sp. C, left valve USNM 236023, X100 ........................................ 142
8. Hulingsina ashermani (Ulrich and Bassler), left valve USNM 236026, X100 ........................................ 141
9. Aurila sp. cf. A. amygdala (Stephenson), left valve USNM 236012, X100 ........................................ 143
10. Paradoxostoma sp., left valve, damaged USNM 236040, X60 ........................................ 148
PLATE 2
MATERIAL: Two damaged right valves and one juvenile valve.

REMARKS: The material is insufficient for identification at the species level. The damaged adults were recovered from the sample taken at locality TU 580; the juvenile is from TU 733.

Genus MEGACYTHERE Puri, 1960

REMARKS: See Hall’s (1965) discussion of the validity of this genus.

MEGACYTHERE EDWARDSI Kontrovitz, n. sp.
Plate 4, figures 5, 6

DIAGNOSIS: Distinguished by the straight dorsum and sinuous ventrum that converge anteriorly, the acutely rounded caudal process in the right valve and the ornamentation of numerous sinuous longitudinal ridges and cross-ridges that give a reticulate appearance.

DESCRIPTION: Moderately calcified, medium size. Trapezoidal in lateral view. Dorsal margin is nearly straight; ventral margin is sinuous and converging anteriorly. Anterior margin broadly rounded; posterior margin, broadly rounded below mid-height, an acutely rounded carinal process at mid-height; above, straight and sloping up to posterior cardinal angle. No dimorphic features.

Surface: Reticulate, with about nine to 12 sinuous horizontal ridges; cross-ridges are distinct but less pronounced. Ornamentation becomes weak near anterior and posterior margins.

Internal features: Hinge, right valve, anterior element is elongate and curved with convex side toward center of valve, enlarged at anterior, A socket lies above anterior element. Medial element, an indistinct groove. Posterior element is an enlarged extension of selvage from posterior. Left valve, a long medial bar is enlarged anteriorly into a high thin tooth; bar is also slightly enlarged at posterior.

Marginal area, widest at anterior, narrows slightly at posteriorventral and ventral regions. Anterior vestibule is distinct. Radial pore canals, widely spaced, often bifurcating with funnel-shaped openings at anterior; few false. Muscle scars not observed.

HOLOTYPE: Left valve, figured, USNM 236006; length .60 mm, height .30 mm.

PARATYPES: Right valve, figured, USNM 236007; length .55 mm, height .29 mm. Left valve, USNM 236008; length .60 mm, height .30 mm. Right valve, USNM 236009; length .59 mm, height .33 mm. Left valve, USNM 236010; length .61 mm, height .31 mm.

TYPE LOCALITY: Tulane University Department of Geology Locality 201 (see section VIII of this report).

DIMENSIONS: Right valves, length .55-.61 mm; height .29-.33 mm; left valves, length .60-.63 mm; height .29-.32 mm.

MATERIAL: Fourteen valves.

REMARKS: This species differs from Megacythere striata (Puri, 1953b), by the presence of a distinctly reticulate surface. Megacythere robusta Puri, 1960, is similar, but the new species described here can be distinguished by its lack of large scattered normal pore canals, the greater length/height ratio (2), its smaller size and more distinctly reticulate ornamentation. This species is named in honor of Dr. Richard A. Edwards.
University of Florida, who introduced the writer to the study of micropaleontology.

Subfamily CYTHEROMATINAE
Elofson, 1939
Genus PELLUCISTOMA
Coryell and Fields, 1937
PELLUCISTOMA sp. aff. P. ATKINSI
Hall, 1965
Plate 4, figure 7
DIMENSIONS: Left valve, length .56 mm; height .29 mm.
MATERIAL: Sixteen valves, of which 11 are juveniles.
REMARKS: The external outline and most of the internal features of this species are similar to those of P. atkinsi Hall, 1965. The latter differs by having obviously branching radial pore canals and in being smaller than the species reported here.

Family TRACHYLEBERIDIDAE
Sylvester-Bradley, 1948
Subfamily TRACHYLEBERIDINAE
Sylvester-Bradley, 1948
Genus ACTINOCYHEREIS Puri, 1953
ACTINOCYHEREIS TRIANGULARIS
Morales, 1966
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Figures
1. Loxoconcha sp. cf. L. matagordensis Swain, carapace, left valve
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2. Loxoconcha sp. cf. L. sarasotana Benson and Coleman, right valve
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3. Loxocorniculum fischeri (Brady), left valve
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USNM 236042, X100 .................................................. 152
8. Neocaudites sp. cf. N. triplistrata (Edwards), left valve
USNM 236034, X100 .................................................. 154
9. Cytheromorpha paracastanea (Swain), left valve
USNM 236027, X100 .................................................. 148
10. Actinocythereis triangularis Morales, right valve
USNM 236011, X100 .................................................. 152

DIMENSIONS: Carapace, ? female, length .75 mm; height .40 mm; width .38 mm.
MATERIAL: Two carapaces, 13 valves.
REMARKS: These specimens are larger than those described by Morales (1966) from the southeast coast of Mexico; the size is similar to those from the west coast of Florida (Benson and Coleman, 1963). The radial pore canals are slightly curved at the anterodorsal and anteroventral margins in these valves. This species differs from Actinocythereis vandenboldi Kontrovitz, 1976, by its rounded, not pointed posterior and its less distinct ornamentation that is arranged in a different pattern.
ENVIRONMENT: Previously reported from modern sediments deposited in shallow brackish and marine waters; subtropical and tropical.

Genus NEOCAUDITES Puri, 1960

PLATE 4
Figures
1. Loxoconcha sp. cf. L. matagordensis Swain, carapace, left valve
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2. Loxoconcha sp. cf. L. sarasotana Benson and Coleman, right valve
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3. Loxocorniculum fischeri (Brady), left valve
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5. Megacythere edwardsi Kontrovitz, n. sp., Paratype, right valve
USNM 236007, X100 .................................................. 150
6. Megacythere edwardsi Kontrovitz, n. sp., Holotype, left valve
USNM 236006, X100 .................................................. 150
7. Pellucistoma sp. aff. P. atkinsi Hall, left valve
USNM 236042, X100 .................................................. 152
8. Neocaudites sp. cf. N. triplistrata (Edwards), left valve
USNM 236034, X100 .................................................. 154
9. Cytheromorpha paracastanea (Swain), left valve
USNM 236027, X100 .................................................. 148
10. Actinocythereis triangularis Morales, right valve
USNM 236011, X100 .................................................. 152

Actinocythereis cf. A. exanthemata (Ulrich and Bassler). CURTIS, 1960, p. 478, pl. 3, fig. 10 (not Cythere exanthemata Ulrich and Bassler, 1904, p. 117-118, pl. 36, figs. 1-5).
Actinocythereis sp. aff. A. exanthemata (Ulrich and Bassler). BENSON and COLEMAN, 1963, p. 48, pl. 6, fig. 12, text figs. 31-a-d.
Actinocythereis triangularis MORALES, 1966, p. 80-81, 83, pl. 8, figs. 1-a-d.

MATERIAL: Two carapaces, 13 valves.

REMARKS: These specimens are larger than those described by Morales (1966) from the southeast coast of Mexico; the size is similar to those from the west coast of Florida (Benson and Coleman, 1963). The radial pore canals are slightly curved at the anterodorsal and anteroventral margins in these valves. This species differs from Actinocythereis vandenboldi Kontrovitz, 1976, by its rounded, not pointed posterior and its less distinct ornamentation that is arranged in a different pattern.
ENVIRONMENT: Previously reported from modern sediments deposited in shallow brackish and marine waters; subtropical and tropical.
Subfamily CYTHERETTINAE Triebel, 1952
Genus PROTOCYTHERETTA Puri, 1958
PROTOCYTHERETTA PUMICOSA
(Brady, 1866)
Plate 5, figure 1
Cythere pumicosa BRADY, 1866, p. 379, pl. 61, figs. 3a-c.
Cythere danaiana BRADY, 1869, p. 124, pl. 14, figs. 13, 14. Not CURTIS, 1960, p. 478, pl. 2 (top), fig. 2.
Paracytheretta danaiana (sic) (Brady). PURI, 1952, p. 210, pl. 40, figs. 10, 11; text fig. 11.
Cytheretta danaiana (sic) (Brady). PURI and HULINGS, 1957, p. 174, 187, fig. 11. HULINGS, 1966, p. 46, fig. 6b. HULINGS, 1967, p. 642, fig. 3.

DIMENSIONS:
Left valve, length .96 mm; height .53 mm.
MATERIAL: Six valves and three juvenile valves.

REMARKS: Van den Bold (1971, personal communication) has indicated that Protopocytheretta pumicosa (Brady, 1866) is a senior synonym of P. danaiana (Brady, 1869).

ENVIRONMENT: Previously reported from modern sediments occurring from near the shoreline to water depths of about 152.4 meters; marine; mild temperate, subtropical and tropical.

? Subfamily
Genus BASSLERITES Howe, 1937
Basslerites sp.
Plate 5, figure 7
DIMENSIONS: Carapace, ? female, length .39 mm; height .20 mm; width .16 mm.
MATERIAL: One carapace, two damaged valves.

REMARKS: Exact identification is not possible with these specimens. This form is similar to Basslerites minutus van den Bold, 1958b, but differs by having a more rounded posterior cardinal angle in the left valve; the shape of the posterolateral depressions is

PLATE 5

Figures    Page
1. Protocyeretta pumicosa (Brady), left valve  USNM 236045, X60 .................................................. 154
2. Physocypria sp. cf. P. pustulosa (Sharpe), right valve  USNM 236043, X100 .............................................. 155
3. Limnocythere sp., right valve  USNM 236028, X100 .................................................. 156
4. Xestoleberis rigbyi Morales, left valve  USNM 236048, X100 .............................................. 155
5. Cytherella sp., left valve  USNM 236018, X100 .................................................. 156
6. Cytherelloidea sp. aff. C. leonensis Howe, right valve  USNM 236019, X100 .................................................. 156
7. Basslerites sp., carapace, left view  USNM 236015, X100 .................................................. 154
also different. This species differs from *B. miocenica* (Howe, 1935) by its size and shape and from *B. vokesi* Kontrovitz, 1976, by its less convex dorsal and ventral outlines.

Family XESTOLEBERIDIDAE Sars, 1928
Genus XESTOLEBERIS Sars, 1866
*Xestoleberis rigbyi* Morales, 1966
Plate 5, figure 4

*Xestoleberis rigbyi* Morales, 1966, p. 87, 89, pl. 8, figs. 4a-d.
DIMENSIONS: Left valve, length .55 mm; height .36 mm.
MATERIAL: One carapace and 18 valves.

ENVIRONMENT: Previously reported from modern sediments deposited at water depths less than 5.5 meters; brackish and marine; tropical.

Family CYCLOCYPRIDIDAE Kaufman, 1900
Genus PHYSOCYPRIA Várva, 1898
*Physocypria sp. cf. P. pustulosa* (Sharpe, 1897)
Plate 5, figure 2
*Physocypria pustulosa* (Sharpe). SWAIN, 1955, p. 610, pl. 60, figs. 5a, b (with synonymy).
DIMENSIONS: Carapace, ? female, length .58 mm; height .40 mm; width .30 mm.

MATERIAL: Two carapaces, five valves.

REMARKS: This species is somewhat similar to Physocypria fadeewi Dubowski, 1927, as reported by Furtos (1936), but differs by having a more narrow inner lamella and in being more compressed in dorsal view.

ENVIRONMENT: Previously reported from fresh water bodies and from brackish water in the upper portion of San Antonio Bay, Texas (Swain, 1955). Species of this genus have been reported as living only in fresh water (Swain, 1961; Van Morkhoven, 1963).

Family LIMNOCYtheridae Klie, 1938
Genus LIMNOCYTHERE Brady, 1868

LIMNOCYTHERE sp.
Plate 5, figure 3

? Limnocythere sp. PURI and VANSTRUM, p. 26, fig. 2.

? Limnocythere ? sanctipatricii Brady and Robertson. KEYSER, 1975, p. 490, text fig. 3 (not Limnocythere sancti-patricii Brady and Robertson, 1969, p. 17, pl. 18, figs. 8-11; pl. 21, fig. 4).

DESCRIPTION: Moderately calcified, medium size. Right valve, lateral view, trapezoidal, sloping toward posterior; greatest height at anterior cardinal angle. Dorsal margin, straight and sloping toward posterior; ventral margin slightly concave. Anterior margin broadly rounded, posterior more acutely rounded.

Surface: Faintly pitted with a sub-vertical sulcus just in front of mid-length; two nodes, one above the other, just behind mid-length. Lower node gives an alate appearance to valve. Behind lower node, a deep sulcus from ventral margin to mid-height.

DIMENSIONS: Right valve, ? female, length .60 mm; height .34 mm.

MATERIAL: Twenty-three valves.

REMARKS: This species differs from Limnocythere sanctipatricii Brady and Robertson, 1869, by being less coarsely pitted, less elongate and by being larger. The specimens are poorly preserved, thus, a complete description is not possible.

ENVIRONMENT: Probably the form reported from the mangrove swamps of southwestern Florida (Keyser, 1975).

Suborder PLATYCopina Sars, 1866
Family CYthereLLIDAE Sars, 1866

Genus CYthereLLA Jones, 1849

CYthereLLA sp.
Plate 5, figure 5

DESCRIPTION: Left valve, lateral view, short. Dorsal margin, straight at anterior, sloping behind mid-length. Ventral margin, slightly concave at middle. Anterior margin, broadly rounded; posterior more narrowly rounded. Surface, smooth. Internal features normal for genus.

DIMENSIONS: Left valve, length .57 mm; height .34 mm.

MATERIAL: Seven valves.

REMARKS: The few specimens are insufficient for establishing the identity of this form at the species level.

Genus CYthereLLOIDEA Alexander, 1929
CYthereLLOIDEA sp. aff. C. Leonensis Howe, 1934
Plate 5, figure 6

DIMENSIONS: Carapace, length .65 mm; height .35 mm; width .26 mm.

MATERIAL: One carapace and six valves.

REMARKS: The ornamentation on this form differs from C. leonensis Howe, 1934, by being more subdued and in having the dorsal rib flexed inward at about one-third of the length from the anterior. The outline of the carapace is similar to Howe's species.

VIII. LOCALITY DATA
The following are Tulane University fossil locality numbers:

201, “Bermont Formation,” pit just south of Belle Glade, Palm Beach Co., Florida.


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